



Hawes Crossing

Master Traffic Impact Analysis

Northwest of Loop 202 and
State Route 24 Interchange
Mesa, Arizona

May 2019
Project No. 17-1390

Prepared For:

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EXECUTIVE SUMMARY

This report documents a master traffic impact analysis performed for the Hawes Crossing project which is located northwest of the State Route 202 (SR-202) and State Route 24 (SR-24) system interchange in Mesa, Arizona. The Hawes Crossing master plan proposes a mixed land use development of approximately 1,132 acres. The development land uses include single family residential, multi-family residential, commercial, office and technology land uses.

The overall development stretches approximately 1¾-miles north-south at its longest point and approximately 1¾-miles east-west at its widest point. The site plan illustrates collector roadways throughout the site. The narrative describes an iconic/interesting north-south roadway parallel to Hawes Road approximately ¼-mile to the west. The current site plan depicts three (3) looped collector roads that service residential areas and one (1) looped collector that services the technology mixed use area. All collector connections to arterial roads are planned to have landscaped entrances. All single family residential zones are located away from arterial roadways whereas all land use types that include commercial, office or technology are located adjacent to the arterial roadways.

The following conclusions and recommendations have been documented in this study:

- ◆ Under the existing conditions, all study intersections are evaluated to operate at a LOS C or better during peak hours.
- ◆ The site is anticipated to generate approximately 103,880 daily trips with 4,067 trips during the AM peak hour and 7,958 trips during the PM peak hour.
- ◆ The recommended lane configurations and traffic controls based on the 2040 projected traffic volumes are presented in **Figure 19** through **Figure 23**.
- ◆ While most signalized intersections are anticipated to operate at overall LOS D or better, some individual movements are anticipated to experience heavy delays during the AM and/or PM peak hours. This is often due to the overall high traffic volumes entering the intersection compared to the intersection's capacity, particularly in turning movements. It is well known that methodology from the NCHRP Report 765 has a tendency to over represent turning movements and underrepresent through volumes when converting AADT to peak hour volumes. Study intersections will likely have reduced turning movement volumes than projected and may operate with lower delays and better LOS than projected.
- ◆ These recommendations are based on the projected 2040 total traffic volumes, which include site traffic volumes using estimated land use densities and background volumes estimated from 2040 AADTs. The recommendations of this study also consider maximum densities of proposed land uses. If the projected is developed at densities near the target densities. Individualized traffic impact analyses are recommended when individual parcels or phases are in the platting stages and overall site plan is updated to incorporate the modifications recommended within this study.
- ◆ The intersection of Hawes Road and Warner Road is expected to experience heavy delays by study horizon year 2040. As shown in **Figure 20**, this intersection is planned for signalization by 2040 the proximity of the Loop 202 interchange to the south is

expected to increase the east/west turning volumes on Warner Road, as well as the north/south through volumes along Hawes Road, increasing delays for these movements. It is recommended this intersection be monitored for future signal timing modification upon buildout of the area.

- ◆ Intersection N along Hawes Road has stop controlled east/west movement(s) that are anticipated to operate with heavy turning movement delays during the PM peak hour. As shown in **Figure 21**, while the spacing of this intersection could be acceptable for signalization, due to the location or proximity of other surrounding intersections, this location is not recommended to be signalized. It is recommended that the roadways internal to the site be designed, and driveways to individual parcels placed, to encourage use of roadways leading to signalized intersections for improved traffic flow characteristics.
- ◆ Per the City of Mesa standards, dual left-turn lanes are required at all arterial to arterial intersections, however, many study intersections analyzed within this analysis only warrant single left-turn lanes. Therefore, it is recommended right-of-way be provided for future dual left-turn lanes at all arterial to arterial intersections with the interim conditions providing a single left-turn lane with the dual left-turn striped out for future use when needed. The following is a list of dual-left turn lane locations that warranted due to projected 2040 intersection delays:
 - Sossaman Road & Elliot Road - southbound
 - Sossaman Road & Warner Road – northbound, southbound, eastbound, westbound
 - Hawes Road & Warner Road - northbound, southbound, eastbound, westbound
 - Hawes Road & Loop 202 EB Ramps - northbound
 - Hawes Road & Loop 202 WB Ramps – southbound
 - Ellsworth Road & Elliot Road – northbound, southbound
 - Ellsworth Road & Warner Road - northbound
- ◆ Per the City of Mesa standards, dedicated right-turn lanes are required at all arterial to arterial intersections. The following is a list of right-turn lanes that will be needed to improve intersection delays.
 - Hawes Road & Guadalupe Road – northbound
 - Power Road & Elliot Road – northbound, southbound, eastbound
 - Sossaman Road & Elliot Road – northbound, southbound, westbound
 - Hawes Road & Elliot Road – eastbound
 - Sossaman Road & Warner Road – northbound, southbound, eastbound
 - Hawes Road & Warner Road – northbound, southbound, eastbound, westbound
 - Hawes Road & Loop 202 WB Ramps – southbound, westbound
 - Ellsworth Road and Warner Road – southbound, eastbound, westbound
 - Intersection B – southbound and eastbound
 - Intersection D – northbound and eastbound
 - Intersection K – eastbound
 - Intersection Q – eastbound

- Intersection Z – southbound
 - Intersection AB – eastbound
 - Intersection AE – southbound, eastbound
 - Intersection AG – southbound, eastbound
 - Intersection AH – northbound
 - Intersection AI – southbound
 - Intersection AJ – eastbound
 - Intersection AK - southbound
- ◆ Free flow right-turn lanes are recommended for the locations listed below to improve intersection delay. It should be noted that the HCM 2016 does not analyze free flow right-turn lanes or clustered diamond traffic interchanges, therefore HCM 2000 methodology was used to analyze all traffic interchanges within the study area. The right-turn lane needs of these intersections should be evaluated with future TIAs of individual phases of the development.
- (Int.5) Guadalupe Road westbound approaching Loop 202 northbound off-ramp
 - (Int.11) Loop 202 northbound off-ramp approaching Elliot Road (dual)
- ◆ Signalization is recommended at all arterial-arterial intersections as well as at the arterial-collector intersections listed below. The City's *Engineering and Design Standards* indicates that signalization of intersections less than 1/8-mile from an arterial (centerline to centerline) or between 1/6-mile and 1/3-mile is not acceptable. Intersections E, F and X are approximately 1/4-mile from Hawes Road and require a variance from the design standards to be signalized. Intersection Y, located on Warner Road approximately 1/8-mile east of Hawes Road, was requested by City staff to be shifted to at least 800 feet east of Hawes Road. Intersections AA and AB are planned future intersections from a different development. Intersection AK is located on Warner Road approximately 1/4-mile west of Ellsworth Road and requires a variance from the design standards to be signalized. Recommended signal locations and spacing are depicted in **Figure 24**.
- (Int.8) 80th Street and Elliot Road ~2,660 feet (1/2-mile) east of Sossaman Road
 - Intersection E at Elliot Road ~1,320 feet (1/4-mile) west of Hawes Road
 - Intersection F at Elliot Road ~1,285 feet ($\leq 1/4$ -mile) east of Hawes Road and ~1,285 feet ($\leq 1/4$ -mile) west of Loop 202 SB Ramps
 - Intersection J at Hawes Road ~810 feet ($\leq 1/6$ -mile) south of Elliot Road
 - Intersection U at Hawes Road ~820 feet ($\leq 1/6$ -mile) north of Warner Road
 - Intersection X at Warner Road ~1,320 feet (1/4-mile) west of Hawes Road
 - Intersection Y at Warner Road ~660 feet (1/8-mile) east of Hawes Road
 - Intersection AA at Elliot Road ~709 feet ($\geq 1/8$ -mile) east of Loop 202 NB Ramps
 - Intersection AB at Elliot Road ~774 feet ($\leq 1/6$ -mile) west of Ellsworth Road

INTRODUCTION

The Hawes Crossing project is located north of State Route 202 (SR-202) and State Route 24 (SR-24) system interchange in Mesa, Arizona. A location map is illustrated in **Figure 1**. The development is a master planned community with a mix of land uses. CivTech Inc. has been retained by Mesa-Casa Grande Land Company, LLC, to prepare a Master Traffic Impact Analysis (MTIA). Hawes Crossing is anticipated to be fully buildout by 2040.

PURPOSE OF REPORT AND STUDY OBJECTIVES

The purpose of this study is to analyze the traffic impacts of the proposed Hawes Crossing project on the surrounding street system and to project general needs of the roadway network to support the project. This MTIA is intended to project overall transportation needs; individual traffic impact analyses are expected to be required as portions of the project are platted. The specific objectives of the study are:

- ◆ To determine whether the planned street system in the vicinity of the site is adequate to accommodate the increased traffic that results from the proposed development;
- ◆ To recommend additional street improvements or traffic control devices, where necessary, to mitigate the site-generated traffic;
- ◆ To evaluate the main site access driveways; and,
- ◆ Evaluate the internal site circulation and provide recommendations if necessary.

Study Area

The scope of this study was discussed with City of Mesa Traffic Engineering Staff. The scope of the study will include the following intersections:

- ◆ Sossaman Road and Guadalupe Road
- ◆ Farnsworth Drive/Bridlewood and Guadalupe Road
- ◆ Hawes Road and Guadalupe Road
- ◆ SR-202 SB Ramps and Guadalupe Road
- ◆ SR-202 NB Ramps and Guadalupe Road
- ◆ Power Road and Elliot Road
- ◆ Sossaman Road and Elliot Road
- ◆ 80th Street and Elliot Road
- ◆ Hawes Road and Elliot Road
- ◆ SR-202 SB Ramps and Elliot Road
- ◆ SR-202 NB Ramps and Elliot Road
- ◆ Hawes Road and SR-202 WB Ramps
- ◆ Hawes Road and SR-202 EB Ramps
- ◆ Ellsworth Road and Elliot Road
- ◆ Ellsworth Road and Warner Road

Analysis Years

Per discussion with the City of Mesa, this study will consider a horizon year of 2040.

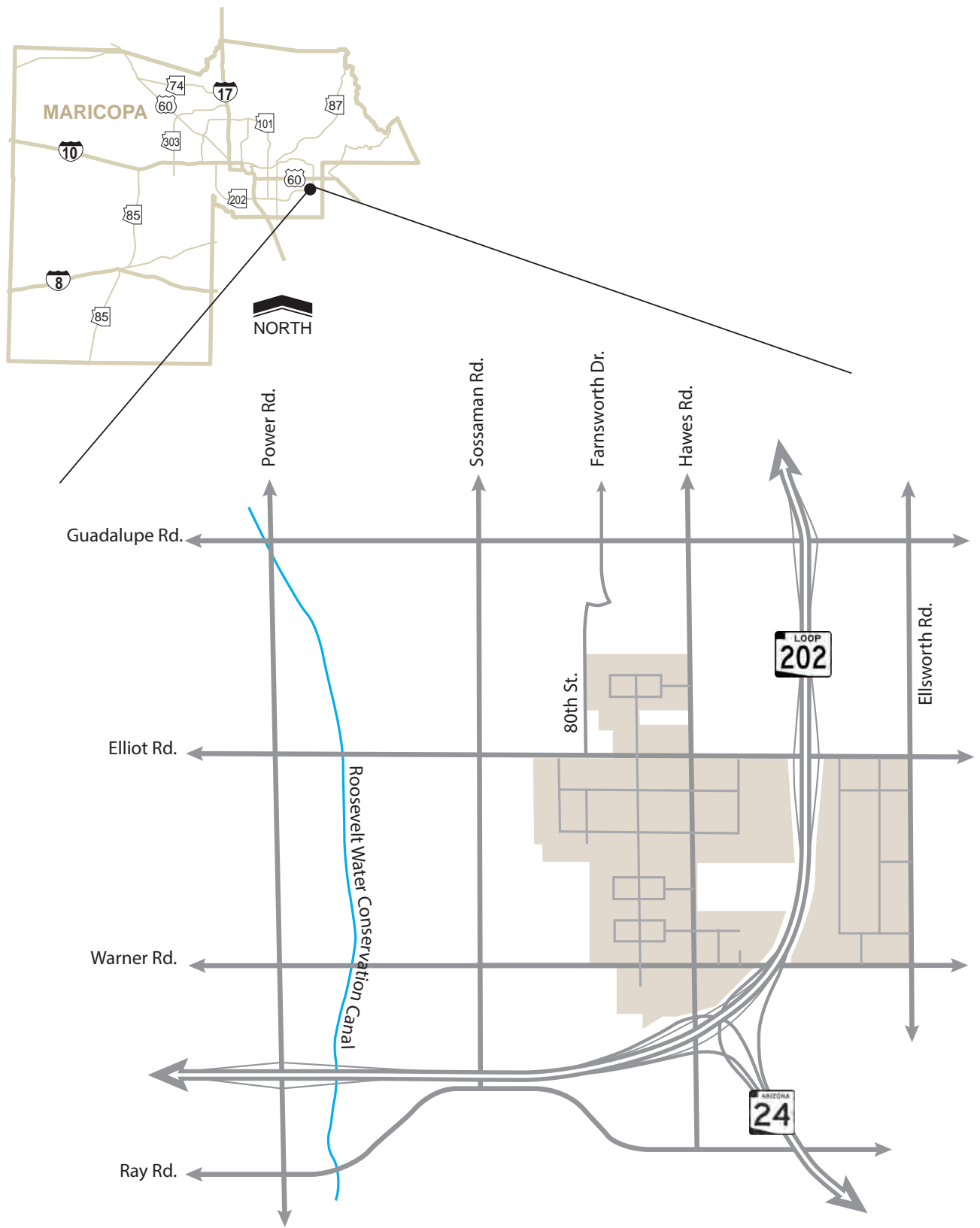


Figure 1: Vicinity Map

EXISTING CONDITIONS

EXISTING AND SURROUNDING LAND USE

The site consists of multiple parcels. Several of the parcels include dairy farms or are vacant desert land. The site also includes some existing single family homes, light industrial and agriculture land uses.

Land uses surrounding the site include residential housing, light industrial, and vacant parcels.

ROADWAY NETWORK

State Route 202 (SR-202) is located along portions of the development's southern and eastern border. SR-24 begins at SR-202 adjacent to the site. The roadway network within the study area includes Guadalupe Road, Elliot Road, Warner Road, Sossaman Road, Hawes Road, 80th Street, Farnsworth Drive/Bridlewood and Ellsworth Road.

Guadalupe Road is an east-west roadway classified as a principal arterial within Figure 2-2 of the *Mesa Gateway Strategic Development Plan, Transportation Analysis Memorandum*, dated January 23, 2009. Guadalupe Road traverses the East Phoenix Metropolitan Area, beginning west of the Meridian Road alignment in Mesa and continuing west through Tempe, until terminating at South Pointe Parkway in Phoenix. Guadalupe Road provides direct access to SR-202 (San Tan Freeway) and State Route 101 ("Loop 101" - Price Freeway). Within the vicinity of the site, Guadalupe Road has a posted speed limit of 45 mph and generally consists of three (3) through lanes and a bike lane in each direction, separated by a center two-way left-turn lane (CTWLT).

Elliot Road is an east-west roadway classified as a principal arterial within the *Mesa Gateway Strategic Development Plan*. Elliot Road traverses the East Phoenix Metropolitan Area, beginning at Meridian Road in Mesa and continuing west through Tempe, becoming the Warner Elliot Loop in Phoenix. Elliot Road provides direct access to SR-202 (San Tan Freeway), State Route 101 (Price Freeway) and I-10. Within the study area, Elliot Road has a posted speed limit of 45 mph and consists of one (1) through lane in each direction.

Warner Road is an east-west roadway functionally classified as a collector west of Ellsworth Road and as principal arterial east of Ellsworth Road within the *Mesa Gateway Strategic Development Plan*. Warner Road traverses the East Phoenix Metropolitan Area, beginning at Meridian Road in Mesa and continuing west through Tempe, becoming the Warner Elliot Loop in Phoenix. Warner Road provides direct access to SR-202 (San Tan Freeway), Loop 101 (Price Freeway) and I-10. Warner Road has not been constructed between the Roosevelt Water Conservation Canal and Sossaman Road. Within the study area, Warner Road has a posted speed limit of 40 mph and consists of one (1) through lane in each direction.

Sossaman Road is a north-south roadway functionally classified as a principal arterial within the *Mesa Gateway Strategic Development Plan* north of Elliot Road, a collector between Elliot Road and Warner Road and a principal arterial south of Phoenix-Mesa Gateway Airport. Sossaman Road begins north of University Drive in Mesa and terminates south of Hunt Highway in Queen Creek. Sossaman Road provides direct access to US-60 (to/from the west only). Sossaman Road has not been constructed between Warner Road and the Phoenix-Mesa Gateway Airport. North of Guadalupe Road, Sossaman Road consists of one (1) northbound lane a two-way left turn lane and two (2) southbound lanes with bike lanes in both directions. Between Guadalupe Road and Peralta Avenue (1/2-mile street south Guadalupe Road), Sossaman Road has a fully constructed width for a 4-lane arterial, though the roadway transitions with striping to a 2-lane roadway south of Peralta Avenue. Sossaman Road has a posted speed limit of 45 mph north of Elliot Rad and 40 mph south of Elliot Road.

Hawes Road is a north-south roadway functionally classified as a principal arterial within the *Mesa Gateway Strategic Development Plan*. Hawes Road is a series of roadway segments, the northernmost in Mesa between Las Sendas Mountain Drive and McKellips Road and the southernmost in Queen Creek between Rittenhouse Road and south of Empire Boulevard. North of Guadalupe Road, Hawes Road has a posted speed limit of 40 mph and has width sufficient for a 4-lane arterial but is striped with three (3) northbound through lanes and one (1) southbound through lane, with a two-way left turn lane and bike lanes in both directions. Hawes Road narrows to the south. South of Guadalupe Road, Hawes Road has a posted speed limit of 35 mph and consists of one (1) through lane and bike lanes in both directions with a two-way left-turn lane until south of Peralta Avenue (1/2-mile street south Guadalupe Road), where Hawes Road is a two-lane road.

80th Street is a north-south 2-lane, unstriped roadway within the vicinity of the site that has a posted speed limit of 35 mph. The street is not depicted within the *Mesa Gateway Strategic Development Plan*, though this study considers the roadway to be a collector within the study area. The northern 80th Street segment within the study area begins at Portobello Avenue (approximately 1,500 feet south of Guadalupe Road) and terminates at Elliot Road. The southern 80th Street segment within the study area begins approximately 2,300 feet north of Warner Road and terminates at Warner Road.

Farnsworth Drive/Bridlewood is a north-south 2-lane roadway within the vicinity of the site. Neither street is depicted within the *Mesa Gateway Strategic Development Plan*, though this study considers the streets to be collectors within the study area. Farnsworth Drive is a residential collector with a posted speed limit of 35 mph and has a raised center median that begins at Baseline Road and terminates at Guadalupe Road. Bridlewood continues from Guadalupe Road at the Farnsworth Drive alignment as a residential collector, has speed limit of 20 mph and terminates at Portobello Avenue.

Ellsworth Road is a north-south roadway functionally classified as a principal arterial within the *Mesa Gateway Strategic Development Plan*. Ellsworth Road begins north at McDowell Road where it transitioning from Userly Pass Road and terminates south in Queen Creek where it transitions into Hunt Highway. Ellsworth Road provides access to SR-202 and US-60. Within the vicinity of the site, Ellsworth Road has a posted speed limit of 50 mph and consists of a 4-lane roadway divided by a center raised median.

INTERSECTION CONFIGURATIONS AND TRAFFIC CONTROLS

The intersection of **Sossaman Road and Guadalupe Road** is a four-legged signalized intersection. All left-turn movements operate with permitted phasing. The northbound approach consists of an exclusive left-turn lane, one (1) through lane, a bike lane and an exclusive right-turn lane. The southbound approach consists of an exclusive left-turn lane, two (2) through lanes, a bike lane and an exclusive right-turn lane. The eastbound approach consists of an exclusive left-turn lane, three (3) through lanes and a bike lane; right-turns are permitted from the outside through lane. The westbound approach consists of an exclusive left-turn lane, three (3) through lanes, a bike lane and an exclusive right-turn lane.

The intersection of **Farnsworth Drive/Bridlewood and Guadalupe Road** is a four-legged signalized intersection. All left-turn movements operate with permitted phasing. The northbound approach consists of an exclusive left-turn lane and a shared through/right-turn lane. The southbound approach consists of an exclusive left-turn lane, a shared through/right-turn lane and a bike lane. The eastbound approach consists of an exclusive left-turn lane, two (2) through lanes, a bike lane and a drop right-turn lane. The westbound approach consists of an exclusive left-turn lane, three (3) through lanes and a bike lane; right-turns are permitted from the outside through lane.

The intersection of **Hawes Road and Guadalupe Road** is a four-legged signalized intersection. All left-turn movements operate with permitted phasing. The northbound approach consists of an exclusive left-turn lane and a shared through/right-turn lane. The southbound approach consists of an exclusive left-turn lane, one (1) through lane, a bike lane and an exclusive right-turn lane. The eastbound approach consists of an exclusive left-turn lane, one (1) through lane and a drop right-turn lane. The westbound approach consists of an exclusive left-turn lane, three (3) through lanes, a bike lane and an exclusive right-turn lane.

The intersection of **SR-202 SB Ramps and Guadalupe Road** is a four-legged signalized intersection. The left-turn movement approaching the on ramp operates with lagging protected phasing. The south leg is a one-way on-ramp. The southbound approach consists of an exclusive left-turn lane, a shared left/right-turn lane and an exclusive right-turn lane. The eastbound approach consists of two (2) queueing lanes approaching the northbound on ramp, three (3) through lanes, a bike lane and an exclusive right-turn lane. The westbound approach consists of dual left-turn lanes, three (3) through lanes and a bike lane.

The intersection of **SR-202 NB Ramps and Guadalupe Road** is a four-legged signalized intersection. The left-turn movement approaching the on ramp operates with lagging protected phasing. The north leg is a one-way on-ramp. The northbound approach consists of an exclusive left-turn lane, a shared left/through/right-turn lane and an exclusive right-turn lane. The eastbound approach consists of dual left-turn lanes, three (3) through lanes and a bike lane. The westbound approach consists of two (2) queueing lanes approaching the southbound on ramp, three (3) through lanes, a bike lane and an exclusive right-turn lane.

The intersection of **Power Road and Elliot Road** is a four-legged signalized intersection. All left-turn movements operate with permitted phasing. The north- and southbound approaches consist of an exclusive left-turn lane and two (2) through lanes; right-turns are permitted from the outside through lane. The east- and westbound approaches consist of an exclusive left-turn lane and a shared through/right-turn lane.

The intersection of **Sossaman Road and Elliot Road** is a four-legged signalized intersection. All left-turn movements operate with permitted phasing. All approaches consist of an exclusive left-turn lane and a shared through/right-turn lane.

The intersection of **80th Street and Elliot Road** is a three-legged, one-way stop controlled intersection with the southbound approach stop controlled. All approaches provide a single approach lane.

The intersection of **Hawes Road and Elliot Road** is a four-legged, two-way stop controlled intersection with the north- and southbound approaches stop controlled. All approaches provide a single approach lane.

The intersection of **SR-202 SB Ramps and Elliot Road** is a four-legged signalized intersection. The left-turn movement approaching the on ramp operates with lagging protected phasing. The south leg is a one-way on-ramp. The southbound approach consists of an exclusive left-turn lane, a shared left/through/right-turn lane and an exclusive right-turn lane. The eastbound approach consists of two (2) queueing lanes approaching the northbound on ramp, two (2) through lanes and an exclusive right-turn lane. The westbound approach consists of dual left-turn lanes and two (2) through lanes.

The intersection of **SR-202 NB Ramps and Elliot Road** is a four-legged signalized intersection. The left-turn movement approaching the on ramp operates with lagging protected phasing. The north leg is a one-way on-ramp. The northbound approach consists of an exclusive left-turn lane, a shared left/through/right-turn lane and an exclusive right-turn lane. The eastbound approach consists of dual left-turn lanes and three (3) through lanes. The westbound approach consists of two (2) queueing lanes approaching the southbound on ramp, two (2) through lanes, and an exclusive right-turn lane. Current construction in the area closes several of the intersection's approach lanes.

The intersection of **Hawes Road and SR-202 WB Ramps** is a four-legged signalized intersection. The left-turn movement approaching the on ramp operates with protected phasing. The northbound approach consists of a single left-turn lane. The north leg is a barricaded dead end. The west leg is a one-way on-ramp. The westbound approach consists of an exclusive left-turn lane and a shared left-turn/through lane.

The intersection of **Hawes Road and SR-202 EB Ramps** is a four-legged signalized intersection. The left-turn movement approaching the on ramp operates with lagging protected phasing. The northbound approach consists of one (1) queueing lane approaching the westbound on ramp and an exclusive right-turn lane. The southbound approach consists of an exclusive left turn lane and two (2) through lanes. The eastbound approach consists of an exclusive left-turn lane, one (1) through lane and an exclusive right-turn lane. The east leg is a one-way on-ramp.

The intersection of **Ellsworth Road and Elliot Road** is a four-legged signalized intersection. All left-turn movements operate with protected-permitted phasing. The north and southbound approaches consists of an exclusive left-turn lane, two (2) through lanes, a bike lane and an exclusive right-turn lane. The east and westbound approaches consists of an exclusive left-turn lane, two (2) through lanes, and an exclusive drop right-turn lane.

The intersection of **Ellsworth Road and Warner Road** operates as three-legged, one-way stop controlled intersection with the eastbound stop controlled. The northbound approach consists of an exclusive left-turn lane, a through lane, a shared through-right-turn lane and a bike lane. The southbound approach consists of an exclusive left-turn lane (for future use), a through lane, a shared through/right-turn lane and a bike lane. The eastbound approach consists of a shared through/right-turn lane.

The existing lane configurations are illustrated in **Figure 2** and **Figure 3**.

TRAFFIC VOLUMES

Field Data Services of Arizona was retained to conduct AM and PM peak hour turning movement counts at the study intersections. The counts for most intersections were performed on Tuesday, October 3, 2017 from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM. The counts for the intersections of Ellsworth Road/Elliot Road and Ellsworth Road/Warner Road were performed on Tuesday August 12, 2018 from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM. **Figure 4** depicts the recorded peak hour turning movement volumes within the study area. Traffic volume summaries are provided in **Appendix B**.

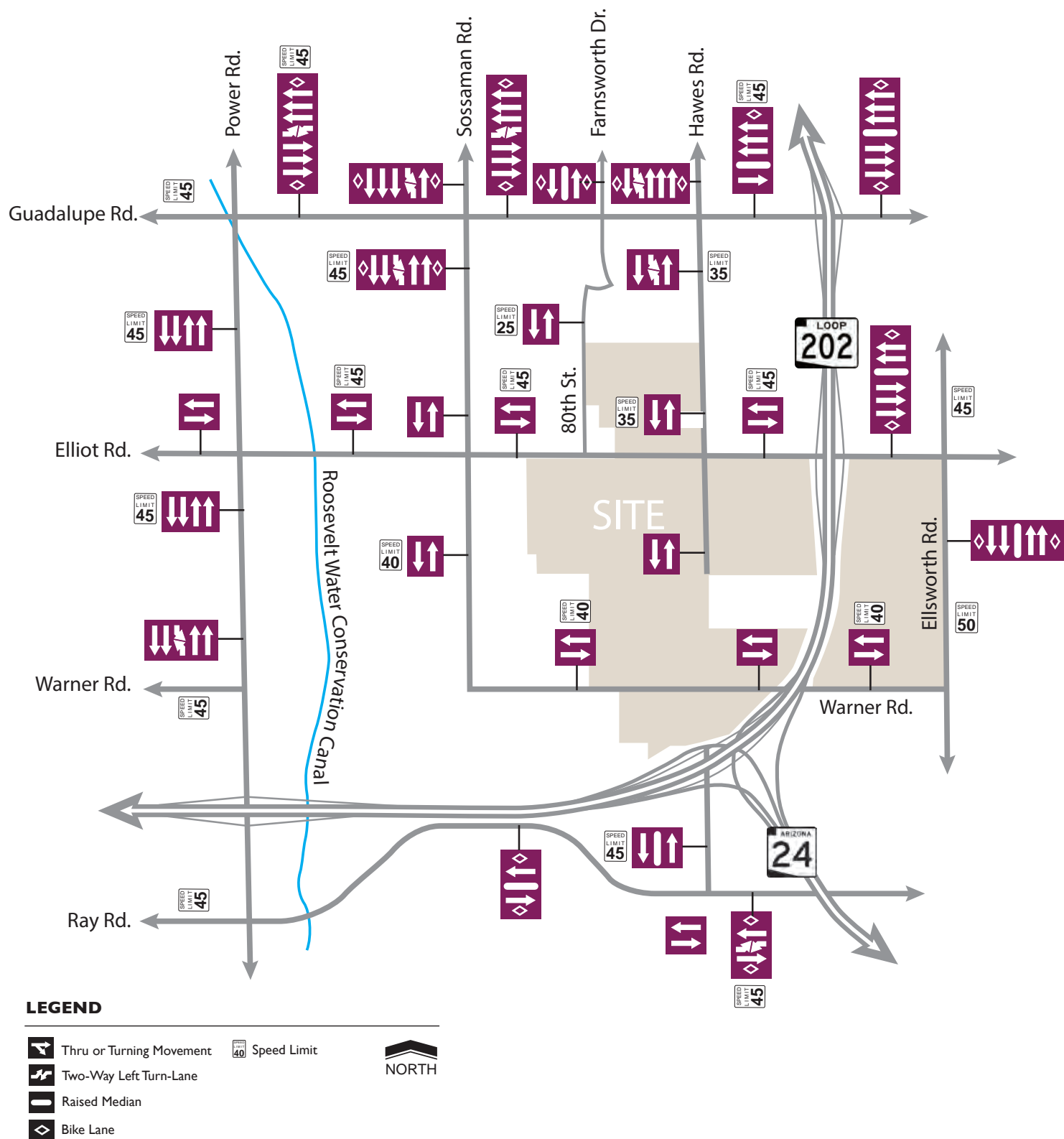


Figure 2: Existing Roadway Segment Configurations

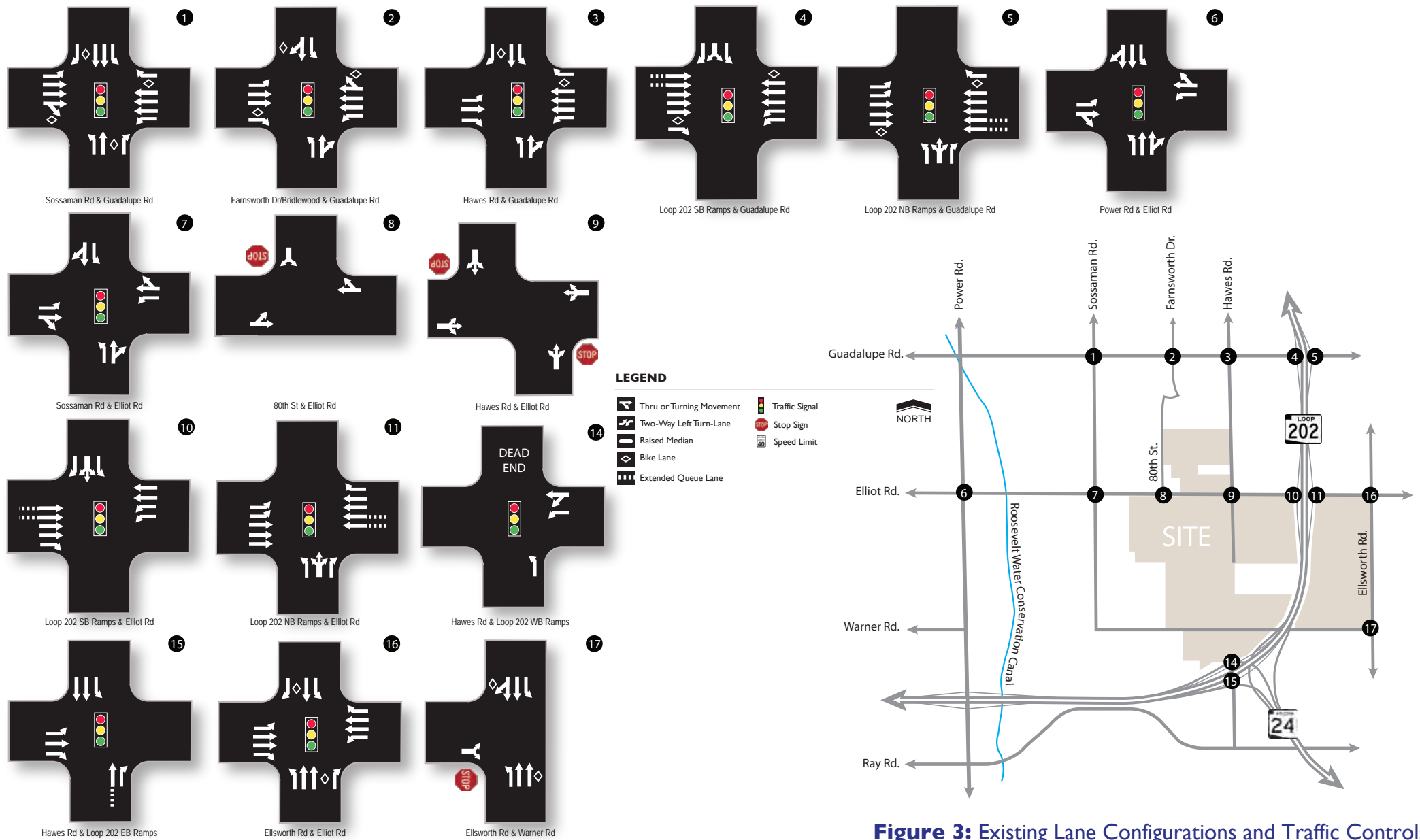
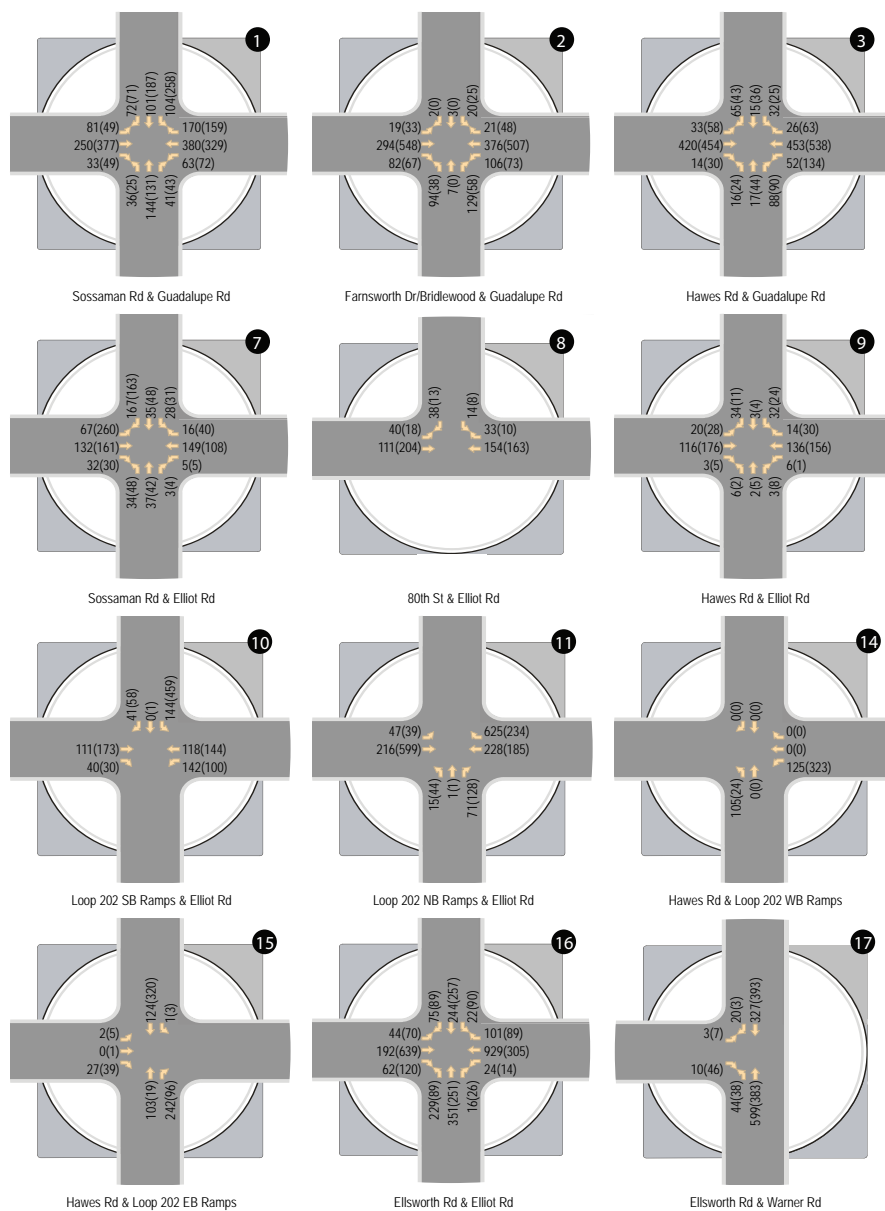


Figure 3: Existing Lane Configurations and Traffic Controls



LEGEND

XX(XX) - AM(PM) Peak Hour Traffic Volumes

XX Average Daily Traffic Volumes (in thousands)

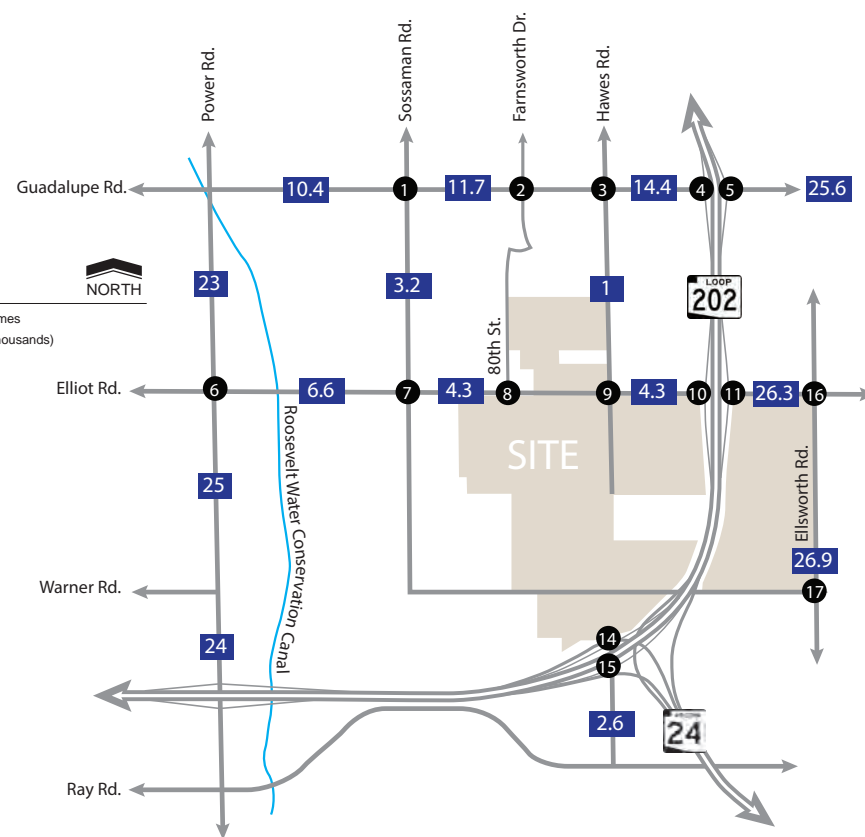


Figure 4: Existing Traffic Volumes

CAPACITY ANALYSIS

The concept of level of service (LOS) uses qualitative measures that characterize operational conditions within the traffic stream. The individual levels of service are described by factors that include speed, travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Six levels of service are defined for each type of facility for which analysis procedures are available. They are given letter designations A through F, with LOS A representing the best operating conditions and LOS F the worst. Each level of service represents a range of operating conditions. Levels of service for intersections are defined within ranges of average control delay per vehicle, the number of seconds a vehicle can expect to wait due to the presence of a traffic control device. **Table 1** lists the level of service criteria for signalized and unsignalized intersections.

Table 1: Intersection Level of Service Criteria

Level of Service	Control Delay (sec/veh)	
	Signalized	Unsignalized
A	≤ 10	≤ 10
B	> 10-20	> 10-15
C	> 20-35	> 15-25
D	> 35-55	> 25-35
E	> 55-80	> 35-50
F*	> 80 (or v/c>1)	> 50 (or v/c>1)

Source: Exhibits 19-8, 20-2, 21-8, and 22-8, Highway Capacity Manual 2017

Synchro 10 software using the methodologies of the latest (6th) edition of the Highway Capacity Manual (HCM 6) were used to calculate average per-movement control delays, from which movement, approach, and overall intersection levels of service with the exception of the existing Loop 202 traffic interchange locations. Since HCM 6th edition cannot support clustered diamond interchanges HCM 2000 methodology was used to calculate LOS for each existing traffic interchange location. A 90-second cycle with Synchro optimized phasing and splits were used to analyze all study signalized intersections with the exception of the Loop 202 traffic interchanges which used a 120-second cycle length. The capacity analysis for the AM and PM peak hours under existing conditions are summarized in **Table 2**. Existing analysis worksheets have been included in **Appendix C**.

Table 2: 2018 Existing Peak Hour Levels-of-Service

ID	Intersection	Traffic Control	Movement	Existing Delay (LOS)	
				AM	PM
1	Sossaman Road & Guadalupe Road	Signal	NB	17.4 (B)	10.3 (B)
			SB	18.5 (B)	13.2 (B)
			EB	15.8 (B)	24.0 (C)
			WB	24.6 (C)	32.1 (C)
			Overall	20.2 (C)	21.9 (C)
2	Farnsworth Drive/Bridlewood & Guadalupe Road	Signal	NB	20.7 (C)	24.1 (C)
			SB	21.8 (C)	25.5 (C)
			EB	21.8 (C)	20.7 (C)
			WB	13.8 (B)	10.3 (B)
			Overall	18.1 (B)	16.4 (B)
3	Hawes Road & Guadalupe Road	Signal	NB	28.6 (C)	29.5 (C)
			SB	28.4 (C)	28.3 (C)
			EB	10.0 (A)	10.3 (B)
			WB	8.2 (A)	9.4 (A)
			Overall	12.7 (B)	13.1 (B)

Table 2 (Continued): 2018 Existing Peak Hour Levels-of-Service

ID	Intersection	Traffic Control	Movement	Existing Delay (LOS)	
				AM	PM
4	SR-202 SB Ramps & Guadalupe Road	Signal	SB	40.6 (D)	36.8 (D)
			EB	22.7 (C)	33.3 (C)
			WB	15.0 (B)	24.6 (C)
			Overall	22.8 (C)	32.8 (C)
5	SR-202 NB Ramps & Guadalupe Road	Signal	NB	48.6 (D)	27.4 (C)
			EB	27.0 (C)	32.5 (C)
			WB	30.0 (C)	31.8 (C)
			Overall	30.6 (C)	31.4 (C)
6	Power Road & Elliot Road	Signal	NB	16.4 (B)	15.2 (B)
			SB	13.4 (B)	17.2 (B)
			EB	32.2 (C)	35.5 (D)
			WB	29.6 (C)	48.9 (D)
7	Sossaman Road & Elliot Road	Signal	Overall	19.0 (B)	22.3 (C)
			NB	16.8 (B)	28.0 (C)
			SB	17.0 (B)	28.3 (C)
			EB	18.2 (B)	12.6 (B)
8	80 th Street & Elliot Road	1-way stop (SB)	WB	17.5 (B)	9.7 (A)
			Overall	17.5 (B)	17.7 (B)
			SB left/right	9.9 (A)	9.9 (A)
			EB left/thru	7.7 (A)	7.6 (A)
9	Hawes Road & Elliot Road	2-way stop (NB/SB)	NB shared	10.9 (B)	10.9 (B)
			SB shared	10.7 (B)	12.0 (B)
			EB shared	1.1 (A)	1.0 (A)
			WB shared	0.3 (A)	0.0 (A)
10	SR-202 SB Ramps & Elliot Road	Signal	SB	42.1 (D)	25.8 (C)
			EB	12.5 (B)	28.3 (C)
			WB	24.9 (C)	21.3 (C)
			Overall	27.1 (C)	25.2 (C)
11	SR-202 NB Ramps & Elliot Road	Signal	NB	40.5 (C)	22.2 (C)
			EB	19.6 (B)	31.3 (C)
			WB	20.5 (C)	43.0 (D)
			Overall	21.7 (C)	34.0 (C)
14	Hawes Road & SR-202 WB Ramps	Signal	NB	18.3 (B)	24.2 (C)
			WB	20.3 (B)	15.1 (B)
			Overall	19.4 (B)	15.7 (B)
15	Hawes Road & SR-202 EB Ramps	Signal	NB	37.9 (D)	39.2 (D)
			SB	27.9 (C)	35.4 (D)
			EB	36.6 (D)	47.9 (D)
			Overall	35.3 (D)	37.5 (D)
16	Ellsworth Road & Elliot Road	Signal	NB	36.1 (D)	43.3 (D)
			SB	46.0 (D)	41.9 (D)
			EB	8.2 (A)	8.9 (A)
			WB	25.7 (C)	16.8 (B)
17	Ellsworth Road & Warner Road	1-way Stop (EB)	Overall	29.2 (C)	23.7 (C)
			NB Left	0.6 (A)	8.4 (A)
			EB Left	16.9 (C)	15.8 (C)
			EB Right	9.5 (A)	9.9 (A)

Under the existing conditions, all study intersections are evaluated to operate overall at LOS D or better during the peak hours.

PROPOSED DEVELOPMENT

The Hawes Crossing master plan proposes a mixed land use development of approximately 1,132 gross acres. The development land uses include single family residential, multi-family residential, commercial, office and technology land uses. The site plan indicates the following land use zones:

Single Family Residential (+156 gross acres) with a density of 3.5-5.0 dwelling units (DU) per acre. This study analyzes the target density of 4.5 single family DU's per acre.

Medium/High Density Residential (+280 gross acres) with a density of 5.5-10.0 DU per acre. This study analyzes the target density of 8.0 multi-family DU's per acre.

Urban Density Residential (+57 gross acres) with a density of 10.5 – 25.0 DU per acre. This study analyzes the target density of 16.5 apartment DU's per acre.

Urban Mixed Use (+344 gross acres) with a density of 6.0 – 12.0 DU per acre with commercial retail/restaurant on the ground floor. This study analyzes the target density 8.0 apartment DU's per acre for the residential component and a floor-to-area ratio (FAR) of 0.4 to determine the square footage of the commercial uses.

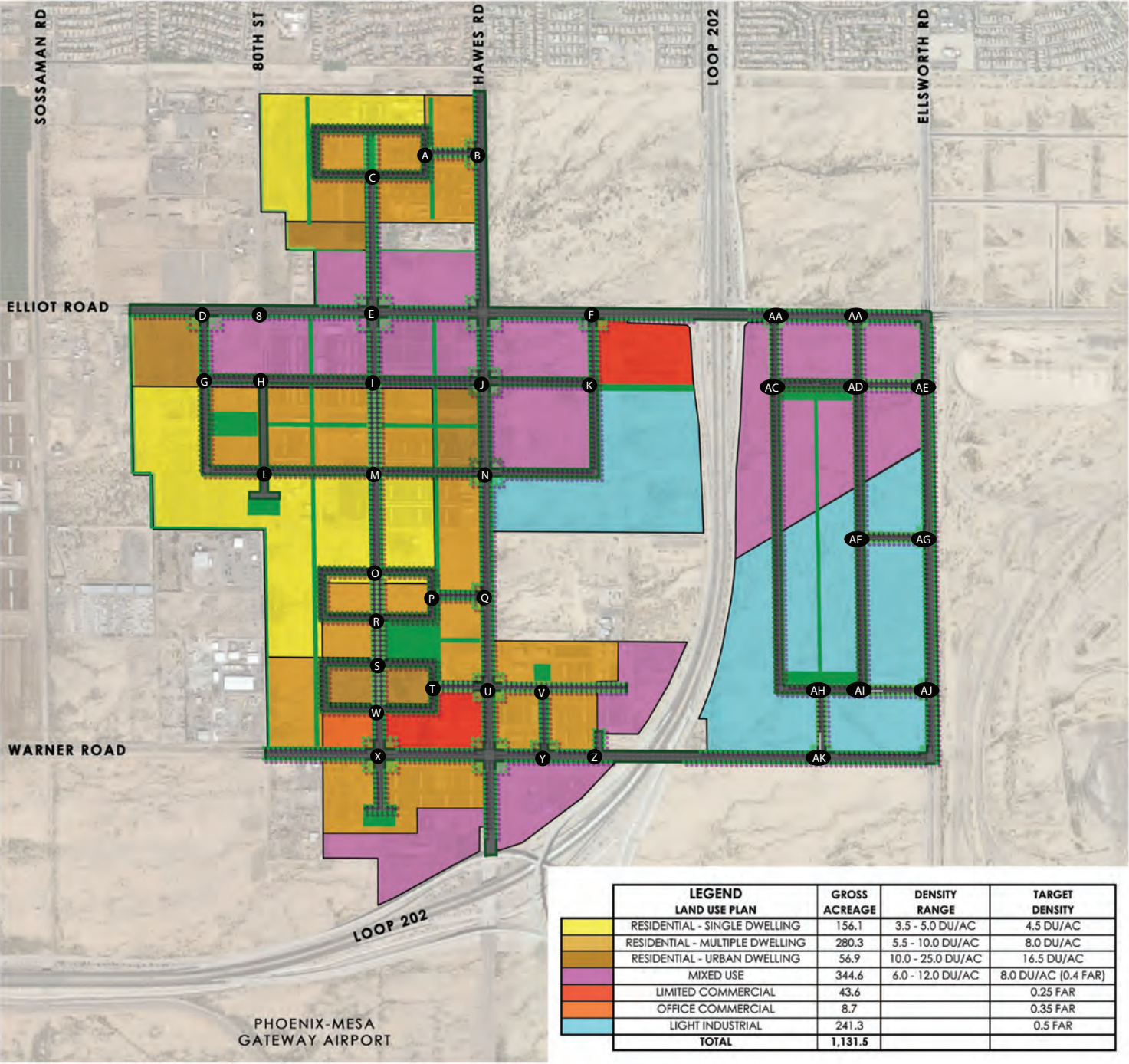
Light Industrial (+241 gross acres) is intended to focus on industrial uses. This study analyzes this land use as general light industrial as characterized by the Institute of Transportation Engineers' (ITE) land use code (LUC) 110. This study analyzes the target intensity FAR of 0.5 to determine the square footage of the industrial uses.

Commercial (+44 gross acres) - this study analyzes the square footage determined by a floor-to-area ratio (FAR) of 0.25.

Office (+9 gross acres) - this study analyzes the square footage determined by a floor-to-area ratio (FAR) of 0.35.

The listed gross acreages include parks, open space, future roadways and right-of-way. City of Mesa Staff requested a change to the collector road access (previously only one) to Elliot Road, west of Loop 202. The changes resulted in a second roadway and access and the land use on the southwest corner of Elliot Road and Ellsworth Road was changed from urban density residential to mixed-use.

The portion of the site located to the east of Loop 202 consists predominantly of mix-use/light industrial land use. The remainder of the land uses are located north/west of Loop 202. Urban mixed use, commercial, office and urban density residential parcels all have frontage along arterial roadways and Loop 202 whereas none of the single-family parcels are adjacent to arterial roadways or Loop 202. The planned layout of the site is illustrated in **Figure 5**.



Note: Private Driveways are Assumed to Parcels Containing Commercial Land Use.

Figure 5: Site Plan and Access

SITE ACCESS AND CIRCULATION

The overall development stretches approximately 1¾-miles north-south at its longest point and approximately 1½-miles east-west at its widest point and will provide a number of access points. The site plan illustrates collector roadways throughout the site. The site plan illustrates collector roadways throughout the site. The narrative describes an iconic/interesting north-south roadway parallel to Hawes Road approximately ¼-mile to the west. The current site plan depicts three (3) looped collector roads that service residential areas and one (1) looped collector that services the technology mixed-use area. All collector connections to arterial roads are planned to have landscaped entrances. All single family residential zones are located away from arterial roadways whereas all land use types that include commercial, office or technology are located adjacent to the arterial roadways.

Included within this study are 37 new, site related intersections generally labeled alphabetically west to east and north to south. Where commercial land uses are present, driveways are assumed, although these will not be analyzed for LOS at this planning stage.

PROJECTED TRAFFIC VOLUMES

SITE TRIP GENERATION

The potential trip generation for the proposed development was estimated utilizing the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th Edition* and *Trip Generation Handbook, 3rd Edition*. The ITE *Trip Generation Manual* contains data collected by various transportation professionals for a wide range of different land uses. The data are summarized in the report and average rates and equations have been established that correlate the relationship between an independent variable that describes the development size and generated trips for each categorized land use. The report provides information for daily and peak hour trips.

Internal Capture

According to data presented by ITE in the Trip Generation handbook, trips attracted to commercial and retail land uses are often shared. This means that a single trip (vehicle) to the proposed mixed-use parcels within the Hawes Crossing development may visit other generators within the same parcels during the same visit, a phenomenon known as “internal interaction.” For example, residents within the areas designated as Urban Mixed Use may use the retail/restaurant land uses within the same parcel. The methodology published by ITE was used to calculate an appropriate internal reduction which was found to be approximately 10% for the multifamily land uses and 30% for the commercial land uses. This study applies the respective percentages to the AM peak hour, PM peak hour and the daily external trips.

Pass-by Trips A portion of the traffic entering and exiting the site may be estimated to come from traffic already on the external street system. The term ‘pass-by’ trips refers to traffic already traveling on a study roadway adjacent to the site from an external origin to an external destination outside of the study area that visits the proposed site (such as a commercial parcel) on the way to its destination. Although a portion of trips to/from the retail/restaurant portion of the site could be pass-by trips, to be conservative, this study does not include any reductions to account for expected pass-by trips.

Table 3 summarizes the trip generation estimate of the development based on the land use types, densities and sizes. Detailed trip generation calculations are included in **Appendix D**.

Table 3: Trip Generation Summary

Land Use	ITE LUC	Size		Weekday Trips Generated					
				Daily		AM Peak Hour		PM Peak Hour	
				Total	Enter	Exit	Total	Enter	Exit
Homes	210	703	DU	6,384	127	381	508	420	247
Apartments	221	4,126	DU	22,484	345	984	1,329	988	631
Commercial	820	2,456	KSF	63,146	949	582	1,531	3,203	3,470
Office	710	133	KSF	1,396	130	21	151	24	125
Light Industrial	110	7,518	KSF	28,612	1,108	151	1,259	112	752
Totals (Prior to Adjustments)				122,022	2,659	2,119	4,778	4,747	5,225
Internal Capture				(18,142)	(310)	(250)	(560)	(902)	(963)
Totals				103,880	2,349	1,869	4,218	3,026	6,403

The site is anticipated to generate approximately 103,880 daily trips with 4,218 trips during the AM peak hour and 6,403 trips during the PM peak hour.

DIRECTIONAL DISTRIBUTION AND TRIP ASSIGNMENT

Three (3) distribution patterns were used for this study. It is expected that the majority of the trips generated during the peak hours by the residential components of the site would travel to/from places of employment external to the study area which estimated approximately 80% of the residential trips to travel to/from the Loop 202 freeway. Trips generated by the commercial would be to/from housing in the general vicinity, and office/industrial land uses would use major freeways and routes to travel to/from work from different residential areas not within the vicinity of the site. The directional distribution of population and employment in the general vicinity, based on projected socioeconomic data published by Maricopa Association of Governments, were used as a basis for evaluating likely travel directions of trips to/from the site. It is expected that drivers will use major routes and freeways where convenient. The trip distribution applied in this study is shown in **Table 4** and depicted in **Figure 6**.

Trip distribution calculations are included in **Appendix E**. The percentages presented in **Table 4** were applied to the trips generated to determine the AM and PM peak hour site traffic at the intersections within the study area. **Figure 7**, **Figure 8**, **Figure 9** and **Figure 10** present the resulting site generated traffic volumes for intersections 1 through 15, A through N and O through Z, and 16 through 17 plus AA through AK, respectively.

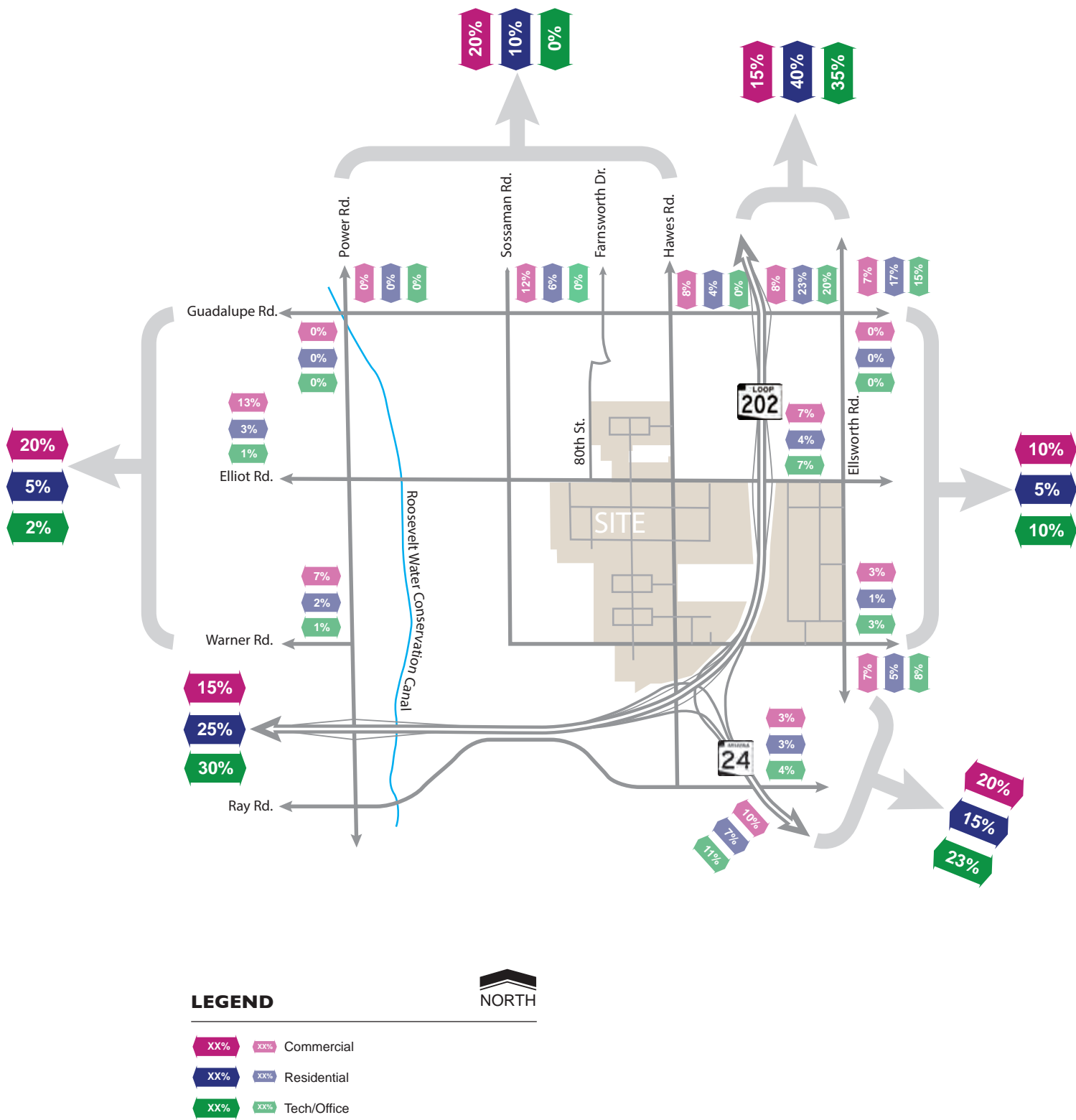


Figure 6: Trip Distribution

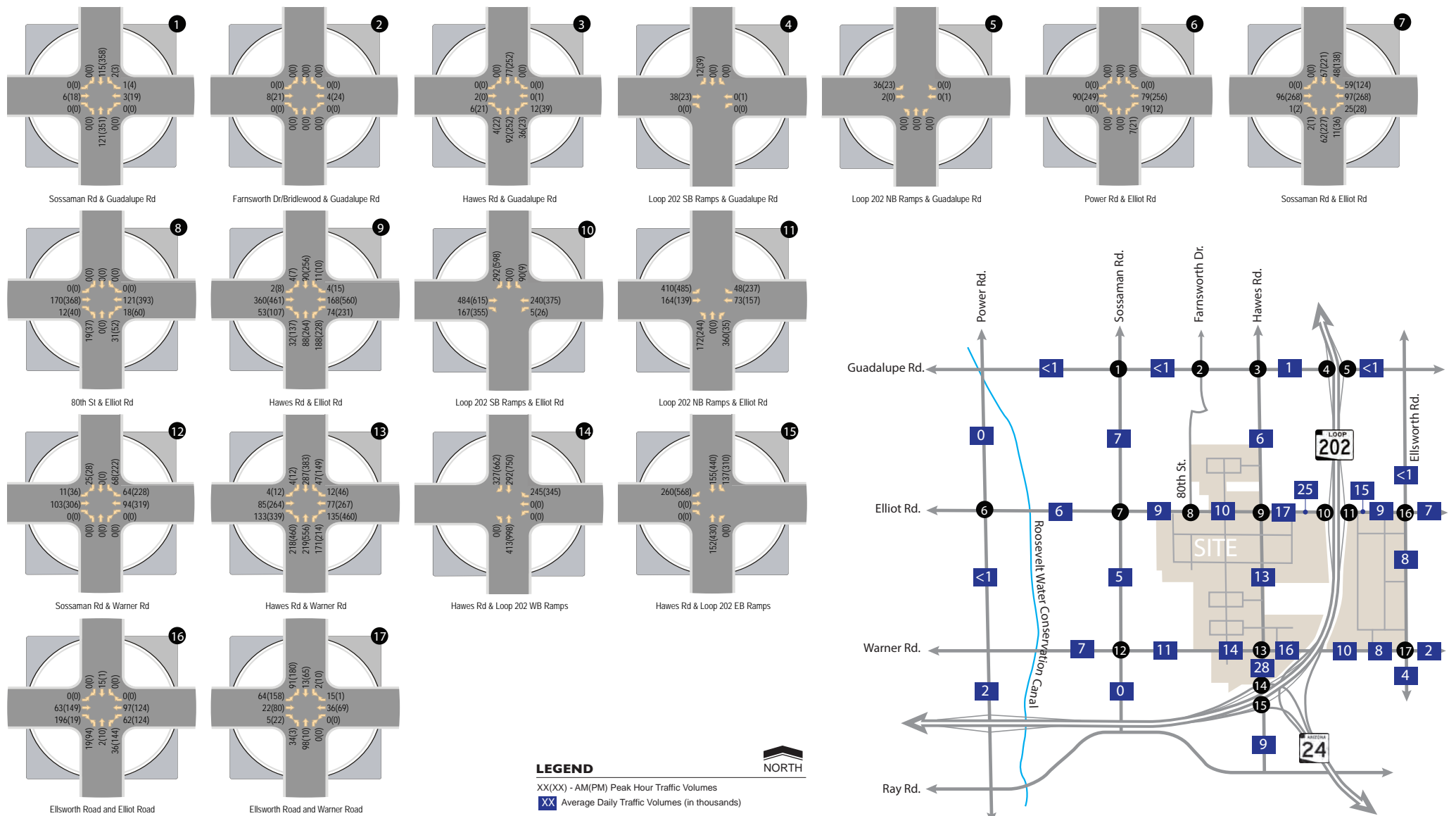


Figure 7: Site Generated Traffic Volumes A

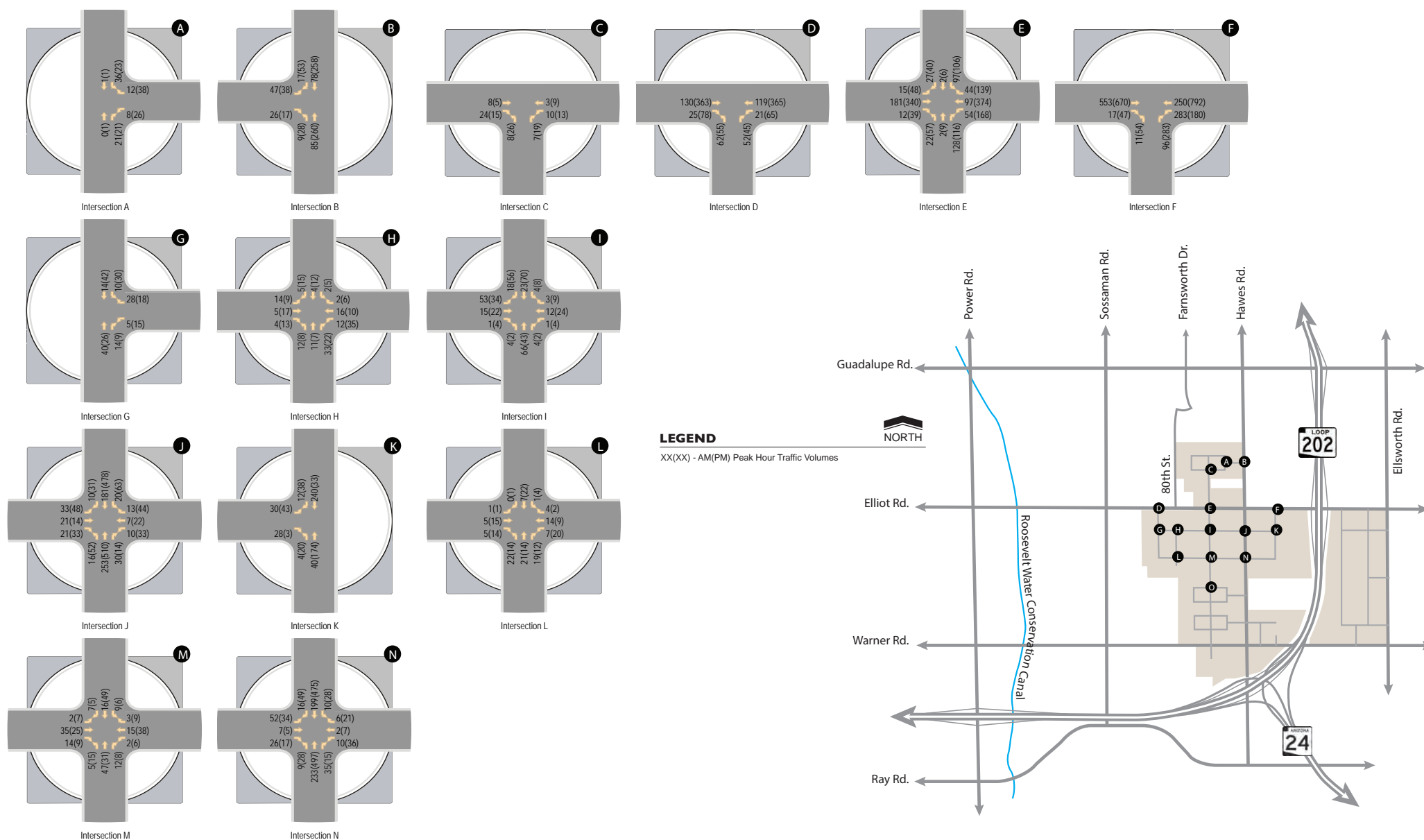
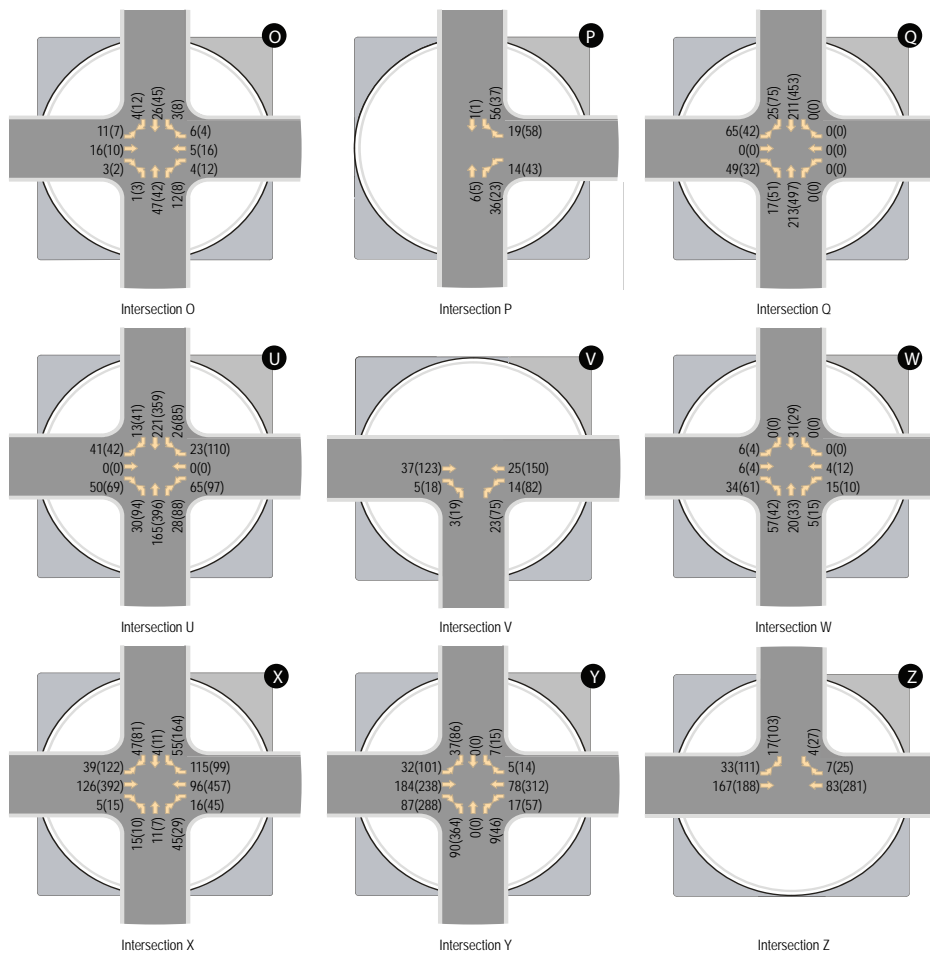


Figure 8: Site Generated Traffic Volumes B



LEGEND

XX(XX) - AM(PM) Peak Hour Traffic Volumes

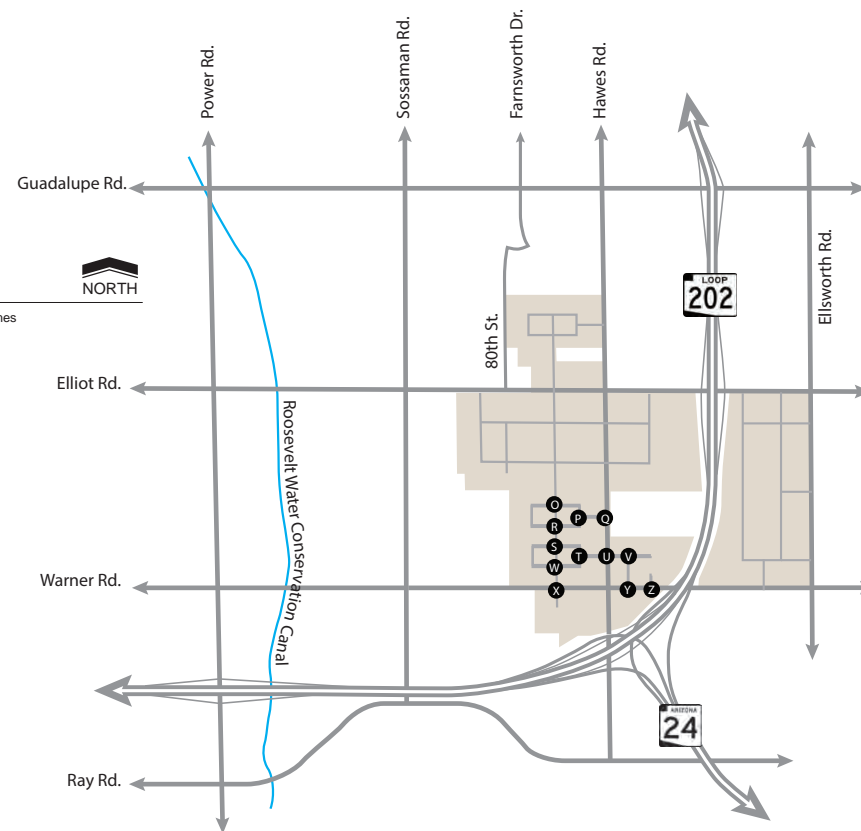
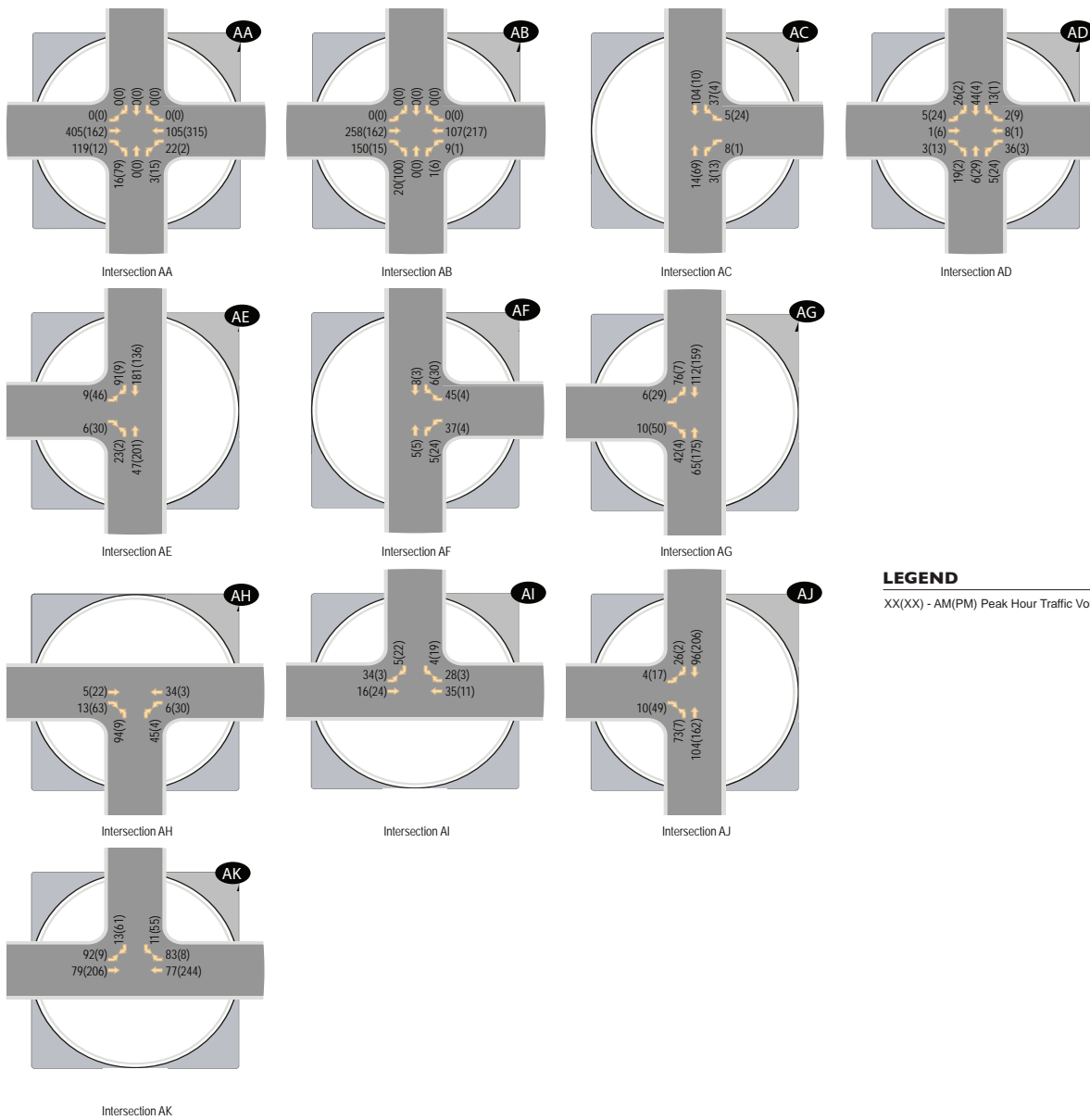


Figure 9: Site Generated Traffic Volumes C



LEGEND
XX(XX) - AM(PM) Peak Hour Traffic Volumes

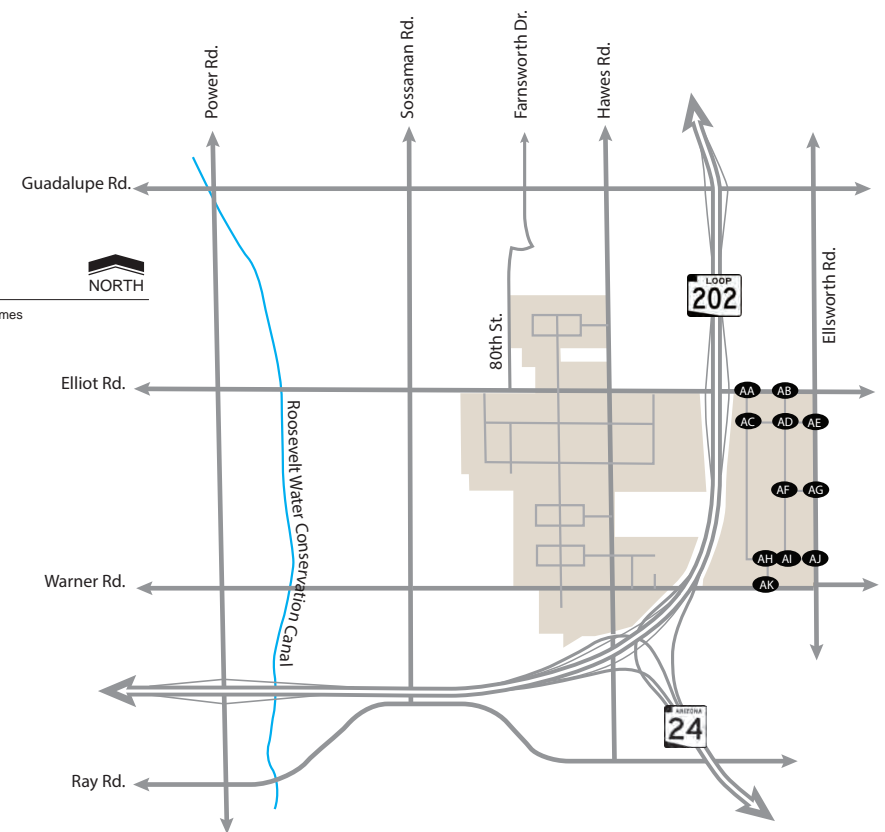


Figure 10: Site Generated Traffic Volumes D

Table 4: Trip Distribution by Percentage

Roadway	To/From	Distribution by Land Use Type		
		Commercial	Residential	Office/Industrial
SR-202 and Ellsworth Road ⁽¹⁾	North	15%	40%	35%
SR-202	West	15%	25%	30%
SR-24, Ellsworth Road and Hawes Road ⁽¹⁾	Southeast/South	20%	15%	23%
Power Road, Sossaman Road and Hawes Road ⁽¹⁾	North	20%	10%	0%
Guadalupe Road, Elliot Road and Warner Road ⁽¹⁾	East	10%	5%	10%
Guadalupe Road, Elliot Road and Warner Road ⁽¹⁾	West	20%	5%	2%
TOTALS		100%	100%	100%

(1) Total distribution for both roads. Individual roadway distribution splits will differ based on location within the site.

FUTURE BACKGROUND TRAFFIC

Future 2040 background traffic volumes are based on the projected average daily traffic (ADT) volumes projected within the City of Mesa 2040 Transportation Plan. The future ADTs east of Loop 202 along Elliot Road and Warner Road were reduced by the projected site ADTs at the same locations. The 2040 ADTs were converted into peak hour intersection turning movement volumes predominantly using methodology described within the National Cooperative Highway Research Program (NCHRP) Report 765. Volumes approaching/departing another developments planned intersections on Elliot Road, between Loop 202 and Ellsworth Road, were estimated. **Figure 11**, **Figure 12**, **Figure 13**, and **Figure 14** present the projected 2040 background traffic volumes for intersections 1 through 15, A through N, O through Z, and 16 through 17 plus AA through AK, respectively. Calculation worksheets for background traffic volume conversions are included in **Appendix F**.

FUTURE TOTAL TRAFFIC

Anticipated total traffic volumes for the 2040 study year were computed by adding the site generated traffic to the background traffic volumes. **Figure 15**, **Figure 16**, **Figure 17** and **Figure 18** present the projected 2040 background traffic volumes for intersections 1 through 15, A through N, O through Z and 16 through 17 plus AA through AK, respectively.

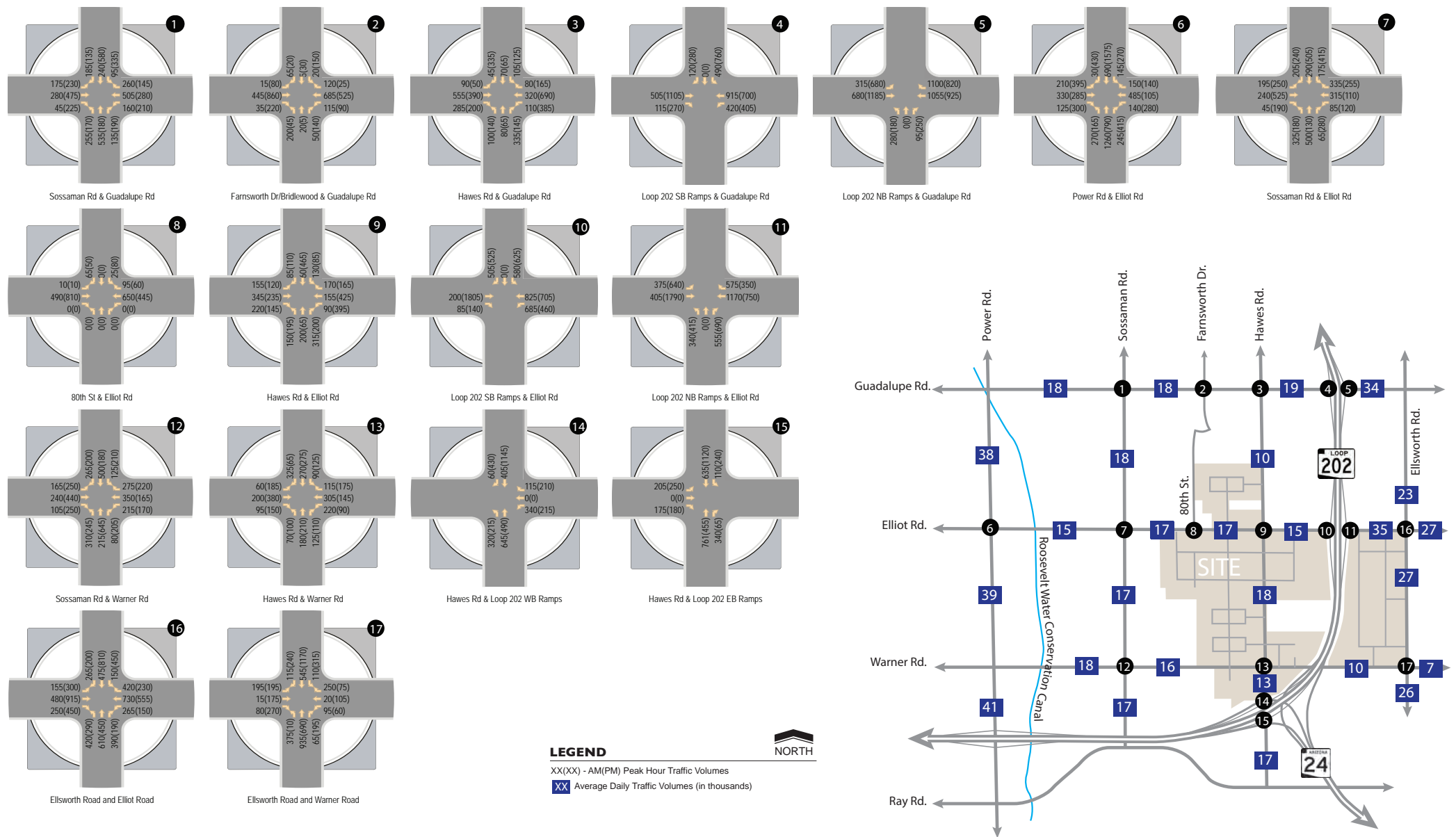
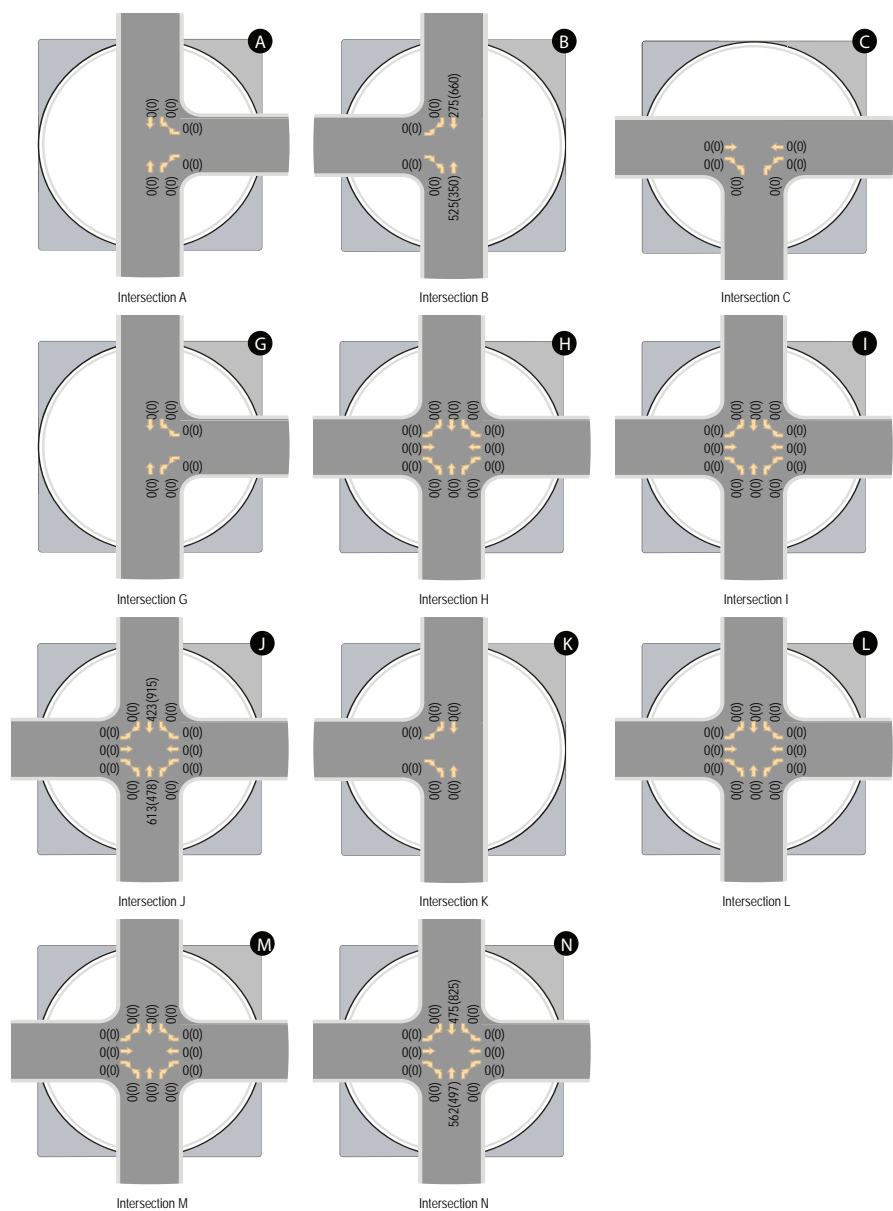


Figure I I: 2040 Background Traffic Volumes A



LEGEND

XX(XX) - AM(PM) Peak Hour Traffic Volumes

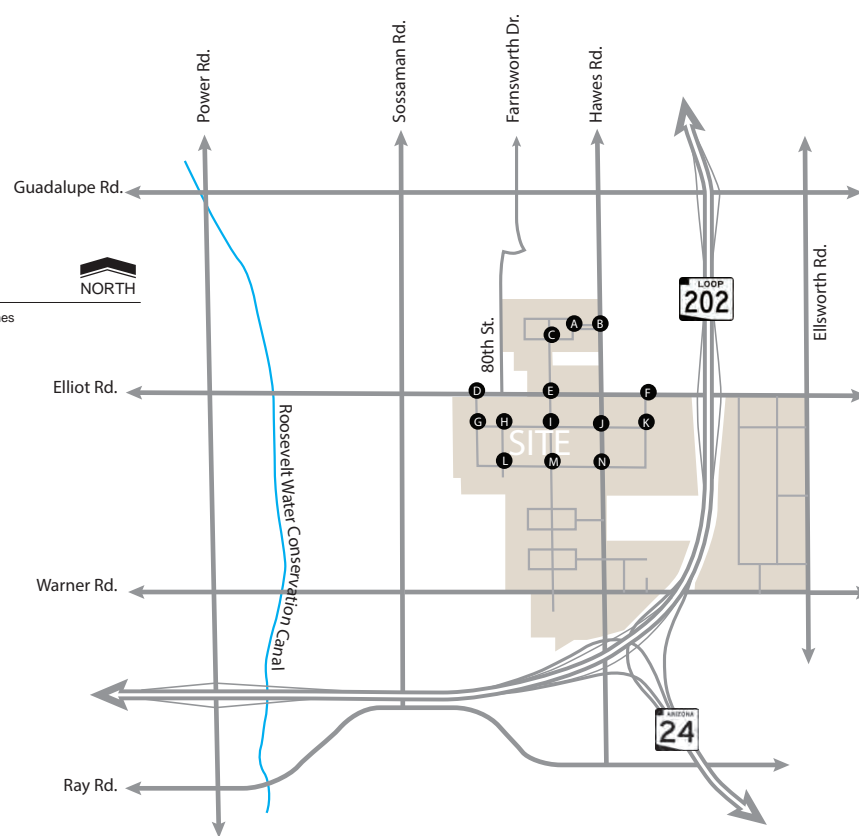


Figure 12: 2040 Background Traffic Volumes B

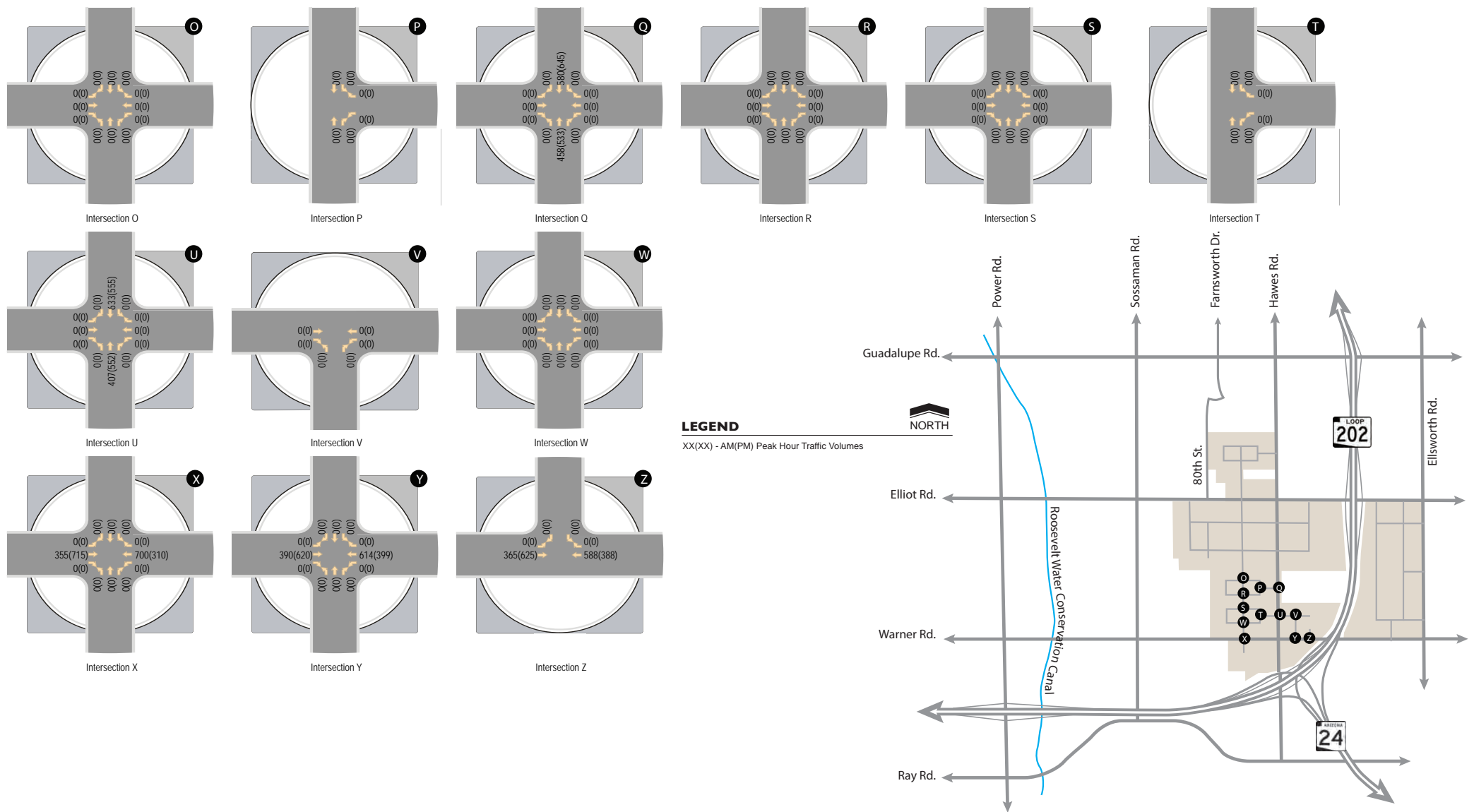


Figure I3: 2040 Background Traffic Volumes C

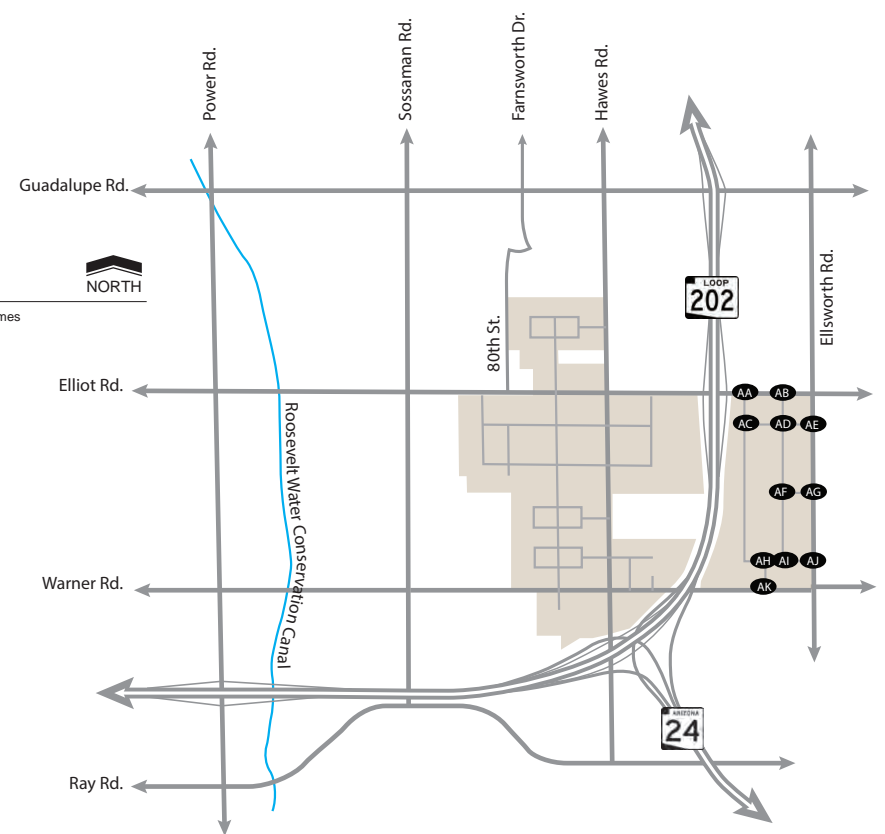
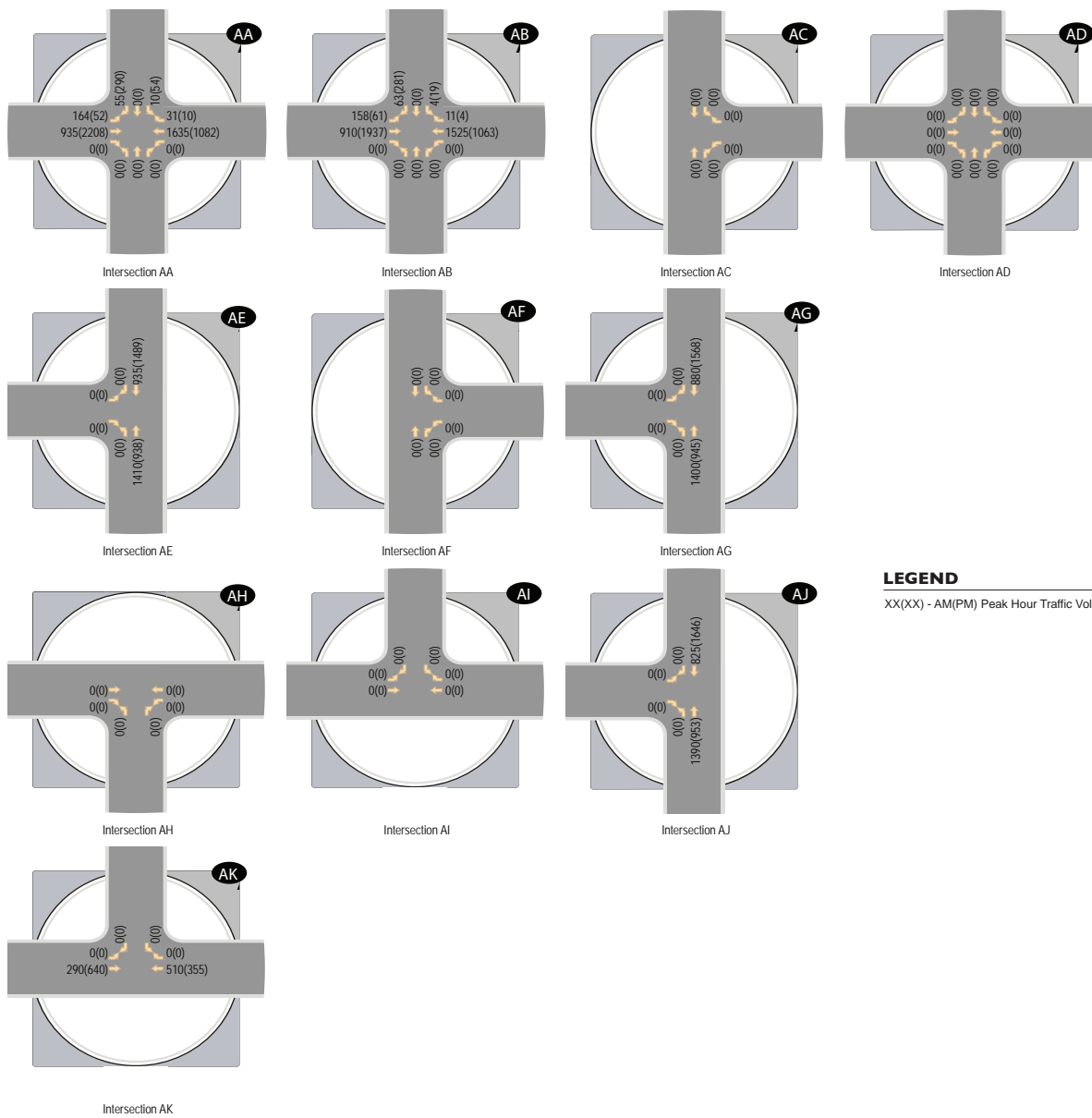


Figure I4: 2040 Background Traffic Volumes D

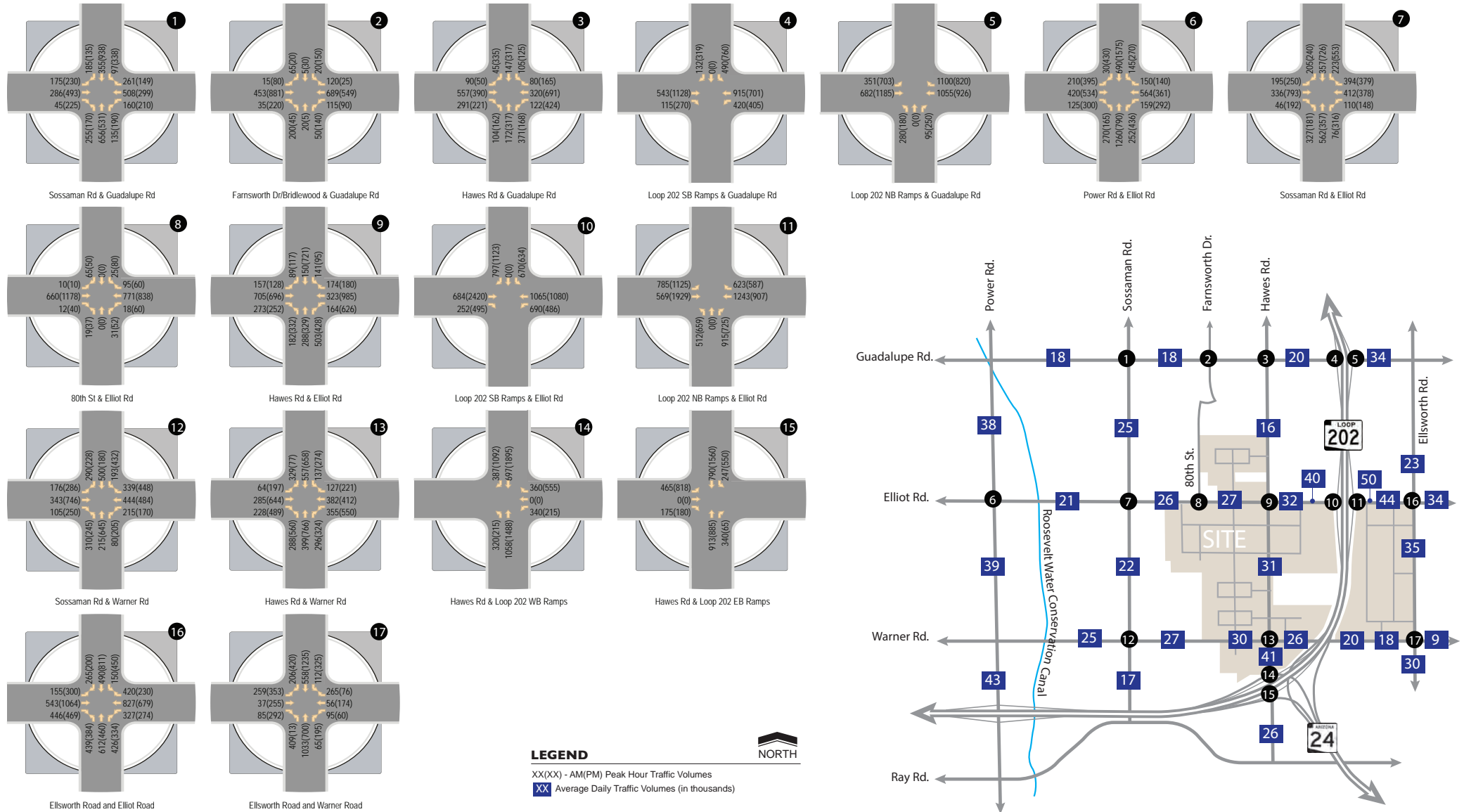


Figure 15: 2040 Total Traffic Volumes A

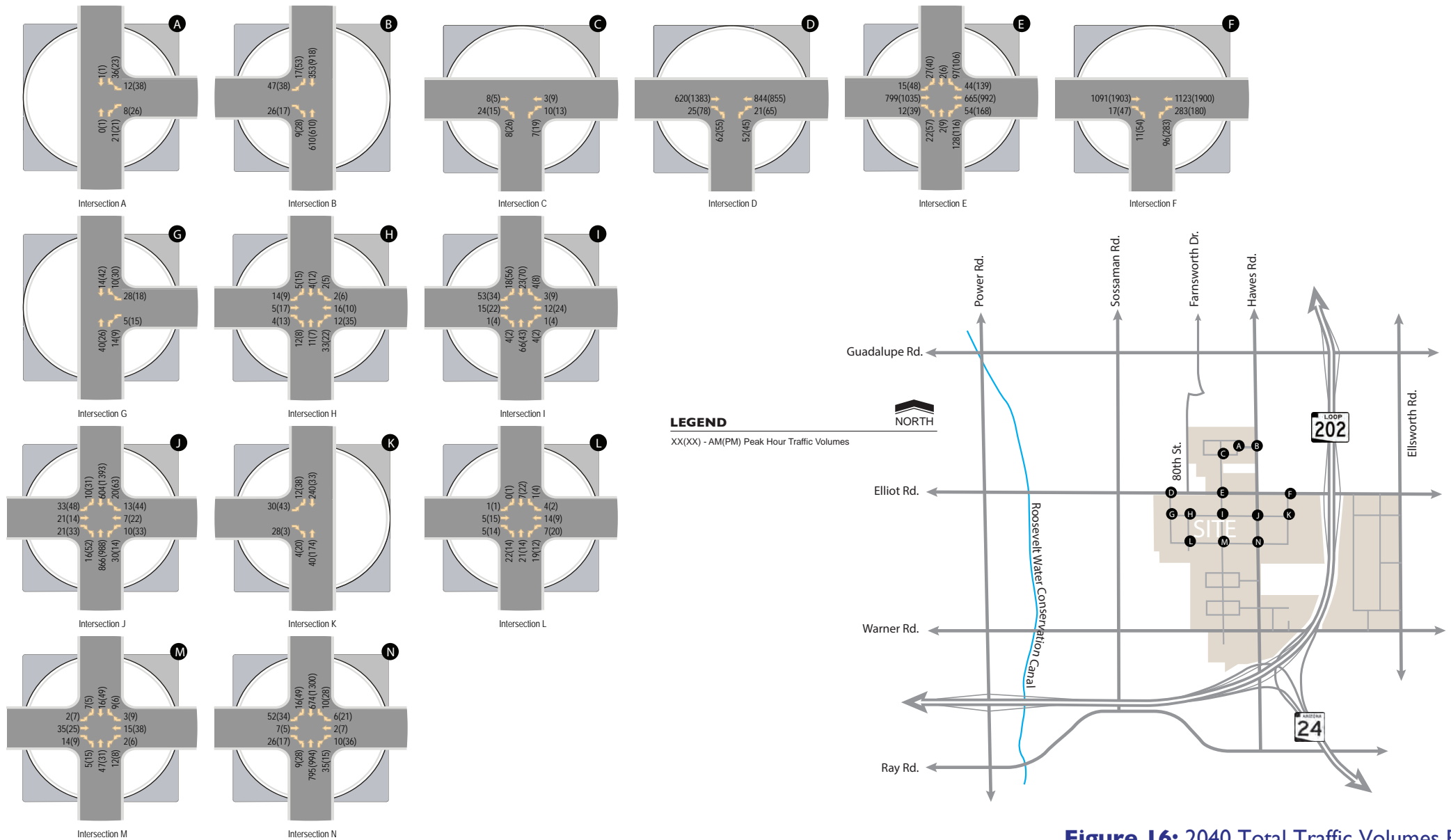


Figure 16: 2040 Total Traffic Volumes B

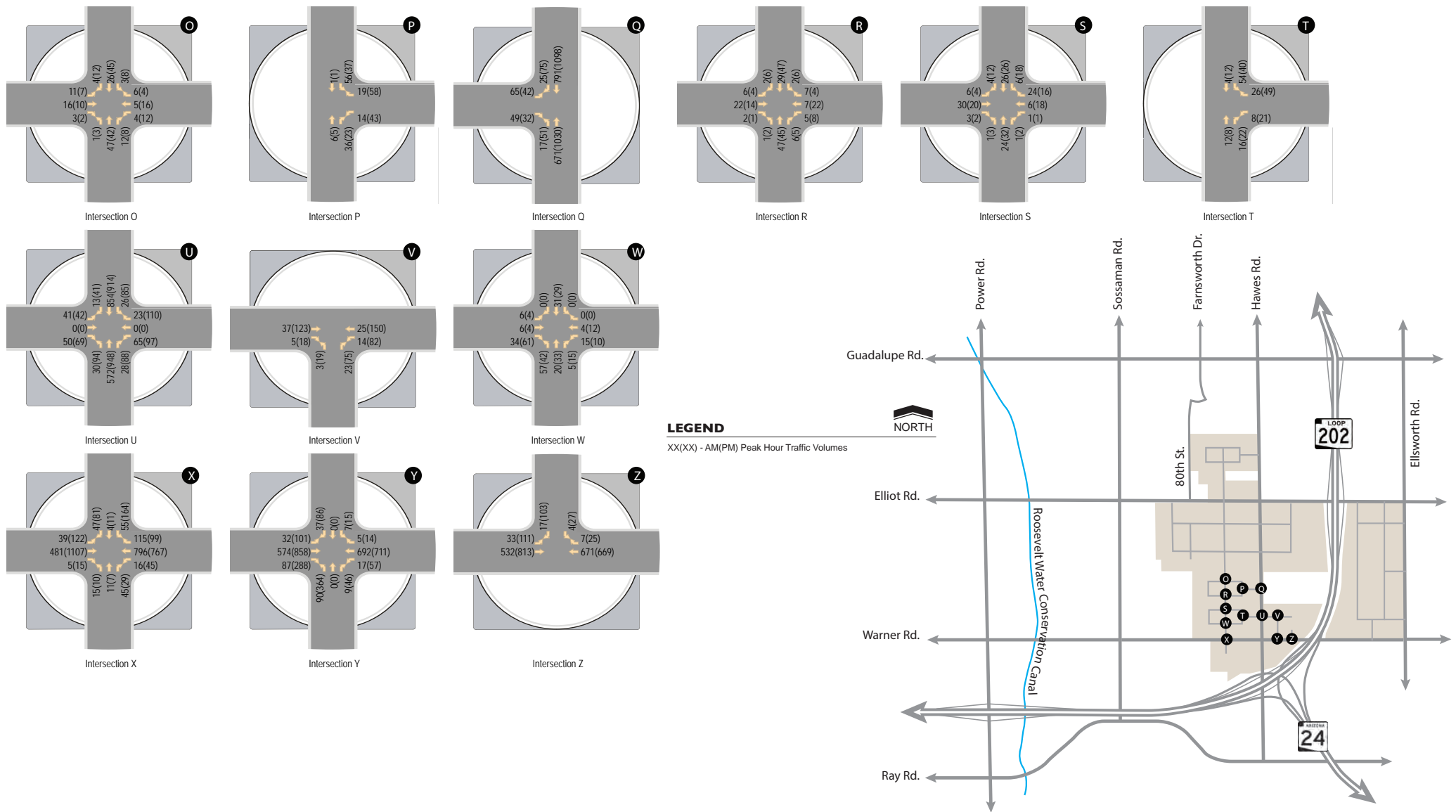


Figure 17: 2040 Total Traffic Volumes C

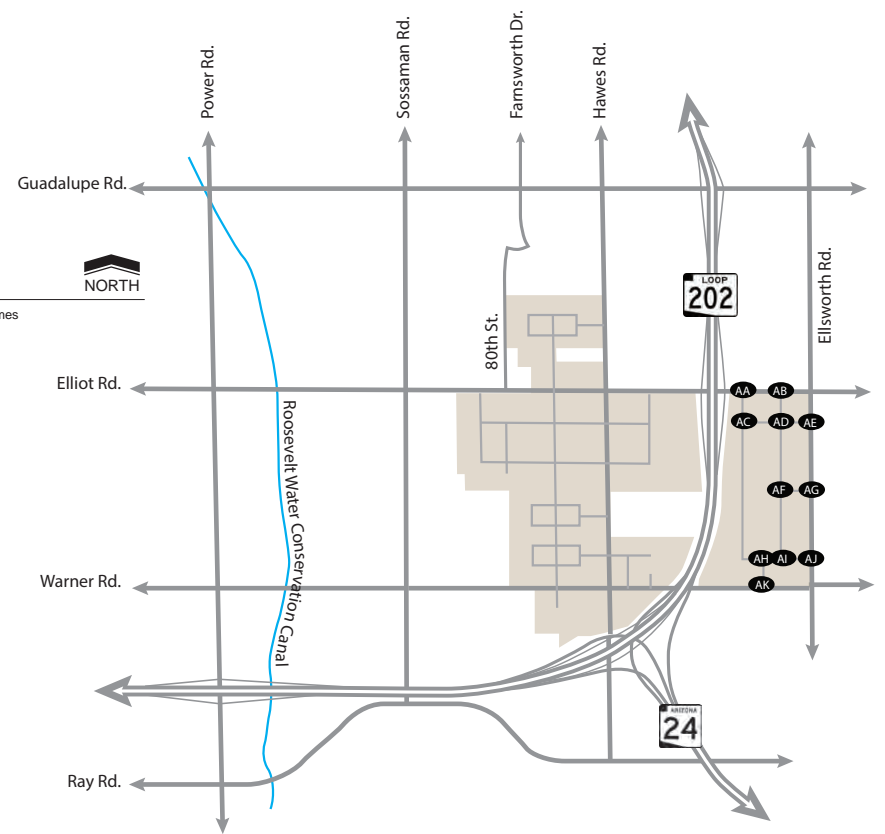
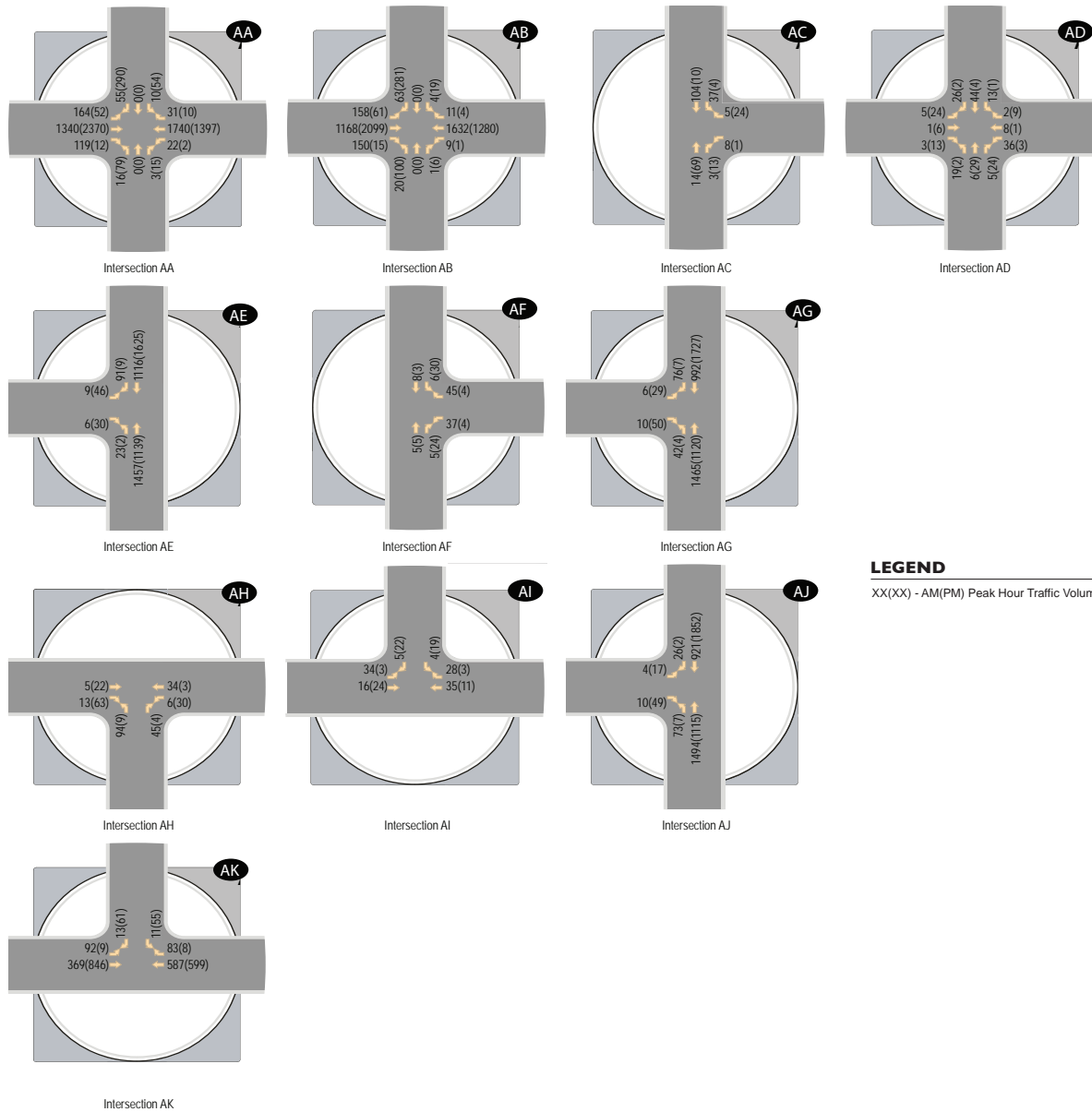


Figure 18: 2040 Total Traffic Volumes D

TRAFFIC AND IMPROVEMENT ANALYSIS

One of the purposes of this study is to project the roadway needs for 2040 given the proposed site traffic volumes as well as the projected background traffic volumes. The lane configurations and traffic controls presented in **Figure 19** through **Figure 23** are recommended based on the 2040 projected conditions.

Mesa's 2040 Transportation Plan indicates that all arterial roadways within the study area are planned to be either 4-lane arterials or 6-lane arterials. Power Road, Hawes Road, Ellsworth Road, Guadalupe Road and Elliot Road are planned to be 6-lane roads within the study area. Sossaman Road and Warner Road are planned to be 4-lane roads within the study area.

LEFT-TURN LANES

A left turn lane is recommended at all arterial intersections where the left turn movement is allowed. Dual left turn lanes were evaluated when the turn volume of the approach exceeded 300 vehicles per hour, the turn movement would otherwise operate poorly and dual left turn lanes would improve the delay, or where dual left turn lanes were recommended in the opposing approach. See section 6.1.6 of the *Maricopa County Department of Transportation Roadway Design Manual* ("MCDOT RDM") for additional conditions.

RIGHT-TURN LANES

The City of Mesa does not have warranting criteria for right turn lanes published within their *Engineering and Design Standards* (2012), or *Mesa Standard Details* (2012). For analysis purposes, a right-turn lane was added to an arterial road approach if the turn movement exceeded 300 vehicles per hour during at least one of the peak hours (see section 6.1.6 of the MCDOT RDM for additional conditions) or the turn movement would otherwise operate poorly. A right-turn lane was also considered on arterial approaching driveways when the right-turn volumes exceeded 30 vehicles in at least one peak hour. A right-turn lane is also assumed at all collector approaches to arterial roads.

SIGNALIZATION

All arterial-arterial intersections were evaluated under signalized conditions, with protected phasing only for dual left turn lanes, no protected phase if corresponding turn movements operates acceptable and protected-permitted phasing in all other conditions. Right turn overlaps were avoided unless they were found to mitigate poor LOS (of the same or another movement by allowing adjustment of phase durations). Signalization is discussed further after the LOS table and in **Figure 24**.

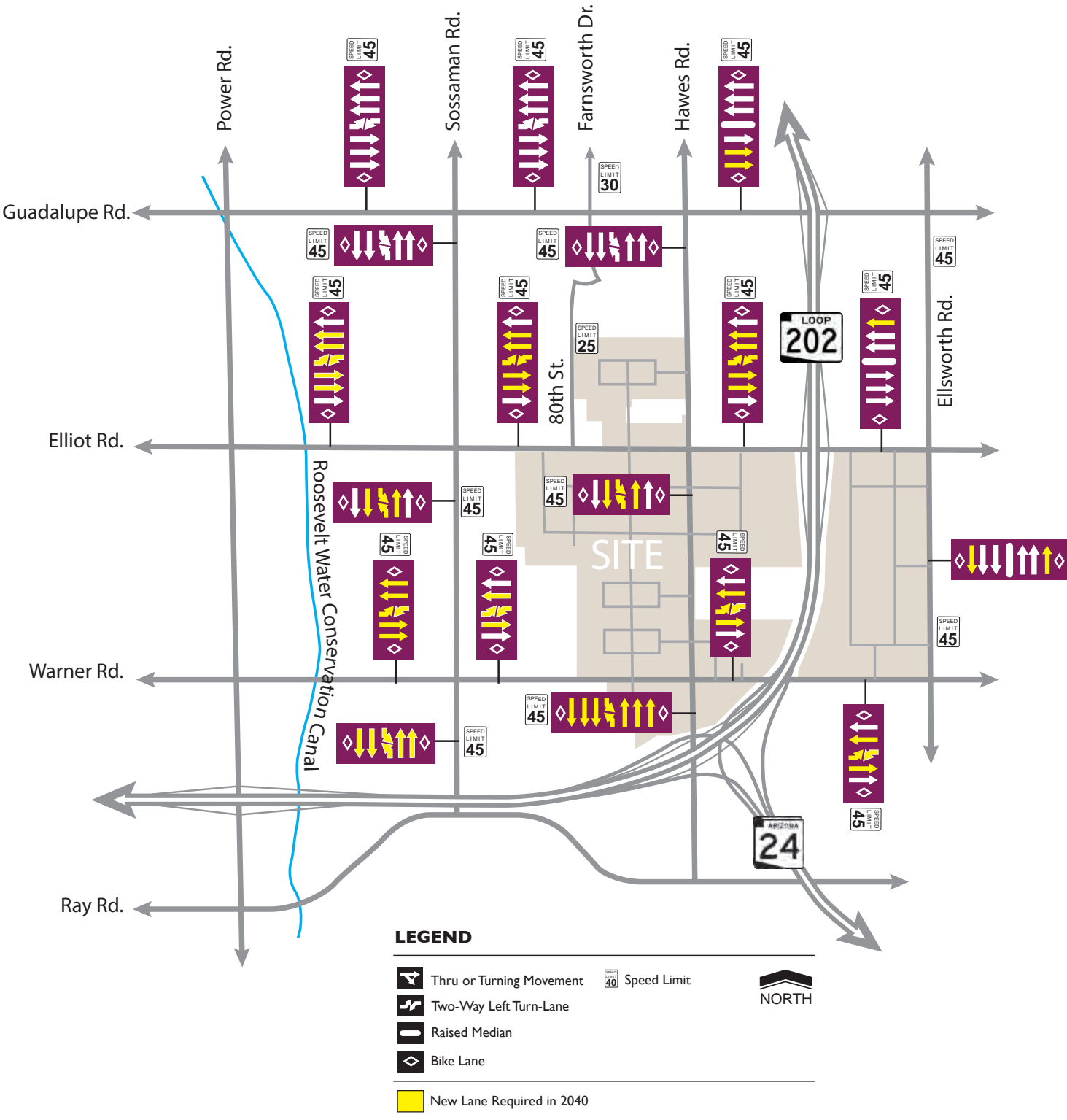
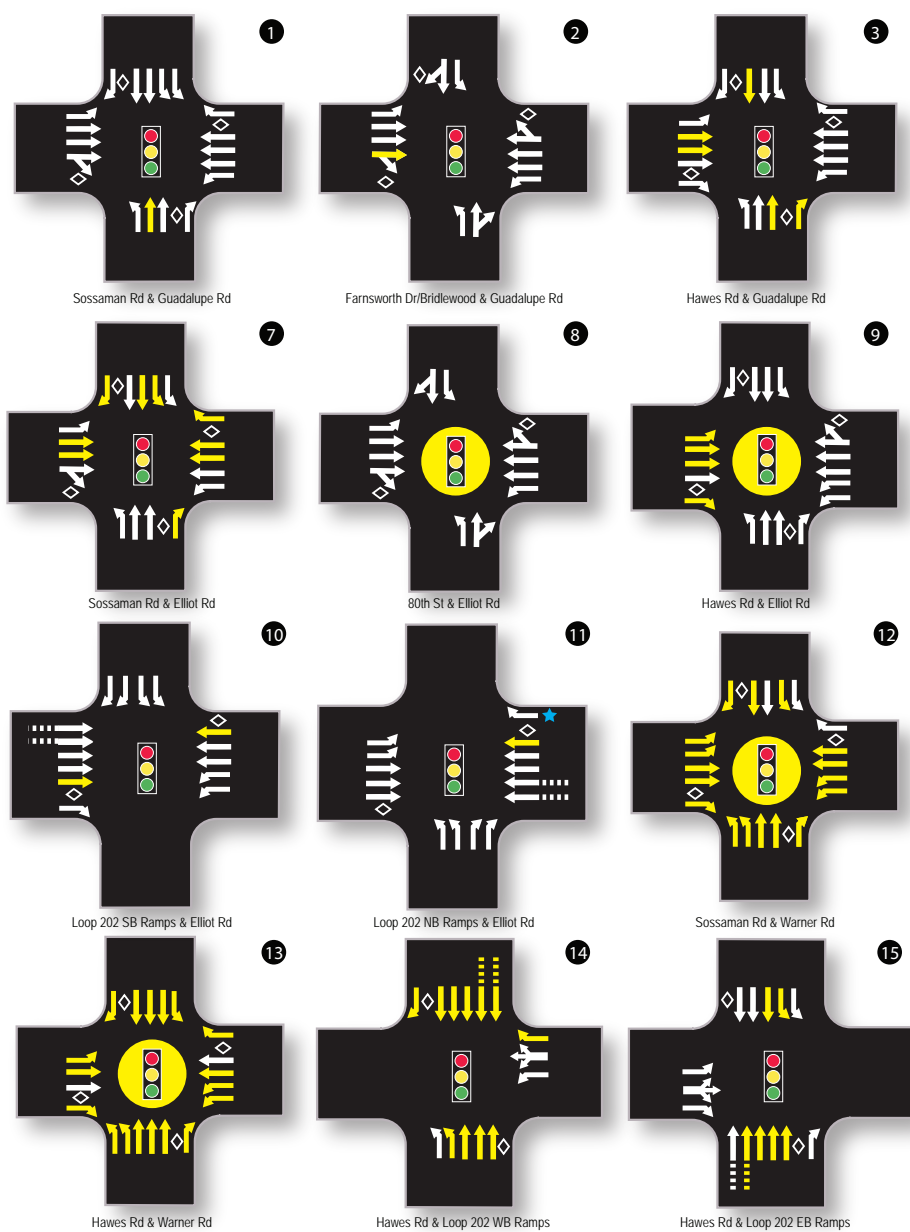


Figure 19: Proposed Roadway Segment Configurations



LEGEND

- Thru or Turning Movement
- Two-Way Left Turn-Lane
- Raised Median
- Bike Lane
- Extended Queue Lane
- Traffic Signal
- Stop Sign
- Speed Limit
- Required in 2040
- Free Flow Right-Turn Lane

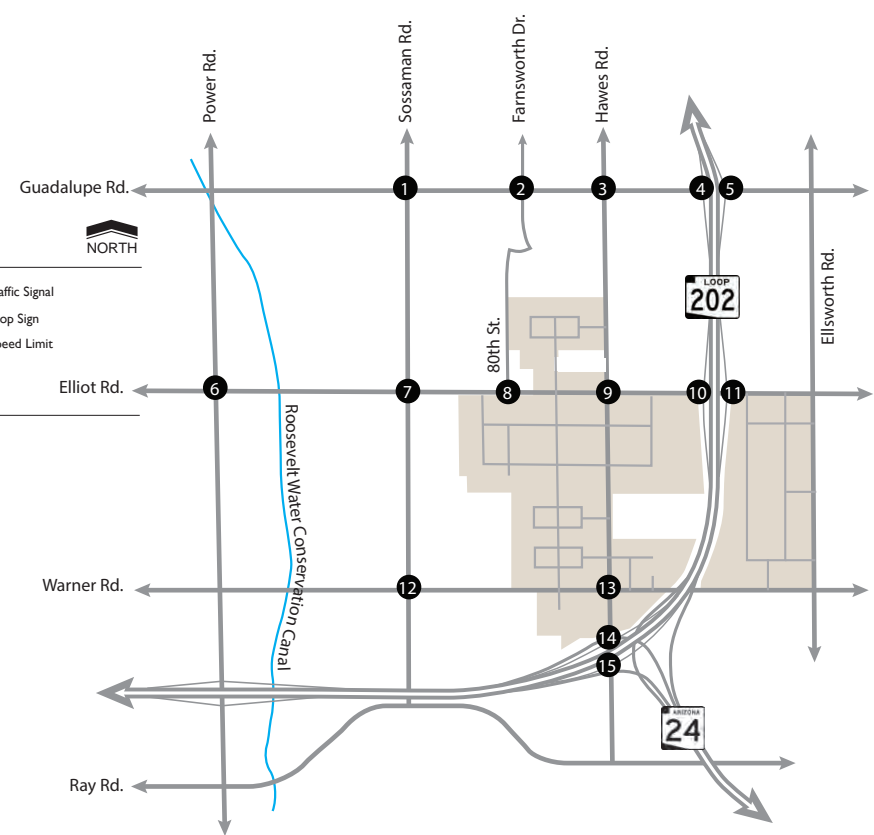


Figure 20: Proposed Lane Configurations and Traffic Controls A

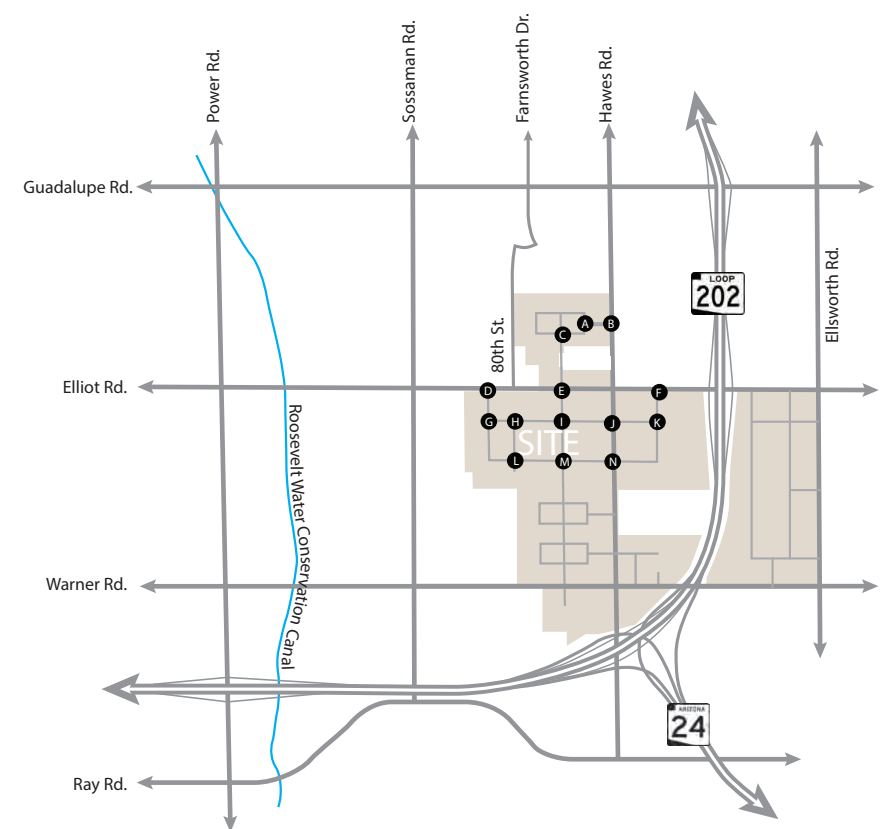
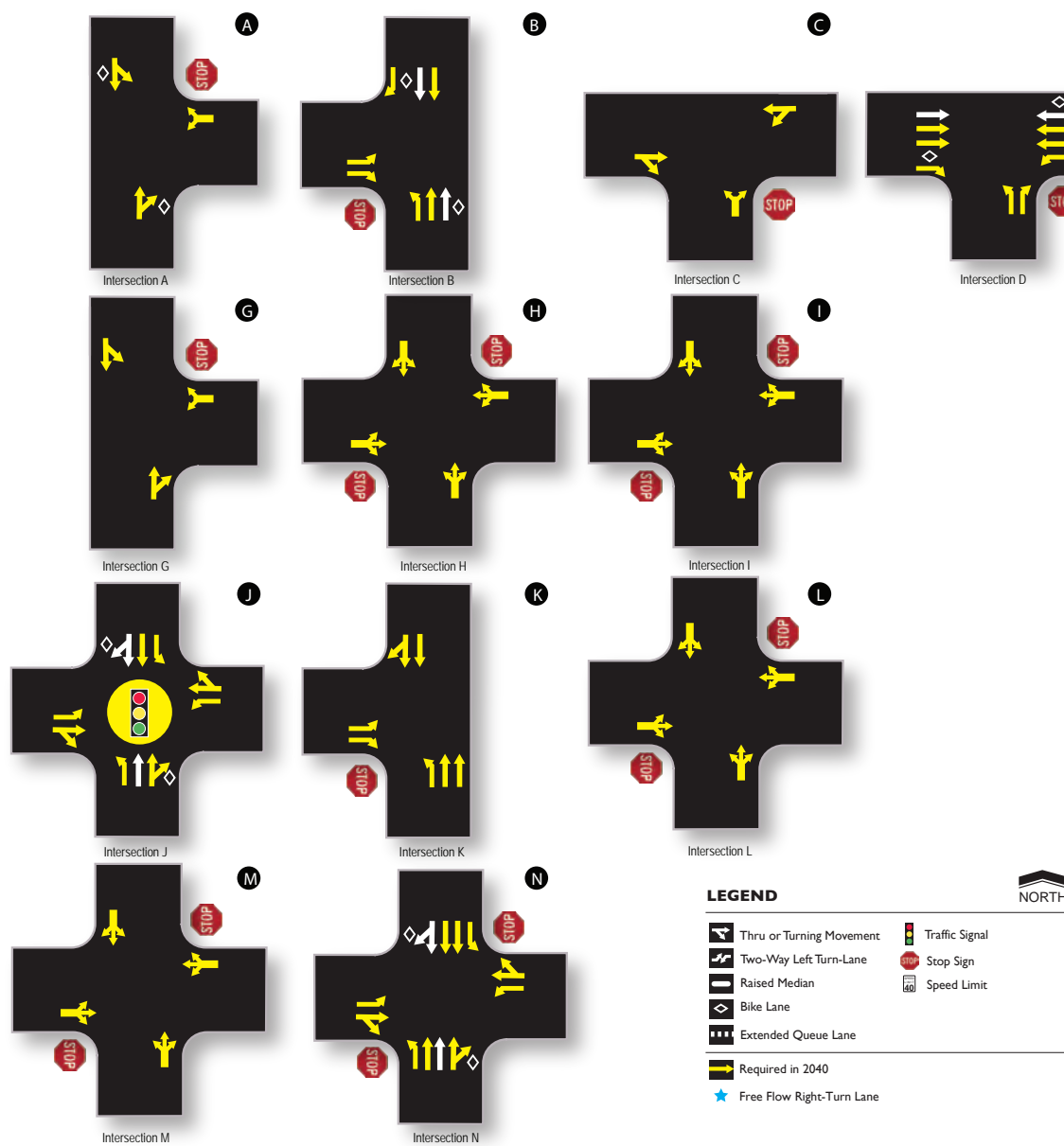


Figure 2I: Proposed Lane Configurations and Traffic Controls B

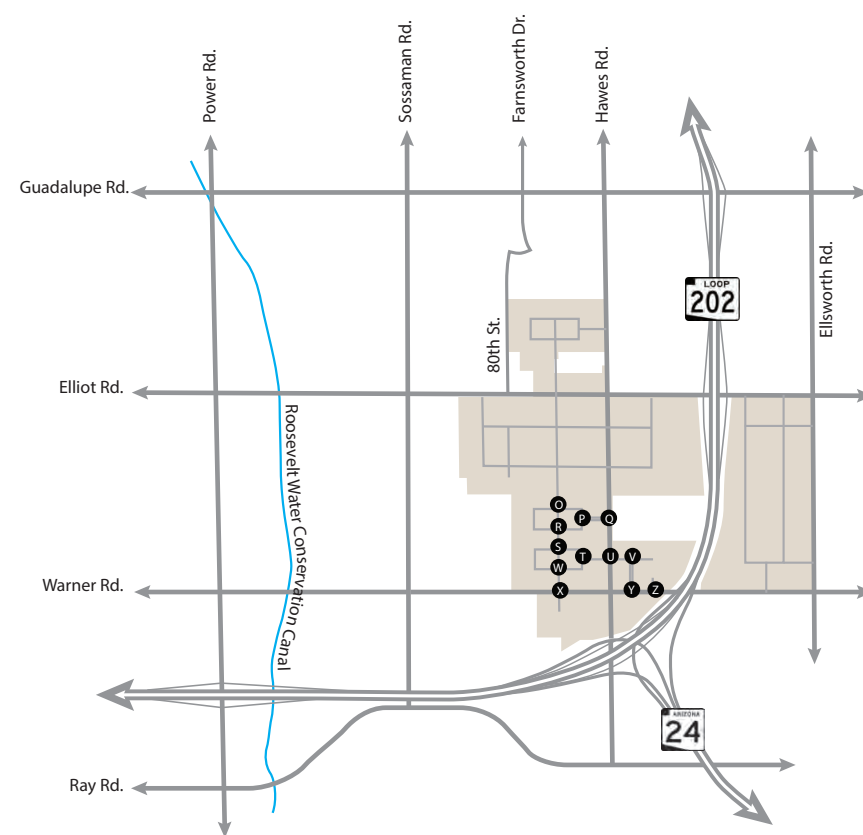
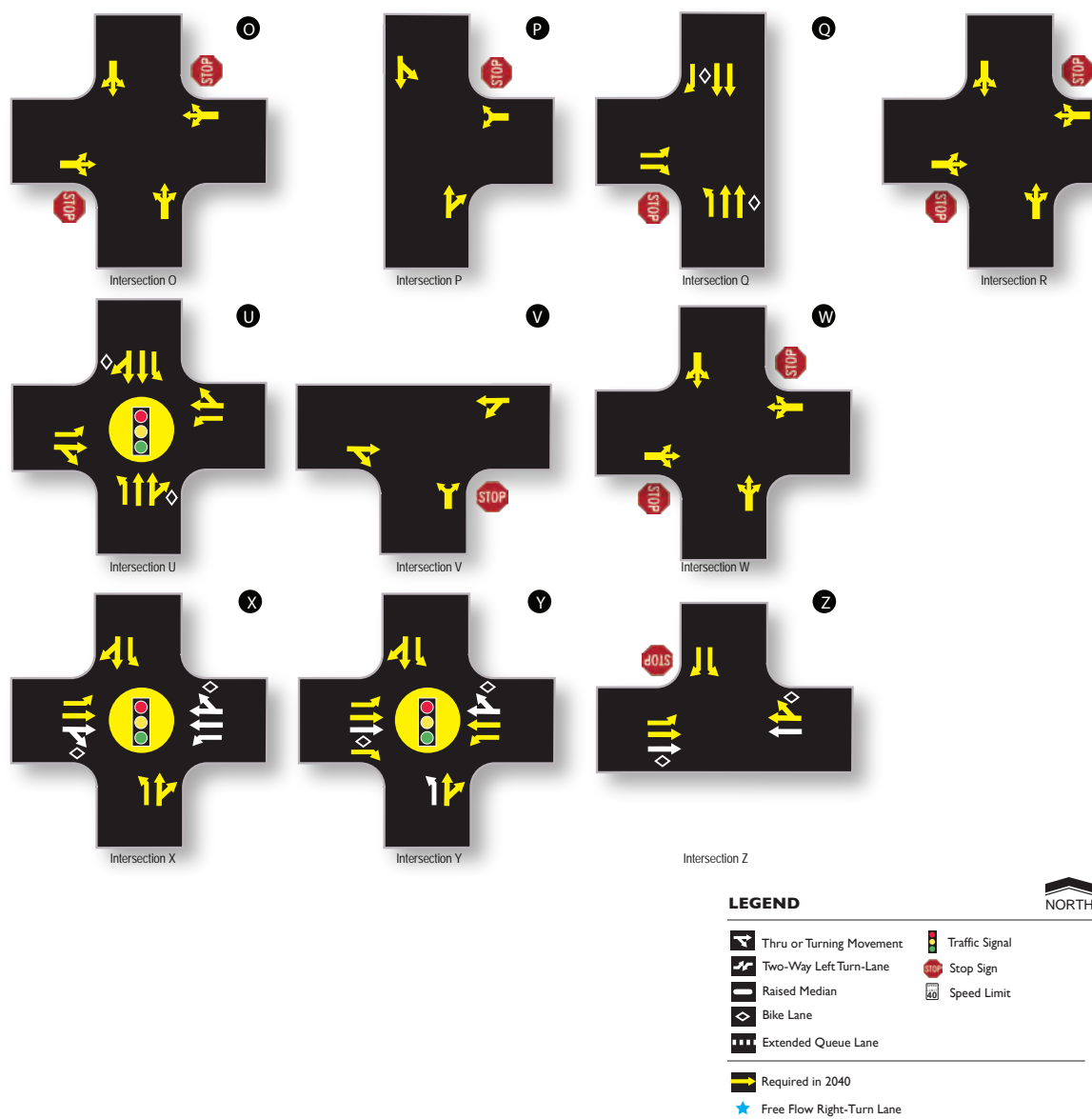


Figure 22: Proposed Lane Configurations and Traffic Controls C

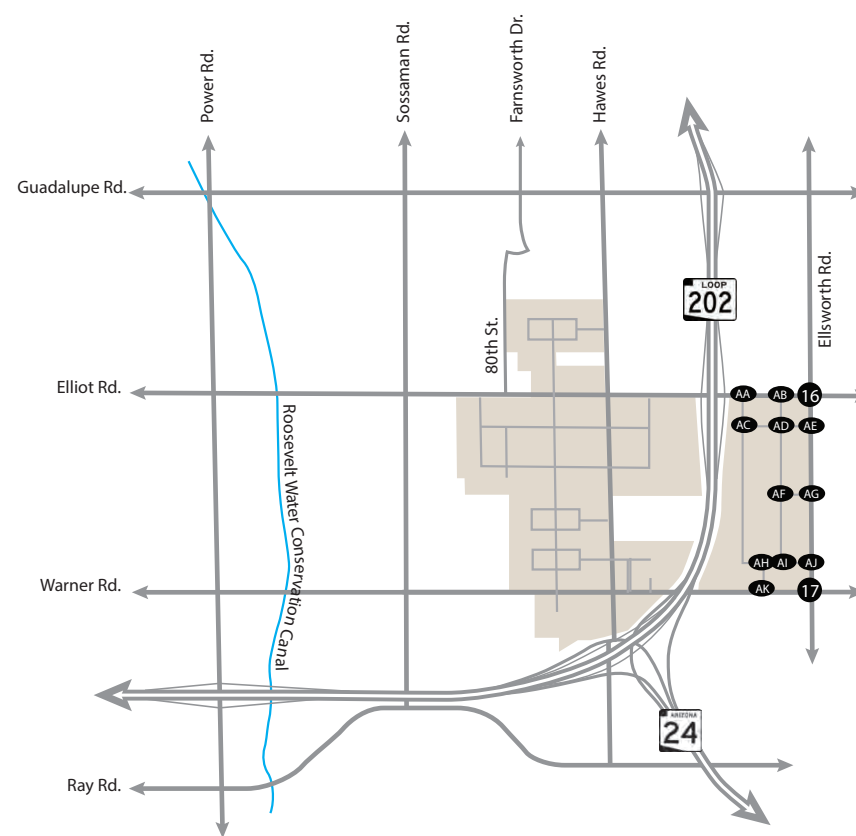
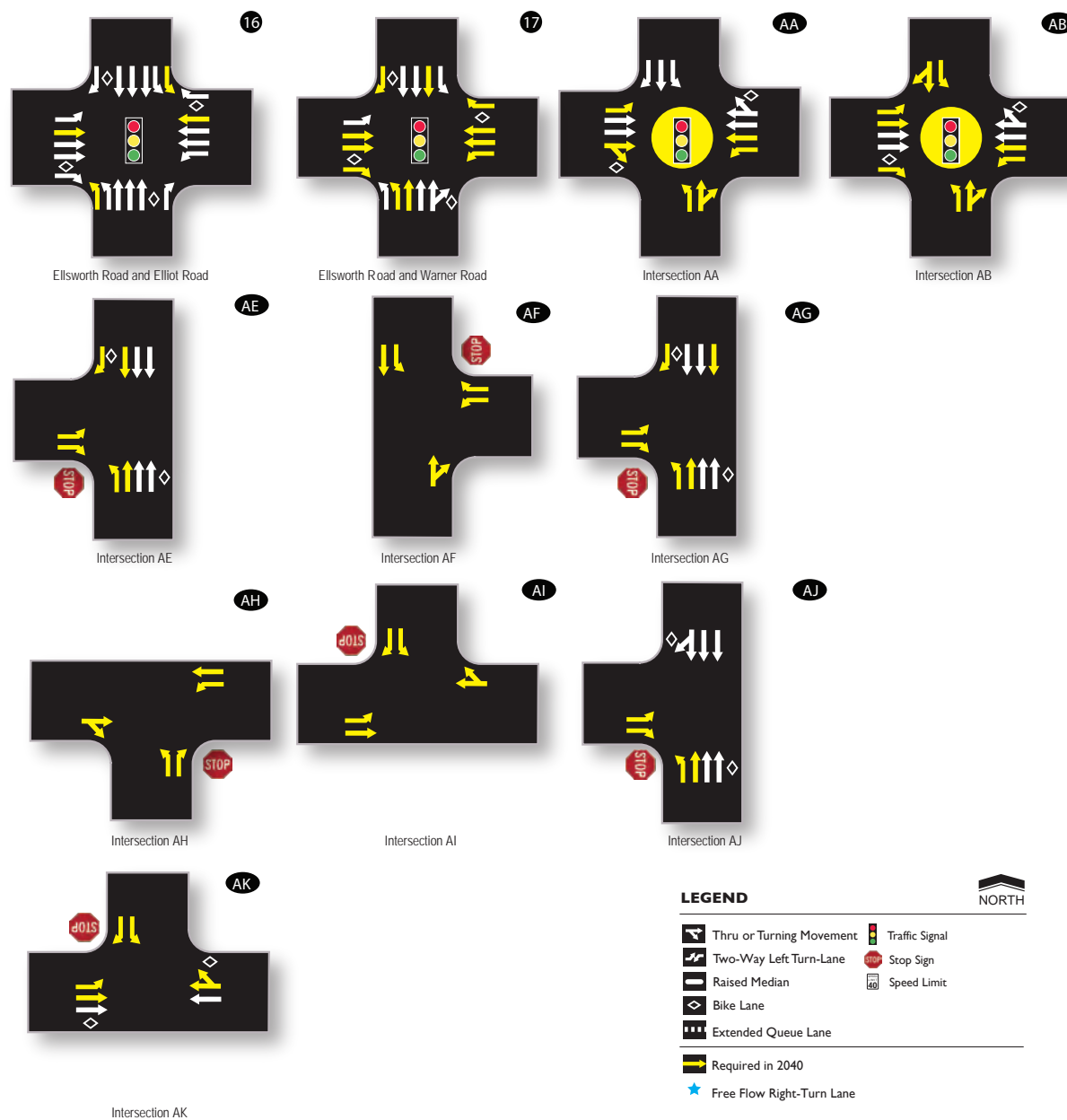


Figure 23: Proposed Lane Configurations and Traffic Controls D

PEAK HOUR CAPACITY ANALYSIS

Results of the intersection capacity analysis for the 2040 horizon year are displayed in **Table 5**. A cycle length of 90 seconds was used for all signalized intersections and included coordinated operations where applicable. The lane configurations and traffic controls presented in **Figure 20** through **Figure 23** were utilized for the 2040 intersection analyses. Analysis worksheets are included in **Appendix G**.

Table 5: 2040 Peak Hour Levels of Service

ID	Intersection	Traffic Control	Approach/ Movement	2040 Delay (LOS)	
				AM	PM
1	Sossaman Road & Guadalupe Road	Signal	NB	36.0 (D)	31.5 (C)
			SB	25.8 (C)	27.3 (C)
			EB	23.6 (C)	44.0 (D)
			WB	18.2 (B)	44.6 (D)
			Overall	26.6 (C)	35.2 (D)
2	Farnsworth Drive/Bridlewood & Guadalupe Road	Signal	NB	21.1 (C)	31.2 (C)
			SB	17.0 (B)	41.7 (D)
			EB	2.8 (A)	0.5 (A)
			WB	27.9 (C)	18.0 (B)
			Overall	19.2 (B)	12.0 (B)
3	Hawes Road & Guadalupe Road	Signal	NB	29.3 (C)	32.4 (C)
			SB	22.4 (C)	34.3 (C)
			EB	29.7 (C)	34.6 (C)
			WB	20.3 (C)	23.6 (C)
			Overall	26.6 (C)	29.9 (C)
4	SR-202 SB Ramps & Guadalupe Road	Signal	SB	35.0 (C)	45.6 (D)
			EB	27.2 (C)	34.3 (C)
			WB	35.2 (D)	43.4 (D)
			Overall	33.1 (C)	40.5 (D)
5	SR-202 NB Ramps & Guadalupe Road	Signal	NB	31.0 (C)	24.0 (C)
			EB	41.6 (D)	49.3 (D)
			WB	15.6 (B)	24.6 (C)
			Overall	24.8 (C)	36.0 (D)
6	Power Road & Elliot Road	Signal	NB	26.5 (C)	42.2 (D)
			SB	29.1 (C)	49.2 (D)
			EB	29.8 (C)	52.9 (D)
			WB	41.4 (D)	34.6 (C)
			Overall	30.7 (C)	46.3 (D)
7	Sossaman Road & Elliot Road	Signal	NB	28.5 (C)	33.6 (C)
			SB	40.1 (D)	34.3 (C)
			EB	25.0 (C)	41.2 (D)
			WB	33.1 (C)	29.4 (C)
			Overall	32.0 (C)	35.1 (D)
8	80 th Street & Elliot Road	Signal	NB	24.1 (C)	29.2 (C)
			SB	24.6 (C)	31.7 (C)
			EB	9.7 (A)	8.4 (A)
			WB	0.6 (A)	13.2 (B)
			Overall	6.2 (A)	12.4 (B)
9	Hawes Road & Elliot Road	Signal	NB	38.7 (D)	39.2 (D)
			SB	51.8 (D)	47.6 (D)
			EB	42.0 (D)	48.4 (D)
			WB	20.8 (C)	51.2 (D)
			Overall	37.7 (D)	47.3 (D)

Table 5 (Continued): 2040 Peak Hour Levels of Service

ID	Intersection	Traffic Control	Approach/ Movement	2040 Delay (LOS)	
				AM	PM
10	SR-202 SB Ramps & Elliot Road	Signal	SB	45.5 (D)	47.4 (D)
			EB	29.5 (C)	26.2 (C)
			WB	41.6 (D)	46.7 (D)
			Overall	40.5 (D)	37.3 (D)
11	SR-202 NB Ramps & Elliot Road	Signal	NB	40.9 (D)	54.0 (D)
			EB	52.3 (D)	27.6 (C)
			WB	30.8 (C)	29.2 (C)
			Overall	40.2 (D)	34.2 (C)
12	Sossaman Road & Warner Road	Signal	NB	22.1 (C)	39.1 (D)
			SB	31.7 (C)	35.5 (D)
			EB	35.8 (D)	46.6 (D)
			WB	33.5 (C)	36.2 (D)
13	Hawes Road & Warner Road	Signal	Overall	31.3 (C)	39.9 (D)
			NB	43.3 (D)	53.0 (D)
			SB	39.4 (D)	54.4 (D)
			EB	49.8 (D)	55.3 (E)
14	Hawes Road & SR-202 WB Ramps	Signal	WB	50.1 (D)	57.3 (E)
			Overall	45.1 (D)	54.9 (D)
			NB	21.3 (C)	34.9 (C)
			SB	19.9 (B)	36.4 (D)
15	Hawes Road & SR-202 EB Ramps	Signal	WB	43.9 (D)	33.4 (C)
			Overall	25.8 (C)	35.5 (D)
			NB	17.0 (B)	27.1 (C)
			SB	16.1 (B)	22.6 (C)
16	Ellsworth Road & Elliot Road	Signal	EB	44.3 (D)	53.7 (D)
			Overall	22.6 (C)	31.3 (C)
			NB	29.4 (C)	42.8 (D)
			SB	39.0 (D)	40.8 (D)
17	Ellsworth Road & Warner Road	Signal	EB	44.2 (D)	28.6 (C)
			WB	39.3 (D)	42.2 (D)
			Overall	37.6 (D)	37.5 (D)
			NB	36.4 (D)	40.1 (D)
A	Intersection A	1-way Stop (WB)	SB Thru/Left	7.1 (A)	7.0 (A)
			WB Shared	8.7 (A)	8.9 (A)
			NB Left	8.2 (A)	10.9 (B)
			EB Left	17.3 (C)	35.0 (D)
B	Intersection B & Hawes Road	1-way Stop (EB)	EB Right	9.6 (A)	12.3 (B)
			NB Shared	8.7 (A)	8.8 (A)
			WB Thru/Left	5.6 (A)	4.3 (A)
			Overall	11.6 (B)	278.1 (F)
C	Intersection C	1-way Stop (NB)	NB Left	9.9 (A)	19.7 (C)
			NB Right	9.3 (A)	34.4 (D)
			WB Left		
			Overall	8.8 (A)	8.9 (A)
D	Intersection D at Elliot Road	1-way Stop (NB)	NB	23.0 (C)	30.3 (C)
			SB	26.3 (C)	34.7 (C)
			EB	0.6 (A)	0.7 (A)
			WB	12.0 (B)	10.0 (B)
E	Intersection E & Elliot Road	Signal	Overall	8.8 (A)	8.9 (A)
			NB	33.3 (C)	33.4 (C)
			EB	16.3 (B)	20.7 (C)
			WB	8.3 (A)	10.2 (B)
F	Intersection F & Elliot Road	Signal	Overall	12.7 (B)	16.7 (B)

Table 5 (Continued): 2040 Peak Hour Levels of Service

ID	Intersection	Traffic Control	Approach/ Movement	2040 Delay (LOS)	
				AM	PM
G	Intersection G	1-way Stop (WB)	SB Thru/Left WB Shared	3.1 (A) 8.7 (A)	3.1 (A) 9.0 (A)
H	Intersection H	2-way Stop (EB/WB)	NB Shared SB Shared EB Shared WB Shared	1.6 (A) 1.3 (A) 9.2 (A) 9.4 (A)	1.6 (A) 1.1 (A) 9.2 (A) 9.4 (A)
I	Intersection I	2-way Stop (EB/WB)	NB Shared SB Shared EB Shared WB Shared	0.4 (A) 0.7 (A) 9.9 (A) 9.7 (A)	0.3 (A) 0.4 (A) 10.4 (B) 10.1 (B)
J	Intersection J & Hawes Road	Signal	NB SB EB WB Overall	2.9 (A) 2.5 (A) 43.4 (D) 41.8 (D) 5.3 (A)	5.1 (A) 5.3 (A) 40.3 (D) 39.6 (D) 7.6 (A)
K	Intersection K	1-way Stop (EB)	NB Left EB Left EB Right	7.8 (A) 10.6 (B) 9.9 (A)	7.4 (A) 10.0 (B) 8.6 (A)
L	Intersection L	2-way Stop (NB/SB)	NB Shared SB Shared EB Shared WB Shared	9.1 (A) 9.3 (A) 0.7 (A) 2.0 (A)	9.3 (A) 9.6 (A) 0.2 (A) 4.7 (A)
M	Intersection M	2-way Stop (EB/WB)	NB Shared SB Shared EB Shared WB Shared	0.6 (A) 2.1 (A) 9.7 (A) 9.7 (A)	2.0 (A) 0.7 (A) 9.9 (A) 10.0 (B)
N	Intersection N & Hawes Road	2-way Stop (EB/WB)	NB Left SB Left EB Left EB Thru/Right WB Left WB Thru/Right	9.3 (A) 10.0 (A) 57.1 (F) 20.6 (C) 45.9 (E) 20.8 (C)	13.9 (B) 12.3 (B) 1991.3 (F) 128.6 (F) 1274.7 (F) 174.7 (F)
O	Intersection O	2-way Stop (EB/WB)	NB Shared SB Shared EB Shared WB Shared	0.1 (A) 0.7 (A) 9.5 (A) 9.2 (A)	0.4 (A) 0.9 (A) 9.7 (A) 9.7 (A)
P	Intersection P	1-way Stop (WB)	SB Thru/Left WB Shared	7.3 (A) 9.0 (A)	7.1 (A) 9.2 (A)
Q	Intersection Q & Hawes Road	1-way Stop (EB)	NB Left EB Left EB Right	10.0 (A) 25.4 (D) 12.2 (B)	12.9 (B) 129.9 (F) 14.2 (B)
R	Intersection R	2-way Stop (EB/WB)	NB Shared SB Shared EB Shared WB Shared	0.1 (A) 0.4 (A) 9.6 (A) 9.2 (A)	0.3 (A) 0.7 (A) 9.8 (A) 9.8 (A)
S	Intersection S	2-way Stop (EB/WB)	NB Shared SB Shared EB Shared WB Shared	0.3 (A) 1.2 (A) 9.6 (A) 8.8 (A)	0.6 (A) 2.4 (A) 9.8 (A) 9.4 (A)
T	Intersection T	1-way Stop (WB)	SB Thru/Left WB Shared	6.9 (A) 8.8 (A)	5.7 (A) 9.0 (A)

Table 5 (Continued): 2040 Peak Hour Levels of Service

ID	Intersection	Traffic Control	Approach/ Movement	2040 Delay (LOS)	
				AM	PM
U	Intersection U & Hawes Road	2-way Stop (EB/WB)	NB	4.6 (A)	2.5 (A)
			SB	5.5 (A)	7.2 (A)
			EB	20.9 (C)	23.9 (C)
			WB	21.9 (C)	25.0 (C)
			Overall	6.9 (A)	6.6 (A)
V	Intersection V	1-way Stop (NB)	NB Shared	8.7 (A)	10.4 (B)
			WB Thru/Left	2.6 (A)	2.7 (A)
W	Intersection W	2-way Stop (EB/WB)	NB Shared	5.1 (A)	3.4 (A)
			SB Shared	0.0 (A)	0.0 (A)
			EB Shared	9.1 (A)	8.9 (A)
			WB Shared	10.4 (B)	10.4 (B)
			Overall	11.8 (B)	14.6 (B)
X	Intersection X & Warner Road	Signal	NB	26.8 (C)	28.3 (C)
			SB	27.9 (C)	34.2 (C)
			EB	9.3 (A)	13.4 (B)
			WB	10.4 (B)	10.7 (B)
			Overall	11.8 (B)	14.6 (B)
Y	Intersection Y & Warner Road	Signal	NB	28.5 (C)	39.8 (D)
			SB	25.2 (C)	19.8 (B)
			EB	12.8 (B)	27.7 (C)
			WB	15.6 (B)	25.7 (C)
			Overall	15.6 (B)	28.6 (C)
Z	Intersection Z & Warner Road	1-way Stop (SB)	SB Left	14.5 (B)	17.0 (C)
			SB Right	11.0 (B)	12.2 (B)
			EB Left	9.4 (A)	10.0 (B)
			Overall	26.0 (C)	25.4 (C)
AA	Intersection AA & Elliot Road	Signal	NB	46.9 (D)	36.2 (D)
			SB	21.9 (C)	54.0 (D)
			EB	16.8 (B)	34.9 (C)
			WB	34.1 (C)	1.2 (A)
			Overall	26.0 (C)	25.4 (C)
AB	Intersection AB & Elliot Road	Signal	NB	47.5 (D)	40.5 (D)
			SB	19.1 (B)	54.1 (D)
			EB	12.9 (B)	15.0 (B)
			WB	5.5 (A)	3.0 (A)
			Overall	9.4 (A)	14.7 (B)
AC	Intersection AC & Elliot Road	1-way Stop (WB)	SB Left	7.3 (A)	7.4 (A)
			WB Left	9.8 (A)	9.0 (A)
			WB Right	8.4 (A)	8.8 (A)
			Overall	9.4 (A)	14.7 (B)
AD	Intersection AD	2-way Stop (EB/WB)	NB Left	7.4 (A)	7.2 (A)
			SB Left	7.3 (A)	7.3 (A)
			EB Left	9.6 (A)	9.0 (A)
			EB Thru/Right	9.0 (A)	8.8 (A)
			WB Left	9.7 (A)	9.0 (A)
			WB Thru/Right	9.8 (A)	8.6 (A)
			Overall	9.4 (A)	14.7 (B)
AE	Ellsworth Road & Intersection AE	1-way Stop (EB)	NB Left	10.5 (B)	10.3 (B)
			EB Left	22.6 (C)	25.6 (D)
			EB Right	10.4 (B)	12.0 (B)
			Overall	10.5 (B)	10.3 (B)
AF	Intersection AF	1-way Stop (WB)	SB Left	7.2 (A)	10.9 (B)
			WB Left	8.8 (A)	22.3 (C)
			WB Right	8.5 (A)	18.6 (C)
			Overall	10.5 (B)	10.3 (B)
AG	Ellsworth Road & Intersection AG	1-way Stop (EB)	NB Left	10.1 (B)	10.5 (B)
			EB Left	15.4 (C)	21.2 (C)
			EB Right	10.2 (B)	12.7 (B)
			Overall	10.5 (B)	10.3 (B)

Table 5 (Continued): 2040 Peak Hour Levels of Service

ID	Intersection	Traffic Control	Approach/ Movement	2040 Delay (LOS)	
				AM	PM
AH	Intersection AH	1-way Stop (NB)	NB Left NB Right WB Left	9.3 (A) 8.5 (A) 7.3 (A)	9.3 (A) 8.6 (A) 7.5 (A)
AI	Intersection AI	1-way Stop (SB)	EB Left SB Left SB Right	7.4 (A) 9.4 (B) 8.6 (A)	7.2 (A) 8.8 (A) 8.5 (A)
AJ	Ellsworth Road & Intersection AJ	1-way Stop (EB)	NB Left EB Left EB Right	17.5 (C) 15.4 (C) 13.7 (B)	37.9 (E) 68.4 (F) 29.9 (D)
AK	Intersection AK & Warner Road	1-way Stop (SB)	SB Left SB Right EB Left	26.5 (D) 10.9 (B) 9.8 (A)	33.5 (D) 11.1 (B) 9.0 (A)

All study intersections are evaluated under projected 2040 conditions and are expected to operate at LOS D or better during the peak hours with the exception of the following, key intersections and analysis findings are discussed below.

While most signalized intersections are anticipated to operate at overall LOS D or better, some individual movements are anticipated to experience heavy delays during the AM and/or PM peak hours. This is often due to the overall high traffic volumes entering the intersection compared to the intersection's capacity, particularly in turning movements. It is well known that methodology from the NCHRP Report 765 has a tendency to over represent turning movements and underrepresent through volumes when converting AADT to peak hour volumes. Study intersections will likely have reduced turning movement volumes than projected and may operate with lower delays and better LOS than projected.

The recommended lane configurations and traffic controls based on the 2040 projected traffic volumes are presented in **Figure 19** through **Figure 23**.

These recommendations are based on the projected 2040 total traffic volumes, which include site traffic volumes using estimated land use densities and background volumes estimated from 2040 AADTs. The recommendations of this study also consider maximum densities of proposed land uses. If the projected is developed at densities near the target densities. Individualized traffic impact analyses are recommended when individual parcels or phases are in the platting stages and overall site plan is updated to incorporate the modifications recommended within this study.

The intersection of Hawes Road and Warner Road is expected to experience heavy delays by study horizon year 2040. Although this intersection is planned for signalization by 2040 the proximity of the Loop 202 interchange to the south is expected to increase the east/west turning volumes on Warner Road, as well as the north/south through volumes along Hawes Road, increasing delays for these movements. It is recommended this intersection be monitored for future signal timing modification upon buildout of the area.

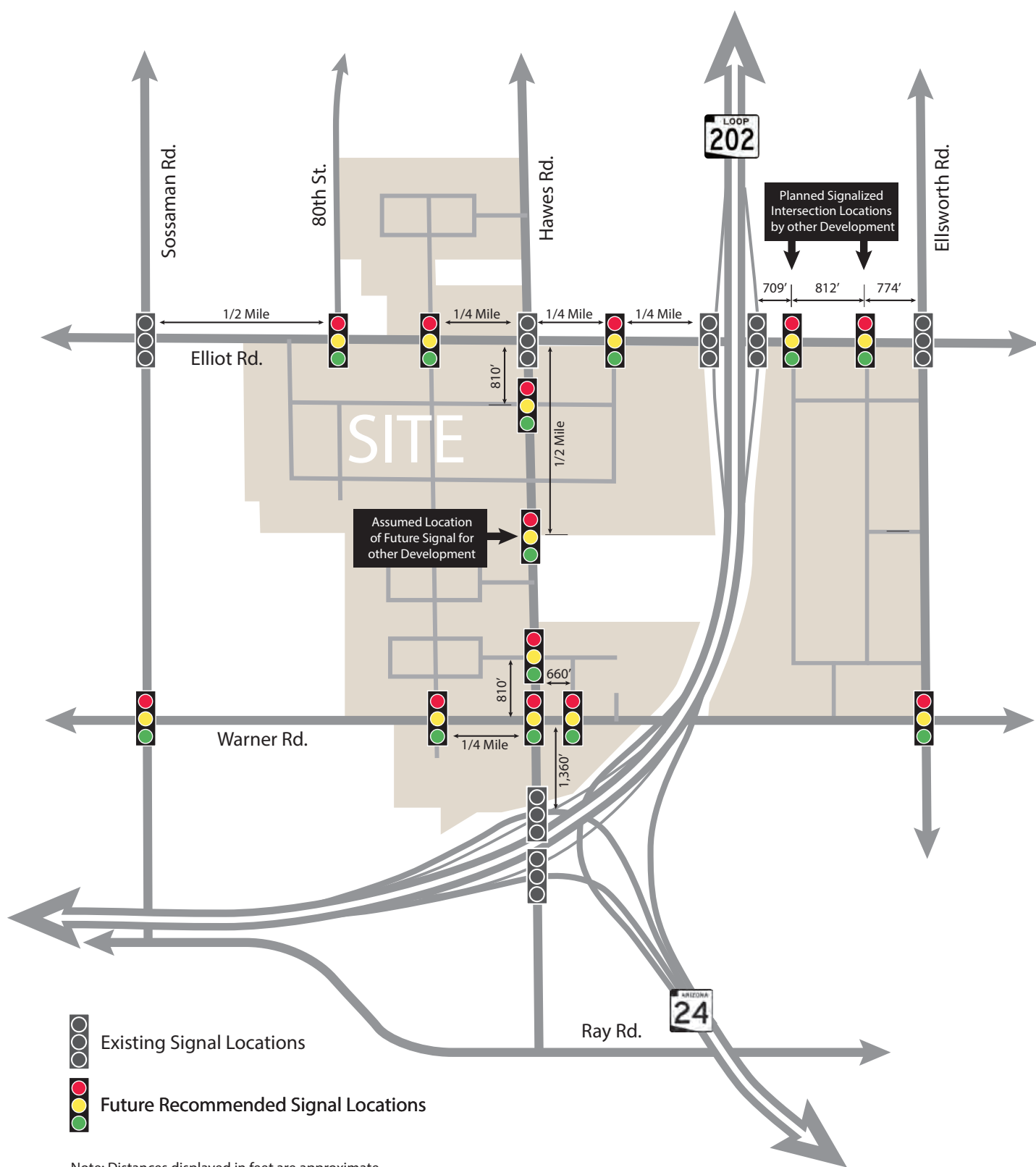
Intersection N along Hawes Road has stop controlled east/west movement(s) that are anticipated to operate with heavy turning movement delays during the PM peak hour. While the spacing of this intersection could be acceptable for signalization, due to the location or proximity of other surrounding intersections, this location is not recommended to be signalized. It is recommended that the roadways internal to the site be designed, and driveways to individual parcels placed, to encourage use of roadways leading to signalized intersections for improved traffic flow characteristics.

Free flow right-turn lanes are recommended for the locations listed below to improve intersection delay. It should be noted that the HCM 2016 does not analyze free flow right-turn lanes or clustered diamond traffic interchanges, therefore HCM 2000 methodology was used to analyze all traffic interchanges within the study area. The right-turn lane needs of these intersections should be evaluated with future TIAs of individual phases of the development.

- (Int.5) Guadalupe Road westbound approaching Loop 202 northbound off-ramp
- (Int.11) Loop 202 northbound off-ramp approaching Elliot Road (dual)

Signalization is recommended at all arterial-arterial intersections as well as at the arterial-collector intersections listed below. The City's *Engineering and Design Standards* indicates that signalization of intersections less than 1/8-mile from an arterial (centerline to centerline) or between 1/6-mile and 1/3-mile is not acceptable. Intersections E, F and X are approximately 1/4-mile from Hawes Road and require a variance from the design standards to be signalized. Intersection Y, located on Warner Road approximately 1/8-mile east of Hawes Road, was requested by City staff to be shifted to at least 800 feet east of Hawes Road. Intersections AA and AB are planned future intersections from a different development. Intersection AK is located on Warner Road approximately 1/4-mile west of Ellsworth Road and requires a variance from the design standards to be signalized. Recommended signal locations and spacing are depicted in **Figure 24**.

- (Int.8) 80th Street and Elliot Road ~2,660 feet (1/2-mile) east of Sossaman Road
- Intersection E at Elliot Road ~1,320 feet (1/4-mile) west of Hawes Road
- Intersection F at Elliot Road ~1,285 feet ($\leq 1/4$ -mile) east of Hawes Road and ~1,285 feet ($\leq 1/4$ -mile) west of Loop 202 SB Ramps
- Intersection J at Hawes Road ~810 feet ($\leq 1/6$ -mile) south of Elliot Road
- Intersection U at Hawes Road ~820 feet ($\leq 1/6$ -mile) north of Warner Road
- Intersection X at Warner Road ~1,320 feet (1/4-mile) west of Hawes Road
- Intersection Y at Warner Road ~660 feet (1/8-mile) east of Hawes Road
- Intersection AA at Elliot Road ~709 feet ($\geq 1/8$ -mile) east of Loop 202 NB Ramps
- Intersection AB at Elliot Road ~774 feet ($\leq 1/6$ -mile) west of Ellsworth Road



Note: Distances displayed in feet are approximate.

City of Mesa Staff request intersection "Y" be located at least 800' east of Hawes Rd. (Currently depicted at 660')

Figure 24: Proposed Signal Locations

QUEUE LENGTH ANALYSIS

Left Turn Lane Analysis

Adequate turn storage should be supplied on any approach where turn lanes are permitted and/or warranted. A queuing analysis was performed for all warranted/recommended and existing intersection turn lanes where site traffic is expected as well as left turn lanes adjacent to the site. According to the methodology documented in *A Policy on Geometric Design of Highways and Streets* (the AASHTO “Green Book”), the storage length for a turn lane is typically estimated as the length required to hold the average number of arriving vehicles per two minutes, where unsignalized, or per one-and-a-half signal cycles, where signalized.¹ The formulas used for the calculations are shown below.

For signalized intersections, the storage length is determined by the following formula:

$$\text{Storage Length} = [1.5 \times (\text{veh/hr})/(\text{cycles/hr})] \times 25 \text{ feet}$$

For unsignalized intersections, the storage length is determined by the following formula:

$$\text{Storage Length} = [(\text{veh/hr})/(30 \text{ periods/hr})] \times 25 \text{ feet}$$

Using the traffic volumes and lane configurations projected for the 2040 horizon year, the resulting turn lane storage for turn movements affiliated with the site using AASHTO and ADOT guidelines were calculated with a 90-second cycle length for most signalized intersections and a 120-second cycle for SR on- and off-ramps are summarized in **Table 6**. Calculations for the queue storage length recommendations are provided in **Appendix H**.

¹ The American Association of Highway and Transportation Officials on pages 714-715 of its publication, *Geometric Design of Highways and Streets* (“AASHTO Green Book”), indicates that storage length for a turn lane, exclusive of taper, “should usually be based on one and one-half to two times the average number of vehicles that would store per cycle” at a signalized intersection.

Table 6: Turn Lane Lengths

ID	Intersection	Intersection Control	Movement	Queue Storage			
				Existing ⁽¹⁾	AASHTO/ADOT ⁽⁴⁾	Synchro ⁽²⁾	Recommended
1	Sossaman Rd. & Guadalupe Rd.	Signal	NB Left	205'	325'	187' ⁽³⁾	205' ⁽³⁾
			SB Left	255'	425'	224' ⁽³⁾	255' ⁽³⁾
			EB Left	265'	300'	189'	265' ⁽⁸⁾
			WB Left	250'	275'	221'	250' ⁽⁸⁾
			NB Right	150'	250'	53'	250'
			SB Right	260'	250'	51'	260' ⁽⁸⁾
			WB Right	220'	325'	42'	220'
2	Farnsworth Dr./ Bridlewood & Guadalupe Rd.	Signal	NB Left	85'	250'	149'	250'
			SB Left	80'	200'	151'	200'
			EB Left	175'	100'	19'	175'
			WB Left	150'	150'	101'	150'
3	Hawes Road & Guadalupe Road	Signal	NB Left	155'	200'	129'	155' ⁽⁸⁾
			SB Left	250'	175'	95'	250'
			EB Left	175'	125'	39' ⁽³⁾	175' ⁽³⁾
			WB Left	260'	525'	297' ⁽³⁾	260' ⁽³⁾⁽⁸⁾
			NB Right	-	475'	153'	350' ⁽⁷⁾
			SB Right	250'	425'	97'	350' ⁽⁷⁾
			EB Right	260'	375'	90'	350' ⁽⁷⁾
			WB Right	260'	225'	44'	260'
4	SR-202 SB Ramps & Guadalupe Road	Signal	SB Left	295'	475'/565' ⁽³⁾⁽⁴⁾	530' ⁽³⁾	530' ⁽³⁾
			WB Left	540' ⁽³⁾	275'/365' ⁽³⁾⁽⁴⁾	274' ⁽³⁾	540' ⁽³⁾
			SB Right	295'	200'/290' ⁽³⁾⁽⁴⁾	70' ⁽³⁾	295' ⁽³⁾
			EB Right	270'	350'/440' ⁽⁴⁾	63' ⁽⁶⁾	350'
5	SR-202 NB Ramps & Guadalupe Road	Signal	NB Left	295'	175'/265' ⁽³⁾⁽⁴⁾	162' ⁽³⁾	295' ⁽³⁾
			EB Left	545' ⁽³⁾	450'/540' ⁽³⁾⁽⁴⁾	421' ⁽³⁾	545' ⁽³⁾
			NB Right	295'	175'/265' ⁽³⁾⁽⁴⁾	44' ⁽³⁾	295' ⁽³⁾
			WB Right	270'	1,350'/1,445' ⁽⁴⁾	0' ⁽⁶⁾	350' ⁽⁷⁾
6	Power Road & Elliot Road	Signal	NB Left	160'	350'	204'	350'
			SB left	160'	350'	253'	350'
			EB Left	100'	500'	397'	350' ⁽⁷⁾
			WB Left	110'	375'	251'	350'
			NB Right	-	550'	219'	350' ⁽⁷⁾
			SB Right	-	550'	206'	350' ⁽⁷⁾
			EB Right	-	375'	147'	350' ⁽⁷⁾
7	Sossaman Road & Elliot Road	Signal	NB Left	155'	425'	209' ⁽³⁾	300'
			SB Left	155'	350' ⁽³⁾	261' ⁽³⁾	350' ⁽³⁾⁽⁷⁾
			EB Left	155'	325'	179'	325'
			WB Left	155'	200'	132'	200'
			NB Right	-	400'	40'	350' ⁽⁷⁾
			SB Right	-	300'	80'	250'
			WB Right	-	500'	237'	350' ⁽⁷⁾

(1) Measured from beginning of stop bar.

(2) HCM 95th percentile queue reported, value shown is the total queue for that movement.

(3) Dual left-turn lanes

(4) Calculated using ADOT minimum queue storage calculations

(5) Minimum requirement for a deceleration lane at a site driveway by City of Mesa is 150'.

(6) HCM 95th percentile queue not provided at channelized by-pass right-turn lanes or free flow right-turn lanes.(7) AASHTO storage is longer than existing and longer than 350'. CivTech recommends 350' or the Synchro 95th percentile queue, whichever is greater.

(8) Center two-way left-turn lane or large left-turn gap allows for additional storage

Table 6 (Continued): Turn Lane Lengths

ID	Intersection	Intersection Control	Movement	Queue Storage			
				Existing ⁽¹⁾	AASHTO/ADOT ⁽⁴⁾	Synchro ⁽²⁾	Recommended
8	80 th Street & Elliot Road	Signal	NB Left	-	50'	46'	150' ⁽⁵⁾
			SB Left	-	100'	85'	150' ⁽⁵⁾
			EB Left	-	25'	2'	150' ⁽⁵⁾
			WB Left	-	75'	65'	150' ⁽⁵⁾
9	Hawes Road & Elliot Road	Signal	NB Left	-	425'	475'	275'
			SB Left	-	175'	151'	200'
			EB Left	-	200'	181'	200'
			WB Left	-	400' ⁽³⁾	401' ⁽³⁾	350' ⁽³⁾⁽⁷⁾
			NB Right	-	625'	357'	350' ⁽⁷⁾
			SB Right	-	150'	0'	150' ⁽⁵⁾
			EB Right	-	350'	78'	150' ⁽⁵⁾
10	SR-202 SB Ramps & Elliot Road	Signal	SB Left	300'	425'/515' ⁽³⁾⁽⁴⁾	384' ⁽³⁾	350' ⁽³⁾
			WB Left	535' ⁽³⁾	425'/540' ⁽³⁾⁽⁴⁾	393' ⁽³⁾	535' ⁽³⁾
			SB Right	300'	700'/815' ⁽³⁾⁽⁴⁾	59' ⁽³⁾⁽⁶⁾	350' ⁽⁷⁾
			EB Right	275'	625'/715' ⁽³⁾⁽⁴⁾	77' ⁽³⁾⁽⁶⁾	350' ⁽⁷⁾
11	SR-202 NB Ramps & Elliot Road	Signal	NB Left	355'	425'/515' ⁽³⁾⁽⁴⁾	396' ⁽³⁾	355' ⁽³⁾
			EB Left	535' ⁽³⁾	700'/815' ⁽³⁾⁽⁴⁾	657' ⁽³⁾	535' ⁽³⁾
			NB Right	350'	575'/665' ⁽³⁾⁽⁴⁾	226' ⁽³⁾	350' ⁽³⁾
			WB Right	380'	775'/490' ⁽³⁾⁽⁴⁾	604' ⁽³⁾⁽⁶⁾	380' ⁽³⁾
12	Sossaman Road & Warner Road	Signal	NB Left	-	200' ⁽³⁾	186' ⁽³⁾	200' ⁽³⁾
			SB Left	-	275' ⁽³⁾	207' ⁽³⁾	300' ⁽³⁾
			EB Left	-	200' ⁽³⁾	135' ⁽³⁾	200' ⁽³⁾
			WB Left	-	150' ⁽³⁾	173' ⁽³⁾	150' ⁽³⁾
			NB Right	-	275'	96'	275'
			SB Right	-	375'	182'	350' ⁽⁷⁾
			EB Right	-	325'	43'	325'
13	Hawes Road & Warner Road	Signal	WB Right	-	550'	124'	350' ⁽⁷⁾
			NB Left	-	200' ⁽³⁾	331' ⁽³⁾	330' ⁽³⁾
			SB Left	-	350'	192' ⁽³⁾	200'
			EB Left	-	250'	126' ⁽³⁾	150'
			WB Left	-	350' ⁽³⁾	374' ⁽³⁾	350' ⁽³⁾
			NB Right	-	400'	269'	350' ⁽⁷⁾
			SB Right	-	425'	24'	350' ⁽⁷⁾
14	Hawes Road & SR-202 WB Ramps	Signal	EB Right	-	600'	379' ⁽⁶⁾	350' ⁽⁷⁾
			WB Right	-	275'	108'	275'
			NB Left	425'	200'/290' ⁽³⁾⁽⁴⁾	186' ⁽³⁾	425' ⁽³⁾
			WB Left	430'	225'/315' ⁽³⁾⁽⁴⁾	276' ⁽³⁾	430' ⁽³⁾
15	Hawes Road & SR-202 EB Ramps	Signal	SB Right	-	1,350'/1,465' ⁽⁴⁾	789'	790'
			WB Right	-	350'/440' ⁽⁴⁾	75'	440'
			SB Left	430'	350'/440' ⁽³⁾⁽⁴⁾	350' ⁽³⁾	350' ⁽³⁾
			EB Left	330'	525'/615' ⁽³⁾⁽⁴⁾	600' ⁽³⁾	600' ⁽³⁾
			NB Right	245'	425'/515' ⁽⁴⁾	60'	515'
			EB Right	330'	125'/215' ⁽⁴⁾	66'	330'

(1) Measured from beginning of stop bar.

(2) HCM 95th percentile queue reported, value shown is the total queue for that movement.

(3) Dual left-turn lanes

(4) Calculated using ADOT minimum queue storage calculations

(5) Minimum requirement for a deceleration lane at a site driveway by City of Mesa is 150'.

(6) HCM 95th percentile queue not provided at channelized by-pass right-turn lanes or free flow right-turn lanes.(7) AASHTO storage is longer than existing and longer than 350'. CivTech recommends 350' or the Synchro 95th percentile queue, whichever is greater.

(8) Center two-way left-turn lane or large left-turn gap allows for additional storage

Table 6 (Continued): Turn Lane Lengths

ID	Intersection	Intersection Control	Movement	Queue Storage			
				Existing ⁽¹⁾	AASHTO/ADOT ⁽⁴⁾	Synchro ⁽²⁾	Recommended
16	Ellsworth Road & Elliot Road	Signal	NB Left	250'	275' ⁽³⁾	229' ⁽³⁾	300' ⁽³⁾
			SB Left	245'	300' ⁽³⁾	252' ⁽³⁾	300' ⁽³⁾
			EB Left	260'	375'	290' ⁽³⁾	300'
			WB Left	255'	425'	389' ⁽³⁾	350' ⁽⁷⁾
			NB Right	260'	525'	219'	350' ⁽⁷⁾
			SB Right	180'	325'	65'	325'
			EB Right	205'	575'	533' ⁽⁶⁾	350' ⁽⁷⁾
			WB Right	275'	525'	196'	350' ⁽⁷⁾
17	Ellsworth Road & Warner Road	Signal	NB Left	250'	275' ⁽³⁾	218' ⁽³⁾	300' ⁽³⁾
			SB Left	200'	400'	371' ⁽³⁾	350'
			EB Left	-	450'	482' ⁽³⁾	350'
			WB Left	-	125'	112' ⁽³⁾	150' ⁽⁵⁾
			SB Right	-	525'	37' ⁽⁶⁾	350' ⁽⁷⁾
			EB Right	-	375'	139'	350' ⁽⁷⁾
			WB Right	-	325'	154'	350' ⁽⁷⁾
B	Hawes Road and Intersection B	1-way stop (EB)	NB Left	-	100'	-	150' ⁽⁵⁾
			EB Left	-	125'	-	150' ⁽⁵⁾
			SB Right	-	125'	-	150' ⁽⁵⁾
			EB Right	-	100'	-	150' ⁽⁵⁾
D	Intersection D & Elliot Road	1-way stop (NB)	NB Left	-	150'	-	150' ⁽⁵⁾
			WB Left	-	150'	-	150' ⁽⁵⁾
			NB Right	-	125'	-	150' ⁽⁵⁾
			EB Right	-	150'	-	150' ⁽⁵⁾
E	Intersection E/Scenic Roadway & Elliot Road	Signal	NB Left	-	75'	63'	150' ⁽⁵⁾
			SB Left	-	155'	108'	155'
			EB Left	-	75'	38'	150' ⁽⁵⁾
			WB Left	-	225'	212'	250'
F	Intersection F and Elliot Road	Signal	NB Left	-	50'	61'	150' ⁽⁵⁾
			WB Left	-	175'	122'	175'
			NB Right	-	175'	64' ⁽³⁾⁽⁶⁾	175'
J	Hawes Road & Intersection J	Signal	NB Left	-	75'	32'	150' ⁽⁵⁾
			SB Left	-	100'	29'	150' ⁽⁵⁾
			EB Left	-	75'	61'	150' ⁽⁵⁾
			WB Left	-	50'	35'	150' ⁽⁵⁾
K	Intersection K	1-way stop (EB)	NB Left	-	100'	-	150' ⁽⁵⁾
			EB Left	-	125'	-	150' ⁽⁵⁾
			EB Right	-	100'	-	150' ⁽⁵⁾
N	Hawes Road & Intersection N	2-way Stop (EB & WB)	NB Left	-	100'	-	150' ⁽⁵⁾
			SB Left	-	100'	-	150' ⁽⁵⁾
			EB Left	-	125'	-	150' ⁽⁵⁾
			WB Left	-	125'	-	150' ⁽⁵⁾

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(3) Dual left-turn lanes

(4) Calculated using ADOT minimum queue storage calculations

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(8) Center two-way left-turn lane or large left-turn gap allows for additional storage

Table 6 (Continued): Turn Lane Lengths

ID	Intersection	Intersection Control	Movement	Queue Storage			
				Existing ⁽¹⁾	AASHTO/ADOT ⁽⁴⁾	Synchro ⁽²⁾	Recommended
Q	Hawes Road & Intersection Q	1-way Stop (EB)	NB Left	-	125'	-	150' ⁽⁵⁾
			EB Left	-	150'	-	150'
			SB Right	-	150'	-	150'
			EB Right	-	125'	-	150' ⁽⁵⁾
U	Hawes Road & Intersection U	Signal	NB Left	-	125'	37'	150' ⁽⁵⁾
			SB Left	-	125'	110'	150' ⁽⁵⁾
			EB Left	-	75'	37'	150' ⁽⁵⁾
			WB Left	-	50'	77'	150' ⁽⁵⁾
X	Intersection X & Warner Road	Signal	NB Left	-	25'	24'	150' ⁽⁵⁾
			SB Left	-	225'	161'	225'
			EB Left	-	150'	16'	150' ⁽⁵⁾
			WB Left	-	75'	42'	150' ⁽⁵⁾
Y	Warner Road & Intersection Y	Signal	NB Left	-	450'	376'	350' ⁽⁷⁾
			SB Left	-	25'	20'	150' ⁽⁵⁾
			EB Left	-	125'	61'	150' ⁽⁵⁾
			WB Left	-	75'	38'	150' ⁽⁵⁾
			EB Right	-	375'	126'	350' ⁽⁷⁾
Z	Warner Road & Intersection Z	1-way Stop (SB)	SB Left	-	100'		150' ⁽⁵⁾
			EB Left	-	175'		175'
			SB Right	-	175'		175'
AA	Intersection AA & Elliot Road	Signal	NB Left	-	100'	93'	150' ⁽⁵⁾
			SB Left	-	75'	129'	150' ⁽⁵⁾
			EB Left	-	225'	131'	150' ⁽⁵⁾
			WB Left	-	50'	12'	150' ⁽⁵⁾
			SB Right	-	375'	430'	350' ⁽⁷⁾
AB	Intersection AB & Elliot Road	Signal	NB Left	-	125'	103'	150' ⁽⁵⁾
			SB Left	-	25'	44'	150' ⁽⁵⁾
			EB Left	-	200'	134'	150' ⁽⁵⁾
			WB Left	-	25'	8'	150' ⁽⁵⁾
			SB Right	-	200'	332'	200'
AC	Intersection AC	1-way Stop (WB)	SB Left	-	125'		150' ⁽⁵⁾
			WB Left	-	100'		150' ⁽⁵⁾
			WB Right	-	100'		150' ⁽⁵⁾
AD	Intersection AD	All-way Stop	NB Left	-	100'		150' ⁽⁵⁾
			SB Left	-	100'		150' ⁽⁵⁾
			EB Left	-	100'		150' ⁽⁵⁾
			WB Left	-	125'		150' ⁽⁵⁾
AE	Ellsworth Road & Intersection AE	1-way Stop (EB)	NB Left	-	100'		150' ⁽⁵⁾
			EB Left	-	125'		150' ⁽⁵⁾
			SB Right	-	150'		150' ⁽⁵⁾
			EB Right	-	100'		150' ⁽⁵⁾

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Table 6 (Continued): Turn Lane Lengths

ID	Intersection	Intersection Control	Movement	Queue Storage			
				Existing ⁽¹⁾	AASHTO/ADOT ⁽⁴⁾	Synchro ⁽²⁾	Recommended
AF	Intersection AF	1-way Stop (WB)	SB Left	-	100'		150' ⁽⁵⁾
			WB Left	-	125'		150' ⁽⁵⁾
			WB Right	-	125'		150' ⁽⁵⁾
AG	Ellsworth Road & Intersection AG	1-way Stop (EB)	NB Left	-	125'		150' ⁽⁵⁾
			EB Left	-	100'		150' ⁽⁵⁾
			SB Right	-	150'		150' ⁽⁵⁾
			EB Right	-	125'		150' ⁽⁵⁾
AH	Intersection AH	1-way Stop (NB)	NB Left	-	175'		175'
			WB Left	-	100'		150' ⁽⁵⁾
			NB Right	-	125'		150' ⁽⁵⁾
AI	Intersection AI	1-way Stop (SB)	SB Left	-	100'		150' ⁽⁵⁾
			EB Left	-	125'		150' ⁽⁵⁾
			SB Right	-	100'		150' ⁽⁵⁾
AJ	Ellsworth Road & Intersection AJ	1-way Stop (EB)	NB Left	-	150'		150'
			EB Left	-	100'		175'
			SB Right	-	100'		150' ⁽⁵⁾
			EB Right	-	125'		125' ⁽⁵⁾
AK	Warner Road & Intersection AK	1-way Stop (SB)	SB Left	-	125'		150' ⁽⁵⁾
			EB Left	-	175'		175'
			SB Right	-	125'		150' ⁽⁵⁾

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(8) Center two-way left-turn lane or large left-turn gap allows for additional storage

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations have been documented in this study:

- ◆ Under the existing conditions, all study intersections are evaluated to operate at a LOS C or better during peak hours.
- ◆ The site is anticipated to generate approximately 103,880 daily trips with 4,067 trips during the AM peak hour and 7,958 trips during the PM peak hour.
- ◆ The recommended lane configurations and traffic controls based on the 2040 projected traffic volumes are presented in **Figure 19** through **Figure 23**.
- ◆ While most signalized intersections are anticipated to operate at overall LOS D or better, some individual movements are anticipated to experience heavy delays during the AM and/or PM peak hours. This is often due to the overall high traffic volumes entering the intersection compared to the intersection's capacity, particularly in turning movements. It is well known that methodology from the NCHRP Report 765 has a tendency to over represent turning movements and underrepresent through volumes when converting AADT to peak hour volumes. Study intersections will likely have reduced turning movement volumes than projected and may operate with lower delays and better LOS than projected.
- ◆ These recommendations are based on the projected 2040 total traffic volumes, which include site traffic volumes using estimated land use densities and background volumes estimated from 2040 AADTs. The recommendations of this study also consider maximum densities of proposed land uses. If the projected is developed at densities near the target densities. Individualized traffic impact analyses are recommended when individual parcels or phases are in the platting stages and overall site plan is updated to incorporate the modifications recommended within this study.
- ◆ The intersection of Hawes Road and Warner Road is expected to experience heavy delays by study horizon year 2040. As shown in **Figure 20**, this intersection is planned for signalization by 2040 the proximity of the Loop 202 interchange to the south is expected to increase the east/west turning volumes on Warner Road, as well as the north/south through volumes along Hawes Road, increasing delays for these movements. It is recommended this intersection be monitored for future signal timing modification upon buildout of the area.
- ◆ Intersection N along Hawes Road has stop controlled east/west movement(s) that are anticipated to operate with heavy turning movement delays during the PM peak hour. As shown in **Figure 21**, while the spacing of this intersection could be acceptable for signalization, due to the location or proximity of other surrounding intersections, this location is not recommended to be signalized. It is recommended that the roadways internal to the site be designed, and driveways to individual parcels placed, to encourage use of roadways leading to signalized intersections for improved traffic flow characteristics.
- ◆ Per the City of Mesa standards, dual left-turn lanes are required at all arterial to arterial intersections, however, many study intersections analyzed within this analysis only warrant single left-turn lanes. Therefore, it is recommended right-of-way be provided for future dual left-turn lanes at all arterial to arterial intersections with the interim

conditions providing a single left-turn lane with the dual left-turn striped out for future use when needed. The following is a list of dual-left turn lane locations that warranted due to projected 2040 intersection delays:

- Sossaman Road & Elliot Road - southbound
 - Sossaman Road & Warner Road – northbound, southbound, eastbound, westbound
 - Hawes Road & Warner Road - northbound, southbound, eastbound, westbound
 - Hawes Road & Loop 202 EB Ramps - northbound
 - Hawes Road & Loop 202 WB Ramps – southbound
 - Ellsworth Road & Elliot Road – northbound, southbound
 - Ellsworth Road & Warner Road - northbound
- ◆ Per the City of Mesa standards, dedicated right-turn lanes are required at all arterial to arterial intersections. The following is a list of right-turn lanes that will be needed to improve intersection delays.
- Hawes Road & Guadalupe Road – northbound
 - Power Road & Elliot Road – northbound, southbound, eastbound
 - Sossaman Road & Elliot Road – northbound, southbound, westbound
 - Hawes Road & Elliot Road – eastbound
 - Sossaman Road & Warner Road – northbound, southbound, eastbound
 - Hawes Road & Warner Road – northbound, southbound, eastbound, westbound
 - Hawes Road & Loop 202 WB Ramps – southbound, westbound
 - Ellsworth Road and Warner Road – southbound, eastbound, westbound
 - Intersection B – southbound and eastbound
 - Intersection D – northbound and eastbound
 - Intersection K – eastbound
 - Intersection Q – eastbound
 - Intersection Z – southbound
 - Intersection AB – eastbound
 - Intersection AE – southbound, eastbound
 - Intersection AG – southbound, eastbound
 - Intersection AH – northbound
 - Intersection AI – southbound
 - Intersection AJ – eastbound
 - Intersection AK - southbound
- ◆ Free flow right-turn lanes are recommended for the locations listed below to improve intersection delay. It should be noted that the HCM 2016 does not analyze free flow right-turn lanes or clustered diamond traffic interchanges, therefore HCM 2000 methodology was used to analyze all traffic interchanges within the study area. The right-turn lane needs of these intersections should be evaluated with future TIAs of individual phases of the development.
- (Int.5) Guadalupe Road westbound approaching Loop 202 northbound off-ramp

- (Int.11) Loop 202 northbound off-ramp approaching Elliot Road (dual)
- ◆ Signalization is recommended at all arterial-arterial intersections as well as at the arterial-collector intersections listed below. The City's *Engineering and Design Standards* indicates that signalization of intersections less than 1/8-mile from an arterial (centerline to centerline) or between 1/6-mile and 1/3-mile is not acceptable. Intersections E, F and X are approximately 1/4-mile from Hawes Road and require a variance from the design standards to be signalized. Intersection Y, located on Warner Road approximately 1/8-mile east of Hawes Road, was requested by City staff to be shifted to at least 800 feet east of Hawes Road. Intersections AA and AB are planned future intersections from a different development. Intersection AK is located on Warner Road approximately 1/4-mile west of Ellsworth Road and requires a variance from the design standards to be signalized. Recommended signal locations and spacing are depicted in **Figure 24**.
 - (Int.8) 80th Street and Elliot Road ~2,660 feet (1/2-mile) east of Sossaman Road
 - Intersection E at Elliot Road ~1,320 feet (1/4-mile) west of Hawes Road
 - Intersection F at Elliot Road ~1,285 feet ($\leq 1/4$ -mile) east of Hawes Road and ~1,285 feet ($\leq 1/4$ -mile) west of Loop 202 SB Ramps
 - Intersection J at Hawes Road ~810 feet ($\leq 1/6$ -mile) south of Elliot Road
 - Intersection U at Hawes Road ~820 feet ($\leq 1/6$ -mile) north of Warner Road
 - Intersection X at Warner Road ~1,320 feet (1/4-mile) west of Hawes Road
 - Intersection Y at Warner Road ~660 feet (1/8-mile) east of Hawes Road
 - Intersection AA at Elliot Road ~709 feet ($\geq 1/8$ -mile) east of Loop 202 NB Ramps
 - Intersection AB at Elliot Road ~774 feet ($\leq 1/6$ -mile) west of Ellsworth Road

LIST OF REFERENCES

- A Policy on Geometric Design of Highways and Streets.* American Association of State Highway and Transportation Officials, Washington, D.C., 2001.
- Highway Capacity Manual.* Transportation Research Board, Washington, D.C., 2010.
- Manual on Uniform Traffic Control Devices.* U.S. Department of Transportation, Federal Highways Administration, Washington, D.C., 2009.
- NPTS Urban Travel Patterns Report.* December 1999.
- Trip Generation 10th Edition.* Institute of Transportation Engineers, Washington, D.C., 2017.
- Trip Generation Handbook, 3rd Edition,* Institute of Transportation Engineers, Washington, D.C., 2014.
- Gateway Strategic Development Plan Transportation Analysis.* City of Mesa, Mesa, 23 January 2009.
- City of Mesa 2040 Transportation Plan.* City of Mesa, Mesa, Adopted 17 November 2014.
- Roadway Design Manual.* Maricopa County Department of Transportation, Arizona, Updated February 2017.

TECHNICAL APPENDIX

APPENDIX A:	REVIEW COMMENTS AND RESPONSES
APPENDIX B:	EXISTING TRAFFIC COUNTS
APPENDIX C:	EXISTING PEAK HOUR CAPACITY ANALYSES
APPENDIX D:	TRIP GENERATION
APPENDIX E:	TRIP DISTRIBUTION CALCULATIONS
APPENDIX F:	BACKGROUND VOLUME CALCULATIONS
APPENDIX G:	2040 TOTAL PEAK HOUR ANALYSES
APPENDIX H:	TURN LANE LENGTH ANALYSES

APPENDIX A

REVIEW COMMENTS AND RESPONSES

Hawes Crossing (Formerly Mesa Inner Loop)
2nd Submittal Comments and Responses

CivTech, Inc.

Review Comments & Responses

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Sabine Ellis, City of Mesa**

Item	Location	Code	Review Comment	Response
1.	Cover Page	4	TIA will not be approved without approval letter from ADOT.	
2.	Page iii	1	Add list of Appendices	A list of Appendices is included under the Technical Appendix on page 56.
3.	Page 2	1	Include reference to the figures that shows all these intersections. Also provide an overview map with all proposed signals and their distances.	Text updated to add in distances between proposed signals. Also Figure 24 was added in to illustrate proposed signal distances.
4.	Page 2	1	Please add something to the effect that "Per City of Mesa Standards, dedicated RTLs are required at all arterial to arterial intersections. The following is a list of right-turn lanes that will be needed to improve intersection delay." It should be assumed that we ask for dedicated RTL at all arterial to arterial intersections.	Inserted text as quoted in the comment.
5.	Page 2	1	I'm guessing that a "channelized by-pass right turn-lane" is a dedicated right turn lane?	Agreed.
6.	Page 4		Add a note about when full build-out is anticipated.	Added to end of introduction paragraph on page 3 (top of page 3).
7.	Page 7	1	Striped, not stripped	Text updated.
8.	Page 7	1	Remove advisory speed limit, that is for the speed cushions only. Instead, state that the speed limit is 25 mph.	Text updated.
9.	Figure 2	1	Hawes is 35 between Guadalupe Road and Elliot Road	Figure 2 updated.
10.	Figure 2	1	Add speed limit (Elliot)	Figure 2 updated.
11.	Figure 2	1	Add speed limit (Ellsworth)	Figure 2 updated.
12.	Page 14		Show delay in seconds as well. Typical.	
13.	Page 16	2	Use target density, not maximum density. Traffic numbers using max are very high and not realistic. Update all calcs accordingly. Note: Target density was provided by Doug Ostler in comment responses for the previous review, showing the legend of land uses.	Trip Generation and all site/total volumes have been updated to represent planned Target Density values.



Hawes Crossing (Formerly Mesa Inner Loop)
2nd Submittal Comments and Responses

CivTech, Inc.

Review Comments & Responses

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Sabine Ellis, City of Mesa**

Item	Location	Code	Review Comment	Response
14.	Figure 5	4	Need to consider access for the land-locked parcels.	This site plan only reflects the arterial and major collector network other minor collectors and local collector roads will provide access to the land locked parcels and are not shown within this study/analysis.
15.	Figure 5	4	Intersection F does not comply with spacing requirements. Adjust as much as possible as discussed on 12/20.	Agreed. Plan will be updated during design to meet the recommendation in the report. Please stipulate during MITA approval.
16.	Figure 5	4	ADOT will need to review and approve signal locations close to the 202 interchange (i.e., F and AA).	-
17.	Figure 5	1	This needs to be coordinated with development to the north. They already have two set driveway locations that may be signalized in the future which AA would be dependent on.	Coordination has occurred and there locations are set to align.
18.	Figure 5	1	Signals AD/AF/AI need to be coordinated with Eastmark as they already have proposed signal locations.	Coordination has occurred and there locations are set to align.
19.	Figure 5	1	Need to consider access for the land-locked parcels.	Coordination has occurred and there locations are set to align.
20.	Figure 5	1	Y is too close to Hawes. Move west to be approx. 880' as discussed on 12/20.	Coordination has occurred and there locations are set to align.
21.	Figure 5	1	AJ needs to be coordinated with potential property to the south.	Agreed.
22.	Figure 5	1	Add legend and make sure nomenclature matches previous page.	Figure 5 updated.
23.	Page 19	1	Update numbers per comment on pg. 16. Typical.	Text updated.
24.	Figure 6	1	Clarify trip distribution. 80% of residential traffic on freeways is high, there doesn't seem to be a justification for such a high number.	Do to the rural nature of the area and the planned employment areas to occur external to the study area it was assumed the majority of the proposed residential traffic that is not anticipated to interact internal to the site would travel to/from the freeway to external employment areas.
25.	Figure 6	1	Show Hawes Rd since it will be built w/the development. Typical.	Text updated.
26.	Figure 7	1	Show Elliot & Ellsworth and Warner & Ellsworth in this figure so that all arterial/arterial intersection are included here.	Figure 7 updated to include ADT volumes at all arterial/arterial intersections.



Hawes Crossing (Formerly Mesa Inner Loop)
2nd Submittal Comments and Responses

CivTech, Inc.

Review Comments & Responses

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Sabine Ellis, City of Mesa**

Item	Location	Code	Review Comment	Response
27.	Figure 7	1	SB in PM doesn't seem to add up looking at traffic coming from the north. Verify.	Figure 7 updated.
28.	Figure 7	1	Show Elliot & Ellsworth and Warner & Ellsworth in this figure so that all arterial/arterial intersection are included here.	ADT volumes included on Elliot & Ellsworth and Warner & Ellsworth.
29.	Figure 7	1	This seems low based on the TMCs on the left. Verify.	Volumes verified.
30.	Figure 7	1	Show volumes on Ellsworth.	Ellsworth ADT volumes included on Figure 7.
31.	Figure 9	1	No intersections/connections to Hawes in this area?	Figure 9 updated with Hawes Road connection to the south.
32.	Figure 10	1	Needs to be coordinated with development to the north.	Agreed.
33.	Page 34	1	All arterial to arterial intersections should be designed with dual left turns per Mesa Stds. If not warranted due to volumes, they will be striped as a single left turn until duals are needed.	Due to low projected future volumes a large portion of all arterial to arterial intersections do not all warrant dual left-turn lanes however, text will be updated that ROW be provided for future dual turn lanes at all arterial to arterial intersections.
34.	Page 34	1	Current version is 2017	
35.	Figure 19	1	Show 3rd thru lane in white since it will have to be built per 2040 plan, warranted or not.	Cross section that this comment references was removed in the Jan 2019 TIA.
36.	Figure 19	1	Remove 4th thru lane in both directions. There will not be sufficient ROW to accomplish this. Typical.	Figure 19 has been updated.
37.	Figure 20	1	Why 3 EB thru lanes for 566 vph and rest of Warner is 2 lanes?	Figure 20 has been updated with new projected target volumes thus reducing mitigation.
38.	Figure 20	1	Remove 4th thru lane in EB/WB direction.	Figure 20 has been updated with new projected target volumes thus reducing much of the previously recommended mitigation.
39.	Page 40	3	In the analysis, a peak hour factor of 0.9 was used. That is typically acceptable but with as much congestion as we will have here, use 0.92 to see if that helps with delay. Using the target density vs. the max density as noted before might have already helped with this.	With the reduced target density values the 0.9 PHF was sufficient in both AM and PM peak 2040 synchro models.



Hawes Crossing (Formerly Mesa Inner Loop)
2nd Submittal Comments and Responses

CivTech, Inc.

Review Comments & Responses

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Sabine Ellis, City of Mesa**

Item	Location	Code	Review Comment	Response
40.	Page 40	1	Include delay in seconds in table.	Dealy has been added to all LOS tables.
41.	Page 46	1	Per previous comment, remove comment about 4th lane in each direction.	Comment removed.
42.	Page 47	1	Re-evaluate storage lengths with new traffic numbers and updated cycle lengths where applicable. Modifying storage lengths at intersections outside of the project limits, especially when already fully built out, will most likely not be feasible or cost prohibitive	Volumes and Queue storage table has been updated with the Target Density values.
43.	Appendix C	1	Cover Page : What are cycle lengths? Not all cycle lengths add up in analysis, verify. OK to modify if needed to accommodate demand	Appendix C has been updated to included Phaseing sheets which included cycle lengths. A 90-second CL was applied to all study signals with the exception of the Loop 202 TI's which used a 120-CL.
44.	Appendix D	1	Page 1 of 5: This is a confusing breakdown. There is supposed to be a total of 156 AC of single family residential with assumed 5 DU/AC. Which means LC 210 should be a total of 780 DUs (156 x 5). Shown here are only 676 DUs (592 + 84). Please show a better overview that shows the gross AC, target density, amount of DUs and LUC for all uses, but using the target density instead of the max density as noted on page 16.	Appendix D Trip Generaiton has been updated.



Hawes Crossing (Formerly Mesa Inner Loop)**CivTech, Inc.****Review Comments & Responses****1st Submittal Comments and Responses**

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Sabine Ellis, City of Mesa**

Item	Review Comment	(Code) & Response
1.	Page 1, 3rd Bullet - Include reference to the figures that shows all these intersections. Also provide an overview map with all proposed signals and their distances.	Requested text and figure are now provided.
2.	Page 1, 3rd Bullet - Why 80th St and Elliot? ["Signalization is recommended at...the intersection of 80th Street and Elliot Road"]	Growth in traffic volumes on 80th Street and construction of the project are projected to require signalization to operate acceptably (1/2-mile street). The south leg is also an analyzed driveway of the site.
3.	Page 1, 3rd Bullet - Signal spacing needs to comply with Engineering & Design Standards.	The developer proposes roads at the indicated locations, spacing. The site plan has been modified following a follow-up meeting with a City transportation staff member.
4.	Page 2, 1st Bullet - This needs to be coordinated with ADOT. Please submit TIA to ADOT for review.	(1) The TIA will be provided to ADOT.
5.	Page 2, 2nd Bullet - Hawes Rd is to be a 6-lane arterial within the project limits.	(1) The updated TIA recommends Hawes Road to be a 6-lane road.
6.	Page 2, 3rd Bullet - Why did you not use MAG's projected volumes?	(1) MAG's projected volumes, displayed within the Mesa 2040 Transportation Plan were indeed used. The NCHRP report cited includes strategy/guidelines of how to convert ADT to peak hour turning movement volumes.
7.	Page 3, Last Sentence - When is full build-out?	(1) Full build-out is anticipated in 20-25 years. The year 2040 will be assumed (22 years from 2018).
8.	Page 15, 3rd Paragraph - Use most current (10th edition)	(1) The updated TIA now uses the latest edition (10th) of Trip Generation Manual.
9.	Page 16/Figure 5 - What do colors mean? Provide legend. Also show arterial street names on map.	(1) The legend is now provided.
10.	Page 29, 2nd Paragraph - Hawes Rd to be 6 lanes within full project	(1) The updated TIA recommends Hawes Road to be a 6-lane road.
11.	Page 37, 2nd Paragraph - Spacing to comply with standards	(1) A follow up meeting was held with a city transportation staff member. The site plan has been revised. The developer proposes roads at the now indicated locations, spacing.
12.	Page 39, 1st Sentence - Duplicate. Delete.	(1) Duplicate sentence has been removed.
13.	Appendix F, First Page, Header - 225? [Referencing NCHRP Report]	(1) This should reference NCHRP 765, not 225. This has been revised.



Hawes Crossing (Formerly Mesa Inner Loop)**CivTech, Inc.****Review Comments & Responses****1st Submittal Comments and Responses**

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Sabine Ellis, City of Mesa**

Item	Review Comment	(Code) & Response
14.	Appendix F, 2nd Page, Notes - Bethany and 303? [reference to model used]	(1) This should state "Mesa Transportation Plan 2040." This was revised and is now on the first page of the set.
15.	Appendix F, 5th Page, Table Header, Left Side - Riggs Road?	(1) This should have stated "Mesa Inner Loop" as does the other pages in Appendix F. This may be revised in a future submittal.



APPENDIX B

EXISTING TRAFFIC COUNTS

Intersection Turning Movement Prepared by:



Project #: 17-1383-001

TMC SUMMARY OF Sossaman Rd. & Guadalupe Rd.

Sossaman Rd.

Guadalupe Rd.

APPROACH LANES

	AM	MD	PM	TOTAL
Left	72		71	143
Thru	101		187	288
Right	104		258	362

↓

N

↑

Guadalupe Rd.

Sossaman Rd.

APPROACH LANES

	AM	MD	PM	TOTAL
Left	25		36	61
Thru	131		144	275
Right	43		41	84

↓

APPROACH LANES

	AM	MD	PM	TOTAL
Left	170		159	329
Thru	380		329	709
Right	63		72	135

↓

CONTROL

Signal

LOCATION #: 17-1383-001

TURNING MOVEMENT COUNT

Sossaman Rd. & Guadalupe Rd.
(Intersection Name)

TUESDAY **10/03/17**
Day Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR 700 AM

NOON PEAK HOUR

PM PEAK HOUR 400 PM

Intersection Turning Movement

Prepared by:



Project #: 17-1383-002

TMC SUMMARY OF Farnsworth Dr / Bridlewood & Guadalupe Rd.

Farnsworth Dr / t

Guadalupe Rd.

N

APPROACH LANES				
	AM	MD	PM	TOTAL
Left	2		0	2
Thru	3		0	3
Right	20		25	45

APPROACH LANES				
	AM	MD	PM	TOTAL
Left	21		48	69
Thru	376		507	883
Right	106		73	179

CONTROL
Signal

	TOTAL	AM	MD	PM
Left	52	19		33
Thru	842	294		548
Right	149	82		67

	TOTAL	AM	MD	PM
Left	132	94		38
Thru	7	7		0
Right	187	129		58

LOCATION #: 17-1383-002

TURNING MOVEMENT COUNT

Farnsworth Dr / Bridlewood & Guadalupe
(Intersection Name)

TUESDAY
Day

10/03/17
Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR 730 AM

NOON PEAK HOUR

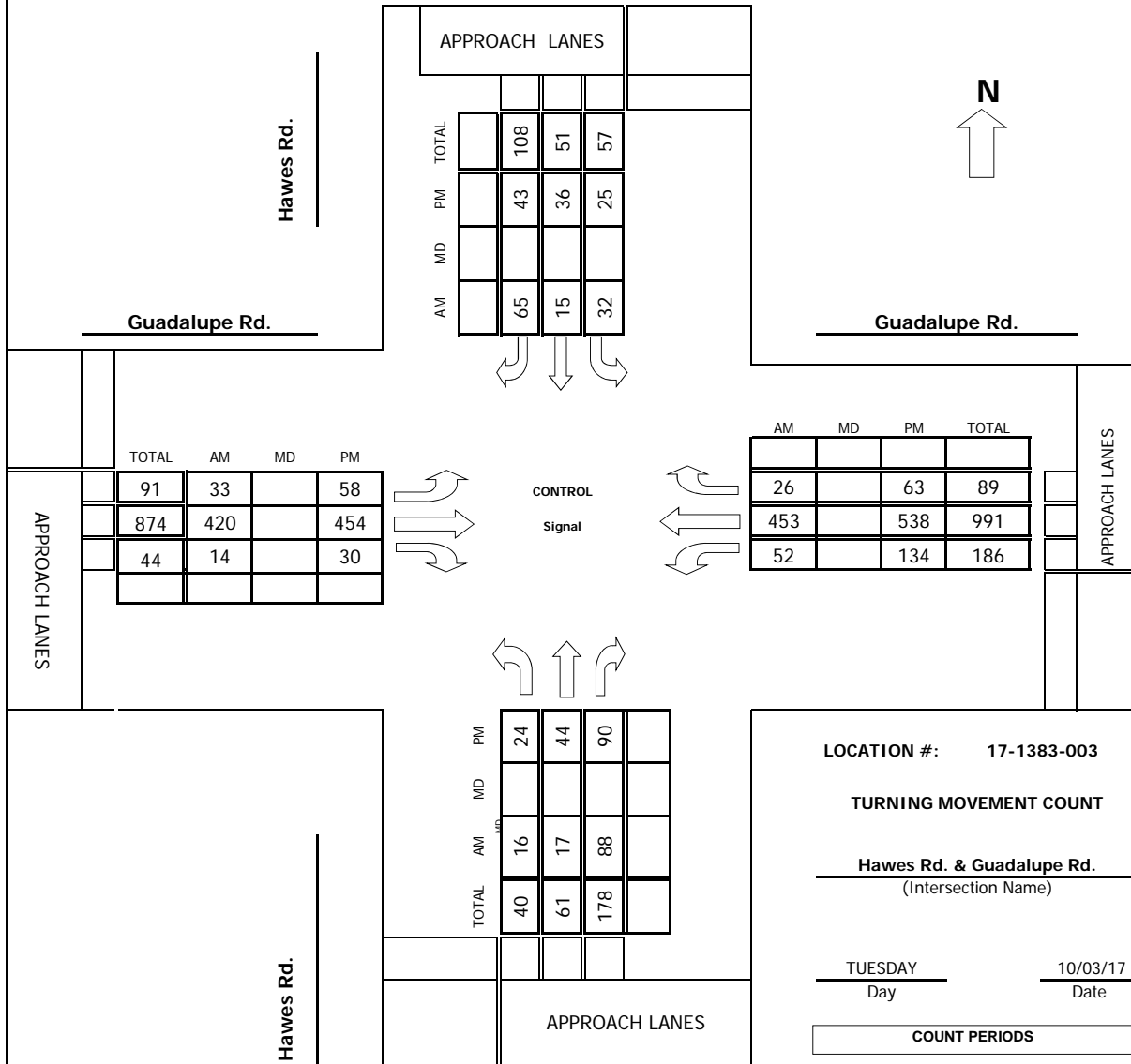
PM PEAK HOUR 400 PM

Intersection Turning Movement Prepared by:



Project #: 17-1383-003

TMC SUMMARY OF Hawes Rd. & Guadalupe Rd.



AM PEAK HOUR 700 AM

NOON PEAK HOUR

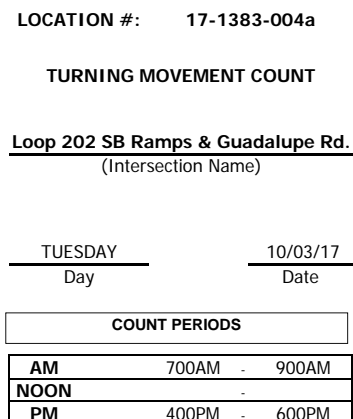
PM PEAK HOUR 500 PM

Prepared by:



520,316,6745

TMC SUMMARY OF Loop 202 SB Ramps & Guadalupe Rd.



AM PEAK HOUR	<u>700 AM</u>
NOON PEAK HOUR	<u> </u>
PM PEAK HOUR	<u>445 PM</u>

Intersection Turning Movement

Prepared by:



Project #: 17-1383-004b

TMC SUMMARY OF Loop 202 NB Ramps & Guadalupe Rd.

Loop 202 NB Ramps

Guadalupe Rd.

APPROACH LANES	TOTAL	AM	MD	PM
Left	428	300		128
Thru	1490	433		1057
Right	0	0		0

Guadalupe Rd.

APPROACH LANES	AM	MD	PM	TOTAL
Left	788		297	1085
Thru	664		463	1127
Right	0		0	0

CONTROL Signal

Loop 202 NB Ramps

APPROACH LANES	TOTAL	AM	MD	PM
Left	127	32		95
Thru	7	6		1
Right	478	156		322

LOCATION #: 17-1383-004b

TURNING MOVEMENT COUNT

Loop 202 NB Ramps & Guadalupe Rd.
(Intersection Name)

TUESDAY **10/03/17**
Day Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR 700 AM

NOON PEAK HOUR

PM PEAK HOUR 445 PM

Intersection Turning Movement

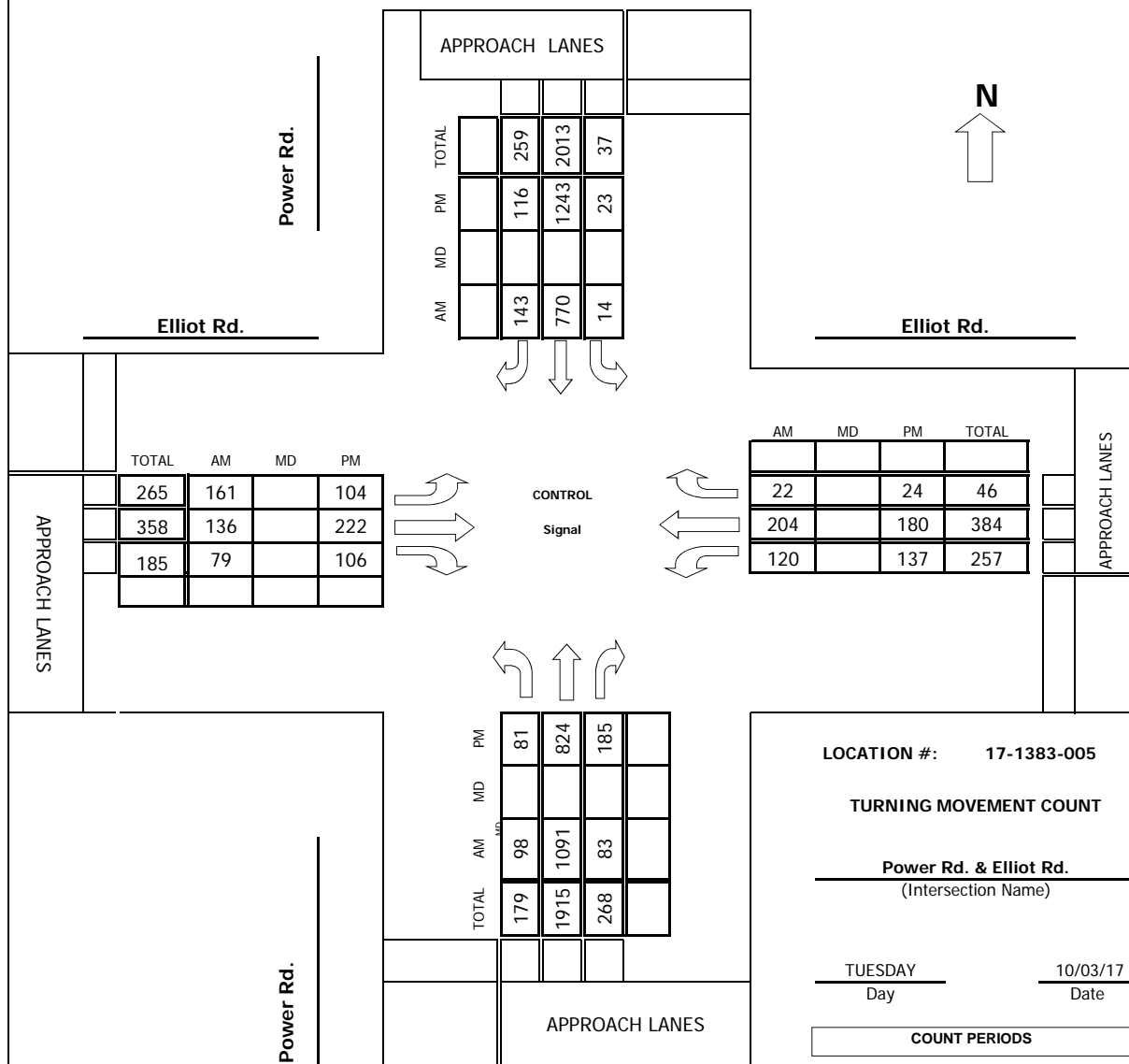
Prepared by:



520.316.6745

Project #: 17-1383-005

TMC SUMMARY OF Power Rd. & Elliot Rd.



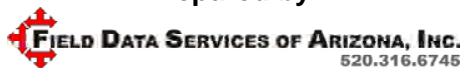
AM PEAK HOUR 700 AM

NOON PEAK HOUR

PM PEAK HOUR 445 PM

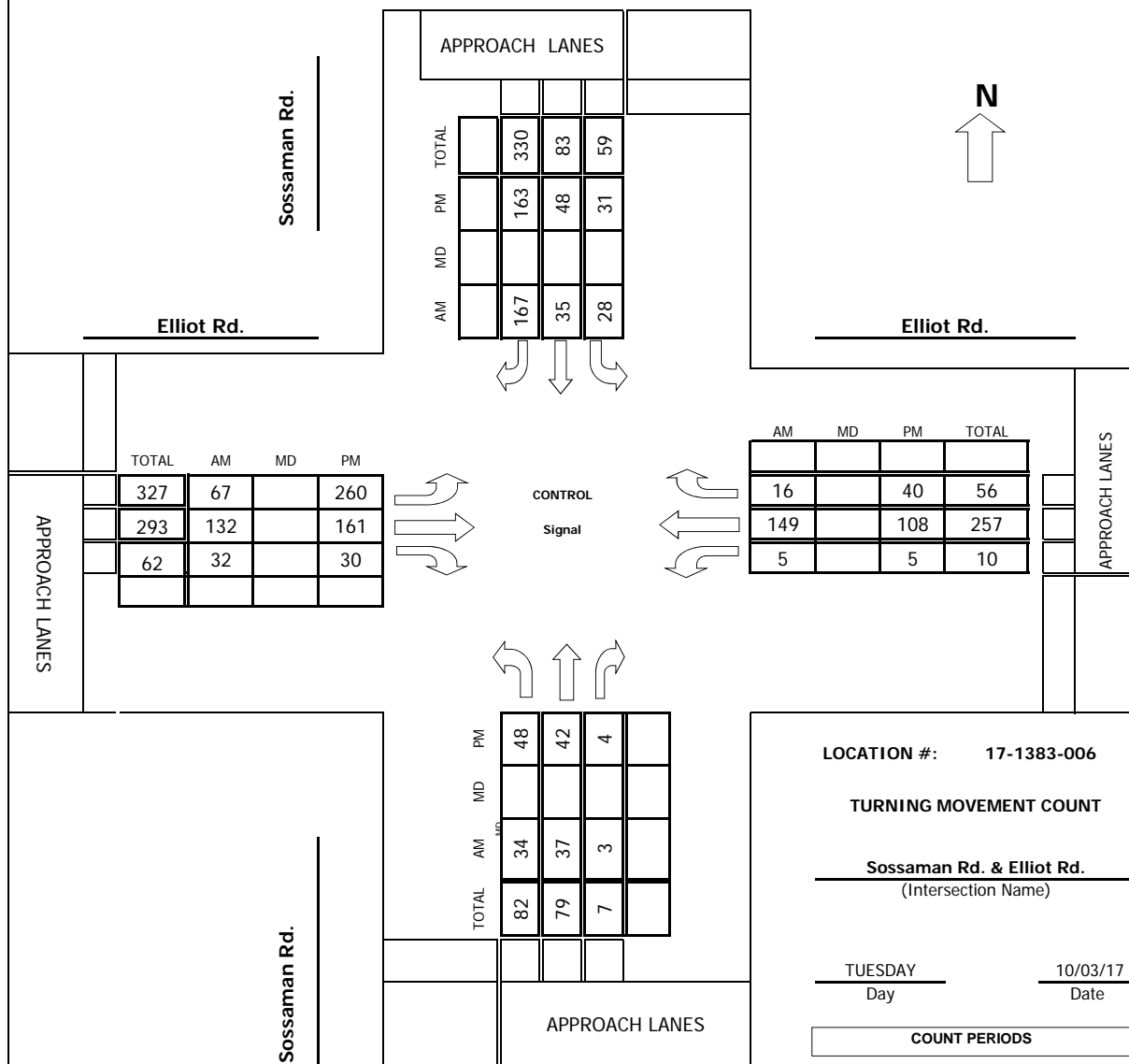
Intersection Turning Movement

Prepared by:



Project #: 17-1383-006

TMC SUMMARY OF Sossaman Rd. & Elliot Rd.



AM PEAK HOUR 715 AM

NOON PEAK HOUR

PM PEAK HOUR 430 PM

Intersection Turning Movement

Prepared by:



Project #: 17-1383-007

TMC SUMMARY OF 80th St. & Elliot Rd.

80th St.

Elliot Rd.

APPROACH LANES				
	TOTAL	PM	MD	AM
Left	51	13		38
Thru	0	0		0
Right	22	8		14

CONTROL
1-Way Stop
SB

TOTAL	AM	MD	PM
58	40		18
315	111		204
0	0		0

80th St.

N
↑

Elliot Rd.

AM	MD	PM	TOTAL
33		10	43
154		163	317
0		0	0

APPROACH LANES

LOCATION #: 17-1383-007

TURNING MOVEMENT COUNT

80th St. & Elliot Rd.
(Intersection Name)

TUESDAY
Day

10/03/17
Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR 730 AM

NOON PEAK HOUR

PM PEAK HOUR 445 PM

Intersection Turning Movement

Prepared by:



Project #: 17-1383-008

TMC SUMMARY OF Hawes Rd. & Elliot Rd.

Hawes Rd.

Elliot Rd.

N

↑

Elliot Rd.

APPROACH LANES				
	AM	MD	PM	TOTAL
Left	34		11	45
Thru	3		4	7
Right	32		24	56

	AM	MD	PM	TOTAL
Left	14		30	44
Thru	136		156	292
Right	6		1	7

Hawes Rd.

Elliot Rd.

	TOTAL	AM	MD	PM
Left	48	20		28
Thru	292	116		176
Right	8	3		5

	TOTAL	AM	MD	PM
Left	8	6		2
Thru	7	2		5
Right	11	3		8

CONTROL

2-Way Stop

NB & SB

Hawes Rd.

Elliot Rd.

APPROACH LANES

LOCATION #: **17-1383-008**

TURNING MOVEMENT COUNT

Hawes Rd. & Elliot Rd.
(Intersection Name)

TUESDAY
Day

10/03/17
Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR 730 AM

NOON PEAK HOUR

PM PEAK HOUR 500 PM

Intersection Turning Movement

Prepared by:



Project #: 17-1383-009a

TMC SUMMARY OF Loop 202 SB Ramps & Elliot Rd.

Loop 202 SB Ram

Elliot Rd.

AM	MD	PM	TOTAL
41		58	99
0		1	1
144		459	603

N

Elliot Rd.

APPROACH LANES

TOTAL	AM	MD	PM
0	0		0
284	111		173
70	40		30

CONTROL

Signal

APPROACH LANES

AM	MD	PM	TOTAL
0		0	0
118		144	262
142		100	242

Loop 202 SB Ramps

TOTAL	AM	MD	PM
0	0		0
0	0		0
0	0		0

APPROACH LANES

LOCATION #: 17-1383-009a

TURNING MOVEMENT COUNT

Loop 202 SB Ramps & Elliot Rd.
(Intersection Name)

TUESDAY **10/03/17**
Day Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR 715 AM

NOON PEAK HOUR

PM PEAK HOUR 430 PM

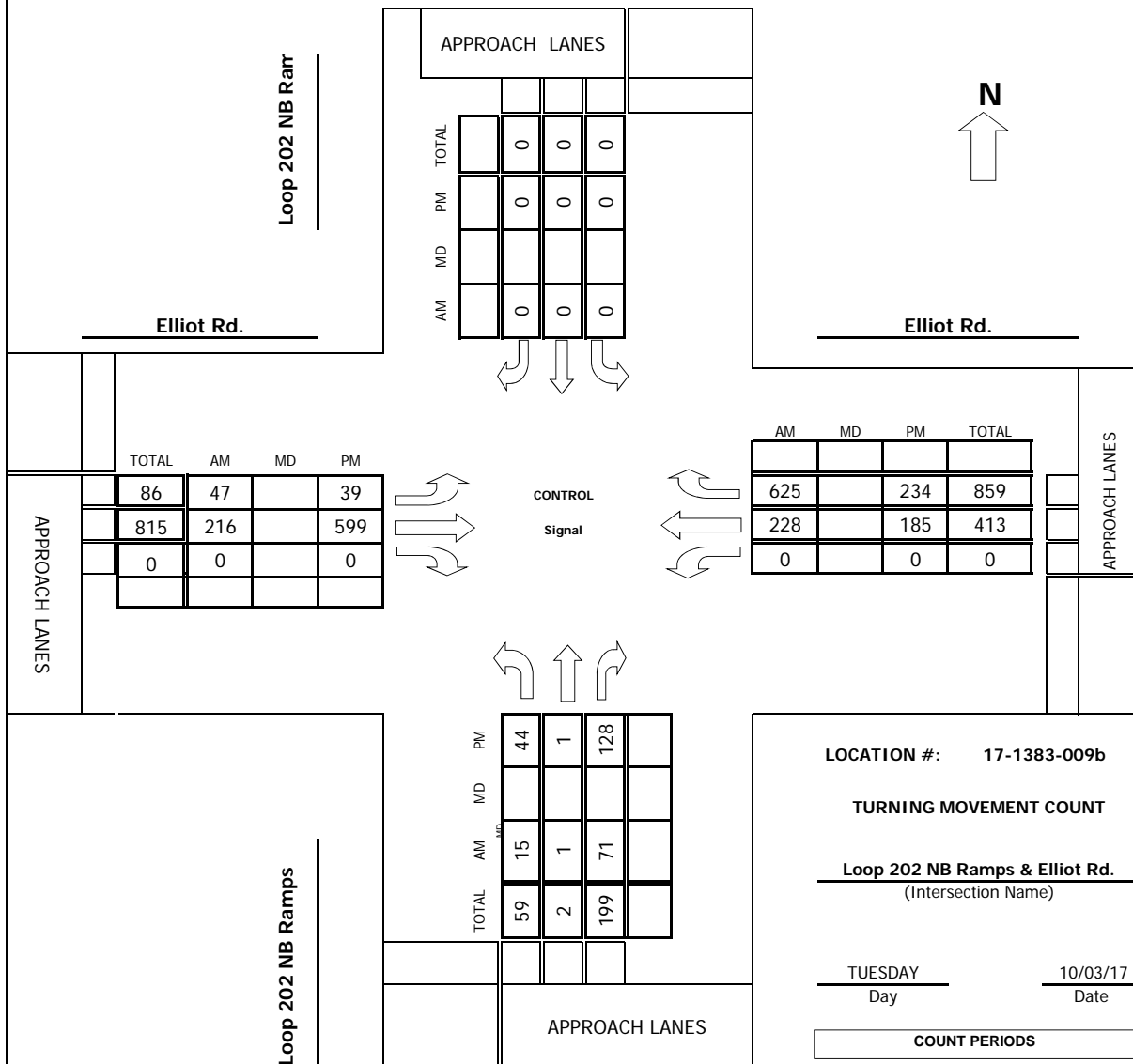
Prepared by:



520.316.6745

Project #: 17-1383-009b

TMC SUMMARY OF Loop 202 NB Ramps & Elliot Rd.

AM PEAK HOUR 700 AM

NOON PEAK HOUR

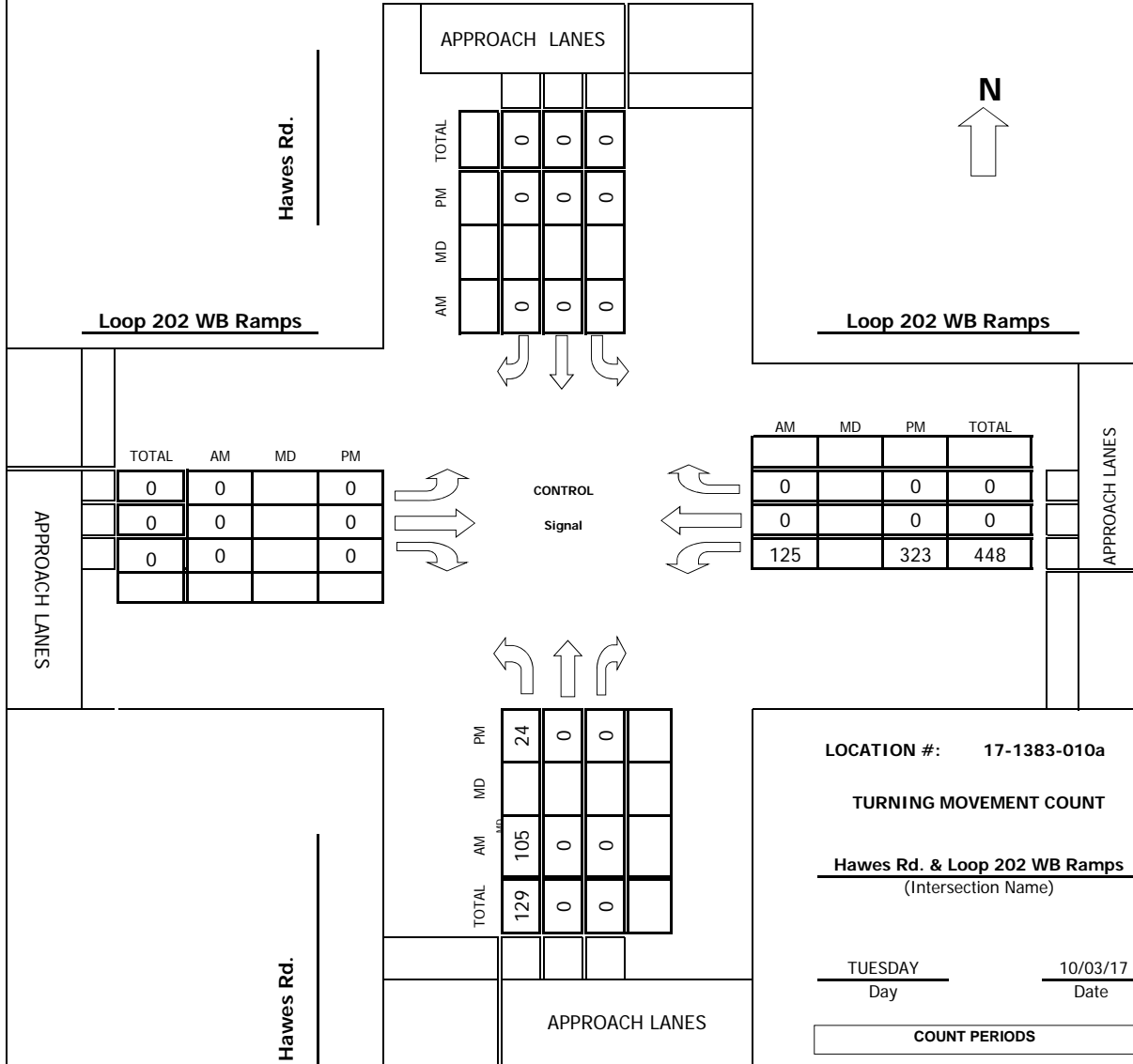
PM PEAK HOUR 430 PM

Intersection Turning Movement Prepared by:



Project #: 17-1383-010a

TMC SUMMARY OF Hawes Rd. & Loop 202 WB Ramps



LOCATION #: 17-1383-010a

TURNING MOVEMENT COUNT

Hawes Rd. & Loop 202 WB Ramps
(Intersection Name)

TUESDAY 10/03/17
Day Date

COUNT PERIODS

AM	700AM	-	900AM
NOON	-	-	-
PM	400PM	-	600PM

AM PEAK HOUR 700 AM

NOON PEAK HOUR

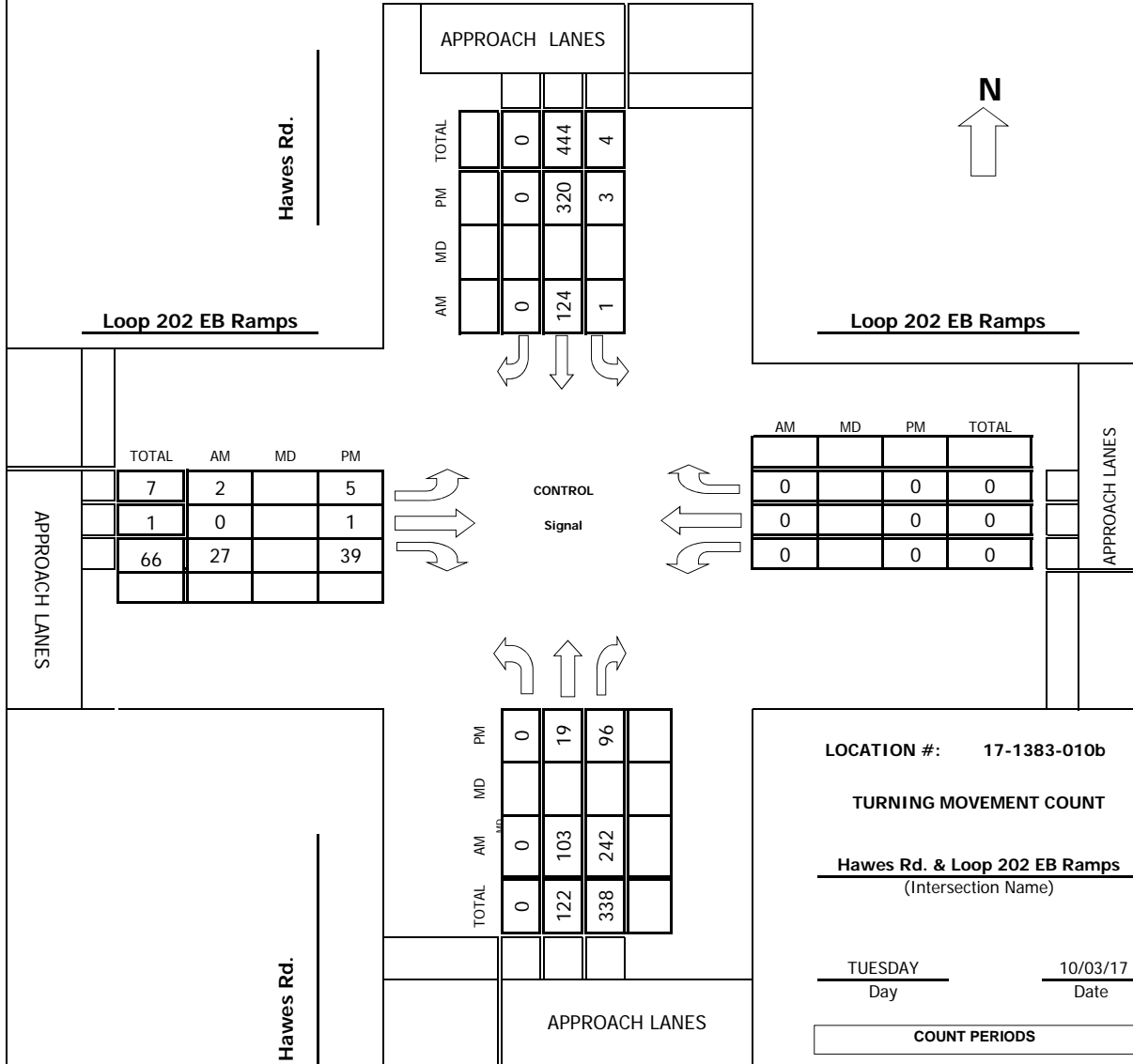
PM PEAK HOUR 445 PM

Intersection Turning Movement Prepared by:



Project #: 17-1383-010b

TMC SUMMARY OF Hawes Rd. & Loop 202 EB Ramps



AM PEAK HOUR 700 AM

NOON PEAK HOUR

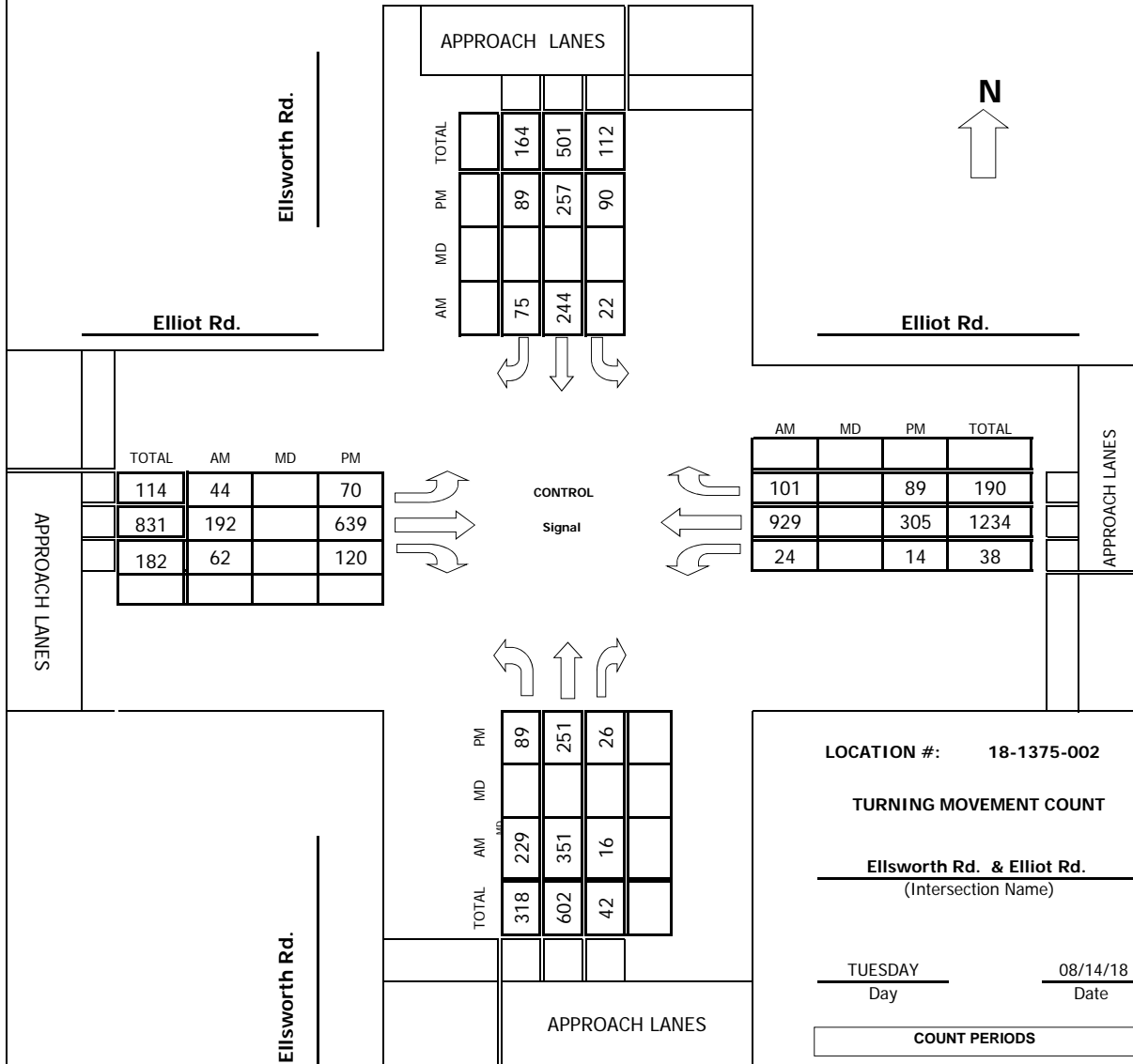
PM PEAK HOUR 445 PM

Intersection Turning Movement Prepared by:



Project #: 18-1375-002

TMC SUMMARY OF Ellsworth Rd. & Elliot Rd.



LOCATION #: **18-1375-002**

TURNING MOVEMENT COUNT

Ellsworth Rd. & Elliot Rd.
(Intersection Name)

TUESDAY
Day

08/14/18
Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR 715 AM

NOON PEAK HOUR

PM PEAK HOUR 500 PM

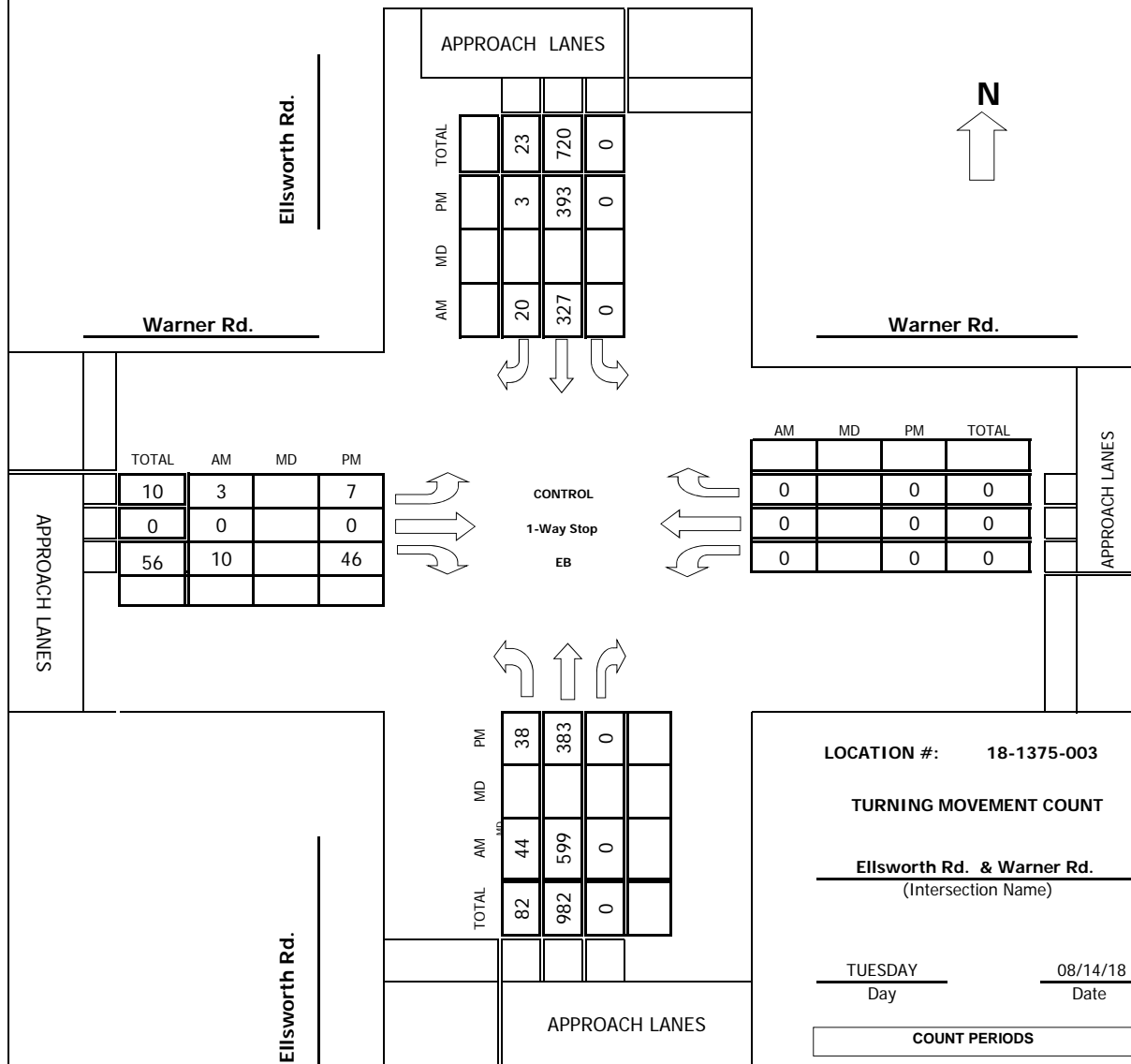
Intersection Turning Movement

Prepared by:



Project #: 18-1375-003

TMC SUMMARY OF Ellsworth Rd. & Warner Rd.



LOCATION #: **18-1375-003**

TURNING MOVEMENT COUNT

Ellsworth Rd. & Warner Rd.
(Intersection Name)

TUESDAY
Day

08/14/18
Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR 715 AM

NOON PEAK HOUR

PM PEAK HOUR 500 PM

N-S STREET: Sossaman Rd. DATE: 10/03/17 LOCATION: Mesa
E-W STREET: Guadalupe Rd. DAY: TUESDAY PROJECT#: 17-1383-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	8	28	8	33	33	15	10	54	5	21	118	37	370
7:15 AM	8	37	17	18	22	17	18	68	5	20	88	42	360
7:30 AM	16	40	10	20	21	26	26	53	11	9	92	43	367
7:45 AM	4	39	6	33	25	14	27	75	12	13	82	48	378
8:00 AM	7	28	9	23	32	12	12	66	6	12	75	48	330
8:15 AM	2	38	9	30	29	19	12	47	4	9	87	51	337
8:30 AM	8	31	5	17	29	6	9	47	1	10	71	42	276
8:45 AM	2	31	4	22	21	8	8	41	2	6	56	45	246
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	55	272	68	196	212	117	122	451	46	100	669	356	2664
Approach %	13.92	68.86	17.22	37.33	40.38	22.29	19.71	72.86	7.43	8.89	59.47	31.64	
App/Depart	395	/	750	525	/	358	619	/	715	1125	/	841	

AM Peak Hr Begins at: 700 AM

PEAK	Volumes	36	144	41	104	101	72	81	250	33	63	380	170	1475
Approach %		16.29	65.16	18.55	37.55	36.46	25.99	22.25	68.68	9.07	10.28	61.99	27.73	

PEAK HR.	FACTOR:	0.837	0.855	0.798	0.871	0.976
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CONTROL: Signal

COMMENT 1: 33.364898, -111.670712

GPS:

HOURS:

	FROM:		TO:	
AM	700	AM	900	AM
NOON				
PM	400	PM	600	PM

N-S STREET: Sossaman Rd. DATE: 10/03/17 LOCATION: Mesa
E-W STREET: Guadalupe Rd. DAY: TUESDAY PROJECT#: 17-1383-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	3	35	12	67	44	19	13	103	10	12	89	39	446
4:15 PM	7	33	9	73	38	16	6	85	12	21	69	36	405
4:30 PM	10	31	7	61	54	18	17	108	12	13	98	43	472
4:45 PM	5	32	15	57	51	18	13	81	15	26	73	41	427
5:00 PM	6	28	8	78	61	23	14	63	5	10	73	42	411
5:15 PM	4	26	12	56	65	15	16	77	8	10	86	32	407
5:30 PM	6	26	11	74	55	18	10	73	15	25	97	40	450
5:45 PM	8	34	16	50	45	7	13	81	13	19	90	43	419
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	49	245	90	516	413	134	102	671	90	136	675	316	3437
Approach %	12.76	63.80	23.44	48.54	38.85	12.61	11.82	77.75	10.43	12.07	59.89	28.04	
App/Depart	384	/	663	1063	/	639	863	/	1277	1127	/	858	

PM Peak Hr Begins at: 400 PM

PEAK	Volumes	25	131	43	258	187	71	49	377	49	72	329	159	1750
Approach %		12.56	65.83	21.61	50.00	36.24	13.76	10.32	79.37	10.32	12.86	58.75	28.39	

PEAK HR.	FACTOR:	0.957	0.970	0.867	0.909	0.927
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CONTROL: Signal

COMMENT 1: 0

GPS: 33.364898, -111.670712

HOURS:

	FROM:		TO:	
AM	700	AM	900	AM
NOON	0	0	0	0
PM	400	PM	600	PM



	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 0	EL 1	ET 2	ER 1	WL 1	WT 3	WR 0	TOTAL

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	137	9	196	34	6	2	32	578	102	137	763	38	2034
Approach %	40.06	2.63	57.31	80.95	14.29	4.76	4.49	81.18	14.33	14.61	81.34	4.05	
App/Depart	342	/	79	42	/	245	712	/	808	938	/	902	

FROM:		TO:	
AM	700	AM	900
NOON			
PM	400	PM	600



	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 0	EL 1	ET 2	ER 1	WL 1	WT 3	WR 0	TOTAL

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	70	2	104	39	2	0	67	1012	136	140	1013	75	2660
Approach %	39.77	1.14	59.09	95.12	4.88	0.00	5.51	83.29	11.19	11.40	82.49	6.11	
App/Depart	176	/	144	41	/	278	1215	/	1155	1228	/	1083	

FROM:		TO:	
AM	700	AM	900
NOON	0	0	0
PM	400	PM	600



N-S STREET: Hawes Rd. DATE: 10/03/17 LOCATION: Mesa

E-W STREET:	Guadalupe Rd.	DAY: TUESDAY	PROJECT#	17-1383-003
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[illegible]

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	36	29	150	57	24	114	68	733	24	104	804	45	2188
Approach %	16.74	13.49	69.77	29.23	12.31	58.46	8.24	88.85	2.91	10.91	84.37	4.72	
App/Depart	215	/	142	195	/	152	825	/	940	953	/	954	

AM Peak Hr Begins at: 700 AM

PEAK													
Volumes	16	17	88	32	15	65	33	420	14	52	453	26	1231
Approach %	13.22	14.05	72.73	28.57	13.39	58.04	7.07	89.94	3.00	9.79	85.31	4.90	

PEAK HR. FACTOR:	0.840	0.848	0.778	0.928	0.897
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CONTROL:	Signal		
COMMENT 1:			
GPS:	33.364803, -111.653358		
HOURS:		FROM:	TO:

	FROM:		TO:	
AM	700	AM	900	AM
NOON				
PM	400	PM	600	PM



N-S STREET: Hawes Rd. DATE: 10/03/17 LOCATION: Mesa

E-W STREET:	Guadalupe Rd.	DAY:	TUESDAY	PROJECT#	17-1383-003
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[illegible]

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	53	83	196	47	75	76	105	933	71	255	1052	112	3058
Approach %	15.96	25.00	59.04	23.74	37.88	38.38	9.47	84.13	6.40	17.97	74.14	7.89	
App/Depart	332	/	300	198	/	401	1109	/	1176	1419	/	1181	

PM Peak Hr Begins at: 500 PM

PEAK													
Volumes	24	44	90	25	36	43	58	454	30	134	538	63	1539
Approach %	15.19	27.85	56.96	24.04	34.62	41.35	10.70	83.76	5.54	18.23	73.20	8.57	

PEAK HR. FACTOR:	0.823	0.788	0.891	0.933	0.945
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CONTROL:	Signal			
COMMENT 1:	0			
GPS:	33.364803, -111.653358			
HOURS:	<table border="1"><tr><td></td><td>FROM:</td><td>TO:</td></tr></table>		FROM:	TO:
	FROM:	TO:		

	FROM:		TO:	
AM	700	AM	900	AM
NOON	0	0	0	0
PM	400	PM	600	PM

N-S STREET: Loop 202 SB Ramps DATE: 10/03/17 LOCATION: Mesa
E-W STREET: Guadalupe Rd. DAY: TUESDAY PROJECT#: 17-1383-004a

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	0	0	45	0	39	0	155	21	54	118	0	432
7:15 AM	0	0	0	42	1	33	0	151	19	50	130	0	426
7:30 AM	0	0	0	41	0	30	0	131	16	66	123	0	407
7:45 AM	0	0	0	54	0	28	0	116	13	63	93	0	367
8:00 AM	0	0	0	64	1	38	0	110	21	64	107	0	405
8:15 AM	0	0	0	53	0	32	0	95	19	78	75	0	352
8:30 AM	0	0	0	49	0	19	0	84	17	65	90	0	324
8:45 AM	0	0	0	46	0	32	0	72	25	65	64	0	304
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	0	0	394	2	251	0	914	151	505	800	0	3017
Approach %	####	####	####	60.90	0.31	38.79	0.00	85.82	14.18	38.70	61.30	0.00	
App/Depart	0	/	0	647	/	658	1065	/	1308	1305	/	1051	

AM Peak Hr Begins at: 700 AM

PEAK													
Volumes	0	0	0	182	1	130	0	553	69	233	464	0	1632
Approach %	####	####	####	58.15	0.32	41.53	0.00	88.91	11.09	33.43	66.57	0.00	

PEAK HR.													
FACTOR:	0.000	0.932	0.884	0.922	0.944								

CONTROL:	Signal
COMMENT 1:	
GPS:	33.364720, -111.644768
HOURS:	
	FROM: TO:
AM	700 AM 900 AM
NOON	
PM	400 PM 600 PM

N-S STREET: Loop 202 SB Ramps DATE: 10/03/17 LOCATION: Mesa
E-W STREET: Guadalupe Rd. DAY: TUESDAY PROJECT#: 17-1383-004a

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	0	0	0	145	0	88	0	111	19	57	79	0	499
4:15 PM	0	0	0	127	0	92	0	202	12	58	77	0	568
4:30 PM	0	0	0	173	0	96	0	125	26	45	85	0	550
4:45 PM	0	0	0	156	1	112	0	141	27	50	73	0	560
5:00 PM	0	0	0	169	0	103	0	150	22	39	105	0	588
5:15 PM	0	0	0	177	0	106	0	105	21	49	99	0	557
5:30 PM	0	0	0	169	0	118	0	115	13	58	96	0	569
5:45 PM	0	0	0	163	0	106	0	126	17	63	71	0	546
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	0	0	1279	1	821	0	1075	157	419	685	0	4437
Approach %	####	####	####	60.88	0.05	39.08	0.00	87.26	12.74	37.95	62.05	0.00	
App/Depart	0	/	0	2101	/	577	1232	/	2354	1104	/	1506	

PM Peak Hr Begins at: 445 PM

PEAK													
Volumes	0	0	0	671	1	439	0	511	83	196	373	0	2274
Approach %	####	####	####	60.40	0.09	39.51	0.00	86.03	13.97	34.45	65.55	0.00	

PEAK HR.													
FACTOR:	0.000	0.968	0.863	0.924	0.967								

CONTROL:	Signal
COMMENT 1:	
GPS:	33.364720, -111.644768
HOURS:	
	FROM: TO:
AM	700 AM 900 AM
NOON	0 0 0 0
PM	400 PM 600 PM

N-S STREET: Loop 202 NB Ramps DATE: 10/03/17 LOCATION: Mesa
E-W STREET: Guadalupe Rd. DAY: TUESDAY PROJECT#: 17-1383-004b

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	1.3	0.3	1.3	0	0	0	2	3	0	0	5	1	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	5	2	47	0	0	0	76	127	0	0	171	216	644
7:15 AM	9	2	35	0	0	0	66	129	0	0	170	201	612
7:30 AM	11	2	38	0	0	0	81	89	0	0	177	183	581
7:45 AM	7	0	36	0	0	0	77	88	0	0	146	188	542
8:00 AM	19	0	37	0	0	0	63	110	0	0	150	149	528
8:15 AM	7	2	34	0	0	0	53	94	0	0	145	169	504
8:30 AM	12	0	26	0	0	0	54	78	0	0	139	146	455
8:45 AM	10	1	26	0	0	0	43	75	0	0	120	113	388
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	80	9	279	0	0	0	513	790	0	0	1218	1365	4254
Approach %	21.74	2.45	75.82	####	####	####	39.37	60.63	0.00	0.00	47.15	52.85	
App/Depart	368	/	1887	0	/	0	1303	/	1069	2583	/	1298	

AM Peak Hr Begins at: 700 AM

PEAK													
Volumes	32	6	156	0	0	0	300	433	0	0	664	788	2379
Approach %	16.49	3.09	80.41	####	####	####	40.93	59.07	0.00	0.00	45.73	54.27	

PEAK HR. FACTOR: 0.898 0.000 0.903 0.938 0.924

CONTROL:	Signal
COMMENT 1:	
GPS:	33.364720, -111.644768
HOURS:	
	FROM: TO:
AM	700 AM 900 AM
NOON	
PM	400 PM 600 PM

N-S STREET: Loop 202 NB Ramps DATE: 10/03/17 LOCATION: Mesa
E-W STREET: Guadalupe Rd. DAY: TUESDAY PROJECT#: 17-1383-004b

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	1.3	0.3	1.3	0	0	0	2	3	0	0	5	1	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	18	0	68	0	0	0	31	220	0	0	119	68	524
4:15 PM	24	0	73	0	0	0	40	283	0	0	109	53	582
4:30 PM	19	0	72	0	0	0	42	253	0	0	109	71	566
4:45 PM	14	0	71	0	0	0	33	265	0	0	105	81	569
5:00 PM	26	0	69	0	0	0	30	291	0	0	114	81	611
5:15 PM	23	1	92	0	0	0	27	256	0	0	123	64	586
5:30 PM	32	0	90	0	0	0	38	245	0	0	121	71	597
5:45 PM	39	1	75	0	0	0	40	247	0	0	97	51	550
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	195	2	610	0	0	0	281	2060	0	0	897	540	4585
Approach %	24.16	0.25	75.59	####	####	####	12.00	88.00	0.00	0.00	62.42	37.58	
App/Depart	807	/	823	0	/	0	2341	/	2670	1437	/	1092	

PM Peak Hr Begins at: 445 PM

PEAK													
Volumes	95	1	322	0	0	0	128	1057	0	0	463	297	2363
Approach %	22.73	0.24	77.03	####	####	####	10.80	89.20	0.00	0.00	60.92	39.08	

PEAK HR. FACTOR: 0.857 0.000 0.923 0.974 0.967

CONTROL:	Signal
COMMENT 1:	
GPS:	33.364720, -111.644768
HOURS:	
	FROM: TO:
AM	700 AM 900 AM
NOON	0 0 0 0
PM	400 PM 600 PM

N-S STREET: **Power Rd.** DATE: **10/03/17** LOCATION: **Mesa**
 E-W STREET: **Elliot Rd.** DAY: **TUESDAY** PROJECT# **17-1383-005**

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	29	280	20	6	179	35	37	30	10	24	42	6	698
7:15 AM	17	247	19	4	201	38	60	33	18	29	47	5	718
7:30 AM	30	296	22	2	202	35	32	38	22	32	71	6	788
7:45 AM	22	268	22	2	188	35	32	35	29	35	44	5	717
8:00 AM	32	238	12	2	156	31	19	33	16	29	47	4	619
8:15 AM	30	176	14	3	162	29	30	29	34	32	52	2	593
8:30 AM	13	197	16	2	178	16	33	28	23	24	32	9	571
8:45 AM	13	156	12	1	172	10	25	16	16	14	31	3	469
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	186	1858	137	22	1438	229	268	242	168	219	366	40	5173
Approach %	8.53	85.19	6.28	1.30	85.14	13.56	39.53	35.69	24.78	35.04	58.56	6.40	
App/Depart	2181	/	2166	1689	/	1825	678	/	401	625	/	781	

AM Peak Hr Begins at: 700 AM

PEAK													
Volumes	98	1091	83	14	770	143	161	136	79	120	204	22	2921
Approach %	7.70	85.77	6.53	1.51	83.06	15.43	42.82	36.17	21.01	34.68	58.96	6.36	

PEAK HR.													
FACTOR:		0.914		0.954			0.847			0.794		0.927	

CONTROL:	Signal
COMMENT 1:	
GPS:	33.350564, -111.687434
HOURS:	
	FROM: TO:
AM	700 AM 900 AM
NOON	
PM	400 PM 600 PM

N-S STREET: **Power Rd.** DATE: **10/03/17** LOCATION: **Mesa**
 E-W STREET: **Elliot Rd.** DAY: **TUESDAY** PROJECT# **17-1383-005**

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	25	221	31	7	297	35	29	44	19	27	45	3	783
4:15 PM	25	216	39	1	248	28	27	54	35	24	32	6	735
4:30 PM	21	203	49	2	302	27	31	49	30	24	42	6	786
4:45 PM	17	205	61	4	283	24	29	52	34	37	54	6	806
5:00 PM	19	218	22	9	350	25	24	55	25	34	38	3	822
5:15 PM	26	187	40	7	299	33	29	56	22	35	46	7	787
5:30 PM	19	214	62	3	311	34	22	59	25	31	42	8	830
5:45 PM	16	214	67	4	221	20	20	51	19	51	54	7	744
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	168	1678	371	37	2311	226	211	420	209	263	353	46	6293
Approach %	7.58	75.69	16.73	1.44	89.78	8.78	25.12	50.00	24.88	39.73	53.32	6.95	
App/Depart	2217	/	1935	2574	/	2783	840	/	828	662	/	747	

PM Peak Hr Begins at: 445 PM

PEAK													
Volumes	81	824	185	23	1243	116	104	222	106	137	180	24	3245
Approach %	7.43	75.60	16.97	1.66	89.94	8.39	24.07	51.39	24.54	40.18	52.79	7.04	

PEAK HR.													
FACTOR:		0.924		0.900			0.939			0.879		0.977	

CONTROL:	Signal
COMMENT 1:	
GPS:	33.350564, -111.687434
HOURS:	
	FROM: TO:
AM	700 AM 900 AM
NOON	0 0 0 0
PM	400 PM 600 PM

N-S STREET: **Sossaman Rd.** DATE: **10/03/17** LOCATION: **Mesa**
E-W STREET: **Elliot Rd.** DAY: **TUESDAY** PROJECT# **17-1383-006**

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	8	7	1	3	7	42	11	29	8	1	30	2	149
7:15 AM	15	10	1	9	11	37	21	28	10	1	27	4	174
7:30 AM	11	11	1	1	3	50	23	33	8	2	45	4	192
7:45 AM	5	7	0	7	14	48	11	41	6	0	29	3	171
8:00 AM	3	9	1	11	7	32	12	30	8	2	48	5	168
8:15 AM	6	10	2	6	6	30	16	20	14	0	48	8	166
8:30 AM	11	13	0	6	7	23	18	29	2	1	30	9	149
8:45 AM	6	14	2	3	6	18	9	12	6	1	21	3	101
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	65	81	8	46	61	280	121	222	62	8	278	38	1270
Approach %	42.21	52.60	5.19	11.89	15.76	72.35	29.88	54.81	15.31	2.47	85.80	11.73	
App/Depart	154	/	240	387	/	131	405	/	276	324	/	623	

AM Peak Hr Begins at: 715 AM

PEAK	Volumes	34	37	3	28	35	167	67	132	32	5	149	16	705
Approach %		45.95	50.00	4.05	12.17	15.22	72.61	29.00	57.14	13.85	2.94	87.65	9.41	

PEAK HR.	FACTOR:	0.712	0.833	0.902	0.773	0.918
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CONTROL:	Signal
COMMENT 1:	
GPS:	33.350435, -111.670626
HOURS:	
	FROM: TO:
AM	700 AM 900 AM
NOON	
PM	400 PM 600 PM

N-S STREET: **Sossaman Rd.** DATE: **10/03/17** LOCATION: **Mesa**
E-W STREET: **Elliot Rd.** DAY: **TUESDAY** PROJECT# **17-1383-006**

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	13	18	3	9	11	23	24	41	10	1	32	9	194
4:15 PM	6	6	1	3	8	26	28	56	6	1	25	3	169
4:30 PM	14	10	1	7	12	31	65	44	8	1	19	6	218
4:45 PM	14	12	0	8	14	35	109	33	16	3	29	21	294
5:00 PM	10	11	2	5	17	60	43	48	3	1	29	6	235
5:15 PM	10	9	1	11	5	37	43	36	3	0	31	7	193
5:30 PM	3	8	0	8	6	28	65	42	5	0	32	8	205
5:45 PM	6	9	2	19	10	70	68	45	15	0	30	11	285
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	76	83	10	70	83	310	445	345	66	7	227	71	1793
Approach %	44.97	49.11	5.92	15.12	17.93	66.95	51.99	40.30	7.71	2.30	74.43	23.28	
App/Depart	169	/	599	463	/	156	856	/	425	305	/	613	

PM Peak Hr Begins at: 430 PM

PEAK	Volumes	48	42	4	31	48	163	260	161	30	5	108	40	940
Approach %		51.06	44.68	4.26	12.81	19.83	67.36	57.65	35.70	6.65	3.27	70.59	26.14	

PEAK HR.	FACTOR:	0.904	0.738	0.714	0.722	0.799
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CONTROL:	Signal
COMMENT 1:	
GPS:	33.350435, -111.670626
HOURS:	
	FROM: TO:
AM	700 AM 900 AM
NOON	0 0 0 0
PM	400 PM 600 PM

N-S STREET: 80th St. DATE: 10/03/17 LOCATION: Mesa
E-W STREET: Elliot Rd. DAY: TUESDAY PROJECT#: 17-1383-007

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	0	0	2	0	2	4	29	0	0	37	1	75
7:15 AM	0	0	0	5	0	3	5	27	0	0	31	4	75
7:30 AM	0	0	0	4	0	5	8	26	0	0	35	5	83
7:45 AM	0	0	0	2	0	7	7	36	0	0	37	4	93
8:00 AM	0	0	0	6	0	11	14	31	0	0	38	15	115
8:15 AM	0	0	0	2	0	15	11	18	0	0	44	9	99
8:30 AM	0	0	0	2	0	12	5	28	0	0	30	1	78
8:45 AM	0	0	0	1	0	3	0	22	0	0	27	3	56
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	0	0	24	0	58	54	217	0	0	279	42	674
Approach %	####	####	####	29.27	0.00	70.73	19.93	80.07	0.00	0.00	86.92	13.08	
App/Depart	0	/	96	82	/	0	271	/	241	321	/	337	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	0	0	0	14	0	38	40	111	0	0	154	33	390
Approach %	####	####	####	26.92	0.00	73.08	26.49	73.51	0.00	0.00	82.35	17.65	

PEAK HR.													
FACTOR:	0.000			0.765			0.839			0.882		0.848	

CONTROL:	1-Way Stop (SB)
COMMENT 1:	
GPS:	33.350375, -111.661882
HOURS:	
	FROM: TO:
AM	700 AM 900 AM
NOON	
PM	400 PM 600 PM

N-S STREET: 80th St. DATE: 10/03/17 LOCATION: Mesa
E-W STREET: Elliot Rd. DAY: TUESDAY PROJECT#: 17-1383-007

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	0	0	0	3	0	16	3	50	0	0	32	2	106
4:15 PM	0	0	0	1	0	1	3	41	0	0	37	2	85
4:30 PM	0	0	0	5	0	2	8	46	0	0	35	3	99
4:45 PM	0	0	0	2	0	3	3	43	0	0	46	5	102
5:00 PM	0	0	0	1	0	3	3	62	0	0	33	2	104
5:15 PM	0	0	0	2	0	3	7	48	0	0	45	3	108
5:30 PM	0	0	0	3	0	4	5	51	0	0	39	0	102
5:45 PM	0	0	0	0	0	3	1	39	0	0	47	2	92
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	0	0	17	0	35	33	380	0	0	314	19	798
Approach %	####	####	####	32.69	0.00	67.31	7.99	92.01	0.00	0.00	94.29	5.71	
App/Depart	0	/	52	52	/	0	413	/	397	333	/	349	

PM Peak Hr Begins at: 445 PM

PEAK													
Volumes	0	0	0	8	0	13	18	204	0	0	163	10	416
Approach %	####	####	####	38.10	0.00	61.90	8.11	91.89	0.00	0.00	94.22	5.78	

PEAK HR.													
FACTOR:	0.000			0.750			0.854			0.848		0.963	

CONTROL:	1-Way Stop (SB)
COMMENT 1:	
GPS:	33.350375, -111.661882
HOURS:	
	FROM: TO:
AM	700 AM 900 AM
NOON	0 0 0 0
PM	400 PM 600 PM

N-S STREET: Hawes Rd. DATE: 10/03/17 LOCATION: Mesa
E-W STREET: Elliot Rd. DAY: TUESDAY PROJECT#: 17-1383-008

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	1	0	4	0	4	2	23	0	3	24	1	62
7:15 AM	1	0	1	6	0	5	2	31	0	0	27	1	74
7:30 AM	2	0	0	8	1	5	3	27	1	1	28	3	79
7:45 AM	2	1	0	10	0	11	3	28	0	1	37	3	96
8:00 AM	0	0	2	8	1	7	5	31	0	2	28	5	89
8:15 AM	2	1	1	6	1	11	9	30	2	2	43	3	111
8:30 AM	1	1	0	2	0	12	1	17	0	2	38	2	76
8:45 AM	0	0	0	4	0	4	3	28	0	1	28	2	70
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	8	4	4	48	3	59	28	215	3	12	253	20	657
Approach %	50.00	25.00	25.00	43.64	2.73	53.64	11.38	87.40	1.22	4.21	88.77	7.02	
App/Depart	16	/	52	110	/	18	246	/	267	285	/	320	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	6	2	3	32	3	34	20	116	3	6	136	14	375
Approach %	54.55	18.18	27.27	46.38	4.35	49.28	14.39	83.45	2.16	3.85	87.18	8.97	

PEAK HR.													
FACTOR:	0.688		0.821		0.848		0.813		0.845				

CONTROL:	2-Way Stop (NB & SB)
COMMENT 1:	33.350291, -111.653070
GPS:	
HOURS:	
	FROM: TO:
AM	700 AM 900 AM
NOON	
PM	400 PM 600 PM

N-S STREET: Hawes Rd. DATE: 10/03/17 LOCATION: Mesa
E-W STREET: Elliot Rd. 0 DAY: TUESDAY PROJECT#: 17-1383-008

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	3	1	1	6	1	4	7	46	4	1	44	1	119
4:15 PM	0	1	3	5	0	5	9	44	0	2	25	5	99
4:30 PM	0	1	0	8	2	4	4	36	2	1	35	7	100
4:45 PM	0	0	0	4	0	4	13	36	3	1	34	6	101
5:00 PM	0	0	4	7	2	1	1	41	0	0	44	11	111
5:15 PM	1	2	3	8	1	3	8	52	2	0	29	8	117
5:30 PM	1	2	1	6	0	4	10	38	3	1	44	5	115
5:45 PM	0	1	0	3	1	3	9	45	0	0	39	6	107
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	5	8	12	47	7	28	61	338	14	6	294	49	869
Approach %	20.00	32.00	48.00	57.32	8.54	34.15	14.77	81.84	3.39	1.72	84.24	14.04	
App/Depart	25	/	118	82	/	27	413	/	397	349	/	327	

PM Peak Hr Begins at: 500 PM

PEAK													
Volumes	2	5	8	24	4	11	28	176	5	1	156	30	450
Approach %	13.33	33.33	53.33	61.54	10.26	28.21	13.40	84.21	2.39	0.53	83.42	16.04	

PEAK HR.													
FACTOR:	0.625		0.813		0.843		0.850		0.962				

CONTROL:	2-Way Stop (NB & SB)
COMMENT 1:	33.350291, -111.653070
GPS:	
HOURS:	
	FROM: TO:
AM	700 AM 900 AM
NOON	0 0 0 0
PM	400 PM 600 PM

N-S STREET: Loop 202 SB Ramps DATE: 10/03/17 LOCATION: Mesa
E-W STREET: Elliot Rd. DAY: TUESDAY PROJECT#: 17-1383-009a

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
6:00 AM	0	0	0	1.3	0.3	1.3	0	4	1	2	2	0	142
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	0	0	40	1	9	0	28	11	32	21	0	142
7:15 AM	0	0	0	44	0	7	0	25	10	28	22	0	136
7:30 AM	0	0	0	42	0	11	0	23	12	35	33	0	156
7:45 AM	0	0	0	26	0	8	0	39	7	44	24	0	148
8:00 AM	0	0	0	32	0	15	0	24	11	35	39	0	156
8:15 AM	0	0	0	26	0	6	0	18	3	15	33	0	101
8:30 AM	0	0	0	35	1	10	0	20	10	29	19	0	124
8:45 AM	0	0	0	28	2	8	0	19	4	23	20	0	104
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	0	0	273	4	74	0	196	68	241	211	0	1067
Approach %	####	####	####	77.78	1.14	21.08	0.00	74.24	25.76	53.32	46.68	0.00	
App/Depart	0	/	0	351	/	313	264	/	469	452	/	285	

AM Peak Hr Begins at: 715 AM

PEAK	Volumes	Approach %
	0 0 0 144 0 41 0 111 40 142 118 0 596	#### ##### 77.84 0.00 22.16 0.00 73.51 26.49 54.62 45.38 0.00

PEAK HR.	FACTOR:
	0.000 0.873 0.821 0.878 0.955

CONTROL: Signal

COMMENT 1: 33.350247, -111.644593

GPS:

HOURS:

	FROM:		TO:	
AM	700	AM	900	AM
NOON				
PM	400	PM	600	PM

N-S STREET: Loop 202 SB Ramps DATE: 10/03/17 LOCATION: Mesa
E-W STREET: Elliot Rd. DAY: TUESDAY PROJECT#: 17-1383-009a

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	0	0	0	120	0	7	0	44	9	26	30	0	236
4:15 PM	0	0	0	101	0	8	0	44	5	19	33	0	210
4:30 PM	0	0	0	111	0	11	0	32	8	38	42	0	242
4:45 PM	0	0	0	114	0	25	0	47	6	16	37	0	245
5:00 PM	0	0	0	114	0	11	0	53	8	23	26	0	235
5:15 PM	0	0	0	120	1	11	0	41	8	23	39	0	243
5:30 PM	0	0	0	125	1	11	0	36	8	25	32	0	238
5:45 PM	0	0	0	100	0	14	0	40	2	18	37	0	211
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	0	0	905	2	98	0	337	54	188	276	0	1860
Approach %	####	####	####	90.05	0.20	9.75	0.00	86.19	13.81	40.52	59.48	0.00	
App/Depart	0	/	0	1005	/	244	391	/	1242	464	/	374	

PM Peak Hr Begins at: 430 PM

PEAK	Volumes	Approach %
	0 0 0 459 1 58 0 173 30 100 144 0 965	#### ##### 88.61 0.19 11.20 0.00 85.22 14.78 40.98 59.02 0.00

PEAK HR.	FACTOR:
	0.000 0.932 0.832 0.763 0.985

CONTROL: Signal

COMMENT 1: 0

GPS: 33.350247, -111.644593

HOURS:

	FROM:		TO:	
AM	700	AM	900	AM
NOON	0	0	0	0
PM	400	PM	600	PM

N-S STREET: Loop 202 NB Ramps DATE: 10/03/17 LOCATION: Mesa
E-W STREET: Elliot Rd. DAY: TUESDAY PROJECT#: 17-1383-009b

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
6:00 AM	1.3	0.3	1.3	0	0	0	2	3	0	0	4	1	
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	3	0	23	0	0	0	10	55	0	0	51	163	305
7:15 AM	4	0	19	0	0	0	11	60	0	0	50	165	309
7:30 AM	7	1	16	0	0	0	12	56	0	0	71	150	313
7:45 AM	1	0	13	0	0	0	14	45	0	0	56	147	276
8:00 AM	4	0	16	0	0	0	4	52	0	0	65	148	289
8:15 AM	2	1	6	0	0	0	8	38	0	0	43	92	190
8:30 AM	6	0	3	0	0	0	9	46	0	0	44	95	203
8:45 AM	5	0	7	0	0	0	7	38	0	0	36	91	184
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	32	2	103	0	0	0	75	390	0	0	416	1051	2069
Approach %	23.36	1.46	75.18	####	####	####	16.13	83.87	0.00	0.00	28.36	71.64	
App/Depart	137	/	1128	0	/	0	465	/	493	1467	/	448	

AM Peak Hr Begins at: 700 AM

PEAK													
Volumes	15	1	71	0	0	0	47	216	0	0	228	625	1203
Approach %	17.24	1.15	81.61	####	####	####	17.87	82.13	0.00	0.00	26.73	73.27	

PEAK HR.													
FACTOR:	0.837		0.000		0.926		0.965		0.961				

CONTROL:	Signal
COMMENT 1:	
GPS:	33.350227, -111.643239
HOURS:	
	FROM: TO:
AM	700 AM 900 AM
NOON	
PM	400 PM 600 PM

N-S STREET: Loop 202 NB Ramps DATE: 10/03/17 LOCATION: Mesa
E-W STREET: Elliot Rd. DAY: TUESDAY PROJECT#: 17-1383-009b

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	7	1	26	0	0	0	12	133	0	0	46	58	283
4:15 PM	7	0	33	0	0	0	6	142	0	0	42	57	287
4:30 PM	16	0	25	0	0	0	11	140	0	0	67	65	324
4:45 PM	5	0	30	0	0	0	13	155	0	0	30	58	291
5:00 PM	11	0	30	0	0	0	7	158	0	0	52	68	326
5:15 PM	12	1	43	0	0	0	8	146	0	0	36	43	289
5:30 PM	8	0	27	0	0	0	13	148	0	0	54	51	301
5:45 PM	6	0	20	0	0	0	7	127	0	0	40	43	243
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	72	2	234	0	0	0	77	1149	0	0	367	443	2344
Approach %	23.38	0.65	75.97	####	####	####	6.28	93.72	0.00	0.00	45.31	54.69	
App/Depart	308	/	522	0	/	0	1226	/	1383	810	/	439	

PM Peak Hr Begins at: 430 PM

PEAK													
Volumes	44	1	128	0	0	0	39	599	0	0	185	234	1230
Approach %	25.43	0.58	73.99	####	####	####	6.11	93.89	0.00	0.00	44.15	55.85	

PEAK HR.													
FACTOR:	0.772		0.000		0.949		0.794		0.943				

CONTROL:	Signal
COMMENT 1:	
GPS:	33.350227, -111.643239
HOURS:	
	FROM: TO:
AM	700 AM 900 AM
NOON	0 0 0 0
PM	400 PM 600 PM

N-S STREET: Hawes Rd. DATE: 10/03/17 LOCATION: Mesa
E-W STREET: Loop 202 WB Ramps DAY: TUESDAY PROJECT#: 17-1383-010a

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	29	0	0	0	0	0	0	0	0	30	0	0	59
7:15 AM	33	0	0	0	0	0	0	0	0	27	0	0	60
7:30 AM	27	0	0	0	0	0	0	0	0	40	0	0	67
7:45 AM	16	0	0	0	0	0	0	0	0	28	0	0	44
8:00 AM	16	0	0	0	0	0	0	0	0	31	0	0	47
8:15 AM	17	0	0	0	0	0	0	0	0	22	0	0	39
8:30 AM	6	0	0	0	0	0	0	0	0	39	0	0	45
8:45 AM	4	0	0	0	0	0	0	0	0	26	0	0	30
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	148	0	0	0	0	0	0	0	0	243	0	0	391
Approach %	100.00	0.00	0.00	####	####	####	####	####	####	100.00	0.00	0.00	
App/Depart	148	/	0	0	/	243	0	/	0	243	/	148	

AM Peak Hr Begins at: 700 AM

PEAK													
Volumes	105	0	0	0	0	0	0	0	0	125	0	0	230
Approach %	100.00	0.00	0.00	####	####	####	####	####	####	100.00	0.00	0.00	

PEAK HR. FACTOR: 0.795 0.000 0.000 0.781 0.858

CONTROL:	Signal
COMMENT 1:	
GPS:	33.332126, -111.652970
HOURS:	
	FROM: TO:
AM	700 AM 900 AM
NOON	
PM	400 PM 600 PM

N-S STREET: Hawes Rd. DATE: 10/03/17 LOCATION: Mesa
E-W STREET: Loop 202 WB Ramps DAY: TUESDAY PROJECT#: 17-1383-010a

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	5	0	0	0	0	0	0	0	0	48	0	0	53
4:15 PM	3	0	0	0	0	0	0	0	0	51	0	0	54
4:30 PM	4	0	0	0	0	0	0	0	0	66	0	0	70
4:45 PM	9	0	0	0	0	0	0	0	0	74	0	0	83
5:00 PM	4	0	0	0	0	0	0	0	0	81	0	0	85
5:15 PM	5	0	0	0	0	0	0	0	0	74	0	0	79
5:30 PM	6	0	0	0	0	0	0	0	0	94	0	0	100
5:45 PM	3	0	0	0	0	0	0	0	0	63	0	0	66
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	39	0	0	0	0	0	0	0	0	551	0	0	590
Approach %	100.00	0.00	0.00	####	####	####	####	####	####	100.00	0.00	0.00	
App/Depart	39	/	0	0	/	551	0	/	0	551	/	39	

PM Peak Hr Begins at: 445 PM

PEAK													
Volumes	24	0	0	0	0	0	0	0	0	323	0	0	347
Approach %	100.00	0.00	0.00	####	####	####	####	####	####	100.00	0.00	0.00	

PEAK HR. FACTOR: 0.667 0.000 0.000 0.859 0.868

CONTROL:	Signal
COMMENT 1:	
GPS:	33.332126, -111.652970
HOURS:	
	FROM: TO:
AM	700 AM 900 AM
NOON	0 0 0 0
PM	400 PM 600 PM



DATE: 10/03/17

DAY: TUESDAY

[illegible]

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	141	339	3	240	0	7	0	33	0	0	0	763
Approach %	0.00	29.38	70.63	1.23	98.77	0.00	17.50	0.00	82.50	####	####	####	
App/Depart	480	/	148	243	/	273	40	/	342	0	/	0	

AM Peak Hr Begins at: 700 AM

PEAK													
Volumes	0	103	242	1	124	0	2	0	27	0	0	0	499
Approach %	0.00	29.86	70.14	0.80	99.20	0.00	6.90	0.00	93.10	####	####	####	

PEAK HR. FACTOR:	0.784	0.781	0.725	0.000	0.866
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CONTROL: Signal
COMMENT 1:
GPS: 33.330508, -111.652919

	FROM:		TO:	
AM	700	AM	900	AM
NOON				
PM	400	PM	600	PM



DATE: 10/03/17

0

DAY: TUESDAY

[illegible]

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	34	231	4	547	0	5	1	71	0	0	0	893
Approach %	0.00	12.83	87.17	0.73	99.27	0.00	6.49	1.30	92.21	####	####	####	
App/Depart	265	/	39	551	/	618	77	/	236	0	/	0	

PM Peak Hr Begins at: 445 PM

PEAK													
Volumes	0	19	96	3	320	0	5	1	39	0	0	0	483
Approach %	0.00	16.52	83.48	0.93	99.07	0.00	11.11	2.22	86.67	####	####	####	

PEAK HR. FACTOR:	0.871	0.859	0.662	0.000	0.888
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CONTROL: Signal
COMMENT 1: 0
GPS: 33.330508, -111.652919

	FROM:		TO:	
AM	700	AM	900	AM
NOON	0	0	0	0
PM	400	PM	600	PM

N-S STREET: Ellsworth Rd. DATE: 08/14/18 LOCATION: Mesa
E-W STREET: Elliot Rd. DAY: TUESDAY PROJECT#: 18-1375-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	55	79	2	5	55	14	8	39	19	6	222	20	524
7:15 AM	50	99	5	8	50	21	9	43	16	5	239	29	574
7:30 AM	60	80	2	5	69	20	11	54	13	8	241	24	587
7:45 AM	65	87	6	3	60	16	10	50	18	4	245	28	592
8:00 AM	54	85	3	6	65	18	14	45	15	7	204	20	536
8:15 AM	41	89	2	9	54	14	8	43	17	10	154	16	457
8:30 AM	41	82	5	5	49	10	5	41	16	11	141	19	425
8:45 AM	43	87	4	8	50	11	9	21	13	9	145	21	421
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	409	688	29	49	452	124	74	336	127	60	1591	177	4116
Approach %	36.32	61.10	2.58	7.84	72.32	19.84	13.78	62.57	23.65	3.28	87.04	9.68	
App/Depart	1126	/	939	625	/	639	537	/	414	1828	/	2124	

AM Peak Hr Begins at: 715 AM

PEAK													
Volumes	229	351	16	22	244	75	44	192	62	24	929	101	2289
Approach %	38.42	58.89	2.68	6.45	71.55	21.99	14.77	64.43	20.81	2.28	88.14	9.58	

PEAK HR. FACTOR: 0.943 0.907 0.955 0.951 0.967

CONTROL:	Signal
COMMENT 1:	
GPS:	33.350165, -111.635728
HOURS:	
	FROM: TO:
AM	700 AM 900 AM
NOON	
PM	400 PM 600 PM

N-S STREET: Ellsworth Rd. DATE: 08/14/18 LOCATION: Mesa
E-W STREET: Elliot Rd. DAY: TUESDAY PROJECT#: 18-1375-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	19	76	2	14	63	16	22	120	19	2	87	18	458
4:15 PM	22	59	5	21	66	14	20	133	18	2	101	19	480
4:30 PM	20	66	2	20	60	21	28	141	20	5	85	21	489
4:45 PM	24	60	8	19	54	24	24	147	24	2	86	24	496
5:00 PM	21	65	5	17	74	28	21	154	33	3	96	28	545
5:15 PM	28	58	9	21	59	20	14	161	30	6	60	20	486
5:30 PM	21	54	6	24	55	22	19	166	32	1	74	22	496
5:45 PM	19	74	6	28	69	19	16	158	25	4	75	19	512
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	174	512	43	164	500	164	164	1180	201	25	664	171	3962
Approach %	23.87	70.23	5.90	19.81	60.39	19.81	10.61	76.38	13.01	2.91	77.21	19.88	
App/Depart	729	/	847	828	/	726	1545	/	1387	860	/	1002	

PM Peak Hr Begins at: 500 PM

PEAK													
Volumes	89	251	26	90	257	89	70	639	120	14	305	89	2039
Approach %	24.32	68.58	7.10	20.64	58.94	20.41	8.44	77.08	14.48	3.43	74.75	21.81	

PEAK HR. FACTOR: 0.924 0.916 0.955 0.803 0.935

CONTROL:	Signal
COMMENT 1:	
GPS:	33.350165, -111.635728
HOURS:	
	FROM: TO:
AM	700 AM 900 AM
NOON	0 0 0 0
PM	400 PM 600 PM

N-S STREET: Ellsworth Rd. DATE: 08/14/18 LOCATION: Mesa
E-W STREET: Warner Rd. DAY: TUESDAY PROJECT#: 18-1375-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	15	128	0	0	83	6	1	0	2	0	0	0	235
7:15 AM	10	152	0	0	77	2	1	0	3	0	0	0	245
7:30 AM	13	149	0	0	85	7	0	0	1	0	0	0	255
7:45 AM	12	155	0	0	76	8	2	0	4	0	0	0	257
8:00 AM	9	143	0	0	89	3	0	0	2	0	0	0	246
8:15 AM	14	139	0	0	76	6	1	0	0	0	0	0	236
8:30 AM	16	122	0	0	79	2	0	0	5	0	0	0	224
8:45 AM	7	136	0	0	69	5	2	0	1	0	0	0	220
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	96	1124	0	0	634	39	7	0	18	0	0	0	1918
Approach %	7.87	92.13	0.00	0.00	94.21	5.79	28.00	0.00	72.00	####	####	####	
App/Depart	1220	/	1131	673	/	652	25	/	0	0	/	135	

AM Peak Hr Begins at: 715 AM

PEAK													
Volumes	44	599	0	0	327	20	3	0	10	0	0	0	1003
Approach %	6.84	93.16	0.00	0.00	94.24	5.76	23.08	0.00	76.92	####	####	####	

PEAK HR. FACTOR: 0.963 0.943 0.542 0.000 0.976

CONTROL:	1-Way Stop (EB)
COMMENT 1:	
GPS:	33.335683, -111.635604
HOURS:	
	FROM: TO:
AM	700 AM 900 AM
NOON	
PM	400 PM 600 PM

N-S STREET: Ellsworth Rd. DATE: 08/14/18 LOCATION: Mesa
E-W STREET: Warner Rd. DAY: TUESDAY PROJECT#: 18-1375-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	7	83	0	0	89	2	1	0	13	0	0	0	195
4:15 PM	9	88	0	0	87	1	5	0	11	0	0	0	201
4:30 PM	20	80	0	0	85	1	2	0	10	0	0	0	198
4:45 PM	8	96	0	0	96	0	1	0	15	0	0	0	216
5:00 PM	4	99	0	0	108	0	1	0	17	0	0	0	229
5:15 PM	15	98	0	0	96	1	1	0	9	0	0	0	220
5:30 PM	7	87	0	0	99	2	1	0	8	0	0	0	204
5:45 PM	12	99	0	0	90	0	4	0	12	0	0	0	217
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	82	730	0	0	750	7	16	0	95	0	0	0	1680
Approach %	10.10	89.90	0.00	0.00	99.08	0.92	14.41	0.00	85.59	####	####	####	
App/Depart	812	/	746	757	/	845	111	/	0	0	/	89	

PM Peak Hr Begins at: 500 PM

PEAK													
Volumes	38	383	0	0	393	3	7	0	46	0	0	0	870
Approach %	9.03	90.97	0.00	0.00	99.24	0.76	13.21	0.00	86.79	####	####	####	

PEAK HR. FACTOR: 0.931 0.917 0.736 0.000 0.950

CONTROL:	1-Way Stop (EB)
COMMENT 1:	
GPS:	33.335683, -111.635604
HOURS:	
	FROM: TO:
AM	700 AM 900 AM
NOON	0 0 0 0
PM	400 PM 600 PM



Pedestrian & Bicycle Study

N-S STREET: Sossaman Rd.
E-W STREET: Guadalupe Rd.

Date: 10/03/17
Day: TUESDAY

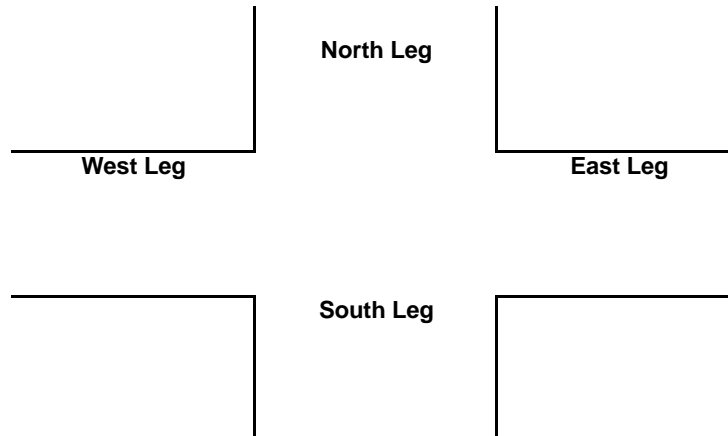
City: Mesa
Project #: 17-1383-00

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	1
7:15 AM	1	2	0	0
7:30 AM	0	0	0	1
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	2	1	2
8:30 AM	1	0	2	0
8:45 AM	0	0	0	0
TOTAL	2	4	3	4

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	1	0	0	1
7:15 AM	0	1	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	1	0
8:00 AM	1	0	0	0
8:15 AM	1	1	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	3	2	1	1

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	1	0	0	2
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	1	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	2	0	0	2

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	1	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	1	0	0





Pedestrian & Bicycle Study

N-S STREET: Farnsworth Dr / Bridlewood
E-W STREET: Guadalupe Rd.

Date: 10/03/17
Day: TUESDAY

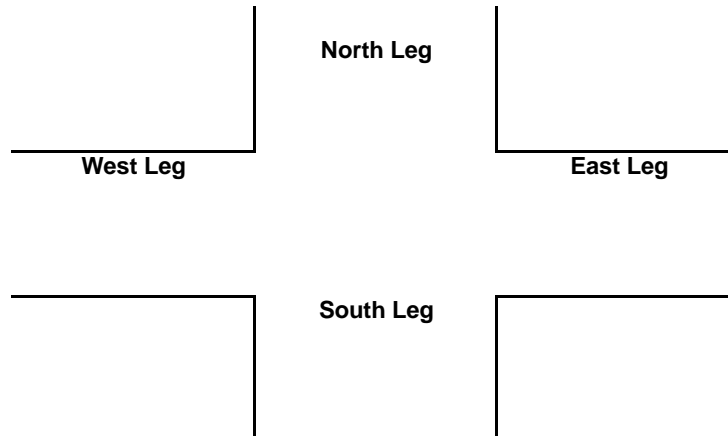
City: Mesa
Project #: 17-1383-00

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	1	0	0	0
7:15 AM	1	0	1	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	1	0
8:15 AM	0	0	0	0
8:30 AM	0	1	0	1
8:45 AM	1	0	0	0
TOTAL	3	1	2	1

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	1	1	0	0
7:15 AM	1	0	0	0
7:30 AM	0	0	1	0
7:45 AM	1	1	0	0
8:00 AM	0	2	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	3	4	1	0

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	1	0	1	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	4	0	0
5:15 PM	0	3	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	1	7	1	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	1
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	1	0	0
5:45 PM	0	0	0	0
TOTAL	0	1	0	1





Pedestrian & Bicycle Study

N-S STREET: Hawes Rd.
E-W STREET: Guadalupe Rd.

Date: 10/03/17
Day: TUESDAY

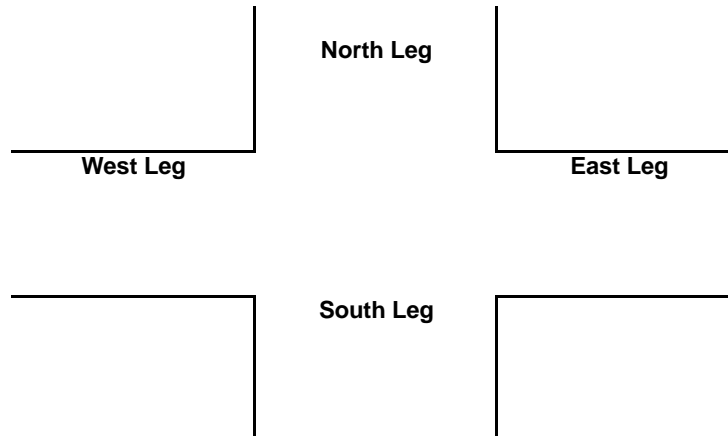
City: Mesa
Project #: 17-1383-00

PEDESTRIANS				
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	2	0	1
7:15 AM	0	0	0	1
7:30 AM	0	0	0	0
7:45 AM	1	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	1	2	0	2

BICYCLES				
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	1	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	1	0

PEDESTRIANS				
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	1	0
4:15 PM	0	0	0	0
4:30 PM	0	0	1	0
4:45 PM	1	1	1	0
5:00 PM	0	2	1	0
5:15 PM	2	0	0	3
5:30 PM	1	0	0	0
5:45 PM	0	0	0	0
TOTAL	4	3	4	3

BICYCLES				
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	1
5:45 PM	0	0	0	0
TOTAL	0	0	0	1





Pedestrian & Bicycle Study

N-S STREET: Loop 202 SB Ramps
E-W STREET: Guadalupe Rd.

Date: 10/03/17
Day: TUESDAY

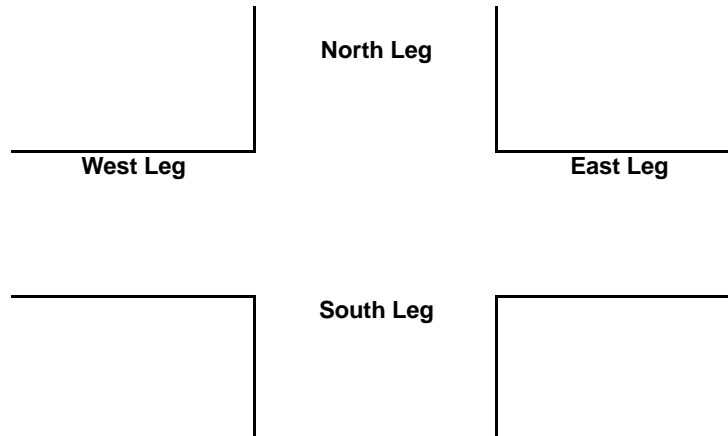
City: Mesa
Project #: 17-1383-00

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	2	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	2	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	1	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	1	0	0

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	1	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	1	0	0
5:30 PM	0	1	0	0
5:45 PM	0	1	0	0
TOTAL	0	4	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	1	0	0	0
4:30 PM	0	0	0	0
4:45 PM	1	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	2	0	0	0





Pedestrian & Bicycle Study

N-S STREET: Loop 202 NB Ramps
E-W STREET: Guadalupe Rd.

Date: 10/03/17
Day: TUESDAY

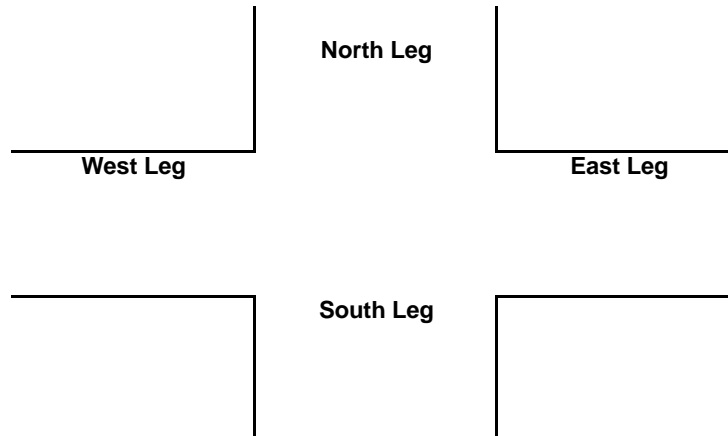
City: Mesa
Project #: 17-1383-00

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	2	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	2	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	1	0	0
7:15 AM	0	0	0	0
7:30 AM	0	1	0	0
7:45 AM	0	1	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	3	0	0

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	1	0	0
5:15 PM	0	0	0	0
5:30 PM	0	1	0	0
5:45 PM	0	0	0	0
TOTAL	0	2	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0





Pedestrian & Bicycle Study

N-S STREET: Power Rd.
E-W STREET: Elliot Rd.

Date: 10/03/17
Day: TUESDAY

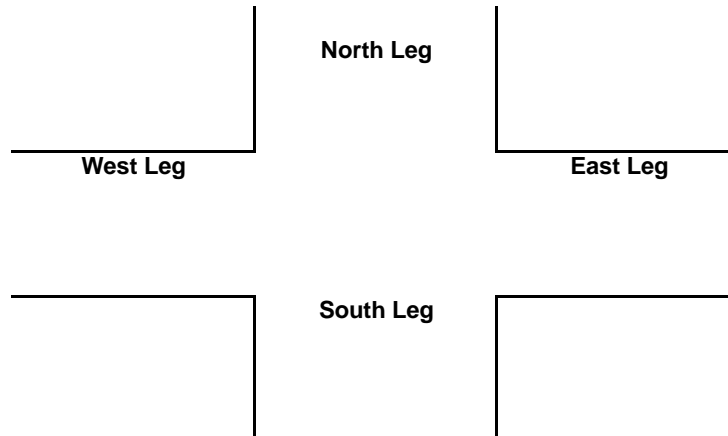
City: Mesa
Project #: 17-1383-00

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0





Pedestrian & Bicycle Study

N-S STREET: Sossaman Rd.
E-W STREET: Elliot Rd.

Date: 10/03/17
Day: TUESDAY

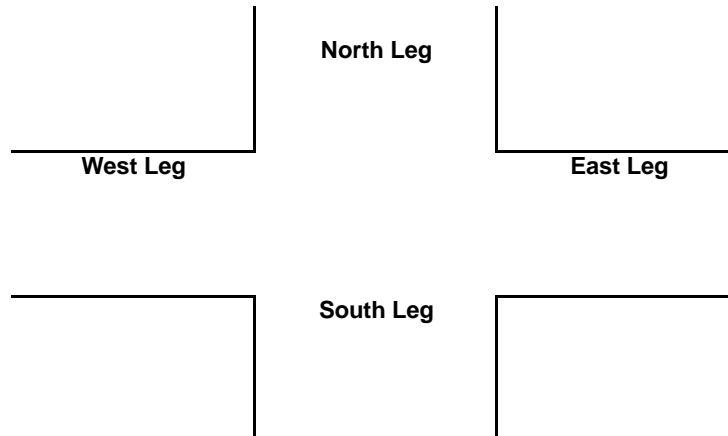
City: Mesa
Project #: 17-1383-00

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	1	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	1	0	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	1
TOTAL	0	0	0	1





Pedestrian & Bicycle Study

N-S STREET: 80th St.
E-W STREET: Elliot Rd.

Date: 10/03/17
Day: TUESDAY

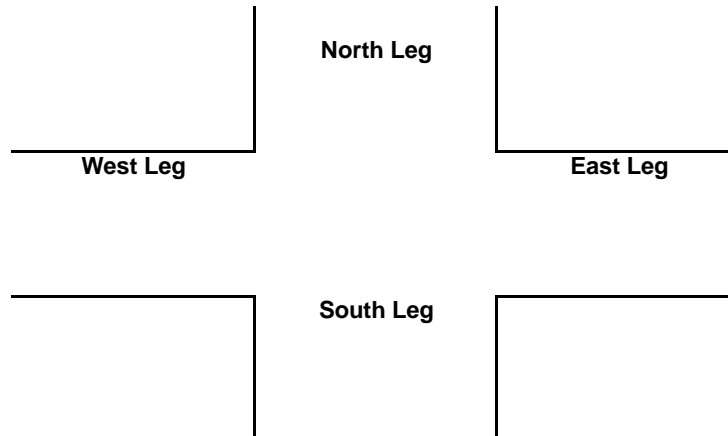
City: Mesa
Project #: 17-1383-00

PEDESTRIANS				
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

BICYCLES				
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

PEDESTRIANS				
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0

BICYCLES				
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0





Pedestrian & Bicycle Study

N-S STREET: Hawes Rd.
E-W STREET: Elliot Rd.

Date: 10/03/17
Day: TUESDAY

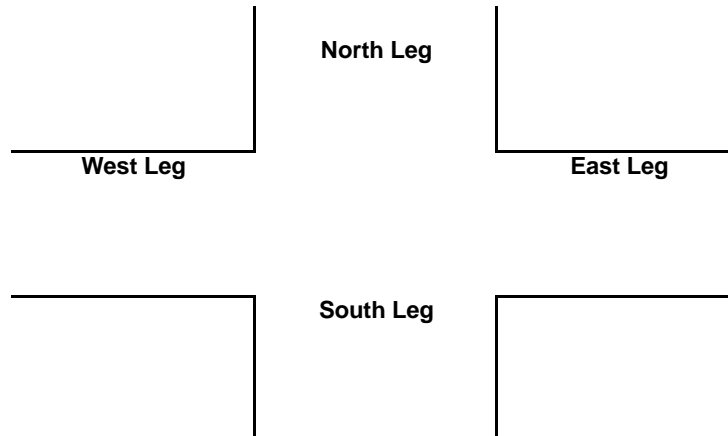
City: Mesa
Project #: 17-1383-00

PEDESTRIANS				
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

BICYCLES				
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

PEDESTRIANS				
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0

BICYCLES				
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0





Pedestrian & Bicycle Study

N-S STREET: Loop 202 SB Ramps
E-W STREET: Elliot Rd.

Date: 10/03/17
Day: TUESDAY

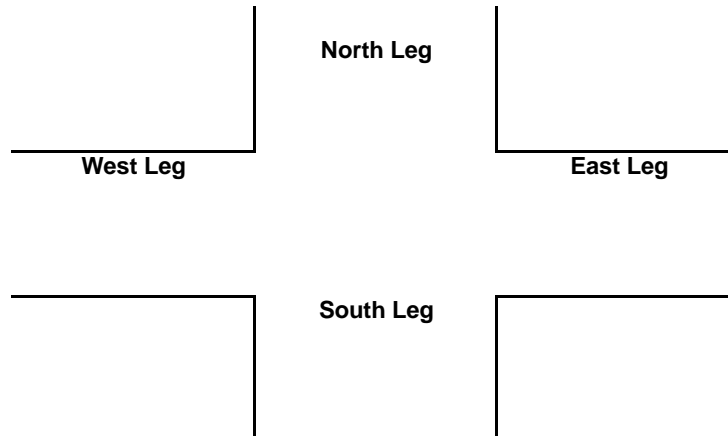
City: Mesa
Project #: 17-1383-00

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	1	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	1	0	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0





Pedestrian & Bicycle Study

N-S STREET: Loop 202 NB Ramps
E-W STREET: Elliot Rd.

Date: 10/03/17
Day: TUESDAY

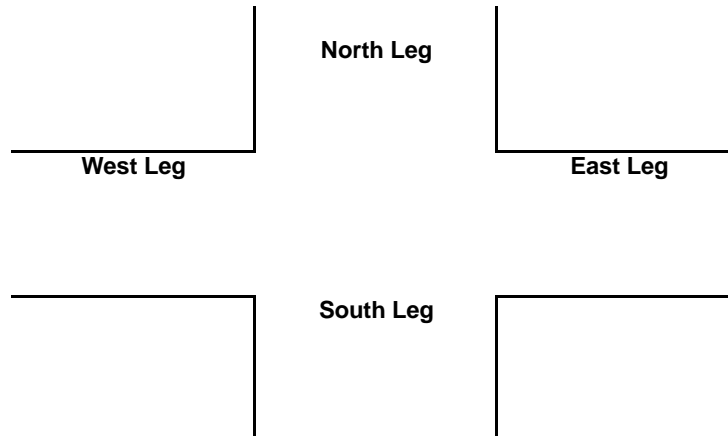
City: Mesa
Project #: 17-1383-00

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	1	0	0	0
7:15 AM	0	1	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	1	1	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0





Pedestrian & Bicycle Study

N-S STREET: Hawes Rd.
E-W STREET: Loop 202 WB Ramps

Date: 10/03/17
Day: TUESDAY

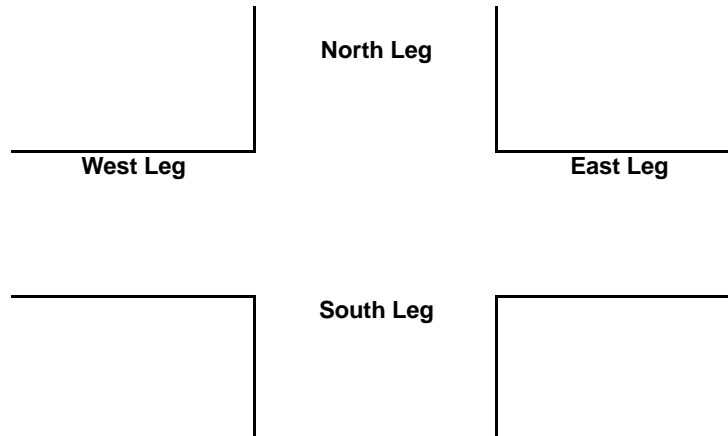
City: Mesa
Project #: 17-1383-01

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0





Pedestrian & Bicycle Study

N-S STREET: Hawes Rd.
E-W STREET: Loop 202 EB Ramps

Date: 10/03/17
Day: TUESDAY

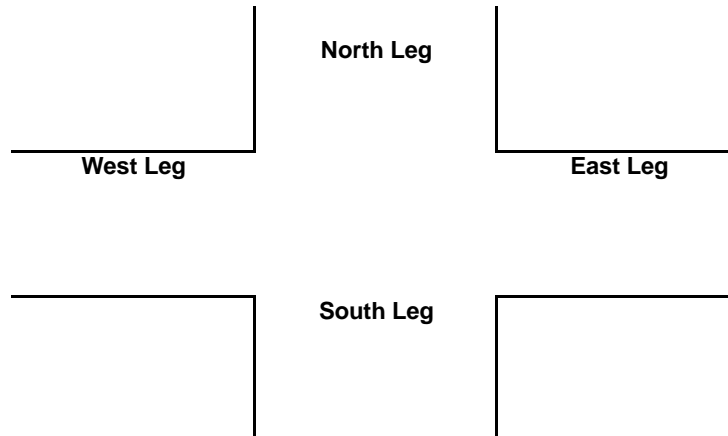
City: Mesa
Project #: 17-1383-01

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0





Pedestrian & Bicycle Study

N-S STREET: Ellsworth Rd.
E-W STREET: Elliot Rd.

Date: 08/14/18
Day: TUESDAY

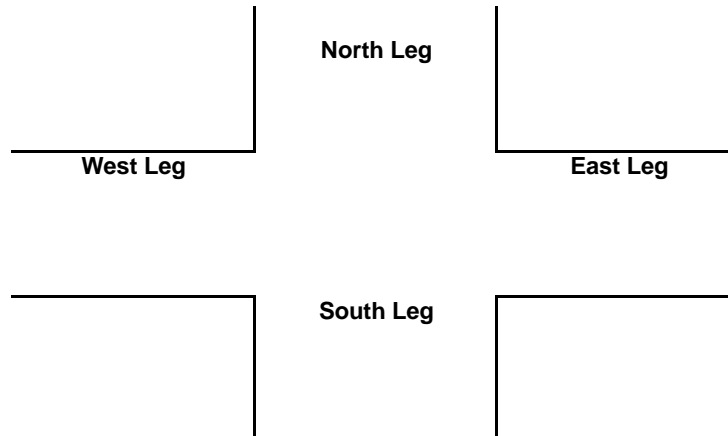
City: Mesa
Project #: 18-1375-00

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	2	0	0	0
5:00 PM	1	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	3	0	0	0





Pedestrian & Bicycle Study

N-S STREET: Ellsworth Rd.
E-W STREET: Warner Rd.

Date: 08/14/18
Day: TUESDAY

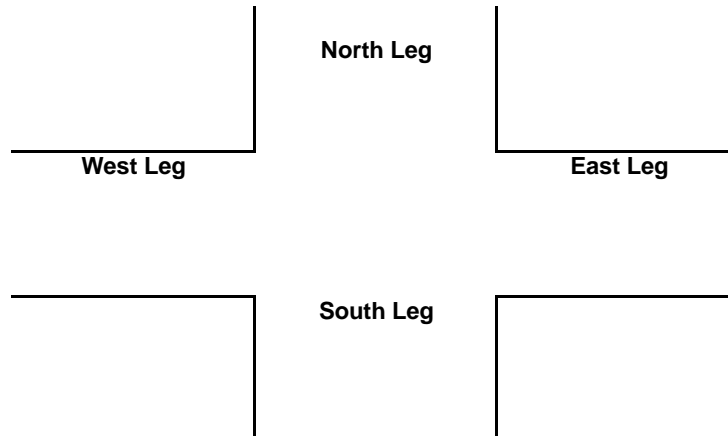
City: Mesa
Project #: 18-1375-00

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	0	0	0	0



APPENDIX C

EXISTING PEAK HOUR CAPACITY ANALYSIS

Existing AM
1: Sossaman Rd & Guadalupe Rd

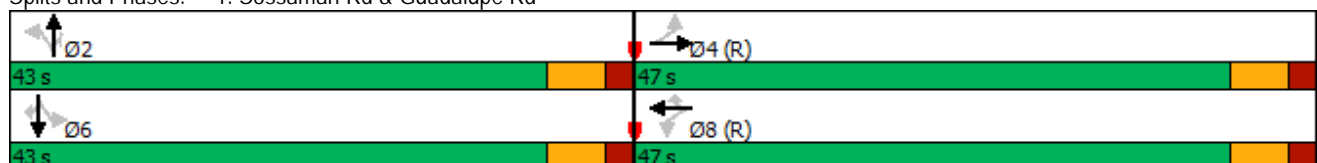
17-1390 Hawes Crossing TIA
05/21/2019



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	Max	C-Max	Max	C-Max
Maximum Split (s)	43	47	43	47
Maximum Split (%)	47.8%	52.2%	47.8%	52.2%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	12	55	12	55
End Time (s)	55	12	55	12
Yield/Force Off (s)	49	6	49	6
Yield/Force Off 170(s)	38	85	38	85
Local Start Time (s)	47	0	47	0
Local Yield (s)	84	41	84	41
Local Yield 170(s)	73	30	73	30






















Intersection Summary	
Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	50
Offset: 55 (61%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 1: Sossaman Rd & Guadalupe Rd



Existing AM
1: Sossaman Rd & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	250	33	63	380	170	36	144	41	104	101	72
Future Volume (veh/h)	81	250	33	63	380	170	36	144	41	104	101	72
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	90	278	37	70	422	189	40	160	46	116	112	80
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	391	2084	270	526	2326	722	547	769	652	499	1461	652
Arrive On Green	0.46	0.46	0.46	0.15	0.15	0.15	0.41	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	810	4575	593	1065	5106	1585	1191	1870	1585	1176	3554	1585
Grp Volume(v), veh/h	90	205	110	70	422	189	40	160	46	116	112	80
Grp Sat Flow(s),veh/h/ln	810	1702	1764	1065	1702	1585	1191	1870	1585	1176	1777	1585
Q Serve(g_s), s	6.9	3.1	3.3	5.2	6.5	9.5	1.9	5.0	1.6	6.3	1.7	2.8
Cycle Q Clear(g_c), s	13.4	3.1	3.3	8.5	6.5	9.5	3.6	5.0	1.6	11.3	1.7	2.8
Prop In Lane	1.00		0.34	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	391	1551	803	526	2326	722	547	769	652	499	1461	652
V/C Ratio(X)	0.23	0.13	0.14	0.13	0.18	0.26	0.07	0.21	0.07	0.23	0.08	0.12
Avail Cap(c_a), veh/h	391	1551	803	526	2326	722	547	769	652	499	1461	652
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.2	14.2	14.2	25.9	23.6	24.8	17.2	17.1	16.1	20.7	16.1	16.4
Incr Delay (d2), s/veh	1.4	0.2	0.4	0.5	0.2	0.9	0.3	0.6	0.2	1.1	0.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	1.2	1.3	1.5	2.7	4.1	0.5	2.2	0.6	1.9	0.7	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.6	14.4	14.6	26.4	23.7	25.7	17.5	17.7	16.3	21.8	16.2	16.8
LnGrp LOS	C	B	B	C	C	C	B	B	B	C	B	B
Approach Vol, veh/h	405		681				246				308	
Approach Delay, s/veh	15.8		24.6				17.4				18.5	
Approach LOS	B		C				B				B	
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	43.0		47.0		43.0		47.0					
Change Period (Y+Rc), s	6.0		6.0		6.0		6.0					
Max Green Setting (Gmax), s	37.0		41.0		37.0		41.0					
Max Q Clear Time (g_c+I1), s	7.0		15.4		13.3		11.5					
Green Ext Time (p_c), s	1.2		2.6		1.4		4.1					
Intersection Summary												
HCM 6th Ctrl Delay	20.2											
HCM 6th LOS	C											

Existing AM
2: Bridlewood /Farnsworth Dr & Guadalupe Rd

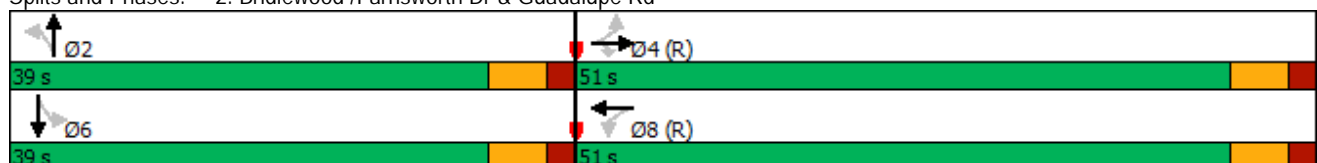
17-1390 Hawes Crossing TIA
05/21/2019



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	Max	C-Max	Max	C-Max
Maximum Split (s)	39	51	39	51
Maximum Split (%)	43.3%	56.7%	43.3%	56.7%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	35	74	35	74
End Time (s)	74	35	74	35
Yield/Force Off (s)	68	29	68	29
Yield/Force Off 170(s)	57	18	57	18
Local Start Time (s)	51	0	51	0
Local Yield (s)	84	45	84	45
Local Yield 170(s)	73	34	73	34





















Intersection Summary	
Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	50
Offset: 74 (82%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 2: Bridlewood /Farnsworth Dr & Guadalupe Rd



Existing AM
2: Bridlewood /Farnsworth Dr & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	294	82	106	376	21	94	7	129	20	3	2
Future Volume (veh/h)	19	294	82	106	376	21	94	7	129	20	3	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No				No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	21	327	91	118	418	23	104	8	143	22	3	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	510	1777	793	488	2478	135	595	31	555	452	384	256
Arrive On Green	0.17	0.17	0.17	0.50	0.50	0.50	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	948	3554	1585	969	4955	270	1411	85	1513	1236	1047	698
Grp Volume(v), veh/h	21	327	91	118	286	155	104	0	151	22	0	5
Grp Sat Flow(s),veh/h/ln	948	1777	1585	969	1702	1822	1411	0	1598	1236	0	1745
Q Serve(g_s), s	1.7	7.1	4.4	7.2	4.1	4.2	4.5	0.0	5.9	1.1	0.0	0.2
Cycle Q Clear(g_c), s	5.9	7.1	4.4	14.4	4.1	4.2	4.7	0.0	5.9	7.1	0.0	0.2
Prop In Lane	1.00		1.00	1.00		0.15	1.00		0.95	1.00		0.40
Lane Grp Cap(c), veh/h	510	1777	793	488	1702	911	595	0	586	452	0	640
V/C Ratio(X)	0.04	0.18	0.11	0.24	0.17	0.17	0.17	0.00	0.26	0.05	0.00	0.01
Avail Cap(c_a), veh/h	510	1777	793	488	1702	911	595	0	586	452	0	640
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.99	0.99	0.99	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.0	21.8	20.6	17.2	12.3	12.3	19.6	0.0	19.9	22.4	0.0	18.1
Incr Delay (d2), s/veh	0.1	0.2	0.3	1.2	0.2	0.4	0.6	0.0	1.1	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.2	1.7	1.7	1.5	1.7	1.6	0.0	2.3	0.4	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.2	22.0	20.9	18.4	12.5	12.7	20.2	0.0	21.0	22.6	0.0	18.1
LnGrp LOS	C	C	C	B	B	B	C	A	C	C	A	B
Approach Vol, veh/h	439			559				255			27	
Approach Delay, s/veh	21.8			13.8				20.7			21.8	
Approach LOS	C			B				C			C	
Timer - Assigned Phs	2			4			6		8			
Phs Duration (G+Y+Rc), s	39.0			51.0			39.0		51.0			
Change Period (Y+Rc), s	6.0			6.0			6.0		6.0			
Max Green Setting (Gmax), s	33.0			45.0			33.0		45.0			
Max Q Clear Time (g_c+I1), s	7.9			9.1			9.1		16.4			
Green Ext Time (p_c), s	1.2			2.7			0.1		3.6			
Intersection Summary												
HCM 6th Ctrl Delay	18.1											
HCM 6th LOS	B											

Existing AM
3: Hawes Rd & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/21/2019



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	Max	C-Max	Max	C-Max
Maximum Split (s)	29	61	29	61
Maximum Split (%)	32.2%	67.8%	32.2%	67.8%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	85	24	85	24
End Time (s)	24	85	24	85
Yield/Force Off (s)	18	79	18	79
Yield/Force Off 170(s)	7	68	7	68
Local Start Time (s)	61	0	61	0
Local Yield (s)	84	55	84	55
Local Yield 170(s)	73	44	73	44

Intersection Summary

























Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	50
Offset: 24 (27%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 3: Hawes Rd & Guadalupe Rd



Existing AM
3: Hawes Rd & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	420	14	52	453	26	16	17	88	32	15	65
Future Volume (veh/h)	33	420	14	52	453	26	16	17	88	32	15	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No				No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	37	467	16	58	503	29	18	19	98	36	17	72
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	576	1143	969	519	3120	969	358	67	348	332	80	338
Arrive On Green	0.61	0.61	0.61	0.61	0.61	0.61	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	872	1870	1585	912	5106	1585	1308	264	1361	1275	312	1321
Grp Volume(v), veh/h	37	467	16	58	503	29	18	0	117	36	0	89
Grp Sat Flow(s),veh/h/ln	872	1870	1585	912	1702	1585	1308	0	1625	1275	0	1633
Q Serve(g_s), s	1.7	11.6	0.4	3.2	3.8	0.7	1.0	0.0	5.2	2.1	0.0	3.9
Cycle Q Clear(g_c), s	5.5	11.6	0.4	14.8	3.8	0.7	4.9	0.0	5.2	7.3	0.0	3.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.84	1.00		0.81
Lane Grp Cap(c), veh/h	576	1143	969	519	3120	969	358	0	415	332	0	417
V/C Ratio(X)	0.06	0.41	0.02	0.11	0.16	0.03	0.05	0.00	0.28	0.11	0.00	0.21
Avail Cap(c_a), veh/h	576	1143	969	519	3120	969	358	0	415	332	0	417
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.7	9.1	6.9	12.9	7.5	6.9	28.3	0.0	26.9	29.8	0.0	26.4
Incr Delay (d2), s/veh	0.2	1.1	0.0	0.4	0.1	0.1	0.3	0.0	1.7	0.7	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	4.6	0.1	0.7	1.3	0.2	0.3	0.0	2.2	0.7	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.0	10.2	6.9	13.3	7.7	7.0	28.6	0.0	28.6	30.5	0.0	27.5
LnGrp LOS	A	B	A	B	A	A	C	A	C	C	A	C
Approach Vol, veh/h	520				590				135			
Approach Delay, s/veh	10.0				8.2				28.6			
Approach LOS	A				A				C			
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	29.0			61.0			29.0			61.0		
Change Period (Y+Rc), s	6.0			6.0			6.0			6.0		
Max Green Setting (Gmax), s	23.0			55.0			23.0			55.0		
Max Q Clear Time (g_c+I1), s	7.2			13.6			9.3			16.8		
Green Ext Time (p_c), s	0.6			3.6			0.4			4.3		
Intersection Summary												
HCM 6th Ctrl Delay	12.7											
HCM 6th LOS	B											

Existing AM
4: Loop 202 SB Ramps & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/21/2019

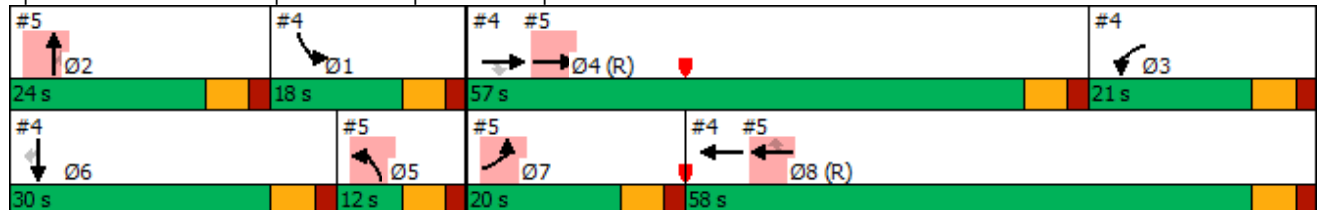


Phase Number	1	2	3	4	5	6	7	8
Node Number	4	5	4	4	5	4	5	4
Movement	SBL	NBT	WBL	EBT	NBL	SBT	EBL	WBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	18	24	21	57	12	30	20	58
Maximum Split (%)	15.0%	20.0%	17.5%	47.5%	10.0%	25.0%	16.7%	48.3%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	82	58	37	100	88	58	100	0
End Time (s)	100	82	58	37	100	88	0	58
Yield/Force Off (s)	94	76	52	31	94	82	114	52
Yield/Force Off 170(s)	94	65	52	20	94	71	114	41
Local Start Time (s)	82	58	37	100	88	58	100	0
Local Yield (s)	94	76	52	31	94	82	114	52
Local Yield 170(s)	94	65	52	20	94	71	114	41

Intersection Summary













Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green	

Splits and Phases: 4: Loop 202 SB Ramps & Guadalupe Rd



Existing AM
4: Loop 202 SB Ramps & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↗	↗↗	↑↑↑					↗	↕	↗
Traffic Volume (vph)	0	553	69	233	464	0	0	0	0	182	0	130
Future Volume (vph)	0	553	69	233	464	0	0	0	0	182	0	130
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	6.0
Lane Util. Factor		0.81	1.00	0.97	0.91					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.96	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.97	1.00
Satd. Flow (prot)		7544	1583	3433	5085					1681	1565	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.97	1.00
Satd. Flow (perm)		7544	1583	3433	5085					1681	1565	1504
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	614	77	259	516	0	0	0	0	202	0	144
RTOR Reduction (vph)	0	0	45	0	0	0	0	0	0	0	81	83
Lane Group Flow (vph)	0	614	32	259	516	0	0	0	0	119	37	26
Turn Type		NA	Perm	Prot	NA					Prot	NA	Perm
Protected Phases		4		3	8					1	6	
Permitted Phases			4									6
Actuated Green, G (s)		49.2	49.2	15.0	50.4					13.8	37.8	28.2
Effective Green, g (s)		49.2	49.2	15.0	50.4					13.8	37.8	28.2
Actuated g/C Ratio		0.41	0.41	0.12	0.42					0.12	0.31	0.23
Clearance Time (s)		6.0	6.0	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
Lane Grp Cap (vph)		3093	649	429	2135					193	492	353
v/s Ratio Prot		c0.08		c0.08	c0.10					c0.07	c0.01	
v/s Ratio Perm			0.02								0.02	0.02
v/c Ratio		0.20	0.05	0.60	0.24					0.62	0.08	0.07
Uniform Delay, d1		22.7	21.3	49.7	22.5					50.6	28.8	35.7
Progression Factor		1.00	1.00	0.61	0.26					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	2.4	0.3					5.7	0.1	0.4
Delay (s)		22.9	21.5	32.6	6.2					56.3	28.9	36.1
Level of Service		C	C	C	A					E	C	D
Approach Delay (s)		22.7			15.0			0.0			40.6	
Approach LOS		C			B			A			D	
Intersection Summary												
HCM 2000 Control Delay			22.8			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				24.0		
Intersection Capacity Utilization			76.5%			ICU Level of Service				D		
Analysis Period (min)			15									

c Critical Lane Group

Existing AM
5: Loop 202 NB Ramps & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/21/2019

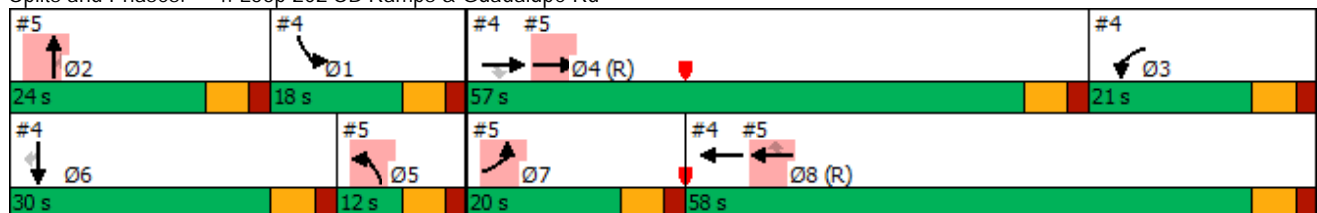


Phase Number	1	2	3	4	5	6	7	8
Node Number	4	5	4	4	5	4	5	4
Movement	SBL	NBT	WBL	EBT	NBL	SBT	EBL	WBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	18	24	21	57	12	30	20	58
Maximum Split (%)	15.0%	20.0%	17.5%	47.5%	10.0%	25.0%	16.7%	48.3%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	82	58	37	100	88	58	100	0
End Time (s)	100	82	58	37	100	88	0	58
Yield/Force Off (s)	94	76	52	31	94	82	114	52
Yield/Force Off 170(s)	94	65	52	20	94	71	114	41
Local Start Time (s)	82	58	37	100	88	58	100	0
Local Yield (s)	94	76	52	31	94	82	114	52
Local Yield 170(s)	94	65	52	20	94	71	114	41

Intersection Summary




















Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green	

Splits and Phases: 4: Loop 202 SB Ramps & Guadalupe Rd



Existing AM
5: Loop 202 NB Ramps & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	300	433	0	0	664	788	32	6	156	0	0	0
Future Volume (vph)	300	433	0	0	664	788	32	6	156	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	6.0			
Lane Util. Factor	0.97	0.91			0.81	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.87	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	5085			7544	1583	1681	1468	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	5085			7544	1583	1681	1468	1504			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	333	481	0	0	738	876	36	7	173	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	388	0	66	78	0	0	0
Lane Group Flow (vph)	333	481	0	0	738	488	32	26	14	0	0	0
Turn Type	Prot	NA			NA	Perm	Prot	NA	Perm			
Protected Phases	7	4			8		5	2				
Permitted Phases						8			2			
Actuated Green, G (s)	13.8	49.2			50.4	50.4	3.6	21.6	18.0			
Effective Green, g (s)	13.8	49.2			50.4	50.4	3.6	21.6	18.0			
Actuated g/C Ratio	0.12	0.41			0.42	0.42	0.03	0.18	0.15			
Clearance Time (s)	6.0	6.0			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			
Lane Grp Cap (vph)	394	2084			3168	664	50	264	225			
v/s Ratio Prot	c0.10	0.09			0.10		c0.02	c0.00				
v/s Ratio Perm						c0.31		0.01	0.01			
v/c Ratio	0.85	0.23			0.23	0.73	0.64	0.10	0.06			
Uniform Delay, d1	52.1	23.1			22.4	29.2	57.6	41.1	43.8			
Progression Factor	0.78	0.30			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	14.9	0.3			0.2	7.1	24.7	0.2	0.5			
Delay (s)	55.6	7.3			22.5	36.3	82.2	41.2	44.3			
Level of Service	E	A			C	D	F	D	D			
Approach Delay (s)		27.0			30.0			48.6			0.0	
Approach LOS		C			C			D			A	
Intersection Summary												
HCM 2000 Control Delay			30.6				HCM 2000 Level of Service		C			
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)		24.0			
Intersection Capacity Utilization			76.5%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												

Existing AM
6: Power Rd & Elliot Rd

17-1390 Hawes Crossing TIA
05/21/2019

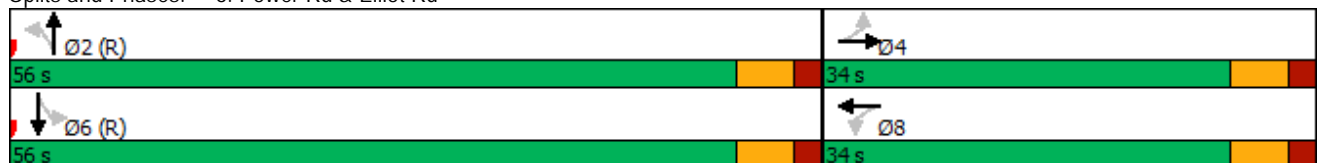


Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	56	34	56	34
Maximum Split (%)	62.2%	37.8%	62.2%	37.8%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	4	60	4	60
End Time (s)	60	4	60	4
Yield/Force Off (s)	54	88	54	88
Yield/Force Off 170(s)	43	77	43	77
Local Start Time (s)	0	56	0	56
Local Yield (s)	50	84	50	84
Local Yield 170(s)	39	73	39	73

Intersection Summary






















Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 4 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 6: Power Rd & Elliot Rd



Existing AM
6: Power Rd & Elliot Rd

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	161	136	79	120	204	22	98	1091	83	14	770	143
Future Volume (veh/h)	161	136	79	120	204	22	98	1091	83	14	770	143
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	179	151	88	133	227	24	109	1212	92	16	856	159
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	285	325	189	288	488	52	303	1919	145	220	1715	319
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.57	0.57	0.57	0.57	0.57	0.57
Sat Flow, veh/h	1129	1108	646	1141	1663	176	555	3348	254	422	2992	556
Grp Volume(v), veh/h	179	0	239	133	0	251	109	642	662	16	508	507
Grp Sat Flow(s),veh/h/ln	1129	0	1754	1141	0	1839	555	1777	1825	422	1777	1770
Q Serve(g_s), s	13.9	0.0	10.0	9.7	0.0	10.1	13.1	21.7	21.8	2.4	15.4	15.4
Cycle Q Clear(g_c), s	23.9	0.0	10.0	19.7	0.0	10.1	28.5	21.7	21.8	24.2	15.4	15.4
Prop In Lane	1.00		0.37	1.00		0.10	1.00		0.14	1.00		0.31
Lane Grp Cap(c), veh/h	285	0	515	288	0	539	303	1019	1046	220	1019	1015
V/C Ratio(X)	0.63	0.00	0.46	0.46	0.00	0.47	0.36	0.63	0.63	0.07	0.50	0.50
Avail Cap(c_a), veh/h	305	0	546	308	0	572	303	1019	1046	220	1019	1015
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	0.99	0.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.8	0.0	26.0	34.1	0.0	26.0	20.0	12.8	12.9	21.0	11.5	11.5
Incr Delay (d2), s/veh	3.7	0.0	0.7	1.1	0.0	0.6	3.3	3.0	2.9	0.6	1.7	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.0	4.2	2.7	0.0	4.4	1.9	8.7	8.9	0.3	6.0	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.5	0.0	26.7	35.2	0.0	26.6	23.3	15.8	15.8	21.6	13.2	13.2
LnGrp LOS	D	A	C	D	A	C	C	B	B	C	B	B
Approach Vol, veh/h	418			384			1413			1031		
Approach Delay, s/veh	32.2			29.6			16.4			13.4		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	57.6			32.4			57.6			32.4		
Change Period (Y+Rc), s	6.0			6.0			6.0			6.0		
Max Green Setting (Gmax), s	50.0			28.0			50.0			28.0		
Max Q Clear Time (g_c+I1), s	30.5			25.9			26.2			21.7		
Green Ext Time (p_c), s	10.3			0.5			7.7			1.0		
Intersection Summary												
HCM 6th Ctrl Delay	19.0											
HCM 6th LOS	B											

Existing AM
7: Elliot Rd & Sossaman Rd

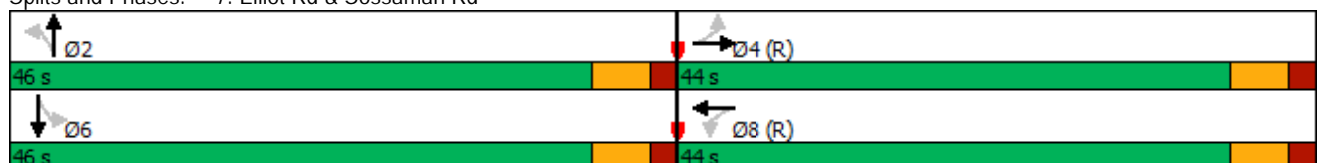
17-1390 Hawes Crossing TIA
05/21/2019



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	Max	C-Max	Max	C-Max
Maximum Split (s)	46	44	46	44
Maximum Split (%)	51.1%	48.9%	51.1%	48.9%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	53	9	53	9
End Time (s)	9	53	9	53
Yield/Force Off (s)	3	47	3	47
Yield/Force Off 170(s)	82	36	82	36
Local Start Time (s)	44	0	44	0
Local Yield (s)	84	38	84	38
Local Yield 170(s)	73	27	73	27





















Intersection Summary	
Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	50
Offset: 9 (10%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 7: Elliot Rd & Sossaman Rd






Existing AM
7: Elliot Rd & Sossaman Rd

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	132	32	5	149	16	34	37	3	28	35	167
Future Volume (veh/h)	67	132	32	5	149	16	34	37	3	28	35	167
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	74	147	36	6	166	18	38	41	3	31	39	186
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	509	613	150	509	700	76	491	765	56	667	125	598
Arrive On Green	0.42	0.42	0.42	0.42	0.42	0.42	0.44	0.44	0.44	0.44	0.44	0.44
Sat Flow, veh/h	1200	1451	355	1201	1658	180	1156	1722	126	1362	282	1346
Grp Volume(v), veh/h	74	0	183	6	0	184	38	0	44	31	0	225
Grp Sat Flow(s),veh/h/ln	1200	0	1806	1201	0	1838	1156	0	1848	1362	0	1628
Q Serve(g_s), s	3.8	0.0	5.9	0.3	0.0	5.8	2.0	0.0	1.2	1.2	0.0	8.0
Cycle Q Clear(g_c), s	9.6	0.0	5.9	6.2	0.0	5.8	10.0	0.0	1.2	2.4	0.0	8.0
Prop In Lane	1.00		0.20	1.00		0.10	1.00		0.07	1.00		0.83
Lane Grp Cap(c), veh/h	509	0	763	509	0	776	491	0	821	667	0	724
V/C Ratio(X)	0.15	0.00	0.24	0.01	0.00	0.24	0.08	0.00	0.05	0.05	0.00	0.31
Avail Cap(c_a), veh/h	509	0	763	509	0	776	491	0	821	667	0	724
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.00	0.85	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.8	0.0	16.7	18.7	0.0	16.7	19.3	0.0	14.2	14.9	0.0	16.1
Incr Delay (d2), s/veh	0.5	0.0	0.6	0.0	0.0	0.7	0.3	0.0	0.1	0.1	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	2.5	0.1	0.0	2.5	0.6	0.0	0.5	0.4	0.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.3	0.0	17.3	18.7	0.0	17.4	19.6	0.0	14.4	15.0	0.0	17.2
LnGrp LOS	C	A	B	B	A	B	B	A	B	B	A	B
Approach Vol, veh/h	257				190				82		256	
Approach Delay, s/veh	18.2				17.5				16.8		17.0	
Approach LOS	B				B				B		B	
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	46.0		44.0		46.0		44.0					
Change Period (Y+Rc), s	6.0		6.0		6.0		6.0					
Max Green Setting (Gmax), s	40.0		38.0		40.0		38.0					
Max Q Clear Time (g_c+I1), s	12.0		11.6		10.0		8.2					
Green Ext Time (p_c), s	0.3		1.3		1.6		1.1					
Intersection Summary												
HCM 6th Ctrl Delay	17.5											
HCM 6th LOS	B											

Existing AM
8: Elliot Rd & 80th St.

17-1390 Hawes Crossing TIA
05/21/2019

Intersection						
Int Delay, s/veh	2.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	40	111	154	33	14	38
Future Vol, veh/h	40	111	154	33	14	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	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	44	123	171	37	16	42
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	208	0	-	0	401	190
Stage 1	-	-	-	-	190	-
Stage 2	-	-	-	-	211	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1363	-	-	-	629	852
Stage 1	-	-	-	-	842	-
Stage 2	-	-	-	-	849	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	1363	-	-	-	607	852
Mov Cap-2 Maneuver	-	-	-	-	656	-
Stage 1	-	-	-	-	813	-
Stage 2	-	-	-	-	849	-
Approach	EB	WB		SB		
HCM Control Delay, s	2	0		9.9		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1363	-	-	-	789	
HCM Lane V/C Ratio	0.033	-	-	-	0.073	
HCM Control Delay (s)	7.7	0	-	-	9.9	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	

Existing AM
9: Hawes Rd & Elliot Rd

17-1390 Hawes Crossing TIA
05/21/2019

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	116	3	6	136	14	6	2	3	32	3	34
Future Vol, veh/h	20	116	3	6	136	14	6	2	3	32	3	34
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	129	3	7	151	16	7	2	3	36	3	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	167	0	0	132	0	0	369	356	131	350	349	159
Stage 1	-	-	-	-	-	-	175	175	-	173	173	-
Stage 2	-	-	-	-	-	-	194	181	-	177	176	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1411	-	-	1453	-	-	588	570	919	605	575	886
Stage 1	-	-	-	-	-	-	827	754	-	829	756	-
Stage 2	-	-	-	-	-	-	808	750	-	825	753	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1411	-	-	1453	-	-	551	557	919	591	562	886
Mov Cap-2 Maneuver	-	-	-	-	-	-	551	557	-	591	562	-
Stage 1	-	-	-	-	-	-	813	741	-	815	752	-
Stage 2	-	-	-	-	-	-	766	746	-	806	740	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.1			0.3			10.9			10.7		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	620	1411	-	-	1453	-	-	705
HCM Lane V/C Ratio	0.02	0.016	-	-	0.005	-	-	0.109
HCM Control Delay (s)	10.9	7.6	0	-	7.5	0	-	10.7
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.4

Existing AM
10: Loop 202 SB Ramps & Elliot Rd

17-1390 Hawes Crossing TIA
05/21/2019

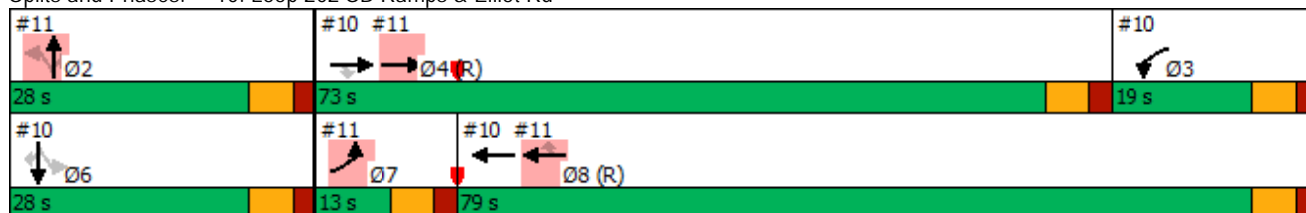


Phase Number	2	3	4	6	7	8
Node Number	11	10	10	10	11	10
Movement	NBTL	WBL	EBT	SBTL	EBL	WBT
Lead/Lag		Lag	Lead		Lead	Lag
Lead-Lag Optimize		Yes	Yes		Yes	Yes
Recall Mode	Max	None	C-Max	Max	None	C-Max
Maximum Split (s)	28	19	73	28	13	79
Maximum Split (%)	23.3%	15.8%	60.8%	23.3%	10.8%	65.8%
Minimum Split (s)	24	11	24	24	11	24
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)	7		7	7		7
Flash Dont Walk (s)	11		11	11		11
Dual Entry	Yes	No	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	79	60	107	79	107	0
End Time (s)	107	79	60	107	0	79
Yield/Force Off (s)	101	73	54	101	114	73
Yield/Force Off 170(s)	90	73	43	90	114	62
Local Start Time (s)	79	60	107	79	107	0
Local Yield (s)	101	73	54	101	114	73
Local Yield 170(s)	90	73	43	90	114	62

Intersection Summary













Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green	

Splits and Phases: 10: Loop 202 SB Ramps & Elliot Rd



Existing AM
10: Loop 202 SB Ramps & Elliot Rd

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗	↗↗	↑↑					↗	↕	↗
Traffic Volume (vph)	0	111	40	142	118	0	0	0	0	144	0	41
Future Volume (vph)	0	111	40	142	118	0	0	0	0	144	0	41
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	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.99	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		6408	1583	3433	3539					1681	1604	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		6408	1583	3433	3539					1681	1604	1504
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	123	44	158	131	0	0	0	0	160	0	46
RTOR Reduction (vph)	0	0	20	0	0	0	0	0	0	0	67	33
Lane Group Flow (vph)	0	123	24	158	131	0	0	0	0	83	15	8
Turn Type		NA	Perm	Prot	NA					Perm	NA	Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		65.8	65.8	14.2	74.5					22.0	22.0	22.0
Effective Green, g (s)		65.8	65.8	14.2	74.5					22.0	22.0	22.0
Actuated g/C Ratio		0.55	0.55	0.12	0.62					0.18	0.18	0.18
Clearance Time (s)		6.0	6.0	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
Lane Grp Cap (vph)		3513	868	406	2197					308	294	275
v/s Ratio Prot		c0.02		c0.05	c0.04							
v/s Ratio Perm			0.02							c0.05	0.01	0.00
v/c Ratio		0.04	0.03	0.39	0.06					0.27	0.05	0.03
Uniform Delay, d1		12.5	12.4	48.9	9.0					42.1	40.4	40.2
Progression Factor		1.00	1.00	0.84	0.52					1.00	1.00	1.00
Incremental Delay, d2		0.0	0.1	0.6	0.1					2.1	0.3	0.2
Delay (s)		12.5	12.5	41.6	4.8					44.2	40.7	40.4
Level of Service		B	B	D	A					D	D	D
Approach Delay (s)		12.5			24.9			0.0			42.1	
Approach LOS		B			C			A			D	
Intersection Summary												
HCM 2000 Control Delay			27.1			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.15									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			62.0%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

Existing AM
11: Loop 202 NB Ramps & Elliot Rd

17-1390 Hawes Crossing TIA
05/21/2019

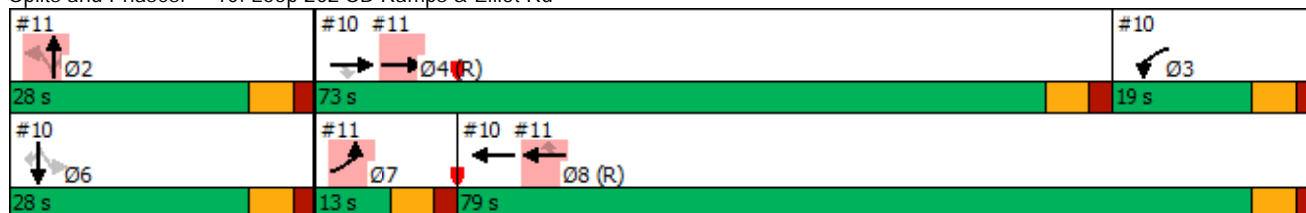


Phase Number	2	3	4	6	7	8
Node Number	11	10	10	10	11	10
Movement	NBTL	WBL	EBT	SBTL	EBL	WBT
Lead/Lag		Lag	Lead		Lead	Lag
Lead-Lag Optimize		Yes	Yes		Yes	Yes
Recall Mode	Max	None	C-Max	Max	None	C-Max
Maximum Split (s)	28	19	73	28	13	79
Maximum Split (%)	23.3%	15.8%	60.8%	23.3%	10.8%	65.8%
Minimum Split (s)	24	11	24	24	11	24
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)	7		7	7		7
Flash Dont Walk (s)	11		11	11		11
Dual Entry	Yes	No	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	79	60	107	79	107	0
End Time (s)	107	79	60	107	0	79
Yield/Force Off (s)	101	73	54	101	114	73
Yield/Force Off 170(s)	90	73	43	90	114	62
Local Start Time (s)	79	60	107	79	107	0
Local Yield (s)	101	73	54	101	114	73
Local Yield 170(s)	90	73	43	90	114	62

Intersection Summary


























Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green	

Splits and Phases: 10: Loop 202 SB Ramps & Elliot Rd



Existing AM
11: Loop 202 NB Ramps & Elliot Rd

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  			  			 				
Traffic Volume (vph)	47	216	0	0	228	625	15	1	71	0	0	0
Future Volume (vph)	47	216	0	0	228	625	15	1	71	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	6.0			
Lane Util. Factor	0.97	0.91			0.86	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.86	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	5085			6408	1583	1681	1456	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	5085			6408	1583	1681	1456	1504			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	52	240	0	0	253	694	17	1	79	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	263	0	31	33	0	0	0
Lane Group Flow (vph)	52	240	0	0	253	431	15	10	8	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	5.5	65.8			74.5	74.5	22.0	22.0	22.0			
Effective Green, g (s)	5.5	65.8			74.5	74.5	22.0	22.0	22.0			
Actuated g/C Ratio	0.05	0.55			0.62	0.62	0.18	0.18	0.18			
Clearance Time (s)	6.0	6.0			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			
Lane Grp Cap (vph)	157	2788			3978	982	308	266	275			
v/s Ratio Prot	c0.02	0.05			0.04							
v/s Ratio Perm						c0.27	c0.01	0.01	0.00			
v/c Ratio	0.33	0.09			0.06	0.44	0.05	0.04	0.03			
Uniform Delay, d1	55.5	12.8			9.0	11.9	40.4	40.3	40.2			
Progression Factor	1.10	0.80			0.25	2.19	1.00	1.00	1.00			
Incremental Delay, d2	1.2	0.1			0.0	1.1	0.3	0.3	0.2			
Delay (s)	62.5	10.3			2.3	27.1	40.7	40.6	40.4			
Level of Service	E	B			A	C	D	D	D			
Approach Delay (s)		19.6			20.5			40.5			0.0	
Approach LOS		B			C			D			A	
Intersection Summary												
HCM 2000 Control Delay		21.7			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.35										
Actuated Cycle Length (s)		120.0			Sum of lost time (s)			18.0				
Intersection Capacity Utilization		62.0%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

Existing AM
14: Hawes Rd & Loop 202 WB Ramps

17-1390 Hawes Crossing TIA
05/21/2019

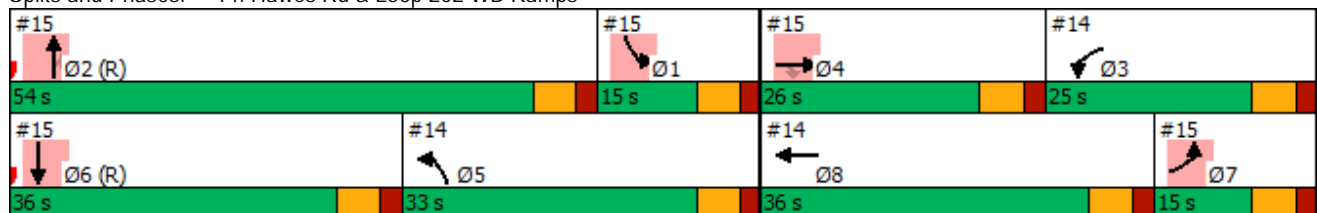


Phase Number	1	2	3	4	5	6	7	8
Node Number	15	15	14	15	14	15	15	14
Movement	SBL	NBT	WBL	EBT	NBL	SBT	EBL	WBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	None	Ped	None	C-Min	None	None
Maximum Split (s)	15	54	25	26	33	36	15	36
Maximum Split (%)	12.5%	45.0%	20.8%	21.7%	27.5%	30.0%	12.5%	30.0%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	15	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	54	0	95	69	36	0	105	69
End Time (s)	69	54	0	95	69	36	0	105
Yield/Force Off (s)	63	48	114	89	63	30	114	99
Yield/Force Off 170(s)	63	37	114	78	63	19	114	88
Local Start Time (s)	54	0	95	69	36	0	105	69
Local Yield (s)	63	48	114	89	63	30	114	99
Local Yield 170(s)	63	37	114	78	63	19	114	88

Intersection Summary

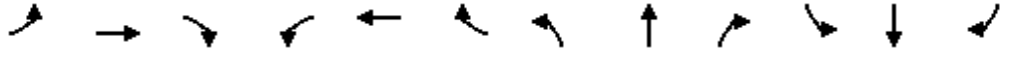



Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 14: Hawes Rd & Loop 202 WB Ramps



Existing AM
14: Hawes Rd & Loop 202 WB Ramps

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	125	0	0	105	0	0	0	0	0
Future Volume (vph)	0	0	0	125	0	0	105	0	0	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					
Lane Util. Factor				0.95	0.95		1.00					
Frt				1.00	1.00		1.00					
Flt Protected				0.95	0.95		0.95					
Satd. Flow (prot)				1681	1681		1770					
Flt Permitted				0.95	0.95		0.95					
Satd. Flow (perm)				1681	1681		1770					
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	139	0	0	117	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	69	70	0	117	0	0	0	0	0
Turn Type				Prot	NA		Prot					
Protected Phases				3	8		5					
Permitted Phases												
Actuated Green, G (s)				36.6	71.3		18.0					
Effective Green, g (s)				36.6	71.3		18.0					
Actuated g/C Ratio				0.31	0.59		0.15					
Clearance Time (s)				6.0	6.0		6.0					
Vehicle Extension (s)				3.0	3.0		3.0					
Lane Grp Cap (vph)				512	998		265					
v/s Ratio Prot				c0.04	c0.02		c0.07					
v/s Ratio Perm					0.02							
v/c Ratio				0.13	0.07		0.44					
Uniform Delay, d1				30.2	10.3		46.4					
Progression Factor				1.00	1.00		0.37					
Incremental Delay, d2				0.1	0.0		1.2					
Delay (s)				30.3	10.3		18.3					
Level of Service				C	B		B					
Approach Delay (s)		0.0			20.3			18.3			0.0	
Approach LOS		A			C			B			A	
Intersection Summary												
HCM 2000 Control Delay			19.4			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.16									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			46.7%			ICU Level of Service			A			
Analysis Period (min)			15									

c Critical Lane Group

Existing AM
15: Hawes Rd & Loop 202 EB Ramps

17-1390 Hawes Crossing TIA
05/21/2019

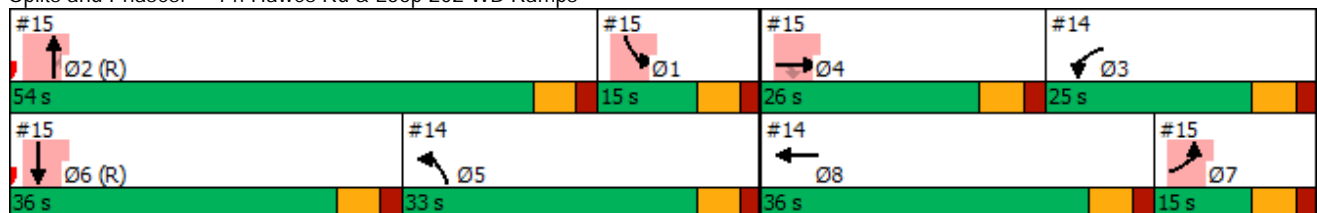


Phase Number	1	2	3	4	5	6	7	8
Node Number	15	15	14	15	14	15	15	14
Movement	SBL	NBT	WBL	EBT	NBL	SBT	EBL	WBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	None	Ped	None	C-Min	None	None
Maximum Split (s)	15	54	25	26	33	36	15	36
Maximum Split (%)	12.5%	45.0%	20.8%	21.7%	27.5%	30.0%	12.5%	30.0%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	15	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	54	0	95	69	36	0	105	69
End Time (s)	69	54	0	95	69	36	0	105
Yield/Force Off (s)	63	48	114	89	63	30	114	99
Yield/Force Off 170(s)	63	37	114	78	63	19	114	88
Local Start Time (s)	54	0	95	69	36	0	105	69
Local Yield (s)	63	48	114	89	63	30	114	99
Local Yield 170(s)	63	37	114	78	63	19	114	88

Intersection Summary





















Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 14: Hawes Rd & Loop 202 WB Ramps



Existing AM
15: Hawes Rd & Loop 202 EB Ramps

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	27	0	0	0	0	103	242	1	124	0
Future Volume (vph)	2	0	27	0	0	0	0	103	242	1	124	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	1.00		1.00					1.00	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770		1583					1863	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770		1583					1863	1583	1770	3539	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	0	30	0	0	0	0	114	269	1	138	0
RTOR Reduction (vph)	0	0	23	0	0	0	0	0	206	0	0	0
Lane Group Flow (vph)	2	0	7	0	0	0	0	114	63	1	138	0
Turn Type	Prot		Perm					NA	Perm	Prot	NA	
Protected Phases	7	4						2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	1.2		28.7					28.2	28.2	2.5	12.7	
Effective Green, g (s)	1.2		28.7					28.2	28.2	2.5	12.7	
Actuated g/C Ratio	0.01		0.24					0.23	0.23	0.02	0.11	
Clearance Time (s)	6.0		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	
Lane Grp Cap (vph)	17		378					437	372	36	374	
v/s Ratio Prot	c0.00							c0.06		c0.00	c0.04	
v/s Ratio Perm			c0.00						0.04			
v/c Ratio	0.12		0.02					0.26	0.17	0.03	0.37	
Uniform Delay, d1	58.9		34.9					37.4	36.6	57.6	49.9	
Progression Factor	1.00		1.00					1.00	1.00	0.98	0.50	
Incremental Delay, d2	3.1		0.0					1.4	1.0	0.3	2.8	
Delay (s)	62.0		34.9					38.9	37.6	57.0	27.6	
Level of Service	E		C					D	D	E	C	
Approach Delay (s)		36.6			0.0			37.9			27.9	
Approach LOS		D			A			D			C	
Intersection Summary												
HCM 2000 Control Delay			35.3					HCM 2000 Level of Service		D		
HCM 2000 Volume to Capacity ratio			0.09									
Actuated Cycle Length (s)			120.0					Sum of lost time (s)		24.0		
Intersection Capacity Utilization			46.7%					ICU Level of Service		A		
Analysis Period (min)			15									

c Critical Lane Group

Existing AM
16: Ellsworth Rd & Elliot Rd

17-1390 Hawes Crossing TIA
05/21/2019

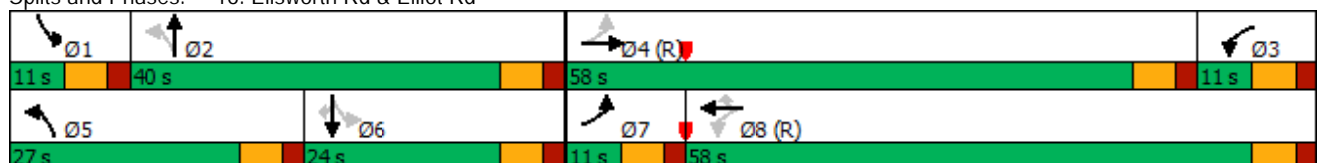


Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	11	40	11	58	27	24	11	58
Maximum Split (%)	9.2%	33.3%	9.2%	48.3%	22.5%	20.0%	9.2%	48.3%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	6	17	115	57	6	33	57	68
End Time (s)	17	57	6	115	33	57	68	6
Yield/Force Off (s)	11	51	0	109	27	51	62	0
Yield/Force Off 170(s)	11	40	0	98	27	40	62	109
Local Start Time (s)	58	69	47	109	58	85	109	0
Local Yield (s)	63	103	52	41	79	103	114	52
Local Yield 170(s)	63	92	52	30	79	92	114	41

Intersection Summary























Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 68 (57%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 16: Ellsworth Rd & Elliot Rd









Existing AM
16: Ellsworth Rd & Elliot Rd

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	192	62	24	929	101	229	351	16	22	244	75
Future Volume (veh/h)	44	192	62	24	929	101	229	351	16	22	244	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	49	213	69	27	1032	112	254	390	18	24	271	83
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	183	1152	363	533	1635	729	404	980	45	271	619	276
Arrive On Green	0.07	0.87	0.87	0.06	0.46	0.46	0.13	0.28	0.28	0.02	0.17	0.17
Sat Flow, veh/h	1781	2659	838	1781	3554	1585	1781	3459	159	1781	3554	1585
Grp Volume(v), veh/h	49	140	142	27	1032	112	254	200	208	24	271	83
Grp Sat Flow(s),veh/h/ln	1781	1777	1720	1781	1777	1585	1781	1777	1842	1781	1777	1585
Q Serve(g_s), s	2.0	1.5	1.6	0.0	26.5	4.9	13.5	10.9	11.0	1.3	8.2	5.5
Cycle Q Clear(g_c), s	2.0	1.5	1.6	0.0	26.5	4.9	13.5	10.9	11.0	1.3	8.2	5.5
Prop In Lane	1.00		0.49	1.00		1.00	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	183	770	745	533	1635	729	404	503	522	271	619	276
V/C Ratio(X)	0.27	0.18	0.19	0.05	0.63	0.15	0.63	0.40	0.40	0.09	0.44	0.30
Avail Cap(c_a), veh/h	198	770	745	533	1635	729	480	503	522	304	619	276
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.1	4.6	4.6	22.6	24.6	18.8	32.7	34.7	34.7	39.2	44.3	43.2
Incr Delay (d2), s/veh	0.8	0.5	0.6	0.0	1.9	0.4	1.9	2.3	2.3	0.1	2.2	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.6	0.7	0.5	11.4	1.9	6.0	5.0	5.3	0.6	3.8	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.8	5.2	5.2	22.7	26.5	19.3	34.6	37.1	37.0	39.4	46.6	46.0
LnGrp LOS	C	A	A	C	C	B	C	D	D	D	D	D
Approach Vol, veh/h	331				1171				662			
Approach Delay, s/veh	8.2				25.7				36.1			
Approach LOS	A				C				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.8	40.0	13.2	58.0	21.9	26.9	10.0	61.2				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	5.0	34.0	5.0	52.0	21.0	18.0	5.0	52.0				
Max Q Clear Time (g_c+I1), s	3.3	13.0	2.0	3.6	15.5	10.2	4.0	28.5				
Green Ext Time (p_c), s	0.0	2.3	0.0	1.8	0.4	1.2	0.0	8.6				
Intersection Summary												
HCM 6th Ctrl Delay	29.2											
HCM 6th LOS	C											

Existing AM
17: Warner Rd. & Ellsworth Rd

17-1390 Hawes Crossing TIA
05/21/2019

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	10	44	599	327	20
Future Vol, veh/h	3	10	44	599	327	20
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	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	11	49	666	363	22
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	805	193	385	0	-	0
Stage 1	374	-	-	-	-	-
Stage 2	431	-	-	-	-	-
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	320	816	1170	-	-	-
Stage 1	666	-	-	-	-	-
Stage 2	623	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	307	816	1170	-	-	-
Mov Cap-2 Maneuver	307	-	-	-	-	-
Stage 1	638	-	-	-	-	-
Stage 2	623	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.2	0.6		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1170	-	307	816	-	-
HCM Lane V/C Ratio	0.042	-	0.011	0.014	-	-
HCM Control Delay (s)	8.2	-	16.9	9.5	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0	0	-	-

Existing PM
1: Sossaman Rd & Guadalupe Rd

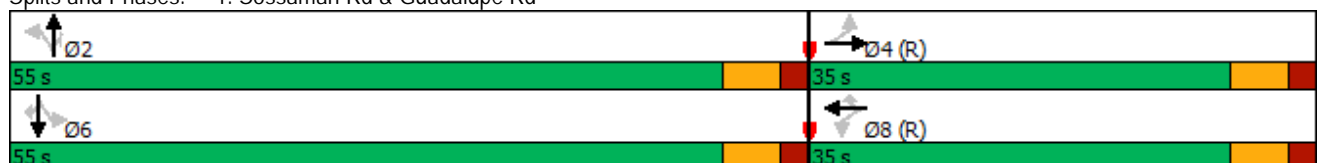
17-1390 Hawes Crossing TIA
05/21/2019



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	Max	C-Max	Max	C-Max
Maximum Split (s)	55	35	55	35
Maximum Split (%)	61.1%	38.9%	61.1%	38.9%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	26	81	26	81
End Time (s)	81	26	81	26
Yield/Force Off (s)	75	20	75	20
Yield/Force Off 170(s)	64	9	64	9
Local Start Time (s)	35	0	35	0
Local Yield (s)	84	29	84	29
Local Yield 170(s)	73	18	73	18
























Intersection Summary	
Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	50
Offset: 81 (90%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 1: Sossaman Rd & Guadalupe Rd



Existing PM
1: Sossaman Rd & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	377	49	72	329	159	25	131	43	258	187	71
Future Volume (veh/h)	49	377	49	72	329	159	25	131	43	258	187	71
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	419	54	80	366	177	28	146	48	287	208	79
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	301	1479	187	313	1645	511	644	1018	863	681	1935	863
Arrive On Green	0.32	0.32	0.32	0.11	0.11	0.11	0.54	0.54	0.54	0.54	0.54	0.54
Sat Flow, veh/h	863	4590	580	921	5106	1585	1092	1870	1585	1189	3554	1585
Grp Volume(v), veh/h	54	309	164	80	366	177	28	146	48	287	208	79
Grp Sat Flow(s),veh/h/ln	863	1702	1766	921	1702	1585	1092	1870	1585	1189	1777	1585
Q Serve(g_s), s	4.5	6.1	6.3	7.4	5.9	9.3	1.1	3.5	1.3	14.2	2.5	2.2
Cycle Q Clear(g_c), s	10.4	6.1	6.3	13.6	5.9	9.3	3.7	3.5	1.3	17.6	2.5	2.2
Prop In Lane	1.00		0.33	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	301	1097	569	313	1645	511	644	1018	863	681	1935	863
V/C Ratio(X)	0.18	0.28	0.29	0.26	0.22	0.35	0.04	0.14	0.06	0.42	0.11	0.09
Avail Cap(c_a), veh/h	301	1097	569	313	1645	511	644	1018	863	681	1935	863
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.99	0.99	0.99	0.94	0.94	0.94	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	22.7	22.8	36.3	29.9	31.4	10.8	10.1	9.6	14.5	9.9	9.8
Incr Delay (d2), s/veh	1.3	0.6	1.3	1.9	0.3	1.8	0.1	0.3	0.1	1.9	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	2.5	2.7	2.0	2.5	4.1	0.3	1.4	0.4	3.9	1.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.8	23.4	24.1	38.3	30.2	33.3	10.9	10.4	9.7	16.4	10.0	10.0
LnGrp LOS	C	C	C	D	C	C	B	B	A	B	B	B
Approach Vol, veh/h	527			623			222			574		
Approach Delay, s/veh	24.0			32.1			10.3			13.2		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	55.0			35.0			55.0			35.0		
Change Period (Y+Rc), s	6.0			6.0			6.0			6.0		
Max Green Setting (Gmax), s	49.0			29.0			49.0			29.0		
Max Q Clear Time (g_c+I1), s	5.7			12.4			19.6			15.6		
Green Ext Time (p_c), s	1.2			3.0			2.8			2.9		
Intersection Summary												
HCM 6th Ctrl Delay	21.9											
HCM 6th LOS	C											

Existing PM
2: Bridlewood /Farnsworth Dr & Guadalupe Rd

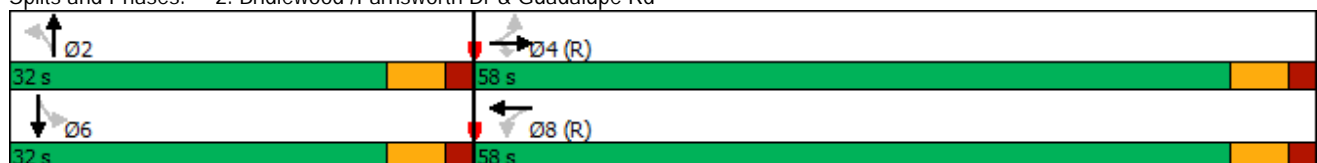
17-1390 Hawes Crossing TIA
05/21/2019



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	Max	C-Max	Max	C-Max
Maximum Split (s)	32	58	32	58
Maximum Split (%)	35.6%	64.4%	35.6%	64.4%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	36	68	36	68
End Time (s)	68	36	68	36
Yield/Force Off (s)	62	30	62	30
Yield/Force Off 170(s)	51	19	51	19
Local Start Time (s)	58	0	58	0
Local Yield (s)	84	52	84	52
Local Yield 170(s)	73	41	73	41

Intersection Summary	
Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	50
Offset: 68 (76%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 2: Bridlewood /Farnsworth Dr & Guadalupe Rd


























Existing PM

17-1390 Hawes Crossing TIA

2: Bridlewood /Farnsworth Dr & Guadalupe Rd

05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			  							
Traffic Volume (veh/h)	33	548	67	73	507	48	38	0	58	25	0	0
Future Volume (veh/h)	33	548	67	73	507	48	38	0	58	25	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	37	609	74	81	563	53	42	0	64	28	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	500	2053	916	407	2746	256	490	0	458	426	540	0
Arrive On Green	0.19	0.19	0.19	0.58	0.58	0.58	0.29	0.00	0.29	0.29	0.00	0.00
Sat Flow, veh/h	807	3554	1585	758	4752	443	1418	0	1585	1338	1870	0
Grp Volume(v), veh/h	37	609	74	81	402	214	42	0	64	28	0	0
Grp Sat Flow(s),veh/h/ln	807	1777	1585	758	1702	1791	1418	0	1585	1338	1870	0
Q Serve(g_s), s	3.5	13.2	3.5	6.1	5.1	5.2	2.0	0.0	2.7	1.4	0.0	0.0
Cycle Q Clear(g_c), s	8.6	13.2	3.5	19.4	5.1	5.2	2.0	0.0	2.7	4.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.25	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	500	2053	916	407	1967	1035	490	0	458	426	540	0
V/C Ratio(X)	0.07	0.30	0.08	0.20	0.20	0.21	0.09	0.00	0.14	0.07	0.00	0.00
Avail Cap(c_a), veh/h	500	2053	916	407	1967	1035	490	0	458	426	540	0
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.96	0.96	0.96	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	21.0	20.7	16.8	16.3	9.1	9.1	23.5	0.0	23.7	25.2	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.4	0.2	1.1	0.2	0.5	0.3	0.0	0.6	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	6.3	1.2	1.2	1.8	2.0	0.7	0.0	1.1	0.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.3	21.1	16.9	17.4	9.3	9.6	23.8	0.0	24.4	25.5	0.0	0.0
LnGrp LOS	C	C	B	B	A	A	C	A	C	C	A	A
Approach Vol, veh/h	720				697				106			
Approach Delay, s/veh	20.7				10.3				24.1			
Approach LOS	C				B				C			
Timer - Assigned Phs	2				4				6			
Phs Duration (G+Y+Rc), s	32.0				58.0				32.0			
Change Period (Y+Rc), s	6.0				6.0				6.0			
Max Green Setting (Gmax), s	26.0				52.0				26.0			
Max Q Clear Time (g_c+I1), s	4.7				15.2				6.1			
Green Ext Time (p_c), s	0.4				5.3				0.0			
Intersection Summary												
HCM 6th Ctrl Delay	16.4											
HCM 6th LOS	B											

Existing PM
3: Hawes Rd & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/21/2019



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	Max	C-Max	Max	C-Max
Maximum Split (s)	29	61	29	61
Maximum Split (%)	32.2%	67.8%	32.2%	67.8%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	85	24	85	24
End Time (s)	24	85	24	85
Yield/Force Off (s)	18	79	18	79
Yield/Force Off 170(s)	7	68	7	68
Local Start Time (s)	61	0	61	0
Local Yield (s)	84	55	84	55
Local Yield 170(s)	73	44	73	44

























Intersection Summary	
Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	50
Offset: 24 (27%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 3: Hawes Rd & Guadalupe Rd



Existing PM
3: Hawes Rd & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	454	30	134	538	63	24	44	90	25	36	43
Future Volume (veh/h)	58	454	30	134	538	63	24	44	90	25	36	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	64	504	33	149	598	70	27	49	100	28	40	48
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	510	1143	969	486	3120	969	361	140	286	306	198	237
Arrive On Green	0.61	0.61	0.61	0.61	0.61	0.61	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	769	1870	1585	868	5106	1585	1309	549	1120	1239	774	929
Grp Volume(v), veh/h	64	504	33	149	598	70	27	0	149	28	0	88
Grp Sat Flow(s),veh/h/ln	769	1870	1585	868	1702	1585	1309	0	1669	1239	0	1703
Q Serve(g_s), s	3.6	12.9	0.7	9.9	4.6	1.6	1.5	0.0	6.6	1.7	0.0	3.7
Cycle Q Clear(g_c), s	8.2	12.9	0.7	22.8	4.6	1.6	5.1	0.0	6.6	8.3	0.0	3.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.67	1.00		0.55
Lane Grp Cap(c), veh/h	510	1143	969	486	3120	969	361	0	426	306	0	435
V/C Ratio(X)	0.13	0.44	0.03	0.31	0.19	0.07	0.07	0.00	0.35	0.09	0.00	0.20
Avail Cap(c_a), veh/h	510	1143	969	486	3120	969	361	0	426	306	0	435
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.5	9.3	7.0	15.4	7.7	7.1	28.3	0.0	27.4	30.8	0.0	26.3
Incr Delay (d2), s/veh	0.5	1.2	0.1	1.5	0.1	0.1	0.4	0.0	2.2	0.6	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	5.1	0.2	2.1	1.6	0.5	0.5	0.0	2.8	0.6	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.0	10.6	7.0	16.9	7.8	7.3	28.7	0.0	29.6	31.4	0.0	27.3
LnGrp LOS	B	B	A	B	A	A	C	A	C	C	A	C
Approach Vol, veh/h	601			817				176			116	
Approach Delay, s/veh	10.3			9.4				29.5			28.3	
Approach LOS	B			A				C			C	
Timer - Assigned Phs	2			4			6		8			
Phs Duration (G+Y+Rc), s	29.0			61.0			29.0		61.0			
Change Period (Y+Rc), s	6.0			6.0			6.0		6.0			
Max Green Setting (Gmax), s	23.0			55.0			23.0		55.0			
Max Q Clear Time (g_c+I1), s	8.6			14.9			10.3		24.8			
Green Ext Time (p_c), s	0.7			4.3			0.4		5.9			
Intersection Summary												
HCM 6th Ctrl Delay	13.1											
HCM 6th LOS	B											

Existing PM
4: Loop 202 SB Ramps & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/21/2019

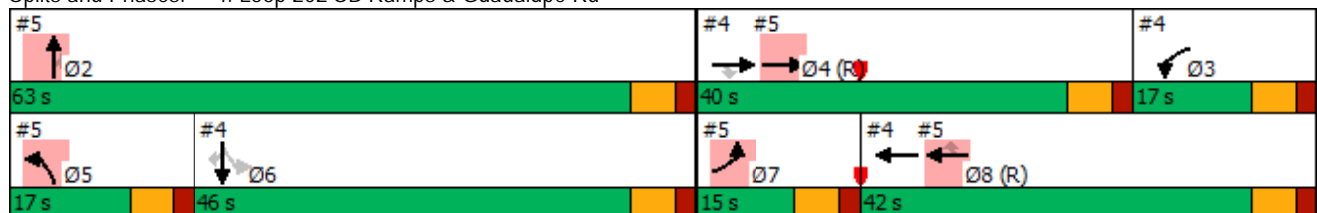


Phase Number	2	3	4	5	6	7	8
Node Number	5	4	4	5	4	5	4
Movement	NBT	WBL	EBT	NBL	SBTL	EBL	WBT
Lead/Lag		Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	63	17	40	17	46	15	42
Maximum Split (%)	52.5%	14.2%	33.3%	14.2%	38.3%	12.5%	35.0%
Minimum Split (s)	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0
Walk Time (s)	7		7		7		7
Flash Dont Walk (s)	11		11		11		11
Dual Entry	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	42	25	105	42	59	105	0
End Time (s)	105	42	25	59	105	0	42
Yield/Force Off (s)	99	36	19	53	99	114	36
Yield/Force Off 170(s)	88	36	8	53	88	114	25
Local Start Time (s)	42	25	105	42	59	105	0
Local Yield (s)	99	36	19	53	99	114	36
Local Yield 170(s)	88	36	8	53	88	114	25

Intersection Summary













Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green	

Splits and Phases: 4: Loop 202 SB Ramps & Guadalupe Rd



Existing PM
4: Loop 202 SB Ramps & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↗	↗↗	↑↑↑					↗	↕	↗
Traffic Volume (vph)	0	511	83	196	373	0	0	0	0	671	0	439
Future Volume (vph)	0	511	83	196	373	0	0	0	0	671	0	439
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	6.0
Lane Util. Factor		0.81	1.00	0.97	0.91					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.96	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		7544	1583	3433	5085					1681	1574	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		7544	1583	3433	5085					1681	1574	1504
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	568	92	218	414	0	0	0	0	746	0	488
RTOR Reduction (vph)	0	0	66	0	0	0	0	0	0	0	126	255
Lane Group Flow (vph)	0	568	26	218	414	0	0	0	0	425	297	131
Turn Type		NA	Perm	Prot	NA					Perm	NA	Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		34.0	34.0	11.0	36.3					40.8	40.8	40.8
Effective Green, g (s)		34.0	34.0	11.0	36.3					40.8	40.8	40.8
Actuated g/C Ratio		0.28	0.28	0.09	0.30					0.34	0.34	0.34
Clearance Time (s)		6.0	6.0	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
Lane Grp Cap (vph)		2137	448	314	1538					571	535	511
v/s Ratio Prot		c0.08		c0.06	c0.08							
v/s Ratio Perm			0.02							c0.25	0.19	0.09
v/c Ratio		0.27	0.06	0.69	0.27					0.74	0.56	0.26
Uniform Delay, d1		33.3	31.3	52.9	31.8					35.0	32.2	28.6
Progression Factor		1.00	1.00	0.64	0.50					1.00	1.00	1.00
Incremental Delay, d2		0.3	0.2	6.3	0.4					8.5	4.1	1.2
Delay (s)		33.6	31.6	40.1	16.4					43.5	36.3	29.8
Level of Service		C	C	D	B					D	D	C
Approach Delay (s)		33.3			24.6			0.0			36.8	
Approach LOS		C			C			A			D	
Intersection Summary												
HCM 2000 Control Delay			32.8			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				24.0		
Intersection Capacity Utilization			49.6%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

Existing PM
5: Loop 202 NB Ramps & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/21/2019

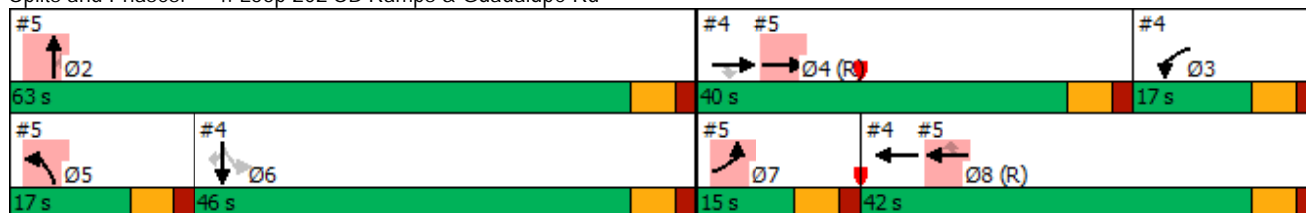


Phase Number	2	3	4	5	6	7	8
Node Number	5	4	4	5	4	5	4
Movement	NBT	WBL	EBT	NBL	SBTL	EBL	WBT
Lead/Lag		Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	63	17	40	17	46	15	42
Maximum Split (%)	52.5%	14.2%	33.3%	14.2%	38.3%	12.5%	35.0%
Minimum Split (s)	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0
Walk Time (s)	7		7		7		7
Flash Dont Walk (s)	11		11		11		11
Dual Entry	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	42	25	105	42	59	105	0
End Time (s)	105	42	25	59	105	0	42
Yield/Force Off (s)	99	36	19	53	99	114	36
Yield/Force Off 170(s)	88	36	8	53	88	114	25
Local Start Time (s)	42	25	105	42	59	105	0
Local Yield (s)	99	36	19	53	99	114	36
Local Yield 170(s)	88	36	8	53	88	114	25

Intersection Summary




























Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green	

Splits and Phases: 4: Loop 202 SB Ramps & Guadalupe Rd



Existing PM
5: Loop 202 NB Ramps & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  			   		 	 				
Traffic Volume (vph)	128	1057	0	0	463	297	95	0	322	0	0	0
Future Volume (vph)	128	1057	0	0	463	297	95	0	322	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	6.0			
Lane Util. Factor	0.97	0.91			0.81	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.86	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	5085			7544	1583	1681	1452	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	5085			7544	1583	1681	1452	1504			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	142	1174	0	0	514	330	106	0	358	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	230	0	98	96	0	0	0
Lane Group Flow (vph)	142	1174	0	0	514	100	95	88	87	0	0	0
Turn Type	Prot	NA			NA	Perm	Prot	NA	Perm			
Protected Phases	7	4			8		5	2				
Permitted Phases						8			2			
Actuated Green, G (s)	8.7	34.0			36.3	36.3	10.2	57.0	57.0			
Effective Green, g (s)	8.7	34.0			36.3	36.3	10.2	57.0	57.0			
Actuated g/C Ratio	0.07	0.28			0.30	0.30	0.08	0.48	0.48			
Clearance Time (s)	6.0	6.0			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			
Lane Grp Cap (vph)	248	1440			2282	478	142	689	714			
v/s Ratio Prot	0.04	c0.23			c0.07		c0.06	c0.01				
v/s Ratio Perm						0.06		0.05	0.06			
v/c Ratio	0.57	0.82			0.23	0.21	0.67	0.13	0.12			
Uniform Delay, d1	53.9	40.1			31.3	31.2	53.3	17.6	17.6			
Progression Factor	1.16	0.60			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	2.8	4.6			0.2	1.0	11.3	0.1	0.3			
Delay (s)	65.2	28.5			31.6	32.2	64.6	17.7	17.9			
Level of Service	E	C			C	C	E	B	B			
Approach Delay (s)		32.5			31.8			27.4			0.0	
Approach LOS		C			C			C			A	
Intersection Summary												
HCM 2000 Control Delay			31.4									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			120.0									Sum of lost time (s) 24.0
Intersection Capacity Utilization			49.6%									ICU Level of Service A
Analysis Period (min)			15									
c Critical Lane Group												

Existing PM
6: Power Rd & Elliot Rd

17-1390 Hawes Crossing TIA
05/21/2019



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	59	31	59	31
Maximum Split (%)	65.6%	34.4%	65.6%	34.4%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	6	65	6	65
End Time (s)	65	6	65	6
Yield/Force Off (s)	59	0	59	0
Yield/Force Off 170(s)	48	79	48	79
Local Start Time (s)	0	59	0	59
Local Yield (s)	53	84	53	84
Local Yield 170(s)	42	73	42	73

Intersection Summary






















Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	65
Offset: 6 (7%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 6: Power Rd & Elliot Rd

Ø2 (R) 59 s	Ø4 31 s
Ø6 (R) 59 s	Ø8 31 s

Existing PM
6: Power Rd & Elliot Rd

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	104	222	106	137	180	24	81	824	185	23	1243	116
Future Volume (veh/h)	104	222	106	137	180	24	81	824	185	23	1243	116
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	116	247	118	152	200	27	90	916	206	26	1381	129
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	283	332	159	171	448	61	180	1698	381	279	1935	180
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.59	0.59	0.59	0.59	0.59	0.59
Sat Flow, veh/h	1154	1196	571	1017	1613	218	347	2883	648	502	3287	306
Grp Volume(v), veh/h	116	0	365	152	0	227	90	564	558	26	744	766
Grp Sat Flow(s),veh/h/ln	1154	0	1768	1017	0	1831	347	1777	1754	502	1777	1815
Q Serve(g_s), s	8.3	0.0	16.9	8.1	0.0	9.2	22.5	17.2	17.3	3.0	26.6	27.0
Cycle Q Clear(g_c), s	17.5	0.0	16.9	25.0	0.0	9.2	49.5	17.2	17.3	20.2	26.6	27.0
Prop In Lane	1.00		0.32	1.00		0.12	1.00		0.37	1.00		0.17
Lane Grp Cap(c), veh/h	283	0	491	171	0	509	180	1046	1033	279	1046	1069
V/C Ratio(X)	0.41	0.00	0.74	0.89	0.00	0.45	0.50	0.54	0.54	0.09	0.71	0.72
Avail Cap(c_a), veh/h	283	0	491	171	0	509	180	1046	1033	279	1046	1069
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.99	0.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.0	0.0	29.6	42.6	0.0	26.8	30.8	11.1	11.2	17.2	13.1	13.2
Incr Delay (d2), s/veh	1.0	0.0	6.0	38.3	0.0	0.6	9.6	2.0	2.0	0.7	4.1	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	7.8	5.2	0.0	4.0	2.3	6.7	6.6	0.4	10.6	11.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.0	0.0	35.6	80.9	0.0	27.4	40.4	13.1	13.2	17.9	17.2	17.3
LnGrp LOS	C	A	D	F	A	C	D	B	B	B	B	B
Approach Vol, veh/h	481			379			1212			1536		
Approach Delay, s/veh	35.5			48.9			15.2			17.2		
Approach LOS	D			D			B			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	59.0			31.0			59.0			31.0		
Change Period (Y+Rc), s	6.0			6.0			6.0			6.0		
Max Green Setting (Gmax), s	53.0			25.0			53.0			25.0		
Max Q Clear Time (g_c+I1), s	51.5			19.5			29.0			27.0		
Green Ext Time (p_c), s	1.1			1.3			12.8			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	22.3											
HCM 6th LOS	C											

Existing PM
7: Elliot Rd & Sossaman Rd

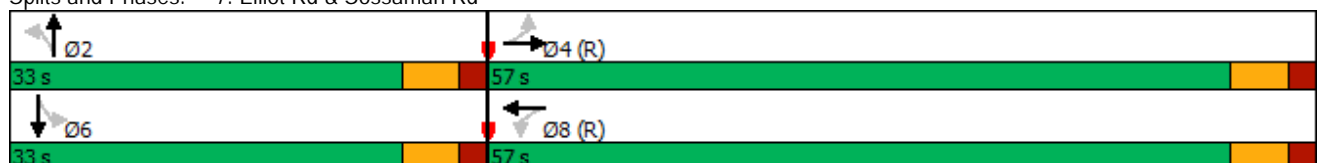
17-1390 Hawes Crossing TIA
05/21/2019



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	Max	C-Max	Max	C-Max
Maximum Split (s)	33	57	33	57
Maximum Split (%)	36.7%	63.3%	36.7%	63.3%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	53	86	53	86
End Time (s)	86	53	86	53
Yield/Force Off (s)	80	47	80	47
Yield/Force Off 170(s)	69	36	69	36
Local Start Time (s)	57	0	57	0
Local Yield (s)	84	51	84	51
Local Yield 170(s)	73	40	73	40





















Intersection Summary	
Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	50
Offset: 86 (96%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 7: Elliot Rd & Sossaman Rd






Existing PM
7: Elliot Rd & Sossaman Rd

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	260	161	30	5	108	40	48	42	4	31	48	163
Future Volume (veh/h)	260	161	30	5	108	40	48	42	4	31	48	163
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	289	179	33	6	120	44	53	47	4	34	53	181
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	719	871	160	676	740	271	291	510	43	459	112	381
Arrive On Green	0.57	0.57	0.57	0.57	0.57	0.57	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1222	1536	283	1170	1306	479	1146	1700	145	1354	372	1270
Grp Volume(v), veh/h	289	0	212	6	0	164	53	0	51	34	0	234
Grp Sat Flow(s),veh/h/ln	1222	0	1819	1170	0	1784	1146	0	1844	1354	0	1642
Q Serve(g_s), s	13.3	0.0	5.1	0.2	0.0	3.9	3.6	0.0	1.8	1.7	0.0	10.5
Cycle Q Clear(g_c), s	17.3	0.0	5.1	5.4	0.0	3.9	14.0	0.0	1.8	3.5	0.0	10.5
Prop In Lane	1.00		0.16	1.00		0.27	1.00		0.08	1.00		0.77
Lane Grp Cap(c), veh/h	719	0	1031	676	0	1011	291	0	553	459	0	493
V/C Ratio(X)	0.40	0.00	0.21	0.01	0.00	0.16	0.18	0.00	0.09	0.07	0.00	0.48
Avail Cap(c_a), veh/h	719	0	1031	676	0	1011	291	0	553	459	0	493
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.66	0.00	0.66	1.00	0.00	1.00	1.00	0.00	1.00	0.99	0.00	0.99
Uniform Delay (d), s/veh	13.4	0.0	9.6	10.9	0.0	9.3	31.4	0.0	22.7	23.9	0.0	25.7
Incr Delay (d2), s/veh	1.1	0.0	0.3	0.0	0.0	0.3	1.4	0.0	0.3	0.3	0.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	2.0	0.1	0.0	1.5	1.1	0.0	0.8	0.6	0.0	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.5	0.0	9.9	10.9	0.0	9.6	32.8	0.0	23.0	24.2	0.0	28.9
LnGrp LOS	B	A	A	B	A	A	C	A	C	C	A	C
Approach Vol, veh/h	501				170				104		268	
Approach Delay, s/veh	12.6				9.7				28.0		28.3	
Approach LOS	B				A				C		C	
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	33.0		57.0		33.0		57.0					
Change Period (Y+Rc), s	6.0		6.0		6.0		6.0					
Max Green Setting (Gmax), s	27.0		51.0		27.0		51.0					
Max Q Clear Time (g_c+I1), s	16.0		19.3		12.5		7.4					
Green Ext Time (p_c), s	0.3		2.4		1.3		1.1					
Intersection Summary												
HCM 6th Ctrl Delay	17.7											
HCM 6th LOS	B											

Existing PM
8: Elliot Rd & 80th St.

17-1390 Hawes Crossing TIA
05/21/2019

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	204	163	10	8	13
Future Vol, veh/h	18	204	163	10	8	13
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	227	181	11	9	14
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	192	0	-	0	454	187
Stage 1	-	-	-	-	187	-
Stage 2	-	-	-	-	267	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1381	-	-	-	606	855
Stage 1	-	-	-	-	845	-
Stage 2	-	-	-	-	821	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	1381	-	-	-	596	855
Mov Cap-2 Maneuver	-	-	-	-	649	-
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	821	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.6	0		9.9		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1381	-	-	-	763	
HCM Lane V/C Ratio	0.014	-	-	-	0.031	
HCM Control Delay (s)	7.6	0	-	-	9.9	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	

Existing PM
9: Hawes Rd & Elliot Rd

17-1390 Hawes Crossing TIA
05/21/2019

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	28	176	5	1	156	30	2	5	8	24	4	11
Future Vol, veh/h	28	176	5	1	156	30	2	5	8	24	4	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	31	196	6	1	173	33	2	6	9	27	4	12

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	206	0	0	202	0	0	461	469	199	461	456	190
Stage 1	-	-	-	-	-	-	261	261	-	192	192	-
Stage 2	-	-	-	-	-	-	200	208	-	269	264	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1365	-	-	1370	-	-	511	492	842	511	501	852
Stage 1	-	-	-	-	-	-	744	692	-	810	742	-
Stage 2	-	-	-	-	-	-	802	730	-	737	690	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1365	-	-	1370	-	-	490	479	842	491	487	852
Mov Cap-2 Maneuver	-	-	-	-	-	-	490	479	-	491	487	-
Stage 1	-	-	-	-	-	-	725	674	-	789	741	-
Stage 2	-	-	-	-	-	-	785	729	-	704	672	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1	0	10.9	12
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	624	1365	-	-	1370	-	-	557
HCM Lane V/C Ratio	0.027	0.023	-	-	0.001	-	-	0.078
HCM Control Delay (s)	10.9	7.7	0	-	7.6	0	-	12
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.3

Existing PM
10: Loop 202 SB Ramps & Elliot Rd

17-1390 Hawes Crossing TIA
05/21/2019



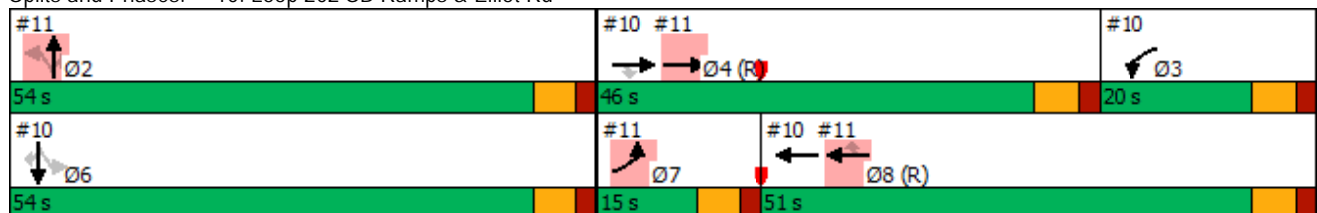
Phase Number	2	3	4	6	7	8
Node Number	11	10	10	10	11	10
Movement	NBTL	WBL	EBT	SBTL	EBL	WBT
Lead/Lag		Lag	Lead		Lead	Lag
Lead-Lag Optimize		Yes	Yes		Yes	Yes
Recall Mode	Max	None	C-Max	Max	None	C-Max
Maximum Split (s)	54	20	46	54	15	51
Maximum Split (%)	45.0%	16.7%	38.3%	45.0%	12.5%	42.5%
Minimum Split (s)	24	11	24	24	11	24
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)	7		7	7		7
Flash Dont Walk (s)	11		11	11		11
Dual Entry	Yes	No	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	77	57	11	77	11	26
End Time (s)	11	77	57	11	26	77
Yield/Force Off (s)	5	71	51	5	20	71
Yield/Force Off 170(s)	114	71	40	114	20	60
Local Start Time (s)	51	31	105	51	105	0
Local Yield (s)	99	45	25	99	114	45
Local Yield 170(s)	88	45	14	88	114	34

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	60




















Offset: 26 (22%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Splits and Phases: 10: Loop 202 SB Ramps & Elliot Rd



Existing PM
10: Loop 202 SB Ramps & Elliot Rd

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	173	30	100	144	0	0	0	0	459	0	58
Future Volume (vph)	0	173	30	100	144	0	0	0	0	459	0	58
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	6.0
Lane Util. Factor		0.86	1.00	0.97	0.95					0.95	0.91	0.95
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	0.95	1.00
Satd. Flow (prot)		6408	1583	3433	3539					1681	1611	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		6408	1583	3433	3539					1681	1611	1504
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	192	33	111	160	0	0	0	0	510	0	64
RTOR Reduction (vph)	0	0	22	0	0	0	0	0	0	0	82	35
Lane Group Flow (vph)	0	192	11	111	160	0	0	0	0	260	174	23
Turn Type		NA	Perm	Prot	NA					Perm	NA	Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		38.8	38.8	15.2	48.1					48.0	48.0	48.0
Effective Green, g (s)		38.8	38.8	15.2	48.1					48.0	48.0	48.0
Actuated g/C Ratio		0.32	0.32	0.13	0.40					0.40	0.40	0.40
Clearance Time (s)		6.0	6.0	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
Lane Grp Cap (vph)		2071	511	434	1418					672	644	601
v/s Ratio Prot		c0.03		c0.03	c0.05							
v/s Ratio Perm			0.01							c0.15	0.11	0.02
v/c Ratio		0.09	0.02	0.26	0.11					0.39	0.27	0.04
Uniform Delay, d1		28.3	27.7	47.3	22.6					25.6	24.2	21.9
Progression Factor		1.00	1.00	0.72	0.53					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	0.3	0.2					1.7	1.0	0.1
Delay (s)		28.4	27.7	34.5	12.0					27.2	25.3	22.1
Level of Service		C	C	C	B					C	C	C
Approach Delay (s)		28.3			21.3			0.0			25.8	
Approach LOS		C			C			A			C	
Intersection Summary												
HCM 2000 Control Delay			25.2			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.26									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			37.8%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

Existing PM
11: Loop 202 NB Ramps & Elliot Rd

17-1390 Hawes Crossing TIA
05/21/2019

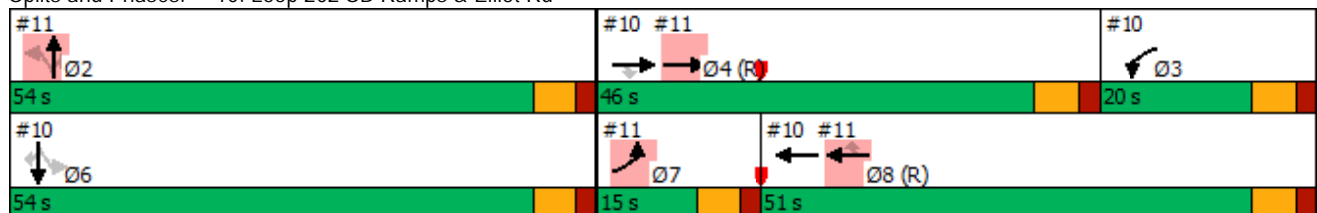


Phase Number	2	3	4	6	7	8
Node Number	11	10	10	10	11	10
Movement	NBTL	WBL	EBT	SBTL	EBL	WBT
Lead/Lag		Lag	Lead		Lead	Lag
Lead-Lag Optimize		Yes	Yes		Yes	Yes
Recall Mode	Max	None	C-Max	Max	None	C-Max
Maximum Split (s)	54	20	46	54	15	51
Maximum Split (%)	45.0%	16.7%	38.3%	45.0%	12.5%	42.5%
Minimum Split (s)	24	11	24	24	11	24
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)	7		7	7		7
Flash Dont Walk (s)	11		11	11		11
Dual Entry	Yes	No	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	77	57	11	77	11	26
End Time (s)	11	77	57	11	26	77
Yield/Force Off (s)	5	71	51	5	20	71
Yield/Force Off 170(s)	114	71	40	114	20	60
Local Start Time (s)	51	31	105	51	105	0
Local Yield (s)	99	45	25	99	114	45
Local Yield 170(s)	88	45	14	88	114	34

Intersection Summary




















Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 26 (22%), Referenced to phase 4:EBT and 8:WBT, Start of Green	

Splits and Phases: 10: Loop 202 SB Ramps & Elliot Rd



Existing PM
11: Loop 202 NB Ramps & Elliot Rd

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	599	0	0	185	234	44	0	128	0	0	0
Future Volume (vph)	39	599	0	0	185	234	44	0	128	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	6.0			
Lane Util. Factor	0.97	0.91			0.86	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.86	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	5085			6408	1583	1681	1453	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	5085			6408	1583	1681	1453	1504			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	43	666	0	0	206	260	49	0	142	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	156	0	44	44	0	0	0
Lane Group Flow (vph)	43	666	0	0	206	104	44	29	30	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	5.9	38.8			48.1	48.1	48.0	48.0	48.0			
Effective Green, g (s)	5.9	38.8			48.1	48.1	48.0	48.0	48.0			
Actuated g/C Ratio	0.05	0.32			0.40	0.40	0.40	0.40	0.40			
Clearance Time (s)	6.0	6.0			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			
Lane Grp Cap (vph)	168	1644			2568	634	672	581	601			
v/s Ratio Prot	0.01	c0.13			0.03							
v/s Ratio Perm						c0.07	c0.03	0.02	0.02			
v/c Ratio	0.26	0.41			0.08	0.16	0.07	0.05	0.05			
Uniform Delay, d1	54.9	31.6			22.3	23.1	22.2	22.0	22.0			
Progression Factor	1.05	0.91			0.74	2.75	1.00	1.00	1.00			
Incremental Delay, d2	0.8	0.7			0.1	0.6	0.2	0.2	0.2			
Delay (s)	58.2	29.5			16.5	64.0	22.4	22.2	22.2			
Level of Service	E	C			B	E	C	C	C			
Approach Delay (s)		31.3			43.0			22.2			0.0	
Approach LOS		C			D			C			A	
Intersection Summary												
HCM 2000 Control Delay			34.0									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.21									
Actuated Cycle Length (s)			120.0									Sum of lost time (s) 18.0
Intersection Capacity Utilization			37.8%									ICU Level of Service A
Analysis Period (min)			15									

c Critical Lane Group

Existing PM
14: Hawes Rd & Loop 202 WB Ramps

17-1390 Hawes Crossing TIA
05/21/2019

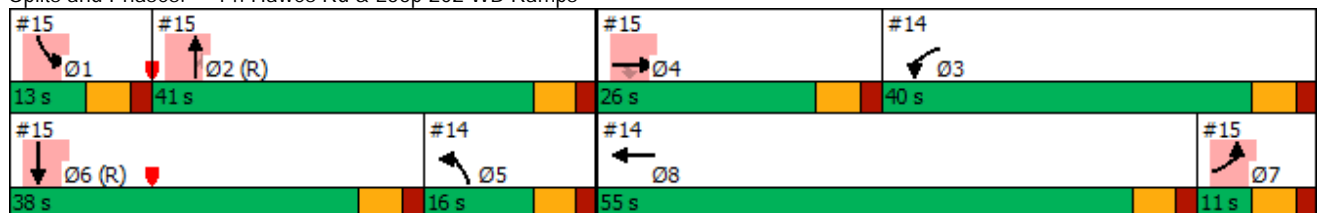


Phase Number	1	2	3	4	5	6	7	8
Node Number	15	15	14	15	14	15	15	14
Movement	SBL	NBT	WBL	EBT	NBL	SBT	EBL	WBT
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	None	Ped	None	C-Min	None	None
Maximum Split (s)	13	41	40	26	16	38	11	55
Maximum Split (%)	10.8%	34.2%	33.3%	21.7%	13.3%	31.7%	9.2%	45.8%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	15	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	107	0	67	41	25	107	96	41
End Time (s)	0	41	107	67	41	25	107	96
Yield/Force Off (s)	114	35	101	61	35	19	101	90
Yield/Force Off 170(s)	114	24	101	50	35	8	101	79
Local Start Time (s)	107	0	67	41	25	107	96	41
Local Yield (s)	114	35	101	61	35	19	101	90
Local Yield 170(s)	114	24	101	50	35	8	101	79

Intersection Summary

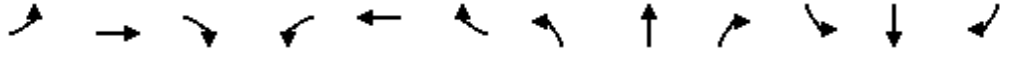



Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 14: Hawes Rd & Loop 202 WB Ramps



Existing PM
14: Hawes Rd & Loop 202 WB Ramps

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	323	0	0	24	0	0	0	0	0
Future Volume (vph)	0	0	0	323	0	0	24	0	0	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					
Lane Util. Factor				0.95	0.95		1.00					
Frt				1.00	1.00		1.00					
Flt Protected				0.95	0.95		0.95					
Satd. Flow (prot)				1681	1681		1770					
Flt Permitted				0.95	0.95		0.95					
Satd. Flow (perm)				1681	1681		1770					
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	359	0	0	27	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	179	180	0	27	0	0	0	0	0
Turn Type				Prot	NA		Prot					
Protected Phases				3	8		5					
Permitted Phases												
Actuated Green, G (s)				52.6	76.6		7.4					
Effective Green, g (s)				52.6	76.6		7.4					
Actuated g/C Ratio				0.44	0.64		0.06					
Clearance Time (s)				6.0	6.0		6.0					
Vehicle Extension (s)				3.0	3.0		3.0					
Lane Grp Cap (vph)				736	1073		109					
v/s Ratio Prot				c0.11	c0.07		c0.02					
v/s Ratio Perm					0.03							
v/c Ratio				0.24	0.17		0.25					
Uniform Delay, d1				21.2	8.8		53.6					
Progression Factor				1.00	1.00		0.43					
Incremental Delay, d2				0.2	0.1		1.2					
Delay (s)				21.4	8.9		24.2					
Level of Service				C	A		C					
Approach Delay (s)		0.0			15.1			24.2			0.0	
Approach LOS		A			B			C			A	
Intersection Summary												
HCM 2000 Control Delay			15.7			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.19									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			37.6%			ICU Level of Service			A			
Analysis Period (min)			15									

c Critical Lane Group

Existing PM
15: Hawes Rd & Loop 202 EB Ramps

17-1390 Hawes Crossing TIA
05/21/2019

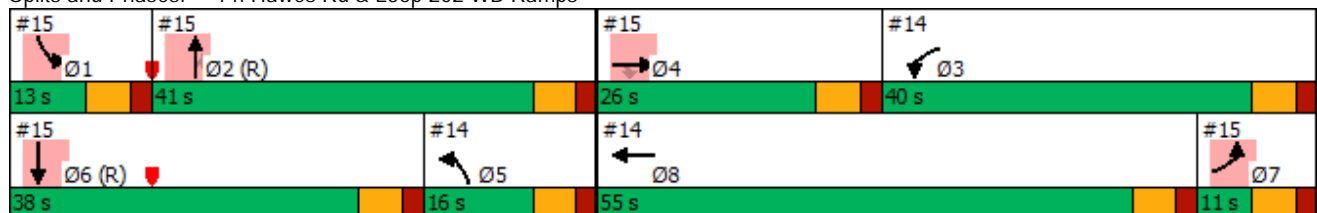


Phase Number	1	2	3	4	5	6	7	8
Node Number	15	15	14	15	14	15	15	14
Movement	SBL	NBT	WBL	EBT	NBL	SBT	EBL	WBT
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	None	Ped	None	C-Min	None	None
Maximum Split (s)	13	41	40	26	16	38	11	55
Maximum Split (%)	10.8%	34.2%	33.3%	21.7%	13.3%	31.7%	9.2%	45.8%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	15	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	107	0	67	41	25	107	96	41
End Time (s)	0	41	107	67	41	25	107	96
Yield/Force Off (s)	114	35	101	61	35	19	101	90
Yield/Force Off 170(s)	114	24	101	50	35	8	101	79
Local Start Time (s)	107	0	67	41	25	107	96	41
Local Yield (s)	114	35	101	61	35	19	101	90
Local Yield 170(s)	114	24	101	50	35	8	101	79

Intersection Summary





















Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 14: Hawes Rd & Loop 202 WB Ramps



Existing PM
15: Hawes Rd & Loop 202 EB Ramps

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	39	0	0	0	0	19	96	3	320	0
Future Volume (vph)	5	0	39	0	0	0	0	19	96	3	320	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	1.00		1.00					1.00	1.00	1.00	0.95	
Frt	1.00		0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770		1583					1863	1583	1770	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770		1583					1863	1583	1770	3539	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	0	43	0	0	0	0	21	107	3	356	0
RTOR Reduction (vph)	0	0	37	0	0	0	0	0	86	0	0	0
Lane Group Flow (vph)	6	0	6	0	0	0	0	21	21	3	356	0
Turn Type	Prot		Perm					NA	Perm	Prot	NA	
Protected Phases	7	4						2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	1.0		18.0					24.1	24.1	1.3	18.0	
Effective Green, g (s)	1.0		18.0					24.1	24.1	1.3	18.0	
Actuated g/C Ratio	0.01		0.15					0.20	0.20	0.01	0.15	
Clearance Time (s)	6.0		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	
Lane Grp Cap (vph)	14		237					374	317	19	530	
v/s Ratio Prot	c0.00							0.01		0.00	c0.10	
v/s Ratio Perm			c0.00						c0.01			
v/c Ratio	0.43		0.03					0.06	0.07	0.16	0.67	
Uniform Delay, d1	59.2		43.5					38.8	38.8	58.8	48.2	
Progression Factor	1.00		1.00					1.00	1.00	0.50	0.60	
Incremental Delay, d2	19.7		0.0					0.3	0.4	3.8	6.5	
Delay (s)	78.9		43.6					39.0	39.3	32.9	35.5	
Level of Service	E		D					D	D	C	D	
Approach Delay (s)		47.9			0.0			39.2			35.4	
Approach LOS		D			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			37.5					HCM 2000 Level of Service		D		
HCM 2000 Volume to Capacity ratio			0.14									
Actuated Cycle Length (s)			120.0					Sum of lost time (s)		24.0		
Intersection Capacity Utilization			37.6%					ICU Level of Service		A		
Analysis Period (min)			15									

c Critical Lane Group

Existing PM
16: Ellsworth Rd & Elliot Rd

17-1390 Hawes Crossing TIA
05/21/2019



Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	19	30	13	58	19	30	13	58
Maximum Split (%)	15.8%	25.0%	10.8%	48.3%	15.8%	25.0%	10.8%	48.3%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	6	25	113	55	6	25	55	68
End Time (s)	25	55	6	113	25	55	68	6
Yield/Force Off (s)	19	49	0	107	19	49	62	0
Yield/Force Off 170(s)	19	38	0	96	19	38	62	109
Local Start Time (s)	58	77	45	107	58	77	107	0
Local Yield (s)	71	101	52	39	71	101	114	52
Local Yield 170(s)	71	90	52	28	71	90	114	41

Intersection Summary























Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 68 (57%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 16: Ellsworth Rd & Elliot Rd

Ø1	Ø2	Ø4 (R)	Ø3
19 s	30 s	58 s	13 s
Ø5	Ø6	Ø7	Ø8 (R)
19 s	30 s	13 s	58 s







Existing PM
16: Ellsworth Rd & Elliot Rd

17-1390 Hawes Crossing TIA
05/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	639	120	14	305	89	89	251	26	90	257	89
Future Volume (veh/h)	70	639	120	14	305	89	89	251	26	90	257	89
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	78	710	133	16	339	99	99	279	29	100	286	99
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	408	1294	242	464	1775	792	295	650	67	299	713	318
Arrive On Green	0.08	0.87	0.87	0.11	0.50	0.50	0.06	0.20	0.20	0.06	0.20	0.20
Sat Flow, veh/h	1781	2987	559	1781	3554	1585	1781	3252	335	1781	3554	1585
Grp Volume(v), veh/h	78	422	421	16	339	99	99	151	157	100	286	99
Grp Sat Flow(s),veh/h/ln	1781	1777	1770	1781	1777	1585	1781	1777	1810	1781	1777	1585
Q Serve(g_s), s	3.3	7.2	7.3	0.0	6.3	4.0	5.2	8.9	9.1	5.3	8.4	6.4
Cycle Q Clear(g_c), s	3.3	7.2	7.3	0.0	6.3	4.0	5.2	8.9	9.1	5.3	8.4	6.4
Prop In Lane	1.00		0.32	1.00		1.00	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	408	770	767	464	1775	792	295	355	362	299	713	318
V/C Ratio(X)	0.19	0.55	0.55	0.03	0.19	0.13	0.34	0.43	0.43	0.33	0.40	0.31
Avail Cap(c_a), veh/h	439	770	767	464	1775	792	383	355	362	386	713	318
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.9	5.0	5.0	19.8	16.6	16.0	35.2	42.0	42.0	35.3	41.7	40.9
Incr Delay (d2), s/veh	0.2	2.6	2.6	0.0	0.2	0.3	0.7	3.7	3.7	0.7	1.7	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	2.2	2.2	0.3	2.6	1.5	2.3	4.3	4.5	2.4	3.9	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.1	7.6	7.7	19.8	16.8	16.4	35.9	45.7	45.8	35.9	43.4	43.4
LnGrp LOS	C	A	A	B	B	B	D	D	D	D	D	D
Approach Vol, veh/h	921				454				407		485	
Approach Delay, s/veh	8.9				16.8				43.3		41.9	
Approach LOS	A				B				D		D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.1	30.0	18.9	58.0	13.1	30.1	10.9	65.9				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	13.0	24.0	7.0	52.0	13.0	24.0	7.0	52.0				
Max Q Clear Time (g_c+I1), s	7.3	11.1	2.0	9.3	7.2	10.4	5.3	8.3				
Green Ext Time (p_c), s	0.1	1.4	0.0	6.5	0.1	1.8	0.0	2.8				
Intersection Summary												
HCM 6th Ctrl Delay	23.7											
HCM 6th LOS	C											

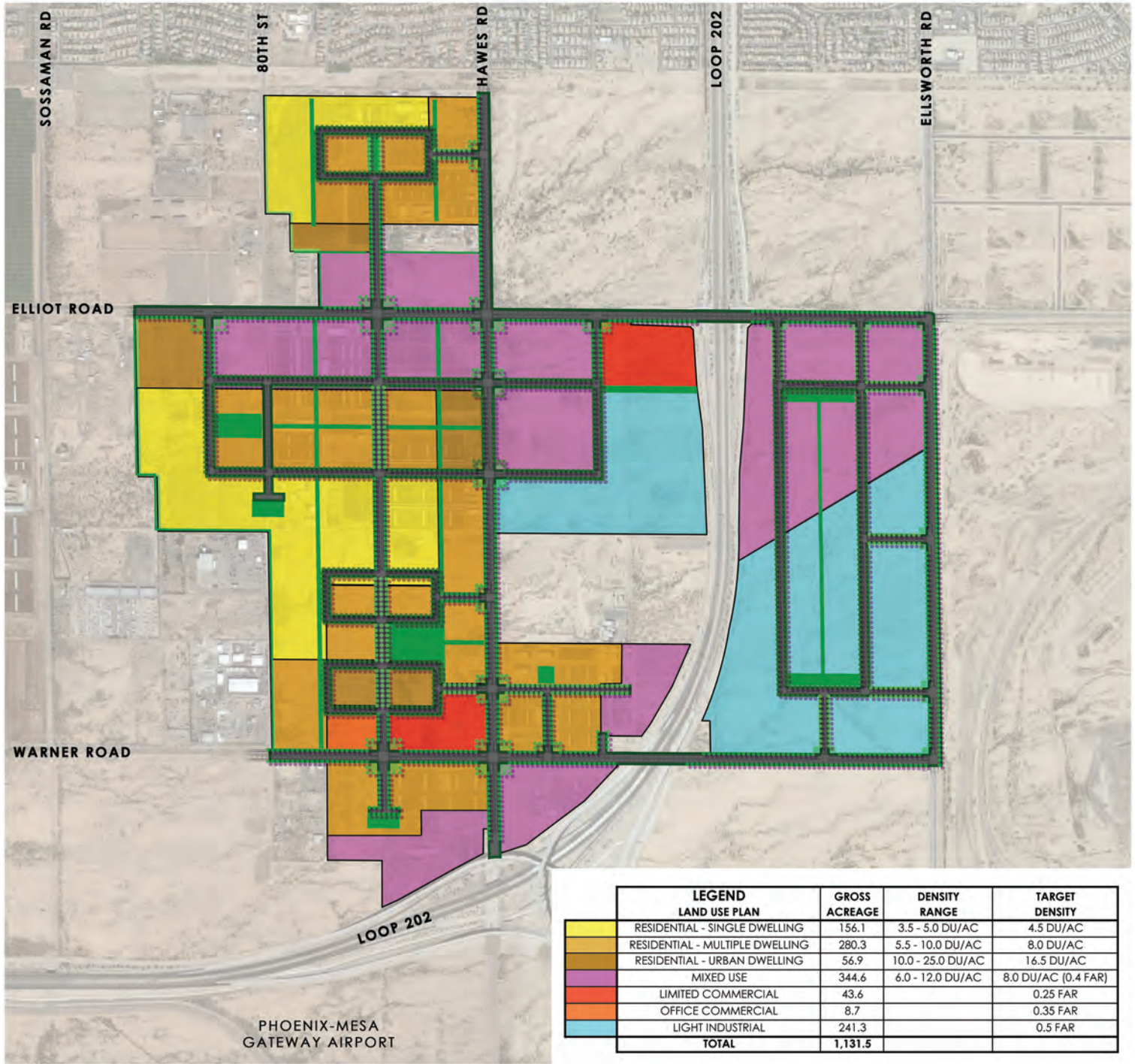
Existing PM
17: Warner Rd. & Ellsworth Rd

17-1390 Hawes Crossing TIA
05/21/2019

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	46	38	383	393	3
Future Vol, veh/h	7	46	38	383	393	3
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	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	51	42	426	437	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	736	220	440	0	-	0
Stage 1	439	-	-	-	-	-
Stage 2	297	-	-	-	-	-
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	354	784	1116	-	-	-
Stage 1	617	-	-	-	-	-
Stage 2	728	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	341	784	1116	-	-	-
Mov Cap-2 Maneuver	341	-	-	-	-	-
Stage 1	594	-	-	-	-	-
Stage 2	728	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.7	0.8		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1116	-	341	784	-	-
HCM Lane V/C Ratio	0.038	-	0.023	0.065	-	-
HCM Control Delay (s)	8.4	-	15.8	9.9	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0.2	-	-

APPENDIX D

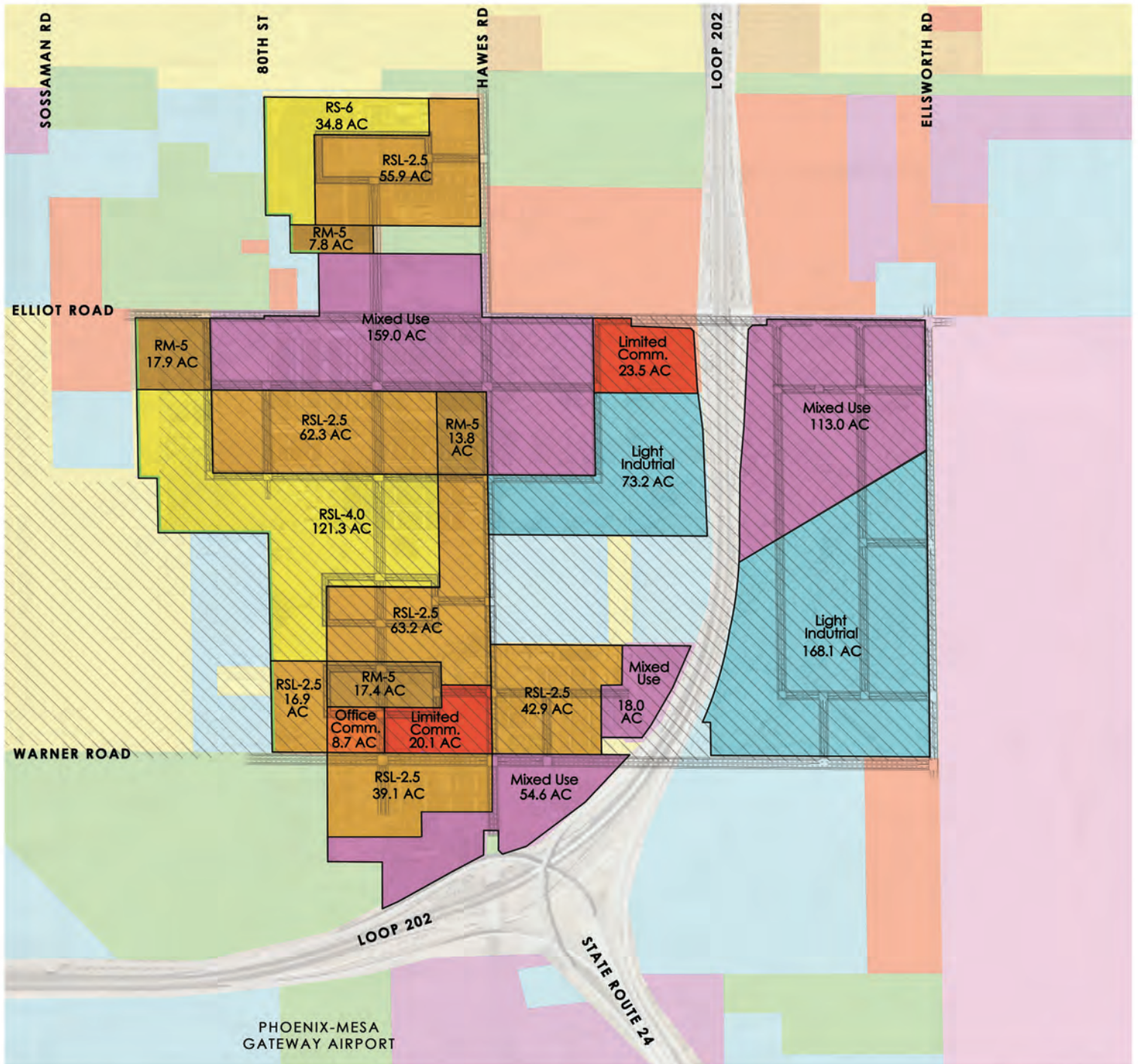
TRIP GENERATION



LEGEND	GROSS	DENSITY	TARGET
LAND USE PLAN	ACREAGE	RANGE	DENSITY
RESIDENTIAL - SINGLE DWELLING	156.1	3.5 - 5.0 DU/AC	4.5 DU/AC
RESIDENTIAL - MULTIPLE DWELLING	280.3	5.5 - 10.0 DU/AC	8.0 DU/AC
RESIDENTIAL - URBAN DWELLING	56.9	10.0 - 25.0 DU/AC	16.5 DU/AC
MIXED USE	344.6	6.0 - 12.0 DU/AC	8.0 DU/AC (0.4 FAR)
LIMITED COMMERCIAL	43.6		0.25 FAR
OFFICE COMMERCIAL	8.7		0.35 FAR
LIGHT INDUSTRIAL	241.3		0.5 FAR
TOTAL	1,131.5		

HAWES CROSSING CONCEPTUAL LAND USE PLAN





HAWES CROSSING EXHIBIT F: PROPOSED ZONING

Mesa Inner Loop

Analyzed

Trip Generation

May 2019

Appendix D

Methodology Overview

This form facilitates trip generation estimation using data within the Institute of Transportation Engineer's (ITE) *Trip Generation Manual*, 10th Edition and methodology described within ITE's *Trip Generation Handbook*, 3rd Edition. These references will be referred to as *Manual and Handbook*, respectively. The *Manual* contains data collected by various transportation professionals for a wide range of different land uses, with each land use category represented by a land use code (LUC). Average rates and equations have been established that correlate the relationship between an independent variable that describes the development size and generated trips for each categorized LUC in various settings and time periods. The *Handbook* indicates an established methodology for how to use data contained within the Manual when to use the fitted curve instead of the average rate and when to adjustments to the volume of trips are appropriate and how to do so. The methodology steps are represented visually in boxes in Figure 3.1. This worksheet applies calculations for each box if applicable.

Box 1 - Define Study Site Land Use Type & Site Characteristics

The analyst is to pick an appropriate LUC(s) based on the subject's zoning/land use(s)/future land use(s). The size of the land use(s) is described in reference to an independent variable(s) specific to (each) the land use (example: 1,000 square feet of building area is relatively common).

Land Use Types and Size

Proposed Use	Amount Units	ITE LUC	ITE Land Use Name
Homes, Hawes & Elliot	657 Dwelling Units	210	Single-Family Detached Housing
Homes, Hawes & Warner	46 Dwelling Units	210	Single-Family Detached Housing
Multifamily, Hawes & Elliot	1,849 Dwelling Units	221	Multifamily Housing (Mid-Rise)
Multifamily, Hawes & Warner	2,277 Dwelling Units	221	Multifamily Housing (Mid-Rise)
Commercial, Hawes & Elliot	475 1,000 square feet	820	Shopping Center
Commercial, Hawes & Warner	1,981 1,000 square feet	820	Shopping Center
Office, Hawes & Warner	133 1,000 square feet	710	General Office Building
Light Ind., Hawes & Elliot	1,553 1,000 square feet	110	General Light Industrial
Light Ind., E. of Loop 202	5,965.109 1,000 square feet	110	General Light Industrial

Box 2 - Define Site Context

Context assessment is to "simply determine whether the study sites is in a multimodal setting" and "could have persons accessing the site by walking, bicycling, or riding transit." This assessment is used in Box 4. The *Manual* separates data into 4 setting categories - **Rural**, **General Urban/Suburban**, **Dense Multi-Urban Use** and **Center City Core**. This worksheet uses the following abbreviations, respectively: **R**, **G**, **D**, and **C**. The *Manual* does not have data for all settings of all land use codes. See the table on the next page titled "Site Context and Time Periods" - if this table is not provided, the "General Urban/Suburban" setting is used by default.

Box 3 - Define Analysis Objectives Types of Trips & Time Period

This tool will focus on vehicular trips for a 24-hour period on a typical weekday as well as its AM peak hour and PM peak hour. Other time period(s) may be of interest.

Box 4 - Is Study Site Multimodal?

Per the Handbook, "if the objective is to establish a local trip generation rate for a particular land use or study site, the simplified approach (Box 9) may be acceptable but the *Box 5 through 8* approach is required if the study site is located in an infill setting, contains a mix of uses on-site, or is near significant transit service."

Box 5/Box 9 - Estimate Baseline Trips/Estimate Vehicular Trips (Determine Equation)

Vehicle trips are estimated using rates/equations applicable to each LUC. When the appropriate graph has a fitted curve, the *Handbook* has a process (Figure 4.2) to determine when to use it versus using the weighted average rate or collecting local data. The methodology requires for engineering judgement in some circumstances and permits engineering judgement to override or make adjustments when appropriate to best project (example 1: study site is expected to operate differently than data in the applicable land use code - such as restaurant that is closed in the morning or in the evening; example 2: LUC data in a localized area fails to be represented by the typically selected fitted curve/weighted average rate - a small shop/LUC 820, AM peak hour is skewed by the high y-intercept).

Mesa Inner Loop

Analyzed

Trip Generation

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Appendix D

Equation Type: Equation Used [Equated Rate] (Type Abbreviations: Weighted Average Rate ("WA"), Fitted Curve ("FC"), or Custom ("C"))

Proposed Use	ADT	AM Peak Hour	PM Peak Hour	(not used)
Homes, Hawes & Elliot	FC: $LN(T)=0.92*LN(X)+2.71$ [8.94]	FC: $T=0.71*X+4.8$ [0.72]	FC: $LN(T)=0.96*LN(X)+0.2$ [0.94]	
Homes, Hawes & Warner	FC: $LN(T)=0.92*LN(X)+2.71$ [11.06]	FC: $T=0.71*X+4.8$ [0.81]	FC: $LN(T)=0.96*LN(X)+0.2$ [1.05]	
Multifamily, Hawes & Elliot	FC: $T=5.45*X-1.75$ [5.45]	FC: $LN(T)=0.98*LN(X)-0.98$ [0.32]	FC: $LN(T)=0.96*LN(X)-0.63$ [0.39]	
Multifamily, Hawes & Warner	FC: $T=5.45*X-1.75$ [5.45]	FC: $LN(T)=0.98*LN(X)-0.98$ [0.32]	FC: $LN(T)=0.96*LN(X)-0.63$ [0.39]	
Commercial, Hawes & Elliot	FC: $LN(T)=0.68*LN(X)+5.57$ [36.52]	FC: $T=0.5*X+151.78$ [0.82]	FC: $LN(T)=0.74*LN(X)+2.89$ [3.62]	
Commercial, Hawes & Warner	FC: $LN(T)=0.68*LN(X)+5.57$ [23.12]	FC: $T=0.5*X+151.78$ [0.58]	FC: $LN(T)=0.74*LN(X)+2.89$ [2.50]	
Office, Hawes & Warner	FC: $LN(T)=0.97*LN(X)+2.5$ [10.52]	FC: $T=0.94*X+26.49$ [1.14]	FC: $LN(T)=0.95*LN(X)+0.36$ [1.12]	
Light Ind., Hawes & Elliot	FC: $T=3.79*X+57.96$ [3.83]	FC: $LN(T)=0.74*LN(X)+0.39$ [0.22]	FC: $LN(T)=0.69*LN(X)+0.43$ [0.16]	
Light Ind., E. of Loop 202	FC: $T=3.79*X+57.96$ [3.80]	FC: $LN(T)=0.74*LN(X)+0.39$ [0.15]	FC: $LN(T)=0.69*LN(X)+0.43$ [0.10]	

Box 5/Box 9 - Estimate Baseline Trips/Estimate Vehicular Trips (Apply Equations and in/out Distributions)

Baseline Vehicular Trips

Proposed Use	ADT				AM Peak Hour				PM Peak Hour				(not used)
	% In	In	Out	Total	% In	In	Out	Total	% In	In	Out	Total	
Homes, Hawes & Elliot	50%	2,938	2,938	5,876	25%	118	353	471	63%	390	229	619	
Homes, Hawes & Warner	50%	254	254	508	25%	9	28	37	63%	30	18	48	
Multifamily, Hawes & Elliot	50%	5,038	5,038	10,076	26%	155	442	597	61%	445	284	729	
Multifamily, Hawes & Warner	50%	6,204	6,204	12,408	26%	190	542	732	61%	543	347	890	
Commercial, Hawes & Elliot	50%	8,670	8,670	17,340	62%	241	148	389	48%	826	895	1,721	
Commercial, Hawes & Warner	50%	22,903	22,903	45,806	62%	708	434	1,142	48%	2,377	2,575	4,952	
Office, Hawes & Warner	50%	698	698	1,396	86%	130	21	151	16%	24	125	149	
Light Ind., Hawes & Elliot	50%	2,973	2,973	5,946	88%	299	41	340	13%	32	213	245	
Light Ind., E. of Loop 202	50%	11,333	11,333	22,666	88%	809	110	919	13%	80	539	619	
Totals		61,011	61,011	122,022		2,659	2,119	4,778		4,747	5,225	9,972	

If vehicle trip reductions are not applied for internal capture and alternative mode, vehicle trips may be separated into vehicle trip subsets (pass-by trips, diverted trips, truck trips, new passenger vehicle trips) as part of Box 10. If vehicle trip reductions are to be applied, continue to Box 6.

Box 6 - Convert Baseline Vehicle Trips to Person Trips

If no vehicle trip reductions are to be applied, this portion may be ignored. The *Handbook* states "There are not enough samples to derive precise percentages by mode...however, for all but one, ...the motor vehicle percentage of total person trips is at least 96 percent." and "[vehicle occupancy for] many of the most commonly analyzed land use codes are not [available]." This form assumes that the total baseline vehicle trips for all land use codes accounts for 90% of total person trips. Unless otherwise specified, this form later reverses the conversion in Box 8.

Box 7 - Estimate Internal Person Trips, External Walk/Bike Trips, Transit Person Trips, External Person Trips (Internal Capture)

Internal capture occurs for mixed-use developments when a portion of the trips generated by the site are expected to have the both the origin and destination within the site. Internal capture is not dependent on mode choice. The table below presents the internal capture percentages and trips in units of vehicle trips. CivTech can provide trips in units of persons if requested.

Mesa Inner Loop

Analyzed

Trip Generation

May 2019

Appendix D

Adjustments for Internal Trips

Proposed Use	ADT				AM Peak Hour				PM Peak Hour				(not used)
	Percent	In	Out	Total	Percent	In	Out	Total	Percent	In	Out	Total	
Homes, Hawes & Elliot	0%	0	0	0	0%	0	0	0	0%	0	0	0	
Homes, Hawes & Warner	0%	0	0	0	0%	0	0	0	0%	0	0	0	
Multifamily, Hawes & Elliot	10%	504	504	1,008	10%	16	44	60	10%	45	28	73	
Multifamily, Hawes & Warner	10%	620	620	1,240	10%	19	54	73	10%	54	35	89	
Commercial, Hawes & Elliot	10%	867	867	1,734	10%	24	15	39	10%	83	89	172	
Commercial, Hawes & Warner	30%	6,871	6,871	13,742	30%	212	131	343	30%	713	773	1,486	
Office, Hawes & Warner	30%	209	209	418	30%	39	6	45	30%	7	38	45	
Light Ind., Hawes & Elliot	0%	0	0	0	0%	0	0	0	0%	0	0	0	
Light Ind., E. of Loop 202	0%	0	0	0	0%	0	0	0	0%	0	0	0	
Totals		9,071	9,071	18,142		310	250	560		902	963	1,865	

Average

15%

12%

19%

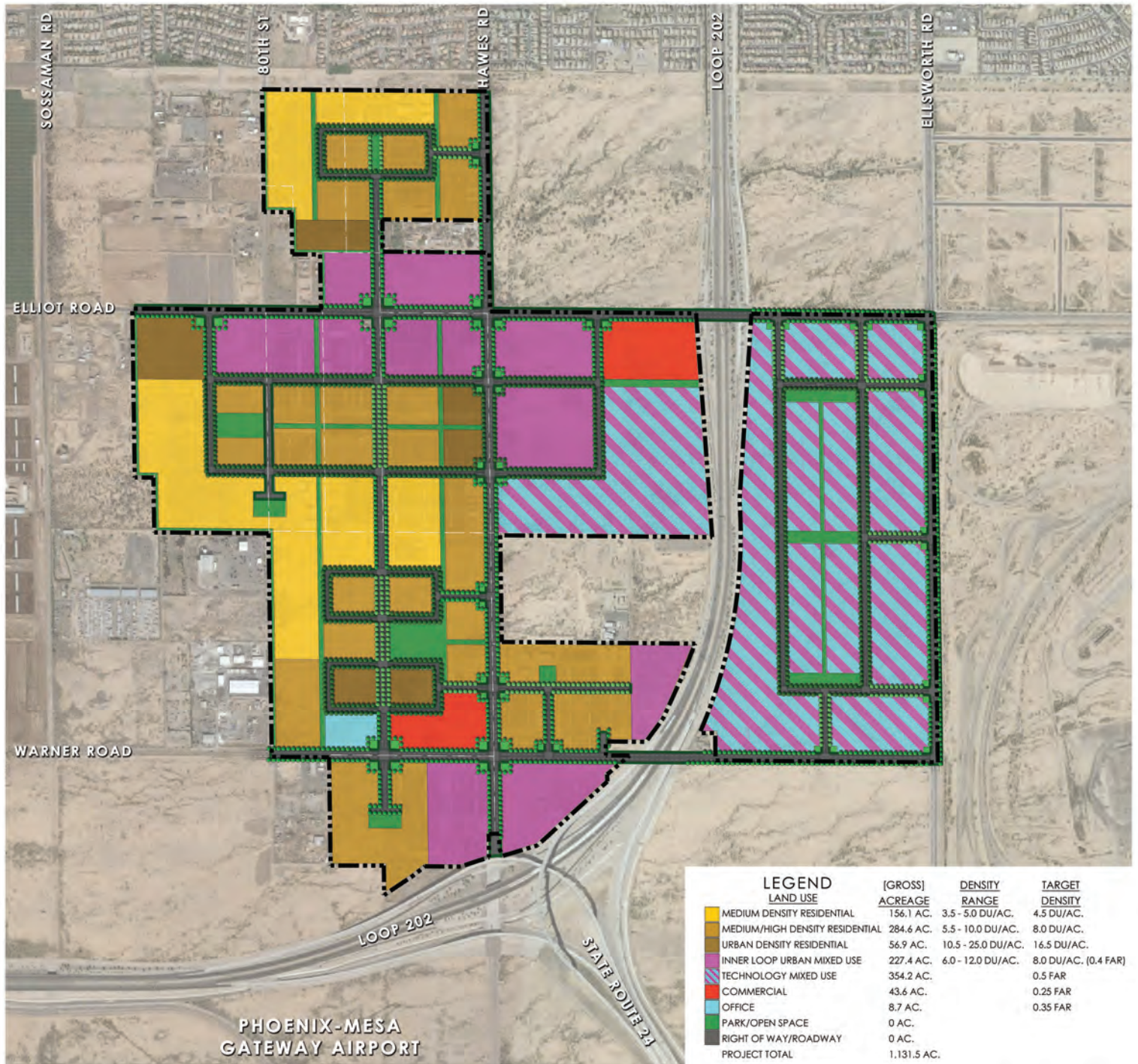
Box 8 - Convert Person Trips to Final Vehicle Trips

The vehicle occupancy and baseline alternate mode are now factored out from the external trips in vehicles, after any adjustments for internal capture and additional alternate mode from Box 7.

In Box 6, vehicle trips were considered to account for 90% of total person trips. Alternate mode trips in addition to the baseline, if any, are accounted for in Box 7. It is estimated that vehicle trips should be reduced by an additional 0% due to carpooling. The final external trips in vehicles is multiplied by 90% - 0% = 90% to produce the external vehicle trips.

External Vehicular Trips

Proposed Use	ADT			AM Peak Hour			PM Peak Hour			(not used)
	In	Out	Total	In	Out	Total	In	Out	Total	
Homes, Hawes & Elliot	2,938	2,938	5,876	118	353	471	390	229	619	
Homes, Hawes & Warner	254	254	508	9	28	37	30	18	48	
Multifamily, Hawes & Elliot	4,534	4,534	9,068	139	398	537	400	256	656	
Multifamily, Hawes & Warner	5,584	5,584	11,168	171	488	659	489	312	801	
Commercial, Hawes & Elliot	7,803	7,803	15,606	217	133	350	743	806	1,549	
Commercial, Hawes & Warner	16,032	16,032	32,064	496	303	799	1,664	1,802	3,466	
Office, Hawes & Warner	489	489	978	91	15	106	17	87	104	
Light Ind., Hawes & Elliot	2,973	2,973	5,946	299	41	340	32	213	245	
Light Ind., E. of Loop 202	11,333	11,333	22,666	809	110	919	80	539	619	
Totals	51,940	51,940	103,880	2,349	1,869	4,218	3,845	4,262	8,107	



January 14th 2019
 GREY|PICKETT

MESA URBAN DEVELOPMENT EXHIBIT K: CONCEPTUAL LAND USE PLAN



Hawes Crossing

Proposed

Trip Generation

January 2019

Appendix D

Methodology Overview

This form facilitates trip generation estimation using data within the Institute of Transportation Engineer's (ITE) *Trip Generation Manual*, 10th Edition and methodology described within ITE's *Trip Generation Handbook*, 3rd Edition. These references will be referred to as *Manual and Handbook*, respectively. The *Manual* contains data collected by various transportation professionals for a wide range of different land uses, with each land use category represented by a land use code (LUC). Average rates and equations have been established that correlate the relationship between an independent variable that describes the development size and generated trips for each categorized LUC in various settings and time periods. The *Handbook* indicates an established methodology for how to use data contained within the Manual when to use the fitted curve instead of the average rate and when to adjustments to the volume of trips are appropriate and how to do so. The methodology steps are represented visually in boxes in Figure 3.1. This worksheet applies calculations for each box if applicable.

Box 1 - Define Study Site Land Use Type & Site Characteristics

The analyst is to pick an appropriate LUC(s) based on the subject's zoning/land use(s)/future land use(s). The size of the land use(s) is described in reference to an independent variable(s) specific to (each) the land use (example: 1,000 square feet of building area is relatively common).

Land Use Types and Size

Proposed Use	Amount Units	ITE LUC	ITE Land Use Name
Homes, Hawes & Elliot	592 Dwelling Units	210	Single-Family Detached Housing
Homes, Hawes & Warner	84 Dwelling Units	210	Single-Family Detached Housing
Multifamily, Hawes & Elliot	3,023 Dwelling Units	221	Multifamily Housing (Mid-Rise)
Multifamily, Hawes & Warner	2,050 Dwelling Units	221	Multifamily Housing (Mid-Rise)
Multifamily, E. of Loop 202	0 Dwelling Units	221	Multifamily Housing (Mid-Rise)
Commercial, Hawes & Elliot	2,301 1,000 square feet	820	Shopping Center
Commercial, Hawes & Warner	1,039 1,000 square feet	820	Shopping Center
Office, Hawes & Warner	88 1,000 square feet	710	General Office Building
Technology, Hawes & Elliot	1,383 1,000 square feet	760	Research and Development Center
Technology, E. of Loop 202	4,909 1,000 square feet	760	Research and Development Center
	+/-40 acres of multifamily east of Loop 202 was replaced by Tech.		

Box 2 - Define Site Context

Context assessment is to "simply determine whether the study sites is in a multimodal setting" and "could have persons accessing the site by walking, bicycling, or riding transit." This assessment is used in Box 4. The *Manual* separates data into 4 setting categories - **Rural**, **General Urban/Suburban**, **Dense Multi-Urban Use** and **Center City Core**. This worksheet uses the following abbreviations, respectively: **R**, **G**, **D**, and **C**. The *Manual* does not have data for all settings of all land use codes. See the table on the next page titled "Site Context and Time Periods" - if this table is not provided, the "General Urban/Suburban" setting is used by default.

Box 3 - Define Analysis Objectives Types of Trips & Time Period

This tool will focus on vehicular trips for a 24-hour period on a typical weekday as well as its AM peak hour and PM peak hour. Other time period(s) may be of interest.



Proposed

January 2019

Box 4 - Is Study Site Multimodal?

Box 5/Box 9 - Estimate Baseline Trips/Estimate Vehicular Trips (Determine Equation)

Equation Type: Equation Used [Equated Rate] (Type Abbreviations: Weighted Average Rate ("WA"), Fitted Curve ("FC"), or Custom ("C"))



Proposed

January 2019

Appendix D

Box 5/Box 9 - Estimate Baseline Trips/Estimate Vehicular Trips (Apply Equations and in/out Distributions)

Baseline Vehicular Trips

Proposed Use	ADT				AM Peak Hour				PM Peak Hour				(not used)
	% In	In	Out	Total	% In	In	Out	Total	% In	In	Out	Total	
Homes, Hawes & Elliot	50%	2,670	2,670	5,340	25%	106	319	425	63%	353	207	560	
Homes, Hawes & Warner	50%	443	443	886	25%	16	48	64	63%	54	32	86	
Multifamily, Hawes & Elliot	50%	8,237	8,237	16,474	26%	251	716	967	61%	712	456	1,168	
Multifamily, Hawes & Warner	50%	5,585	5,585	11,170	26%	172	489	661	61%	491	314	805	
Multifamily, E. of Loop 202	50%	0	0	0	26%	0	0	0	61%	0	0	0	
Commercial, Hawes & Elliot	50%	25,354	25,354	50,708	62%	807	495	1,302	48%	2,655	2,877	5,532	
Commercial, Hawes & Warner	50%	14,770	14,770	29,540	62%	416	255	671	48%	1,475	1,598	3,073	
Office, Hawes & Warner	50%	471	471	942	86%	95	15	110	16%	16	85	101	
Technology, Hawes & Elliot	50%	7,175	7,175	14,350	83%	869	178	1,047	16%	232	1,219	1,451	
Technology, E. of Loop 202	50%	25,210	25,210	50,420	75%	2,396	798	3,194	15%	768	4,350	5,118	
Totals		89,915	89,915	179,830		5,128	3,313	8,441		6,756	11,138	17,894	

If vehicle trip reductions are not applied for internal capture and alternative mode, vehicle trips may be separated into vehicle trip subsets (pass-by trips, diverted trips, truck trips, new passenger vehicle trips) as part of Box 10. If vehicle trip reductions are to be applied, continue to Box 6.

Box 6 - Convert Baseline Vehicle Trips to Person Trips

If no vehicle trip reductions are to be applied, this portion may be ignored. The *Handbook* states "There are not enough samples to derive precise percentages by mode...however, for all but one, ...the motor vehicle percentage of total person trips is at least 96 percent." and "[vehicle occupancy for] many of the most commonly analyzed land use codes are not [available]." This form assumes that the total baseline vehicle trips for all land use codes accounts for 90% of total person trips. Unless otherwise specified, this form later reverses the conversion in Box 8.

Hawes Crossing

Proposed

Trip Generation

January 2019

Appendix D

Box 7 - Estimate Internal Person Trips, External Walk/Bike Trips, Transit Person Trips, External Person Trips (Internal Capture)

Internal capture occurs for mixed-use developments when a portion of the trips generated by the site are expected to have the both the origin and destination within the site. Internal capture is not dependent on mode choice. The table below presents the internal capture percentages and trips in units of vehicle trips. CivTech can provide trips in units of persons if requested.

Adjustments for Internal Trips

Proposed Use	ADT				AM Peak Hour				PM Peak Hour				(not used)
	Percent	In	Out	Total	Percent	In	Out	Total	Percent	In	Out	Total	
Homes, Hawes & Elliot	0%	0	0	0	0%	0	0	0	0%	0	0	0	
Homes, Hawes & Warner	0%	0	0	0	0%	0	0	0	0%	0	0	0	
Multifamily, Hawes & Elliot	10%	824	824	1,648	10%	25	72	97	10%	71	46	117	
Multifamily, Hawes & Warner	10%	559	559	1,118	10%	17	49	66	10%	49	32	81	
Multifamily, E. of Loop 202	10%	0	0	0	10%	0	0	0	10%	0	0	0	
Commercial, Hawes & Elliot	30%	7,606	7,606	15,212	30%	242	149	391	30%	797	863	1,660	
Commercial, Hawes & Warner	30%	4,431	4,431	8,862	30%	125	76	201	30%	443	479	922	
Office, Hawes & Warner	0%	0	0	0	0%	0	0	0	0%	0	0	0	
Technology, Hawes & Elliot	0%	0	0	0	0%	0	0	0	0%	0	0	0	
Technology, E. of Loop 202	0%	0	0	0	0%	0	0	0	0%	0	0	0	
Totals		13,420	13,420	26,840		409	346	755		1,360	1,420	2,780	

Average

15%

9%

16%

Proposed

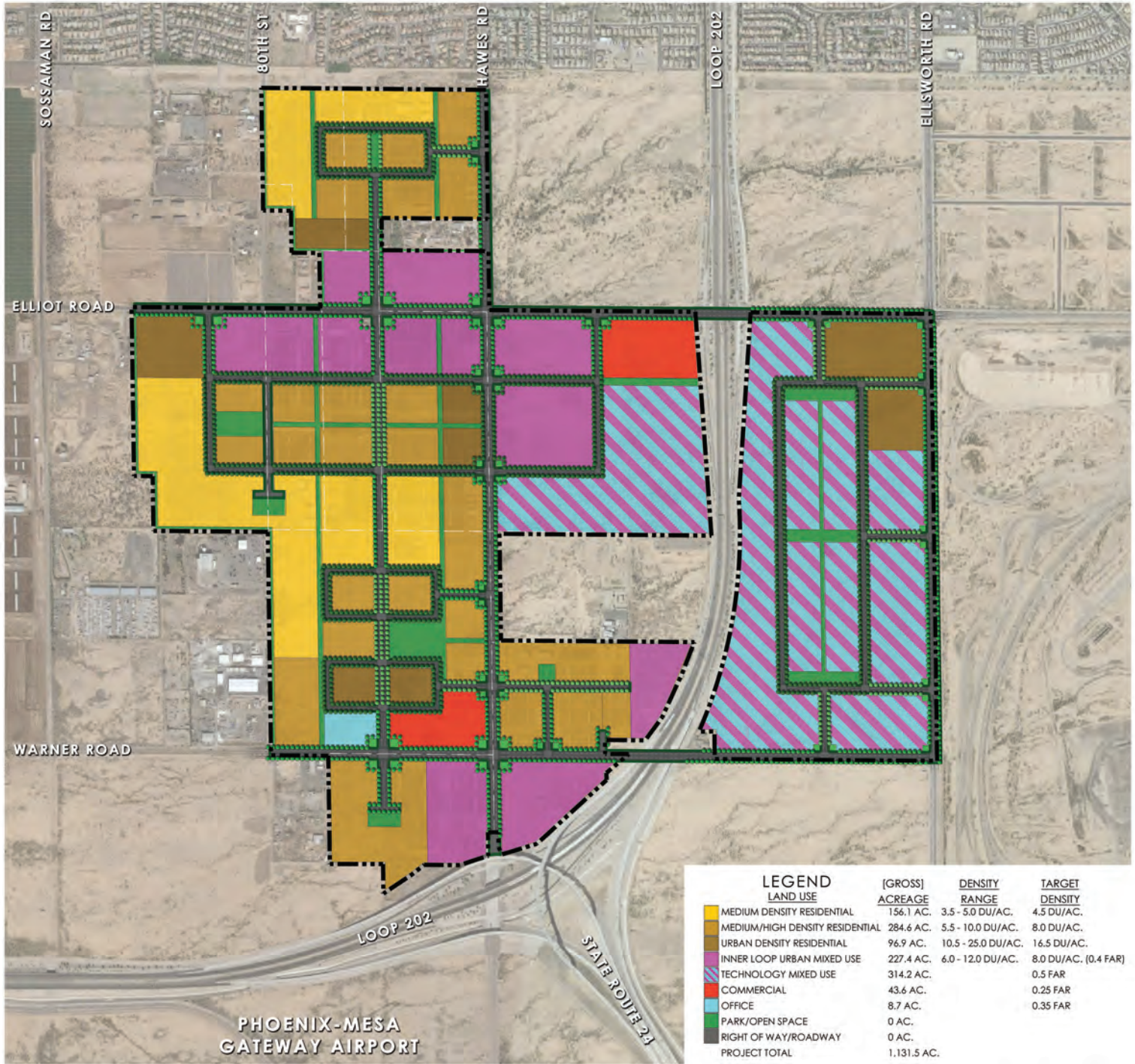
January 2019

Box 8 - Convert Person Trips to Final Vehicle Trips

0%

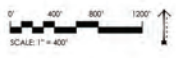
Proposed Use	ADT			AM Peak Hour			PM Peak Hour			(not used)
	In	Out	Total	In	Out	Total	In	Out	Total	
Homes, Hawes & Elliot	2,670	2,670	5,340	106	319	425	353	207	560	
Homes, Hawes & Warner	443	443	886	16	48	64	54	32	86	
Multifamily, Hawes & Elliot	7,413	7,413	14,826	226	644	870	641	410	1,051	
Multifamily, Hawes & Warner	5,026	5,026	10,052	155	440	595	442	282	724	
Multifamily, E. of Loop 202	0	0	0	0	0	0	0	0	0	
Commercial, Hawes & Elliot	17,748	17,748	35,496	565	346	911	1,858	2,014	3,872	
Commercial, Hawes & Warner	10,339	10,339	20,678	291	179	470	1,032	1,119	2,151	
Office, Hawes & Warner	471	471	942	95	15	110	16	85	101	
Technology, Hawes & Elliot	7,175	7,175	14,350	869	178	1,047	232	1,219	1,451	
Technology, E. of Loop 202	25,210	25,210	50,420	2,396	798	3,194	768	4,350	5,118	
Totals	76,495	76,495	152,990	4,719	2,967	7,686	5,396	9,718	15,114	
Analyzed	73,774	73,774	147,548	4,395	2,996	7,391	5,419	9,049	14,468	
Differences (amount)	2,721	2,721	5,442	324	(29)	295	(23)	669	646	
Percent more	4%	4%	3.7%	7%	-1%	4.0%	0%	7%	4.5%	





LEGEND			
LAND USE	[GROSS] ACREAGE	DENSITY RANGE	TARGET DENSITY
MEDIUM DENSITY RESIDENTIAL	156.1 AC.	3.5 - 5.0 DU/AC.	4.5 DU/AC.
MEDIUM/HIGH DENSITY RESIDENTIAL	284.6 AC.	5.5 - 10.0 DU/AC.	8.0 DU/AC.
URBAN DENSITY RESIDENTIAL	96.9 AC.	10.5 - 25.0 DU/AC.	16.5 DU/AC.
INNER LOOP URBAN MIXED USE	227.4 AC.	6.0 - 12.0 DU/AC.	8.0 DU/AC. (0.4 FAR)
TECHNOLOGY MIXED USE	314.2 AC.		0.5 FAR
COMMERCIAL	43.6 AC.		0.25 FAR
OFFICE	8.7 AC.		0.35 FAR
PARK/OPEN SPACE	0 AC.		
RIGHT OF WAY/ROADWAY	0 AC.		
PROJECT TOTAL	1,131.5 AC.		

MESA URBAN DEVELOPMENT CONCEPTUAL LAND USE MASTER PLAN



Mesa Inner Loop

Analyzed

Trip Generation

October 2018

Appendix D

Methodology Overview

This form facilitates trip generation estimation using data within the Institute of Transportation Engineer's (ITE) *Trip Generation Manual*, 10th Edition and methodology described within ITE's *Trip Generation Handbook*, 3rd Edition. These references will be referred to as *Manual and Handbook*, respectively. The *Manual* contains data collected by various transportation professionals for a wide range of different land uses, with each land use category represented by a land use code (LUC). Average rates and equations have been established that correlate the relationship between an independent variable that describes the development size and generated trips for each categorized LUC in various settings and time periods. The *Handbook* indicates an established methodology for how to use data contained within the Manual when to use the fitted curve instead of the average rate and when to adjustments to the volume of trips are appropriate and how to do so. The methodology steps are represented visually in boxes in Figure 3.1. This worksheet applies calculations for each box if applicable.

Box 1 - Define Study Site Land Use Type & Site Characteristics

The analyst is to pick an appropriate LUC(s) based on the subject's zoning/land use(s)/future land use(s). The size of the land use(s) is described in reference to an independent variable(s) specific to (each) the land use (example: 1,000 square feet of building area is relatively common).

Land Use Types and Size

Proposed Use	Amount Units	ITE LUC	ITE Land Use Name
Homes, Hawes & Elliot	592 Dwelling Units	210	Single-Family Detached Housing
Homes, Hawes & Warner	84 Dwelling Units	210	Single-Family Detached Housing
Multifamily, Hawes & Elliot	3,023 Dwelling Units	221	Multifamily Housing (Mid-Rise)
Multifamily, Hawes & Warner	2,050 Dwelling Units	221	Multifamily Housing (Mid-Rise)
Multifamily, E. of Loop 202	709 Dwelling Units	221	Multifamily Housing (Mid-Rise)
Commercial, Hawes & Elliot	2,301 1,000 square feet	820	Shopping Center
Commercial, Hawes & Warner	1,039 1,000 square feet	820	Shopping Center
Office, Hawes & Warner	88 1,000 square feet	710	General Office Building
Technology, Hawes & Elliot	1,383 1,000 square feet	760	Research and Development Center
Technology, E. of Loop 202	4,037 1,000 square feet	760	Research and Development Center

Box 2 - Define Site Context

Context assessment is to "simply determine whether the study sites is in a multimodal setting" and "could have persons accessing the site by walking, bicycling, or riding transit." This assessment is used in Box 4. The *Manual* separates data into 4 setting categories - **Rural**, **General Urban/Suburban**, **Dense Multi-Urban Use** and **Center City Core**. This worksheet uses the following abbreviations, respectively: **R**, **G**, **D**, and **C**. The *Manual* does not have data for all settings of all land use codes. See the table on the next page titled "Site Context and Time Periods" - if this table is not provided, the "General Urban/Suburban" setting is used by default.

Box 3 - Define Analysis Objectives Types of Trips & Time Period

This tool will focus on vehicular trips for a 24-hour period on a typical weekday as well as its AM peak hour and PM peak hour. Other time period(s) may be of interest.



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October 2018

Box 4 - Is Study Site Multimodal?

Box 5/Box 9 - Estimate Baseline Trips/Estimate Vehicular Trips (Determine Equation)

Equation Type: Equation Used [Equated Rate] (Type Abbreviations: Weighted Average Rate ("WA"), Fitted Curve ("FC"), or Custom ("C"))



Analyzed

Trip Generation

October 2018

Appendix D

Box 5/Box 9 - Estimate Baseline Trips/Estimate Vehicular Trips (Apply Equations and in/out Distributions)

Baseline Vehicular Trips

Proposed Use	ADT				AM Peak Hour				PM Peak Hour				(not used)
	% In	In	Out	Total	% In	In	Out	Total	% In	In	Out	Total	
Homes, Hawes & Elliot	50%	2,670	2,670	5,340	25%	106	319	425	63%	353	207	560	
Homes, Hawes & Warner	50%	443	443	886	25%	16	48	64	63%	54	32	86	
Multifamily, Hawes & Elliot	50%	8,237	8,237	16,474	26%	251	716	967	61%	712	456	1,168	
Multifamily, Hawes & Warner	50%	5,585	5,585	11,170	26%	172	489	661	61%	491	314	805	
Multifamily, E. of Loop 202	50%	1,931	1,931	3,862	26%	61	172	233	61%	177	113	290	
Commercial, Hawes & Elliot	50%	25,354	25,354	50,708	62%	807	495	1,302	48%	2,655	2,877	5,532	
Commercial, Hawes & Warner	50%	14,770	14,770	29,540	62%	416	255	671	48%	1,475	1,598	3,073	
Office, Hawes & Warner	50%	471	471	942	86%	95	15	110	16%	16	85	101	
Technology, Hawes & Elliot	50%	7,175	7,175	14,350	83%	869	178	1,047	16%	232	1,219	1,451	
Technology, E. of Loop 202	50%	20,751	20,751	41,502	75%	2,017	672	2,689	15%	632	3,579	4,211	
Totals		87,387	87,387	174,774		4,810	3,359	8,169		6,797	10,480	17,277	

If vehicle trip reductions are not applied for internal capture and alternative mode, vehicle trips may be separated into vehicle trip subsets (pass-by trips, diverted trips, truck trips, new passenger vehicle trips) as part of Box 10. If vehicle trip reductions are to be applied, continue to Box 6.

Box 6 - Convert Baseline Vehicle Trips to Person Trips

If no vehicle trip reductions are to be applied, this portion may be ignored. The *Handbook* states "There are not enough samples to derive precise percentages by mode...however, for all but one, ...the motor vehicle percentage of total person trips is at least 96 percent." and "[vehicle occupancy for] many of the most commonly analyzed land use codes are not [available]." This form assumes that the total baseline vehicle trips for all land use codes accounts for 90% of total person trips. Unless otherwise specified, this form later reverses the conversion in Box 8.

Mesa Inner Loop

Analyzed

Trip Generation

October 2018

Appendix D

Box 7 - Estimate Internal Person Trips, External Walk/Bike Trips, Transit Person Trips, External Person Trips (Internal Capture)

Internal capture occurs for mixed-use developments when a portion of the trips generated by the site are expected to have the both the origin and destination within the site. Internal capture is not dependent on mode choice. The table below presents the internal capture percentages and trips in units of vehicle trips. CivTech can provide trips in units of persons if requested.

Adjustments for Internal Trips

Proposed Use	ADT				AM Peak Hour				PM Peak Hour				(not used)
	Percent	In	Out	Total	Percent	In	Out	Total	Percent	In	Out	Total	
Homes, Hawes & Elliot	0%	0	0	0	0%	0	0	0	0%	0	0	0	
Homes, Hawes & Warner	0%	0	0	0	0%	0	0	0	0%	0	0	0	
Multifamily, Hawes & Elliot	10%	824	824	1,648	10%	25	72	97	10%	71	46	117	
Multifamily, Hawes & Warner	10%	559	559	1,118	10%	17	49	66	10%	49	32	81	
Multifamily, E. of Loop 202	10%	193	193	386	10%	6	17	23	10%	18	11	29	
Commercial, Hawes & Elliot	30%	7,606	7,606	15,212	30%	242	149	391	30%	797	863	1,660	
Commercial, Hawes & Warner	30%	4,431	4,431	8,862	30%	125	76	201	30%	443	479	922	
Office, Hawes & Warner	0%	0	0	0	0%	0	0	0	0%	0	0	0	
Technology, Hawes & Elliot	0%	0	0	0	0%	0	0	0	0%	0	0	0	
Technology, E. of Loop 202	0%	0	0	0	0%	0	0	0	0%	0	0	0	
Totals		13,613	13,613	27,226		415	363	778		1,378	1,431	2,809	

Average

16%

10%

16%

Analyzed

October 2018

Box 8 - Convert Person Trips to Final Vehicle Trips

0%

Proposed Use	ADT			AM Peak Hour			PM Peak Hour			(not used)
	In	Out	Total	In	Out	Total	In	Out	Total	
Homes, Hawes & Elliot	2,670	2,670	5,340	106	319	425	353	207	560	
Homes, Hawes & Warner	443	443	886	16	48	64	54	32	86	
Multifamily, Hawes & Elliot	7,413	7,413	14,826	226	644	870	641	410	1,051	
Multifamily, Hawes & Warner	5,026	5,026	10,052	155	440	595	442	282	724	
Multifamily, E. of Loop 202	1,738	1,738	3,476	55	155	210	159	102	261	
Commercial, Hawes & Elliot	17,748	17,748	35,496	565	346	911	1,858	2,014	3,872	
Commercial, Hawes & Warner	10,339	10,339	20,678	291	179	470	1,032	1,119	2,151	
Office, Hawes & Warner	471	471	942	95	15	110	16	85	101	
Technology, Hawes & Elliot	7,175	7,175	14,350	869	178	1,047	232	1,219	1,451	
Technology, E. of Loop 202	20,751	20,751	41,502	2,017	672	2,689	632	3,579	4,211	
Totals	73,774	73,774	147,548	4,395	2,996	7,391	5,419	9,049	14,468	

APPENDIX E

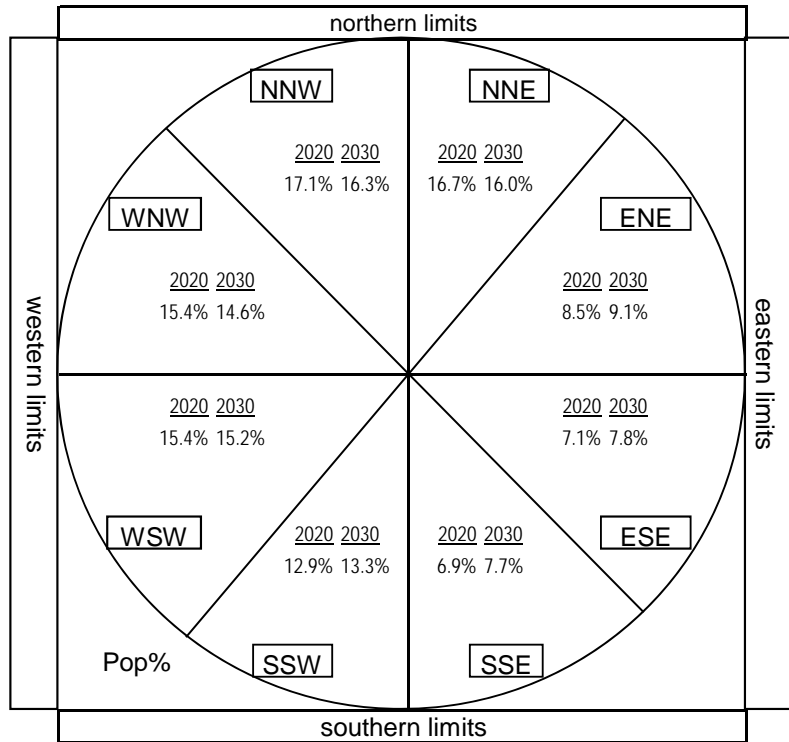
TRIP DISTRIBUTION CALCULATIONS

Quadrant	2020				2030			
	Population	Percent			Population	Percent		
North Northwest	34,667	17.1%			37,988	16.3%		
North Northeast	33,800	16.7%			37,264	16.0%		
North	68,467	33.8%			75,252	32.3%		
East Northeast	17,129	8.5%			21,198	9.1%		
East Southeast	14,311	7.1%			18,048	7.8%		
East	31,440	15.6%			39,246	16.9%		
South Southeast	14,054	6.9%			17,895	7.7%		
South Southwest	26,169	12.9%			30,810	13.3%		
South	40,224	19.8%			48,705	21.0%		
West Southwest	31,123	15.4%			35,303	15.2%		
West Northwest	31,184	15.4%			33,930	14.6%		
West	62,307	30.8%			69,233	29.8%		
Totals	202,438	100.0%			232,436	100.0%		

Radius

Population radius: 5 miles

Select Analysis Year (2020, 2030, 2040,2050)
2020



[illegible]

Trip Distribution - Population from West														
Mesa Innerloop	5-mile radius													
	RAZ	MPA	Population	Population	% of TAZ	Adjusted	Adjusted	RAZ	MPA	Population	Population	% of TAZ	Adjusted	Adjusted
Traffic Impact (and Mitigation) Analysis/Study	WSW							WNW						
	319	GI	71,323	80,930	40%	28,529	32,372	312	GI	31,767	34,443	90%	28,590	30,999
	321	ME	25,938	29,312	10%	2,594	2,931	321	ME	25,938	29,312	10%	2,594	2,931

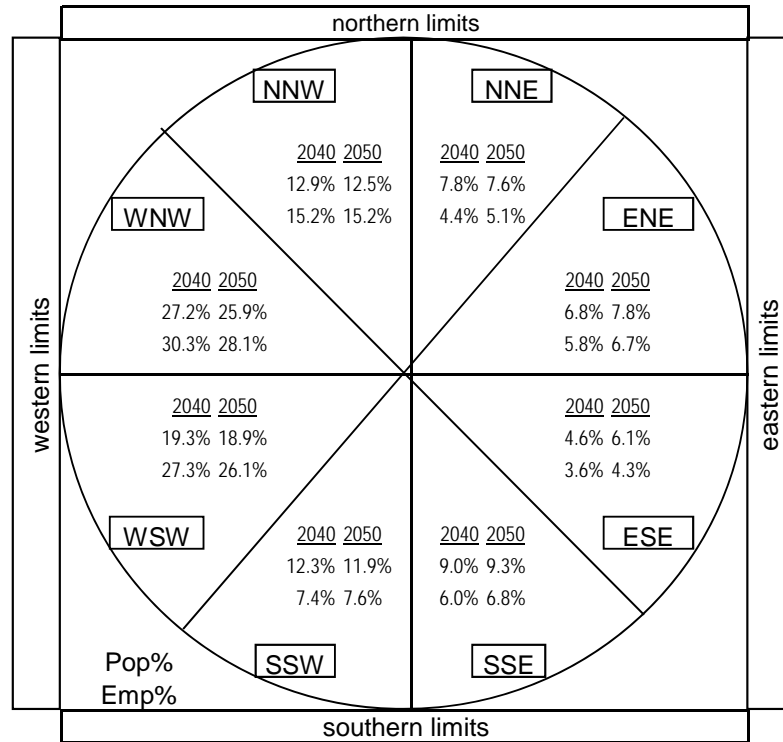
From WSW						31,123	35,303	From WNW						
From West														
												31,184	33,930	
												62,307	69,233	

Quadrant	2040				2050			
	Population	Percent	Employment	Percent	Population	Percent	Employment	Percent
North Northwest	172,890	12.9%	82,302	15.2%	176,312	12.5%	94,506	15.2%
North Northeast	104,216	7.8%	23,956	4.4%	106,844	7.6%	31,380	5.1%
North	277,106	20.7%	106,258	19.7%	283,156	20.1%	125,886	20.3%
East Northeast	90,874	6.8%	31,073	5.8%	110,713	7.8%	41,717	6.7%
East Southeast	61,493	4.6%	19,518	3.6%	86,819	6.1%	26,900	4.3%
East	152,367	11.4%	50,591	9.4%	197,532	13.9%	68,617	11.0%
South Southeast	120,623	9.0%	32,353	6.0%	131,132	9.3%	42,260	6.8%
South Southwest	164,565	12.3%	39,897	7.4%	169,014	11.9%	47,201	7.6%
South	285,188	21.4%	72,250	13.4%	300,146	21.2%	89,460	14.4%
West Southwest	257,578	19.3%	147,415	27.3%	267,460	18.9%	161,936	26.1%
West Northwest	363,326	27.2%	163,910	30.3%	366,381	25.9%	174,200	28.1%
West	620,904	46.5%	311,325	57.6%	633,841	44.8%	336,136	54.2%
Totals	1,335,564	100.0%	540,425	100.0%	1,414,675	100.0%	620,098	99.9%

Radii

Population radius: 12 miles
Employment radius: 12 miles

Select Analysis Year (2020, 2030, 2040,2050)
2040



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[illegible][illegible]

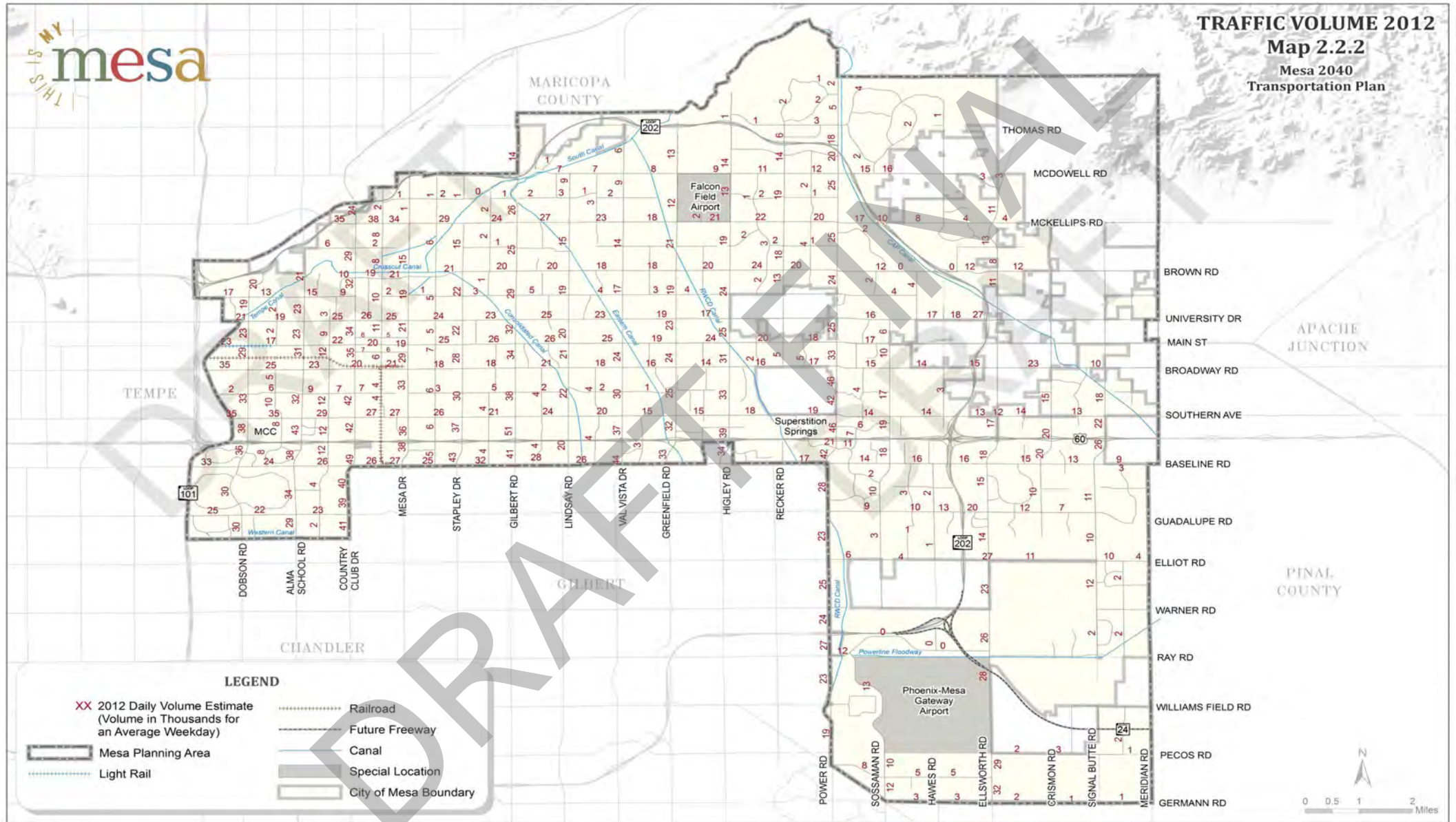
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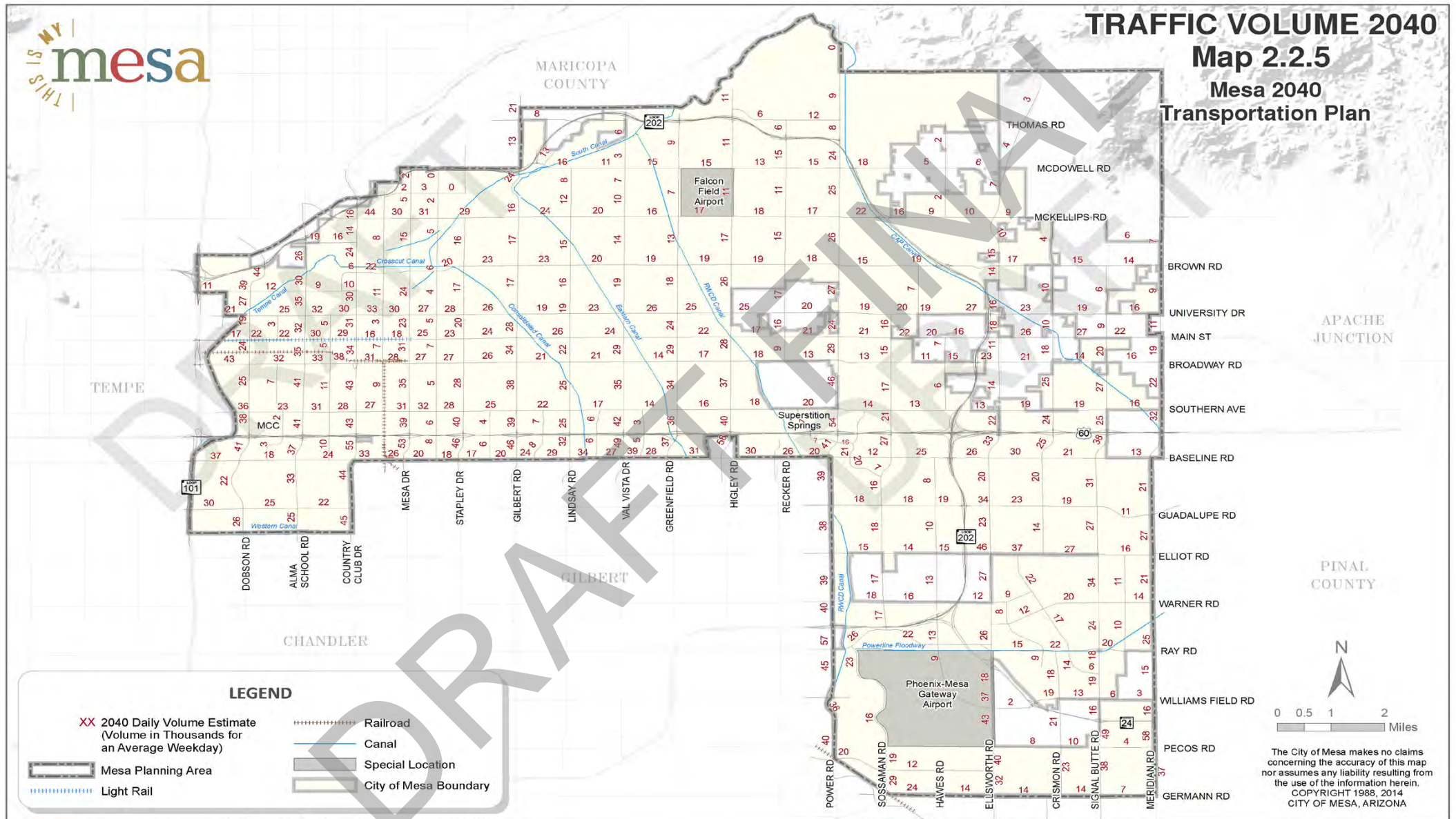
APPENDIX F

BACKGROUND VOLUME CALCULATIONS

MESA 2040 Transportation Plan



MESA 2040 Transportation Plan



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Background Calculations

Source: NCHRP Report 785

Hawes Crossing Intersection	Total Volumes											
	West of Intersection Eastbound			East of Intersection Westbound			South of Intersection Northbound			North of Intersection Southbound		
	Approach	Departure	Total	Approach	Departure	Total	Approach	Departure	Total	Approach	Departure	Total
Sossaman Rd. / Guadalupe Rd.	9,000	9,000	18,000	9,000	9,000	18,000	9,000	9,000	18,000	8,000	8,000	16,000
Farnsworth Dr. / Guadalupe Rd.	9,000	9,000	18,000	9,000	9,000	18,000	2,650	2,650	5,300	1,500	1,500	3,000
Hawes Rd. / Guadalupe Rd.	9,000	9,000	18,000	9,500	9,500	19,000	5,000	5,000	10,000	4,000	4,000	8,000
Loop 202 SB Ramps / Guadalupe Rd.	9,500	9,500	19,000	15,000	15,000	30,000	0	10,000	10,000	10,000	0	10,000
Loop 202 NB Ramps / Guadalupe Rd.	15,000	15,000	30,000	17,000	17,000	34,000	5,000	0	5,000	0	20,000	20,000
Power Rd. / Elliot Rd.	7,500	7,500	15,000	7,500	7,500	15,000	19,500	19,500	39,000	19,000	19,000	38,000
Sossaman Rd. / Elliot Rd.	7,500	7,500	15,000	7,000	7,000	14,000	8,500	8,500	17,000	9,000	9,000	18,000
80th St. / Elliot Rd.	7,000	7,000	14,000	7,000	7,000	14,000	0	0	0	1,000	1,000	2,000
Hawes Rd. / Elliot Rd.	7,000	7,000	14,000	7,500	7,500	15,000	6,500	6,500	13,000	5,000	5,000	10,000
Loop 202 SB Ramps / Elliot Rd.	7,500	7,500	15,000	18,600	18,600	37,200	0	6,000	6,000	22,000	0	22,000
Loop 202 NB Ramps / Elliot Rd.	18,600	18,600	37,200	17,500	17,500	35,000	11,000	0	11,000	0	12,000	12,000
Sossaman Rd. / Warner Rd.	9,000	9,000	18,000	8,000	8,000	16,000	8,500	8,500	17,000	8,500	8,500	17,000
Hawes Rd. / Warner Rd.	8,000	8,000	16,000	6,000	6,000	12,000	6,500	6,500	13,000	6,500	6,500	13,000
Hawes Rd. / Loop 202 WB Ramps	0	4,500	4,500	6,000	0	6,000	12,650	12,650	25,300	10,000	10,000	20,000
Hawes Rd. / Loop 202 EB Ramps	4,500	0	4,500	0	6,000	6,000	10,000	10,000	20,000	12,650	12,650	25,300
Ellsworth Road / Elliot Road	17,500	17,500	35,000	13,500	13,500	27,000	13,500	13,500	27,000	11,500	11,500	23,000
Ellsworth Road / Warner Road	5,000	5,000	10,000	3,500	3,500	7,000	13,000	13,000	26,000	13,500	13,500	27,000

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Notes:

2040 ADT retrieved from Map 2.2.5 "TRAFFIC VOLUME 2040" of *Mesa 2040 Transportation Plan*

Where 2040 ADT were not provided in map referenced above, values were estimated (for example, at interchange ramps)

2040 ADT on Elliot Road, west of Loop 202, and on Warner Road, west of Loop 202, were reduced by the projected ADT generated by the site.

Background Calculations

Source: NCHRP Report 765

[illegible]

Background Calculations

Source: NCHRP Report 785

Hawes Crossing AM Peak Hour Intersection	2040 Volumes - AM Approach & Departure Volumes												
	West of Intersection				East of Intersection			South of Intersection			North of Intersection		
	Eastbound				Westbound			Northbound			Southbound		
	Group	Approach	Departure	Total	Approach	Departure	Total	Approach	Departure	Total	Approach	Departure	Total
Sossaman Rd. / Guadalupe Rd.	NW	505	935	1,440	935	505	1,440	935	505	1,440	450	830	1,280
Farnsworth Dr. / Guadalupe Rd.	NW	505	935	1,440	935	505	1,440	275	150	425	85	155	240
Hawes Rd. / Guadalupe Rd.	NE	935	505	1,440	530	990	1,520	520	280	800	225	415	640
Loop 202 SB Ramps / Guadalupe Rd.	202 N/S	530	990	1,520	1,560	840	2,400	0	800	800	800	0	800
Loop 202 NB Ramps / Guadalupe Rd.	202 N/S	840	1,560	2,400	1,770	950	2,720	400	0	400	0	1,600	1,600
Power Rd. / Elliot Rd.	NW	420	780	1,200	780	420	1,200	2,030	1,090	3,120	1,065	1,975	3,040
Sossaman Rd. / Elliot Rd.	NW	420	780	1,200	730	390	1,120	885	475	1,360	505	935	1,440
80th St. / Elliot Rd.	NW	390	730	1,120	730	390	1,120	0	0	0	55	105	160
Hawes Rd. / Elliot Rd.	NE	730	390	1,120	420	780	1,200	675	365	1,040	280	520	800
Loop 202 SB Ramps / Elliot Rd.	202 N/S	420	780	1,200	1,935	1,040	2,975	0	480	480	1,760	0	1,760
Loop 202 NB Ramps / Elliot Rd.	202 N/S	1,040	1,935	2,975	1,820	980	2,800	880	0	880	0	960	960
Sossaman Rd. / Warner Rd.	S	505	935	1,440	830	450	1,280	475	885	1,360	885	475	1,360
Hawes Rd. / Warner Rd.	S	450	830	1,280	625	335	960	365	675	1,040	675	365	1,040
Hawes Rd. / Loop 202 WB Ramps	202 E/W	0	360	360	480	0	480	1,315	710	2,025	560	1,040	1,600
Hawes Rd. / Loop 202 EB Ramps	202 E/W	360	0	360	0	480	480	1,040	560	1,600	710	1,315	2,025
Ellsworth Road / Elliot Road		980	1,820	2,800	1,405	755	2,160	1,405	755	2,160	645	1,195	1,840
Ellsworth Road / Warner Road		280	520	800	365	195	560	1,350	730	2,080	755	1,405	2,160

	NW	NE	S	202 N/S	202 E/W
Peak hour factor	8.0%	8.0%	8.0%	8.0%	8.0%
Directional factor	65%	65%	65%	65%	65%
predominant E/W travel	WB	EB	WB	WB	
predominant N/S travel	NB	NB	SB		NB
Rounding factor	5	5	5	5	5

Background Calculations

Source: NCHRP Report 785

Hawes Crossing AM Peak Hour Intersection	2040 Volumes - AM Balanced Approach & Departure Volumes											
	West of Intersection Eastbound			East of Intersection Westbound			South of Intersection Northbound			North of Intersection Southbound		
	Approach	Departure	Total	Approach	Departure	Total	Approach	Departure	Total	Approach	Departure	Total
Sossaman Rd. / Guadalupe Rd.	500	945	1,445	925	510	1,435	925	510	1,435	445	835	1,280
Farnsworth Dr. / Guadalupe Rd.	495	950	1,445	920	515	1,435	270	150	420	85	155	240
Hawes Rd. / Guadalupe Rd.	930	505	1,435	530	995	1,525	515	280	795	225	420	645
Loop 202 SB Ramps / Guadalupe Rd.	505	1,035	1,540	1,490	880	2,370	0	840	840	760	0	760
Loop 202 NB Ramps / Guadalupe Rd.	995	1,275	2,270	2,095	775	2,870	375	0	375	0	1,415	1,415
Power Rd. / Elliot Rd.	420	785	1,205	775	420	1,195	2,025	1,095	3,120	1,060	1,980	3,040
Sossaman Rd. / Elliot Rd.	425	775	1,200	735	385	1,120	890	470	1,360	510	930	1,440
80th St. / Elliot Rd.	400	715	1,115	745	380	1,125	0	0	0	55	105	160
Hawes Rd. / Elliot Rd.	720	395	1,115	415	790	1,205	665	370	1,035	275	525	800
Loop 202 SB Ramps / Elliot Rd.	325	950	1,275	1,510	1,270	2,780	0	785	785	1,170	0	1,170
Loop 202 NB Ramps / Elliot Rd.	1,060	1,900	2,960	1,855	960	2,815	895	0	895	0	950	950
Sossaman Rd. / Warner Rd.	510	925	1,435	840	445	1,285	480	880	1,360	890	470	1,360
Hawes Rd. / Warner Rd.	460	810	1,270	640	330	970	375	665	1,040	685	355	1,040
Hawes Rd. / Loop 202 WB Ramps	0	380	380	455	0	455	1,240	745	1,985	530	1,100	1,630
Hawes Rd. / Loop 202 EB Ramps	380	0	380	0	450	450	1,095	525	1,620	745	1,245	1,990
Ellsworth Road / Elliot Road	990	1,800	2,790	1,420	745	2,165	1,420	745	2,165	650	1,185	1,835
Ellsworth Road / Warner Road	285	510	795	370	190	560	1,375	715	2,090	770	1,380	2,150

Rounding factor

5

Background Calculations

Source: NCHRP Report 785

Hawes Crossing AM Peak Hour Intersection	2023 Volumes - AM Peak Hour Turning Movements											
	West of Intersection Eastbound			East of Intersection Westbound			South of Intersection Northbound			North of Intersection Southbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Sossaman Rd. / Guadalupe Rd.	175	280	45	160	505	260	255	535	135	95	240	185
Farnsworth Dr. / Guadalupe Rd.	15	445	35	115	685	120	200	20	50	20	5	65
Hawes Rd. / Guadalupe Rd.	90	555	285	110	320	80	100	80	335	105	70	45
Loop 202 SB Ramps / Guadalupe Rd.	0	390	115	420	915	0	0	0	0	490	0	120
Loop 202 NB Ramps / Guadalupe Rd.	315	680	0	0	995	1,100	280	0	95	0	0	0
Power Rd. / Elliot Rd.	210	330	125	140	485	150	270	1,260	245	145	690	30
Sossaman Rd. / Elliot Rd.	195	240	45	85	315	335	325	500	65	175	290	205
80th St. / Elliot Rd.	10	490	0	0	650	95	0	0	0	25	0	65
Hawes Rd. / Elliot Rd.	155	345	220	90	155	170	150	200	315	130	60	85
Loop 202 SB Ramps / Elliot Rd.	0	240	85	685	825	0	0	0	0	580	0	505
Loop 202 NB Ramps / Elliot Rd.	375	405	0	0	1,280	575	340	0	555	0	0	0
Sossaman Rd. / Warner Rd.	165	240	105	215	350	275	310	215	80	125	500	265
Hawes Rd. / Warner Rd.	60	200	95	220	305	115	70	180	125	90	270	325
Hawes Rd. / Loop 202 WB Ramps	0	0	0	340	0	115	320	645	0	0	470	60
Hawes Rd. / Loop 202 EB Ramps	205	0	175	0	0	0	0	420	340	110	635	0
Ellsworth Road / Elliot Road	155	480	250	265	730	420	420	610	390	150	475	265
Ellsworth Road / Warner Road	195	15	80	95	20	250	375	935	65	110	545	115

Rounding factor	5
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Background Calculations

Source: NCHRP Report 785

Hawes Crossing PM Peak Hour Intersection	2040 Volumes - PM Approach & Departure Volumes												
	West of Intersection				East of Intersection			South of Intersection			North of Intersection		
	Group	Approach	Departure	Total	Westbound		Total	Northbound		Total	Southbound		Total
					Approach	Departure		Approach	Departure		Approach	Departure	
Sossaman Rd. / Guadalupe Rd.	NW	1,170	630	1,800	630	1,170	1,800	630	1,170	1,800	1,040	560	1,600
Farnsworth Dr. / Guadalupe Rd.	NW	1,170	630	1,800	630	1,170	1,800	185	345	530	195	105	300
Hawes Rd. / Guadalupe Rd.	NE	630	1,170	1,800	1,235	665	1,900	350	650	1,000	520	280	800
Loop 202 SB Ramps / Guadalupe Rd.	202 N/S	1,235	665	1,900	1,050	1,950	3,000	0	1,000	1,000	1,000	0	1,000
Loop 202 NB Ramps / Guadalupe Rd.	202 N/S	1,950	1,050	3,000	1,190	2,210	3,400	500	0	500	0	2,000	2,000
Power Rd. / Elliot Rd.	NW	975	525	1,500	525	975	1,500	1,365	2,535	3,900	2,470	1,330	3,800
Sossaman Rd. / Elliot Rd.	NW	975	525	1,500	490	910	1,400	595	1,105	1,700	1,170	630	1,800
80th St. / Elliot Rd.	NW	910	490	1,400	490	910	1,400	0	0	0	130	70	200
Hawes Rd. / Elliot Rd.	NE	490	910	1,400	975	525	1,500	455	845	1,300	650	350	1,000
Loop 202 SB Ramps / Elliot Rd.	202 N/S	975	525	1,500	1,300	2,420	3,720	0	600	600	2,200	0	2,200
Loop 202 NB Ramps / Elliot Rd.	202 N/S	2,420	1,300	3,720	1,225	2,275	3,500	1,100	0	1,100	0	1,200	1,200
Sossaman Rd. / Warner Rd.	S	1,170	630	1,800	560	1,040	1,600	1,105	595	1,700	595	1,105	1,700
Hawes Rd. / Warner Rd.	S	1,040	560	1,600	420	780	1,200	845	455	1,300	455	845	1,300
Hawes Rd. / Loop 202 WB Ramps	202 E/W	0	450	450	600	0	600	885	1,645	2,530	1,300	700	2,000
Hawes Rd. / Loop 202 EB Ramps	202 E/W	450	0	450	0	600	600	700	1,300	2,000	1,645	885	2,530
Ellsworth Road / Elliot Road		2,275	1,225	3,500	945	1,755	2,700	945	1,755	2,700	1,495	805	2,300
Ellsworth Road / Warner Road		650	350	1,000	245	455	700	910	1,690	2,600	1,755	945	2,700

	NW	NE	S	202 N/S	202 E/W
Peak hour factor	10.0%	10.0%	10.0%	10.0%	10.0%
Directional factor	65%	65%	65%	65%	65%
predominant E/W travel	EB	WB	EB	EB	
predominant N/S travel	SB	SB	NB		SB
Rounding factor	5	5	5	5	5

Background Calculations

Source: NCHRP Report 785

Hawes Crossing PM Peak Hour Intersection	2040 Volumes - PM Balanced Approach & Departure Volumes											
	West of Intersection Eastbound			East of Intersection Westbound			South of Intersection Northbound			North of Intersection Southbound		
	Approach	Departure	Total	Approach	Departure	Total	Approach	Departure	Total	Approach	Departure	Total
Sossaman Rd. / Guadalupe Rd.	1,180	625	1,805	635	1,160	1,795	635	1,160	1,795	1,050	555	1,605
Farnsworth Dr. / Guadalupe Rd.	1,190	620	1,810	640	1,150	1,790	190	340	530	200	105	305
Hawes Rd. / Guadalupe Rd.	635	1,165	1,800	1,240	660	1,900	350	645	995	525	280	805
Loop 202 SB Ramps / Guadalupe Rd.	1,295	630	1,925	1,105	1,850	2,955	0	960	960	1,040	0	1,040
Loop 202 NB Ramps / Guadalupe Rd.	2,385	815	3,200	1,455	1,720	3,175	430	0	430	0	1,735	1,735
Power Rd. / Elliot Rd.	980	525	1,505	525	970	1,495	1,370	2,530	3,900	2,475	1,325	3,800
Sossaman Rd. / Elliot Rd.	965	530	1,495	485	920	1,405	590	1,115	1,705	1,160	635	1,795
80th St. / Elliot Rd.	890	500	1,390	480	930	1,410	0	0	0	130	70	200
Hawes Rd. / Elliot Rd.	495	900	1,395	985	520	1,505	460	835	1,295	660	345	1,005
Loop 202 SB Ramps / Elliot Rd.	875	580	1,455	1,165	2,670	3,835	0	710	710	1,920	0	1,920
Loop 202 NB Ramps / Elliot Rd.	2,430	1,295	3,725	1,230	2,270	3,500	1,105	0	1,105	0	1,200	1,200
Sossaman Rd. / Warner Rd.	1,160	635	1,795	555	1,050	1,605	1,095	600	1,695	590	1,115	1,705
Hawes Rd. / Warner Rd.	1,015	570	1,585	410	795	1,205	825	465	1,290	445	865	1,310
Hawes Rd. / Loop 202 WB Ramps	0	450	450	600	0	600	885	1,640	2,525	1,300	700	2,000
Hawes Rd. / Loop 202 EB Ramps	450	0	450	0	600	600	700	1,300	2,000	1,640	885	2,525
Ellsworth Road / Elliot Road	2,250	1,240	3,490	935	1,775	2,710	935	1,775	2,710	1,480	815	2,295
Ellsworth Road / Warner Road	640	355	995	240	465	705	895	1,720	2,615	1,725	960	2,685

Rounding factor	5
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Background Calculations

Source: NCHRP Report 785

Hawes Crossing PM Peak Hour Intersection	2023 Volumes - PM Peak Hour Turning Movements											
	West of Intersection Eastbound			East of Intersection Westbound			South of Intersection Northbound			North of Intersection Southbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Sossaman Rd. / Guadalupe Rd.	230	475	225	210	280	145	170	180	190	335	580	135
Farnsworth Dr. / Guadalupe Rd.	80	860	220	90	525	25	45	5	140	150	30	20
Hawes Rd. / Guadalupe Rd.	50	390	200	385	690	165	140	65	145	125	65	335
Loop 202 SB Ramps / Guadalupe Rd.	0	1,025	270	405	700	0	0	0	0	760	0	280
Loop 202 NB Ramps / Guadalupe Rd.	680	1,185	0	0	635	820	180	0	250	0	0	0
Power Rd. / Elliot Rd.	395	285	300	280	105	140	165	790	415	270	1,575	430
Sossaman Rd. / Elliot Rd.	250	525	190	120	110	255	180	130	280	415	505	240
80th St. / Elliot Rd.	10	810	0	0	445	60	0	0	0	80	0	50
Hawes Rd. / Elliot Rd.	120	235	145	395	425	165	195	65	200	85	465	110
Loop 202 SB Ramps / Elliot Rd.	0	835	140	460	705	0	0	0	0	625	0	525
Loop 202 NB Ramps / Elliot Rd.	640	1,790	0	0	880	350	415	0	690	0	0	0
Sossaman Rd. / Warner Rd.	250	440	250	170	165	220	245	645	205	210	180	200
Hawes Rd. / Warner Rd.	185	380	150	90	145	175	100	210	110	125	275	65
Hawes Rd. / Loop 202 WB Ramps	0	0	0	215	0	210	215	490	0	0	870	430
Hawes Rd. / Loop 202 EB Ramps	250	0	180	0	0	0	0	635	65	240	1,120	0
Ellsworth Road / Elliot Road	300	915	450	150	555	230	290	450	190	450	810	200
Ellsworth Road / Warner Road	195	175	270	60	105	75	10	690	195	315	1,170	240

Rounding factor	5
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APPENDIX G

2040 TOTAL PEAK HOUR ANALYSES

2040 Total AM
1: Sossaman Rd & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SRTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	17	31	16	26	18	30	16	26
Maximum Split (%)	18.9%	34.4%	17.8%	28.9%	20.0%	33.3%	17.8%	28.9%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	6	23	54	70	36	6	54	70
End Time (s)	23	54	70	6	54	36	70	6
Yield/Force Off (s)	17	48	64	0	48	30	64	0
Yield/Force Off 170(s)	17	37	64	79	48	19	64	79
Local Start Time (s)	26	43	74	0	56	26	74	0
Local Yield (s)	37	68	84	20	68	50	84	20
Local Yield 170(s)	37	57	84	9	68	39	84	9

Intersection Summary
























Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 70 (78%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 1: Sossaman Rd & Guadalupe Rd

17 s	31 s	16 s	26 s
30 s	18 s	16 s	26 s

2040 Total AM
1: Sossaman Rd & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	286	45	160	508	261	255	656	135	97	355	185
Future Volume (veh/h)	175	286	45	160	508	261	255	656	135	97	355	185
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	194	318	50	178	564	290	283	729	150	108	394	206
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	398	1292	197	480	1447	449	322	1009	450	202	948	423
Arrive On Green	0.10	0.29	0.29	0.18	0.57	0.57	0.09	0.28	0.28	0.07	0.27	0.27
Sat Flow, veh/h	1781	4469	683	1781	5106	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	194	240	128	178	564	290	283	729	150	108	394	206
Grp Sat Flow(s),veh/h/ln	1781	1702	1747	1781	1702	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	6.8	4.9	5.1	6.3	5.5	11.3	5.4	16.6	6.7	4.5	8.2	6.8
Cycle Q Clear(g_c), s	6.8	4.9	5.1	6.3	5.5	11.3	5.4	16.6	6.7	4.5	8.2	6.8
Prop In Lane	1.00		0.39	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	398	984	505	480	1447	449	322	1009	450	202	948	423
V/C Ratio(X)	0.49	0.24	0.25	0.37	0.39	0.65	0.88	0.72	0.33	0.54	0.42	0.49
Avail Cap(c_a), veh/h	421	984	505	514	1447	449	407	1009	450	298	948	423
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.92	0.92	0.92	0.75	0.75	0.75	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.6	24.5	24.5	17.7	15.2	16.4	36.9	29.0	25.5	30.0	27.2	13.0
Incr Delay (d2), s/veh	0.9	0.6	1.2	0.4	0.7	6.5	12.9	3.4	1.5	2.2	1.3	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.8	3.4	3.8	3.9	3.3	1.5	10.6	10.8	4.6	3.5	6.2	6.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.5	25.1	25.7	18.1	15.9	22.9	49.8	32.4	27.0	32.2	28.6	17.0
LnGrp LOS	C	C	C	B	B	C	D	C	C	C	C	B
Approach Vol, veh/h		562			1032			1162			708	
Approach Delay, s/veh		23.6			18.2			36.0			25.8	
Approach LOS		C			B			D			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.2	31.5	14.3	32.0	13.7	30.0	14.8	31.5				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	11.0	25.0	10.0	20.0	12.0	24.0	10.0	20.0				
Max Q Clear Time (g_c+I1), s	6.5	18.6	8.3	7.1	7.4	10.2	8.8	13.3				
Green Ext Time (p_c), s	0.1	2.7	0.1	1.6	0.3	2.5	0.1	2.5				
Intersection Summary												
HCM 6th Ctrl Delay			26.6									
HCM 6th LOS			C									

2040 Total AM
2: Farnsworth Dr & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019

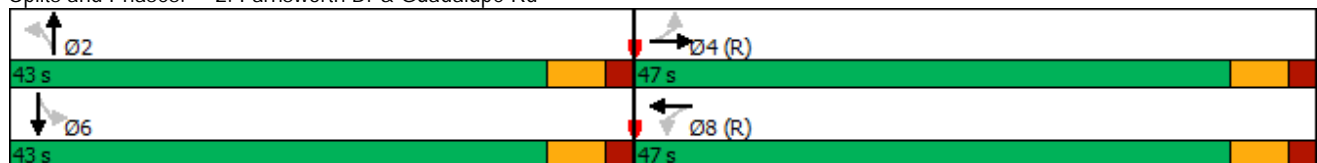


Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	Max	C-Max	Max	C-Max
Maximum Split (s)	43	47	43	47
Maximum Split (%)	47.8%	52.2%	47.8%	52.2%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	68	21	68	21
End Time (s)	21	68	21	68
Yield/Force Off (s)	15	62	15	62
Yield/Force Off 170(s)	4	51	4	51
Local Start Time (s)	47	0	47	0
Local Yield (s)	84	41	84	41
Local Yield 170(s)	73	30	73	30

Intersection Summary





















Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	50
Offset: 21 (23%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 2: Farnsworth Dr & Guadalupe Rd



2040 Total AM
2: Farnsworth Dr & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	453	35	115	689	120	200	20	50	20	5	65
Future Volume (veh/h)	15	453	35	115	689	120	200	20	50	20	5	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	17	503	39	128	766	133	222	22	56	22	6	72
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	264	2203	169	463	1997	344	583	192	489	585	51	609
Arrive On Green	0.91	0.91	0.91	0.15	0.15	0.15	0.41	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	619	4836	371	864	4384	755	1321	467	1189	1321	123	1480
Grp Volume(v), veh/h	17	353	189	128	593	306	222	0	78	22	0	78
Grp Sat Flow(s),veh/h/ln	619	1702	1804	864	1702	1734	1321	0	1656	1321	0	1604
Q Serve(g_s), s	1.1	1.0	1.1	12.0	14.1	14.3	11.3	0.0	2.6	0.9	0.0	2.7
Cycle Q Clear(g_c), s	15.4	1.0	1.1	13.0	14.1	14.3	14.0	0.0	2.6	3.6	0.0	2.7
Prop In Lane	1.00		0.21	1.00		0.44	1.00		0.72	1.00		0.92
Lane Grp Cap(c), veh/h	264	1551	822	463	1551	790	583	0	681	585	0	659
V/C Ratio(X)	0.06	0.23	0.23	0.28	0.38	0.39	0.38	0.00	0.11	0.04	0.00	0.12
Avail Cap(c_a), veh/h	264	1551	822	463	1551	790	583	0	681	585	0	659
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.96	0.96	0.96	0.99	0.99	0.99	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	5.9	2.2	2.2	26.8	26.8	26.9	20.7	0.0	16.4	17.5	0.0	16.4
Incr Delay (d2), s/veh	0.5	0.3	0.6	1.5	0.7	1.4	1.9	0.0	0.3	0.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.2	0.7	0.8	5.2	10.6	11.1	6.6	0.0	1.9	0.5	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.4	2.6	2.9	28.3	27.5	28.3	22.6	0.0	16.7	17.6	0.0	16.8
LnGrp LOS	A	A	A	C	C	C	C	A	B	B	A	B
Approach Vol, veh/h		559			1027			300			100	
Approach Delay, s/veh		2.8			27.9			21.1			17.0	
Approach LOS		A			C			C			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		43.0		47.0		43.0		47.0				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		37.0		41.0		37.0		41.0				
Max Q Clear Time (g_c+I1), s		16.0		17.4		5.6		16.3				
Green Ext Time (p_c), s		1.1		3.3		0.4		6.7				
Intersection Summary												
HCM 6th Ctrl Delay				19.2								
HCM 6th LOS				B								

2040 Total AM
3: Hawes Rd & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	EBL	WBTL
Lead/Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	11	33	15	31	11	33	11	35
Maximum Split (%)	12.2%	36.7%	16.7%	34.4%	12.2%	36.7%	12.2%	38.9%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	40	7	51	66	40	7	51	62
End Time (s)	51	40	66	7	51	40	62	7
Yield/Force Off (s)	45	34	60	1	45	34	56	1
Yield/Force Off 170(s)	45	23	60	80	45	23	56	80
Local Start Time (s)	64	31	75	0	64	31	75	86
Local Yield (s)	69	58	84	25	69	58	80	25
Local Yield 170(s)	69	47	84	14	69	47	80	14

Intersection Summary

























Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 66 (73%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 3: Hawes Rd & Guadalupe Rd

33 s	11 s	15 s	31 s
33 s	11 s	11 s	35 s

2040 Total AM
3: Hawes Rd & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	557	291	122	320	80	104	172	371	105	147	45
Future Volume (veh/h)	90	557	291	122	320	80	104	172	371	105	147	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	100	619	323	136	356	89	116	191	412	117	163	50
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	438	1578	490	324	1663	516	485	1066	476	386	1066	476
Arrive On Green	0.02	0.10	0.10	0.07	0.33	0.33	0.05	0.30	0.30	0.05	0.30	0.30
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	100	619	323	136	356	89	116	191	412	117	163	50
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.4	10.2	12.9	4.6	4.5	2.6	0.0	3.6	15.6	0.0	3.0	1.5
Cycle Q Clear(g_c), s	3.4	10.2	12.9	4.6	4.5	2.6	0.0	3.6	15.6	0.0	3.0	1.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	438	1578	490	324	1663	516	485	1066	476	386	1066	476
V/C Ratio(X)	0.23	0.39	0.66	0.42	0.21	0.17	0.24	0.18	0.87	0.30	0.15	0.11
Avail Cap(c_a), veh/h	439	1578	490	375	1663	516	490	1066	476	391	1066	476
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.1	32.5	19.2	19.4	22.0	11.4	23.2	23.3	14.9	24.8	23.1	12.2
Incr Delay (d2), s/veh	0.3	0.7	6.7	0.9	0.3	0.7	0.3	0.4	18.7	0.4	0.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.5	7.9	10.1	3.3	3.1	2.4	3.2	2.6	11.8	3.4	2.2	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.3	33.2	25.8	20.3	22.3	12.1	23.4	23.7	33.6	25.2	23.4	12.6
LnGrp LOS	C	C	C	C	C	B	C	C	C	C	C	B
Approach Vol, veh/h	1042		581				719		330			
Approach Delay, s/veh	29.7		20.3				29.3		22.4			
Approach LOS	C		C				C		C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.7	33.0	12.5	33.8	10.7	33.0	11.0	35.3				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	5.0	27.0	9.0	25.0	5.0	27.0	5.0	29.0				
Max Q Clear Time (g_c+I1), s	2.0	17.6	6.6	14.9	2.0	5.0	5.4	6.5				
Green Ext Time (p_c), s	0.1	1.8	0.1	3.6	0.1	1.0	0.0	2.4				
Intersection Summary												
HCM 6th Ctrl Delay	26.6											
HCM 6th LOS	C											

2040 Total AM
4: Loop 202 SB Ramps & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019

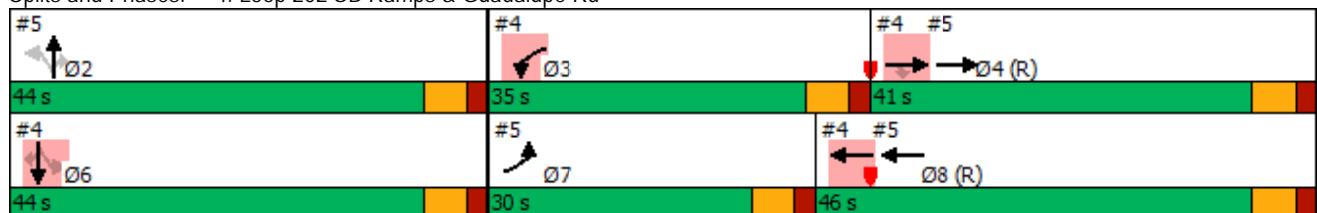


Phase Number	2	3	4	6	7	8
Node Number	5	4	4	4	5	4
Movement	NBTL	WBL	EBT	SBTL	EBL	WBT
Lead/Lag		Lead	Lag		Lead	Lag
Lead-Lag Optimize		Yes	Yes		Yes	Yes
Recall Mode	Max	None	C-Max	Max	None	C-Max
Maximum Split (s)	44	35	41	44	30	46
Maximum Split (%)	36.7%	29.2%	34.2%	36.7%	25.0%	38.3%
Minimum Split (s)	24	11	24	24	11	24
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)	7		7	7		7
Flash Dont Walk (s)	11		11	11		11
Dual Entry	Yes	No	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	41	85	0	41	85	115
End Time (s)	85	0	41	85	115	41
Yield/Force Off (s)	79	114	35	79	109	35
Yield/Force Off 170(s)	68	114	24	68	109	24
Local Start Time (s)	41	85	0	41	85	115
Local Yield (s)	79	114	35	79	109	35
Local Yield 170(s)	68	114	24	68	109	24

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green	

Splits and Phases: 4: Loop 202 SB Ramps & Guadalupe Rd















2040 Total AM

17-1390 Hawes Crossing TIA

4: Loop 202 SB Ramps & Guadalupe Rd

05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↑	↑↑	↑↑↑					↑	↑↓	↑
Traffic Volume (vph)	0	543	115	420	915	0	0	0	0	490	0	132
Future Volume (vph)	0	543	115	420	915	0	0	0	0	490	0	132
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	6.0
Lane Util. Factor		0.81	1.00	0.97	0.91					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.99	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		7544	1583	3433	5085					1681	1605	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		7544	1583	3433	5085					1681	1605	1504
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	603	128	467	1017	0	0	0	0	544	0	147
RTOR Reduction (vph)	0	0	83	0	0	0	0	0	0	0	56	90
Lane Group Flow (vph)	0	603	45	467	1017	0	0	0	0	283	220	42
Turn Type		NA	Perm	Prot	NA					Perm	NA	Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		42.5	42.5	21.5	45.2					38.0	38.0	38.0
Effective Green, g (s)		42.5	42.5	21.5	45.2					38.0	38.0	38.0
Actuated g/C Ratio		0.35	0.35	0.18	0.38					0.32	0.32	0.32
Clearance Time (s)		6.0	6.0	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
Lane Grp Cap (vph)		2671	560	615	1915					532	508	476
v/s Ratio Prot		0.08		c0.14	c0.20							
v/s Ratio Perm			0.03							c0.17	0.14	0.03
v/c Ratio		0.23	0.08	0.76	0.53					0.53	0.43	0.09
Uniform Delay, d1		27.2	25.8	46.8	29.1					33.7	32.5	28.8
Progression Factor		1.00	1.00	1.62	0.46					1.00	1.00	1.00
Incremental Delay, d2		0.2	0.3	5.1	1.0					3.8	2.7	0.4
Delay (s)		27.4	26.0	80.8	14.3					37.5	35.1	29.2
Level of Service		C	C	F	B					D	D	C
Approach Delay (s)		27.2			35.2			0.0			35.0	
Approach LOS		C			D			A			C	
Intersection Summary												
HCM 2000 Control Delay			33.1			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			49.0%			ICU Level of Service				A		
Analysis Period (min)			15									

c Critical Lane Group

2040 Total AM
5: Loop 202 NB Ramps & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019

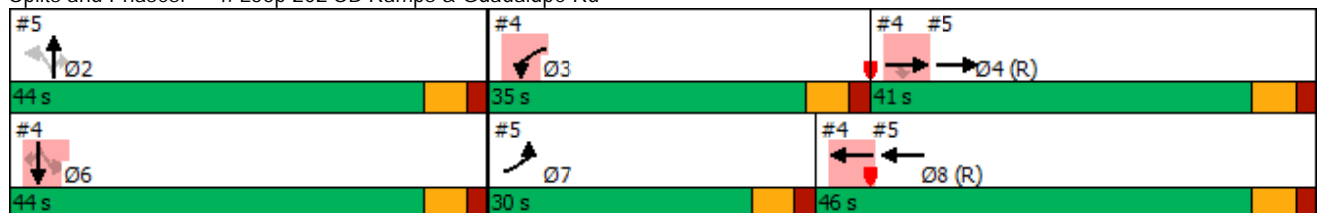


Phase Number	2	3	4	6	7	8
Node Number	5	4	4	4	5	4
Movement	NBTL	WBL	EBT	SBTL	EBL	WBT
Lead/Lag		Lead	Lag		Lead	Lag
Lead-Lag Optimize		Yes	Yes		Yes	Yes
Recall Mode	Max	None	C-Max	Max	None	C-Max
Maximum Split (s)	44	35	41	44	30	46
Maximum Split (%)	36.7%	29.2%	34.2%	36.7%	25.0%	38.3%
Minimum Split (s)	24	11	24	24	11	24
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)	7		7	7		7
Flash Dont Walk (s)	11		11	11		11
Dual Entry	Yes	No	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	41	85	0	41	85	115
End Time (s)	85	0	41	85	115	41
Yield/Force Off (s)	79	114	35	79	109	35
Yield/Force Off 170(s)	68	114	24	68	109	24
Local Start Time (s)	41	85	0	41	85	115
Local Yield (s)	79	114	35	79	109	35
Local Yield 170(s)	68	114	24	68	109	24

Intersection Summary




















Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green	

Splits and Phases: 4: Loop 202 SB Ramps & Guadalupe Rd



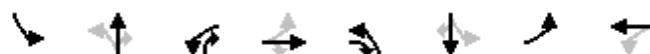
2040 Total AM
5: Loop 202 NB Ramps & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	351	682	0	0	1055	1100	280	0	95	0	0	0
Future Volume (vph)	351	682	0	0	1055	1100	280	0	95	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	0.91			0.81	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.99	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (prot)	3433	5085			7544	1583	1681	1603	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (perm)	3433	5085			7544	1583	1681	1603	1504			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	390	758	0	0	1172	1222	311	0	106	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	56	65	0	0	0
Lane Group Flow (vph)	390	758	0	0	1172	1222	162	104	30	0	0	0
Turn Type	Prot	NA			NA	Free	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases						Free	2		2			
Actuated Green, G (s)	18.8	42.5			45.2	120.0	38.0	38.0	38.0			
Effective Green, g (s)	18.8	42.5			45.2	120.0	38.0	38.0	38.0			
Actuated g/C Ratio	0.16	0.35			0.38	1.00	0.32	0.32	0.32			
Clearance Time (s)	6.0	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			
Lane Grp Cap (vph)	537	1800			2841	1583	532	507	476			
v/s Ratio Prot	0.11	0.15			0.16							
v/s Ratio Perm						c0.77	0.10	0.06	0.02			
v/c Ratio	0.73	0.42			0.41	0.77	0.30	0.21	0.06			
Uniform Delay, d1	48.2	29.4			27.6	0.0	31.0	30.0	28.6			
Progression Factor	1.27	0.96			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	4.6	0.7			0.4	3.7	1.5	0.9	0.3			
Delay (s)	65.9	29.1			28.0	3.7	32.5	30.9	28.8			
Level of Service	E	C			C	A	C	C	C			
Approach Delay (s)		41.6			15.6			31.0			0.0	
Approach LOS		D			B			C			A	
Intersection Summary												
HCM 2000 Control Delay			24.8									C
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			120.0									18.0
Intersection Capacity Utilization			49.0%									A
Analysis Period (min)			15									
c Critical Lane Group												

2040 Total AM
6: Power Rd & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	12	36	18	24	21	27	18	24
Maximum Split (%)	13.3%	40.0%	20.0%	26.7%	23.3%	30.0%	20.0%	26.7%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	78	0	36	54	78	9	36	54
End Time (s)	0	36	54	78	9	36	54	78
Yield/Force Off (s)	84	30	48	72	3	30	48	72
Yield/Force Off 170(s)	84	19	48	61	3	19	48	61
Local Start Time (s)	69	81	27	45	69	0	27	45
Local Yield (s)	75	21	39	63	84	21	39	63
Local Yield 170(s)	75	10	39	52	84	10	39	52

Intersection Summary
























Cycle Length 90
Control Type Actuated-Coordinated
Natural Cycle 80
Offset: 9 (10%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Splits and Phases: 6: Power Rd & Elliot Rd

Ø1	Ø2 (R)	Ø3	Ø4
12 s	36 s	18 s	24 s
Ø5	Ø6 (R)	Ø7	Ø8
21 s	27 s	18 s	24 s

2040 Total AM
6: Power Rd & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	210	420	125	159	564	150	270	1260	252	145	690	30
Future Volume (veh/h)	210	420	125	159	564	150	270	1260	252	145	690	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	233	467	139	177	627	167	300	1400	280	161	767	33
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	327	1082	554	368	753	197	432	1807	721	231	1444	448
Arrive On Green	0.13	0.21	0.21	0.10	0.19	0.19	0.14	0.35	0.35	0.07	0.28	0.28
Sat Flow, veh/h	1781	5106	1585	1781	4030	1054	1781	5106	1585	1781	5106	1585
Grp Volume(v), veh/h	233	467	139	177	528	266	300	1400	280	161	767	33
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1681	1781	1702	1585	1781	1702	1585
Q Serve(g_s), s	9.3	7.1	5.6	7.1	13.4	13.8	10.2	22.0	10.5	5.8	11.4	1.4
Cycle Q Clear(g_c), s	9.3	7.1	5.6	7.1	13.4	13.8	10.2	22.0	10.5	5.8	11.4	1.4
Prop In Lane	1.00		1.00	1.00		0.63	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	327	1082	554	368	636	314	432	1807	721	231	1444	448
V/C Ratio(X)	0.71	0.43	0.25	0.48	0.83	0.85	0.70	0.77	0.39	0.70	0.53	0.07
Avail Cap(c_a), veh/h	341	1082	554	425	681	336	483	1807	721	231	1444	448
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.9	30.8	20.9	25.5	35.2	35.3	18.6	25.9	16.2	23.5	27.2	23.6
Incr Delay (d2), s/veh	6.5	0.3	0.2	0.8	6.9	14.8	3.8	3.3	1.6	8.8	1.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.6	5.0	3.5	5.2	9.5	10.5	7.5	13.5	6.7	5.1	8.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.4	31.0	21.1	26.3	42.1	50.2	22.3	29.2	17.8	32.4	28.6	24.0
LnGrp LOS	C	C	C	C	D	D	C	C	B	C	C	C
Approach Vol, veh/h	839				971				1980			
Approach Delay, s/veh	29.8				41.4				26.5			
Approach LOS	C				D				C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.0	37.9	15.1	25.1	18.4	31.5	17.3	22.8				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	6.0	30.0	12.0	18.0	15.0	21.0	12.0	18.0				
Max Q Clear Time (g_c+I1), s	7.8	24.0	9.1	9.1	12.2	13.4	11.3	15.8				
Green Ext Time (p_c), s	0.0	4.4	0.1	2.2	0.3	2.9	0.0	1.1				
Intersection Summary												
HCM 6th Ctrl Delay	30.7											
HCM 6th LOS	C											



Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	21	28	12	29	25	24	16	25
Maximum Split (%)	23.3%	31.1%	13.3%	32.2%	27.8%	26.7%	17.8%	27.8%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	62	83	21	33	62	87	21	37
End Time (s)	83	21	33	62	87	21	37	62
Yield/Force Off (s)	77	15	27	56	81	15	31	56
Yield/Force Off 170(s)	77	4	27	45	81	4	31	45
Local Start Time (s)	25	46	74	86	25	50	74	0
Local Yield (s)	40	68	80	19	44	68	84	19
Local Yield 170(s)	40	57	80	8	44	57	84	8

Intersection Summary
























Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 37 (41%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 7: Sossaman Rd & Elliot Rd

Ø1	Ø2	Ø3	Ø4 (R)
21 s	28 s	12 s	29 s
Ø5	Ø6	Ø7	Ø8 (R)
25 s	24 s	16 s	25 s

2040 Total AM
7: Sossaman Rd & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	336	46	110	412	394	327	562	76	223	357	205
Future Volume (veh/h)	195	336	46	110	412	394	327	562	76	223	357	205
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	217	373	51	122	458	438	363	624	84	248	397	228
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	382	1309	175	413	1240	538	479	1005	554	334	711	317
Arrive On Green	0.11	0.29	0.29	0.07	0.24	0.24	0.18	0.28	0.28	0.10	0.20	0.20
Sat Flow, veh/h	1781	4556	609	1781	5106	1585	1781	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	217	277	147	122	458	438	363	624	84	248	397	228
Grp Sat Flow(s),veh/h/ln	1781	1702	1761	1781	1702	1585	1781	1777	1585	1728	1777	1585
Q Serve(g_s), s	8.1	5.7	5.9	4.6	6.7	21.9	13.8	13.7	3.3	6.3	9.1	12.1
Cycle Q Clear(g_c), s	8.1	5.7	5.9	4.6	6.7	21.9	13.8	13.7	3.3	6.3	9.1	12.1
Prop In Lane	1.00		0.35	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	382	978	506	413	1240	538	479	1005	554	334	711	317
V/C Ratio(X)	0.57	0.28	0.29	0.30	0.37	0.81	0.76	0.62	0.15	0.74	0.56	0.72
Avail Cap(c_a), veh/h	382	978	506	413	1240	538	536	1005	554	576	711	317
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	1.00	1.00	1.00	0.90	0.90	0.90	0.91	0.91	0.91
Uniform Delay (d), s/veh	21.8	24.9	24.9	23.1	28.3	27.1	21.5	28.1	20.1	39.6	32.4	33.6
Incr Delay (d2), s/veh	1.7	0.6	1.3	0.4	0.8	12.7	5.0	2.6	0.5	3.0	2.9	12.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.9	4.0	4.5	3.3	4.8	14.9	9.6	9.5	2.2	4.8	7.1	9.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.5	25.5	26.2	23.5	29.2	39.8	26.5	30.7	20.6	42.5	35.3	45.7
LnGrp LOS	C	C	C	C	C	D	C	C	C	D	D	D
Approach Vol, veh/h	641		1018			1071			873			
Approach Delay, s/veh	25.0		33.1			28.5			40.1			
Approach LOS	C		C			C			D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.7	31.4	12.0	31.9	22.1	24.0	16.0	27.9				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	15.0	22.0	6.0	23.0	19.0	18.0	10.0	19.0				
Max Q Clear Time (g_c+I1), s	8.3	15.7	6.6	7.9	15.8	14.1	10.1	23.9				
Green Ext Time (p_c), s	0.4	2.2	0.0	2.1	0.4	1.2	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay	32.0											
HCM 6th LOS	C											

2040 Total AM
8: Elliot Rd & 80th Street

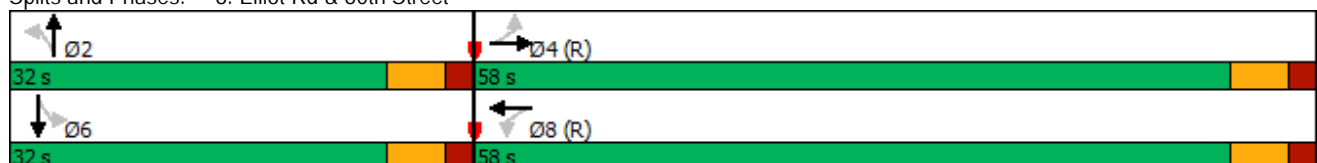
17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	None	C-Max	Max	C-Max
Maximum Split (s)	32	58	32	58
Maximum Split (%)	35.6%	64.4%	35.6%	64.4%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	48	80	48	80
End Time (s)	80	48	80	48
Yield/Force Off (s)	74	42	74	42
Yield/Force Off 170(s)	63	31	63	31
Local Start Time (s)	58	0	58	0
Local Yield (s)	84	52	84	52
Local Yield 170(s)	73	41	73	41





















Intersection Summary	
Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	50
Offset: 80 (89%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

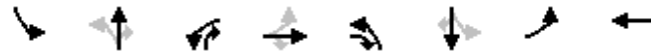
Splits and Phases: 8: Elliot Rd & 80th Street



2040 Total AM
8: Elliot Rd & 80th Street

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	660	12	18	771	95	19	0	31	25	0	65
Future Volume (veh/h)	10	660	12	18	771	95	19	0	31	25	0	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	733	13	20	857	106	21	0	34	28	0	72
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	417	2985	53	443	2661	328	419	0	458	456	0	458
Arrive On Green	0.58	0.58	0.58	1.00	1.00	1.00	0.29	0.00	0.29	0.29	0.00	0.29
Sat Flow, veh/h	583	5166	92	715	4605	567	1328	0	1585	1375	0	1585
Grp Volume(v), veh/h	11	483	263	20	632	331	21	0	34	28	0	72
Grp Sat Flow(s),veh/h/ln	583	1702	1854	715	1702	1768	1328	0	1585	1375	0	1585
Q Serve(g_s), s	0.7	6.3	6.3	0.3	0.0	0.0	1.1	0.0	1.4	1.4	0.0	3.0
Cycle Q Clear(g_c), s	0.7	6.3	6.3	6.6	0.0	0.0	4.1	0.0	1.4	2.8	0.0	3.0
Prop In Lane	1.00		0.05	1.00		0.32	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	417	1967	1071	443	1967	1022	419	0	458	456	0	458
V/C Ratio(X)	0.03	0.25	0.25	0.05	0.32	0.32	0.05	0.00	0.07	0.06	0.00	0.16
Avail Cap(c_a), veh/h	417	1967	1071	443	1967	1022	419	0	458	456	0	458
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.2	9.3	9.4	0.4	0.0	0.0	25.4	0.0	23.3	24.3	0.0	23.8
Incr Delay (d2), s/veh	0.1	0.3	0.5	0.2	0.4	0.8	0.0	0.0	0.1	0.3	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.2	3.7	4.2	0.0	0.2	0.4	0.6	0.0	0.9	0.8	0.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.3	9.6	9.9	0.6	0.4	0.8	25.4	0.0	23.3	24.5	0.0	24.6
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h	757			983			55			100		
Approach Delay, s/veh	9.7			0.6			24.1			24.6		
Approach LOS	A			A			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	32.0			58.0			32.0			58.0		
Change Period (Y+Rc), s	6.0			6.0			6.0			6.0		
Max Green Setting (Gmax), s	26.0			52.0			26.0			52.0		
Max Q Clear Time (g_c+I1), s	6.1			8.3			5.0			8.6		
Green Ext Time (p_c), s	0.2			5.0			0.4			7.1		
Intersection Summary												
HCM 6th Ctrl Delay	6.2											
HCM 6th LOS	A											

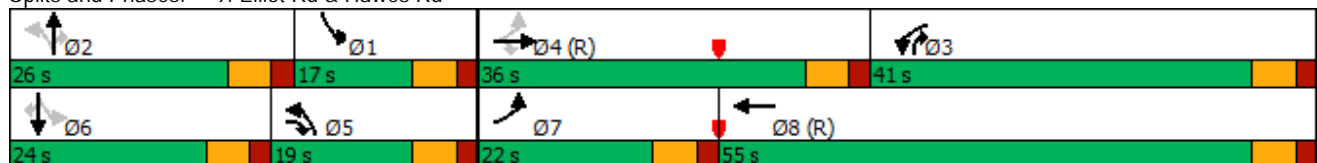


Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	EBL	WBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	17	26	41	36	19	24	22	55
Maximum Split (%)	14.2%	21.7%	34.2%	30.0%	15.8%	20.0%	18.3%	45.8%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	81	55	14	98	79	55	98	0
End Time (s)	98	81	55	14	98	79	0	55
Yield/Force Off (s)	92	75	49	8	92	73	114	49
Yield/Force Off 170(s)	92	64	49	117	92	62	114	38
Local Start Time (s)	81	55	14	98	79	55	98	0
Local Yield (s)	92	75	49	8	92	73	114	49
Local Yield 170(s)	92	64	49	117	92	62	114	38

Intersection Summary






















Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green	

Splits and Phases: 9: Elliot Rd & Hawes Rd



2040 Total AM
9: Elliot Rd & Hawes Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	705	273	164	323	174	182	288	503	141	150	89
Future Volume (veh/h)	157	705	273	164	323	174	182	288	503	141	150	89
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	174	783	303	182	359	193	202	320	559	157	167	99
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	265	1277	497	1163	1648	767	293	592	798	186	533	238
Arrive On Green	0.10	0.25	0.25	0.34	0.48	0.48	0.06	0.17	0.17	0.05	0.15	0.15
Sat Flow, veh/h	1781	5106	1585	3456	3404	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	174	783	303	182	359	193	202	320	559	157	167	99
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1728	1702	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	10.2	16.3	11.9	4.4	7.3	8.6	0.7	9.9	0.0	3.5	5.0	5.2
Cycle Q Clear(g_c), s	10.2	16.3	11.9	4.4	7.3	8.6	0.7	9.9	0.0	3.5	5.0	5.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	265	1277	497	1163	1648	767	293	592	798	186	533	238
V/C Ratio(X)	0.66	0.61	0.61	0.16	0.22	0.25	0.69	0.54	0.70	0.84	0.31	0.42
Avail Cap(c_a), veh/h	320	1277	497	1163	1648	767	373	592	798	266	533	238
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.96	0.96	0.96	0.94	0.94	0.94	0.95	0.95	0.95	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.4	39.9	35.0	27.9	17.8	18.2	48.8	45.8	22.9	53.9	45.5	26.8
Incr Delay (d2), s/veh	3.5	2.1	5.3	0.1	0.3	0.7	3.5	3.3	4.8	15.4	1.5	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.0	11.1	8.1	3.2	5.1	5.7	9.7	7.9	17.9	9.1	4.1	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.9	42.0	40.2	27.9	18.1	18.9	52.3	49.1	27.7	69.3	47.0	32.1
LnGrp LOS	D	D	D	C	B	B	D	D	C	E	D	C
Approach Vol, veh/h	1260				734				1081			
Approach Delay, s/veh	42.0				20.8				38.7			
Approach LOS	D				C				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.6	26.0	46.4	36.0	13.6	24.0	18.3	64.1				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	11.0	20.0	35.0	30.0	13.0	18.0	16.0	49.0				
Max Q Clear Time (g_c+I1), s	5.5	11.9	6.4	18.3	2.7	7.2	12.2	10.6				
Green Ext Time (p_c), s	0.2	2.6	0.6	4.7	0.4	0.9	0.1	3.6				
Intersection Summary												
HCM 6th Ctrl Delay			37.7									
HCM 6th LOS			D									
Notes												

2040 Total AM
10: Loop 202 SB Ramps & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	2	3	4	6	7	8
Node Number	11	10	10	10	11	10
Movement	NBL	WBL	EBT	SBL	EBL	WBT
Lead/Lag		Lead	Lag		Lead	Lag
Lead-Lag Optimize		Yes	Yes		Yes	Yes
Recall Mode	Max	None	C-Max	Max	None	C-Max
Maximum Split (s)	36	42	42	36	41	43
Maximum Split (%)	30.0%	35.0%	35.0%	30.0%	34.2%	35.8%
Minimum Split (s)	24	11	24	24	11	24
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)	7		7	7		7
Flash Dont Walk (s)	11		11	11		11
Dual Entry	Yes	No	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	42	78	0	42	78	119
End Time (s)	78	0	42	78	119	42
Yield/Force Off (s)	72	114	36	72	113	36
Yield/Force Off 170(s)	61	114	25	61	113	25
Local Start Time (s)	42	78	0	42	78	119
Local Yield (s)	72	114	36	72	113	36
Local Yield 170(s)	61	114	25	61	113	25

Intersection Summary













Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green	

Splits and Phases: 10: Loop 202 SB Ramps & Elliot Rd

#11 Ø2	#10 Ø3	#10 #11 Ø4 (R)
36 s	42 s	42 s
#10 Ø6	#11 Ø7	#10 #11 Ø8 (R)
36 s	41 s	43 s

2040 Total AM
10: Loop 202 SB Ramps & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↑	↑↑	↑↑↑					↑↑		↑↑
Traffic Volume (vph)	0	684	252	690	1065	0	0	0	0	670	0	797
Future Volume (vph)	0	684	252	690	1065	0	0	0	0	670	0	797
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		0.81	1.00	0.97	0.91					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		7544	1583	3433	5085					3433		2787
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		7544	1583	3433	5085					3433		2787
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	760	280	767	1183	0	0	0	0	744	0	886
RTOR Reduction (vph)	0	0	186	0	0	0	0	0	0	0	0	665
Lane Group Flow (vph)	0	760	94	767	1183	0	0	0	0	744	0	222
Turn Type		NA	Perm	Prot	NA					Perm		Perm
Protected Phases		4		3	8							
Permitted Phases			4							6		6
Actuated Green, G (s)		40.3	40.3	31.7	38.4					30.0		30.0
Effective Green, g (s)		40.3	40.3	31.7	38.4					30.0		30.0
Actuated g/C Ratio		0.34	0.34	0.26	0.32					0.25		0.25
Clearance Time (s)		6.0	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
Lane Grp Cap (vph)		2533	531	906	1627					858		696
v/s Ratio Prot		0.10		c0.22	c0.23							
v/s Ratio Perm			0.06							c0.22		0.08
v/c Ratio		0.30	0.18	0.85	0.73					0.87		0.32
Uniform Delay, d1		29.4	28.1	41.8	36.2					43.1		36.7
Progression Factor		1.00	1.00	1.53	0.57					1.00		1.00
Incremental Delay, d2		0.3	0.7	6.0	2.3					11.5		1.2
Delay (s)		29.7	28.9	70.1	23.0					54.6		37.9
Level of Service		C	C	E	C					D		D
Approach Delay (s)		29.5			41.6			0.0			45.5	
Approach LOS		C			D			A			D	
Intersection Summary												
HCM 2000 Control Delay			40.2			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			90.6%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

2040 Total AM
11: Loop 202 NB Ramps & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	2	3	4	6	7	8
Node Number	11	10	10	10	11	10
Movement	NBL	WBL	EBT	SBL	EBL	WBT
Lead/Lag		Lead	Lag		Lead	Lag
Lead-Lag Optimize		Yes	Yes		Yes	Yes
Recall Mode	Max	None	C-Max	Max	None	C-Max
Maximum Split (s)	36	42	42	36	41	43
Maximum Split (%)	30.0%	35.0%	35.0%	30.0%	34.2%	35.8%
Minimum Split (s)	24	11	24	24	11	24
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)	7		7	7		7
Flash Dont Walk (s)	11		11	11		11
Dual Entry	Yes	No	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	42	78	0	42	78	119
End Time (s)	78	0	42	78	119	42
Yield/Force Off (s)	72	114	36	72	113	36
Yield/Force Off 170(s)	61	114	25	61	113	25
Local Start Time (s)	42	78	0	42	78	119
Local Yield (s)	72	114	36	72	113	36
Local Yield 170(s)	61	114	25	61	113	25

Intersection Summary



















Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green	

Splits and Phases: 10: Loop 202 SB Ramps & Elliot Rd

#11 Ø2	#10 Ø3	#10 #11 Ø4 (R)
36 s	42 s	42 s
#10 Ø6	#11 Ø7	#10 #11 Ø8 (R)
36 s	41 s	43 s

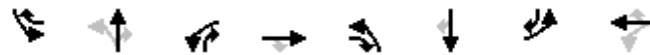
2040 Total AM
11: Loop 202 NB Ramps & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	785	569	0	0	1243	623	512	0	915	0	0	0
Future Volume (vph)	785	569	0	0	1243	623	512	0	915	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	0.91			0.81	1.00	0.97		0.88			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	3433	5085			7544	1583	3433		2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	5085			7544	1583	3433		2787			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	872	632	0	0	1381	692	569	0	1017	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	349	0	0	754	0	0	0
Lane Group Flow (vph)	872	632	0	0	1381	343	569	0	263	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm		Perm			
Protected Phases	7	4			8							
Permitted Phases						8	2		2			
Actuated Green, G (s)	33.6	40.3			38.4	38.4	30.0		30.0			
Effective Green, g (s)	33.6	40.3			38.4	38.4	30.0		30.0			
Actuated g/C Ratio	0.28	0.34			0.32	0.32	0.25		0.25			
Clearance Time (s)	6.0	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			
Lane Grp Cap (vph)	961	1707			2414	506	858		696			
v/s Ratio Prot	c0.25	0.12			0.18							
v/s Ratio Perm						c0.22	c0.17		0.09			
v/c Ratio	0.91	0.37			0.57	0.68	0.66		0.38			
Uniform Delay, d1	41.7	30.2			34.0	35.4	40.5		37.3			
Progression Factor	1.38	1.02			0.38	1.69	1.00		1.00			
Incremental Delay, d2	10.2	0.5			0.7	5.2	4.0		1.6			
Delay (s)	67.5	31.4			13.6	65.1	44.5		38.8			
Level of Service	E	C			B	E	D		D			
Approach Delay (s)		52.3			30.8			40.9			0.0	
Approach LOS		D			C			D			A	
Intersection Summary												
HCM 2000 Control Delay			40.2									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			120.0									Sum of lost time (s) 18.0
Intersection Capacity Utilization			90.6%									ICU Level of Service E
Analysis Period (min)			15									
c Critical Lane Group												

2040 Total AM
12: Sossaman Rd & Warner Road

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBT	NBL	SBT	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	19	31	16	24	23	27	14	26
Maximum Split (%)	21.1%	34.4%	17.8%	26.7%	25.6%	30.0%	15.6%	28.9%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	61	80	21	37	61	84	21	35
End Time (s)	80	21	37	61	84	21	35	61
Yield/Force Off (s)	74	15	31	55	78	15	29	55
Yield/Force Off 170(s)	74	4	31	44	78	4	29	44
Local Start Time (s)	67	86	27	43	67	0	27	41
Local Yield (s)	80	21	37	61	84	21	35	61
Local Yield 170(s)	80	10	37	50	84	10	35	50

Intersection Summary

























Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 84 (93%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	

Splits and Phases: 12: Sossaman Rd & Warner Road

Ø1	Ø2 (R)	Ø3	Ø4
19 s	31 s	16 s	24 s
Ø5	Ø6 (R)	Ø7	Ø8
23 s	27 s	14 s	26 s









2040 Total AM
12: Sossaman Rd & Warner Road

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	176	343	105	215	444	339	310	215	80	193	500	290
Future Volume (veh/h)	176	343	105	215	444	339	310	215	80	193	500	290
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	196	381	117	239	493	377	344	239	89	214	556	322
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	269	671	548	360	790	488	449	1236	727	296	984	562
Arrive On Green	0.08	0.19	0.19	0.11	0.22	0.22	0.16	0.35	0.35	0.09	0.28	0.28
Sat Flow, veh/h	3456	3554	1585	1781	3554	1585	1781	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	196	381	117	239	493	377	344	239	89	214	556	322
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1585	1781	1777	1585	1728	1777	1585
Q Serve(g_s), s	5.0	8.8	4.7	9.8	11.3	19.4	11.7	4.2	2.9	5.4	12.1	14.8
Cycle Q Clear(g_c), s	5.0	8.8	4.7	9.8	11.3	19.4	11.7	4.2	2.9	5.4	12.1	14.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	269	671	548	360	790	488	449	1236	727	296	984	562
V/C Ratio(X)	0.73	0.57	0.21	0.66	0.62	0.77	0.77	0.19	0.12	0.72	0.57	0.57
Avail Cap(c_a), veh/h	307	711	565	360	790	488	507	1236	727	499	984	562
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	0.88	0.88
Uniform Delay (d), s/veh	40.6	33.2	20.8	26.0	31.6	28.3	18.9	20.5	14.0	40.1	27.9	23.5
Incr Delay (d2), s/veh	7.4	1.0	0.2	4.5	1.5	7.5	6.2	0.3	0.3	3.0	2.1	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.1	6.6	3.0	7.7	8.3	12.4	9.1	3.2	1.8	4.2	8.5	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.9	34.1	21.0	30.6	33.1	35.8	25.0	20.9	14.3	43.1	30.0	27.2
LnGrp LOS	D	C	C	C	C	D	C	C	B	D	C	C
Approach Vol, veh/h		694			1109			672			1092	
Approach Delay, s/veh		35.8			33.5			22.1			31.7	
Approach LOS		D			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.7	37.3	16.0	23.0	20.1	30.9	13.0	26.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	13.0	25.0	10.0	18.0	17.0	21.0	8.0	20.0				
Max Q Clear Time (g_c+I1), s	7.4	6.2	11.8	10.8	13.7	16.8	7.0	21.4				
Green Ext Time (p_c), s	0.3	1.7	0.0	1.5	0.4	1.8	0.1	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			31.3									
HCM 6th LOS			C									

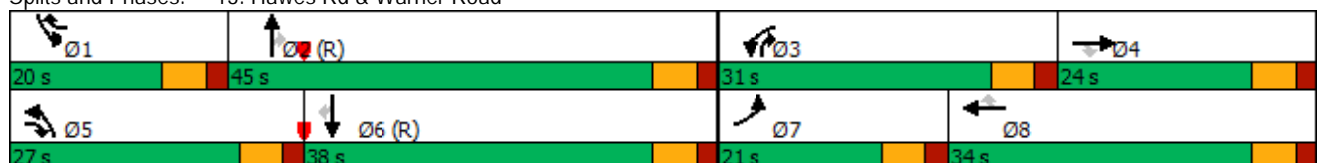
2040 Total AM
13: Hawes Rd & Warner Road

17-1390 Hawes Crossing TIA
05/17/2019

								
Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBT	NBL	SBT	EBL	WBT
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	20	45	31	24	27	38	21	34
Maximum Split (%)	16.7%	37.5%	25.8%	20.0%	22.5%	31.7%	17.5%	28.3%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	8	28	73	104	8	35	73	94
End Time (s)	28	73	104	8	35	73	94	8
Yield/Force Off (s)	22	67	98	2	29	67	88	2
Yield/Force Off 170(s)	22	56	98	111	29	56	88	111
Local Start Time (s)	93	113	38	69	93	0	38	59
Local Yield (s)	107	32	63	87	114	32	53	87
Local Yield 170(s)	107	21	63	76	114	21	53	76

























Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 35 (29%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 13: Hawes Rd & Warner Road



2040 Total AM
13: Hawes Rd & Warner Road

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	234	160	288	455	382	27	368	329	256	217	632	174
Future Volume (veh/h)	234	160	288	455	382	27	368	329	256	217	632	174
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	260	178	320	506	424	30	409	366	284	241	702	193
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	322	533	459	579	798	494	483	1404	892	302	1218	543
Arrive On Green	0.09	0.15	0.15	0.17	0.22	0.22	0.05	0.13	0.13	0.09	0.34	0.34
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	260	178	320	506	424	30	409	366	284	241	702	193
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	8.9	5.4	18.0	17.1	12.6	1.6	14.1	11.1	14.4	8.2	19.4	10.9
Cycle Q Clear(g_c), s	8.9	5.4	18.0	17.1	12.6	1.6	14.1	11.1	14.4	8.2	19.4	10.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	322	533	459	579	798	494	483	1404	892	302	1218	543
V/C Ratio(X)	0.81	0.33	0.70	0.87	0.53	0.06	0.85	0.26	0.32	0.80	0.58	0.36
Avail Cap(c_a), veh/h	432	533	459	720	829	508	605	1404	892	403	1218	543
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.89	0.89	0.89	0.94	0.94	0.94
Uniform Delay (d), s/veh	53.4	45.6	37.9	48.7	41.0	29.0	56.0	36.4	21.0	53.7	32.3	29.5
Incr Delay (d2), s/veh	8.1	0.4	4.6	9.8	0.6	0.1	8.1	0.4	0.8	7.6	1.9	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.4	4.2	13.5	12.6	9.3	1.1	11.2	8.7	10.0	6.8	12.9	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.4	46.0	42.5	58.5	41.6	29.0	64.1	36.8	21.8	61.3	34.2	31.2
LnGrp LOS	E	D	D	E	D	C	E	D	C	E	C	C
Approach Vol, veh/h	758			960			1059			1136		
Approach Delay, s/veh	49.8			50.1			43.3			39.4		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.5	53.4	26.1	24.0	22.8	47.1	17.2	32.9				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	14.0	39.0	25.0	18.0	21.0	32.0	15.0	28.0				
Max Q Clear Time (g_c+I1), s	10.2	16.4	19.1	20.0	16.1	21.4	10.9	14.6				
Green Ext Time (p_c), s	0.3	3.1	1.0	0.0	0.7	3.7	0.3	2.1				
Intersection Summary												
HCM 6th Ctrl Delay	45.1											
HCM 6th LOS	D											

2040 Total AM
14: Hawes Rd & Loop 202 WB Ramps

17-1390 Hawes Crossing TIA
05/17/2019

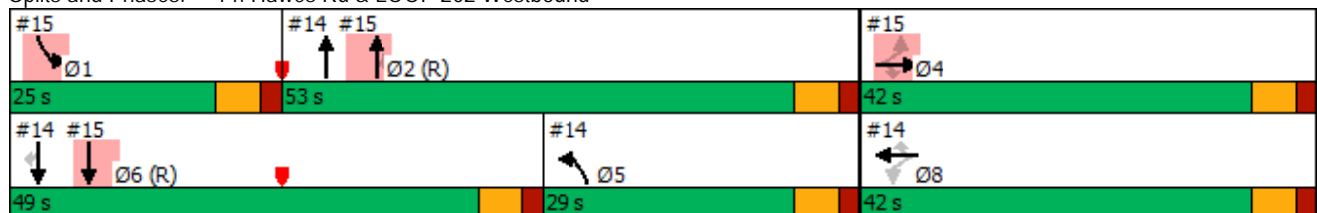


Phase Number	1	2	4	5	6	8
Node Number	15	14	15	14	14	14
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lag	Lead	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	Ped	None	C-Max	None
Maximum Split (s)	25	53	42	29	49	42
Maximum Split (%)	20.8%	44.2%	35.0%	24.2%	40.8%	35.0%
Minimum Split (s)	11	24	24	11	24	24
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	5	15	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		11	11		11	11
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	76	101	34	5	76	34
End Time (s)	101	34	76	34	5	76
Yield/Force Off (s)	95	28	70	28	119	70
Yield/Force Off 170(s)	95	17	59	28	108	59
Local Start Time (s)	95	0	53	24	95	53
Local Yield (s)	114	47	89	47	18	89
Local Yield 170(s)	114	36	78	47	7	78

Intersection Summary

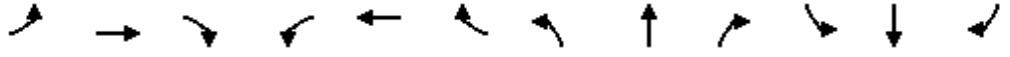







Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 101 (84%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 14: Hawes Rd & LOOP 202 Westbound



2040 Total AM
14: Hawes Rd & Loop 202 WB Ramps

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	340	0	360	320	1058	0	0	697	387
Future Volume (vph)	0	0	0	340	0	360	320	1058	0	0	697	387
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	6.0
Lane Util. Factor				0.95	0.91	0.95	0.97	0.91			0.81	1.00
Frt				1.00	0.91	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1516	1504	3433	5085			7544	1583
Flt Permitted				0.95	0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1516	1504	3433	5085			7544	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	378	0	400	356	1176	0	0	774	430
RTOR Reduction (vph)	0	0	0	0	106	194	0	0	0	0	0	241
Lane Group Flow (vph)	0	0	0	268	156	54	356	1176	0	0	774	189
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				26.2	26.2	26.2	23.0	61.0			52.8	52.8
Effective Green, g (s)				26.2	26.2	26.2	23.0	61.0			52.8	52.8
Actuated g/C Ratio				0.22	0.22	0.22	0.19	0.51			0.44	0.44
Clearance Time (s)				6.0	6.0	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
Lane Grp Cap (vph)				367	330	328	657	2584			3319	696
v/s Ratio Prot							c0.10	c0.23			0.10	
v/s Ratio Perm				c0.16	0.10	0.04						c0.12
v/c Ratio				0.73	0.47	0.17	0.54	0.46			0.23	0.27
Uniform Delay, d1				43.6	40.9	38.0	43.7	18.9			21.0	21.4
Progression Factor				1.00	1.00	1.00	0.92	0.78			0.65	1.41
Incremental Delay, d2				7.3	1.1	0.2	0.9	0.6			0.1	0.8
Delay (s)				50.9	41.9	38.3	41.3	15.2			13.8	30.9
Level of Service				D	D	D	D	B			B	C
Approach Delay (s)		0.0			43.9			21.3			19.9	
Approach LOS		A			D			C			B	
Intersection Summary												
HCM 2000 Control Delay			25.8									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			120.0									Sum of lost time (s) 18.0
Intersection Capacity Utilization			61.2%									ICU Level of Service B
Analysis Period (min)			15									
c Critical Lane Group												

2040 Total AM
15: Hawes Rd & Loop 202 EB Ramps

17-1390 Hawes Crossing TIA
05/17/2019

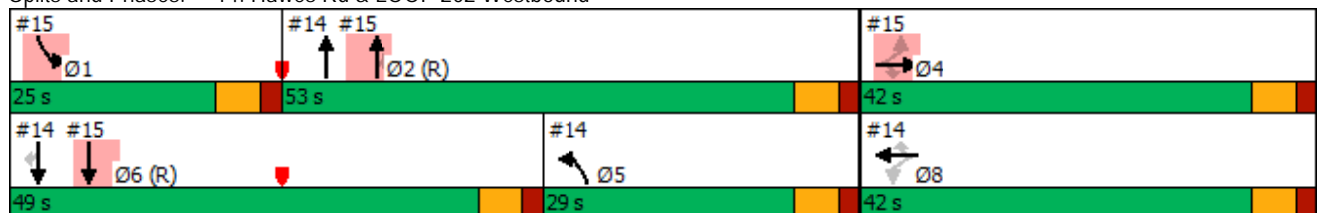


Phase Number	1	2	4	5	6	8
Node Number	15	14	15	14	14	14
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lead	Lag		Lag	Lead	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	Ped	None	C-Max	None
Maximum Split (s)	25	53	42	29	49	42
Maximum Split (%)	20.8%	44.2%	35.0%	24.2%	40.8%	35.0%
Minimum Split (s)	11	24	24	11	24	24
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	5	15	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		11	11		11	11
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	76	101	34	5	76	34
End Time (s)	101	34	76	34	5	76
Yield/Force Off (s)	95	28	70	28	119	70
Yield/Force Off 170(s)	95	17	59	28	108	59
Local Start Time (s)	95	0	53	24	95	53
Local Yield (s)	114	47	89	47	18	89
Local Yield 170(s)	114	36	78	47	7	78

Intersection Summary





















Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 101 (84%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 14: Hawes Rd & LOOP 202 Westbound



2040 Total AM
15: Hawes Rd & Loop 202 EB Ramps

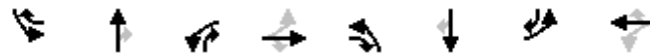
17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	465	0	175	0	0	0	0	913	340	247	790	0
Future Volume (vph)	465	0	175	0	0	0	0	913	340	247	790	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	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.81	1.00	0.97	0.91	
Frt	1.00	0.99	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.96	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1603	1504					7544	1583	3433	5085	
Flt Permitted	0.95	0.96	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1603	1504					7544	1583	3433	5085	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	517	0	194	0	0	0	0	1014	378	274	878	0
RTOR Reduction (vph)	0	106	137	0	0	0	0	0	186	0	0	0
Lane Group Flow (vph)	269	161	38	0	0	0	0	1014	192	274	878	0
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	26.2	26.2	26.2					61.0	61.0	14.8	52.8	
Effective Green, g (s)	26.2	26.2	26.2					61.0	61.0	14.8	52.8	
Actuated g/C Ratio	0.22	0.22	0.22					0.51	0.51	0.12	0.44	
Clearance Time (s)	6.0	6.0	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	
Lane Grp Cap (vph)	367	349	328					3834	804	423	2237	
v/s Ratio Prot								c0.13		c0.08	c0.17	
v/s Ratio Perm	c0.16	0.10	0.03						0.12			
v/c Ratio	0.73	0.46	0.12					0.26	0.24	0.65	0.39	
Uniform Delay, d1	43.6	40.8	37.6					16.8	16.5	50.1	22.7	
Progression Factor	1.00	1.00	1.00					1.00	1.00	0.73	0.36	
Incremental Delay, d2	7.4	1.0	0.2					0.2	0.7	3.3	0.5	
Delay (s)	51.0	41.7	37.8					16.9	17.2	40.0	8.7	
Level of Service	D	D	D					B	B	D	A	
Approach Delay (s)		44.3			0.0			17.0			16.1	
Approach LOS		D			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			22.6									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			120.0									Sum of lost time (s) 18.0
Intersection Capacity Utilization			61.2%									ICU Level of Service B
Analysis Period (min)			15									

c Critical Lane Group

2040 Total AM
16: Elliot Rd & Ellsworth Rd

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	26	40	30	24	38	28	18	36
Maximum Split (%)	21.7%	33.3%	25.0%	20.0%	31.7%	23.3%	15.0%	30.0%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	9	89	35	65	117	89	35	53
End Time (s)	35	9	65	89	35	117	53	89
Yield/Force Off (s)	29	3	59	83	29	111	47	83
Yield/Force Off 170(s)	29	112	59	72	29	100	47	72
Local Start Time (s)	40	0	66	96	28	0	66	84
Local Yield (s)	60	34	90	114	60	22	78	114
Local Yield 170(s)	60	23	90	103	60	11	78	103

Intersection Summary

























Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 89 (74%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 16: Elliot Rd & Ellsworth Rd

Ø2 (R)	Ø1	Ø3	Ø4
40 s	26 s	30 s	24 s
Ø6 (R)	Ø5	Ø7	Ø8
28 s	38 s	18 s	36 s









2040 Total AM
16: Elliot Rd & Ellsworth Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	543	551	327	827	420	439	612	426	150	490	265
Future Volume (veh/h)	155	543	551	327	827	420	439	612	426	150	490	265
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			Yes	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1869	1869	1869
Adj Flow Rate, veh/h	172	603	612	363	919	467	488	680	473	167	544	294
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	259	734	683	403	1185	664	992	1447	744	646	935	445
Arrive On Green	0.03	0.05	0.05	0.19	0.23	0.23	0.29	0.28	0.28	0.19	0.18	0.18
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	3456	5106	1585	3453	5102	1584
Grp Volume(v), veh/h	172	603	612	363	919	467	488	680	473	167	544	294
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1728	1702	1585	1726	1701	1584
Q Serve(g_s), s	9.7	14.0	13.9	20.1	20.2	7.4	14.1	13.2	9.9	5.0	11.7	7.7
Cycle Q Clear(g_c), s	9.7	14.0	13.9	20.1	20.2	7.4	14.1	13.2	9.9	5.0	11.7	7.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	259	734	683	403	1185	664	992	1447	744	646	935	445
V/C Ratio(X)	0.67	0.82	0.90	0.90	0.78	0.70	0.49	0.47	0.64	0.26	0.58	0.66
Avail Cap(c_a), veh/h	263	766	693	429	1277	693	992	1447	744	646	935	445
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.94	0.94	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.8	55.6	11.9	33.7	43.2	11.3	35.5	35.6	8.0	41.7	44.8	14.2
Incr Delay (d2), s/veh	5.7	6.6	13.6	20.8	2.9	3.1	0.4	1.1	4.1	0.2	2.6	7.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.4	11.0	12.1	16.0	13.3	9.4	9.7	9.3	7.8	3.7	8.7	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.5	62.2	25.5	54.5	46.0	14.4	35.9	36.6	12.1	41.9	47.4	21.7
LnGrp LOS	D	E	C	D	D	B	D	D	B	D	D	C
Approach Vol, veh/h	1387			1749			1641			1005		
Approach Delay, s/veh	44.2			39.3			29.4			39.0		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	28.4	40.0	28.3	23.2	40.4	28.0	17.7	33.8				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	20.0	34.0	24.0	18.0	32.0	22.0	12.0	30.0				
Max Q Clear Time (g_c+I1), s	7.0	15.2	22.1	16.0	16.1	13.7	11.7	22.2				
Green Ext Time (p_c), s	0.4	5.9	0.2	1.2	1.5	2.8	0.0	4.4				
Intersection Summary												
HCM 6th Ctrl Delay	37.6											
HCM 6th LOS	D											
Notes												

2040 Total AM
17: Ellsworth Rd & Warner Road









17-1390 Hawes Crossing TIA
05/17/2019

								
Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBTL	NBL	SBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	18	52	12	38	29	41	24	26
Maximum Split (%)	15.0%	43.3%	10.0%	31.7%	24.2%	34.2%	20.0%	21.7%
Minimum Split (s)	11	24	11	24	11	24	24	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	6	24	76	88	6	35	76	100
End Time (s)	24	76	88	6	35	76	100	6
Yield/Force Off (s)	18	70	82	0	29	70	94	0
Yield/Force Off 170(s)	18	59	82	109	29	59	83	109
Local Start Time (s)	91	109	41	53	91	0	41	65
Local Yield (s)	103	35	47	85	114	35	59	85
Local Yield 170(s)	103	24	47	74	114	24	48	74

Intersection Summary
























Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	85
Offset: 35 (29%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	

Splits and Phases: 17: Ellsworth Rd & Warner Road

 Ø1	 Ø2 (R)	 Ø3	 Ø4
18 s	52 s	12 s	38 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
29 s	41 s	24 s	26 s




2040 Total AM
17: Ellsworth Rd & Warner Road

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	37	85	95	56	265	409	1033	65	112	558	206
Future Volume (veh/h)	259	37	85	95	56	265	409	1033	65	112	558	206
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	288	41	94	106	62	294	454	1148	72	124	620	229
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	476	935	658	358	592	362	525	2089	131	284	1711	763
Arrive On Green	0.15	0.26	0.26	0.05	0.17	0.17	0.15	0.43	0.43	0.06	0.34	0.34
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	4911	308	1781	5106	1585
Grp Volume(v), veh/h	288	41	94	106	62	294	454	796	424	124	620	229
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1815	1781	1702	1585
Q Serve(g_s), s	15.5	1.0	4.4	5.9	1.8	20.0	15.4	21.0	21.1	5.4	11.0	10.5
Cycle Q Clear(g_c), s	15.5	1.0	4.4	5.9	1.8	20.0	15.4	21.0	21.1	5.4	11.0	10.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.17	1.00		1.00
Lane Grp Cap(c), veh/h	476	935	658	358	592	362	525	1448	772	284	1711	763
V/C Ratio(X)	0.60	0.04	0.14	0.30	0.10	0.81	0.86	0.55	0.55	0.44	0.36	0.30
Avail Cap(c_a), veh/h	483	948	663	358	592	362	662	1448	772	352	1711	763
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.2	33.0	21.8	39.1	42.4	43.9	49.7	25.9	25.9	24.1	30.2	18.9
Incr Delay (d2), s/veh	2.1	0.0	0.1	0.5	0.1	13.2	9.6	1.5	2.8	1.1	0.6	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.0	0.8	2.9	4.7	1.4	14.3	11.5	13.2	14.2	4.1	7.9	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.3	33.0	21.9	39.6	42.5	57.0	59.3	27.4	28.7	25.1	30.8	19.9
LnGrp LOS	C	C	C	D	D	E	E	C	C	C	C	B
Approach Vol, veh/h	423				462				1674			
Approach Delay, s/veh	31.5				51.1				36.4			
Approach LOS	C				D				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.4	57.0	12.0	37.6	24.2	46.2	23.6	26.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	12.0	46.0	6.0	32.0	23.0	35.0	18.0	20.0				
Max Q Clear Time (g_c+I1), s	7.4	23.1	7.9	6.4	17.4	13.0	17.5	22.0				
Green Ext Time (p_c), s	0.1	8.1	0.0	0.5	0.8	4.7	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay	35.3											
HCM 6th LOS	D											







2040 Total AM
31: Intersection A

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	5.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	12	0	21	36	1
Future Vol, veh/h	8	12	0	21	36	1
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	13	0	23	40	1
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	93	12	0	0	23	0
Stage 1	12	-	-	-	-	-
Stage 2	81	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	907	1069	-	-	1592	-
Stage 1	1011	-	-	-	-	-
Stage 2	942	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	884	1069	-	-	1592	-
Mov Cap-2 Maneuver	884	-	-	-	-	-
Stage 1	1011	-	-	-	-	-
Stage 2	918	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	8.7	0		7.1		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	986	1592	-	
HCM Lane V/C Ratio	-	-	0.023	0.025	-	
HCM Control Delay (s)	-	-	8.7	7.3	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-	

2040 Total AM
32: Hawes Rd & Intersection B

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	47	26	9	610	353	17
Future Vol, veh/h	47	26	9	610	353	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	100	0	100	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	29	10	678	392	19
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	751	196	411	0	-	0
Stage 1	392	-	-	-	-	-
Stage 2	359	-	-	-	-	-
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	*347	812	1144	-	-	-
Stage 1	*652	-	-	-	-	-
Stage 2	*800	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	*344	812	1144	-	-	-
Mov Cap-2 Maneuver	*344	-	-	-	-	-
Stage 1	*646	-	-	-	-	-
Stage 2	*800	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.6	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1144	-	344	812	-	-
HCM Lane V/C Ratio	0.009	-	0.152	0.036	-	-
HCM Control Delay (s)	8.2	-	17.3	9.6	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0	-	0.5	0.1	-	-
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

2040 Total AM
33: Intersection C

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	3.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↱	
Traffic Vol, veh/h	8	24	10	3	8	7
Future Vol, veh/h	8	24	10	3	8	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	27	11	3	9	8
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	36	0	48	23
Stage 1	-	-	-	-	23	-
Stage 2	-	-	-	-	25	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1575	-	962	1054
Stage 1	-	-	-	-	1000	-
Stage 2	-	-	-	-	998	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1575	-	955	1054
Mov Cap-2 Maneuver	-	-	-	-	955	-
Stage 1	-	-	-	-	1000	-
Stage 2	-	-	-	-	991	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	5.6		8.7		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	999	-	-	1575	-	
HCM Lane V/C Ratio	0.017	-	-	0.007	-	
HCM Control Delay (s)	8.7	-	-	7.3	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

2040 Total AM
34: Intersection D & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	0.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑	↑	↑	↑↑↑↑	↑	↑
Traffic Vol, veh/h	620	25	21	844	62	52
Future Vol, veh/h	620	25	21	844	62	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	150	-	150	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	689	28	23	938	69	58
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	717	0	1110	345
Stage 1	-	-	-	-	689	-
Stage 2	-	-	-	-	421	-
Critical Hdwy	-	-	5.34	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	-	-	3.12	-	3.82	3.92
Pot Cap-1 Maneuver	-	-	862	-	*634	*796
Stage 1	-	-	-	-	*708	-
Stage 2	-	-	-	-	*758	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	862	-	*616	*796
Mov Cap-2 Maneuver	-	-	-	-	*616	-
Stage 1	-	-	-	-	*708	-
Stage 2	-	-	-	-	*737	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.2		10.8	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	616	796	-	-	862	-
HCM Lane V/C Ratio	0.112	0.073	-	-	0.027	-
HCM Control Delay (s)	11.6	9.9	-	-	9.3	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.4	0.2	-	-	0.1	-
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

2040 Total AM
35: Intersection E & Elliot Rd

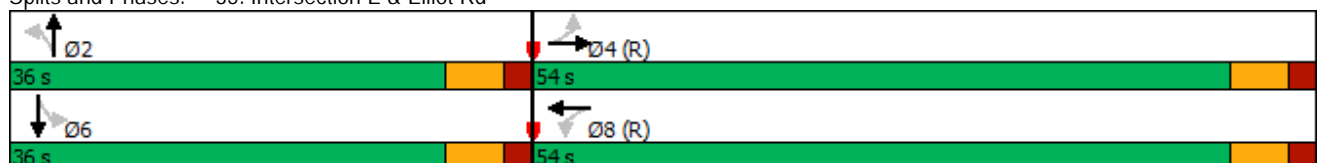
17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	Max	C-Max	Max	C-Max
Maximum Split (s)	36	54	36	54
Maximum Split (%)	40.0%	60.0%	40.0%	60.0%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	26	62	26	62
End Time (s)	62	26	62	26
Yield/Force Off (s)	56	20	56	20
Yield/Force Off 170(s)	45	9	45	9
Local Start Time (s)	54	0	54	0
Local Yield (s)	84	48	84	48
Local Yield 170(s)	73	37	73	37





















Intersection Summary	
Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	50
Offset: 62 (69%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 35: Intersection E & Elliot Rd



2040 Total AM
35: Intersection E & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	799	12	54	665	44	22	2	128	97	2	27
Future Volume (veh/h)	15	799	12	54	665	44	22	2	128	97	2	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	17	888	13	60	739	49	24	2	142	108	2	30
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	389	2765	40	410	2610	172	520	7	522	412	33	500
Arrive On Green	1.00	1.00	1.00	0.53	0.53	0.53	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	687	5185	76	618	4893	323	1377	22	1566	1244	100	1500
Grp Volume(v), veh/h	17	583	318	60	513	275	24	0	144	108	0	32
Grp Sat Flow(s),veh/h/ln	687	1702	1857	618	1702	1812	1377	0	1588	1244	0	1600
Q Serve(g_s), s	0.4	0.0	0.0	4.5	7.5	7.5	1.1	0.0	6.0	6.3	0.0	1.2
Cycle Q Clear(g_c), s	7.9	0.0	0.0	4.5	7.5	7.5	2.3	0.0	6.0	12.3	0.0	1.2
Prop In Lane	1.00		0.04	1.00		0.18	1.00		0.99	1.00		0.94
Lane Grp Cap(c), veh/h	389	1815	990	410	1815	967	520	0	529	412	0	533
V/C Ratio(X)	0.04	0.32	0.32	0.15	0.28	0.28	0.05	0.00	0.27	0.26	0.00	0.06
Avail Cap(c_a), veh/h	389	1815	990	410	1815	967	520	0	529	412	0	533
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.98	0.96	0.96	0.96	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.6	0.0	0.0	10.9	11.5	11.6	21.2	0.0	22.0	26.5	0.0	20.4
Incr Delay (d2), s/veh	0.2	0.5	0.8	0.7	0.4	0.7	0.2	0.0	1.3	1.5	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.2	0.4	1.1	4.6	5.1	0.7	0.0	4.3	3.6	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.8	0.5	0.8	11.6	11.9	12.3	21.4	0.0	23.3	28.0	0.0	20.6
LnGrp LOS	A	A	A	B	B	B	C	A	C	C	A	C
Approach Vol, veh/h	918			848			168			140		
Approach Delay, s/veh	0.6			12.0			23.0			26.3		
Approach LOS	A			B			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	36.0			54.0			36.0			54.0		
Change Period (Y+Rc), s	6.0			6.0			6.0			6.0		
Max Green Setting (Gmax), s	30.0			48.0			30.0			48.0		
Max Q Clear Time (g_c+I1), s	8.0			9.9			14.3			9.5		
Green Ext Time (p_c), s	0.9			6.3			0.4			6.0		
Intersection Summary												
HCM 6th Ctrl Delay	8.8											
HCM 6th LOS	A											

2040 Total AM
36: Intersection F

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	2	3	4	5	8
Movement	NBR	WBL	EBT	NBL	WBTL
Lead/Lag		Lead	Lag		
Lead-Lag Optimize		Yes	Yes		
Recall Mode	Max	None	C-Max	Max	C-Max
Maximum Split (s)	24	29	37	24	66
Maximum Split (%)	26.7%	32.2%	41.1%	26.7%	73.3%
Minimum Split (s)	24	11	24	24	24
Yellow Time (s)	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)			7		7
Flash Dont Walk (s)			11		11
Dual Entry	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	4	28	57	4	28
End Time (s)	28	57	4	28	4
Yield/Force Off (s)	22	51	88	22	88
Yield/Force Off 170(s)	22	51	77	22	77
Local Start Time (s)	37	61	0	37	61
Local Yield (s)	55	84	31	55	31
Local Yield 170(s)	55	84	20	55	20







Intersection Summary	
Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 57 (63%), Referenced to phase 4:EBT and 8:WBTL, Start of Green	

Splits and Phases: 36: Intersection F






2040 Total AM
36: Intersection F

17-1390 Hawes Crossing TIA
05/17/2019

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↑	↑↑↑	↑	↑
Traffic Volume (veh/h)	1091	17	283	1123	11	96
Future Volume (veh/h)	1091	17	283	1123	11	96
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1212	19	314	1248	12	107
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2531	40	429	3404	356	317
Arrive On Green	0.49	0.49	0.11	0.67	0.20	0.20
Sat Flow, veh/h	5347	81	1781	5274	1781	1585
Grp Volume(v), veh/h	797	434	314	1248	12	107
Grp Sat Flow(s),veh/h/ln	1702	1856	1781	1702	1781	1585
Q Serve(g_s), s	14.1	14.1	7.3	9.7	0.5	5.2
Cycle Q Clear(g_c), s	14.1	14.1	7.3	9.7	0.5	5.2
Prop In Lane		0.04	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1663	907	429	3404	356	317
V/C Ratio(X)	0.48	0.48	0.73	0.37	0.03	0.34
Avail Cap(c_a), veh/h	1663	907	686	3404	356	317
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.77	0.77	0.66	0.66	1.00	1.00
Uniform Delay (d), s/veh	15.4	15.4	12.4	6.6	29.0	30.9
Incr Delay (d2), s/veh	0.8	1.4	1.6	0.2	0.2	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.2	9.0	4.4	4.8	0.4	3.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	16.1	16.8	14.0	6.8	29.2	33.8
LnGrp LOS	B	B	B	A	C	C
Approach Vol, veh/h	1231			1562	119	
Approach Delay, s/veh	16.3			8.3	33.3	
Approach LOS	B			A	C	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		24.0	16.0	50.0		66.0
Change Period (Y+Rc), s		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s		18.0	23.0	31.0		60.0
Max Q Clear Time (g_c+I1), s		7.2	9.3	16.1		11.7
Green Ext Time (p_c), s		0.2	0.7	6.6		10.8
Intersection Summary						
HCM 6th Ctrl Delay			12.7			
HCM 6th LOS			B			

2040 Total AM
37: Intersection G

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	3.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	28	40	14	10	14
Future Vol, veh/h	5	28	40	14	10	14
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	31	44	16	11	16
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	90	52	0	0	60	0
Stage 1	52	-	-	-	-	-
Stage 2	38	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	910	1016	-	-	1544	-
Stage 1	970	-	-	-	-	-
Stage 2	984	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	904	1016	-	-	1544	-
Mov Cap-2 Maneuver	904	-	-	-	-	-
Stage 1	970	-	-	-	-	-
Stage 2	977	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	8.7	0		3.1		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	997	1544	-	
HCM Lane V/C Ratio	-	-	0.037	0.007	-	
HCM Control Delay (s)	-	-	8.7	7.3	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

2040 Total AM
38: Intersection H

17-1390 Hawes Crossing TIA
05/17/2019

Intersection												
Int Delay, s/veh	5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	14	5	4	12	16	2	12	11	33	2	4	5
Future Vol, veh/h	14	5	4	12	16	2	12	11	33	2	4	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	6	4	13	18	2	13	12	37	2	4	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	78	86	7	73	71	31	10	0	0	49	0	0
Stage 1	11	11	-	57	57	-	-	-	-	-	-	-
Stage 2	67	75	-	16	14	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	911	804	1075	918	819	1043	1610	-	-	1558	-	-
Stage 1	1010	886	-	955	847	-	-	-	-	-	-	-
Stage 2	943	833	-	1004	884	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	887	797	1075	903	812	1043	1610	-	-	1558	-	-
Mov Cap-2 Maneuver	887	797	-	903	812	-	-	-	-	-	-	-
Stage 1	1002	885	-	947	840	-	-	-	-	-	-	-
Stage 2	914	826	-	993	883	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	9.2			9.4			1.6			1.3		
HCM LOS	A			A								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1610	-	-	892	859	1558	-	-
HCM Lane V/C Ratio	0.008	-	-	0.029	0.039	0.001	-	-
HCM Control Delay (s)	7.3	0	-	9.2	9.4	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

2040 Total AM
39: Intersection I

17-1390 Hawes Crossing TIA
05/17/2019

Intersection												
Int Delay, s/veh	4.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	53	15	1	1	12	3	4	66	4	4	23	18
Future Vol, veh/h	53	15	1	1	12	3	4	66	4	4	23	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	59	17	1	1	13	3	4	73	4	4	26	20
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	135	129	36	136	137	75	46	0	0	77	0	0
Stage 1	44	44	-	83	83	-	-	-	-	-	-	-
Stage 2	91	85	-	53	54	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	836	762	1037	835	754	986	1562	-	-	1522	-	-
Stage 1	970	858	-	925	826	-	-	-	-	-	-	-
Stage 2	916	824	-	960	850	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	818	757	1037	817	749	986	1562	-	-	1522	-	-
Mov Cap-2 Maneuver	818	757	-	817	749	-	-	-	-	-	-	-
Stage 1	967	855	-	922	824	-	-	-	-	-	-	-
Stage 2	895	822	-	937	847	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	9.9		9.7			0.4			0.7			
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1562	-	-	806	789	1522	-	-				
HCM Lane V/C Ratio	0.003	-	-	0.095	0.023	0.003	-	-				
HCM Control Delay (s)	7.3	0	-	9.9	9.7	7.4	0	-				
HCM Lane LOS	A	A	-	A	A	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	0	-	-				

2040 Total AM
40: Intersection J

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	62	28	62	28
Maximum Split (%)	68.9%	31.1%	68.9%	31.1%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	22	84	22	84
End Time (s)	84	22	84	22
Yield/Force Off (s)	78	16	78	16
Yield/Force Off 170(s)	67	5	67	5
Local Start Time (s)	0	62	0	62
Local Yield (s)	56	84	56	84
Local Yield 170(s)	45	73	45	73





















Intersection Summary	
Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	50
Offset: 22 (24%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 40: Intersection J









2040 Total AM
40: Intersection J

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	21	21	10	7	13	16	866	30	20	604	10
Future Volume (veh/h)	33	21	21	10	7	13	16	866	30	20	604	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	37	23	23	11	8	14	18	962	33	22	671	11
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	146	51	51	126	37	64	658	2828	97	495	2887	47
Arrive On Green	0.06	0.06	0.06	0.06	0.06	0.06	0.81	0.81	0.81	0.81	0.81	0.81
Sat Flow, veh/h	1390	858	858	1360	610	1068	759	3505	120	566	3578	59
Grp Volume(v), veh/h	37	0	46	11	0	22	18	488	507	22	333	349
Grp Sat Flow(s),veh/h/ln	1390	0	1716	1360	0	1678	759	1777	1849	566	1777	1860
Q Serve(g_s), s	2.3	0.0	2.3	0.7	0.0	1.1	0.5	6.6	6.6	1.0	4.0	4.0
Cycle Q Clear(g_c), s	3.5	0.0	2.3	3.0	0.0	1.1	4.5	6.6	6.6	7.5	4.0	4.0
Prop In Lane	1.00		0.50	1.00		0.64	1.00		0.07	1.00		0.03
Lane Grp Cap(c), veh/h	146	0	103	126	0	100	658	1434	1492	495	1434	1500
V/C Ratio(X)	0.25	0.00	0.45	0.09	0.00	0.22	0.03	0.34	0.34	0.04	0.23	0.23
Avail Cap(c_a), veh/h	402	0	419	377	0	410	658	1434	1492	495	1434	1500
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.96	0.96	0.96
Uniform Delay (d), s/veh	42.0	0.0	40.9	42.3	0.0	40.3	2.6	2.3	2.3	3.3	2.1	2.1
Incr Delay (d2), s/veh	0.9	0.0	3.0	0.3	0.0	1.1	0.1	0.6	0.6	0.2	0.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.5	0.0	1.9	0.4	0.0	0.9	0.1	2.0	2.0	0.2	1.2	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.9	0.0	43.9	42.6	0.0	41.4	2.7	3.0	2.9	3.5	2.4	2.4
LnGrp LOS	D	A	D	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h	83			33			1013			704		
Approach Delay, s/veh	43.4			41.8			2.9			2.5		
Approach LOS	D			D			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	78.6			11.4			78.6			11.4		
Change Period (Y+Rc), s	6.0			6.0			6.0			6.0		
Max Green Setting (Gmax), s	56.0			22.0			56.0			22.0		
Max Q Clear Time (g_c+I1), s	8.6			5.5			9.5			5.0		
Green Ext Time (p_c), s	7.1			0.2			4.4			0.1		
Intersection Summary												
HCM 6th Ctrl Delay 5.3												
HCM 6th LOS A												





2040 Total AM
41: Intersection K

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	28	4	40	240	12
Future Vol, veh/h	30	28	4	40	240	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	31	4	44	267	13
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	304	274	280	0	-	0
Stage 1	274	-	-	-	-	-
Stage 2	30	-	-	-	-	-
Critical Hdwy	6.63	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	676	764	1281	-	-	-
Stage 1	771	-	-	-	-	-
Stage 2	989	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	674	764	1281	-	-	-
Mov Cap-2 Maneuver	682	-	-	-	-	-
Stage 1	769	-	-	-	-	-
Stage 2	989	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.3	0.7		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1281	-	682	764	-	-
HCM Lane V/C Ratio	0.003	-	0.049	0.041	-	-
HCM Control Delay (s)	7.8	-	10.6	9.9	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	0.1	-	-

2040 Total AM
42: Intersection L

17-1390 Hawes Crossing TIA
05/17/2019

Intersection												
Int Delay, s/veh	6.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	5	5	7	14	4	22	21	19	1	7	0
Future Vol, veh/h	1	5	5	7	14	4	22	21	19	1	7	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	6	6	8	16	4	24	23	21	1	8	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	20	0	0	12	0	0	49	47	9	67	48	18
Stage 1	-	-	-	-	-	-	11	11	-	34	34	-
Stage 2	-	-	-	-	-	-	38	36	-	33	14	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1596	-	-	1607	-	-	951	845	1073	926	844	1061
Stage 1	-	-	-	-	-	-	1010	886	-	982	867	-
Stage 2	-	-	-	-	-	-	977	865	-	983	884	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1596	-	-	1607	-	-	940	840	1073	884	839	1061
Mov Cap-2 Maneuver	-	-	-	-	-	-	940	840	-	884	839	-
Stage 1	-	-	-	-	-	-	1009	885	-	981	863	-
Stage 2	-	-	-	-	-	-	963	861	-	937	883	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.7			2			9.1			9.3		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	938	1596	-	-	1607	-	-	844				
HCM Lane V/C Ratio	0.073	0.001	-	-	0.005	-	-	0.011				
HCM Control Delay (s)	9.1	7.3	0	-	7.3	0	-	9.3				
HCM Lane LOS	A	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0				

2040 Total AM
43: Intersection M

17-1390 Hawes Crossing TIA
05/17/2019

Intersection												
Int Delay, s/veh	4.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	35	14	2	15	3	5	47	12	9	16	7
Future Vol, veh/h	2	35	14	2	15	3	5	47	12	9	16	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	39	16	2	17	3	6	52	13	10	18	8









Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	123	119	22	141	117	59	26	0	0	65	0	0
Stage 1	42	42	-	71	71	-	-	-	-	-	-	-
Stage 2	81	77	-	70	46	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	852	771	1055	829	773	1007	1588	-	-	1537	-	-
Stage 1	972	860	-	939	836	-	-	-	-	-	-	-
Stage 2	927	831	-	940	857	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	828	763	1055	778	764	1007	1588	-	-	1537	-	-
Mov Cap-2 Maneuver	828	763	-	778	764	-	-	-	-	-	-	-
Stage 1	968	854	-	935	833	-	-	-	-	-	-	-
Stage 2	902	828	-	878	851	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	9.7		9.7		0.6		2.1	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1588	-	-	828	794	1537	-	-
HCM Lane V/C Ratio	0.003	-	-	0.068	0.028	0.007	-	-
HCM Control Delay (s)	7.3	0	-	9.7	9.7	7.4	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

2040 Total AM
44: Intersection N

17-1390 Hawes Crossing TIA
05/17/2019

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	52	7	26	10	2	6	9	795	35	10	674	16
Future Vol, veh/h	52	7	26	10	2	6	9	795	35	10	674	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	250	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	58	8	29	11	2	7	10	883	39	11	749	18

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1243	1722	384	1324	1712	461	767	0	0	922	0	0
Stage 1	780	780	-	923	923	-	-	-	-	-	-	-
Stage 2	463	942	-	401	789	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	131	88	614	114	90	547	842	-	-	736	-	-
Stage 1	354	404	-	290	347	-	-	-	-	-	-	-
Stage 2	548	340	-	597	400	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	124	86	614	99	88	547	842	-	-	736	-	-
Mov Cap-2 Maneuver	124	86	-	99	88	-	-	-	-	-	-	-
Stage 1	350	398	-	287	343	-	-	-	-	-	-	-
Stage 2	531	336	-	549	394	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	42.9	34.7	0.1	0.1
HCM LOS	E	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	842	-	-	124	267	99	237	736	-	-
HCM Lane V/C Ratio	0.012	-	-	0.466	0.137	0.112	0.038	0.015	-	-
HCM Control Delay (s)	9.3	-	-	57.1	20.6	45.9	20.8	10	-	-
HCM Lane LOS	A	-	-	F	C	E	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	2.1	0.5	0.4	0.1	0	-	-




2040 Total AM
45: Intersection O

17-1390 Hawes Crossing TIA
05/17/2019

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	16	3	4	5	6	1	47	12	3	26	4
Future Vol, veh/h	11	16	3	4	5	6	1	47	12	3	26	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	18	3	4	6	7	1	52	13	3	29	4
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	104	104	31	109	100	59	33	0	0	65	0	0
Stage 1	37	37	-	61	61	-	-	-	-	-	-	-
Stage 2	67	67	-	48	39	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	876	786	1043	870	790	1007	1579	-	-	1537	-	-
Stage 1	978	864	-	950	844	-	-	-	-	-	-	-
Stage 2	943	839	-	965	862	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	864	784	1043	850	788	1007	1579	-	-	1537	-	-
Mov Cap-2 Maneuver	864	784	-	850	788	-	-	-	-	-	-	-
Stage 1	977	862	-	949	843	-	-	-	-	-	-	-
Stage 2	930	838	-	940	860	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	9.5		9.2			0.1			0.7			
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1579	-	-	833	882	1537	-	-				
HCM Lane V/C Ratio	0.001	-	-	0.04	0.019	0.002	-	-				
HCM Control Delay (s)	7.3	0	-	9.5	9.2	7.3	0	-				
HCM Lane LOS	A	A	-	A	A	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-				







2040 Total AM
46: Intersection P

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	5.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	19	6	36	56	1
Future Vol, veh/h	14	19	6	36	56	1
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	21	7	40	62	1
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	152	27	0	0	47	0
Stage 1	27	-	-	-	-	-
Stage 2	125	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	840	1048	-	-	1560	-
Stage 1	996	-	-	-	-	-
Stage 2	901	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	806	1048	-	-	1560	-
Mov Cap-2 Maneuver	806	-	-	-	-	-
Stage 1	996	-	-	-	-	-
Stage 2	865	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9	0		7.3		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	930	1560	-	
HCM Lane V/C Ratio	-	-	0.039	0.04	-	
HCM Control Delay (s)	-	-	9	7.4	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-	

2040 Total AM
47: Intersection Q

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	65	49	17	671	791	25
Future Vol, veh/h	65	49	17	671	791	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	250	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	72	54	19	746	879	28
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1304	454	907	0	-	0
Stage 1	893	-	-	-	-	-
Stage 2	411	-	-	-	-	-
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	*255	553	746	-	-	-
Stage 1	*360	-	-	-	-	-
Stage 2	*779	-	-	-	-	-
Platoon blocked, %	1			-	-	-
Mov Cap-1 Maneuver	*248	553	746	-	-	-
Mov Cap-2 Maneuver	*248	-	-	-	-	-
Stage 1	*351	-	-	-	-	-
Stage 2	*779	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	19.7	0.2		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	746	-	248	553	-	-
HCM Lane V/C Ratio	0.025	-	0.291	0.098	-	-
HCM Control Delay (s)	10	-	25.4	12.2	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.2	0.3	-	-
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

2040 Total AM
48: Intersection R

17-1390 Hawes Crossing TIA
05/17/2019

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	22	2	5	7	7	1	47	6	2	29	2
Future Vol, veh/h	6	22	2	5	7	7	1	47	6	2	29	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	24	2	6	8	8	1	52	7	2	32	2
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	103	98	33	108	96	56	34	0	0	59	0	0
Stage 1	37	37	-	58	58	-	-	-	-	-	-	-
Stage 2	66	61	-	50	38	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	877	792	1041	871	794	1011	1578	-	-	1545	-	-
Stage 1	978	864	-	954	847	-	-	-	-	-	-	-
Stage 2	945	844	-	963	863	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	862	790	1041	847	792	1011	1578	-	-	1545	-	-
Mov Cap-2 Maneuver	862	790	-	847	792	-	-	-	-	-	-	-
Stage 1	977	863	-	953	846	-	-	-	-	-	-	-
Stage 2	928	843	-	933	862	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	9.6			9.2			0.1			0.4		
HCM LOS	A			A								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1578	-	-	817	877	1545	-	-				
HCM Lane V/C Ratio	0.001	-	-	0.041	0.024	0.001	-	-				
HCM Control Delay (s)	7.3	0	-	9.6	9.2	7.3	0	-				
HCM Lane LOS	A	A	-	A	A	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-				




2040 Total AM
49: Intersection S

17-1390 Hawes Crossing TIA
05/17/2019

Intersection												
Int Delay, s/veh	5.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		<div>↕</div>			<div>↕</div>			<div>↕</div>			<div>↕</div>	
Traffic Vol, veh/h	6	30	3	1	6	24	1	24	1	6	26	4
Future Vol, veh/h	6	30	3	1	6	24	1	24	1	6	26	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	33	3	1	7	27	1	27	1	7	29	4
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	92	75	31	93	77	28	33	0	0	28	0	0
Stage 1	45	45	-	30	30	-	-	-	-	-	-	-
Stage 2	47	30	-	63	47	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	892	815	1043	891	813	1047	1579	-	-	1585	-	-
Stage 1	969	857	-	987	870	-	-	-	-	-	-	-
Stage 2	967	870	-	948	856	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	860	810	1043	856	808	1047	1579	-	-	1585	-	-
Mov Cap-2 Maneuver	860	810	-	856	808	-	-	-	-	-	-	-
Stage 1	968	853	-	986	869	-	-	-	-	-	-	-
Stage 2	934	869	-	904	852	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	9.6			8.8			0.3			1.2		
HCM LOS	A			A								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1579	-	-	832	984	1585	-	-				
HCM Lane V/C Ratio	0.001	-	-	0.052	0.035	0.004	-	-				
HCM Control Delay (s)	7.3	0	-	9.6	8.8	7.3	0	-				
HCM Lane LOS	A	A	-	A	A	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-				

2040 Total AM
50: Intersection T

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	5.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	26	12	16	54	4
Future Vol, veh/h	8	26	12	16	54	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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	29	13	18	60	4
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	146	22	0	0	31	0
Stage 1	22	-	-	-	-	-
Stage 2	124	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	846	1055	-	-	1582	-
Stage 1	1001	-	-	-	-	-
Stage 2	902	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	814	1055	-	-	1582	-
Mov Cap-2 Maneuver	814	-	-	-	-	-
Stage 1	1001	-	-	-	-	-
Stage 2	868	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	8.8	0		6.9		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	986	1582	-	
HCM Lane V/C Ratio	-	-	0.038	0.038	-	
HCM Control Delay (s)	-	-	8.8	7.4	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-	

2040 Total AM
51: Intersection U









17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	26	24	26	24
Maximum Split (%)	52.0%	48.0%	52.0%	48.0%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	26	0	26
End Time (s)	26	0	26	0
Yield/Force Off (s)	20	44	20	44
Yield/Force Off 170(s)	9	33	9	33
Local Start Time (s)	0	26	0	26
Local Yield (s)	20	44	20	44
Local Yield 170(s)	9	33	9	33





















Intersection Summary	
Cycle Length	50
Control Type	Actuated-Coordinated
Natural Cycle	50
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 51: Intersection U

 Ø2 (R)  26 s	 Ø4  24 s
 Ø6 (R)  26 s	 Ø8  24 s

2040 Total AM
51: Intersection U

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	0	50	65	0	23	30	572	28	26	854	13
Future Volume (veh/h)	41	0	50	65	0	23	30	572	28	26	854	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	46	0	56	72	0	26	33	636	31	29	949	14
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	290	0	190	262	0	190	442	2208	108	574	2295	34
Arrive On Green	0.12	0.00	0.12	0.12	0.00	0.12	0.64	0.64	0.64	0.64	0.64	0.64
Sat Flow, veh/h	1385	0	1585	1348	0	1585	583	3449	168	769	3585	53
Grp Volume(v), veh/h	46	0	56	72	0	26	33	327	340	29	470	493
Grp Sat Flow(s),veh/h/ln	1385	0	1585	1348	0	1585	583	1777	1840	769	1777	1861
Q Serve(g_s), s	1.5	0.0	1.6	2.6	0.0	0.7	1.5	4.1	4.1	0.9	6.5	6.5
Cycle Q Clear(g_c), s	2.3	0.0	1.6	4.2	0.0	0.7	7.9	4.1	4.1	4.9	6.5	6.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.09	1.00		0.03
Lane Grp Cap(c), veh/h	290	0	190	262	0	190	442	1137	1178	574	1137	1191
V/C Ratio(X)	0.16	0.00	0.29	0.27	0.00	0.14	0.07	0.29	0.29	0.05	0.41	0.41
Avail Cap(c_a), veh/h	622	0	571	586	0	571	442	1137	1178	574	1137	1191
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.92	0.92	0.92	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.7	0.0	20.1	22.0	0.0	19.7	6.3	4.0	4.0	5.1	4.4	4.4
Incr Delay (d2), s/veh	0.3	0.0	0.9	0.6	0.0	0.3	0.3	0.6	0.6	0.2	1.1	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	0.0	1.1	1.4	0.0	0.5	0.3	1.4	1.4	0.2	2.3	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.0	0.0	20.9	22.5	0.0	20.0	6.6	4.6	4.5	5.2	5.5	5.5
LnGrp LOS	C	A	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h	102			98			700			992		
Approach Delay, s/veh	20.9			21.9			4.6			5.5		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	38.0			12.0			38.0			12.0		
Change Period (Y+Rc), s	6.0			6.0			6.0			6.0		
Max Green Setting (Gmax), s	20.0			18.0			20.0			18.0		
Max Q Clear Time (g_c+I1), s	9.9			4.3			8.5			6.2		
Green Ext Time (p_c), s	2.9			0.3			4.5			0.2		
Intersection Summary												
HCM 6th Ctrl Delay	6.9											
HCM 6th LOS	A											

2040 Total AM
52: Intersection V

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	3.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↱	↱
Traffic Vol, veh/h	37	5	14	25	3	23
Future Vol, veh/h	37	5	14	25	3	23
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	6	16	28	3	26
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	47	0	104	44
Stage 1	-	-	-	-	44	-
Stage 2	-	-	-	-	60	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1560	-	894	1026
Stage 1	-	-	-	-	978	-
Stage 2	-	-	-	-	963	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1560	-	885	1026
Mov Cap-2 Maneuver	-	-	-	-	885	-
Stage 1	-	-	-	-	978	-
Stage 2	-	-	-	-	953	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		2.6		8.7	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	1007	-	-	1560	-	
HCM Lane V/C Ratio	0.029	-	-	0.01	-	
HCM Control Delay (s)	8.7	-	-	7.3	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

2040 Total AM
53: Intersection W

17-1390 Hawes Crossing TIA
05/17/2019

Intersection												
Int Delay, s/veh	5.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	6	34	15	4	0	57	20	5	0	31	0
Future Vol, veh/h	6	6	34	15	4	0	57	20	5	0	31	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	7	38	17	4	0	63	22	6	0	34	0
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	187	188	34	208	185	25	34	0	0	28	0	0
Stage 1	34	34	-	151	151	-	-	-	-	-	-	-
Stage 2	153	154	-	57	34	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	774	707	1039	749	709	1051	1578	-	-	1585	-	-
Stage 1	982	867	-	851	772	-	-	-	-	-	-	-
Stage 2	849	770	-	955	867	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	746	678	1039	694	680	1051	1578	-	-	1585	-	-
Mov Cap-2 Maneuver	746	678	-	694	680	-	-	-	-	-	-	-
Stage 1	942	867	-	816	740	-	-	-	-	-	-	-
Stage 2	809	738	-	913	867	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	9.1			10.4			5.1			0		
HCM LOS	A			B								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1578	-	-	927	691	1585	-	-				
HCM Lane V/C Ratio	0.04	-	-	0.055	0.031	-	-	-				
HCM Control Delay (s)	7.4	0	-	9.1	10.4	0	-	-				
HCM Lane LOS	A	A	-	A	B	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.1	0	-	-				

2040 Total AM
54: Intersection X

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	Max	C-Max	Max	C-Max
Maximum Split (s)	29	61	29	61
Maximum Split (%)	32.2%	67.8%	32.2%	67.8%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	40	69	40	69
End Time (s)	69	40	69	40
Yield/Force Off (s)	63	34	63	34
Yield/Force Off 170(s)	52	23	52	23
Local Start Time (s)	61	0	61	0
Local Yield (s)	84	55	84	55
Local Yield 170(s)	73	44	73	44





















Intersection Summary	
Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	50
Offset: 69 (77%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 54: Intersection X



2040 Total AM
54: Intersection X

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	586	5	16	721	115	15	11	45	55	4	47
Future Volume (veh/h)	39	586	5	16	721	115	15	11	45	55	4	47
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	43	651	6	18	801	128	17	12	50	61	4	52
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	365	2205	20	488	1875	300	388	81	337	383	29	380
Arrive On Green	0.61	0.61	0.61	0.61	0.61	0.61	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	602	3608	33	777	3069	490	1348	316	1317	1340	114	1488
Grp Volume(v), veh/h	43	321	336	18	464	465	17	0	62	61	0	56
Grp Sat Flow(s),veh/h/ln	602	1777	1864	777	1777	1782	1348	0	1633	1340	0	1603
Q Serve(g_s), s	3.6	7.7	7.7	1.0	12.4	12.4	0.9	0.0	2.6	3.3	0.0	2.4
Cycle Q Clear(g_c), s	16.0	7.7	7.7	8.7	12.4	12.4	3.3	0.0	2.6	6.0	0.0	2.4
Prop In Lane	1.00		0.02	1.00		0.28	1.00		0.81	1.00		0.93
Lane Grp Cap(c), veh/h	365	1086	1139	488	1086	1089	388	0	417	383	0	410
V/C Ratio(X)	0.12	0.30	0.30	0.04	0.43	0.43	0.04	0.00	0.15	0.16	0.00	0.14
Avail Cap(c_a), veh/h	365	1086	1139	488	1086	1089	388	0	417	383	0	410
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.4	8.3	8.3	10.4	9.2	9.2	27.1	0.0	25.9	28.2	0.0	25.8
Incr Delay (d2), s/veh	0.7	0.7	0.7	0.1	1.2	1.2	0.2	0.0	0.8	0.9	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	4.7	4.9	0.3	7.6	7.6	0.5	0.0	2.0	2.1	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.1	9.0	9.0	10.5	10.4	10.4	27.3	0.0	26.7	29.1	0.0	26.5
LnGrp LOS	B	A	A	B	B	B	C	A	C	C	A	C
Approach Vol, veh/h	700			947			79			117		
Approach Delay, s/veh	9.3			10.4			26.8			27.9		
Approach LOS	A			B			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	29.0			61.0			29.0			61.0		
Change Period (Y+Rc), s	6.0			6.0			6.0			6.0		
Max Green Setting (Gmax), s	23.0			55.0			23.0			55.0		
Max Q Clear Time (g_c+I1), s	5.3			18.0			8.0			14.4		
Green Ext Time (p_c), s	0.3			4.4			0.4			6.5		
Intersection Summary												
HCM 6th Ctrl Delay	11.8											
HCM 6th LOS	B											

2040 Total AM
55: Intersection Y

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	2	3	4	6	7	8
Movement	NBTL	WBL	EBTL	SBTL	EBL	WBTL
Lead/Lag		Lead	Lag		Lead	Lag
Lead-Lag Optimize		Yes	Yes		Yes	Yes
Recall Mode	Max	None	C-Max	Max	None	C-Max
Maximum Split (s)	30	13	47	30	13	47
Maximum Split (%)	33.3%	14.4%	52.2%	33.3%	14.4%	52.2%
Minimum Split (s)	24	11	24	24	11	24
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)	7		7	7		7
Flash Dont Walk (s)	11		11	11		11
Dual Entry	Yes	No	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	47	77	0	47	77	0
End Time (s)	77	0	47	77	0	47
Yield/Force Off (s)	71	84	41	71	84	41
Yield/Force Off 170(s)	60	84	30	60	84	30
Local Start Time (s)	47	77	0	47	77	0
Local Yield (s)	71	84	41	71	84	41
Local Yield 170(s)	60	84	30	60	84	30

Intersection Summary






















Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 55: Intersection Y

Ø2	Ø3	Ø4 (R)
30 s	13 s	47 s
Ø6	Ø7	Ø8 (R)
30 s	13 s	47 s






2040 Total AM
55: Intersection Y

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	506	87	17	692	5	90	0	9	7	0	37
Future Volume (veh/h)	32	506	87	17	692	5	90	0	9	7	0	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	36	562	97	19	769	6	100	0	10	8	0	41
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	393	1821	812	444	1808	14	418	0	423	448	0	423
Arrive On Green	0.03	0.51	0.51	0.02	0.50	0.50	0.27	0.00	0.27	0.27	0.00	0.27
Sat Flow, veh/h	1781	3554	1585	1781	3614	28	1366	0	1585	1405	0	1585
Grp Volume(v), veh/h	36	562	97	19	378	397	100	0	10	8	0	41
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1865	1366	0	1585	1405	0	1585
Q Serve(g_s), s	0.9	8.2	2.9	0.5	12.2	12.2	5.4	0.0	0.4	0.4	0.0	1.8
Cycle Q Clear(g_c), s	0.9	8.2	2.9	0.5	12.2	12.2	7.1	0.0	0.4	0.8	0.0	1.8
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	393	1821	812	444	889	933	418	0	423	448	0	423
V/C Ratio(X)	0.09	0.31	0.12	0.04	0.43	0.43	0.24	0.00	0.02	0.02	0.00	0.10
Avail Cap(c_a), veh/h	473	1821	812	545	889	933	418	0	423	448	0	423
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.9	12.7	11.4	10.7	14.3	14.3	27.5	0.0	24.4	24.6	0.0	24.8
Incr Delay (d2), s/veh	0.1	0.4	0.3	0.0	1.5	1.4	1.4	0.0	0.1	0.1	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.6	5.4	1.7	0.3	8.2	8.5	3.4	0.0	0.3	0.2	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.0	13.2	11.7	10.8	15.8	15.7	28.9	0.0	24.5	24.7	0.0	25.3
LnGrp LOS	B	B	B	B	B	B	C	A	C	C	A	C
Approach Vol, veh/h	695				794				110			
Approach Delay, s/veh	12.8				15.6				28.5			
Approach LOS	B				B				C			
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	30.0		7.9	52.1		30.0		9.0	51.0			
Change Period (Y+Rc), s	6.0		6.0	6.0		6.0		6.0	6.0			
Max Green Setting (Gmax), s	24.0		7.0	41.0		24.0		7.0	41.0			
Max Q Clear Time (g_c+I1), s	9.1		2.5	10.2		3.8		2.9	14.2			
Green Ext Time (p_c), s	0.2		0.0	4.0		0.2		0.0	4.6			
Intersection Summary												
HCM 6th Ctrl Delay	15.6											
HCM 6th LOS	B											

2040 Total AM
56: Intersection Z

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	33	481	671	7	4	17
Future Vol, veh/h	33	481	671	7	4	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	100	-	-	-	-	250
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	534	746	8	4	19
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	754	0	-	0	1091	377
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	341	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	852	-	-	-	*305	621
Stage 1	-	-	-	-	*427	-
Stage 2	-	-	-	-	*855	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	852	-	-	-	*291	621
Mov Cap-2 Maneuver	-	-	-	-	*384	-
Stage 1	-	-	-	-	*409	-
Stage 2	-	-	-	-	*855	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.6	0		11.7		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	852	-	-	-	384	621
HCM Lane V/C Ratio	0.043	-	-	-	0.012	0.03
HCM Control Delay (s)	9.4	-	-	-	14.5	11
HCM Lane LOS	A	-	-	-	B	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0	0.1
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

2040 Total AM
57: Intersection AA

17-1390 Hawes Crossing TIA
05/17/2019

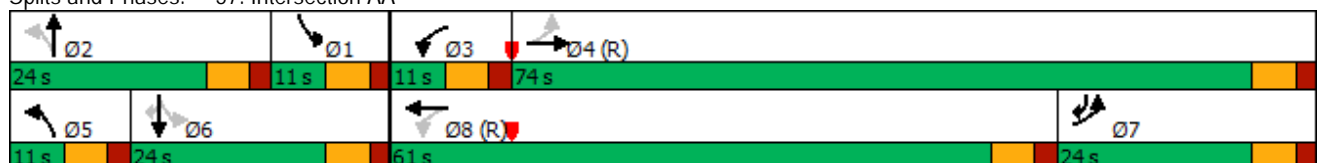


Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	EBL	WBTL
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	None	None	C-Max
Maximum Split (s)	11	24	11	74	11	24	24	61
Maximum Split (%)	9.2%	20.0%	9.2%	61.7%	9.2%	20.0%	20.0%	50.8%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	71	47	82	93	47	58	23	82
End Time (s)	82	71	93	47	58	82	47	23
Yield/Force Off (s)	76	65	87	41	52	76	41	17
Yield/Force Off 170(s)	76	54	87	30	52	65	41	6
Local Start Time (s)	98	74	109	0	74	85	50	109
Local Yield (s)	103	92	114	68	79	103	68	44
Local Yield 170(s)	103	81	114	57	79	92	68	33

Intersection Summary






















Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 93 (78%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 57: Intersection AA



2040 Total AM
57: Intersection AA

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	164	1340	119	22	1740	31	16	0	3	10	0	55
Future Volume (veh/h)	164	1340	119	22	1740	31	16	0	3	10	0	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	182	1489	132	24	1933	34	18	0	3	11	0	61
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	405	2933	260	166	2368	42	202	0	238	174	269	512
Arrive On Green	0.18	0.61	0.61	0.02	0.46	0.46	0.02	0.00	0.15	0.01	0.00	0.14
Sat Flow, veh/h	1781	4775	423	1781	5167	91	1781	0	1585	1781	1870	1585
Grp Volume(v), veh/h	182	1061	560	24	1273	694	18	0	3	11	0	61
Grp Sat Flow(s),veh/h/ln	1781	1702	1794	1781	1702	1854	1781	0	1585	1781	1870	1585
Q Serve(g_s), s	4.7	21.0	21.0	0.9	38.8	38.9	1.1	0.0	0.2	0.0	0.0	0.3
Cycle Q Clear(g_c), s	4.7	21.0	21.0	0.9	38.8	38.9	1.1	0.0	0.2	0.0	0.0	0.3
Prop In Lane	1.00		0.24	1.00		0.05	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	405	2091	1102	166	1560	850	202	0	238	174	269	512
V/C Ratio(X)	0.45	0.51	0.51	0.14	0.82	0.82	0.09	0.00	0.01	0.06	0.00	0.12
Avail Cap(c_a), veh/h	405	2091	1102	200	1560	850	243	0	238	225	281	521
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.3	13.0	13.0	22.5	28.1	28.1	47.3	0.0	43.4	51.5	0.0	16.4
Incr Delay (d2), s/veh	0.8	0.9	1.7	0.4	4.8	8.6	0.2	0.0	0.1	0.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.3	12.6	13.4	0.7	22.3	25.1	0.9	0.0	0.1	0.6	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.0	13.9	14.6	22.9	33.0	36.7	47.5	0.0	43.5	51.6	0.0	16.5
LnGrp LOS	D	B	B	C	C	D	D	A	D	D	A	B
Approach Vol, veh/h	1803			1991			21			72		
Approach Delay, s/veh	16.8			34.1			46.9			21.9		
Approach LOS	B			C			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.5	24.0	8.8	79.7	8.3	23.3	27.5	61.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	5.0	18.0	5.0	68.0	5.0	18.0	18.0	55.0				
Max Q Clear Time (g_c+I1), s	2.0	2.2	2.9	23.0	3.1	2.3	6.7	40.9				
Green Ext Time (p_c), s	0.0	0.0	0.0	17.4	0.0	0.1	0.4	10.1				
Intersection Summary												
HCM 6th Ctrl Delay	26.0											
HCM 6th LOS	C											

2040 Total AM
58: Intersection AB

17-1390 Hawes Crossing TIA
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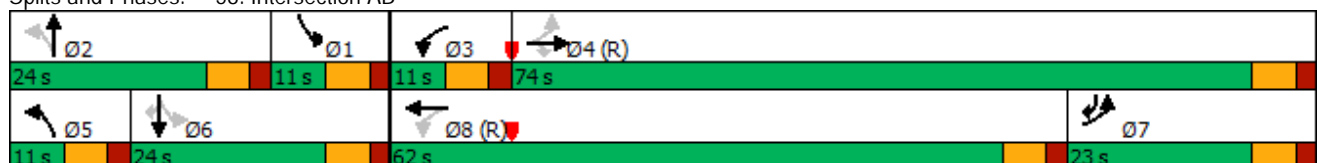


Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	EBL	WBTL
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	None	None	C-Max
Maximum Split (s)	11	24	11	74	11	24	23	62
Maximum Split (%)	9.2%	20.0%	9.2%	61.7%	9.2%	20.0%	19.2%	51.7%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	82	58	93	104	58	69	35	93
End Time (s)	93	82	104	58	69	93	58	35
Yield/Force Off (s)	87	76	98	52	63	87	52	29
Yield/Force Off 170(s)	87	65	98	41	63	76	52	18
Local Start Time (s)	98	74	109	0	74	85	51	109
Local Yield (s)	103	92	114	68	79	103	68	45
Local Yield 170(s)	103	81	114	57	79	92	68	34

Intersection Summary























Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 104 (87%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 58: Intersection AB








2040 Total AM
58: Intersection AB

17-1390 Hawes Crossing TIA
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	158	1168	150	9	1632	11	20	0	1	4	0	63
Future Volume (veh/h)	158	1168	150	9	1632	11	20	0	1	4	0	63
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	176	1298	167	10	1813	12	22	0	1	4	0	70
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	473	3232	1003	182	2442	16	203	0	238	157	250	494
Arrive On Green	0.18	0.63	0.63	0.02	0.93	0.93	0.02	0.00	0.15	0.01	0.00	0.13
Sat Flow, veh/h	1781	5106	1585	1781	5234	35	1781	0	1585	1781	1870	1585
Grp Volume(v), veh/h	176	1298	167	10	1179	646	22	0	1	4	0	70
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1864	1781	0	1585	1781	1870	1585
Q Serve(g_s), s	0.0	15.0	5.2	0.4	9.0	9.0	1.3	0.0	0.1	0.0	0.0	0.4
Cycle Q Clear(g_c), s	0.0	15.0	5.2	0.4	9.0	9.0	1.3	0.0	0.1	0.0	0.0	0.4
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	473	3232	1003	182	1589	870	203	0	238	157	250	494
V/C Ratio(X)	0.37	0.40	0.17	0.05	0.74	0.74	0.11	0.00	0.00	0.03	0.00	0.14
Avail Cap(c_a), veh/h	473	3232	1003	235	1589	870	238	0	238	222	281	520
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.72	0.72	0.72	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.3	10.8	9.0	20.4	2.4	2.4	47.4	0.0	43.4	52.4	0.0	17.1
Incr Delay (d2), s/veh	0.5	0.4	0.4	0.1	2.3	4.1	0.2	0.0	0.0	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.6	8.9	3.1	0.3	2.9	4.0	1.1	0.0	0.0	0.2	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.8	11.2	9.4	20.5	4.7	6.6	47.7	0.0	43.4	52.5	0.0	17.2
LnGrp LOS	C	B	A	C	A	A	D	A	D	D	A	B
Approach Vol, veh/h	1641				1835				23		74	
Approach Delay, s/veh	12.9				5.5				47.5		19.1	
Approach LOS	B				A				D		B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.6	24.0	7.4	82.0	8.6	22.0	27.4	62.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	5.0	18.0	5.0	68.0	5.0	18.0	17.0	56.0				
Max Q Clear Time (g_c+I1), s	2.0	2.1	2.4	17.0	3.3	2.4	2.0	11.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	12.6	0.0	0.1	0.4	18.0				
Intersection Summary												
HCM 6th Ctrl Delay	9.4											
HCM 6th LOS	A											









2040 Total AM
59: Intersection AC

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	2.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	5	14	3	37	104
Future Vol, veh/h	8	5	14	3	37	104
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	6	16	3	41	116
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	216	18	0	0	19	0
Stage 1	18	-	-	-	-	-
Stage 2	198	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	772	1061	-	-	1597	-
Stage 1	1005	-	-	-	-	-
Stage 2	835	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	752	1061	-	-	1597	-
Mov Cap-2 Maneuver	752	-	-	-	-	-
Stage 1	1005	-	-	-	-	-
Stage 2	813	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	9.3	0	1.9			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 752 1061	1597	-		
HCM Lane V/C Ratio	-	- 0.012 0.005	0.026	-		
HCM Control Delay (s)	-	- 9.8 8.4	7.3	-		
HCM Lane LOS	-	- A A	A	-		
HCM 95th %tile Q(veh)	-	- 0 0	0.1	-		

2040 Total AM
60: Intersection AD

17-1390 Hawes Crossing TIA
05/17/2019

Intersection												
Int Delay, s/veh	4.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	1	3	36	8	2	19	6	5	13	44	26
Future Vol, veh/h	5	1	3	36	8	2	19	6	5	13	44	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	1	3	40	9	2	21	7	6	14	49	29







Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	150	147	64	146	158	10	78	0	0	13	0	0
Stage 1	92	92	-	52	52	-	-	-	-	-	-	-
Stage 2	58	55	-	94	106	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	818	744	1000	823	734	1071	1520	-	-	1606	-	-
Stage 1	915	819	-	961	852	-	-	-	-	-	-	-
Stage 2	954	849	-	913	807	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	795	727	1000	805	717	1071	1520	-	-	1606	-	-
Mov Cap-2 Maneuver	795	727	-	805	717	-	-	-	-	-	-	-
Stage 1	902	812	-	948	840	-	-	-	-	-	-	-
Stage 2	929	837	-	901	800	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	9.3			9.7			4.7			1.1		
HCM LOS	A			A								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1520	-	-	795	914	805	768	1606	-	-
HCM Lane V/C Ratio	0.014	-	-	0.007	0.005	0.05	0.014	0.009	-	-
HCM Control Delay (s)	7.4	-	-	9.6	9	9.7	9.8	7.3	-	-
HCM Lane LOS	A	-	-	A	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0.2	0	0	-	-






2040 Total AM
61: Intersection AE

17-1390 Hawes Crossing TIA
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Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	6	23	1457	1116	91
Future Vol, veh/h	9	6	23	1457	1116	91
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	250	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	7	26	1619	1240	101
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1940	620	1341	0	-	0
Stage 1	1240	-	-	-	-	-
Stage 2	700	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	223	*675	682	-	-	-
Stage 1	632	-	-	-	-	-
Stage 2	413	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	215	*675	682	-	-	-
Mov Cap-2 Maneuver	215	-	-	-	-	-
Stage 1	608	-	-	-	-	-
Stage 2	413	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	17.7	0.2		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	682	-	215	675	-	-
HCM Lane V/C Ratio	0.037	-	0.047	0.01	-	-
HCM Control Delay (s)	10.5	-	22.6	10.4	-	-
HCM Lane LOS	B	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0	-	-
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon







2040 Total AM
62: Intersection AF

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	7.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	37	45	5	5	6	8
Future Vol, veh/h	37	45	5	5	6	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	50	6	6	7	9
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	32	9	0	0	12	0
Stage 1	9	-	-	-	-	-
Stage 2	23	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	982	1073	-	-	1607	-
Stage 1	1014	-	-	-	-	-
Stage 2	1000	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	978	1073	-	-	1607	-
Mov Cap-2 Maneuver	978	-	-	-	-	-
Stage 1	1014	-	-	-	-	-
Stage 2	996	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	8.6	0	3.1			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 978 1073	1607	-		
HCM Lane V/C Ratio	-	- 0.042 0.047	0.004	-		
HCM Control Delay (s)	-	- 8.8 8.5	7.2	-		
HCM Lane LOS	-	- A A	A	-		
HCM 95th %tile Q(veh)	-	- 0.1 0.1	0	-		

2040 Total AM
63: Intersection AG

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	10	42	1465	992	76
Future Vol, veh/h	6	10	42	1465	992	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	11	47	1628	1102	84
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1889	593	1186	0	-	0
Stage 1	1144	-	-	-	-	-
Stage 2	745	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	*378	*697	758	-	-	-
Stage 1	*643	-	-	-	-	-
Stage 2	*604	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	*354	*697	758	-	-	-
Mov Cap-2 Maneuver	*354	-	-	-	-	-
Stage 1	*603	-	-	-	-	-
Stage 2	*604	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.1	0.3		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	758	-	354	697	-	-
HCM Lane V/C Ratio	0.062	-	0.019	0.016	-	-
HCM Control Delay (s)	10.1	-	15.4	10.2	-	-
HCM Lane LOS	B	-	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.1	0	-	-
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon






2040 Total AM
64: Intersection AH

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	6.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↘	↗	↘	↗
Traffic Vol, veh/h	5	13	6	34	94	45
Future Vol, veh/h	5	13	6	34	94	45
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	-	250	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	14	7	38	104	50
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	20	0	65	13
Stage 1	-	-	-	-	13	-
Stage 2	-	-	-	-	52	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1596	-	941	1067
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	970	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1596	-	937	1067
Mov Cap-2 Maneuver	-	-	-	-	937	-
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	966	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1.1		9	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	937	1067	-	-	1596	-
HCM Lane V/C Ratio	0.111	0.047	-	-	0.004	-
HCM Control Delay (s)	9.3	8.5	-	-	7.3	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0	-







2040 Total AM
65: Intersection AI

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	34	16	35	28	4	5
Future Vol, veh/h	34	16	35	28	4	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	18	39	31	4	6
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	70	0	-	0	149	55
Stage 1	-	-	-	-	55	-
Stage 2	-	-	-	-	94	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1531	-	-	-	843	1012
Stage 1	-	-	-	-	968	-
Stage 2	-	-	-	-	930	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1531	-	-	-	822	1012
Mov Cap-2 Maneuver	-	-	-	-	822	-
Stage 1	-	-	-	-	944	-
Stage 2	-	-	-	-	930	-
Approach	EB	WB		SB		
HCM Control Delay, s	5	0		9		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1531	-	-	-	822	1012
HCM Lane V/C Ratio	0.025	-	-	-	0.005	0.005
HCM Control Delay (s)	7.4	-	-	-	9.4	8.6
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0	0






2040 Total AM
66: Intersection AJ

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	10	73	1494	921	26
Future Vol, veh/h	4	10	73	1494	921	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	11	81	1660	1023	29
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1864	526	1052	0	-	0
Stage 1	1038	-	-	-	-	-
Stage 2	826	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	*452	425	369	-	-	-
Stage 1	*229	-	-	-	-	-
Stage 2	*582	-	-	-	-	-
Platoon blocked, %	1	-	-	-	-	-
Mov Cap-1 Maneuver	*352	425	369	-	-	-
Mov Cap-2 Maneuver	*352	-	-	-	-	-
Stage 1	*179	-	-	-	-	-
Stage 2	*582	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.2	0.8		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	369	-	352	425	-	-
HCM Lane V/C Ratio	0.22	-	0.013	0.026	-	-
HCM Control Delay (s)	17.5	-	15.4	13.7	-	-
HCM Lane LOS	C	-	C	B	-	-
HCM 95th %tile Q(veh)	0.8	-	0	0.1	-	-
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

2040 Total AM
67: Intersection AK

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	92	369	587	83	11	13
Future Vol, veh/h	92	369	587	83	11	13
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	-	-	-	250	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	102	410	652	92	12	14
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	744	0	-	0	1107	372
Stage 1	-	-	-	-	698	-
Stage 2	-	-	-	-	409	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	859	-	-	-	204	625
Stage 1	-	-	-	-	455	-
Stage 2	-	-	-	-	639	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	859	-	-	-	180	625
Mov Cap-2 Maneuver	-	-	-	-	180	-
Stage 1	-	-	-	-	401	-
Stage 2	-	-	-	-	639	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.9	0		18.1		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	859	-	-	-	180	625
HCM Lane V/C Ratio	0.119	-	-	-	0.068	0.023
HCM Control Delay (s)	9.8	-	-	-	26.5	10.9
HCM Lane LOS	A	-	-	-	D	B
HCM 95th %tile Q(veh)	0.4	-	-	-	0.2	0.1

2040 Total PM
1: Sossaman Rd & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	27	25	14	24	12	40	14	24
Maximum Split (%)	30.0%	27.8%	15.6%	26.7%	13.3%	44.4%	15.6%	26.7%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	24	51	76	0	24	36	76	0
End Time (s)	51	76	0	24	36	76	0	24
Yield/Force Off (s)	45	70	84	18	30	70	84	18
Yield/Force Off 170(s)	45	59	84	7	30	59	84	7
Local Start Time (s)	24	51	76	0	24	36	76	0
Local Yield (s)	45	70	84	18	30	70	84	18
Local Yield 170(s)	45	59	84	7	30	59	84	7

Intersection Summary
























Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 1: Sossaman Rd & Guadalupe Rd

Ø1	Ø2	Ø3	Ø4 (R)
27 s	25 s	14 s	24 s
Ø5	Ø6	Ø7	Ø8 (R)
12 s	40 s	14 s	24 s

2040 Total PM
1: Sossaman Rd & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	493	225	210	299	149	170	531	190	338	938	135
Future Volume (veh/h)	230	493	225	210	299	149	170	531	190	338	938	135
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	256	548	250	233	332	166	189	590	211	376	1042	150
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	362	693	307	268	1021	317	255	969	432	473	1343	599
Arrive On Green	0.09	0.20	0.20	0.03	0.07	0.07	0.07	0.27	0.27	0.17	0.38	0.38
Sat Flow, veh/h	1781	3465	1534	1781	5106	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	256	538	260	233	332	166	189	590	211	376	1042	150
Grp Sat Flow(s),veh/h/ln	1781	1702	1594	1781	1702	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	8.0	13.5	14.0	8.0	5.6	9.1	6.0	13.0	10.1	12.8	23.2	5.9
Cycle Q Clear(g_c), s	8.0	13.5	14.0	8.0	5.6	9.1	6.0	13.0	10.1	12.8	23.2	5.9
Prop In Lane	1.00		0.96	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	362	681	319	268	1021	317	255	969	432	473	1343	599
V/C Ratio(X)	0.71	0.79	0.82	0.87	0.33	0.52	0.74	0.61	0.49	0.80	0.78	0.25
Avail Cap(c_a), veh/h	362	681	319	268	1021	317	255	969	432	582	1343	599
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.79	0.79	0.79	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.6	34.2	34.4	31.3	36.2	37.9	26.1	28.5	27.5	18.8	24.7	19.2
Incr Delay (d2), s/veh	6.2	9.1	20.1	24.5	0.8	6.0	8.8	2.3	3.1	6.2	4.5	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.7	10.2	11.2	5.1	4.3	7.5	6.0	8.9	6.8	9.3	14.8	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.7	43.3	54.5	55.8	37.1	43.9	34.9	30.8	30.6	25.0	29.1	20.2
LnGrp LOS	C	D	D	E	D	D	C	C	C	C	C	C
Approach Vol, veh/h	1054				731				990		1568	
Approach Delay, s/veh	44.0				44.6				31.5		27.3	
Approach LOS	D				D				C		C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.5	30.5	14.0	24.0	12.0	40.0	14.0	24.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	21.0	19.0	8.0	18.0	6.0	34.0	8.0	18.0				
Max Q Clear Time (g_c+I1), s	14.8	15.0	10.0	16.0	8.0	25.2	10.0	11.1				
Green Ext Time (p_c), s	0.6	1.6	0.0	1.0	0.0	4.6	0.0	1.4				
Intersection Summary												
HCM 6th Ctrl Delay			35.2									
HCM 6th LOS			D									
Notes												

2040 Total PM
2: Farnsworth Dr & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	Max	C-Max	Max	C-Max
Maximum Split (s)	28	62	28	62
Maximum Split (%)	31.1%	68.9%	31.1%	68.9%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	7	35	7	35
End Time (s)	35	7	35	7
Yield/Force Off (s)	29	1	29	1
Yield/Force Off 170(s)	18	80	18	80
Local Start Time (s)	62	0	62	0
Local Yield (s)	84	56	84	56
Local Yield 170(s)	73	45	73	45





















Intersection Summary	
Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 35 (39%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 2: Farnsworth Dr & Guadalupe Rd



2040 Total PM
2: Farnsworth Dr & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	881	220	90	549	25	45	5	140	150	30	20
Future Volume (veh/h)	80	881	220	90	549	25	45	5	140	150	30	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No				No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	89	979	244	100	610	28	50	6	156	167	33	22
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	492	2537	631	364	3114	142	377	14	375	275	256	171
Arrive On Green	1.00	1.00	1.00	0.21	0.21	0.21	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	790	4078	1014	456	5005	229	1349	59	1535	1224	1047	698
Grp Volume(v), veh/h	89	817	406	100	414	224	50	0	162	167	0	55
Grp Sat Flow(s),veh/h/ln	790	1702	1688	456	1702	1829	1349	0	1594	1224	0	1745
Q Serve(g_s), s	2.0	0.0	0.0	16.9	9.1	9.1	2.7	0.0	7.7	12.0	0.0	2.2
Cycle Q Clear(g_c), s	11.1	0.0	0.0	16.9	9.1	9.1	4.9	0.0	7.7	19.7	0.0	2.2
Prop In Lane	1.00		0.60	1.00		0.12	1.00		0.96	1.00		0.40
Lane Grp Cap(c), veh/h	492	2118	1050	364	2118	1138	377	0	390	275	0	426
V/C Ratio(X)	0.18	0.39	0.39	0.27	0.20	0.20	0.13	0.00	0.42	0.61	0.00	0.13
Avail Cap(c_a), veh/h	492	2118	1050	364	2118	1138	377	0	390	275	0	426
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.64	0.64	0.64	0.87	0.87	0.87	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.9	0.0	0.0	20.2	17.1	17.1	28.4	0.0	28.6	36.9	0.0	26.5
Incr Delay (d2), s/veh	0.5	0.3	0.7	1.6	0.2	0.3	0.7	0.0	3.2	9.6	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.1	0.2	0.4	3.9	6.3	6.8	1.7	0.0	5.8	7.4	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.4	0.3	0.7	21.8	17.3	17.5	29.2	0.0	31.8	46.5	0.0	27.1
LnGrp LOS	A	A	A	C	B	B	C	A	C	D	A	C
Approach Vol, veh/h	1312			738				212			222	
Approach Delay, s/veh	0.5			18.0				31.2			41.7	
Approach LOS	A			B				C			D	
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	28.0			62.0			28.0			62.0		
Change Period (Y+Rc), s	6.0			6.0			6.0			6.0		
Max Green Setting (Gmax), s	22.0			56.0			22.0			56.0		
Max Q Clear Time (g_c+I1), s	9.7			13.1			21.7			18.9		
Green Ext Time (p_c), s	0.8			10.8			0.0			5.9		
Intersection Summary												
HCM 6th Ctrl Delay	12.0											
HCM 6th LOS	B											

2040 Total PM
3: Guadalupe Rd & Hawes Rd

17-1390 Hawes Crossing TIA
05/17/2019

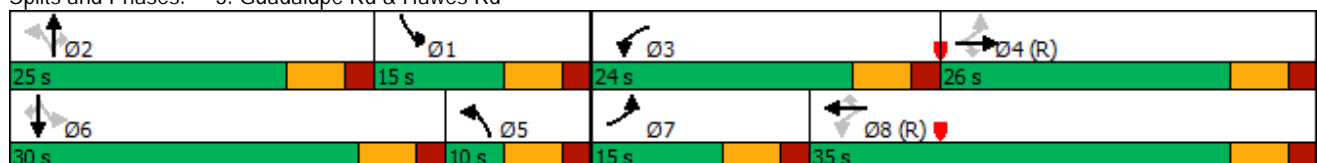


Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	EBL	WBTL
Lead/Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	15	25	24	26	10	30	15	35
Maximum Split (%)	16.7%	27.8%	26.7%	28.9%	11.1%	33.3%	16.7%	38.9%
Minimum Split (s)	11	24	11	24	10	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	4	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	44	19	59	83	49	19	59	74
End Time (s)	59	44	83	19	59	49	74	19
Yield/Force Off (s)	53	38	77	13	53	43	68	13
Yield/Force Off 170(s)	53	27	77	2	53	32	68	2
Local Start Time (s)	51	26	66	0	56	26	66	81
Local Yield (s)	60	45	84	20	60	50	75	20
Local Yield 170(s)	60	34	84	9	60	39	75	9

Intersection Summary

























Cycle Length 90
Control Type Actuated-Coordinated
Natural Cycle 80
Offset: 83 (92%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Splits and Phases: 3: Guadalupe Rd & Hawes Rd



2040 Total PM
3: Guadalupe Rd & Hawes Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	390	221	424	691	165	162	317	168	125	317	335
Future Volume (veh/h)	50	390	221	424	691	165	162	317	168	125	317	335
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	56	433	246	471	768	183	180	352	187	139	352	372
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	286	1137	353	544	1945	604	253	750	335	355	948	423
Arrive On Green	0.01	0.07	0.07	0.20	0.38	0.38	0.04	0.21	0.21	0.10	0.27	0.27
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	56	433	246	471	768	183	180	352	187	139	352	372
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	2.2	7.3	10.5	18.0	9.9	4.5	0.0	7.8	5.5	0.0	7.3	15.4
Cycle Q Clear(g_c), s	2.2	7.3	10.5	18.0	9.9	4.5	0.0	7.8	5.5	0.0	7.3	15.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	286	1137	353	544	1945	604	253	750	335	355	948	423
V/C Ratio(X)	0.20	0.38	0.70	0.87	0.39	0.30	0.71	0.47	0.56	0.39	0.37	0.88
Avail Cap(c_a), veh/h	390	1137	353	544	1945	604	254	750	335	356	948	423
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.9	35.8	23.1	20.1	20.3	7.6	38.0	31.1	10.6	32.9	26.9	18.3
Incr Delay (d2), s/veh	0.3	0.9	9.9	13.7	0.6	1.3	8.8	2.1	6.6	0.7	1.1	22.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.6	5.6	8.6	13.5	6.7	4.6	7.7	6.1	6.9	4.9	5.4	12.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.2	36.7	33.0	33.8	20.9	8.9	46.8	33.2	17.2	33.6	28.0	40.5
LnGrp LOS	C	D	C	C	C	A	D	C	B	C	C	D
Approach Vol, veh/h		735			1422			719			863	
Approach Delay, s/veh		34.6			23.6			32.4			34.3	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.0	25.0	24.0	26.0	10.0	30.0	9.8	40.3				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	9.0	19.0	18.0	20.0	4.0	24.0	9.0	29.0				
Max Q Clear Time (g_c+I1), s	2.0	9.8	20.0	12.5	2.0	17.4	4.2	11.9				
Green Ext Time (p_c), s	0.2	1.8	0.0	2.1	0.1	1.9	0.0	5.1				
Intersection Summary												
HCM 6th Ctrl Delay			29.9									
HCM 6th LOS			C									

2040 Total PM
4: Loop 202 SB Ramps & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019



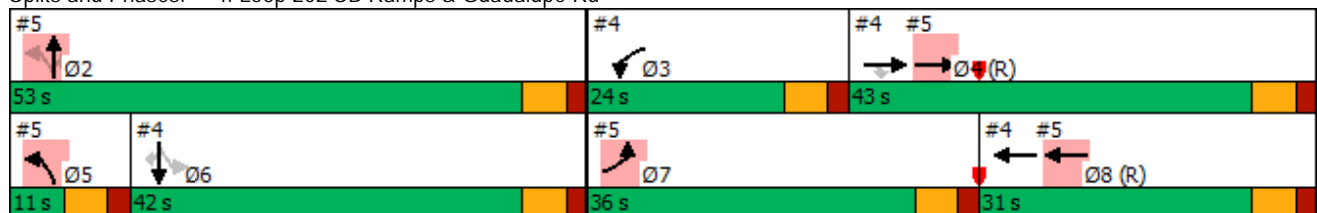
Phase Number	2	3	4	5	6	7	8
Node Number	5	4	4	5	4	5	4
Movement	NBTL	WBL	EBT	NBL	SBTL	EBL	WBT
Lead/Lag		Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	53	24	43	11	42	36	31
Maximum Split (%)	44.2%	20.0%	35.8%	9.2%	35.0%	30.0%	25.8%
Minimum Split (s)	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0
Walk Time (s)	7		7		7		7
Flash Dont Walk (s)	11		11		11		11
Dual Entry	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	87	20	44	87	98	20	56
End Time (s)	20	44	87	98	20	56	87
Yield/Force Off (s)	14	38	81	92	14	50	81
Yield/Force Off 170(s)	3	38	70	92	3	50	70
Local Start Time (s)	31	84	108	31	42	84	0
Local Yield (s)	78	102	25	36	78	114	25
Local Yield 170(s)	67	102	14	36	67	114	14

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90













Offset: 56 (47%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Splits and Phases: 4: Loop 202 SB Ramps & Guadalupe Rd



2040 Total PM
4: Loop 202 SB Ramps & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↗	↗↗	↑↑↑					↗	↕	↗
Traffic Volume (vph)	0	1128	270	405	701	0	0	0	0	760	0	319
Future Volume (vph)	0	1128	270	405	701	0	0	0	0	760	0	319
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	6.0
Lane Util. Factor		0.81	1.00	0.97	0.91					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.99	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		7544	1583	3433	5085					1681	1601	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		7544	1583	3433	5085					1681	1601	1504
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1253	300	450	779	0	0	0	0	844	0	354
RTOR Reduction (vph)	0	0	207	0	0	0	0	0	0	0	134	223
Lane Group Flow (vph)	0	1253	93	450	779	0	0	0	0	439	306	96
Turn Type		NA	Perm	Prot	NA					Perm	NA	Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		37.3	37.3	17.7	25.6					36.0	36.0	36.0
Effective Green, g (s)		37.3	37.3	17.7	25.6					36.0	36.0	36.0
Actuated g/C Ratio		0.31	0.31	0.15	0.21					0.30	0.30	0.30
Clearance Time (s)		6.0	6.0	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
Lane Grp Cap (vph)		2344	492	506	1084					504	480	451
v/s Ratio Prot		c0.17		c0.13	c0.15							
v/s Ratio Perm			0.06							c0.26	0.19	0.06
v/c Ratio		0.53	0.19	0.89	0.72					0.87	0.64	0.21
Uniform Delay, d1		34.2	30.3	50.2	43.9					39.8	36.4	31.4
Progression Factor		1.00	1.00	1.44	0.34					1.00	1.00	1.00
Incremental Delay, d2		0.9	0.9	14.7	3.4					18.3	6.4	1.1
Delay (s)		35.1	31.1	87.0	18.3					58.1	42.7	32.5
Level of Service		D	C	F	B					E	D	C
Approach Delay (s)		34.3			43.4			0.0			45.6	
Approach LOS		C			D			A			D	
Intersection Summary												
HCM 2000 Control Delay			40.5			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				24.0		
Intersection Capacity Utilization			67.6%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

2040 Total PM
5: Loop 202 NB Ramps & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019



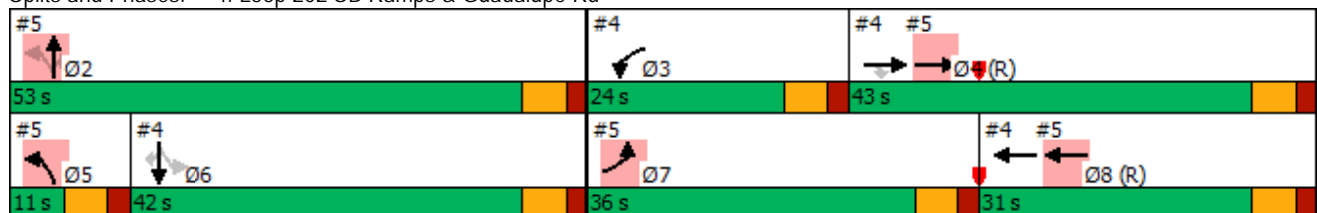
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Node Number	5	4	4	5	4	5	4
Movement	NBTL	WBL	EBT	NBL	SBTL	EBL	WBT
Lead/Lag		Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	53	24	43	11	42	36	31
Maximum Split (%)	44.2%	20.0%	35.8%	9.2%	35.0%	30.0%	25.8%
Minimum Split (s)	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0
Walk Time (s)	7		7		7		7
Flash Dont Walk (s)	11		11		11		11
Dual Entry	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	87	20	44	87	98	20	56
End Time (s)	20	44	87	98	20	56	87
Yield/Force Off (s)	14	38	81	92	14	50	81
Yield/Force Off 170(s)	3	38	70	92	3	50	70
Local Start Time (s)	31	84	108	31	42	84	0
Local Yield (s)	78	102	25	36	78	114	25
Local Yield 170(s)	67	102	14	36	67	114	14

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90




















Offset: 56 (47%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Splits and Phases: 4: Loop 202 SB Ramps & Guadalupe Rd



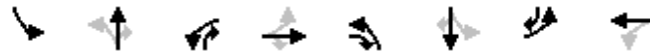
2040 Total PM
5: Loop 202 NB Ramps & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	703	1185	0	0	926	820	180	0	250	0	0	0
Future Volume (vph)	703	1185	0	0	926	820	180	0	250	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	0.91			0.81	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.88	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	3433	5085			7544	1583	1681	1478	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	3433	5085			7544	1583	1681	1478	1504			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	781	1317	0	0	1029	911	200	0	278	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	83	93	0	0	0
Lane Group Flow (vph)	781	1317	0	0	1029	911	168	74	60	0	0	0
Turn Type	Prot	NA			NA	Free	pm+pt	NA	Perm			
Protected Phases	7	4			8		5	2				
Permitted Phases						Free	2		2			
Actuated Green, G (s)	29.4	37.3			25.6	120.0	47.0	47.0	47.0			
Effective Green, g (s)	29.4	37.3			25.6	120.0	47.0	47.0	47.0			
Actuated g/C Ratio	0.24	0.31			0.21	1.00	0.39	0.39	0.39			
Clearance Time (s)	6.0	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			
Lane Grp Cap (vph)	841	1580			1609	1583	658	578	589			
v/s Ratio Prot	c0.23	c0.26			0.14		0.01	0.01				
v/s Ratio Perm						c0.58	0.09	0.04	0.04			
v/c Ratio	0.93	0.83			0.64	0.58	0.26	0.13	0.10			
Uniform Delay, d1	44.3	38.5			43.0	0.0	24.7	23.4	23.1			
Progression Factor	1.58	0.65			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	13.2	4.1			2.0	1.5	0.2	0.1	0.3			
Delay (s)	83.2	29.2			45.0	1.5	24.9	23.5	23.5			
Level of Service	F	C			D	A	C	C	C			
Approach Delay (s)		49.3			24.6			24.0			0.0	
Approach LOS		D			C			C			A	
Intersection Summary												
HCM 2000 Control Delay			36.0				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)			24.0		
Intersection Capacity Utilization			67.6%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

2040 Total PM
6: Power Rd & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	19	28	19	24	11	36	19	24
Maximum Split (%)	21.1%	31.1%	21.1%	26.7%	12.2%	40.0%	21.1%	26.7%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	71	0	28	47	71	82	28	47
End Time (s)	0	28	47	71	82	28	47	71
Yield/Force Off (s)	84	22	41	65	76	22	41	65
Yield/Force Off 170(s)	84	11	41	54	76	11	41	54
Local Start Time (s)	71	0	28	47	71	82	28	47
Local Yield (s)	84	22	41	65	76	22	41	65
Local Yield 170(s)	84	11	41	54	76	11	41	54

Intersection Summary
























Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 6: Power Rd & Elliot Rd

Ø1	Ø2 (R)	Ø3	Ø4
19 s	28 s	19 s	24 s
Ø5	Ø6 (R)	Ø7	Ø8
11 s	36 s	19 s	24 s

2040 Total PM
6: Power Rd & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	395	534	300	292	361	140	165	790	436	270	1575	430
Future Volume (veh/h)	395	534	300	292	361	140	165	790	436	270	1575	430
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	439	593	333	324	401	156	183	878	484	300	1750	478
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	419	1021	405	395	734	272	179	1262	621	369	1702	757
Arrive On Green	0.14	0.20	0.20	0.14	0.20	0.20	0.06	0.25	0.25	0.14	0.33	0.33
Sat Flow, veh/h	1781	5106	1585	1781	3669	1361	1781	5106	1585	1781	5106	1585
Grp Volume(v), veh/h	439	593	333	324	371	186	183	878	484	300	1750	478
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1625	1781	1702	1585	1781	1702	1585
Q Serve(g_s), s	13.0	9.5	17.8	13.0	8.8	9.3	5.0	14.1	22.2	10.7	30.0	20.3
Cycle Q Clear(g_c), s	13.0	9.5	17.8	13.0	8.8	9.3	5.0	14.1	22.2	10.7	30.0	20.3
Prop In Lane	1.00		1.00	1.00		0.84	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	419	1021	405	395	681	325	179	1262	621	369	1702	757
V/C Ratio(X)	1.05	0.58	0.82	0.82	0.54	0.57	1.02	0.70	0.78	0.81	1.03	0.63
Avail Cap(c_a), veh/h	419	1021	405	395	681	325	179	1262	621	374	1702	757
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.1	32.6	31.6	24.8	32.3	32.5	31.3	30.8	24.0	21.5	30.0	17.6
Incr Delay (d2), s/veh	56.7	0.8	12.8	11.6	0.8	2.1	73.3	3.2	9.4	12.8	29.4	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	14.4	6.8	12.4	10.2	6.3	6.6	8.7	9.7	14.8	9.1	22.7	11.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	85.8	33.4	44.3	36.4	33.1	34.7	104.6	34.0	33.4	34.3	59.4	21.5
LnGrp LOS	F	C	D	D	C	C	F	C	C	C	F	C
Approach Vol, veh/h	1365				881				1545			
Approach Delay, s/veh	52.9				34.6				42.2			
Approach LOS	D				C				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.8	28.2	19.0	24.0	11.0	36.0	19.0	24.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	13.0	22.0	13.0	18.0	5.0	30.0	13.0	18.0				
Max Q Clear Time (g_c+I1), s	12.7	24.2	15.0	19.8	7.0	32.0	15.0	11.3				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8				
Intersection Summary												
HCM 6th Ctrl Delay	46.3											
HCM 6th LOS	D											
Notes												

2040 Total PM
7: Sossaman Rd & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	24	24	14	28	14	34	17	25
Maximum Split (%)	26.7%	26.7%	15.6%	31.1%	15.6%	37.8%	18.9%	27.8%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	51	75	9	23	51	65	9	26
End Time (s)	75	9	23	51	65	9	26	51
Yield/Force Off (s)	69	3	17	45	59	3	20	45
Yield/Force Off 170(s)	69	82	17	34	59	82	20	34
Local Start Time (s)	25	49	73	87	25	39	73	0
Local Yield (s)	43	67	81	19	33	67	84	19
Local Yield 170(s)	43	56	81	8	33	56	84	8

Intersection Summary























Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 26 (29%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 7: Sossaman Rd & Elliot Rd

Ø1	Ø2	Ø3	Ø4 (R)
24 s	24 s	14 s	28 s
Ø5	Ø6	Ø7	Ø8 (R)
14 s	34 s	17 s	25 s

2040 Total PM
7: Sossaman Rd & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	250	793	192	148	378	379	181	357	316	553	726	240
Future Volume (veh/h)	250	793	192	148	378	379	181	357	316	553	726	240
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	278	881	213	164	420	421	201	397	351	614	807	267
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	390	1004	242	257	1078	647	295	721	463	681	1106	493
Arrive On Green	0.12	0.24	0.24	0.09	0.21	0.21	0.09	0.20	0.20	0.20	0.31	0.31
Sat Flow, veh/h	1781	4108	988	1781	5106	1585	1781	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	278	729	365	164	420	421	201	397	351	614	807	267
Grp Sat Flow(s),veh/h/ln	1781	1702	1692	1781	1702	1585	1781	1777	1585	1728	1777	1585
Q Serve(g_s), s	11.0	18.5	18.7	6.4	6.4	19.0	8.0	9.0	18.1	15.6	18.2	12.6
Cycle Q Clear(g_c), s	11.0	18.5	18.7	6.4	6.4	19.0	8.0	9.0	18.1	15.6	18.2	12.6
Prop In Lane	1.00		0.58	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	390	832	414	257	1078	647	295	721	463	681	1106	493
V/C Ratio(X)	0.71	0.88	0.88	0.64	0.39	0.65	0.68	0.55	0.76	0.90	0.73	0.54
Avail Cap(c_a), veh/h	390	832	414	257	1078	647	295	721	463	691	1106	493
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.69	0.69	0.69	1.00	1.00	1.00	0.57	0.57	0.57	0.47	0.47	0.47
Uniform Delay (d), s/veh	24.2	32.7	32.7	26.1	30.5	21.5	26.2	32.2	29.0	35.3	27.6	25.7
Incr Delay (d2), s/veh	4.2	9.1	17.0	5.1	1.1	5.0	3.6	1.7	6.6	8.0	2.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.7	12.0	13.2	5.2	4.6	11.8	5.8	6.3	10.5	9.9	10.5	7.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.4	41.8	49.7	31.2	31.6	26.5	29.8	33.9	35.6	43.3	29.7	27.7
LnGrp LOS	C	D	D	C	C	C	C	C	D	D	C	C
Approach Vol, veh/h	1372				1005				949		1688	
Approach Delay, s/veh	41.2				29.4				33.6		34.3	
Approach LOS	D				C				C		C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	23.7	24.3	14.0	28.0	14.0	34.0	17.0	25.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	18.0	18.0	8.0	22.0	8.0	28.0	11.0	19.0				
Max Q Clear Time (g_c+I1), s	17.6	20.1	8.4	20.7	10.0	20.2	13.0	21.0				
Green Ext Time (p_c), s	0.1	0.0	0.0	0.8	0.0	3.6	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay	35.1											
HCM 6th LOS	D											

2040 Total PM
8: Elliot Rd & 80th Street

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	None	C-Max	Max	C-Max
Maximum Split (s)	26	64	26	64
Maximum Split (%)	28.9%	71.1%	28.9%	71.1%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	44	70	44	70
End Time (s)	70	44	70	44
Yield/Force Off (s)	64	38	64	38
Yield/Force Off 170(s)	53	27	53	27
Local Start Time (s)	64	0	64	0
Local Yield (s)	84	58	84	58
Local Yield 170(s)	73	47	73	47





















Intersection Summary	
Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 70 (78%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 8: Elliot Rd & 80th Street



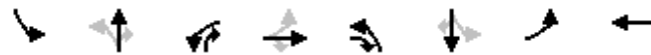
2040 Total PM
8: Elliot Rd & 80th Street

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1178	40	60	838	60	37	0	52	80	0	50
Future Volume (veh/h)	10	1178	40	60	838	60	37	0	52	80	0	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	1309	44	67	931	67	41	0	58	89	0	56
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	373	3269	110	290	3134	225	341	0	352	339	0	352
Arrive On Green	0.64	0.64	0.64	0.43	0.43	0.43	0.22	0.00	0.22	0.22	0.00	0.22
Sat Flow, veh/h	564	5073	171	403	4862	349	1348	0	1585	1345	0	1585
Grp Volume(v), veh/h	11	878	475	67	651	347	41	0	58	89	0	56
Grp Sat Flow(s),veh/h/ln	564	1702	1840	403	1702	1808	1348	0	1585	1345	0	1585
Q Serve(g_s), s	0.9	11.1	11.1	11.0	11.2	11.3	2.3	0.0	2.7	5.1	0.0	2.6
Cycle Q Clear(g_c), s	12.1	11.1	11.1	22.1	11.2	11.3	4.8	0.0	2.7	7.8	0.0	2.6
Prop In Lane	1.00		0.09	1.00		0.19	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	373	2194	1186	290	2194	1165	341	0	352	339	0	352
V/C Ratio(X)	0.03	0.40	0.40	0.23	0.30	0.30	0.12	0.00	0.16	0.26	0.00	0.16
Avail Cap(c_a), veh/h	373	2194	1186	290	2194	1165	341	0	352	339	0	352
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.93	0.93	0.93	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.6	7.7	7.7	19.4	12.3	12.3	30.2	0.0	28.3	31.4	0.0	28.2
Incr Delay (d2), s/veh	0.1	0.5	1.0	1.7	0.3	0.6	0.2	0.0	0.2	1.9	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.2	5.9	6.7	2.1	7.3	7.8	1.3	0.0	1.8	3.3	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.8	8.2	8.7	21.2	12.6	12.9	30.3	0.0	28.5	33.3	0.0	29.2
LnGrp LOS	B	A	A	C	B	B	C	A	C	C	A	C
Approach Vol, veh/h	1364			1065			99			145		
Approach Delay, s/veh	8.4			13.2			29.2			31.7		
Approach LOS	A			B			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	26.0			64.0			26.0			64.0		
Change Period (Y+Rc), s	6.0			6.0			6.0			6.0		
Max Green Setting (Gmax), s	20.0			58.0			20.0			58.0		
Max Q Clear Time (g_c+I1), s	6.8			14.1			9.8			24.1		
Green Ext Time (p_c), s	0.3			11.3			0.3			8.5		
Intersection Summary												
HCM 6th Ctrl Delay	12.4											
HCM 6th LOS	B											

2040 Total PM
9: Elliot Rd & Hawes Rd

17-1390 Hawes Crossing TIA
05/17/2019

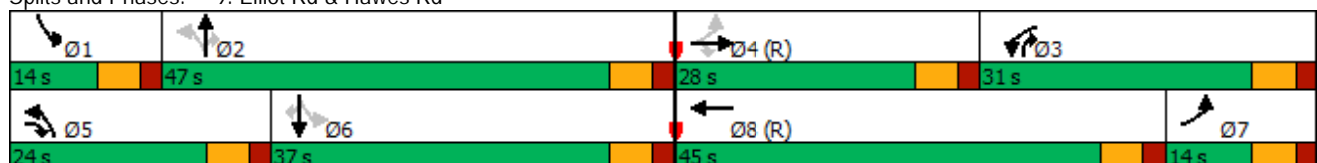


Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	EBL	WBT
Lead/Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	14	47	31	28	24	37	14	45
Maximum Split (%)	11.7%	39.2%	25.8%	23.3%	20.0%	30.8%	11.7%	37.5%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	59	73	28	0	59	83	45	0
End Time (s)	73	0	59	28	83	0	59	45
Yield/Force Off (s)	67	114	53	22	77	114	53	39
Yield/Force Off 170(s)	67	103	53	11	77	103	53	28
Local Start Time (s)	59	73	28	0	59	83	45	0
Local Yield (s)	67	114	53	22	77	114	53	39
Local Yield 170(s)	67	103	53	11	77	103	53	28

Intersection Summary
























Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green	

Splits and Phases: 9: Elliot Rd & Hawes Rd



2040 Total PM
9: Elliot Rd & Hawes Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	128	696	252	626	985	180	332	329	428	95	721	117
Future Volume (veh/h)	128	696	252	626	985	180	332	329	428	95	721	117
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	142	773	280	696	1094	200	369	366	476	106	801	130
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	179	936	528	720	1410	258	353	1244	885	333	918	409
Arrive On Green	0.07	0.18	0.18	0.21	0.32	0.32	0.15	0.35	0.35	0.06	0.26	0.26
Sat Flow, veh/h	1781	5106	1585	3456	4339	793	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	142	773	280	696	858	436	369	366	476	106	801	130
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1728	1702	1728	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	5.3	17.5	7.9	24.0	27.3	27.3	18.0	9.0	5.6	5.2	25.9	6.2
Cycle Q Clear(g_c), s	5.3	17.5	7.9	24.0	27.3	27.3	18.0	9.0	5.6	5.2	25.9	6.2
Prop In Lane	1.00		1.00	1.00		0.46	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	179	936	528	720	1106	561	353	1244	885	333	918	409
V/C Ratio(X)	0.79	0.83	0.53	0.97	0.78	0.78	1.05	0.29	0.54	0.32	0.87	0.32
Avail Cap(c_a), veh/h	179	936	528	720	1106	561	353	1244	885	348	918	409
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.76	0.76	0.76	0.91	0.91	0.91	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.6	47.2	11.8	47.1	36.6	36.6	31.9	28.3	5.7	29.8	42.6	21.6
Incr Delay (d2), s/veh	21.4	8.2	3.8	21.5	4.1	7.8	58.3	0.5	2.1	0.5	11.2	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.6	12.5	6.8	17.1	16.3	17.3	18.5	6.8	6.1	4.0	18.1	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.0	55.4	15.6	68.6	40.7	44.4	90.1	28.8	7.8	30.3	53.8	23.6
LnGrp LOS	E	E	B	E	D	D	F	C	A	C	D	C
Approach Vol, veh/h	1195				1990				1211		1037	
Approach Delay, s/veh	48.4				51.2				39.2		47.6	
Approach LOS	D				D				D		D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.0	48.0	31.0	28.0	24.0	37.0	14.0	45.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	8.0	41.0	25.0	22.0	18.0	31.0	8.0	39.0				
Max Q Clear Time (g_c+I1), s	7.2	11.0	26.0	19.5	20.0	27.9	7.3	29.3				
Green Ext Time (p_c), s	0.0	4.1	0.0	1.4	0.0	1.6	0.0	5.3				
Intersection Summary												
HCM 6th Ctrl Delay			47.3									
HCM 6th LOS			D									
Notes												

2040 Total PM
10: Loop 202 SB Ramps & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019

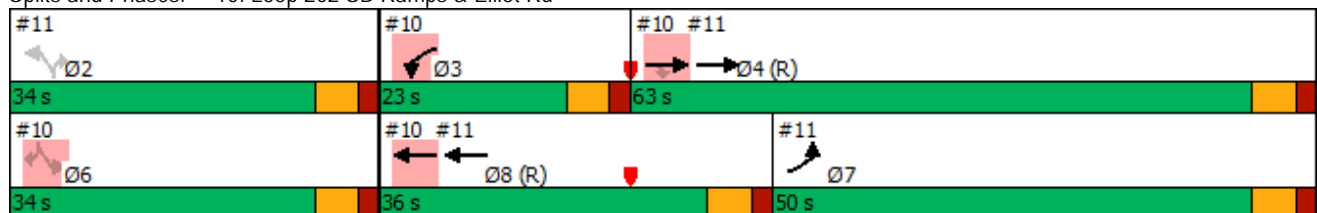


Phase Number	2	3	4	6	7	8
Node Number	11	10	10	10	11	10
Movement	NBL	WBL	EBT	SBL	EBL	WBT
Lead/Lag		Lead	Lag		Lag	Lead
Lead-Lag Optimize		Yes	Yes		Yes	Yes
Recall Mode	Max	None	C-Max	Max	None	C-Max
Maximum Split (s)	34	23	63	34	50	36
Maximum Split (%)	28.3%	19.2%	52.5%	28.3%	41.7%	30.0%
Minimum Split (s)	24	11	24	24	11	24
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)	7		7	7		7
Flash Dont Walk (s)	11		11	11		11
Dual Entry	Yes	No	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	63	97	0	63	13	97
End Time (s)	97	0	63	97	63	13
Yield/Force Off (s)	91	114	57	91	57	7
Yield/Force Off 170(s)	80	114	46	80	57	116
Local Start Time (s)	63	97	0	63	13	97
Local Yield (s)	91	114	57	91	57	7
Local Yield 170(s)	80	114	46	80	57	116

Intersection Summary













Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green	

Splits and Phases: 10: Loop 202 SB Ramps & Elliot Rd



2040 Total PM
10: Loop 202 SB Ramps & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↑	↑↑	↑↑↑					↑↑		↑↑
Traffic Volume (vph)	0	2420	495	486	1080	0	0	0	0	634	0	1123
Future Volume (vph)	0	2420	495	486	1080	0	0	0	0	634	0	1123
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		0.81	1.00	0.97	0.91					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		7544	1583	3433	5085					3433		2787
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		7544	1583	3433	5085					3433		2787
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2689	550	540	1200	0	0	0	0	704	0	1248
RTOR Reduction (vph)	0	0	274	0	0	0	0	0	0	0	0	953
Lane Group Flow (vph)	0	2689	276	540	1200	0	0	0	0	704	0	295
Turn Type		NA	Perm	Prot	NA					Perm		Perm
Protected Phases		4		3	8							
Permitted Phases			4							6		6
Actuated Green, G (s)		57.0	57.0	17.0	30.0					28.0		28.0
Effective Green, g (s)		57.0	57.0	17.0	30.0					28.0		28.0
Actuated g/C Ratio		0.48	0.48	0.14	0.25					0.23		0.23
Clearance Time (s)		6.0	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
Lane Grp Cap (vph)		3583	751	486	1271					801		650
v/s Ratio Prot		c0.36		0.16	c0.24							
v/s Ratio Perm			0.17							c0.21		0.11
v/c Ratio		0.75	0.37	1.11	0.94					0.88		0.45
Uniform Delay, d1		25.7	20.0	51.5	44.2					44.4		39.4
Progression Factor		1.00	1.00	0.54	0.29					1.00		1.00
Incremental Delay, d2		1.5	1.4	69.0	11.6					13.1		2.3
Delay (s)		27.2	21.4	96.7	24.3					57.5		41.7
Level of Service		C	C	F	C					E		D
Approach Delay (s)		26.2			46.7			0.0			47.4	
Approach LOS		C			D			A			D	
Intersection Summary												
HCM 2000 Control Delay			37.3			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			77.6%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

2040 Total PM
11: Loop 202 NB Ramps & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	2	3	4	6	7	8
Node Number	11	10	10	10	11	10
Movement	NBL	WBL	EBT	SBL	EBL	WBT
Lead/Lag		Lead	Lag		Lag	Lead
Lead-Lag Optimize		Yes	Yes		Yes	Yes
Recall Mode	Max	None	C-Max	Max	None	C-Max
Maximum Split (s)	34	23	63	34	50	36
Maximum Split (%)	28.3%	19.2%	52.5%	28.3%	41.7%	30.0%
Minimum Split (s)	24	11	24	24	11	24
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)	7		7	7		7
Flash Dont Walk (s)	11		11	11		11
Dual Entry	Yes	No	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	63	97	0	63	13	97
End Time (s)	97	0	63	97	63	13
Yield/Force Off (s)	91	114	57	91	57	7
Yield/Force Off 170(s)	80	114	46	80	57	116
Local Start Time (s)	63	97	0	63	13	97
Local Yield (s)	91	114	57	91	57	7
Local Yield 170(s)	80	114	46	80	57	116

Intersection Summary



















Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green	

Splits and Phases: 10: Loop 202 SB Ramps & Elliot Rd

#11 Ø2	#10 Ø3	#10 #11 Ø4 (R)
34 s	23 s	63 s
#10 Ø6	#10 #11 Ø8 (R)	#11 Ø7
34 s	36 s	50 s









2040 Total PM
11: Loop 202 NB Ramps & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1125	1929	0	0	907	587	659	0	725	0	0	0
Future Volume (vph)	1125	1929	0	0	907	587	659	0	725	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			
Lane Util. Factor	0.97	0.91			0.81	1.00	0.97		0.88			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	3433	5085			7544	1583	3433		2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	5085			7544	1583	3433		2787			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1250	2143	0	0	1008	652	732	0	806	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	370	0	0	0
Lane Group Flow (vph)	1250	2143	0	0	1008	652	732	0	436	0	0	0
Turn Type	Prot	NA			NA	Free	Perm		Perm			
Protected Phases	7	4			8							
Permitted Phases						Free	2		2			
Actuated Green, G (s)	44.0	57.0			30.0	120.0	28.0		28.0			
Effective Green, g (s)	44.0	57.0			30.0	120.0	28.0		28.0			
Actuated g/C Ratio	0.37	0.48			0.25	1.00	0.23		0.23			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	1258	2415			1886	1583	801		650			
v/s Ratio Prot	c0.36	c0.42			c0.13							
v/s Ratio Perm						0.41	c0.21		0.16			
v/c Ratio	0.99	0.89			0.53	0.41	0.91		0.67			
Uniform Delay, d1	37.9	28.6			39.0	0.0	44.8		41.8			
Progression Factor	0.65	0.54			1.21	1.00	1.00		1.00			
Incremental Delay, d2	18.1	3.3			0.8	0.6	16.7		5.4			
Delay (s)	42.6	18.9			47.8	0.6	61.5		47.2			
Level of Service	D	B			D	A	E		D			
Approach Delay (s)		27.6			29.2			54.0			0.0	
Approach LOS		C			C			D			A	
Intersection Summary												
HCM 2000 Control Delay			34.2				HCM 2000 Level of Service		C			
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)		18.0			
Intersection Capacity Utilization			77.6%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												









2040 Total PM
12: Sossaman Rd & Warner Road

17-1390 Hawes Crossing TIA
05/17/2019

								
Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBT	NBL	SBT	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	20	28	14	28	18	30	18	24
Maximum Split (%)	22.2%	31.1%	15.6%	31.1%	20.0%	33.3%	20.0%	26.7%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)	7			7			7	
Flash Dont Walk (s)	11			11			11	
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	60	80	18	32	60	78	18	36
End Time (s)	80	18	32	60	78	18	36	60
Yield/Force Off (s)	74	12	26	54	72	12	30	54
Yield/Force Off 170(s)	74	1	26	43	72	1	30	43
Local Start Time (s)	70	0	28	42	70	88	28	46
Local Yield (s)	84	22	36	64	82	22	40	64
Local Yield 170(s)	84	11	36	53	82	11	40	53

























Intersection Summary	
Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 80 (89%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 12: Sossaman Rd & Warner Road

 Ø1	 Ø2 (R)	 Ø3	 Ø4
20 s	28 s	14 s	28 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
18 s	30 s	18 s	24 s

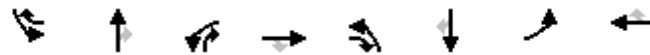
2040 Total PM
12: Sossaman Rd & Warner Road

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	286	746	250	170	484	448	245	645	205	432	180	228
Future Volume (veh/h)	286	746	250	170	484	448	245	645	205	432	180	228
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	318	829	278	189	538	498	272	717	228	480	200	253
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	395	869	549	246	778	594	352	869	528	538	1059	654
Arrive On Green	0.11	0.24	0.24	0.09	0.22	0.22	0.10	0.24	0.24	0.16	0.30	0.30
Sat Flow, veh/h	3456	3554	1585	1781	3554	1585	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	318	829	278	189	538	498	272	717	228	480	200	253
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	8.1	20.7	12.5	7.4	12.5	19.7	6.9	17.2	10.1	12.3	3.8	10.0
Cycle Q Clear(g_c), s	8.1	20.7	12.5	7.4	12.5	19.7	6.9	17.2	10.1	12.3	3.8	10.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	395	869	549	246	778	594	352	869	528	538	1059	654
V/C Ratio(X)	0.80	0.95	0.51	0.77	0.69	0.84	0.77	0.83	0.43	0.89	0.19	0.39
Avail Cap(c_a), veh/h	461	869	549	246	778	594	461	869	528	538	1059	654
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.61	0.61	0.61
Uniform Delay (d), s/veh	38.9	33.5	23.3	26.3	32.4	25.7	39.4	32.2	23.4	37.3	23.5	18.5
Incr Delay (d2), s/veh	8.8	20.2	0.8	13.7	2.6	10.3	5.8	8.8	2.6	11.5	0.2	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.7	16.1	7.9	6.9	9.1	15.8	5.7	13.0	7.0	8.8	2.7	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.6	53.8	24.1	40.0	35.0	36.0	45.2	41.0	25.9	48.7	23.7	19.5
LnGrp LOS	D	D	C	D	C	D	D	D	C	D	C	B
Approach Vol, veh/h	1425			1225			1217			933		
Approach Delay, s/veh	46.6			36.2			39.1			35.5		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.0	28.0	14.0	28.0	15.2	32.8	16.3	25.7				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	14.0	22.0	8.0	22.0	12.0	24.0	12.0	18.0				
Max Q Clear Time (g_c+I1), s	14.3	19.2	9.4	22.7	8.9	12.0	10.1	21.7				
Green Ext Time (p_c), s	0.0	1.5	0.0	0.0	0.3	1.6	0.2	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			39.9									
HCM 6th LOS			D									
Notes												

2040 Total PM
13: Hawes Rd & Warner Road

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBT	NBL	SBT	EBL	WBT
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	19	42	27	32	29	32	19	40
Maximum Split (%)	15.8%	35.0%	22.5%	26.7%	24.2%	26.7%	15.8%	33.3%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	100	119	41	68	100	9	41	60
End Time (s)	119	41	68	100	9	41	60	100
Yield/Force Off (s)	113	35	62	94	3	35	54	94
Yield/Force Off 170(s)	113	24	62	83	3	24	54	83
Local Start Time (s)	91	110	32	59	91	0	32	51
Local Yield (s)	104	26	53	85	114	26	45	85
Local Yield 170(s)	104	15	53	74	114	15	45	74

Intersection Summary

























Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 9 (8%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 13: Hawes Rd & Warner Road

Ø1	Ø2 (R)	Ø3	Ø4
19 s	42 s	27 s	32 s
Ø5	Ø6 (R)	Ø7	Ø8
29 s	32 s	19 s	40 s

2040 Total PM
13: Hawes Rd & Warner Road

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	197	644	489	550	412	221	560	766	324	274	658	77
Future Volume (veh/h)	197	644	489	550	412	221	560	766	324	274	658	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	219	716	543	611	458	246	622	851	360	304	731	86
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	279	770	647	605	1105	655	662	1087	762	354	770	343
Arrive On Green	0.08	0.22	0.22	0.17	0.31	0.31	0.06	0.10	0.10	0.20	0.43	0.43
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	219	716	543	611	458	246	622	851	360	304	731	86
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	7.5	23.7	26.0	21.0	12.2	12.9	21.5	28.1	19.8	10.2	23.8	4.1
Cycle Q Clear(g_c), s	7.5	23.7	26.0	21.0	12.2	12.9	21.5	28.1	19.8	10.2	23.8	4.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	279	770	647	605	1105	655	662	1087	762	354	770	343
V/C Ratio(X)	0.79	0.93	0.84	1.01	0.41	0.38	0.94	0.78	0.47	0.86	0.95	0.25
Avail Cap(c_a), veh/h	374	770	647	605	1105	655	662	1087	762	374	770	343
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.46	0.46	0.46	0.89	0.89	0.89
Uniform Delay (d), s/veh	54.1	46.1	31.9	49.5	32.7	24.4	55.5	50.0	27.6	46.9	33.4	27.8
Incr Delay (d2), s/veh	7.7	17.7	9.6	39.2	0.2	0.4	12.1	2.7	1.0	15.7	20.5	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.2	17.7	21.4	17.8	8.8	8.3	14.7	17.8	11.7	7.9	14.3	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.8	63.8	41.5	88.7	32.9	24.8	67.6	52.7	28.6	62.6	53.9	29.4
LnGrp LOS	E	E	D	F	C	C	E	D	C	E	D	C
Approach Vol, veh/h	1478			1315				1833			1121	
Approach Delay, s/veh	55.3			57.3				53.0			54.4	
Approach LOS	E			E				D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.3	42.7	27.0	32.0	29.0	32.0	15.7	43.3				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	13.0	36.0	21.0	26.0	23.0	26.0	13.0	34.0				
Max Q Clear Time (g_c+I1), s	12.2	30.1	23.0	28.0	23.5	25.8	9.5	14.9				
Green Ext Time (p_c), s	0.1	3.2	0.0	0.0	0.0	0.1	0.2	3.4				
Intersection Summary												
HCM 6th Ctrl Delay	54.9											
HCM 6th LOS	D											

14: Hawes Rd & Loop 202 WB Ramps



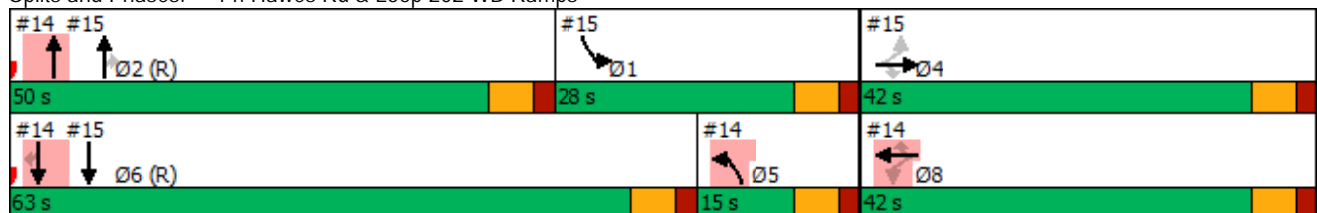
Phase Number	1	2	4	5	6	8
Node Number	15	14	15	14	14	14
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lag	Lead		Lag	Lead	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	Ped	None	C-Max	None
Maximum Split (s)	28	50	42	15	63	42
Maximum Split (%)	23.3%	41.7%	35.0%	12.5%	52.5%	35.0%
Minimum Split (s)	11	24	24	11	24	24
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	5	15	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		11	11		11	11
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	104	54	12	117	54	12
End Time (s)	12	104	54	12	117	54
Yield/Force Off (s)	6	98	48	6	111	48
Yield/Force Off 170(s)	6	87	37	6	100	37
Local Start Time (s)	50	0	78	63	0	78
Local Yield (s)	72	44	114	72	57	114
Local Yield 170(s)	72	33	103	72	46	103

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90




















Offset: 54 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Splits and Phases: 14: Hawes Rd & Loop 202 WB Ramps



2040 Total PM
14: Hawes Rd & Loop 202 WB Ramps

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	215	0	555	215	1488	0	0	1895	1092
Future Volume (vph)	0	0	0	215	0	555	215	1488	0	0	1895	1092
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	6.0
Lane Util. Factor				0.95	0.91	0.95	0.97	0.91			0.81	1.00
Frt				1.00	0.86	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1454	1504	3433	5085			7544	1583
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1454	1504	3433	5085			7544	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	239	0	617	239	1653	0	0	2106	1213
RTOR Reduction (vph)	0	0	0	0	207	207	0	0	0	0	0	453
Lane Group Flow (vph)	0	0	0	215	113	114	239	1653	0	0	2106	760
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				35.1	35.1	35.1	9.0	44.9			57.9	57.9
Effective Green, g (s)				35.1	35.1	35.1	9.0	44.9			57.9	57.9
Actuated g/C Ratio				0.29	0.29	0.29	0.08	0.37			0.48	0.48
Clearance Time (s)				6.0	6.0	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
Lane Grp Cap (vph)				491	425	439	257	1902			3639	763
v/s Ratio Prot							c0.07	0.33			0.28	
v/s Ratio Perm				c0.13	0.08	0.08						c0.48
v/c Ratio				0.44	0.27	0.26	0.93	0.87			0.58	1.00
Uniform Delay, d1				34.4	32.6	32.5	55.2	34.8			22.3	30.9
Progression Factor				1.00	1.00	1.00	1.15	0.62			0.84	1.17
Incremental Delay, d2				0.6	0.3	0.3	32.3	4.7			0.6	29.6
Delay (s)				35.1	32.9	32.8	95.5	26.1			19.4	65.9
Level of Service				D	C	C	F	C			B	E
Approach Delay (s)		0.0			33.4			34.9			36.4	
Approach LOS		A			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			35.5									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			120.0									Sum of lost time (s) 18.0
Intersection Capacity Utilization			100.4%									ICU Level of Service G
Analysis Period (min)			15									

c Critical Lane Group

2040 Total PM
15: Hawes Rd & Loop 202 EB Ramps

17-1390 Hawes Crossing TIA
05/17/2019

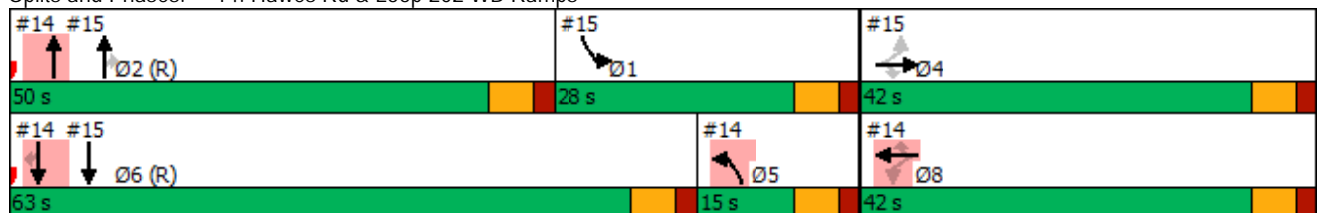


Phase Number	1	2	4	5	6	8
Node Number	15	14	15	14	14	14
Movement	SBL	NBT	EBTL	NBL	SBT	WBTL
Lead/Lag	Lag	Lead		Lag	Lead	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	Ped	None	C-Max	None
Maximum Split (s)	28	50	42	15	63	42
Maximum Split (%)	23.3%	41.7%	35.0%	12.5%	52.5%	35.0%
Minimum Split (s)	11	24	24	11	24	24
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	5	15	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		11	11		11	11
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	104	54	12	117	54	12
End Time (s)	12	104	54	12	117	54
Yield/Force Off (s)	6	98	48	6	111	48
Yield/Force Off 170(s)	6	87	37	6	100	37
Local Start Time (s)	50	0	78	63	0	78
Local Yield (s)	72	44	114	72	57	114
Local Yield 170(s)	72	33	103	72	46	103

Intersection Summary





















Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 54 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 14: Hawes Rd & Loop 202 WB Ramps



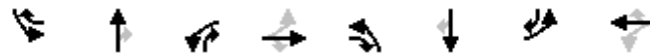
2040 Total PM
15: Hawes Rd & Loop 202 EB Ramps

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	818	0	180	0	0	0	0	885	65	550	1560	0
Future Volume (vph)	818	0	180	0	0	0	0	885	65	550	1560	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	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.81	1.00	0.97	0.91	
Frt	1.00	0.99	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1607	1504					7544	1583	3433	5085	
Flt Permitted	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1607	1504					7544	1583	3433	5085	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	909	0	200	0	0	0	0	983	72	611	1733	0
RTOR Reduction (vph)	0	96	120	0	0	0	0	0	45	0	0	0
Lane Group Flow (vph)	464	369	60	0	0	0	0	983	27	611	1733	0
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	35.1	35.1	35.1					44.9	44.9	22.0	57.9	
Effective Green, g (s)	35.1	35.1	35.1					44.9	44.9	22.0	57.9	
Actuated g/C Ratio	0.29	0.29	0.29					0.37	0.37	0.18	0.48	
Clearance Time (s)	6.0	6.0	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	
Lane Grp Cap (vph)	491	470	439					2822	592	629	2453	
v/s Ratio Prot								0.13		c0.18	c0.34	
v/s Ratio Perm	c0.28	0.23	0.04						0.02			
v/c Ratio	0.95	0.78	0.14					0.35	0.05	0.97	0.71	
Uniform Delay, d1	41.5	39.0	31.3					27.0	23.9	48.7	24.4	
Progression Factor	1.00	1.00	1.00					1.00	1.00	0.78	0.27	
Incremental Delay, d2	27.2	8.4	0.1					0.3	0.1	25.7	1.5	
Delay (s)	68.7	47.4	31.4					27.4	24.1	63.5	8.2	
Level of Service	E	D	C					C	C	E	A	
Approach Delay (s)		53.7			0.0			27.1			22.6	
Approach LOS		D			A			C			C	
Intersection Summary												
HCM 2000 Control Delay			31.3									C
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			120.0									
Intersection Capacity Utilization			100.4%									G
Analysis Period (min)			15									
c Critical Lane Group												

2040 Total PM
16: Elliot Rd & Ellsworth Rd

17-1390 Hawes Crossing TIA
05/17/2019

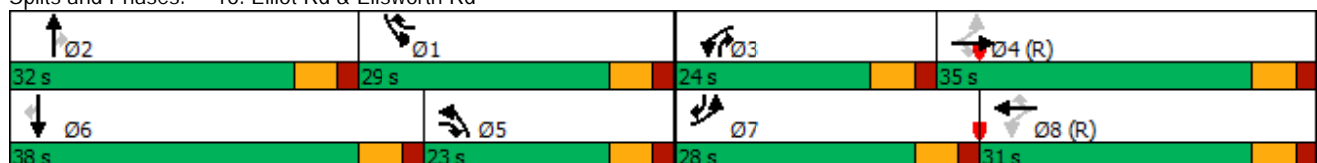


Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	29	32	24	35	23	38	28	31
Maximum Split (%)	24.2%	26.7%	20.0%	29.2%	19.2%	31.7%	23.3%	25.8%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	4	92	33	57	10	92	33	61
End Time (s)	33	4	57	92	33	10	61	92
Yield/Force Off (s)	27	118	51	86	27	4	55	86
Yield/Force Off 170(s)	27	107	51	75	27	113	55	75
Local Start Time (s)	63	31	92	116	69	31	92	0
Local Yield (s)	86	57	110	25	86	63	114	25
Local Yield 170(s)	86	46	110	14	86	52	114	14

Intersection Summary

























Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 61 (51%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 16: Elliot Rd & Ellsworth Rd



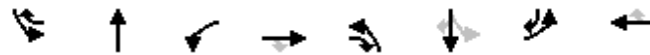
2040 Total PM
16: Elliot Rd & Ellsworth Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	300	1064	469	274	719	190	364	460	334	450	811	200
Future Volume (veh/h)	300	1064	469	274	719	190	364	460	334	450	811	200
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No		No		No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	333	1182	521	304	799	211	404	511	371	500	901	222
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	404	1305	616	330	1210	666	460	1106	573	633	1362	681
Arrive On Green	0.33	0.51	0.51	0.14	0.24	0.24	0.13	0.22	0.22	0.18	0.27	0.27
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	333	1182	521	304	799	211	404	511	371	500	901	222
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	17.3	25.3	14.7	15.3	17.0	3.9	13.8	10.5	11.2	16.6	18.9	5.6
Cycle Q Clear(g_c), s	17.3	25.3	14.7	15.3	17.0	3.9	13.8	10.5	11.2	16.6	18.9	5.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	404	1305	616	330	1210	666	460	1106	573	633	1362	681
V/C Ratio(X)	0.82	0.91	0.85	0.92	0.66	0.32	0.88	0.46	0.65	0.79	0.66	0.33
Avail Cap(c_a), veh/h	440	1305	616	340	1210	666	490	1106	573	662	1362	681
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.54	0.54	0.54	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.3	28.0	7.5	30.9	41.4	8.1	51.1	40.9	11.6	46.8	39.2	8.1
Incr Delay (d2), s/veh	6.5	6.2	7.8	28.9	2.8	1.2	15.9	1.4	5.6	6.2	2.5	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.8	10.8	6.9	13.8	11.6	3.2	11.1	7.9	7.4	11.9	12.6	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.8	34.2	15.2	59.9	44.2	9.3	66.9	42.3	17.2	53.0	41.7	9.4
LnGrp LOS	C	C	B	E	D	A	E	D	B	D	D	A
Approach Vol, veh/h	2036		1314		1286		1623					
Approach Delay, s/veh	28.6		42.2		42.8		40.8					
Approach LOS	C		D		D		D					
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	28.0	32.0	23.3	36.7	22.0	38.0	25.6	34.4				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	23.0	26.0	18.0	29.0	17.0	32.0	22.0	25.0				
Max Q Clear Time (g_c+I1), s	18.6	13.2	17.3	27.3	15.8	20.9	19.3	19.0				
Green Ext Time (p_c), s	0.8	3.7	0.1	1.4	0.2	4.9	0.3	2.9				
Intersection Summary												
HCM 6th Ctrl Delay			37.5									
HCM 6th LOS			D									
Notes												

2040 Total PM
17: Ellsworth Rd & Warner Road

17-1390 Hawes Crossing TIA
05/17/2019

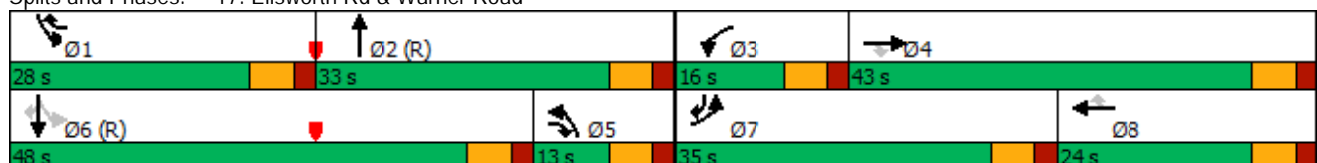


Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBT	NBL	SBTL	EBL	WBT
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	28	33	16	43	13	48	35	24
Maximum Split (%)	23.3%	27.5%	13.3%	35.8%	10.8%	40.0%	29.2%	20.0%
Minimum Split (s)	11	24	11	24	11	24	24	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7	7	7
Flash Dont Walk (s)		11		11		11	11	11
Dual Entry	No	Yes	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	28	56	89	105	76	28	89	4
End Time (s)	56	89	105	28	89	76	4	28
Yield/Force Off (s)	50	83	99	22	83	70	118	22
Yield/Force Off 170(s)	50	72	99	11	83	59	107	11
Local Start Time (s)	92	0	33	49	20	92	33	68
Local Yield (s)	114	27	43	86	27	14	62	86
Local Yield 170(s)	114	16	43	75	27	3	51	75

Intersection Summary
























Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 56 (47%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	

Splits and Phases: 17: Ellsworth Rd & Warner Road






2040 Total PM
17: Ellsworth Rd & Warner Road

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	353	255	292	60	174	76	13	700	195	325	1235	420
Future Volume (veh/h)	353	255	292	60	174	76	13	700	195	325	1235	420
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	392	283	324	67	193	84	14	778	217	361	1372	467
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	417	934	637	86	274	413	480	1216	336	387	1787	926
Arrive On Green	0.23	0.26	0.26	0.05	0.08	0.08	0.14	0.31	0.31	0.18	0.35	0.35
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	3977	1099	1781	5106	1585
Grp Volume(v), veh/h	392	283	324	67	193	84	14	665	330	361	1372	467
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1673	1781	1702	1585
Q Serve(g_s), s	25.9	7.7	3.0	4.5	6.4	5.0	0.4	20.2	20.5	20.8	28.7	6.4
Cycle Q Clear(g_c), s	25.9	7.7	3.0	4.5	6.4	5.0	0.4	20.2	20.5	20.8	28.7	6.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.66	1.00		1.00
Lane Grp Cap(c), veh/h	417	934	637	86	274	413	480	1040	511	387	1787	926
V/C Ratio(X)	0.94	0.30	0.51	0.78	0.71	0.20	0.03	0.64	0.65	0.93	0.77	0.50
Avail Cap(c_a), veh/h	430	1096	709	148	533	528	480	1040	511	387	1787	926
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.1	35.4	12.8	56.5	54.1	34.7	44.7	36.0	36.0	36.2	34.7	4.4
Incr Delay (d2), s/veh	28.4	0.2	0.6	13.9	3.3	0.2	0.0	3.0	6.2	29.6	3.2	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	20.6	5.9	7.4	4.1	5.2	3.4	0.3	13.3	13.8	17.5	17.5	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.5	35.6	13.4	70.4	57.4	34.9	44.7	39.0	42.2	65.8	37.9	6.4
LnGrp LOS	E	D	B	E	E	C	D	D	D	E	D	A
Approach Vol, veh/h		999			344			1009			2200	
Approach Delay, s/veh		43.3			54.4			40.1			35.8	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	28.0	42.7	11.8	37.5	22.7	48.0	34.1	15.2				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	22.0	27.0	10.0	37.0	7.0	42.0	29.0	18.0				
Max Q Clear Time (g_c+I1), s	22.8	22.5	6.5	9.7	2.4	30.7	27.9	8.4				
Green Ext Time (p_c), s	0.0	2.4	0.0	2.8	0.0	7.6	0.2	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			39.8									
HCM 6th LOS			D									







2040 Total PM
31: Intersection A

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	6.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	26	38	1	21	23	1
Future Vol, veh/h	26	38	1	21	23	1
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	42	1	23	26	1
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	66	13	0	0	24	0
Stage 1	13	-	-	-	-	-
Stage 2	53	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	939	1067	-	-	1591	-
Stage 1	1010	-	-	-	-	-
Stage 2	970	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	924	1067	-	-	1591	-
Mov Cap-2 Maneuver	924	-	-	-	-	-
Stage 1	1010	-	-	-	-	-
Stage 2	954	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	8.9	0		7		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	1004	1591	-	
HCM Lane V/C Ratio	-	-	0.071	0.016	-	
HCM Control Delay (s)	-	-	8.9	7.3	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.2	0	-	

2040 Total PM
32: Intersection B

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	38	17	28	610	918	53
Future Vol, veh/h	38	17	28	610	918	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	0	100	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	19	31	678	1020	59
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1421	510	1079	0	-	0
Stage 1	1020	-	-	-	-	-
Stage 2	401	-	-	-	-	-
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	127	509	642	-	-	-
Stage 1	309	-	-	-	-	-
Stage 2	645	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	121	509	642	-	-	-
Mov Cap-2 Maneuver	121	-	-	-	-	-
Stage 1	294	-	-	-	-	-
Stage 2	645	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	34.3	0.5		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	642	-	121	509	-	-
HCM Lane V/C Ratio	0.048	-	0.349	0.037	-	-
HCM Control Delay (s)	10.9	-	35.0	12.3	-	-
HCM Lane LOS	B	-	D	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.4	0.1	-	-

2040 Total PM
33: Intersection C

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	5.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↱	
Traffic Vol, veh/h	5	15	13	9	26	19
Future Vol, veh/h	5	15	13	9	26	19
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	17	14	10	29	21
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	23	0	53	15
Stage 1	-	-	-	-	15	-
Stage 2	-	-	-	-	38	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1592	-	955	1065
Stage 1	-	-	-	-	1008	-
Stage 2	-	-	-	-	984	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1592	-	946	1065
Mov Cap-2 Maneuver	-	-	-	-	946	-
Stage 1	-	-	-	-	1008	-
Stage 2	-	-	-	-	975	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		4.3		8.8	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	993	-	-	1592	-	
HCM Lane V/C Ratio	0.05	-	-	0.009	-	
HCM Control Delay (s)	8.8	-	-	7.3	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

2040 Total PM
34: Intersection D

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	7.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑	↑↑↑	↑	↑
Traffic Vol, veh/h	1383	78	65	855	55	45
Future Vol, veh/h	1383	78	65	855	55	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	150	-	150	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1537	87	72	950	61	50
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1624	0	2061	769
Stage 1	-	-	-	-	1537	-
Stage 2	-	-	-	-	524	-
Critical Hdwy	-	-	5.34	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	-	-	3.12	-	3.82	3.92
Pot Cap-1 Maneuver	-	-	193	-	87	295
Stage 1	-	-	-	-	112	-
Stage 2	-	-	-	-	510	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	193	-	~ 55	295
Mov Cap-2 Maneuver	-	-	-	-	~ 55	-
Stage 1	-	-	-	-	112	-
Stage 2	-	-	-	-	320	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		2.4		161.8	
HCM LOS					F	
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	55	295	-	-	193	-
HCM Lane V/C Ratio	1.111	0.169	-	-	0.374	-
HCM Control Delay (s)	278.1	19.7	-	-	34.4	-
HCM Lane LOS	F	C	-	-	D	-
HCM 95th %tile Q(veh)	5.2	0.6	-	-	1.6	-
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

2040 Total PM
35: Intersection E

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	Max	C-Max	Max	C-Max
Maximum Split (s)	28	62	28	62
Maximum Split (%)	31.1%	68.9%	31.1%	68.9%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	13	41	13	41
End Time (s)	41	13	41	13
Yield/Force Off (s)	35	7	35	7
Yield/Force Off 170(s)	24	86	24	86
Local Start Time (s)	62	0	62	0
Local Yield (s)	84	56	84	56
Local Yield 170(s)	73	45	73	45





















Intersection Summary	
Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 41 (46%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 35: Intersection E



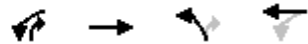
2040 Total PM
35: Intersection E

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	1035	39	168	992	139	57	9	116	106	6	40
Future Volume (veh/h)	48	1035	39	168	992	139	57	9	116	106	6	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	53	1150	43	187	1102	154	63	10	129	118	7	44
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	301	3143	117	372	2818	393	378	28	364	296	54	341
Arrive On Green	1.00	1.00	1.00	0.62	0.62	0.62	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	442	5052	189	469	4528	632	1354	115	1487	1250	222	1397
Grp Volume(v), veh/h	53	775	418	187	828	428	63	0	139	118	0	51
Grp Sat Flow(s),veh/h/ln	442	1702	1836	469	1702	1757	1354	0	1603	1250	0	1619
Q Serve(g_s), s	2.6	0.0	0.0	22.5	10.9	10.9	3.4	0.0	6.5	7.8	0.0	2.2
Cycle Q Clear(g_c), s	13.6	0.0	0.0	22.5	10.9	10.9	5.6	0.0	6.5	14.2	0.0	2.2
Prop In Lane	1.00		0.10	1.00		0.36	1.00		0.93	1.00		0.86
Lane Grp Cap(c), veh/h	301	2118	1143	372	2118	1093	378	0	392	296	0	396
V/C Ratio(X)	0.18	0.37	0.37	0.50	0.39	0.39	0.17	0.00	0.35	0.40	0.00	0.13
Avail Cap(c_a), veh/h	301	2118	1143	372	2118	1093	378	0	392	296	0	396
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	1.3	0.0	0.0	10.7	8.5	8.5	28.7	0.0	28.1	34.0	0.0	26.5
Incr Delay (d2), s/veh	1.2	0.5	0.8	4.8	0.5	1.1	1.0	0.0	2.5	4.0	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.2	0.2	0.5	4.2	6.1	6.6	2.2	0.0	4.9	4.8	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.5	0.5	0.8	15.5	9.0	9.5	29.7	0.0	30.6	38.0	0.0	27.2
LnGrp LOS	A	A	A	B	A	A	C	A	C	D	A	C
Approach Vol, veh/h	1246			1443			202			169		
Approach Delay, s/veh	0.7			10.0			30.3			34.7		
Approach LOS	A			B			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	28.0			62.0			28.0			62.0		
Change Period (Y+Rc), s	6.0			6.0			6.0			6.0		
Max Green Setting (Gmax), s	22.0			56.0			22.0			56.0		
Max Q Clear Time (g_c+I1), s	8.5			15.6			16.2			24.5		
Green Ext Time (p_c), s	0.8			10.3			0.3			13.1		
Intersection Summary												
HCM 6th Ctrl Delay	8.9											
HCM 6th LOS	A											

2040 Total PM
36: Intersection F

17-1390 Hawes Crossing TIA
05/17/2019

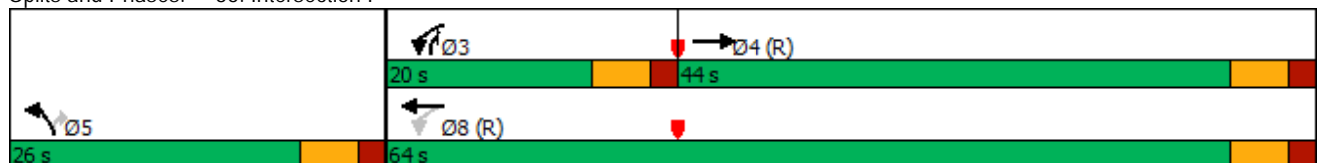


Phase Number	3	4	5	8
Movement	WBL	EBT	NBL	WBTL
Lead/Lag	Lead	Lag		
Lead-Lag Optimize	Yes	Yes		
Recall Mode	None	C-Max	None	C-Max
Maximum Split (s)	20	44	26	64
Maximum Split (%)	22.2%	48.9%	28.9%	71.1%
Minimum Split (s)	24	24	11	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)		7		7
Flash Dont Walk (s)		11		11
Dual Entry	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	57	77	31	57
End Time (s)	77	31	57	31
Yield/Force Off (s)	71	25	51	25
Yield/Force Off 170(s)	71	14	51	14
Local Start Time (s)	70	0	44	70
Local Yield (s)	84	38	64	38
Local Yield 170(s)	84	27	64	27

Intersection Summary







Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 77 (86%), Referenced to phase 4:EBT and 8:WBTL, Start of Green	

Splits and Phases: 36: Intersection F






2040 Total PM
36: Intersection F

17-1390 Hawes Crossing TIA
05/17/2019

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↑	↑↑↑	↑	↑
Traffic Volume (veh/h)	1903	47	180	1900	54	283
Future Volume (veh/h)	1903	47	180	1900	54	283
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	2114	52	200	2111	60	314
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2680	66	245	3384	363	439
Arrive On Green	0.52	0.52	0.07	0.66	0.20	0.20
Sat Flow, veh/h	5294	126	1781	5274	1781	1585
Grp Volume(v), veh/h	1403	763	200	2111	60	314
Grp Sat Flow(s),veh/h/ln	1702	1848	1781	1702	1781	1585
Q Serve(g_s), s	30.1	30.2	4.3	21.4	2.5	16.1
Cycle Q Clear(g_c), s	30.1	30.2	4.3	21.4	2.5	16.1
Prop In Lane		0.07	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1780	966	245	3384	363	439
V/C Ratio(X)	0.79	0.79	0.82	0.62	0.17	0.71
Avail Cap(c_a), veh/h	1780	966	391	3384	396	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.69	0.69	0.39	0.39	1.00	1.00
Uniform Delay (d), s/veh	17.4	17.5	19.3	8.7	29.5	29.3
Incr Delay (d2), s/veh	2.5	4.6	2.9	0.3	0.2	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	15.1	16.9	3.7	8.5	1.9	10.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.0	22.1	22.2	9.1	29.7	34.1
LnGrp LOS	B	C	C	A	C	C
Approach Vol, veh/h	2166			2311	374	
Approach Delay, s/veh	20.7			10.2	33.4	
Approach LOS	C			B	C	
Timer - Assigned Phs	2		3	4	8	
Phs Duration (G+Y+Rc), s	24.3		12.6	53.0	65.7	
Change Period (Y+Rc), s	6.0		6.0	6.0	6.0	
Max Green Setting (Gmax), s	20.0		14.0	38.0	58.0	
Max Q Clear Time (g_c+I1), s	18.1		6.3	32.2	23.4	
Green Ext Time (p_c), s	0.3		0.3	5.0	21.2	
Intersection Summary						
HCM 6th Ctrl Delay			16.7			
HCM 6th LOS			B			

2040 Total PM
37: Intersection G

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	3.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	18	26	9	30	42
Future Vol, veh/h	15	18	26	9	30	42
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	20	29	10	33	47
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	147	34	0	0	39	0
Stage 1	34	-	-	-	-	-
Stage 2	113	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	845	1039	-	-	1571	-
Stage 1	988	-	-	-	-	-
Stage 2	912	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	826	1039	-	-	1571	-
Mov Cap-2 Maneuver	826	-	-	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	892	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9	0		3.1		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	930	1571	-	
HCM Lane V/C Ratio	-	-	0.039	0.021	-	
HCM Control Delay (s)	-	-	9	7.3	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-	

2040 Total PM
38: Intersection H

17-1390 Hawes Crossing TIA
05/17/2019

Intersection												
Int Delay, s/veh	5.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	9	17	13	35	10	6	8	7	22	5	12	15
Future Vol, veh/h	9	17	13	35	10	6	8	7	22	5	12	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	19	14	39	11	7	9	8	24	6	13	17
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	81	84	22	88	80	20	30	0	0	32	0	0
Stage 1	34	34	-	38	38	-	-	-	-	-	-	-
Stage 2	47	50	-	50	42	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	907	806	1055	897	810	1058	1583	-	-	1580	-	-
Stage 1	982	867	-	977	863	-	-	-	-	-	-	-
Stage 2	967	853	-	963	860	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	885	798	1055	862	802	1058	1583	-	-	1580	-	-
Mov Cap-2 Maneuver	885	798	-	862	802	-	-	-	-	-	-	-
Stage 1	976	864	-	971	858	-	-	-	-	-	-	-
Stage 2	943	848	-	925	857	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	9.2			9.4			1.6			1.1		
HCM LOS	A			A								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1583	-	-	891	868	1580	-	-				
HCM Lane V/C Ratio	0.006	-	-	0.049	0.065	0.004	-	-				
HCM Control Delay (s)	7.3	0	-	9.2	9.4	7.3	0	-				
HCM Lane LOS	A	A	-	A	A	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	0	-	-				

2040 Total PM
39: Intersection I

17-1390 Hawes Crossing TIA
05/17/2019

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	34	22	4	4	24	9	2	43	2	8	70	56
Future Vol, veh/h	34	22	4	4	24	9	2	43	2	8	70	56
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	24	4	4	27	10	2	48	2	9	78	62
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	199	181	109	194	211	49	140	0	0	50	0	0
Stage 1	127	127	-	53	53	-	-	-	-	-	-	-
Stage 2	72	54	-	141	158	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	760	713	945	765	686	1020	1443	-	-	1557	-	-
Stage 1	877	791	-	960	851	-	-	-	-	-	-	-
Stage 2	938	850	-	862	767	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	726	708	945	737	681	1020	1443	-	-	1557	-	-
Mov Cap-2 Maneuver	726	708	-	737	681	-	-	-	-	-	-	-
Stage 1	876	786	-	959	850	-	-	-	-	-	-	-
Stage 2	899	849	-	826	762	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	10.4			10.1			0.3			0.4		
HCM LOS	B			B								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1443	-	-	730	748	1557	-	-				
HCM Lane V/C Ratio	0.002	-	-	0.091	0.055	0.006	-	-				
HCM Control Delay (s)	7.5	0	-	10.4	10.1	7.3	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.3	0.2	0	-	-				

2040 Total PM
40: Intersection J

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	66	24	66	24
Maximum Split (%)	73.3%	26.7%	73.3%	26.7%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	35	11	35	11
End Time (s)	11	35	11	35
Yield/Force Off (s)	5	29	5	29
Yield/Force Off 170(s)	84	18	84	18
Local Start Time (s)	0	66	0	66
Local Yield (s)	60	84	60	84
Local Yield 170(s)	49	73	49	73

Intersection Summary





















Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 35 (39%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 40: Intersection J

Ø2 (R) 66 s	Ø4 24 s
Ø6 (R) 66 s	Ø8 24 s







2040 Total PM
40: Intersection J

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	14	33	33	22	44	52	1070	14	63	1401	31
Future Volume (veh/h)	48	14	33	33	22	44	52	1070	14	63	1401	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	53	16	37	37	24	49	58	1189	16	70	1557	34
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	164	52	121	181	57	117	265	2738	37	379	2711	59
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.76	0.76	0.76	0.76	0.76	0.76
Sat Flow, veh/h	1327	502	1160	1351	549	1120	321	3590	48	464	3556	78
Grp Volume(v), veh/h	53	0	53	37	0	73	58	588	617	70	777	814
Grp Sat Flow(s),veh/h/ln	1327	0	1662	1351	0	1669	321	1777	1862	464	1777	1856
Q Serve(g_s), s	3.5	0.0	2.7	2.3	0.0	3.7	8.4	10.6	10.6	5.7	16.6	16.7
Cycle Q Clear(g_c), s	7.2	0.0	2.7	5.0	0.0	3.7	25.1	10.6	10.6	16.3	16.6	16.7
Prop In Lane	1.00		0.70	1.00		0.67	1.00		0.03	1.00		0.04
Lane Grp Cap(c), veh/h	164	0	173	181	0	174	265	1355	1420	379	1355	1416
V/C Ratio(X)	0.32	0.00	0.31	0.20	0.00	0.42	0.22	0.43	0.43	0.18	0.57	0.58
Avail Cap(c_a), veh/h	291	0	332	310	0	334	265	1355	1420	379	1355	1416
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.42	0.42	0.42
Uniform Delay (d), s/veh	41.1	0.0	37.3	39.6	0.0	37.8	9.8	3.8	3.8	6.7	4.5	4.5
Incr Delay (d2), s/veh	1.1	0.0	1.0	0.6	0.0	1.6	1.9	1.0	1.0	0.5	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.1	0.0	2.0	1.4	0.0	2.8	1.1	4.5	4.6	0.9	5.5	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.3	0.0	38.3	40.2	0.0	39.4	11.7	4.8	4.8	7.1	5.3	5.2
LnGrp LOS	D	A	D	D	A	D	B	A	A	A	A	A
Approach Vol, veh/h	106				110				1263		1661	
Approach Delay, s/veh	40.3				39.6				5.1		5.3	
Approach LOS	D				D				A		A	
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	74.6		15.4		74.6		15.4					
Change Period (Y+Rc), s	6.0		6.0		6.0		6.0					
Max Green Setting (Gmax), s	60.0		18.0		60.0		18.0					
Max Q Clear Time (g_c+I1), s	27.1		9.2		18.7		7.0					
Green Ext Time (p_c), s	10.5		0.2		16.6		0.3					
Intersection Summary												
HCM 6th Ctrl Delay	7.6											
HCM 6th LOS	A											

2040 Total PM
41: Intersection K

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	43	3	20	174	33	38
Future Vol, veh/h	43	3	20	174	33	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	3	22	193	37	42
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	199	58	79	0	-	0
Stage 1	58	-	-	-	-	-
Stage 2	141	-	-	-	-	-
Critical Hdwy	6.63	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	780	1008	1518	-	-	-
Stage 1	964	-	-	-	-	-
Stage 2	872	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	769	1008	1518	-	-	-
Mov Cap-2 Maneuver	762	-	-	-	-	-
Stage 1	951	-	-	-	-	-
Stage 2	872	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.9	0.8		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1518	-	762	1008	-	-
HCM Lane V/C Ratio	0.015	-	0.063	0.003	-	-
HCM Control Delay (s)	7.4	-	10	8.6	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	0	-	-

2040 Total PM
42: Intersection L

17-1390 Hawes Crossing TIA
05/17/2019

Intersection												
Int Delay, s/veh	6.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	15	14	20	9	2	14	14	12	4	22	1
Future Vol, veh/h	1	15	14	20	9	2	14	14	12	4	22	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	17	16	22	10	2	16	16	13	4	24	1
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	12	0	0	33	0	0	95	83	25	97	90	11
Stage 1	-	-	-	-	-	-	27	27	-	55	55	-
Stage 2	-	-	-	-	-	-	68	56	-	42	35	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1607	-	-	1579	-	-	888	807	1051	885	800	1070
Stage 1	-	-	-	-	-	-	990	873	-	957	849	-
Stage 2	-	-	-	-	-	-	942	848	-	972	866	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1607	-	-	1579	-	-	856	795	1051	850	788	1070
Mov Cap-2 Maneuver		-	-	-	-	-	856	795	-	850	788	-
Stage 1		-	-	-	-	-	989	872	-	956	837	-
Stage 2		-	-	-	-	-	901	836	-	942	865	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			4.7			9.3			9.6		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	881	1607	-	-	1579	-	-	805				
HCM Lane V/C Ratio	0.05	0.001	-	-	0.014	-	-	0.037				
HCM Control Delay (s)	9.3	7.2	0	-	7.3	0	-	9.6				
HCM Lane LOS	A	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1				

2040 Total PM
43: Intersection M

17-1390 Hawes Crossing TIA
05/17/2019

Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	25	9	6	38	9	15	31	8	6	49	5
Future Vol, veh/h	7	25	9	6	38	9	15	31	8	6	49	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	28	10	7	42	10	17	34	9	7	54	6









Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	170	148	57	163	147	39	60	0	0	43	0	0
Stage 1	71	71	-	73	73	-	-	-	-	-	-	-
Stage 2	99	77	-	90	74	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	794	743	1009	802	744	1033	1544	-	-	1566	-	-
Stage 1	939	836	-	937	834	-	-	-	-	-	-	-
Stage 2	907	831	-	917	833	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	742	731	1009	762	732	1033	1544	-	-	1566	-	-
Mov Cap-2 Maneuver	742	731	-	762	732	-	-	-	-	-	-	-
Stage 1	929	832	-	927	825	-	-	-	-	-	-	-
Stage 2	843	822	-	873	829	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	9.9		10		2		0.7	
HCM LOS	A		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1544	-	-	780	774	1566	-	-
HCM Lane V/C Ratio	0.011	-	-	0.058	0.076	0.004	-	-
HCM Control Delay (s)	7.4	0	-	9.9	10	7.3	0	-
HCM Lane LOS	A	A	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	0	-	-

2040 Total PM
44: Intersection N

17-1390 Hawes Crossing TIA
05/17/2019

Intersection												
Int Delay, s/veh	44.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	34	5	17	36	7	21	28	1157	15	28	1317	49
Future Vol, veh/h	34	5	17	36	7	21	28	1157	15	28	1317	49
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	6	19	40	8	23	31	1286	17	31	1463	54

Major/Minor	Minor2		Minor1		Major1		Major2			
Conflicting Flow All	2261	2917	759	2154	2936	652	1517	0	0	1303
Stage 1	1552	1552	-	1357	1357	-	-	-	-	-
Stage 2	709	1365	-	797	1579	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22
Pot Cap-1 Maneuver	~ 22	15	349	~ 27	15	411	436	-	-	527
Stage 1	119	173	-	157	215	-	-	-	-	-
Stage 2	391	214	-	346	168	-	-	-	-	-
Platoon blocked, %								-	-	-
Mov Cap-1 Maneuver	~ 10	13	349	~ 15	13	411	436	-	-	527
Mov Cap-2 Maneuver	~ 10	13	-	~ 15	13	-	-	-	-	-
Stage 1	111	163	-	146	200	-	-	-	-	-
Stage 2	329	199	-	298	158	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, \$	1259.5		\$ 793.4		0.3		0.2	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	436	-	-	10	51	15	47	527	-	-
HCM Lane V/C Ratio	0.071	-	-	3.778	0.479	2.667	0.662	0.059	-	-
HCM Control Delay (s)	13.9	-	-	\$ 1991.3	128.5	\$ 1274.7	174.7	12.3	-	-
HCM Lane LOS	B	-	-	F	F	F	F	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	5.9	1.8	5.7	2.6	0.2	-	-

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

2040 Total PM
45: Intersection O

17-1390 Hawes Crossing TIA
05/17/2019

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	10	2	12	16	4	3	42	8	8	45	12
Future Vol, veh/h	7	10	2	12	16	4	3	42	8	8	45	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	11	2	13	18	4	3	47	9	9	50	13




Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	144	137	57	139	139	52	63	0	0	56	0	0
Stage 1	75	75	-	58	58	-	-	-	-	-	-	-
Stage 2	69	62	-	81	81	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	825	754	1009	831	752	1016	1540	-	-	1549	-	-
Stage 1	934	833	-	954	847	-	-	-	-	-	-	-
Stage 2	941	843	-	927	828	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	802	748	1009	814	746	1016	1540	-	-	1549	-	-
Mov Cap-2 Maneuver	802	748	-	814	746	-	-	-	-	-	-	-
Stage 1	932	828	-	952	845	-	-	-	-	-	-	-
Stage 2	915	841	-	907	823	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	9.7		9.7		0.4		0.9	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1540	-	-	789	797	1549	-	-
HCM Lane V/C Ratio	0.002	-	-	0.027	0.045	0.006	-	-
HCM Control Delay (s)	7.3	0	-	9.7	9.7	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-







2040 Total PM
46: Intersection P

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	7.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	43	58	5	23	37	1
Future Vol, veh/h	43	58	5	23	37	1
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	64	6	26	41	1
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	102	19	0	0	32	0
Stage 1	19	-	-	-	-	-
Stage 2	83	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	896	1059	-	-	1580	-
Stage 1	1004	-	-	-	-	-
Stage 2	940	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	873	1059	-	-	1580	-
Mov Cap-2 Maneuver	873	-	-	-	-	-
Stage 1	1004	-	-	-	-	-
Stage 2	916	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.2	0		7.1		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	971	1580	-	
HCM Lane V/C Ratio	-	-	0.116	0.026	-	
HCM Control Delay (s)	-	-	9.2	7.3	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-	

2040 Total PM
47: Intersection Q

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	42	32	51	1357	1131	75
Future Vol, veh/h	42	32	51	1357	1131	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	250	250	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	47	36	57	1508	1257	83
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2125	629	1340	0	-	0
Stage 1	1257	-	-	-	-	-
Stage 2	868	-	-	-	-	-
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	*77	425	510	-	-	-
Stage 1	*231	-	-	-	-	-
Stage 2	*531	-	-	-	-	-
Platoon blocked, %	1			-	-	-
Mov Cap-1 Maneuver	*69	425	510	-	-	-
Mov Cap-2 Maneuver	*69	-	-	-	-	-
Stage 1	*205	-	-	-	-	-
Stage 2	*531	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	79.9	0.5		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	510	-	69	425	-	-
HCM Lane V/C Ratio	0.111	-	0.676	0.084	-	-
HCM Control Delay (s)	12.9	-	129.9	14.2	-	-
HCM Lane LOS	B	-	F	B	-	-
HCM 95th %tile Q(veh)	0.4	-	3	0.3	-	-
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

2040 Total PM
48: Intersection R

17-1390 Hawes Crossing TIA
05/17/2019

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	14	1	8	22	4	2	45	5	6	47	6
Future Vol, veh/h	4	14	1	8	22	4	2	45	5	6	47	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	16	1	9	24	4	2	50	6	7	52	7
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	141	130	56	135	130	53	59	0	0	56	0	0
Stage 1	70	70	-	57	57	-	-	-	-	-	-	-
Stage 2	71	60	-	78	73	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	829	761	1011	836	761	1014	1545	-	-	1549	-	-
Stage 1	940	837	-	955	847	-	-	-	-	-	-	-
Stage 2	939	845	-	931	834	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	802	756	1011	818	756	1014	1545	-	-	1549	-	-
Mov Cap-2 Maneuver	802	756	-	818	756	-	-	-	-	-	-	-
Stage 1	939	833	-	954	846	-	-	-	-	-	-	-
Stage 2	907	844	-	908	830	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	9.8		9.8		0.3		0.7					
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1545	-	-	776	794	1549	-	-				
HCM Lane V/C Ratio	0.001	-	-	0.027	0.048	0.004	-	-				
HCM Control Delay (s)	7.3	0	-	9.8	9.8	7.3	0	-				
HCM Lane LOS	A	A	-	A	A	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-				




2040 Total PM
49: Intersection S

17-1390 Hawes Crossing TIA
05/17/2019

Intersection												
Int Delay, s/veh	4.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	20	2	1	18	16	3	32	2	18	26	12
Future Vol, veh/h	4	20	2	1	18	16	3	32	2	18	26	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	22	2	1	20	18	3	36	2	20	29	13
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	138	120	36	131	125	37	42	0	0	38	0	0
Stage 1	76	76	-	43	43	-	-	-	-	-	-	-
Stage 2	62	44	-	88	82	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	833	770	1037	841	765	1035	1567	-	-	1572	-	-
Stage 1	933	832	-	971	859	-	-	-	-	-	-	-
Stage 2	949	858	-	920	827	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	793	758	1037	811	754	1035	1567	-	-	1572	-	-
Mov Cap-2 Maneuver	793	758	-	811	754	-	-	-	-	-	-	-
Stage 1	931	821	-	969	857	-	-	-	-	-	-	-
Stage 2	909	856	-	882	816	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	9.8		9.4			0.6			2.4			
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1567	-	-	779	863	1572	-	-				
HCM Lane V/C Ratio	0.002	-	-	0.037	0.045	0.013	-	-				
HCM Control Delay (s)	7.3	0	-	9.8	9.4	7.3	0	-				
HCM Lane LOS	A	A	-	A	A	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-				

2040 Total PM
50: Intersection T

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	6.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	21	49	8	22	40	12
Future Vol, veh/h	21	49	8	22	40	12
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	54	9	24	44	13
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	122	21	0	0	33	0
Stage 1	21	-	-	-	-	-
Stage 2	101	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	873	1056	-	-	1579	-
Stage 1	1002	-	-	-	-	-
Stage 2	923	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	849	1056	-	-	1579	-
Mov Cap-2 Maneuver	849	-	-	-	-	-
Stage 1	1002	-	-	-	-	-
Stage 2	897	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9	0		5.7		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	984	1579	-	
HCM Lane V/C Ratio	-	-	0.079	0.028	-	
HCM Control Delay (s)	-	-	9	7.3	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-	

2040 Total PM
51: Intersection U

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	36	24	36	24
Maximum Split (%)	60.0%	40.0%	60.0%	40.0%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	11	47	11	47
End Time (s)	47	11	47	11
Yield/Force Off (s)	41	5	41	5
Yield/Force Off 170(s)	30	54	30	54
Local Start Time (s)	0	36	0	36
Local Yield (s)	30	54	30	54
Local Yield 170(s)	19	43	19	43

Intersection Summary






















Cycle Length	60
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 11 (18%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 51: Intersection U

Ø2 (R) 36 s	Ø4 24 s
Ø6 (R) 36 s	Ø8 24 s




2040 Total PM
51: Intersection U

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	0	69	97	0	110	94	1356	88	85	956	41
Future Volume (veh/h)	42	0	69	97	0	110	94	1356	88	85	956	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	47	0	77	108	0	122	104	1507	98	94	1062	46
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	240	0	261	281	0	261	362	2153	139	321	2205	96
Arrive On Green	0.16	0.00	0.16	0.16	0.00	0.16	1.00	1.00	1.00	0.64	0.64	0.64
Sat Flow, veh/h	1269	0	1585	1322	0	1585	509	3388	219	316	3470	150
Grp Volume(v), veh/h	47	0	77	108	0	122	104	787	818	94	544	564
Grp Sat Flow(s),veh/h/ln	1269	0	1585	1322	0	1585	509	1777	1831	316	1777	1843
Q Serve(g_s), s	2.1	0.0	2.6	4.7	0.0	4.2	4.6	0.0	0.0	9.2	9.6	9.6
Cycle Q Clear(g_c), s	6.3	0.0	2.6	7.2	0.0	4.2	14.2	0.0	0.0	9.2	9.6	9.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		0.08
Lane Grp Cap(c), veh/h	240	0	261	281	0	261	362	1129	1164	321	1129	1171
V/C Ratio(X)	0.20	0.00	0.30	0.38	0.00	0.47	0.29	0.70	0.70	0.29	0.48	0.48
Avail Cap(c_a), veh/h	412	0	476	460	0	476	362	1129	1164	321	1129	1171
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.68	0.68	0.68	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.5	0.0	22.0	25.2	0.0	22.7	1.8	0.0	0.0	5.7	5.7	5.7
Incr Delay (d2), s/veh	0.4	0.0	0.6	0.9	0.0	1.3	1.4	2.4	2.4	2.3	1.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.1	0.0	1.7	2.6	0.0	2.8	0.2	1.4	1.4	1.0	4.4	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.9	0.0	22.6	26.1	0.0	24.0	3.2	2.4	2.4	8.0	7.2	7.2
LnGrp LOS	C	A	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h	124			230			1709			1202		
Approach Delay, s/veh	23.9			25.0			2.5			7.2		
Approach LOS	C			C			A			A		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	44.1			15.9			44.1			15.9		
Change Period (Y+Rc), s	6.0			6.0			6.0			6.0		
Max Green Setting (Gmax), s	30.0			18.0			30.0			18.0		
Max Q Clear Time (g_c+I1), s	16.2			8.3			11.6			9.2		
Green Ext Time (p_c), s	9.3			0.3			8.3			0.6		
Intersection Summary												
HCM 6th Ctrl Delay	6.6											
HCM 6th LOS	A											

2040 Total PM
52: Intersection V

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	3.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	123	18	82	150	19	75
Future Vol, veh/h	123	18	82	150	19	75
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	137	20	91	167	21	83
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	157	0	496	147
Stage 1	-	-	-	-	147	-
Stage 2	-	-	-	-	349	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1423	-	533	900
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	714	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1423	-	496	900
Mov Cap-2 Maneuver	-	-	-	-	496	-
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	664	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		2.7		10.4	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	773	-	-	1423	-	
HCM Lane V/C Ratio	0.135	-	-	0.064	-	
HCM Control Delay (s)	10.4	-	-	7.7	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.5	-	-	0.2	-	

2040 Total PM
53: Intersection W

17-1390 Hawes Crossing TIA
05/17/2019

Intersection												
Int Delay, s/veh	5.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	4	61	10	12	0	42	33	15	0	29	0
Future Vol, veh/h	4	4	61	10	12	0	42	33	15	0	29	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	4	68	11	13	0	47	37	17	0	32	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	178	180	32	208	172	46	32	0	0	54	0	0
Stage 1	32	32	-	140	140	-	-	-	-	-	-	-
Stage 2	146	148	-	68	32	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	784	714	1042	749	721	1023	1580	-	-	1551	-	-
Stage 1	984	868	-	863	781	-	-	-	-	-	-	-
Stage 2	857	775	-	942	868	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	754	692	1042	680	699	1023	1580	-	-	1551	-	-
Mov Cap-2 Maneuver	754	692	-	680	699	-	-	-	-	-	-	-
Stage 1	953	868	-	836	757	-	-	-	-	-	-	-
Stage 2	816	751	-	876	868	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	8.9		10.4		3.4		0					
HCM LOS	A		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1580	-	-	991	690	1551	-	-				
HCM Lane V/C Ratio	0.03	-	-	0.077	0.035	-	-	-				
HCM Control Delay (s)	7.3	0	-	8.9	10.4	0	-	-				
HCM Lane LOS	A	A	-	A	B	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.1	0	-	-				

2040 Total PM
54: Intersection X

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	Max	C-Max	Max	C-Max
Maximum Split (s)	27	63	27	63
Maximum Split (%)	30.0%	70.0%	30.0%	70.0%
Minimum Split (s)	24	24	24	24
Yellow Time (s)	4	4	4	4
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	48	75	48	75
End Time (s)	75	48	75	48
Yield/Force Off (s)	69	42	69	42
Yield/Force Off 170(s)	58	31	58	31
Local Start Time (s)	63	0	63	0
Local Yield (s)	84	57	84	57
Local Yield 170(s)	73	46	73	46

Intersection Summary





















Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 75 (83%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 54: Intersection X



2040 Total PM
54: Intersection X

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	1297	15	45	882	99	10	7	29	164	11	81
Future Volume (veh/h)	122	1297	15	45	882	99	10	7	29	164	11	81
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	136	1441	17	50	980	110	11	8	32	182	12	90
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	325	2278	27	221	2040	229	315	76	305	373	44	332
Arrive On Green	0.63	0.63	0.63	0.63	0.63	0.63	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	517	3597	42	364	3221	361	1293	327	1308	1367	190	1424
Grp Volume(v), veh/h	136	711	747	50	541	549	11	0	40	182	0	102
Grp Sat Flow(s),veh/h/ln	517	1777	1863	364	1777	1805	1293	0	1635	1367	0	1614
Q Serve(g_s), s	16.9	22.0	22.1	8.8	14.4	14.4	0.6	0.0	1.7	10.9	0.0	4.7
Cycle Q Clear(g_c), s	31.4	22.0	22.1	30.8	14.4	14.4	5.3	0.0	1.7	12.6	0.0	4.7
Prop In Lane	1.00		0.02	1.00		0.20	1.00		0.80	1.00		0.88
Lane Grp Cap(c), veh/h	325	1125	1180	221	1125	1143	315	0	381	373	0	377
V/C Ratio(X)	0.42	0.63	0.63	0.23	0.48	0.48	0.03	0.00	0.10	0.49	0.00	0.27
Avail Cap(c_a), veh/h	325	1125	1180	221	1125	1143	315	0	381	373	0	377
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.0	10.1	10.1	19.5	8.7	8.7	30.4	0.0	27.1	32.1	0.0	28.2
Incr Delay (d2), s/veh	3.9	2.7	2.6	2.4	1.5	1.4	0.2	0.0	0.6	4.5	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.8	12.0	12.4	1.5	8.4	8.5	0.4	0.0	1.3	7.2	0.0	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.9	12.8	12.7	21.9	10.2	10.1	30.6	0.0	27.7	36.6	0.0	30.0
LnGrp LOS	C	B	B	C	B	B	C	A	C	D	A	C
Approach Vol, veh/h	1594			1140			51			284		
Approach Delay, s/veh	13.4			10.7			28.3			34.2		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	27.0			63.0			27.0			63.0		
Change Period (Y+Rc), s	6.0			6.0			6.0			6.0		
Max Green Setting (Gmax), s	21.0			57.0			21.0			57.0		
Max Q Clear Time (g_c+I1), s	7.3			33.4			14.6			32.8		
Green Ext Time (p_c), s	0.1			12.2			0.6			8.1		
Intersection Summary												
HCM 6th Ctrl Delay	14.6											
HCM 6th LOS	B											

2040 Total PM
55: Intersection Y

17-1390 Hawes Crossing TIA
05/17/2019

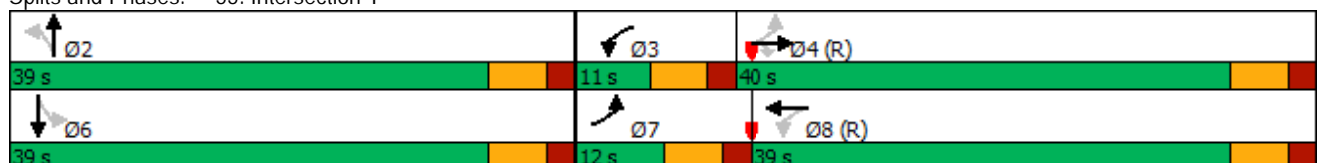


Phase Number	2	3	4	6	7	8
Movement	NBTL	WBL	EBTL	SBTL	EBL	WBTL
Lead/Lag		Lead	Lag		Lead	Lag
Lead-Lag Optimize		Yes	Yes		Yes	Yes
Recall Mode	Max	None	C-Max	Max	None	C-Max
Maximum Split (s)	39	11	40	39	12	39
Maximum Split (%)	43.3%	12.2%	44.4%	43.3%	13.3%	43.3%
Minimum Split (s)	24	11	24	24	11	24
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)	7		7	7		7
Flash Dont Walk (s)	11		11	11		11
Dual Entry	Yes	No	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	39	78	89	39	78	0
End Time (s)	78	89	39	78	0	39
Yield/Force Off (s)	72	83	33	72	84	33
Yield/Force Off 170(s)	61	83	22	61	84	22
Local Start Time (s)	39	78	89	39	78	0
Local Yield (s)	72	83	33	72	84	33
Local Yield 170(s)	61	83	22	61	84	22

Intersection Summary






















Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 55: Intersection Y








2040 Total PM
55: Intersection Y

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	101	1006	288	57	711	14	364	0	46	15	0	86
Future Volume (veh/h)	101	1006	288	57	711	14	364	0	46	15	0	86
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	112	1118	320	63	790	16	404	0	51	17	0	96
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	315	1383	617	199	1342	27	503	0	581	548	0	581
Arrive On Green	0.06	0.39	0.39	0.04	0.38	0.38	0.37	0.00	0.37	0.37	0.00	0.37
Sat Flow, veh/h	1781	3554	1585	1781	3562	72	1300	0	1585	1354	0	1585
Grp Volume(v), veh/h	112	1118	320	63	394	412	404	0	51	17	0	96
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1857	1300	0	1585	1354	0	1585
Q Serve(g_s), s	3.4	25.2	13.9	1.9	16.0	16.0	27.4	0.0	1.9	0.7	0.0	3.7
Cycle Q Clear(g_c), s	3.4	25.2	13.9	1.9	16.0	16.0	31.0	0.0	1.9	2.6	0.0	3.7
Prop In Lane	1.00		1.00	1.00		0.04	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	315	1383	617	199	669	700	503	0	581	548	0	581
V/C Ratio(X)	0.36	0.81	0.52	0.32	0.59	0.59	0.80	0.00	0.09	0.03	0.00	0.17
Avail Cap(c_a), veh/h	333	1383	617	219	669	700	503	0	581	548	0	581
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.1	24.5	21.0	19.5	22.5	22.5	29.7	0.0	18.7	19.5	0.0	19.2
Incr Delay (d2), s/veh	0.7	5.2	3.1	0.9	3.8	3.6	12.7	0.0	0.3	0.1	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.4	15.8	9.0	1.4	11.1	11.4	15.1	0.0	1.3	0.4	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.8	29.7	24.1	20.4	26.2	26.1	42.4	0.0	18.9	19.6	0.0	19.8
LnGrp LOS	B	C	C	C	C	C	D	A	B	B	A	B
Approach Vol, veh/h	1550				869				455			
Approach Delay, s/veh	27.7				25.7				39.8			
Approach LOS	C				C				D			
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	39.0		10.0	41.0		39.0		11.1	39.9			
Change Period (Y+Rc), s	6.0		6.0	6.0		6.0		6.0	6.0			
Max Green Setting (Gmax), s	33.0		5.0	34.0		33.0		6.0	33.0			
Max Q Clear Time (g_c+I1), s	33.0		3.9	27.2		5.7		5.4	18.0			
Green Ext Time (p_c), s	0.0		0.0	4.3		0.6		0.0	4.0			
Intersection Summary												
HCM 6th Ctrl Delay	28.6											
HCM 6th LOS	C											

2040 Total PM
56: Intersection Z

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	111	924	669	25	27	103
Future Vol, veh/h	111	924	669	25	27	103
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	-	250
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	123	1027	743	28	30	114
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	771	0	-	0	1517	386
Stage 1	-	-	-	-	757	-
Stage 2	-	-	-	-	760	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	840	-	-	-	*238	612
Stage 1	-	-	-	-	*424	-
Stage 2	-	-	-	-	*662	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	840	-	-	-	*203	612
Mov Cap-2 Maneuver	-	-	-	-	*331	-
Stage 1	-	-	-	-	*362	-
Stage 2	-	-	-	-	*662	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.1	0		13.2		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	840	-	-	-	331	612
HCM Lane V/C Ratio	0.147	-	-	-	0.091	0.187
HCM Control Delay (s)	10	-	-	-	17	12.2
HCM Lane LOS	B	-	-	-	C	B
HCM 95th %tile Q(veh)	0.5	-	-	-	0.3	0.7
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

2040 Total PM
57: Intersection AA

17-1390 Hawes Crossing TIA
05/17/2019



Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	None	None	C-Max
Maximum Split (s)	11	31	11	67	11	31	21	57
Maximum Split (%)	9.2%	25.8%	9.2%	55.8%	9.2%	25.8%	17.5%	47.5%
Minimum Split (s)	11	24	11	24	11	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	79	90	1	12	79	90	1	22
End Time (s)	90	1	12	79	90	1	22	79
Yield/Force Off (s)	84	115	6	73	84	115	16	73
Yield/Force Off 170(s)	84	104	6	62	84	104	16	62
Local Start Time (s)	57	68	99	110	57	68	99	0
Local Yield (s)	62	93	104	51	62	93	114	51
Local Yield 170(s)	62	82	104	40	62	82	114	40

Intersection Summary






















Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 22 (18%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 57: Intersection AA

Ø1	Ø2	Ø3	Ø4 (R)
11 s	31 s	11 s	67 s
Ø5	Ø6	Ø7	Ø8 (R)
11 s	31 s	21 s	57 s

2040 Total PM
57: Intersection AA

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	2370	12	2	1397	10	79	0	15	54	0	290
Future Volume (veh/h)	52	2370	12	2	1397	10	79	0	15	54	0	290
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	58	2633	13	2	1552	11	88	0	17	60	0	322
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	293	2870	14	75	2690	19	355	0	337	411	390	387
Arrive On Green	0.04	0.55	0.55	0.01	1.00	1.00	0.04	0.00	0.21	0.04	0.00	0.21
Sat Flow, veh/h	1781	5244	26	1781	5231	37	1781	0	1585	1781	1870	1585
Grp Volume(v), veh/h	58	1708	938	2	1010	553	88	0	17	60	0	322
Grp Sat Flow(s),veh/h/ln	1781	1702	1866	1781	1702	1864	1781	0	1585	1781	1870	1585
Q Serve(g_s), s	1.8	54.7	54.9	0.1	0.0	0.0	4.7	0.0	1.0	3.2	0.0	23.1
Cycle Q Clear(g_c), s	1.8	54.7	54.9	0.1	0.0	0.0	4.7	0.0	1.0	3.2	0.0	23.1
Prop In Lane	1.00		0.01	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	293	1863	1021	75	1751	959	355	0	337	411	390	387
V/C Ratio(X)	0.20	0.92	0.92	0.03	0.58	0.58	0.25	0.00	0.05	0.15	0.00	0.83
Avail Cap(c_a), veh/h	452	1863	1021	144	1751	959	355	0	337	419	390	387
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.67	0.67	0.67	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.6	24.7	24.7	25.0	0.0	0.0	35.5	0.0	37.6	35.3	0.0	43.0
Incr Delay (d2), s/veh	0.3	8.7	14.3	0.1	0.9	1.7	0.4	0.0	0.3	0.2	0.0	14.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	31.1	35.6	0.0	0.4	0.8	3.7	0.0	0.8	2.5	0.0	15.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.9	33.3	39.0	25.0	0.9	1.7	35.9	0.0	37.9	35.5	0.0	57.4
LnGrp LOS	B	C	D	C	A	A	D	A	D	D	A	E
Approach Vol, veh/h	2704			1565			105			382		
Approach Delay, s/veh	34.9			1.2			36.2			54.0		
Approach LOS	C			A			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.5	31.5	6.3	71.7	11.0	31.0	10.3	67.7				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	5.0	25.0	5.0	61.0	5.0	25.0	15.0	51.0				
Max Q Clear Time (g_c+I1), s	5.2	3.0	2.1	56.9	6.7	25.1	3.8	2.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	3.9	0.0	0.0	0.1	14.2				
Intersection Summary												
HCM 6th Ctrl Delay	25.4											
HCM 6th LOS	C											

2040 Total PM
58: Intersection AB

17-1390 Hawes Crossing TIA
05/17/2019

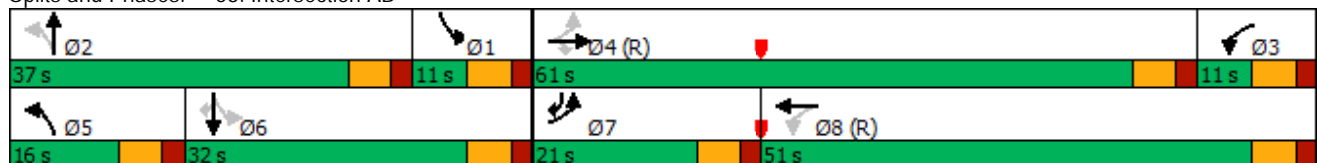


Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	EBL	WBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	Max	None	None	C-Max
Maximum Split (s)	11	37	11	61	16	32	21	51
Maximum Split (%)	9.2%	30.8%	9.2%	50.8%	13.3%	26.7%	17.5%	42.5%
Minimum Split (s)	11	24	11	24	24	24	11	24
Yellow Time (s)	4	4	4	4	4	4	4	4
All-Red Time (s)	2	2	2	2	2	2	2	2
Minimum Initial (s)	5	5	5	5	5	5	5	5
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7	7	7		7
Flash Dont Walk (s)		11		11	11	11		11
Dual Entry	No	Yes	No	Yes	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	19	102	91	30	102	118	30	51
End Time (s)	30	19	102	91	118	30	51	102
Yield/Force Off (s)	24	13	96	85	112	24	45	96
Yield/Force Off 170(s)	24	2	96	74	101	13	45	85
Local Start Time (s)	88	51	40	99	51	67	99	0
Local Yield (s)	93	82	45	34	61	93	114	45
Local Yield 170(s)	93	71	45	23	50	82	114	34

Intersection Summary























Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	115
Offset: 51 (43%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 58: Intersection AB








2040 Total PM
58: Intersection AB

17-1390 Hawes Crossing TIA
05/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	2099	15	1	1280	4	100	0	6	19	0	281
Future Volume (veh/h)	61	2099	15	1	1280	4	100	0	6	19	0	281
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	68	2332	17	1	1422	4	111	0	7	21	0	312
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	255	2340	726	157	2498	7	342	0	409	265	382	383
Arrive On Green	0.07	0.92	0.92	0.11	0.95	0.95	0.08	0.00	0.26	0.03	0.00	0.20
Sat Flow, veh/h	1781	5106	1585	1781	5257	15	1781	0	1585	1781	1870	1585
Grp Volume(v), veh/h	68	2332	17	1	921	505	111	0	7	21	0	312
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1868	1781	0	1585	1781	1870	1585
Q Serve(g_s), s	2.7	52.8	0.1	0.0	3.5	3.5	6.2	0.0	0.4	0.0	0.0	22.3
Cycle Q Clear(g_c), s	2.7	52.8	0.1	0.0	3.5	3.5	6.2	0.0	0.4	0.0	0.0	22.3
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	255	2340	726	157	1617	887	342	0	409	265	382	383
V/C Ratio(X)	0.27	1.00	0.02	0.01	0.57	0.57	0.32	0.00	0.02	0.08	0.00	0.81
Avail Cap(c_a), veh/h	411	2340	726	157	1617	887	342	0	409	287	405	403
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.34	0.34	0.34	0.67	0.67	0.67	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.0	4.9	1.2	50.6	1.7	1.7	38.5	0.0	33.2	45.3	0.0	43.0
Incr Delay (d2), s/veh	0.2	10.1	0.0	0.0	1.0	1.8	2.5	0.0	0.1	0.1	0.0	11.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.9	6.0	0.1	0.0	1.5	2.0	5.3	0.0	0.3	1.0	0.0	14.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.2	15.0	1.2	50.6	2.6	3.4	41.0	0.0	33.2	45.4	0.0	54.7
LnGrp LOS	C	B	A	D	A	A	D	A	C	D	A	D
Approach Vol, veh/h	2417		1427			118			333			
Approach Delay, s/veh	15.0		3.0			40.5			54.1			
Approach LOS	B		A			D			D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.5	37.0	12.5	61.0	16.0	30.5	10.5	63.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	5.0	31.0	5.0	55.0	10.0	26.0	15.0	45.0				
Max Q Clear Time (g_c+I1), s	2.0	2.4	2.0	54.8	8.2	24.3	4.7	5.5				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.2	0.0	0.2	0.1	11.7				
Intersection Summary												
HCM 6th Ctrl Delay	14.7											
HCM 6th LOS	B											









2040 Total PM
59: Intersection AC

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	2.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	24	69	13	4	10
Future Vol, veh/h	1	24	69	13	4	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	27	77	14	4	11
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	103	84	0	0	91	0
Stage 1	84	-	-	-	-	-
Stage 2	19	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	895	975	-	-	1504	-
Stage 1	939	-	-	-	-	-
Stage 2	1004	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	892	975	-	-	1504	-
Mov Cap-2 Maneuver	892	-	-	-	-	-
Stage 1	939	-	-	-	-	-
Stage 2	1001	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	8.8	0		2.1		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	892	975	1504	-
HCM Lane V/C Ratio	-	-	0.001	0.027	0.003	-
HCM Control Delay (s)	-	-	9	8.8	7.4	-
HCM Lane LOS	-	-	A	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0.1	0	-

2040 Total PM
60: Intersection AD

17-1390 Hawes Crossing TIA
05/17/2019

Intersection												
Int Delay, s/veh	4.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	6	13	3	1	9	2	29	24	1	4	2
Future Vol, veh/h	24	6	13	3	1	9	2	29	24	1	4	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	7	14	3	1	10	2	32	27	1	4	2







Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	62	70	5	68	58	46	6	0	0	59	0	0
Stage 1	7	7	-	50	50	-	-	-	-	-	-	-
Stage 2	55	63	-	18	8	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	933	821	1078	925	833	1023	1615	-	-	1545	-	-
Stage 1	1015	890	-	963	853	-	-	-	-	-	-	-
Stage 2	957	842	-	1001	889	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	922	819	1078	906	831	1023	1615	-	-	1545	-	-
Mov Cap-2 Maneuver	922	819	-	906	831	-	-	-	-	-	-	-
Stage 1	1014	889	-	962	852	-	-	-	-	-	-	-
Stage 2	945	841	-	980	888	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	8.9		8.7		0.3		1	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1615	-	-	922	980	906	1000	1545	-	-
HCM Lane V/C Ratio	0.001	-	-	0.029	0.022	0.004	0.011	0.001	-	-
HCM Control Delay (s)	7.2	-	-	9	8.8	9	8.6	7.3	-	-
HCM Lane LOS	A	-	-	A	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	0	0	-	-






2040 Total PM
61: Intersection AE

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	46	30	2	1139	1625	9
Future Vol, veh/h	46	30	2	1139	1625	9
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	0	150	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	51	33	2	1266	1806	10
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2316	903	1816	0	-	0
Stage 1	1806	-	-	-	-	-
Stage 2	510	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	*225	*545	*686	-	-	-
Stage 1	*560	-	-	-	-	-
Stage 2	*519	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	*225	*545	*686	-	-	-
Mov Cap-2 Maneuver	*225	-	-	-	-	-
Stage 1	*558	-	-	-	-	-
Stage 2	*519	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	20.2	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	* 686	-	225	545	-	-
HCM Lane V/C Ratio	0.003	-	0.227	0.061	-	-
HCM Control Delay (s)	10.3	-	25.6	12	-	-
HCM Lane LOS	B	-	D	B	-	-
HCM 95th %tile Q(veh)	0	-	0.8	0.2	-	-
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon







2040 Total PM
62: Intersection AF

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	4	946	24	30	3
Future Vol, veh/h	4	4	946	24	30	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	4	1051	27	33	3
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1134	1065	0	0	1078	0
Stage 1	1065	-	-	-	-	-
Stage 2	69	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	224	270	-	-	647	-
Stage 1	331	-	-	-	-	-
Stage 2	954	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	213	270	-	-	647	-
Mov Cap-2 Maneuver	213	-	-	-	-	-
Stage 1	331	-	-	-	-	-
Stage 2	905	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	20.5	0	9.9			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	213	270	647	-
HCM Lane V/C Ratio	-	-	0.021	0.016	0.052	-
HCM Control Delay (s)	-	-	22.3	18.6	10.9	-
HCM Lane LOS	-	-	C	C	B	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	0.2	-

2040 Total PM
63: Intersection AG

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	29	50	4	1120	1727	7
Future Vol, veh/h	29	50	4	1120	1727	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	56	4	1244	1919	8
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2429	964	1927	0	-	0
Stage 1	1923	-	-	-	-	-
Stage 2	506	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	*255	*524	*658	-	-	-
Stage 1	*537	-	-	-	-	-
Stage 2	*693	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	*254	*524	*658	-	-	-
Mov Cap-2 Maneuver	*254	-	-	-	-	-
Stage 1	*534	-	-	-	-	-
Stage 2	*693	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	15.8	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	* 658	-	254	524	-	-
HCM Lane V/C Ratio	0.007	-	0.127	0.106	-	-
HCM Control Delay (s)	10.5	-	21.2	12.7	-	-
HCM Lane LOS	B	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.4	0.4	-	-
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon






2040 Total PM
64: Intersection AH

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	2.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱		↰	↱	↰	↱
Traffic Vol, veh/h	22	63	30	3	9	4
Future Vol, veh/h	22	63	30	3	9	4
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	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	70	33	3	10	4
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	94	0	128	59
Stage 1	-	-	-	-	59	-
Stage 2	-	-	-	-	69	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1500	-	866	1007
Stage 1	-	-	-	-	964	-
Stage 2	-	-	-	-	954	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1500	-	847	1007
Mov Cap-2 Maneuver	-	-	-	-	847	-
Stage 1	-	-	-	-	964	-
Stage 2	-	-	-	-	933	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		6.8		9.1	
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	847	1007	-	-	1500	-
HCM Lane V/C Ratio	0.012	0.004	-	-	0.022	-
HCM Control Delay (s)	9.3	8.6	-	-	7.5	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	0	0	-	-	0.1	-







2040 Total PM
65: Intersection AI

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	4.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	24	11	3	19	22
Future Vol, veh/h	3	24	11	3	19	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	250
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	27	12	3	21	24
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	15	0	-	0	47	14
Stage 1	-	-	-	-	14	-
Stage 2	-	-	-	-	33	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1603	-	-	-	963	1066
Stage 1	-	-	-	-	1009	-
Stage 2	-	-	-	-	989	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1603	-	-	-	961	1066
Mov Cap-2 Maneuver	-	-	-	-	961	-
Stage 1	-	-	-	-	1007	-
Stage 2	-	-	-	-	989	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.8	0		8.6		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1603	-	-	-	961	1066
HCM Lane V/C Ratio	0.002	-	-	-	0.022	0.023
HCM Control Delay (s)	7.2	-	-	-	8.8	8.5
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0.1






2040 Total PM
66: Intersection AJ

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	49	7	1115	1852	2
Future Vol, veh/h	17	49	7	1115	1852	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	19	54	8	1239	2058	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2571	1030	2060	0	-	0
Stage 1	2059	-	-	-	-	-
Stage 2	512	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	*80	198	117	-	-	-
Stage 1	*52	-	-	-	-	-
Stage 2	*693	-	-	-	-	-
Platoon blocked, %	1			-	-	-
Mov Cap-1 Maneuver	*75	198	117	-	-	-
Mov Cap-2 Maneuver	*75	-	-	-	-	-
Stage 1	*48	-	-	-	-	-
Stage 2	*693	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	39.8	0.2		0		
HCM LOS	E					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	117	-	75	198	-	-
HCM Lane V/C Ratio	0.066	-	0.252	0.275	-	-
HCM Control Delay (s)	37.9	-	68.4	29.9	-	-
HCM Lane LOS	E	-	F	D	-	-
HCM 95th %tile Q(veh)	0.2	-	0.9	1.1	-	-
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

2040 Total PM
67: Intersection AK

17-1390 Hawes Crossing TIA
05/17/2019

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	9	846	599	8	55	61
Future Vol, veh/h	9	846	599	8	55	61
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	-	-	-	250	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	940	666	9	61	68
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	675	0	-	0	1161	338
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	490	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	912	-	-	-	188	658
Stage 1	-	-	-	-	470	-
Stage 2	-	-	-	-	581	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	912	-	-	-	186	658
Mov Cap-2 Maneuver	-	-	-	-	186	-
Stage 1	-	-	-	-	465	-
Stage 2	-	-	-	-	581	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		21.7		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	912	-	-	-	186	658
HCM Lane V/C Ratio	0.011	-	-	-	0.329	0.103
HCM Control Delay (s)	9	-	-	-	33.5	11.1
HCM Lane LOS	A	-	-	-	D	B
HCM 95th %tile Q(veh)	0	-	-	-	1.4	0.3

APPENDIX H

TURN LANE LENGTH ANALYSES

Hawes Crossing

Queue Length Analysis

Signalized Intersection

2040

Length (ft) Veh. Type

Average Vehicle Length (ft): 26 25 Passenger Cycles: 1.5

Intersection Cycle Length (sec): 120 75 Truck

Equation Used: storage length = 1.5 x (vehicles/hour)/(cycles/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	PM Peak (veh/hr)	Max vehs per 1.5 cycles	Turn Lanes	Storage Length
Sossaman Rd & Guadalupe Rd	NB Left	255	170	13	1	325'
	SB Left	97	338	17	1	425'
	EB Left	175	230	12	1	300'
	WB Left	160	210	11	1	275'
	NB Right	135	190	10	1	250'
	SB Right	185	135	10	1	250'
	EB Right	45	225	12	0	-
	WB Right	261	149	13	1	325'
Farnsworth Dr/Bridlewood & Guadalupe Rd	NB Left	200	45	10	1	250'
	SB Left	20	150	8	1	200'
	EB Left	15	80	4	1	100'
	WB Left	115	90	6	1	150'
	NB Right	50	140	7	0	-
	SB Right	65	20	4	0	-
	EB Right	35	220	11	0	-
	WB Right	120	25	6	0	-
Hawes Rd & Guadalupe Rd	NB Left	104	162	8	1	200'
	SB Left	105	125	7	1	175'
	EB Left	90	50	5	1	125'
	WB Left	122	424	21	1	525'
	NB Right	371	168	19	1	475'
	SB Right	45	335	17	1	425'
	EB Right	291	221	15	1	375'
	WB Right	80	165	9	1	225'
Loop 202 SB Ramps & Guadalupe Rd	NB Left	0	0	0	0	-
	SB Left	490	760	38	2	475'
	EB Left	0	0	0	0	-
	WB Left	420	405	21	2	275'
	NB Right	0	0	0	0	-
	SB Right	132	319	16	2	200'
	EB Right	115	270	14	1	350'
	WB Right	0	0	0	0	-
Loop 202 NB Ramps & Guadalupe Rd	NB Left	280	180	14	2	175'
	SB Left	0	0	0	0	-
	EB Left	351	703	35	2	450'
	WB Left	0	0	0	0	-
	NB Right	95	250	13	2	175'
	SB Right	0	0	0	0	-
	EB Right	0	0	0	0	-
	WB Right	1,100	820	54	1	1350'
Power Rd & Elliot Rd	NB Left	270	165	14	1	350'
	SB Left	145	270	14	1	350'
	EB Left	210	395	20	1	500'
	WB Left	159	292	15	1	375'
	NB Right	252	436	22	1	550'
	SB Right	30	430	22	1	550'
	EB Right	125	300	15	1	375'
	WB Right	150	140	8	0	-

Hawes Crossing

Queue Length Analysis

Signalized Intersection

2040

Length (ft) Veh. Type

Average Vehicle Length (ft): 26 25 Passenger Cycles: 1.5

Intersection Cycle Length (sec): 120 75 Truck

Equation Used: storage length = 1.5 x (vehicles/hour)/(cycles/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	PM Peak (veh/hr)	Max vehs per 1.5 cycles	Turn Lanes	Storage Length
Sossaman Rd & Elliot Rd	NB Left	327	181	17	1	425'
	SB Left	223	553	28	2	350'
	EB Left	195	250	13	1	325'
	WB Left	110	148	8	1	200'
	NB Right	76	316	16	1	400'
	SB Right	205	240	12	1	300'
	EB Right	46	192	10	0	-
	WB Right	394	379	20	1	500'
80th St & Elliot Rd	NB Left	19	37	2	1	50'
	SB Left	25	80	4	1	100'
	EB Left	10	10	1	1	25'
	WB Left	18	60	3	1	75'
	NB Right	31	52	3	0	-
	SB Right	65	50	4	0	-
	EB Right	12	40	2	0	-
	WB Right	95	60	5	0	-
Hawes Rd & Elliot Rd	NB Left	182	332	17	1	425'
	SB Left	141	95	7	1	175'
	EB Left	157	128	8	1	200'
	WB Left	164	626	31	2	400'
	NB Right	503	428	25	1	625'
	SB Right	89	117	6	1	150'
	EB Right	273	252	14	1	350'
	WB Right	174	180	9	0	-
Loop 202 SB Ramps & Elliot Rd	NB Left	0	0	0	0	-
	SB Left	670	634	33	2	425'
	EB Left	0	0	0	0	-
	WB Left	690	486	34	2	425'
	NB Right	0	0	0	0	-
	SB Right	797	1,123	56	2	700'
	EB Right	252	495	25	1	625'
	WB Right	0	0	0	0	-
Loop 202 NB Ramps & Elliot Rd	NB Left	512	659	33	2	425'
	SB Left	0	0	0	0	-
	EB Left	785	1,125	56	2	700'
	WB Left	0	0	0	0	-
	NB Right	915	725	45	2	575'
	SB Right	0	0	0	0	-
	EB Right	0	0	0	0	-
	WB Right	623	587	31	1	775'
Sossaman Rd & Warner Rd	NB Left	310	245	16	2	200'
	SB Left	193	432	22	2	275'
	EB Left	176	286	15	2	200'
	WB Left	215	170	11	2	150'
	NB Right	80	205	11	1	275'
	SB Right	290	228	15	1	375'
	EB Right	105	250	13	1	325'
	WB Right	339	448	22	1	550'

Hawes Crossing

Queue Length Analysis

Signalized Intersection

2040

Length (ft) Veh. Type

Average Vehicle Length (ft): 26 25 Passenger Cycles: 1.5

Intersection Cycle Length (sec): 120 75 Truck

Equation Used: storage length = 1.5 x (vehicles/hour)/(cycles/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	PM Peak (veh/hr)	Max vehs per 1.5 cycles	Turn Lanes	Storage Length
Hawes Rd & Warner Rd	NB Left	288	560	28	2	350'
	SB Left	137	274	14	1	350'
	EB Left	64	197	10	1	250'
	WB Left	355	550	27	2	350'
	NB Right	296	324	16	1	400'
	SB Right	329	77	17	1	425'
	EB Right	228	489	24	1	600'
	WB Right	127	221	11	1	275'
Hawes Rd & Loop 202 WB Ramps	NB Left	320	215	16	2	200'
	SB Left	0	0	0	0	-
	EB Left	0	0	0	0	-
	WB Left	340	215	17	2	225'
	NB Right	0	0	0	0	-
	SB Right	387	1,092	54	1	1350'
	EB Right	0	0	0	0	-
	WB Right	360	555	28	2	350'
Hawes Rd & Loop 202 EB Ramps	NB Left	0	0	0	0	-
	SB Left	247	550	27	2	350'
	EB Left	465	818	41	2	525'
	WB Left	0	0	0	0	-
	NB Right	340	65	17	1	425'
	SB Right	0	0	0	0	-
	EB Right	175	180	9	2	125'
	WB Right	0	0	0	0	-
Ellsworth Road and Elliot Road	NB Left	439	384	22	2	275'
	SB Left	150	450	23	2	300'
	EB Left	155	300	15	1	375'
	WB Left	327	274	17	1	425'
	NB Right	426	334	21	1	525'
	SB Right	265	200	13	1	325'
	EB Right	446	469	23	1	575'
	WB Right	420	230	21	1	525'
Ellsworth Road and Warner Road	NB Left	409	13	21	2	275'
	SB Left	112	325	16	1	400'
	EB Left	259	353	18	1	450'
	WB Left	95	60	5	1	125'
	NB Right	65	195	10	0	-
	SB Right	206	420	21	1	525'
	EB Right	85	292	15	1	375'
	WB Right	265	76	13	1	325'
Intersection E	NB Left	22	57	3	1	75'
	SB Left	97	106	6	1	150'
	EB Left	15	48	3	1	75'
	WB Left	54	168	9	1	225'
	NB Right	128	116	7	0	-
	SB Right	27	40	2	0	-
	EB Right	12	39	2	0	-
	WB Right	44	139	7	0	-

Hawes Crossing

Queue Length Analysis

Signalized Intersection

2040

Length (ft) Veh. Type

Average Vehicle Length (ft): 26 25 Passenger Cycles: 1.5

Intersection Cycle Length (sec): 120 75 Truck

Equation Used: storage length = 1.5 x (vehicles/hour)/(cycles/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	PM Peak (veh/hr)	Max vehs per 1.5 cycles	Turn Lanes	Storage Length
Intersection F	NB Left	11	54	3	2	50'
	SB Left	0	0	0	0	-
	EB Left	0	0	0	0	-
	WB Left	283	180	14	2	175'
	NB Right	96	283	14	2	175'
	SB Right	0	0	0	0	-
	EB Right	17	47	3	1	75'
	WB Right	0	0	0	0	-
Intersection J	NB Left	16	52	3	1	75'
	SB Left	20	63	4	1	100'
	EB Left	33	48	3	1	75'
	WB Left	10	33	2	1	50'
	NB Right	30	14	2	0	-
	SB Right	10	31	2	0	-
	EB Right	21	33	2	0	-
	WB Right	13	44	3	0	-
Intersection U	NB Left	30	94	5	1	125'
	SB Left	26	85	5	1	125'
	EB Left	41	42	3	1	75'
	WB Left	65	97	5	1	125'
	NB Right	28	88	5	0	-
	SB Right	13	41	3	0	-
	EB Right	50	69	4	0	-
	WB Right	23	110	6	0	-
Intersection X	NB Left	15	10	1	1	25'
	SB Left	55	164	9	1	225'
	EB Left	39	122	6	1	150'
	WB Left	16	45	3	1	75'
	NB Right	45	29	3	0	-
	SB Right	47	81	4	0	-
	EB Right	5	15	1	0	-
	WB Right	115	99	6	0	-
Intersection Y	NB Left	90	364	18	1	450'
	SB Left	7	15	1	1	25'
	EB Left	32	101	5	1	125'
	WB Left	17	57	3	1	75'
	NB Right	9	46	3	0	-
	SB Right	37	86	5	0	-
	EB Right	87	288	15	1	375'
	WB Right	5	14	1	0	-

Hawes Crossing

Queue Length Analysis

Signalized Intersection

2040

Length (ft) Veh. Type

Average Vehicle Length (ft): 26 25 Passenger Cycles: 1.5

Intersection Cycle Length (sec): 120 75 Truck

Equation Used: storage length = 1.5 x (vehicles/hour)/(cycles/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	PM Peak (veh/hr)	Max vehs per 1.5 cycles	Turn Lanes	Storage Length
Intersection AA	NB Left	16	79	4	1	100'
	SB Left	10	54	3	1	75'
	EB Left	164	52	9	1	225'
	WB Left	22	2	2	1	50'
	NB Right	3	15	1	0	-
	SB Right	55	290	15	1	375'
	EB Right	119	12	6	0	-
	WB Right	31	10	2	0	-
Intersection AB	NB Left	20	100	5	1	125'
	SB Left	4	19	1	1	25'
	EB Left	158	61	8	1	200'
	WB Left	9	1	1	1	25'
	NB Right	1	6	1	0	-
	SB Right	63	281	14	0	-
	EB Right	150	15	8	1	200'
	WB Right	11	4	1	0	-

Hawes Crossing

Queue Length Analysis

Unsignalized Intersection

2040

Average Vehicle Length (ft):
 Length (ft) % Vehicles Veh. Type
 25 98% Passenger
 75 2% Truck

Equation Used: storage length = 2 x (vehicles/hour)/(60 minutes/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	PM Peak (veh/hr)	Veh per 2 minutes	Trucks per 2 minutes	Turn Lanes	Storage Length
Intersection A	NB Left	0	0	0	0	0	-
	SB Left	36	23	2	1	0	-
	EB Left	0	0	0	0	0	-
	WB Left	8	26	1	1	0	-
	NB Right	21	21	1	1	0	-
	SB Right	0	0	0	0	0	-
	EB Right	0	0	0	0	0	-
	WB Right	12	38	2	1	0	-
Intersection B	NB Left	9	28	1	1	1	100'
	SB Left	0	0	0	0	0	-
	EB Left	47	38	2	1	1	125'
	WB Left	0	0	0	0	0	-
	NB Right	0	0	0	0	0	-
	SB Right	17	53	2	1	1	125'
	EB Right	26	17	1	1	1	100'
	WB Right	0	0	0	0	0	-
Intersection C	NB Left	8	26	1	1	0	-
	SB Left	0	0	0	0	0	-
	EB Left	0	0	0	0	0	-
	WB Left	10	13	1	1	0	-
	NB Right	7	19	1	1	0	-
	SB Right	0	0	0	0	0	-
	EB Right	24	15	1	1	0	-
	WB Right	0	0	0	0	0	-
Intersection D	NB Left	62	55	3	1	1	150'
	SB Left	0	0	0	0	0	-
	EB Left	0	0	0	0	0	-
	WB Left	21	65	3	1	1	150'
	NB Right	52	45	2	1	1	125'
	SB Right	0	0	0	0	0	-
	EB Right	25	78	3	1	1	150'
	WB Right	0	0	0	0	0	-
Intersection G	NB Left	0	0	0	0	0	-
	SB Left	10	30	1	1	0	-
	EB Left	0	0	0	0	0	-
	WB Left	5	15	1	1	0	-
	NB Right	14	9	1	1	0	-
	SB Right	0	0	0	0	0	-
	EB Right	0	0	0	0	0	-
	WB Right	28	18	1	1	0	-
Intersection H	NB Left	12	8	1	1	0	-
	SB Left	2	5	1	1	0	-
	EB Left	14	9	1	1	0	-
	WB Left	12	35	2	1	0	-
	NB Right	33	22	2	1	0	-
	SB Right	5	15	1	1	0	-
	EB Right	4	13	1	1	0	-
	WB Right	2	6	1	1	0	-

Hawes Crossing

Queue Length Analysis

Unsignalized Intersection

2040

Average Vehicle Length (ft):
 Length (ft) 25 % Vehicles 98% Veh. Type Passenger
 75 2% Truck

Equation Used: storage length = 2 x (vehicles/hour)/(60 minutes/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	PM Peak (veh/hr)	Veh per 2 minutes	Trucks per 2 minutes	Turn Lanes	Storage Length
Intersection I	NB Left	4	2	1	1	0	-
	SB Left	4	8	1	1	0	-
	EB Left	53	34	2	1	0	-
	WB Left	1	4	1	1	0	-
	NB Right	4	2	1	1	0	-
	SB Right	18	56	2	1	0	-
	EB Right	1	4	1	1	0	-
	WB Right	3	9	1	1	0	-
Intersection K	NB Left	4	20	1	1	1	100'
	SB Left	0	0	0	0	0	-
	EB Left	30	43	2	1	1	125'
	WB Left	0	0	0	0	0	-
	NB Right	0	0	0	0	0	-
	SB Right	12	38	2	1	0	-
	EB Right	28	3	1	1	1	100'
	WB Right	0	0	0	0	0	-
Intersection L	NB Left	22	14	1	1	0	-
	SB Left	1	4	1	1	0	-
	EB Left	1	1	1	1	0	-
	WB Left	7	20	1	1	0	-
	NB Right	19	12	1	1	0	-
	SB Right	0	1	1	1	0	-
	EB Right	5	14	1	1	0	-
	WB Right	4	2	1	1	0	-
Intersection M	NB Left	5	15	1	1	0	-
	SB Left	9	6	1	1	0	-
	EB Left	2	7	1	1	0	-
	WB Left	2	6	1	1	0	-
	NB Right	12	8	1	1	0	-
	SB Right	7	5	1	1	0	-
	EB Right	14	9	1	1	0	-
	WB Right	3	9	1	1	0	-
Intersection N	NB Left	9	28	1	1	1	100'
	SB Left	10	28	1	1	1	100'
	EB Left	52	34	2	1	1	125'
	WB Left	10	36	2	1	1	125'
	NB Right	35	15	2	1	0	-
	SB Right	16	49	2	1	0	-
	EB Right	26	17	1	1	0	-
	WB Right	6	21	1	1	0	-

Hawes Crossing

Queue Length Analysis

Unsignalized Intersection

2040

Average Vehicle Length (ft):
 Length (ft) % Vehicles Veh. Type
 25 98% Passenger
 75 2% Truck

Equation Used: storage length = 2 x (vehicles/hour)/(60 minutes/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	PM Peak (veh/hr)	Veh per 2 minutes	Trucks per 2 minutes	Turn Lanes	Storage Length
Intersection O	NB Left	1	3	1	1	0	-
	SB Left	3	8	1	1	0	-
	EB Left	11	7	1	1	0	-
	WB Left	4	12	1	1	0	-
	NB Right	12	8	1	1	0	-
	SB Right	4	12	1	1	0	-
	EB Right	3	2	1	1	0	-
	WB Right	6	4	1	1	0	-
Intersection P	NB Left	0	0	0	0	0	-
	SB Left	56	37	2	1	0	-
	EB Left	0	0	0	0	0	-
	WB Left	14	43	2	1	0	-
	NB Right	36	23	2	1	0	-
	SB Right	0	0	0	0	0	-
	EB Right	0	0	0	0	0	-
	WB Right	19	58	2	1	0	-
Intersection Q	NB Left	17	51	2	1	1	125'
	SB Left	0	0	0	0	0	-
	EB Left	65	42	3	1	1	150'
	WB Left	0	0	0	0	0	-
	NB Right	0	0	0	0	0	-
	SB Right	25	75	3	1	1	150'
	EB Right	49	32	2	1	1	125'
	WB Right	0	0	0	0	0	-
Intersection R	NB Left	1	2	1	1	0	-
	SB Left	2	6	1	1	0	-
	EB Left	6	4	1	1	0	-
	WB Left	5	8	1	1	0	-
	NB Right	6	5	1	1	0	-
	SB Right	2	6	1	1	0	-
	EB Right	2	1	1	1	0	-
	WB Right	7	4	1	1	0	-
Intersection S	NB Left	1	3	1	1	0	-
	SB Left	6	18	1	1	0	-
	EB Left	6	4	1	1	0	-
	WB Left	1	1	1	1	0	-
	NB Right	1	2	1	1	0	-
	SB Right	4	12	1	1	0	-
	EB Right	3	2	1	1	0	-
	WB Right	24	16	1	1	0	-

Hawes Crossing

Queue Length Analysis

Unsignalized Intersection

2040

Average Vehicle Length (ft):
 Length (ft) % Vehicles Veh. Type
 25 98% Passenger
 75 2% Truck

Equation Used: storage length = 2 x (vehicles/hour)/(60 minutes/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	PM Peak (veh/hr)	Veh per 2 minutes	Trucks per 2 minutes	Turn Lanes	Storage Length
Intersection T	NB Left	0	0	0	0	0	-
	SB Left	54	40	2	1	0	-
	EB Left	0	0	0	0	0	-
	WB Left	8	21	1	1	0	-
	NB Right	16	22	1	1	0	-
	SB Right	0	0	0	0	0	-
	EB Right	0	0	0	0	0	-
	WB Right	26	49	2	1	0	-
Intersection V	NB Left	3	19	1	1	0	-
	SB Left	0	0	0	0	0	-
	EB Left	0	0	0	0	0	-
	WB Left	14	82	3	1	0	-
	NB Right	23	75	3	1	0	-
	SB Right	0	0	0	0	0	-
	EB Right	5	18	1	1	0	-
	WB Right	0	0	0	0	0	-
Intersection W	NB Left	57	42	2	1	0	-
	SB Left	0	0	0	0	0	-
	EB Left	6	4	1	1	0	-
	WB Left	15	10	1	1	0	-
	NB Right	5	15	1	1	0	-
	SB Right	0	0	0	0	0	-
	EB Right	34	61	2	1	0	-
	WB Right	0	0	0	0	0	-
Intersection Z	NB Left	0	0	0	0	0	-
	SB Left	4	27	1	1	1	100'
	EB Left	33	111	4	1	1	175'
	WB Left	0	0	0	0	0	-
	NB Right	0	0	0	0	0	-
	SB Right	17	103	4	1	1	175'
	EB Right	0	0	0	0	0	-
	WB Right	7	25	1	1	0	-
Intersection AC	NB Left	0	0	0	0	0	-
	SB Left	37	4	2	1	1	125'
	EB Left	0	0	0	0	0	-
	WB Left	8	1	1	1	1	100'
	NB Right	3	13	1	1	0	-
	SB Right	0	0	0	0	0	-
	EB Right	0	0	0	0	0	-
	WB Right	5	24	1	1	1	100'

Hawes Crossing

Queue Length Analysis

Unsignalized Intersection

2040

Average Vehicle Length (ft):
 Length (ft) % Vehicles Veh. Type
 25 98% Passenger
 75 2% Truck

Equation Used: storage length = 2 x (vehicles/hour)/(60 minutes/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	PM Peak (veh/hr)	Veh per 2 minutes	Trucks per 2 minutes	Turn Lanes	Storage Length
Intersection AD	NB Left	19	2	1	1	1	100'
	SB Left	13	1	1	1	1	100'
	EB Left	5	24	1	1	1	100'
	WB Left	36	3	2	1	1	125'
	NB Right	5	24	1	1	0	-
	SB Right	26	2	1	1	0	-
	EB Right	3	13	1	1	0	-
	WB Right	2	9	1	1	0	-
Intersection AE	NB Left	23	2	1	1	1	100'
	SB Left	0	0	0	0	0	-
	EB Left	9	46	2	1	1	125'
	WB Left	0	0	0	0	0	-
	NB Right	0	0	0	0	0	-
	SB Right	91	9	3	1	1	150'
	EB Right	6	30	1	1	1	100'
	WB Right	0	0	0	0	0	-
Intersection AF	NB Left	0	0	0	0	0	-
	SB Left	6	30	1	1	1	100'
	EB Left	0	0	0	0	0	-
	WB Left	37	4	2	1	1	125'
	NB Right	5	24	1	1	0	-
	SB Right	0	0	0	0	0	-
	EB Right	0	0	0	0	0	-
	WB Right	45	4	2	1	1	125'
Intersection AG	NB Left	42	4	2	1	1	125'
	SB Left	0	0	0	0	0	-
	EB Left	6	29	1	1	1	100'
	WB Left	0	0	0	0	0	-
	NB Right	0	0	0	0	0	-
	SB Right	76	7	3	1	1	150'
	EB Right	10	50	2	1	1	125'
	WB Right	0	0	0	0	0	-
Intersection AH	NB Left	94	9	4	1	1	175'
	SB Left	0	0	0	0	0	-
	EB Left	0	0	0	0	0	-
	WB Left	6	30	1	1	1	100'
	NB Right	45	4	2	1	1	125'
	SB Right	0	0	0	0	0	-
	EB Right	13	63	3	1	0	-
	WB Right	0	0	0	0	0	-

Hawes Crossing

Queue Length Analysis

Unsignalized Intersection

2040

Average Vehicle Length (ft):

Length (ft)	% Vehicles	Veh. Type
25	98%	Passenger
75	2%	Truck

Equation Used: storage length = 2 x (vehicles/hour)/(60 minutes/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	PM Peak (veh/hr)	Veh per 2 minutes	Trucks per 2 minutes	Turn Lanes	Storage Length
Intersection AI	NB Left	0	0	0	0	0	-
	SB Left	4	19	1	1	1	100'
	EB Left	34	3	2	1	1	125'
	WB Left	0	0	0	0	0	-
	NB Right	0	0	0	0	0	-
	SB Right	5	22	1	1	1	100'
	EB Right	0	0	0	0	0	-
	WB Right	28	3	1	1	0	-
Intersection AJ	NB Left	73	7	3	1	1	150'
	SB Left	0	0	0	0	0	-
	EB Left	4	17	1	1	1	100'
	WB Left	0	0	0	0	0	-
	NB Right	0	0	0	0	0	-
	SB Right	26	2	1	1	1	100'
	EB Right	10	49	2	1	1	125'
	WB Right	0	0	0	0	0	-
Intersection AK	NB Left	0	0	0	0	0	-
	SB Left	11	55	2	1	1	125'
	EB Left	92	9	4	1	1	175'
	WB Left	0	0	0	0	0	-
	NB Right	0	0	0	0	0	-
	SB Right	13	61	2	1	1	125'
	EB Right	0	0	0	0	0	-
	WB Right	83	8	3	1	0	-

Hawes Crossing

Queue Length Analysis

Unsignalized Intersection

Total Traffic: ADOT Minimum and Desirable Queue Storage Calculations
2040

Average Vehicle Length (ft): 25 Lane Width, W = 12 Taper Length, T = Left-Turn Lane Only!
Cycle Length (sec): 120 Posted Speed, S = 50 Speed >= 45 600' 300'
Cycles per Hour: 30 Trucks > 10%? Y Speed < 45 mph
Taper Length, RTI = GAP

Queue Storage Equations:

Queue Length =	1.5	x (vehicles/hour)/(cycles/hour) x average vehicle length*
Storage Length =	Queue Length + Minimum Braking Distance	
Turn Lane Length =	Storage Length - [Gap - 2/3 Gap]	

				Minimum		Desired	
Design Speed (mph)	2/3 Gap (ft)	Calculated Gap (ft)	Design Speed (mph)	Entering Speed (mph)	Braking Speed (mph)	Braking Distance (ft)	Braking Speed (mph)
< 40mph	60	40	30	20	20	20	29
40-50mph	90	60	35	25	25	40	34
> 50mph	140	95	40	30	29	50	38
			45	35	34	85	43
			50	40	38	120	47
			55	45	42	145	52
			60	50	47	200	56
			65	55	52	265	60
			70	60	56	315	64
			75	65	61	400	70

* Queue length: minimum queue length is 2 vehicles (2 cars or 1 car+1 truck), which can be reduced by 20 feet for a free right turn movement.

Intersection	Approach	Free-Flow Right?	AM Peak (veh/hr)	PM Peak (veh/hr)	Lanes	Veh per 2 minutes	Queue Length (ft)*	Minimum Storage Length (ft)	Turn Lane Length (ft)	Desired Storage Length (ft)	Turn Lane Length (ft)
Loop 202 SB Ramps & Guadalupe Rd	NB Left		0	0	0	-	-	-	-	-	-
	SB Left		490	760	2	19	475	595	565	720	690
	EB Left		0	0	0	-	-	-	-	-	-
	WB Left		420	405	2	11	275	395	365	520	490
	NB Right	N	0	0	0	-	-	-	-	-	-
	SB Right	N	132	319	2	8	200	320	290	445	415
	EB Right	N	115	270	1	14	350	470	440	595	565
Loop 202 NB Ramps & Guadalupe Rd	WB Right	N	0	0	0	-	-	-	-	-	-
	NB Left		280	180	2	7	175	295	265	420	390
	SB Left		0	0	0	-	-	-	-	-	-
	EB Left		351	703	2	18	450	570	540	695	665
	WB Left		0	0	0	-	-	-	-	-	-
	NB Right	N	95	250	2	7	175	295	265	420	390
	SB Right	N	0	0	0	-	-	-	-	-	-
	EB Right	N	0	0	0	-	-	-	-	-	-
	WB Right	Y	1,100	820	1	55	1355	1475	1445	1600	1570

Hawes Crossing

Queue Length Analysis

Unsignalized Intersection

Total Traffic: ADOT Minimum and Desirable Queue Storage Calculations
2040

Average Vehicle Length (ft): 25 Lane Width, W = 12 Taper Length, T = Left-Turn Lane Only!
Cycle Length (sec): 120 Posted Speed, S = 50 Speed >= 45 600' 300'
Cycles per Hour: 30 Trucks > 10%? Y Speed < 45 mph
Taper Length, RTI = GAP

Queue Storage Equations:

Queue Length =	1.5	x (vehicles/hour)/(cycles/hour) x average vehicle length*
Storage Length =	Queue Length + Minimum Braking Distance	
Turn Lane Length =	Storage Length - [Gap - 2/3 Gap]	

				Minimum		Desired	
Design Speed (mph)	2/3 Gap (ft)	Calculated Gap (ft)	Design Speed (mph)	Entering Speed (mph)	Braking Speed (mph)	Braking Distance (ft)	Braking Speed (mph)
< 40mph	60	40	30	20	20	20	29
40-50mph	90	60	35	25	25	40	34
> 50mph	140	95	40	30	29	50	38
			45	35	34	85	43
			50	40	38	120	47
			55	45	42	145	52
			60	50	47	200	56
			65	55	52	265	60
			70	60	56	315	64
			75	65	61	400	70

* Queue length: minimum queue length is 2 vehicles (2 cars or 1 car+1 truck), which can be reduced by 20 feet for a free right turn movement.

Intersection	Approach	Free-Flow Right?	AM Peak (veh/hr)	PM Peak (veh/hr)	Lanes	Veh per 2 minutes	Queue Length (ft)*	Minimum Storage Length (ft)	Turn Lane Length (ft)	Desired Storage Length (ft)	Turn Lane Length (ft)
Loop 202 SB Ramps & Elliot Rd	NB Left		0	0	0	-	-	-	-	-	-
	SB Left		670	634	2	17	425	545	515	670	640
	EB Left		0	0	0	-	-	-	-	-	-
	WB Left		690	486	2	18	450	570	540	695	665
	NB Right	N	0	0	0	-	-	-	-	-	-
	SB Right	N	797	1,123	2	29	725	845	815	970	940
	EB Right	N	252	495	1	25	625	745	715	870	840
Loop 202 NB Ramps & Elliot Rd	WB Right	N	0	0	0	-	-	-	-	-	-
	NB Left		512	659	2	17	425	545	515	670	640
	SB Left		0	0	0	-	-	-	-	-	-
	EB Left		785	1,125	2	29	725	845	815	970	940
	WB Left		0	0	0	-	-	-	-	-	-
	NB Right	N	915	725	2	23	575	695	665	820	790
	SB Right	N	0	0	0	-	-	-	-	-	-
	EB Right	N	0	0	0	-	-	-	-	-	-
	WB Right	Y	623	587	2	16	400	520	490	645	615

Hawes Crossing

Queue Length Analysis

Unsignalized Intersection

Total Traffic: ADOT Minimum and Desirable Queue Storage Calculations
2040

Average Vehicle Length (ft): 25 Lane Width, W = 12 Taper Length, T = Left-Turn Lane Only!
Cycle Length (sec): **120** Posted Speed, S = **50** Speed >= 45 600' 300'
Cycles per Hour: 30 Trucks > 10%? **Y** Speed < 45 mph
Taper Length, RTI = GAP

Queue Storage Equations:

Queue Length =	1.5	x (vehicles/hour)/(cycles/hour) x average vehicle length*
Storage Length =	Queue Length + Minimum Braking Distance	
Turn Lane Length =	Storage Length - [Gap - 2/3 Gap]	












				Minimum		Desired	
Design Speed (mph)	2/3 Gap (ft)	Calculated Gap (ft)	Design Speed (mph)	Entering Speed (mph)	Braking Speed (mph)	Braking Distance (ft)	Braking Speed (mph)
< 40mph	60	40	30	20	20	20	29
40-50mph	90	60	35	25	25	40	34
> 50mph	140	95	40	30	29	50	38
			45	35	34	85	43
			50	40	38	120	47
			55	45	42	145	52
			60	50	47	200	56
			65	55	52	265	60
			70	60	56	315	64
			75	65	61	400	70

* Queue length: minimum queue length is 2 vehicles (2 cars or 1 car+1 truck), which can be reduced by 20 feet for a free right turn movement.

Intersection	Approach	Free-Flow Right?	AM Peak (veh/hr)	PM Peak (veh/hr)	Lanes	Veh per 2 minutes	Queue Length (ft)*	Minimum Storage Length (ft)	Turn Lane Length (ft)	Desired Storage Length (ft)	Turn Lane Length (ft)
Hawes Rd & Loop 202 WB Ramps	NB Left		320	215	2	8	200	320	290	445	415
	SB Left		0	0	0	-	-	-	-	-	-
	EB Left		0	0	0	-	-	-	-	-	-
	WB Left		340	215	2	9	225	345	315	470	440
	NB Right	N	0	0	0	-	-	-	-	-	-
	SB Right	N	387	1,092	1	55	1375	1495	1465	1620	1590
	EB Right	N	0	0	0	-	-	-	-	-	-
Hawes Rd & Loop 202 EB Ramps	WB Right	N	360	555	2	14	350	470	440	595	565
	NB Left		0	0	0	-	-	-	-	-	-
	SB Left		247	550	2	14	350	470	440	595	565
	EB Left		465	818	2	21	525	645	615	770	740
	WB Left		0	0	0	-	-	-	-	-	-
	NB Right	N	340	65	1	17	425	545	515	670	640
	SB Right	N	0	0	0	-	-	-	-	-	-
	EB Right	N	175	180	2	5	125	245	215	370	340
	WB Right	N	0	0	0	-	-	-	-	-	-












2040 Total AM
1: Sossaman Rd & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	194	368	178	564	290	283	729	150	108	394	206
v/c Ratio	0.57	0.32	0.44	0.49	0.50	0.67	0.64	0.24	0.42	0.42	0.36
Control Delay	26.0	27.6	15.3	20.8	3.8	35.7	27.5	7.5	31.2	28.9	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	27.6	15.3	20.8	3.8	35.7	27.5	7.5	31.2	28.9	5.9
Queue Length 50th (ft)	73	58	40	53	4	120	168	13	48	97	0
Queue Length 95th (ft)	123	86	69	83	14	#242	254	m47	91	140	51
Internal Link Dist (ft)	420		3050				5200			420	
Turn Bay Length (ft)	250		250		250	250		250	250		250
Base Capacity (vph)	348	1157	417	1153	583	420	1148	636	283	943	573
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.32	0.43	0.49	0.50	0.67	0.64	0.24	0.38	0.42	0.36
Intersection Summary											
#	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.										

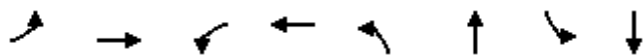
2040 Total PM
1: Sossaman Rd & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	256	798	233	332	166	189	590	211	376	1042	150
v/c Ratio	0.71	0.75	0.97	0.33	0.32	0.92	0.67	0.36	0.79	0.78	0.21
Control Delay	36.6	34.0	84.4	18.6	4.3	66.3	37.4	7.1	29.0	29.7	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.6	34.0	84.4	18.6	4.3	66.3	37.4	7.1	29.0	29.7	2.5
Queue Length 50th (ft)	108	135	76	54	20	70	155	4	126	270	0
Queue Length 95th (ft)	#189	180	#221	81	42	m#187	#220	m53	224	349	24
Internal Link Dist (ft)	420		3050				5200			420	
Turn Bay Length (ft)	250		250		250	250		250	250		250
Base Capacity (vph)	359	1061	240	1017	520	206	878	584	524	1336	711
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.75	0.97	0.33	0.32	0.92	0.67	0.36	0.72	0.78	0.21
Intersection Summary											
# 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.											

2040 Total AM
2: Farnsworth Dr & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019



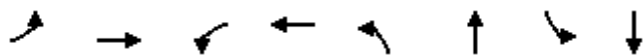
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	17	542	128	899	222	78	22	78
v/c Ratio	0.07	0.24	0.34	0.39	0.41	0.11	0.04	0.11
Control Delay	8.1	6.3	18.5	15.5	21.7	7.3	16.3	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.1	6.3	18.5	15.5	21.7	7.3	16.3	5.3
Queue Length 50th (ft)	2	20	51	127	87	7	7	2
Queue Length 95th (ft)	m8	35	101	163	149	34	22	28
Internal Link Dist (ft)	3050		2090		1306		659	
Turn Bay Length (ft)	250		100		250		250	
Base Capacity (vph)	227	2300	372	2292	540	716	540	702
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.24	0.34	0.39	0.41	0.11	0.04	0.11

Intersection Summary

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

2040 Total PM
2: Farnsworth Dr & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019















Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	89	1223	100	638	50	162	167	55
v/c Ratio	0.19	0.39	0.44	0.20	0.15	0.33	0.58	0.12
Control Delay	5.1	4.0	21.5	11.1	28.2	9.3	39.2	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.1	4.0	21.5	11.1	28.2	9.3	39.2	18.9
Queue Length 50th (ft)	11	47	44	88	22	11	84	15
Queue Length 95th (ft)	m19	62	m99	110	53	60	151	44
Internal Link Dist (ft)	3050		2090		1306		659	
Turn Bay Length (ft)	250		100		250		250	
Base Capacity (vph)	462	3117	228	3147	328	493	288	444
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.39	0.44	0.20	0.15	0.33	0.58	0.12

Intersection Summary

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













2040 Total AM
3: Hawes Rd & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	100	619	323	136	356	89	116	191	412	117	163	50
v/c Ratio	0.25	0.39	0.45	0.37	0.19	0.13	0.25	0.18	0.61	0.26	0.15	0.08
Control Delay	12.5	19.3	4.3	17.9	21.1	0.4	18.6	23.9	13.0	18.8	23.6	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.5	19.3	4.3	17.9	21.1	0.4	18.6	23.9	13.0	18.8	23.6	0.3
Queue Length 50th (ft)	19	103	0	45	53	0	40	42	56	40	35	0
Queue Length 95th (ft)	39	145	90	81	77	0	74	68	153	75	60	0
Internal Link Dist (ft)	2090			1860			3261			506		
Turn Bay Length (ft)	250		250	250		250	250		250	250		250
Base Capacity (vph)	408	1574	713	379	1887	701	461	1061	672	451	1061	602
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.39	0.45	0.36	0.19	0.13	0.25	0.18	0.61	0.26	0.15	0.08
Intersection Summary												

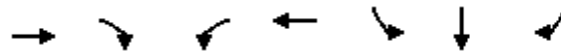
2040 Total PM
3: Guadalupe Rd & Hawes Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	56	433	246	471	768	183	180	352	187	139	352	372
v/c Ratio	0.20	0.38	0.44	0.86	0.41	0.26	0.66	0.47	0.35	0.33	0.37	0.56
Control Delay	15.6	27.6	5.3	34.5	22.8	4.6	36.2	33.5	3.1	23.6	28.3	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.6	27.6	5.3	34.5	22.8	4.6	36.2	33.5	3.1	23.6	28.3	8.7
Queue Length 50th (ft)	15	68	4	178	121	0	70	93	0	52	85	19
Queue Length 95th (ft)	m30	97	20	#297	162	44	#129	135	19	95	125	97
Internal Link Dist (ft)	2090			1710			3261			506		
Turn Bay Length (ft)	250		250	250		250	250		250	250		250
Base Capacity (vph)	323	1147	554	550	1879	700	273	747	535	421	943	661
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.38	0.44	0.86	0.41	0.26	0.66	0.47	0.35	0.33	0.37	0.56
Intersection Summary												
# 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.												

2040 Total AM
4: Loop 202 SB Ramps & Guadalupe Rd

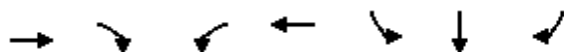
17-1390 Hawes Crossing TIA
05/17/2019



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	603	128	467	1017	283	276	132
v/c Ratio	0.23	0.20	0.76	0.53	0.53	0.49	0.23
Control Delay	28.1	5.8	83.1	14.6	38.1	26.2	6.1
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	28.1	5.8	83.1	14.7	38.1	26.2	6.1
Queue Length 50th (ft)	80	0	199	71	189	131	0
Queue Length 95th (ft)	108	44	255	85	284	224	47
Internal Link Dist (ft)	610			311		791	
Turn Bay Length (ft)		250					
Base Capacity (vph)	2669	642	829	1914	532	564	566
Starvation Cap Reductn	0	0	0	96	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.20	0.56	0.56	0.53	0.49	0.23
Intersection Summary							

2040 Total PM
4: Loop 202 SB Ramps & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1253	300	450	779	439	440	319
v/c Ratio	0.54	0.43	0.89	0.72	0.87	0.72	0.47
Control Delay	35.3	5.5	89.0	18.4	58.9	28.1	5.9
Queue Delay	0.1	0.0	0.0	0.0	30.3	3.3	0.0
Total Delay	35.4	5.5	89.0	18.4	89.2	31.4	5.9
Queue Length 50th (ft)	198	0	193	47	338	192	0
Queue Length 95th (ft)	229	63	#274	56	#530	331	70
Internal Link Dist (ft)	760			311		791	
Turn Bay Length (ft)		250					
Base Capacity (vph)	2342	698	514	1085	504	614	674
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	271	0	0	0	84	96	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.43	0.88	0.72	1.05	0.85	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

2040 Total AM
5: Loop 202 NB Ramps & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	390	758	1172	1222	162	160	95
v/c Ratio	0.72	0.42	0.41	0.77	0.30	0.28	0.18
Control Delay	68.6	29.8	28.6	3.7	33.0	16.5	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.6	29.8	28.6	3.7	33.0	16.5	6.6
Queue Length 50th (ft)	166	110	163	0	100	47	0
Queue Length 95th (ft)	218	134	203	0	162	108	41
Internal Link Dist (ft)		311	480			791	
Turn Bay Length (ft)				250			
Base Capacity (vph)	686	1799	2840	1583	532	563	541
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	22	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.42	0.42	0.77	0.30	0.28	0.18
Intersection Summary							

2040 Total PM
5: Loop 202 NB Ramps & Guadalupe Rd

17-1390 Hawes Crossing TIA
05/17/2019



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	781	1317	1029	911	168	157	153
v/c Ratio	0.93	0.83	0.64	0.58	0.26	0.24	0.22
Control Delay	84.1	29.5	45.2	1.5	26.0	6.5	4.5
Queue Delay	37.5	0.2	0.0	0.0	0.0	0.0	0.0
Total Delay	121.6	29.7	45.2	1.5	26.0	6.5	4.5
Queue Length 50th (ft)	332	369	181	0	91	10	0
Queue Length 95th (ft)	m#421	427	214	0	148	59	44
Internal Link Dist (ft)		311	700			791	
Turn Bay Length (ft)				250			
Base Capacity (vph)	858	1578	1610	1583	658	661	682
Starvation Cap Reductn	133	24	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.85	0.64	0.58	0.26	0.24	0.22

Intersection Summary












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.












2040 Total AM
6: Power Rd & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	233	467	139	177	794	300	1400	280	161	767	33
v/c Ratio	0.75	0.45	0.19	0.47	0.79	0.77	0.81	0.32	0.77	0.59	0.06
Control Delay	36.5	33.0	3.5	18.1	32.2	30.6	32.0	8.2	44.1	32.1	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.5	33.0	3.5	18.1	32.2	30.6	32.0	8.2	44.1	32.1	0.2
Queue Length 50th (ft)	89	85	0	67	111	105	265	49	52	144	0
Queue Length 95th (ft)	#181	119	32	m117	190	#204	323	95	#151	187	0
Internal Link Dist (ft)	495		5070				925		562		
Turn Bay Length (ft)	250		250	250		250		250	250		250
Base Capacity (vph)	318	1043	770	401	1038	411	1721	902	210	1307	596
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.45	0.18	0.44	0.76	0.73	0.81	0.31	0.77	0.59	0.06
Intersection Summary											
#	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.										












2040 Total PM
6: Power Rd & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	439	593	333	324	557	183	878	484	300	1750	478
v/c Ratio	1.20	0.66	0.53	0.91	0.60	0.82	0.66	0.57	0.83	1.03	0.52
Control Delay	138.9	38.3	14.3	47.6	26.6	51.5	32.7	13.7	39.5	61.4	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	138.9	38.3	14.3	47.6	26.6	51.5	32.7	13.7	39.5	61.4	12.2
Queue Length 50th (ft)	~231	115	64	146	94	59	167	119	105	~395	122
Queue Length 95th (ft)	#397	150	147	m#251	121	#192	212	219	#253	#490	206
Internal Link Dist (ft)	495		5070				925		562		
Turn Bay Length (ft)	250		250	250		250		250	250		250
Base Capacity (vph)	365	1017	633	356	1052	224	1339	846	364	1695	911
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.20	0.58	0.53	0.91	0.53	0.82	0.66	0.57	0.82	1.03	0.52
Intersection Summary											
~ 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.											












2040 Total AM
7: Sossaman Rd & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	217	424	122	458	438	363	624	84	248	397	228
v/c Ratio	0.59	0.33	0.39	0.42	0.61	0.71	0.63	0.12	0.55	0.49	0.42
Control Delay	26.5	17.7	17.4	21.7	9.0	26.4	29.6	2.7	46.5	21.2	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.5	17.7	17.4	21.7	9.0	26.4	29.6	2.7	46.5	21.2	4.4
Queue Length 50th (ft)	58	41	28	42	26	113	149	0	66	66	8
Queue Length 95th (ft)	m126	m57	50	57	237	209	224	m5	102	118	23
Internal Link Dist (ft)	5070		1840		5200		5200		5200		
Turn Bay Length (ft)	250		250		250	250		250	250		250
Base Capacity (vph)	375	1295	315	1088	768	547	985	716	572	807	537
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.33	0.39	0.42	0.57	0.66	0.63	0.12	0.43	0.49	0.42
Intersection Summary											
m Volume for 95th percentile queue is metered by upstream signal.											

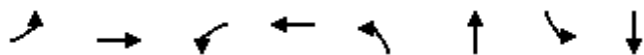
2040 Total PM
7: Sossaman Rd & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	278	1094	164	420	421	201	397	351	614	807	267
v/c Ratio	0.69	0.87	0.69	0.39	0.51	0.76	0.56	0.52	0.90	0.73	0.39
Control Delay	30.6	30.7	41.9	19.9	4.5	32.9	28.9	6.3	44.5	29.5	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	30.7	41.9	19.9	4.5	32.9	28.9	6.3	44.5	29.5	10.0
Queue Length 50th (ft)	107	132	51	36	12	58	87	14	188	218	49
Queue Length 95th (ft)	m179	#200	#132	50	42	m#102	m117	m40	m#261	m271	m80
Internal Link Dist (ft)	5070		930		5200		5200		5200		
Turn Bay Length (ft)	250		250		250	250		250	250		250
Base Capacity (vph)	406	1255	240	1081	822	263	713	682	686	1101	676
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.87	0.68	0.39	0.51	0.76	0.56	0.51	0.90	0.73	0.39
Intersection Summary											
# 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.											

2040 Total AM
8: Elliot Rd & 80th Street

17-1390 Hawes Crossing TIA
05/17/2019



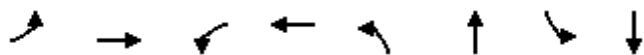
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	11	746	20	963	21	34	28	72
v/c Ratio	0.04	0.25	0.05	0.33	0.05	0.06	0.07	0.13
Control Delay	2.3	2.3	3.6	5.2	23.8	0.2	24.0	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.3	2.3	3.6	5.2	23.8	0.2	24.0	0.5
Queue Length 50th (ft)	1	15	1	112	9	0	12	0
Queue Length 95th (ft)	m2	18	4	141	26	0	32	0
Internal Link Dist (ft)	1130		760		308		936	
Turn Bay Length (ft)	100		100					
Base Capacity (vph)	287	2931	377	2905	382	605	395	567
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.25	0.05	0.33	0.05	0.06	0.07	0.13

Intersection Summary

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

2040 Total PM
8: Elliot Rd & 80th Street

17-1390 Hawes Crossing TIA
05/17/2019














Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	11	1353	67	998	41	58	89	56
v/c Ratio	0.03	0.41	0.33	0.31	0.14	0.14	0.30	0.12
Control Delay	2.6	2.5	14.8	8.4	29.6	6.2	32.5	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.6	2.5	14.8	8.4	29.6	6.2	32.5	0.5
Queue Length 50th (ft)	1	29	24	125	19	0	42	0
Queue Length 95th (ft)	m1	m43	65	156	46	23	85	0
Internal Link Dist (ft)		550		760		238		936
Turn Bay Length (ft)	250		250					
Base Capacity (vph)	318	3264	203	3253	298	408	297	478
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.41	0.33	0.31	0.14	0.14	0.30	0.12

Intersection Summary

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












2040 Total AM
9: Elliot Rd & Hawes Rd

17-1390 Hawes Crossing TIA
05/17/2019

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	174	783	303	182	552	202	320	559	157	167	99
v/c Ratio	0.63	0.56	0.37	0.18	0.25	0.58	0.54	0.64	0.66	0.32	0.25
Control Delay	46.8	39.7	3.8	32.4	16.0	44.3	49.7	19.8	53.8	47.4	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	39.7	3.8	32.4	16.0	44.3	49.7	19.8	53.8	47.4	1.5
Queue Length 50th (ft)	108	190	0	54	69	127	121	232	96	61	0
Queue Length 95th (ft)	181	243	54	84	103	191	169	357	151	96	0
Internal Link Dist (ft)	1250			1230			740			1859	
Turn Bay Length (ft)	250		250	250		250		250	200		200
Base Capacity (vph)	301	1391	804	1001	2241	392	589	871	280	530	399
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.56	0.38	0.18	0.25	0.52	0.54	0.64	0.56	0.32	0.25
Intersection Summary											

2040 Total PM
9: Elliot Rd & Hawes Rd

17-1390 Hawes Crossing TIA
05/17/2019

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	142	773	280	696	1294	369	366	476	106	801	130
v/c Ratio	0.79	0.83	0.45	0.97	0.79	1.13	0.30	0.50	0.29	0.88	0.22
Control Delay	68.8	55.9	10.3	75.2	40.1	121.6	29.7	7.8	22.2	54.6	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.8	55.9	10.3	75.2	40.1	121.6	29.7	7.8	22.2	54.6	0.9
Queue Length 50th (ft)	65	213	41	278	324	~280	108	80	46	314	0
Queue Length 95th (ft)	#150	263	78	#401	383	#475	150	131	82	#417	0
Internal Link Dist (ft)	580			1230			740			970	
Turn Bay Length (ft)	250		250	250		250		250	200		200
Base Capacity (vph)	180	932	618	715	1636	327	1217	943	375	914	590
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.83	0.45	0.97	0.79	1.13	0.30	0.50	0.28	0.88	0.22

Intersection Summary

~ 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.

2040 Total AM
10: Loop 202 SB Ramps & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019



Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	760	280	767	1183	744	886
v/c Ratio	0.30	0.39	0.85	0.73	0.87	0.65
Control Delay	30.5	5.3	71.5	23.4	55.0	4.9
Queue Delay	0.0	0.0	11.7	0.1	45.6	0.0
Total Delay	30.5	5.3	83.2	23.5	100.6	4.9
Queue Length 50th (ft)	108	0	329	107	286	0
Queue Length 95th (ft)	137	63	393	136	#384	53
Internal Link Dist (ft)	1240			311		
Turn Bay Length (ft)		250				
Base Capacity (vph)	2532	717	1029	1626	858	1361
Starvation Cap Reductn	0	0	245	47	0	0
Spillback Cap Reductn	0	0	0	0	177	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.39	0.98	0.75	1.09	0.65

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

2040 Total PM
10: Loop 202 SB Ramps & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019



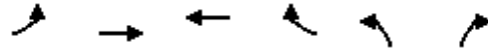
Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	2689	550	540	1200	704	1248
v/c Ratio	0.75	0.54	1.11	0.94	0.88	0.78
Control Delay	27.4	4.3	98.0	25.8	57.9	6.2
Queue Delay	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	27.8	4.3	98.0	25.8	57.9	6.2
Queue Length 50th (ft)	408	12	~222	365	272	1
Queue Length 95th (ft)	445	77	m#307	m#430	#372	59
Internal Link Dist (ft)	1240			311		
Turn Bay Length (ft)		250				
Base Capacity (vph)	3583	1025	486	1271	801	1603
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	392	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.54	1.11	0.94	0.88	0.78

Intersection Summary

- ~ 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.

2040 Total AM
11: Loop 202 NB Ramps & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019



Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	872	632	1381	692	569	1017
v/c Ratio	0.91	0.37	0.57	0.81	0.66	0.70
Control Delay	68.9	32.2	13.7	22.6	44.8	5.5
Queue Delay	48.7	0.0	0.0	6.8	4.2	0.0
Total Delay	117.5	32.2	13.8	29.4	49.1	5.5
Queue Length 50th (ft)	374	100	206	124	205	3
Queue Length 95th (ft)	m#441	m119	159	604	267	59
Internal Link Dist (ft)		311	310			
Turn Bay Length (ft)				200		
Base Capacity (vph)	1001	1706	2414	855	858	1450
Starvation Cap Reductn	280	0	0	124	0	0
Spillback Cap Reductn	0	0	53	0	210	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.21	0.37	0.58	0.95	0.88	0.70

Intersection Summary

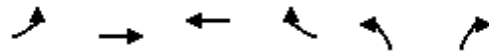
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

2040 Total PM
11: Loop 202 NB Ramps & Elliot Rd

17-1390 Hawes Crossing TIA
05/17/2019



Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	1250	2143	1008	652	732	806
v/c Ratio	0.99	0.89	0.53	0.91	0.91	0.79
Control Delay	44.1	19.2	48.0	43.1	61.9	23.2
Queue Delay	26.5	1.8	0.2	0.0	0.0	0.1
Total Delay	70.6	21.0	48.2	43.1	61.9	23.4
Queue Length 50th (ft)	505	285	204	374	286	138
Queue Length 95th (ft)	#657	337	236	m#469	#396	226
Internal Link Dist (ft)		311	320			
Turn Bay Length (ft)				250		
Base Capacity (vph)	1258	2415	1886	718	801	1020
Starvation Cap Reductn	94	78	0	0	0	0
Spillback Cap Reductn	0	145	271	0	0	13
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.07	0.94	0.62	0.91	0.91	0.80

Intersection Summary













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.

2040 Total AM
12: Sossaman Rd & Warner Road

17-1390 Hawes Crossing TIA
05/17/2019













												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	196	381	117	239	493	377	344	239	89	214	556	322
v/c Ratio	0.65	0.64	0.17	0.73	0.72	0.49	0.73	0.20	0.10	0.52	0.55	0.42
Control Delay	50.5	39.5	4.1	35.9	34.6	4.1	23.8	23.3	2.3	53.8	24.5	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.5	39.5	4.1	35.9	34.6	4.1	23.8	23.3	2.3	53.8	24.5	10.5
Queue Length 50th (ft)	56	106	3	79	93	13	112	51	0	64	153	80
Queue Length 95th (ft)	#93	148	31	#154	125	26	#186	86	18	100	214	182
Internal Link Dist (ft)	420			1970			420			5200		
Turn Bay Length (ft)	250		250	250		250	250		250	250		250
Base Capacity (vph)	305	707	735	326	786	802	505	1181	863	495	1011	765
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.54	0.16	0.73	0.63	0.47	0.68	0.20	0.10	0.43	0.55	0.42

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.













2040 Total PM
12: Sossaman Rd & Warner Road

17-1390 Hawes Crossing TIA
05/17/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	318	829	278	189	538	498	272	717	228	480	200	253
v/c Ratio	0.72	0.96	0.33	0.79	0.74	0.67	0.64	0.83	0.33	0.90	0.21	0.32
Control Delay	47.7	56.8	3.1	52.0	44.4	15.3	44.6	41.9	10.9	42.1	23.2	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	56.8	3.1	52.0	44.4	15.3	44.6	41.9	10.9	42.1	23.2	10.2
Queue Length 50th (ft)	90	245	0	86	126	78	76	203	43	97	57	87
Queue Length 95th (ft)	135	#366	43	#173	180	124	116	#291	96	m#207	m71	m127
Internal Link Dist (ft)	420			2090			420			5200		
Turn Bay Length (ft)	250		250	250		250	250		250	250		250
Base Capacity (vph)	457	865	858	240	724	738	457	865	698	534	975	809
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.96	0.32	0.79	0.74	0.67	0.60	0.83	0.33	0.90	0.21	0.31
Intersection Summary												
# 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.												













2040 Total AM
13: Hawes Rd & Warner Road

17-1390 Hawes Crossing TIA
05/17/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	260	178	320	506	424	30	409	366	284	241	702	193
v/c Ratio	0.67	0.53	0.55	0.79	0.71	0.05	0.73	0.26	0.26	0.62	0.56	0.27
Control Delay	60.0	56.9	22.0	56.2	53.6	0.1	37.2	21.2	14.7	57.8	35.0	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	56.9	22.0	56.2	53.6	0.1	37.2	21.2	14.7	57.8	35.0	2.5
Queue Length 50th (ft)	100	70	117	192	164	0	161	123	132	93	231	0
Queue Length 95th (ft)	144	104	188	249	211	0	122	176	222	132	333	24
Internal Link Dist (ft)	690			370			1200			660		
Turn Bay Length (ft)	250		250	250		250	250		250	250		100
Base Capacity (vph)	429	530	609	715	825	631	623	1433	1104	423	1258	720
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.34	0.53	0.71	0.51	0.05	0.66	0.26	0.26	0.57	0.56	0.27
Intersection Summary												

2040 Total PM
13: Hawes Rd & Warner Road

17-1390 Hawes Crossing TIA
05/17/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	219	716	543	611	458	246	622	851	360	304	731	86
v/c Ratio	0.64	0.94	0.68	1.02	0.45	0.31	0.94	0.79	0.41	0.83	0.95	0.16
Control Delay	60.9	68.0	23.8	90.4	36.6	10.4	43.8	44.7	28.0	68.5	64.7	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.9	68.0	23.8	90.4	36.6	10.4	43.8	44.7	28.0	68.5	64.7	1.1
Queue Length 50th (ft)	84	288	245	~252	153	50	260	359	234	122	299	0
Queue Length 95th (ft)	126	#405	379	#374	205	108	m#331	m415	m269	#192	#407	7
Internal Link Dist (ft)	690				370				1200		660	
Turn Bay Length (ft)	250			250	250			250	250	250		
Base Capacity (vph)	371	766	799	600	1026	785	663	1073	875	371	767	534
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.93	0.68	1.02	0.45	0.31	0.94	0.79	0.41	0.82	0.95	0.16
Intersection Summary												
~ 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.												

2040 Total AM
14: Hawes Rd & LOOP 202 Westbound

17-1390 Hawes Crossing TIA
05/17/2019



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	268	262	248	356	1176	774	430
v/c Ratio	0.73	0.60	0.48	0.54	0.46	0.23	0.46
Control Delay	54.8	24.6	7.3	43.7	16.5	14.4	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.8	24.6	7.3	43.7	16.5	14.4	4.8
Queue Length 50th (ft)	204	94	0	136	124	88	84
Queue Length 95th (ft)	276	174	63	186	149	101	139
Internal Link Dist (ft)	1105				501	1200	
Turn Bay Length (ft)							300
Base Capacity (vph)	504	549	624	657	2583	3319	937
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.48	0.40	0.54	0.46	0.23	0.46
Intersection Summary							

2040 Total PM
14: Hawes Rd & Loop 202 WB Ramps

17-1390 Hawes Crossing TIA
05/17/2019



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	215	320	321	239	1653	2106	1213
v/c Ratio	0.45	0.51	0.49	0.93	0.89	0.57	1.00
Control Delay	39.0	8.3	6.6	98.2	27.1	19.0	34.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	8.3	6.6	98.2	27.1	19.0	34.4
Queue Length 50th (ft)	144	15	2	102	471	270	619
Queue Length 95th (ft)	224	100	75	m#150	m520	m317	m#789
Internal Link Dist (ft)		1105			501	1200	
Turn Bay Length (ft)							300
Base Capacity (vph)	476	624	654	257	1864	3709	1218
Starvation Cap Reductn	0	0	0	0	4	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.51	0.49	0.93	0.89	0.57	1.00

Intersection Summary








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.

2040 Total AM
15: Hawes Rd & LOOP 202 Eastbound

17-1390 Hawes Crossing TIA
05/17/2019

							
Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	269	267	175	1014	378	274	878
v/c Ratio	0.73	0.59	0.38	0.26	0.38	0.65	0.39
Control Delay	55.0	24.4	7.3	18.2	3.4	43.5	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.0	24.4	7.3	18.2	3.4	43.5	9.1
Queue Length 50th (ft)	205	97	0	106	0	77	84
Queue Length 95th (ft)	277	178	54	157	60	91	116
Internal Link Dist (ft)	988		772				501
Turn Bay Length (ft)					300		
Base Capacity (vph)	504	576	573	3832	990	543	2237
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.46	0.31	0.26	0.38	0.50	0.39
Intersection Summary							

2040 Total PM
15: Hawes Rd & Loop 202 EB Ramps

17-1390 Hawes Crossing TIA
05/17/2019















Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	464	465	180	983	72	611	1733
v/c Ratio	0.97	0.84	0.33	0.36	0.11	0.89	0.69
Control Delay	78.6	43.5	8.0	28.1	0.3	51.5	7.9
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Total Delay	78.6	43.7	8.0	28.2	0.3	51.5	7.9
Queue Length 50th (ft)	374	273	8	135	0	257	82
Queue Length 95th (ft)	#600	#472	66	160	0	#350	86
Internal Link Dist (ft)	988		772				501
Turn Bay Length (ft)					300		
Base Capacity (vph)	476	552	545	2766	666	686	2500
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	3	0	168	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.85	0.33	0.38	0.11	0.89	0.69

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.













2040 Total AM
16: Elliot Rd & Ellsworth Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	172	603	612	363	919	467	488	680	473	167	544	294
v/c Ratio	0.73	0.82	0.86	0.90	0.74	0.66	0.56	0.43	0.54	0.32	0.51	0.48
Control Delay	41.8	58.1	31.3	56.9	46.1	16.5	36.8	25.6	5.5	46.7	44.9	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.8	58.1	31.3	56.9	46.1	16.5	36.8	25.6	5.5	46.7	44.9	8.9
Queue Length 50th (ft)	77	183	220	216	239	122	179	116	35	59	142	28
Queue Length 95th (ft)	#157	225	#361	#389	290	196	m229	m120	m54	92	183	65
Internal Link Dist (ft)	695		820		1216		700					
Turn Bay Length (ft)	250		250	250		250	250		250	250		250
Base Capacity (vph)	245	762	732	416	1271	728	915	1568	884	572	1060	622
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.79	0.84	0.87	0.72	0.64	0.53	0.43	0.54	0.29	0.51	0.47
Intersection Summary												
# 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.												












2040 Total PM
16: Elliot Rd & Ellsworth Rd

17-1390 Hawes Crossing TIA
05/17/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	333	1182	521	304	799	211	404	511	371	500	901	222
v/c Ratio	0.88	0.95	0.79	0.94	0.71	0.30	0.84	0.46	0.59	0.77	0.66	0.30
Control Delay	54.7	36.3	26.5	70.9	47.6	7.9	66.6	58.3	21.9	54.8	42.0	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.7	36.3	26.5	70.9	47.6	7.9	66.6	58.3	21.9	54.8	42.0	7.7
Queue Length 50th (ft)	134	293	360	186	214	29	123	151	169	190	228	33
Queue Length 95th (ft)	m#290	#415	533	#362	264	56	m#188	m184	m219	252	277	60
Internal Link Dist (ft)	695		820		1216		700					
Turn Bay Length (ft)	250		250	250		250	250		250	250		250
Base Capacity (vph)	400	1245	662	327	1127	707	486	1101	632	657	1356	757
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.95	0.79	0.93	0.71	0.30	0.83	0.46	0.59	0.76	0.66	0.29
Intersection Summary												
#	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.											












2040 Total AM
17: Ellsworth Rd & Warner Road

17-1390 Hawes Crossing TIA
05/17/2019

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	288	41	94	106	62	294	454	1220	124	620	229
v/c Ratio	0.88	0.08	0.15	0.55	0.28	0.68	0.75	0.46	0.40	0.28	0.21
Control Delay	68.7	42.4	4.5	50.3	56.4	23.5	55.0	19.4	10.8	16.6	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.7	42.4	4.5	50.3	56.4	23.5	55.0	19.4	10.8	16.6	1.2
Queue Length 50th (ft)	197	14	0	65	24	71	174	212	21	81	6
Queue Length 95th (ft)	#283	31	30	112	47	154	218	291	m33	m120	m12
Internal Link Dist (ft)	640			820			760			1240	
Turn Bay Length (ft)	250		250	250		250	250		250		250
Base Capacity (vph)	329	943	646	192	589	467	678	2667	357	2200	1085
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.04	0.15	0.55	0.11	0.63	0.67	0.46	0.35	0.28	0.21
Intersection Summary											
#	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.										

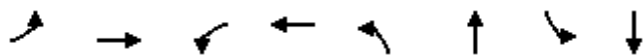
2040 Total PM
17: Ellsworth Rd & Warner Road

17-1390 Hawes Crossing TIA
05/17/2019

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	392	283	324	67	193	84	14	995	361	1372	467
v/c Ratio	0.94	0.28	0.51	0.52	0.55	0.12	0.07	0.76	0.84	0.66	0.41
Control Delay	77.0	35.1	16.8	67.2	57.3	0.4	54.3	44.0	55.8	20.2	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.0	35.1	16.8	67.2	57.3	0.4	54.3	44.0	55.8	20.2	1.8
Queue Length 50th (ft)	297	93	82	50	76	0	5	259	225	195	5
Queue Length 95th (ft)	#482	128	139	99	112	0	16	#317	m#371	m297	m37
Internal Link Dist (ft)	560			820			760			1240	
Turn Bay Length (ft)	250		250	250		250	250		250		250
Base Capacity (vph)	427	1109	641	147	530	691	200	1314	436	2070	1157
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.26	0.51	0.46	0.36	0.12	0.07	0.76	0.83	0.66	0.40
Intersection Summary											
#	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.										

2040 Total AM
35: Intersection E & Elliot Rd

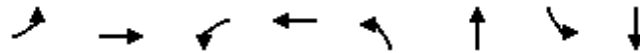
17-1390 Hawes Crossing TIA
05/17/2019



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	17	901	60	788	24	144	108	32
v/c Ratio	0.05	0.33	0.21	0.29	0.05	0.24	0.26	0.06
Control Delay	12.3	13.3	13.6	11.7	20.9	7.0	24.1	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.3	13.3	13.6	11.7	20.9	7.0	24.1	8.6
Queue Length 50th (ft)	4	91	17	83	9	9	44	1
Queue Length 95th (ft)	15	121	42	108	27	49	86	20
Internal Link Dist (ft)	760		1250		317		1590	
Turn Bay Length (ft)	100		100		150		150	
Base Capacity (vph)	324	2708	280	2696	457	609	413	553
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.33	0.21	0.29	0.05	0.24	0.26	0.06
Intersection Summary								

2040 Total PM
35: Intersection E

17-1390 Hawes Crossing TIA
05/17/2019



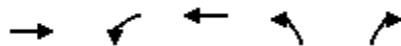
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	53	1193	187	1256	63	139	118	51
v/c Ratio	0.24	0.38	0.79	0.40	0.19	0.30	0.39	0.12
Control Delay	13.6	11.8	39.9	8.6	28.9	12.6	32.9	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	11.8	39.9	8.6	28.9	12.6	32.9	11.0
Queue Length 50th (ft)	16	134	71	113	28	20	56	3
Queue Length 95th (ft)	38	161	#212	141	63	67	108	31
Internal Link Dist (ft)		760		590		317		1590
Turn Bay Length (ft)	100		100		150		150	
Base Capacity (vph)	219	3152	237	3127	329	463	304	429
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.38	0.79	0.40	0.19	0.30	0.39	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

2040 Total AM
36: Intersection F

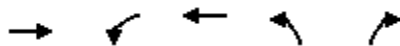
17-1390 Hawes Crossing TIA
05/17/2019



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1231	314	1248	12	107
v/c Ratio	0.57	0.73	0.37	0.03	0.27
Control Delay	21.8	24.1	7.0	29.7	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	24.1	7.0	29.7	8.2
Queue Length 50th (ft)	187	90	101	6	0
Queue Length 95th (ft)	269	170	124	20	41
Internal Link Dist (ft)	1230		1240	740	
Turn Bay Length (ft)		150		150	
Base Capacity (vph)	2162	552	3390	354	402
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	0.57	0.57	0.37	0.03	0.27
Intersection Summary					

2040 Total PM
36: Intersection F

17-1390 Hawes Crossing TIA
05/17/2019



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	2166	200	2111	60	314
v/c Ratio	0.89	0.68	0.62	0.20	0.55
Control Delay	28.1	27.2	9.6	31.9	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	27.2	9.6	31.9	8.0
Queue Length 50th (ft)	383	57	220	28	1
Queue Length 95th (ft)	#580	122	263	m61	64
Internal Link Dist (ft)	1230		1240	740	
Turn Bay Length (ft)		150		150	
Base Capacity (vph)	2431	424	3390	354	567
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	0.47	0.62	0.17	0.55

Intersection Summary

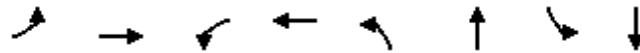
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

2040 Total AM
40: Intersection J

17-1390 Hawes Crossing TIA
05/17/2019



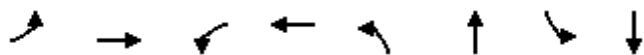
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	37	46	11	22	18	995	22	682
v/c Ratio	0.30	0.27	0.09	0.14	0.03	0.35	0.05	0.24
Control Delay	44.8	27.4	32.7	19.1	2.9	3.3	3.1	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.8	27.4	32.7	19.1	2.9	3.3	3.1	2.9
Queue Length 50th (ft)	20	12	5	2	2	69	2	42
Queue Length 95th (ft)	50	44	m14	m16	7	110	9	70
Internal Link Dist (ft)		1250		1230		446		740
Turn Bay Length (ft)	100		250		100		100	
Base Capacity (vph)	338	438	330	422	596	2879	427	2886
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.11	0.03	0.05	0.03	0.35	0.05	0.24

Intersection Summary

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

2040 Total PM
40: Intersection J

17-1390 Hawes Crossing TIA
05/17/2019











Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	53	53	37	73	58	1205	70	1591
v/c Ratio	0.40	0.26	0.27	0.34	0.29	0.42	0.22	0.56
Control Delay	45.9	20.4	37.8	17.6	8.6	4.2	5.5	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	20.4	37.8	17.6	8.6	4.2	5.5	5.3
Queue Length 50th (ft)	29	8	18	8	8	100	9	157
Queue Length 95th (ft)	m61	m39	m35	m34	32	161	29	254
Internal Link Dist (ft)		1250		1230		446		740
Turn Bay Length (ft)	100		250		100		100	
Base Capacity (vph)	264	363	269	374	197	2842	325	2840
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.15	0.14	0.20	0.29	0.42	0.22	0.56

Intersection Summary

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

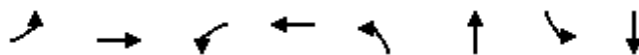
2040 Total AM
51: Intersection U

17-1390 Hawes Crossing TIA
05/17/2019

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	46	56	72	26	33	667	29	963
v/c Ratio	0.21	0.18	0.33	0.07	0.08	0.26	0.05	0.37
Control Delay	19.3	6.3	21.8	0.3	5.9	4.6	5.5	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	6.3	21.8	0.3	5.9	4.6	5.5	5.3
Queue Length 50th (ft)	12	0	19	0	3	41	3	67
Queue Length 95th (ft)	32	19	44	0	15	78	13	123
Internal Link Dist (ft)		225		580		660		1030
Turn Bay Length (ft)	100		100		100		100	
Base Capacity (vph)	496	611	482	655	398	2608	549	2618
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.09	0.15	0.04	0.08	0.26	0.05	0.37
Intersection Summary								

2040 Total PM
51: Intersection U

17-1390 Hawes Crossing TIA
05/17/2019



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	47	77	108	122	104	1605	94	1108
v/c Ratio	0.22	0.24	0.48	0.39	0.35	0.66	0.69	0.46
Control Delay	22.4	9.5	28.9	16.2	7.4	8.0	45.7	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.4	9.5	28.9	16.2	7.4	8.0	45.7	6.9
Queue Length 50th (ft)	15	4	36	21	17	152	20	94
Queue Length 95th (ft)	37	31	70	56	m37	310	#110	170
Internal Link Dist (ft)		225		580		660		1030
Turn Bay Length (ft)	100		100		100		100	
Base Capacity (vph)	379	519	395	513	296	2422	136	2428
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.15	0.27	0.24	0.35	0.66	0.69	0.46

Intersection Summary

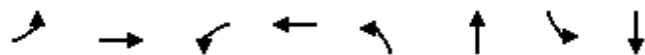
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

2040 Total AM
54: Intersection X

17-1390 Hawes Crossing TIA
05/17/2019



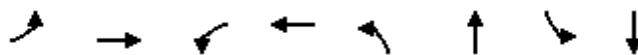
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	43	657	18	929	17	62	61	56
v/c Ratio	0.14	0.30	0.04	0.44	0.05	0.14	0.18	0.12
Control Delay	7.2	5.1	7.4	9.6	25.9	11.1	27.9	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.2	5.1	7.4	9.6	25.9	11.1	27.9	9.4
Queue Length 50th (ft)	2	14	4	128	7	5	27	2
Queue Length 95th (ft)	m15	76	12	169	24	36	60	31
Internal Link Dist (ft)	1840		480		160		410	
Turn Bay Length (ft)	100		100		100		100	
Base Capacity (vph)	304	2161	438	2131	342	455	341	448
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.30	0.04	0.44	0.05	0.14	0.18	0.13

Intersection Summary

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

2040 Total PM
54: Intersection X

17-1390 Hawes Crossing TIA
05/17/2019












Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	136	1458	50	1090	11	40	182	102
v/c Ratio	0.53	0.65	0.35	0.49	0.04	0.10	0.57	0.23
Control Delay	8.6	4.1	16.1	9.5	27.3	12.9	38.8	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.6	4.1	16.1	9.5	27.3	12.9	38.8	9.5
Queue Length 50th (ft)	10	56	12	152	5	4	92	5
Queue Length 95th (ft)	m16	m84	42	196	19	29	161	45
Internal Link Dist (ft)		1720		480		160		410
Turn Bay Length (ft)	100		100		100		100	
Base Capacity (vph)	258	2237	143	2217	300	406	317	446
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.65	0.35	0.49	0.04	0.10	0.57	0.23

Intersection Summary

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










2040 Total AM
55: Intersection Y

17-1390 Hawes Crossing TIA
05/17/2019

									
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	36	562	97	19	775	100	10	8	41
v/c Ratio	0.09	0.29	0.11	0.04	0.42	0.28	0.01	0.02	0.07
Control Delay	8.1	12.6	2.7	7.7	15.5	28.7	0.0	24.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.1	12.6	2.7	7.7	15.5	28.7	0.0	24.7	0.2
Queue Length 50th (ft)	8	73	0	4	153	45	0	3	0
Queue Length 95th (ft)	19	142	22	13	206	89	0	14	0
Internal Link Dist (ft)	130				590		160		278
Turn Bay Length (ft)	100	100		100	100				
Base Capacity (vph)	404	1929	912	524	1825	362	675	373	612
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.29	0.11	0.04	0.42	0.28	0.01	0.02	0.07
Intersection Summary									

2040 Total PM
55: Intersection Y

17-1390 Hawes Crossing TIA
05/17/2019

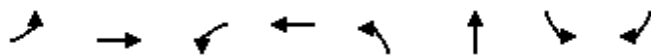
									
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	112	1118	320	63	806	404	51	17	96
v/c Ratio	0.40	0.79	0.43	0.35	0.58	0.85	0.07	0.03	0.14
Control Delay	16.6	29.3	11.2	17.5	24.3	45.4	0.2	18.7	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.6	29.3	11.2	17.5	24.3	45.4	0.2	18.7	0.4
Queue Length 50th (ft)	32	298	55	18	194	208	0	6	0
Queue Length 95th (ft)	61	384	126	38	256	#376	0	20	0
Internal Link Dist (ft)	130		590				160	278	
Turn Bay Length (ft)	100	100		100	100				
Base Capacity (vph)	283	1423	741	181	1389	474	681	494	705
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.79	0.43	0.35	0.58	0.85	0.07	0.03	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

2040 Total AM
57: Intersection AA

17-1390 Hawes Crossing TIA
05/17/2019



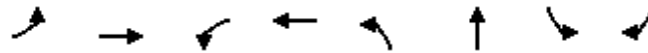
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBR
Lane Group Flow (vph)	182	1621	24	1967	18	3	11	61
v/c Ratio	0.54	0.48	0.15	0.73	0.08	0.01	0.06	0.12
Control Delay	27.6	8.0	17.2	18.1	40.6	0.0	52.7	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.6	8.0	17.2	18.1	40.6	0.0	52.7	0.5
Queue Length 50th (ft)	53	132	6	185	12	0	7	0
Queue Length 95th (ft)	m131	221	m12	254	30	0	29	0
Internal Link Dist (ft)		240		290		1216		
Turn Bay Length (ft)	150		150		150		150	
Base Capacity (vph)	340	3382	156	2696	239	399	200	526
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	1	0	0	0	25
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.48	0.15	0.73	0.08	0.01	0.06	0.12

Intersection Summary

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

2040 Total PM
57: Intersection AA

17-1390 Hawes Crossing TIA
05/17/2019



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBR
Lane Group Flow (vph)	58	2646	2	1563	88	17	60	322
v/c Ratio	0.22	0.90	0.01	0.70	0.18	0.03	0.41	0.92
Control Delay	11.8	11.3	19.5	36.5	32.2	0.1	65.6	69.5
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	11.4	19.5	36.5	32.2	0.1	65.6	69.5
Queue Length 50th (ft)	8	147	1	287	50	0	47	~243
Queue Length 95th (ft)	m11	#873	m2	m373	93	0	#129	#430
Internal Link Dist (ft)	230		715		1216			
Turn Bay Length (ft)	150		150		150		150	
Base Capacity (vph)	288	2955	142	2236	479	506	145	374
Starvation Cap Reductn	0	12	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.90	0.01	0.70	0.18	0.03	0.41	0.86

Intersection Summary










~ 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.










2040 Total AM
58: Intersection AB

17-1390 Hawes Crossing TIA
05/17/2019

									
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBR
Lane Group Flow (vph)	176	1298	167	10	1825	22	1	4	70
v/c Ratio	0.53	0.36	0.14	0.05	0.67	0.09	0.00	0.02	0.14
Control Delay	20.1	1.1	0.2	11.2	20.0	41.0	0.0	53.0	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	1.1	0.2	11.2	20.0	41.0	0.0	53.0	0.6
Queue Length 50th (ft)	36	10	0	3	378	15	0	2	0
Queue Length 95th (ft)	134	20	0	m8	439	35	0	15	0
Internal Link Dist (ft)	345		695		1232				
Turn Bay Length (ft)	250		250	250		250		250	250
Base Capacity (vph)	330	3627	1184	209	2743	239	400	200	514
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.36	0.14	0.05	0.67	0.09	0.00	0.02	0.14
Intersection Summary									
m Volume for 95th percentile queue is metered by upstream signal.									

2040 Total PM
58: Intersection AB

17-1390 Hawes Crossing TIA
05/17/2019

									
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBR
Lane Group Flow (vph)	68	2332	17	1	1426	111	7	21	312
v/c Ratio	0.23	0.78	0.02	0.01	0.66	0.21	0.01	0.29	0.97
Control Delay	9.2	6.6	0.0	14.0	13.8	31.7	0.0	65.9	71.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.2	6.6	0.0	14.0	13.8	31.7	0.0	65.9	71.8
Queue Length 50th (ft)	0	17	0	0	182	68	0	16	134
Queue Length 95th (ft)	m2	#761	m0	m1	209	103	0	44	#332
Internal Link Dist (ft)	715		695		1232				
Turn Bay Length (ft)	250		250	250		250		250	250
Base Capacity (vph)	315	2982	1007	135	2164	522	550	73	335
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.78	0.02	0.01	0.66	0.21	0.01	0.29	0.93
Intersection Summary									
#	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.								