

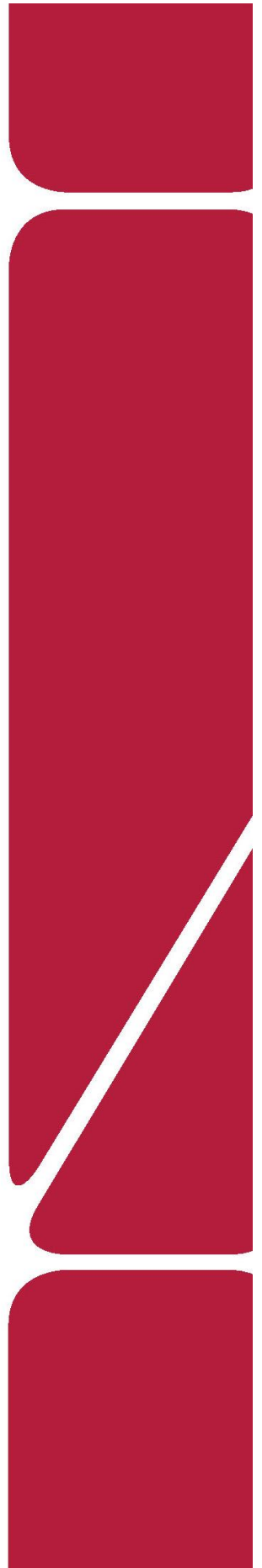


Traffic Impact Study

Crossroads-Meadowbrook El Paso County, Colorado

Prepared for:
Colorado Springs Equities LLC

Kimley»Horn



T R A F F I C I M P A C T S T U D Y

Crossroads-Meadowbrook

El Paso County, Colorado

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The attached traffic report and supporting information were prepared under my responsible charge and they comport with the standard of care. So far as is consistent with the standard of care, said report was prepared in general conformance with the criteria established by the County for traffic reports.

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1.0 EXECUTIVE SUMMARY

The Crossroads-Meadowbrook development areas are proposed along the north and south sides of US-24 in El Paso County, Colorado. This traffic study evaluates three separate project areas; the first area, named Meadowbrook Park, is located on the northeast corner of the US-24 and Newt Drive/SH-94 intersection, the second area, Crossroads North, is located within the triangle area between US-24, Marksheffel Road, and SH-94, and the third development area, Crossroads Mix Use, is located on the northwest corner of the US-24 and Newt Drive/SH-94 intersection.

All three of these development areas are anticipated to include approximately 70 single-family detached housing units, a 18.28-acre public park, a 52,000 square foot movie theater, a 130,000 square foot free standing discount store, 44,942 square feet of retail space, a 7,200 square foot tire store, a 127,000 square foot home improvement store, a 114,000 square foot furniture store, 21,200 square feet of sit down restaurant space, 20,909 square feet of fast food restaurants, a 2,400 square foot coffee shop, and a gas station with 5,000 square foot convenience market. It is expected that buildout of these development areas would be completed in the next five years. Therefore, for purposes of this analysis, this project was evaluated for the short-term 2025 and long-term 2040 horizons.

The purpose of this study is to identify development area traffic generation characteristics, to identify potential traffic related impacts on the local street system, and to develop mitigation measures required for identified impacts. The following intersections were incorporated into this traffic study in accordance with El Paso County and CDOT standards and requirements:

- Meadowbrook Parkway and Marksheffel Road
- US-24 and Marksheffel Road
- Meadowbrook Parkway and Newt Drive
- US-24 and SH-94
- SH-94 and Marksheffel Road

Regional access to Crossroads-Meadowbrook is provided by Interstate 25 (I-25), Powers Boulevard (SH-21), and US-24. Primary access to the development areas will be provided by Marksheffel Road and Meadowbrook Parkway. Direct access to Meadowbrook Park is proposed

at two full movement accesses along Meadowbrook Parkway. Direct access to Crossroads North is proposed from a southern full movement access along Marksheffel Road approximately 1,000 feet north of SH-94 and a northern right-in/right-out access along Marksheffel Road approximately 2,000 feet north of SH-94. Direct access to Crossroads Mix Use is proposed along the future extension of Meadowbrook Parkway at two full movement accesses and an eastern right-in/right-out access.

All three development areas of the Crossroads-Meadowbrook project evaluated in the study are expected to generate a total of approximately 36,498 external daily weekday trips with 2,176 of these trips occurring during the morning peak hour and 2,903 trips occurring during the afternoon peak hour.

Distribution of site traffic on the street system was based on the area street system characteristics, existing traffic patterns and volumes, anticipated surrounding development areas, expected roadway improvements, and the proposed access system for each project area. Assignment of project traffic was based upon the trip generation described previously and the distributions developed. Assigned traffic was added to future traffic volumes projected at the study area intersections to conduct a traffic analysis for the determination of possible improvements needed.

Based on the analysis presented in this report, Kimley-Horn believes the proposed Crossroads-Meadowbrook project areas will be successfully incorporated into the existing and future roadway network. The proposed project development and expected traffic volumes resulted in the following recommendations/conclusions:

2025 Recommendations:

- A CDOT Access Permit will be required for the Newt Drive north leg of the US-24 intersection in association with the Crossroads Mix Use development. Likewise, CDOT Access Permits will be required for the south leg of SH-94 at US-24 and north leg of Marksheffel Road at SH-94 in association with the Crossroads North development.
- It is recommended that a single lane roundabout be constructed at the Meadowbrook Parkway and New Drive intersection with development of the Crossroads Mix Use

project. It is recommended that the roundabout have single lane approaches on the eastbound Newt Drive, northbound Meadowbrook Parkway, and southbound Meadowbrook Parkway approaches and a two-lane approach on westbound Newt Drive with a shared left turn/through lane into the roundabout and a separate right turn lane.

- The intersection of SH-94 and US-24 is projected to operate poorly in 2025 with the existing intersection configuration. Therefore, US-24 may need to provide three through lanes in each direction through this intersection. It is recommended that a third northeastbound through lane along US-24 be designated while constructing a separate 600-foot plus 225-foot taper right turn lane to maintain free right turn movements to eastbound SH-94. The third southwestbound through lane along US-24 can be designated by absorbing the existing right turn lane. The six-lane section of US-24 can occur between the Peterson Road interchange to the west and transition back to a four-lane roadway east of SH-94. In addition to these improvements, it is recommended that 935-foot plus 225-foot taper dual left turn lanes be provided on northeastbound US-24 for the turn to Newt Drive. The area for these dual lefts is presently mostly available; however, the lane is striped out which will require restriping and a slight extension may also need to be constructed. A traffic signal modification will be required at the intersection to incorporate these improvements.
- At the full movement access intersection for Crossroads North along Marksheffel Road, a traffic signal is anticipated to be warranted and needed. Therefore, a traffic signal is recommended for installation at this intersection with development of Crossroads North. A 250-foot with 100-foot taper northbound left turn lane is recommended to be designated along Marksheffel Road at this access intersection. It is also recommended that a 235-foot with 200-foot taper (based on El Paso County standards for 50 mph) southbound right turn lane be constructed at this access intersection along Marksheffel Road due to the volume of traffic entering Crossroads North at this access.
- The northern right-in/right-out access for Crossroads North and all other project access driveways for Meadowbrook Park and Crossroads Mix Use are recommended to be two-way stop-controlled with R1-1 “STOP” signs installed for the exiting approaches.

- The north access along Marksheffel Road for Crossroads North is proposed as a right-in/right-out driveway. To identify the restriction of the access to right turn movements only, a R3-2 No Left Turn sign should be placed underneath the STOP sign on the eastbound driveway approach. Due to the absence of a raised median within Marksheffel Road, a raised median island should be incorporated in the throat of this driveway to further restrict entering and exiting left turn movements. A R3-2 No Left Turn sign should be placed on the northwest corner of the intersection, visible to northbound drivers along Marksheffel Road to restrict entering left turn movements. It is also recommended that a 235-foot with 200-foot taper southbound right turn lane be constructed at this access intersection along Marksheffel Road based on the 50 mph posted speed limit.
- From the CDOT SHAC analysis it was found that a westbound acceleration lane is needed from the southbound right turn at the intersection of SH-94 and Marksheffel Road in association with the Crossroads North project. It is recommended that the acceleration lane be constructed as a continuous lane to tie into the outside through lane on the westbound approach to US-24.
- It is recommended that the following turn lanes be lengthened to CDOT standards and accommodate future projected queue lengths; the 150-foot eastbound left turn at the intersection of Meadowbrook Parkway and Marksheffel Road needs to be lengthened to 175 feet (in association with Crossroads Mix Use), the 475-foot westbound SH-94 dual left turn lanes at the intersection of US-24 and SH-94 need to be lengthened to 740 feet with a 145 foot taper (in association with Crossroads North), and the 300-foot eastbound left turn lane and the 250-foot westbound right turn lane at the intersection of SH-94 and Marksheffel Road need to be lengthened to 850 feet with a 225 foot taper and 600 feet with a 225 foot taper, respectively (in association with Crossroads North).
- Meadowbrook Parkway will be extended along Crossroads Mix Use development project area in association with that project. It is recommended that this roadway be designated as a three-lane roadway with a center two-way left turn lane.

2040 Recommendations:

- If future traffic volume projections are realized, US-24 may need to provide three through lanes in each direction through the Marksheffel Road intersection. If and when this occurs, it is believed that the existing separate eastbound and westbound US-24 right turn lanes could be converted to shared through/right turn lanes.
- At the SH-94 and Marksheffel Road intersection, dual eastbound left turn lanes operating with protected only phasing may be needed to provide acceptable operations.

General Recommendations:

- Any on-site and off-site roadway, signing, striping, and signal improvements should be incorporated into the Civil Drawings, and conform to El Paso County and/or CDOT standards as applicable, as well as the Manual on Uniform Traffic Control Devices – 2009 Edition (MUTCD).

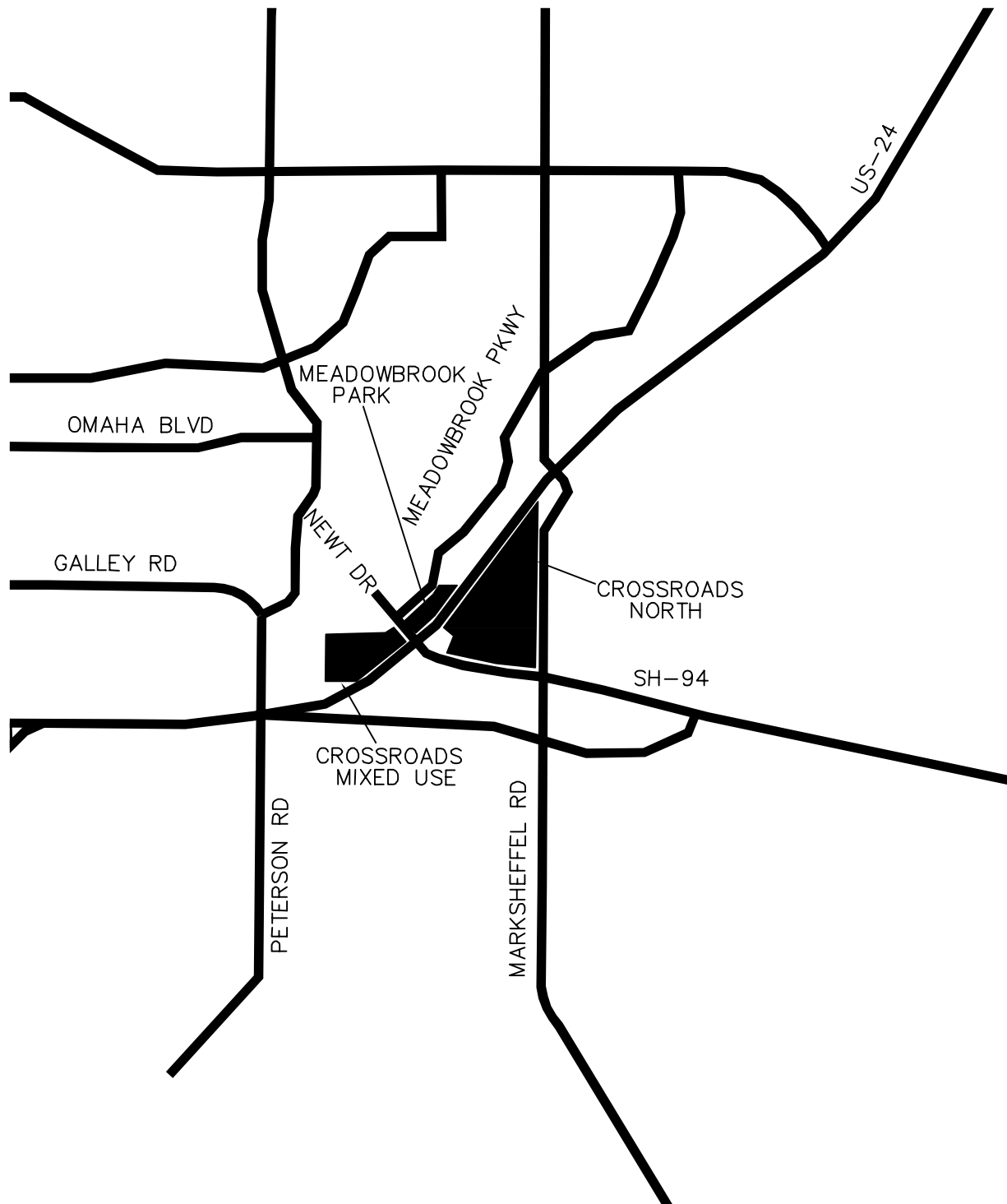
2.0 INTRODUCTION

Kimley-Horn and Associates, Inc. (Kimley-Horn) has prepared this report to document the results of a Traffic Impact Study of future traffic conditions associated with the proposed Crossroads-Meadowbrook project to be located along the north and south sides of US-24 in El Paso County, Colorado. A vicinity map illustrating the location of the Crossroads-Meadowbrook project is shown in **Figure 1**.

This traffic study evaluates three separate development areas; the first area, named Meadowbrook Park, is located on the northeast corner of the US-24 and Newt Drive/SH-94 intersection, the second area, Crossroads North, is located within the triangle area between US-24, Marksheffel Road, and SH-94, and the third development area, Crossroads Mix Use, is located on the northwest corner of the US-24 and Newt Drive/SH-94 intersection. All three of these development areas are anticipated to include approximately 70 single-family detached housing units, a 18.28-acre public park, a 52,000 square foot movie theater, a 130,000 square foot free standing discount store, 44,942 square feet of retail space, a 7,200 square foot tire store, a 127,000 square foot home improvement store, a 114,000 square foot furniture store, 21,200 square feet of sit down restaurant space, 20,909 square feet of fast food restaurants, a 2,400 square foot coffee shop, and a gas station with 5,000 square foot convenience market. A conceptual site plan for the project is attached in **Appendix G**. It is expected that buildout of these development areas would be completed in the next five years. Therefore, for purposes of this analysis, this project was evaluated for the short-term 2025 and long-term 2040 horizons.

The purpose of this study is to identify development area traffic generation characteristics, to identify potential traffic related impacts on the local street system, and to develop mitigation measures required for identified impacts. The following intersections were incorporated into this traffic study in accordance with El Paso County and CDOT standards and requirements:

- Meadowbrook Parkway and Marksheffel Road
- US-24 and Marksheffel Road
- Meadowbrook Parkway and Newt Drive
- US-24 and SH-94
- SH-94 and Marksheffel Road



CROSSROADS-MEADOWBROOK
COLORADO SPRINGS, CO
VICINITY MAP

FIGURE 1

3.0 EXISTING AND FUTURE CONDITIONS

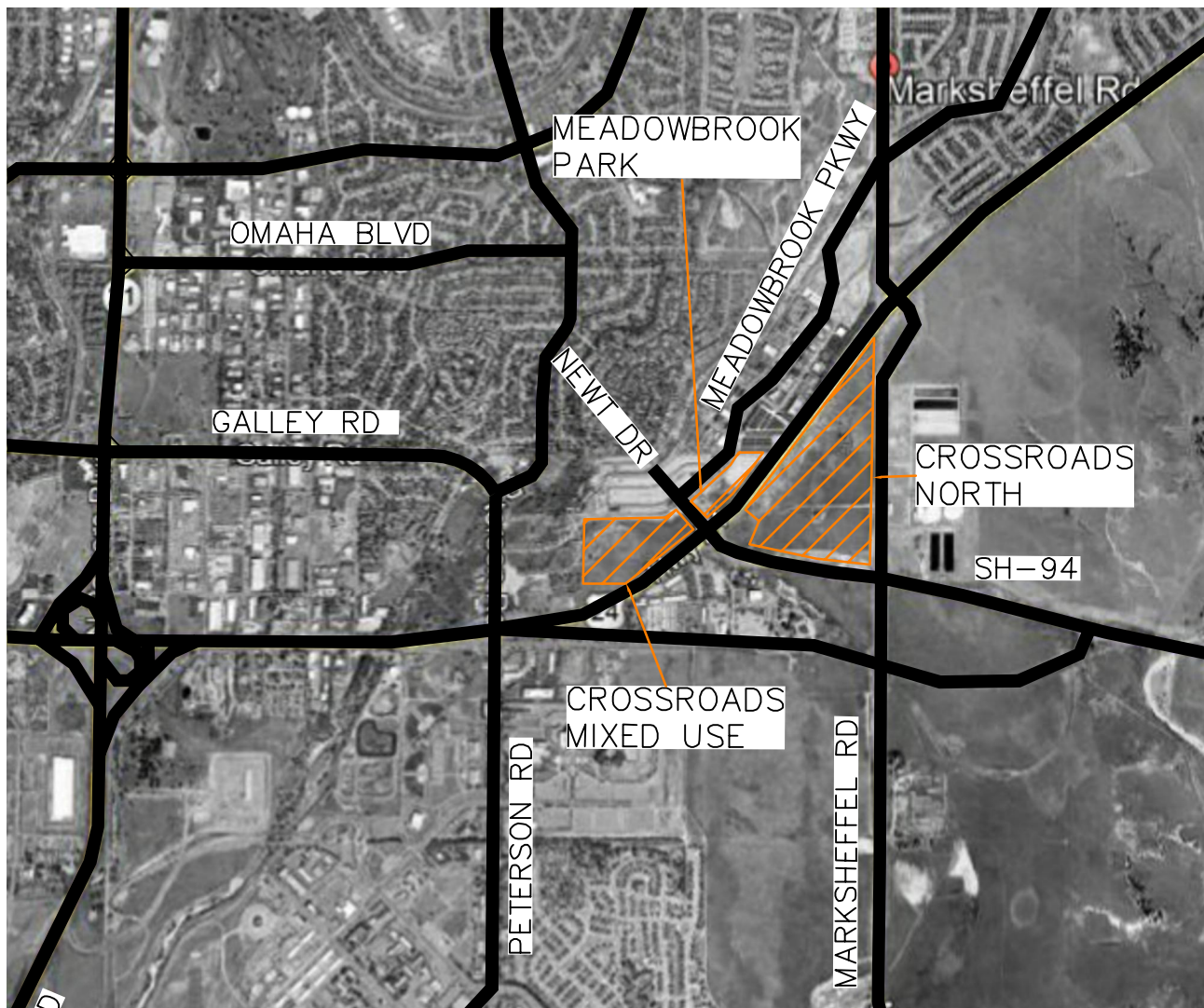
3.1 Existing and Future Study Area

The existing site areas are comprised of vacant land. The surrounding area contains a mix of uses. Directly to the east of Crossroads North exists a water treatment plant. Directly to the south are industrial uses. Directly to the west is mainly residential neighborhoods. Other industrial uses are proposed north of Meadowbrook Park. Outside of these areas, the Colorado Springs Airport and Peterson Air Force Base exists to the southwest. The site area is shown in the aerial of **Figure 2**.

3.2 Existing and Future Roadway Network

Regional access to Crossroads-Meadowbrook is provided by Interstate 25 (I-25), Powers Boulevard (SH-21), and US-24. Primary access to the development areas will be provided by Marksheffel Road and Meadowbrook Parkway. Direct access to Meadowbrook Park is proposed at two full movement accesses along Meadowbrook Parkway. Direct access to Crossroads North is proposed from a southern full movement access along Marksheffel Road approximately 1,000 feet north of SH-94 and a northern right-in/right-out access along Marksheffel Road approximately 2,000 feet north of SH-94. Direct access to Crossroads Mix Use is proposed along the future extension of Meadowbrook Parkway at two full movement accesses and an eastern right-in/right-out access.

SH-94 is a CDOT Highway, categorized E-X: Expressway, Major Bypass that provides one through lane of travel both eastbound and westbound in the development area. SH-94 has a 55 mile per hour speed limit through the study area. US-24 is a CDOT Highway, categorized E-X: Expressway, Major Bypass that provides two through lanes of travel both eastbound and westbound in the vicinity of the project areas. US-24 has a 55 mile per hour speed limit through the study area. Marksheffel Road is an El Paso County arterial that provides two through lanes of travel in each direction, northbound and southbound, with a 55 mile per hour speed limit through the study area. Meadowbrook Parkway is a collector roadway that provides one lane of travel in each direction, with a 35 mile per hour speed limit through the study area.



CROSSROADS—MEADOWBROOK
COLORADO SPRINGS, CO
SITE AREA

FIGURE 2

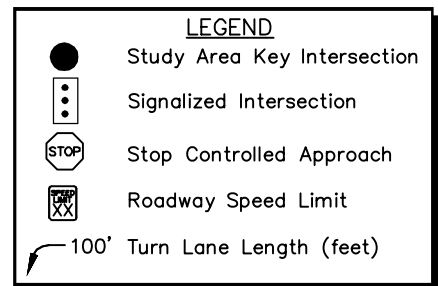
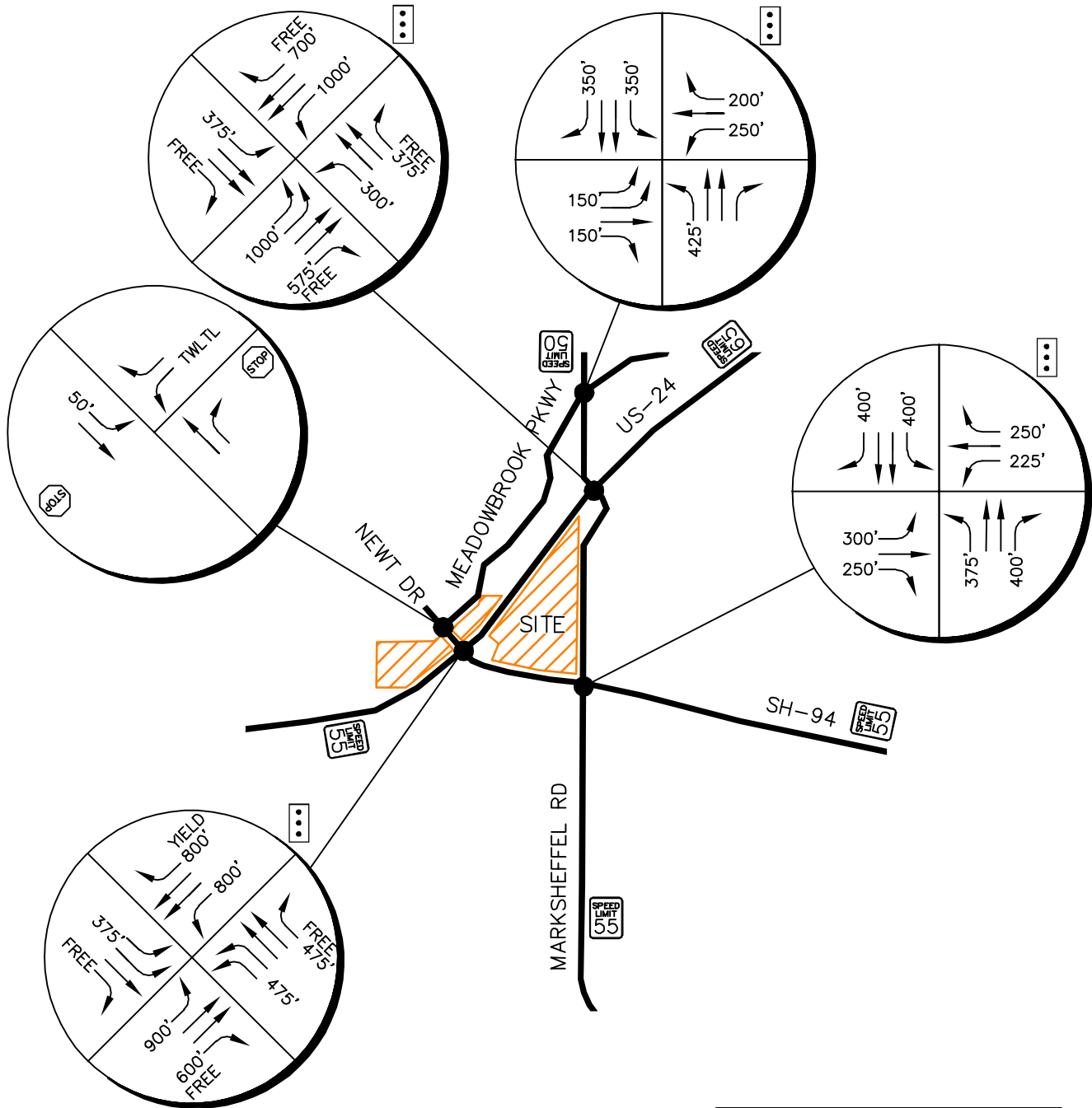
The Meadowbrook Parkway and Marksheffel Road intersection is a four-leg signalized intersection. The eastbound Meadowbrook Parkway approach consists of dual left turn lanes, one through lane, and a right turn lane. The westbound approach consists of a left turn lane, a through lane, and one right turn lane. The northbound and southbound approaches of Marksheffel Road consist of one left turn lane, two through lanes, and a right turn lane.

The Marksheffel Road and US-24 intersection is a four-leg signalized intersection. The northbound, southbound, and westbound approaches consist of a left turn lane, two through lanes, and separate right turn lanes operating with a free right turn movement. The eastbound US-24 approach consists of dual left turn lanes, two through lanes, and a right turn lane with free movements.

The Newt Drive and Meadowbrook Parkway intersection is a T-intersection with stop control on the eastbound and westbound approaches of Newt Drive. The westbound approach consists of one through lane and a right turn lane. The eastbound approach consists of one left turn lane and one through lane. The southbound approach consists of a two-way left turn lane and a right turn lane. With the construction of the Crossroads Mix Use project, a southwest leg will be constructed at this intersection by extension of Meadowbrook Parkway adjacent to the development area.

The intersection of SH-94 and US-24 is signalized with four-legs. Since both state highways run east-west, the traffic software for this intersection assigned SH-94 as east-west and US-24 as north-south. The eastbound Newt Drive approach consists of dual left turn lanes, one through lane, and a free right turn lane. The westbound SH-94 approach consists of dual left turn lanes, two through lanes, and a free right turn lane. The US-24 approaches each consist of a left turn lane, two through lanes, and a right turn lane. The westbound US-24 right turn operates with free turning movements.

The SH-94 and Marksheffel Road intersection is a four-leg signalized intersection. The eastbound and westbound approaches consist of a left turn lane, one through lane, and one right turn lane. The northbound and southbound approaches consist of a left turn lane, two through lanes, and a right turn lane. Existing intersection lane configurations and control for the study area are shown in **Figure 3**.



CROSSROADS—MEADOWBROOK
COLORADO SPRINGS, CO
EXISTING LANE CONFIGURATIONS

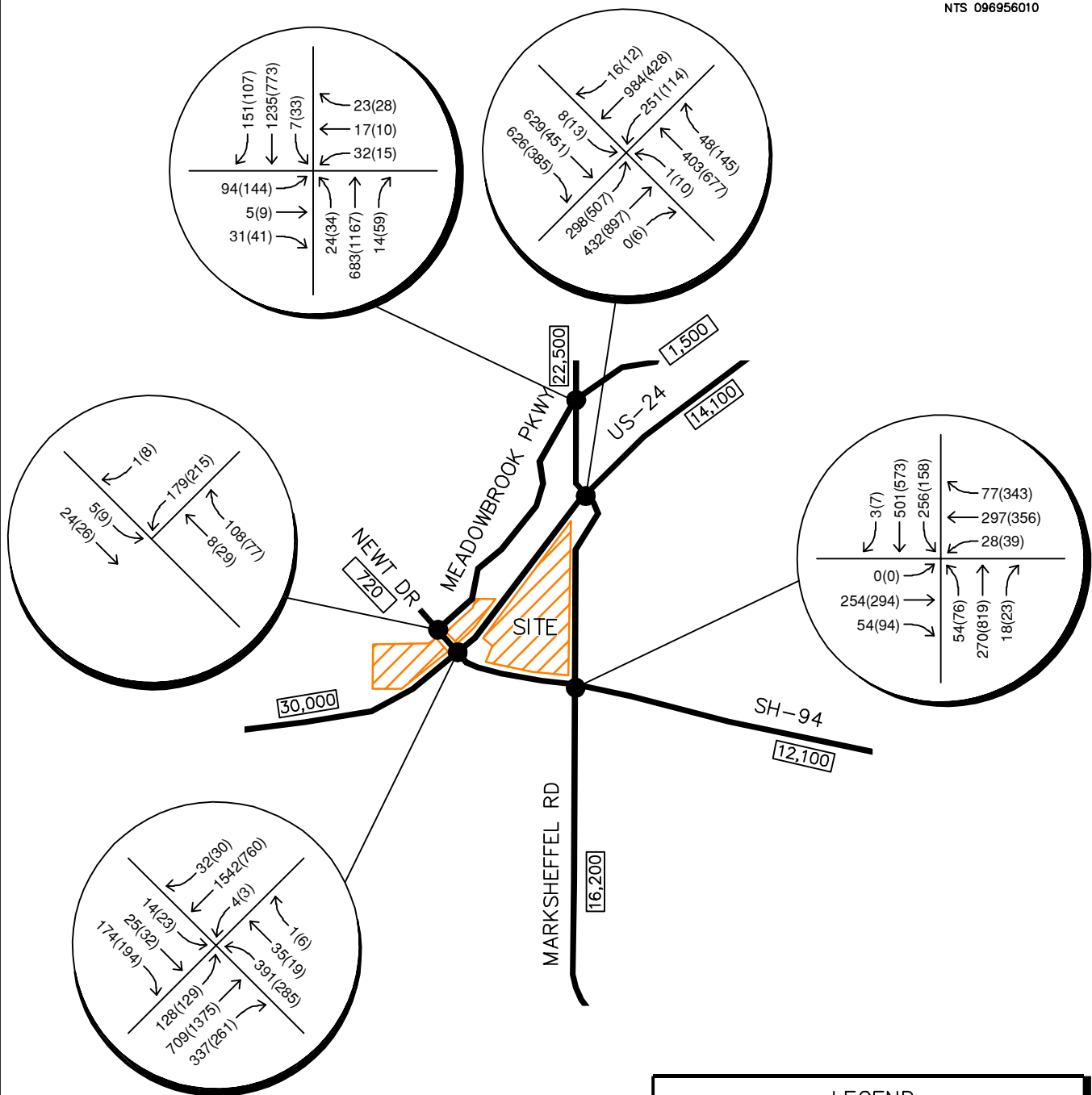
FIGURE 3

3.3 Existing Traffic Volumes

Due to the effects on traffic from COVID-19, traffic counts at each intersection were derived by different methodologies. Existing peak hour turning movement counts, pedestrian counts, and bicycle counts were conducted at the intersections of SH-94 and Marksheffel Road, Meadowbrook Parkway and Newt Drive, and SH-94 and US-24 on Tuesday, June 2, 2020 and at the intersections of Marksheffel Road and US-24 and Meadowbrook Parkway and Marksheffel Road on Thursday, June 4, 2020 during the morning and afternoon peak hours. The weekday counts were conducted in 15-minute intervals during the AM and PM peak hours of adjacent street traffic from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM. The turning movement counts were grown based on data obtained from hourly counts from the CDOT OTIS database to account for a COVID-19 adjustment for this area. The morning and afternoon peak hour counts were adjusted by 20% and 10%, respectively except for the counts at the intersection of SH-94 and Marksheffel Road which were not adjusted in the morning peak hour but were adjusted by 44% for the afternoon peak hour. These adjusted turning movement counts are shown in **Figure 4** with vehicle, pedestrian, bicycle count sheets, and CDOT OTIS data provided in **Appendix A**.

3.4 Unspecified Development Traffic Growth

According to information provided on the website for the Colorado Department of Transportation (CDOT), the average 20-year growth factor along SH-94 in the vicinity of the site is 1.29. This value equates to an annual growth rate of 1.16 percent. SH-94 traffic information from the CDOT Online Transportation Information System (OTIS) website is included in **Appendix B**. Based on this, an annual growth rate of 1.16 percent was used to calculate future traffic volumes within the project study area. This annual growth rate was used to estimate near term 2025 and long term 2040 traffic volume projections at the key intersections. Along with the growth of existing traffic volumes, project traffic from the single-family housing development to the west at Newt Drive were estimated based on the number of homes yet to be occupied and added to the background traffic volumes. Background traffic volumes for 2025 and 2040 are shown in **Figures 5** and **6**, respectively.

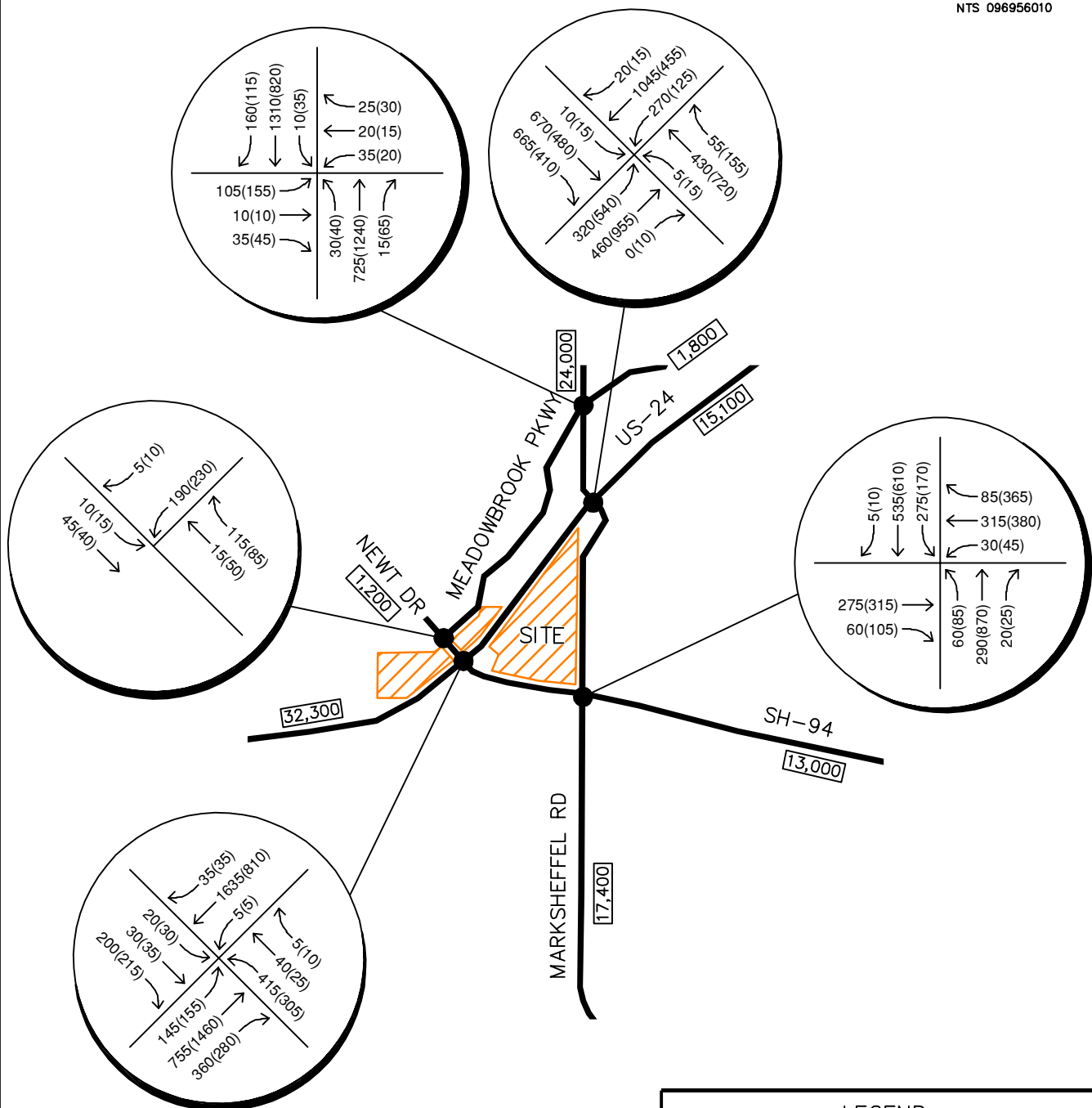


CROSSROADS—MEADOWBROOK
COLORADO SPRINGS, CO
2020 EXISTING ADJUSTED
TRAFFIC VOLUMES

LEGEND

- Study Area Key Intersection
- XXX(XXX) Weekday AM(PM)
Peak Hour Traffic Volumes
- XX,X00 Estimated Daily Traffic Volume

FIGURE 4

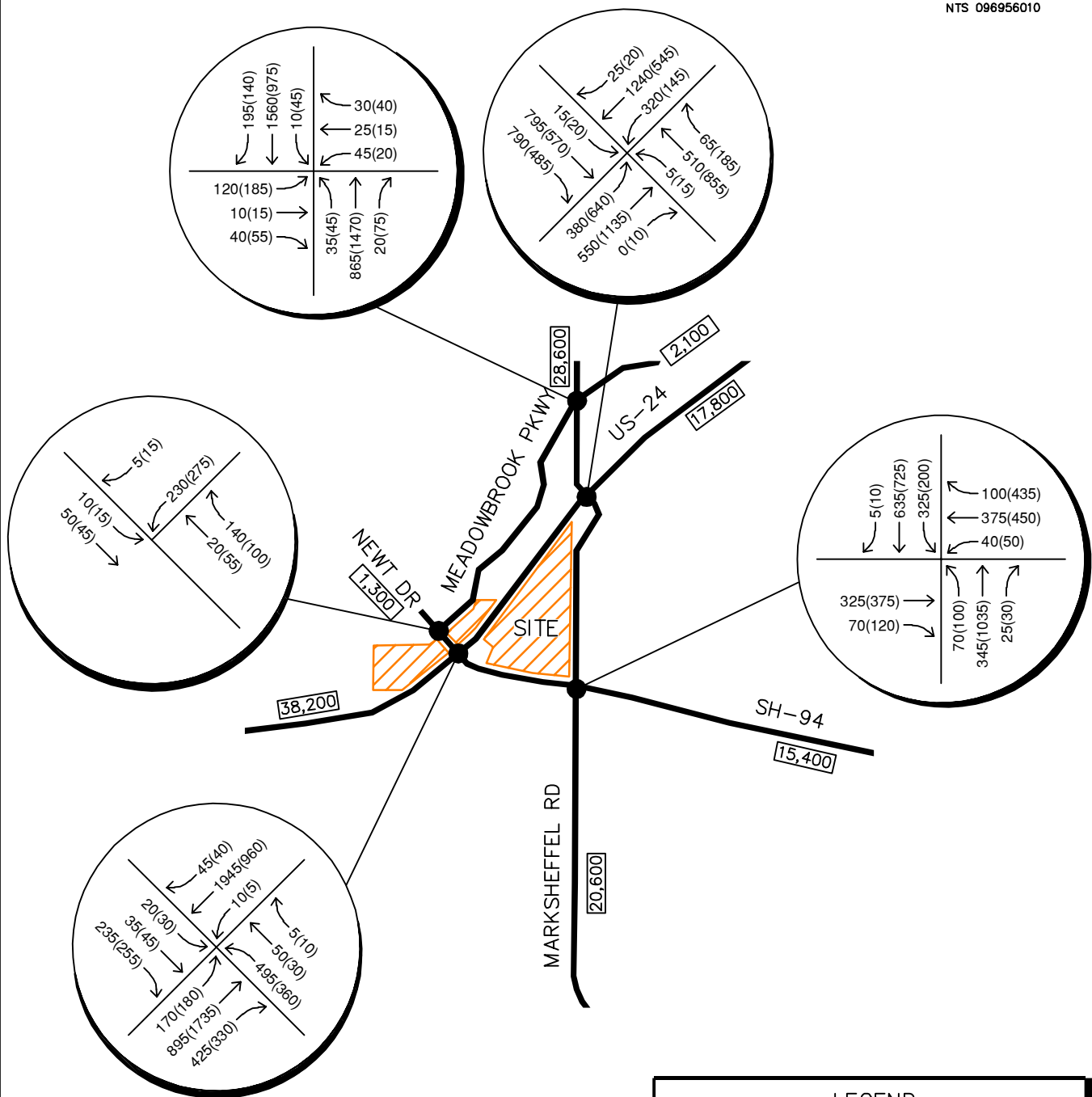


CROSSROADS—MEADOWBROOK
COLORADO SPRINGS, CO
2025 BACKGROUND
TRAFFIC VOLUMES

LEGEND

- Study Area Key Intersection
- XXX(XXX) Weekday AM(PM)
Peak Hour Traffic Volumes
- XX,X00 Estimated Daily Traffic Volume

FIGURE 5



LEGEND

- Study Area Key Intersection
- XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes
- XX,X00 Estimated Daily Traffic Volume

CROSSROADS—MEADOWBROOK
COLORADO SPRINGS, CO
2040 BACKGROUND
TRAFFIC VOLUMES

FIGURE 6

4.0 PROJECT TRAFFIC CHARACTERISTICS

4.1 Trip Generation

Site-generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the proposed land use to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the *Trip Generation Manual*¹ published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses.

For purposes of this traffic evaluation, the project was studied to include approximately 70 single-family detached housing dwelling units, a 18.28 acre public park, a 52,000 square foot movie theater, a 130,000 square foot free standing discount store, 44,942 square feet of retail space, a 7,200 square foot tire store, a 127,000 square foot home improvement store, a 114,000 square foot furniture store, 21,200 square feet of sit down restaurant, 20,909 square feet of fast food restaurants, a 2,400 square foot coffee shop, and a 5,000 square foot gas station with convenience market. Based on this, Kimley-Horn used the ITE Trip Generation Manual average rates and equations that apply to Single-Family Detached House (ITE Code 210), Public Park (ITE Code 411), Movie Theater (ITE Code 444), Free Standing Discount Store (ITE 815), Shopping Center (ITE Code 820), Tire Superstore (ITE Code 849), Home Improvement Superstore (ITE Code 862), Furniture Store (ITE Code 890), High-Turnover (Sit-Down) Restaurant (ITE Code 932), Fast-Food Restaurant with Drive Through (ITE Code 934), Coffee/Donut Shop with Drive Through (ITE Code 937), and Gasoline Station with Convenience Market (ITE Code 960) for traffic associated with the proposed Crossroads-Meadowbrook project. The trip generation calculations are included in **Appendix C**. These calculations illustrate the equations used and directional distribution of trips based on ITE studies.

The Crossroads-Meadowbrook project is expected to generate a total of approximately 36,498 daily weekday external driveway trips. Of these, a total of 2,176 weekday morning peak hour and 2,903 weekday afternoon peak hour trips peak hour trips are expected. Calculations were based on the procedure and information provided in the ITE *Trip Generation Manual*, 10th

¹ Institute of Transportation Engineers, *Trip Generation Manual*, Tenth Edition, Washington DC, 2017.

Edition – Volume 1: User's Guide and Handbook, 2017. **Table 1** provides the estimated external trip generation for the Crossroads-Meadowbrook project.

Table 1 – Crossroads-Meadowbrook Project External Traffic Generation

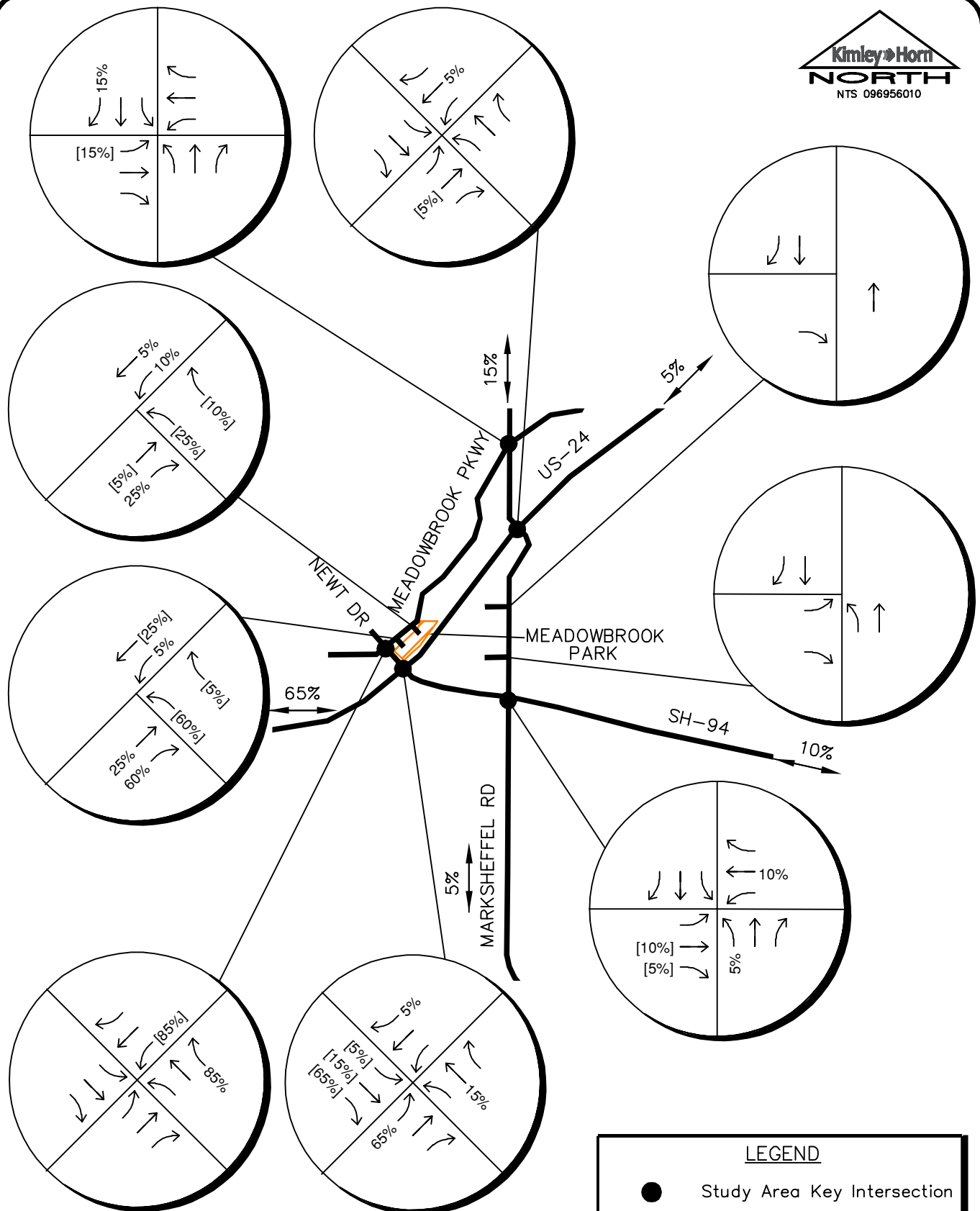
Use and Quantity	Daily	Weekday Vehicles Trips					
		AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Crossroads Mix Use							
Free Standing Discount Store (ITE 815) – 130,000 SF	6,906	152	628	105	47	314	314
Shopping Center (ITE 820) – 44,942 SF	1,696	26	16	42	82	89	171
High-Turnover (Sit-Down) Restaurant (ITE 932) – 10,200 SF	1,146	56	45	101	62	38	100
Fast-Food Restaurant w/ D.T. (ITE 934) – 14,309 SF	6,740	293	282	575	243	224	467
Coffee/Donut Shop w/ D.T. (ITE 937) – 2,400 SF	1,968	109	105	214	53	53	106
Crossroads Mix Use Total	18,456	589	495	1,084	754	718	1,472
Crossroads North							
Public Park (ITE 411) – 18.28 Acres	14	0	0	0	1	1	2
Movie Theater (ITE 444) – 52,000 SF	4,062	5	6	11	302	19	321
Tire Superstore (ITE 849) – 7,200 SF	148	6	4	10	7	8	15
Home Improvement Superstore (ITE 862) – 127,000 SF	3,904	113	86	199	145	151	296
Furniture Store (ITE 890) – 114,000 SF	720	21	9	30	28	31	59
High-Turnover (Sit-Down) Restaurant (ITE 932) – 11,000 SF	1,234	60	49	109	66	41	107
Fast-Food Restaurant w/ D.T. (ITE 934) – 6,600 SF	3,110	135	130	265	112	104	216
Gasoline Station w/ Convenience Market (ITE 960) – 5,000 SF	4,188	208	208	416	173	173	346
Crossroads North Total	17,380	548	492	1,040	834	528	1,362
Meadowbrook Park							
Single-Family Detached Housing (ITE 210) – 70 Dwelling Units	662	13	39	52	44	25	69
Total Site Trip Generation	36,498	1,150	1,026	2,176	1,632	1,271	2,903

4.2 Trip Distribution

Distribution of site traffic on the street system was based on the area street system characteristics, existing traffic patterns, existing and anticipated surrounding demographic information, expected roadway improvements, and the proposed access system for the project. The directional distribution of traffic is a means to quantify the percentage of site-generated traffic that approaches the site from a given direction and departs the site back to the original source. The project trip distribution is illustrated for Meadowbrook Park in **Figure 7**, for Crossroads North in **Figure 8**, and for Crossroads Mix Use in **Figure 9**.

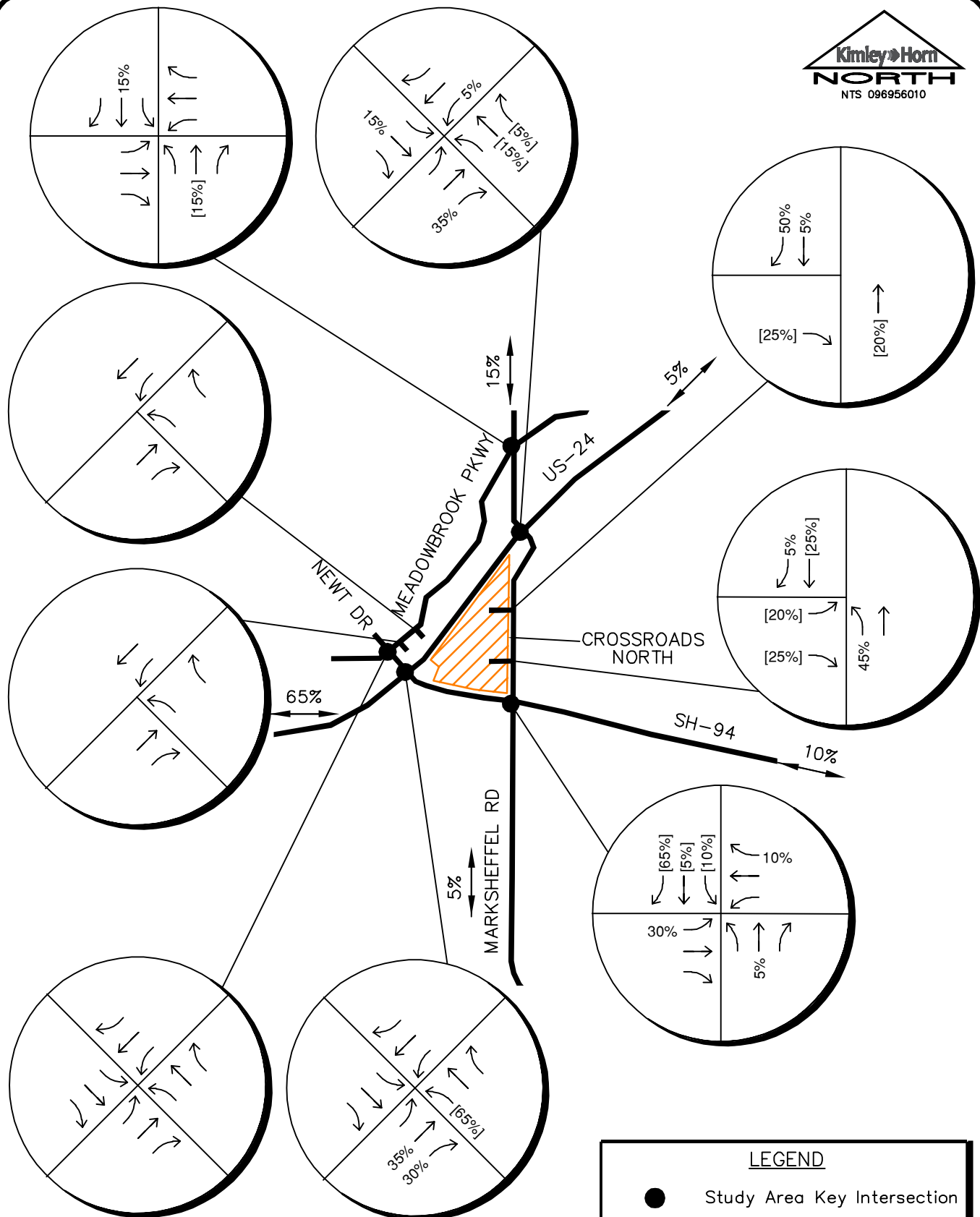
4.3 Traffic Assignment and Total (Background Plus Project) Traffic

Traffic assignment was obtained by applying the project trip distribution of each area to the estimated traffic generation of the associated development shown in the trip generation tables. Project traffic assignment for the Crossroads-Meadowbrook project during the peak hours studied is shown for Meadowbrook Park in **Figure 10**, for Crossroads North in **Figure 11**, and for Crossroads Mix Use in **Figure 12**. The total traffic assignment for all three development areas were summed together as shown in **Figure 13**. Project traffic volumes were added to the background volumes to represent estimated traffic conditions for the short term 2025 horizon and long term 2040 horizon. These background plus project (total) traffic volumes for the project are illustrated for the 2025 and 2040 horizon years in **Figures 14** and **15**, respectively.



CROSSROADS—MEADOWBROOK
 COLORADO SPRINGS, CO
 MEADOWBROOK PARK
 TRIP DISTRIBUTION

FIGURE 7



CROSSROADS-MEADOWBROOK
 COLORADO SPRINGS, CO
 CROSSROADS NORTH
 TRIP DISTRIBUTION

LEGEND

- Study Area Key Intersection
- XX% External Trip Distribution

FIGURE 8

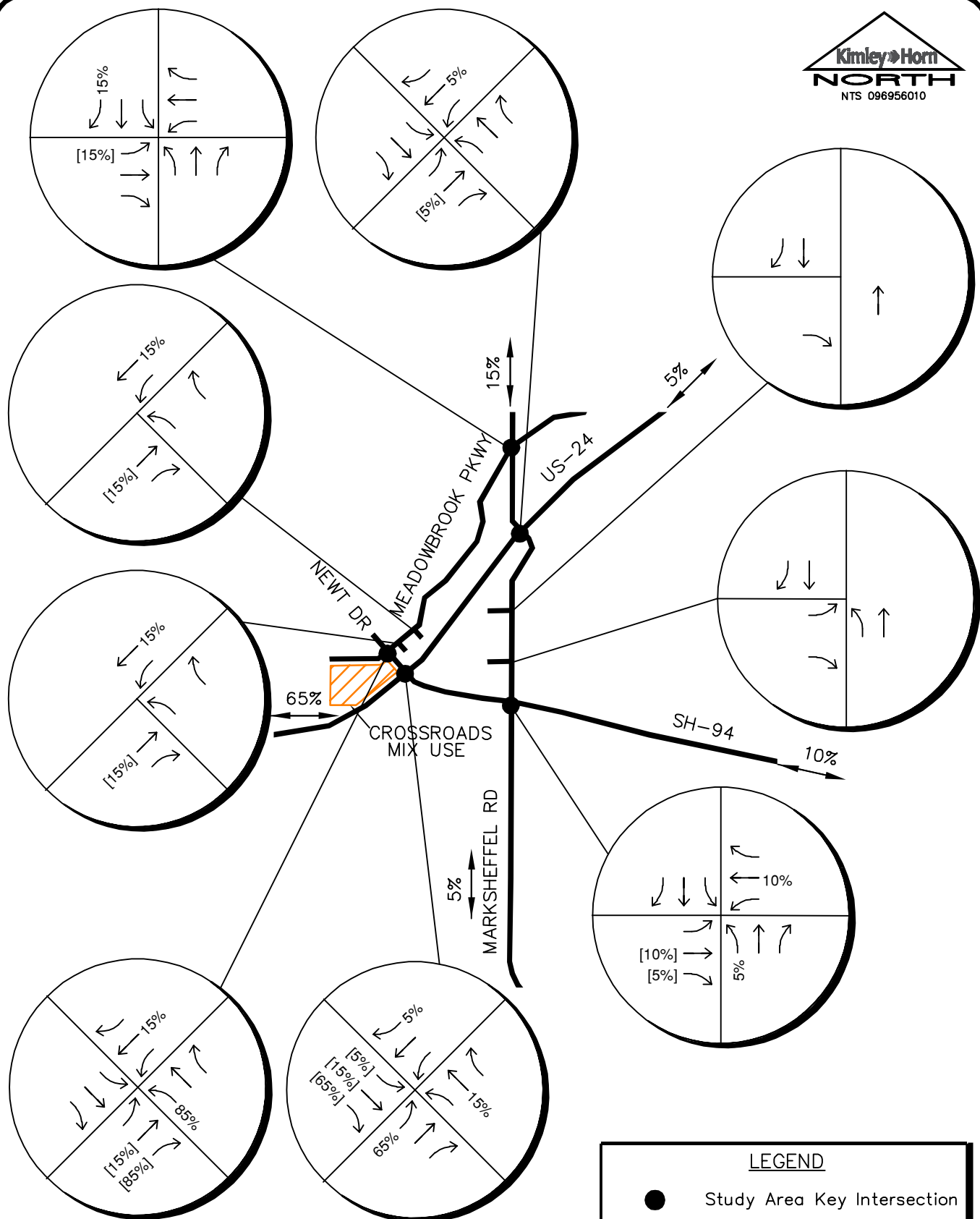
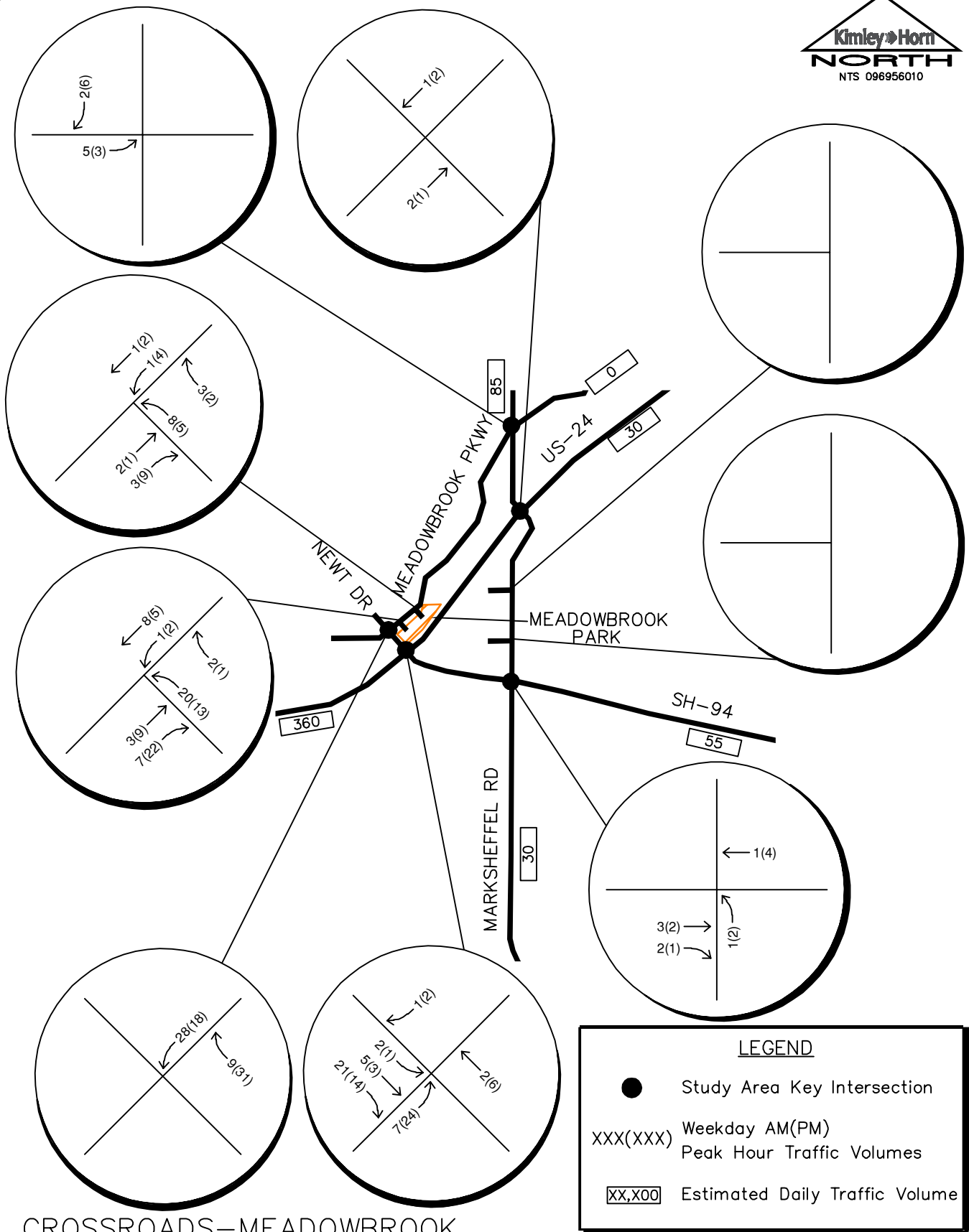
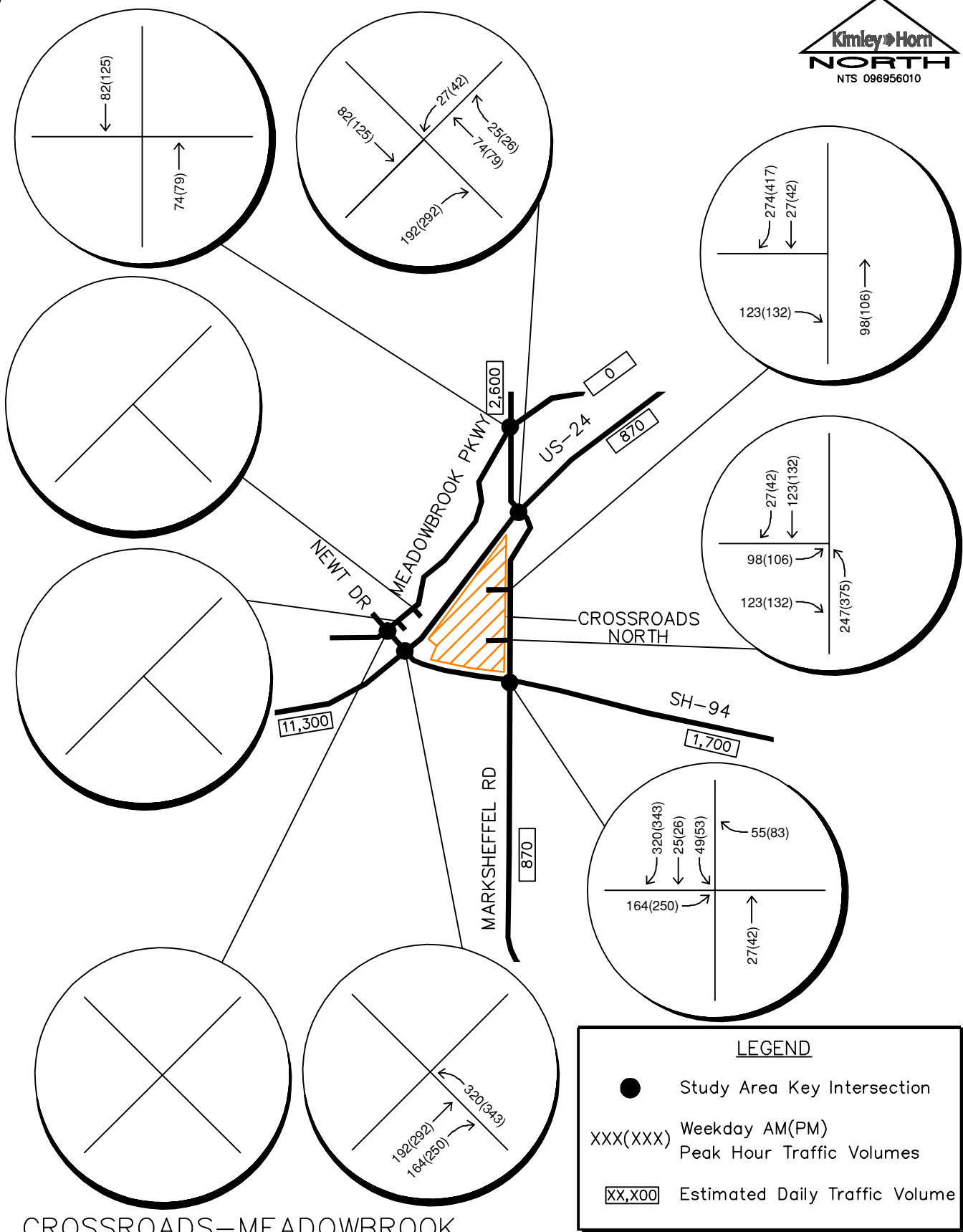


FIGURE 9



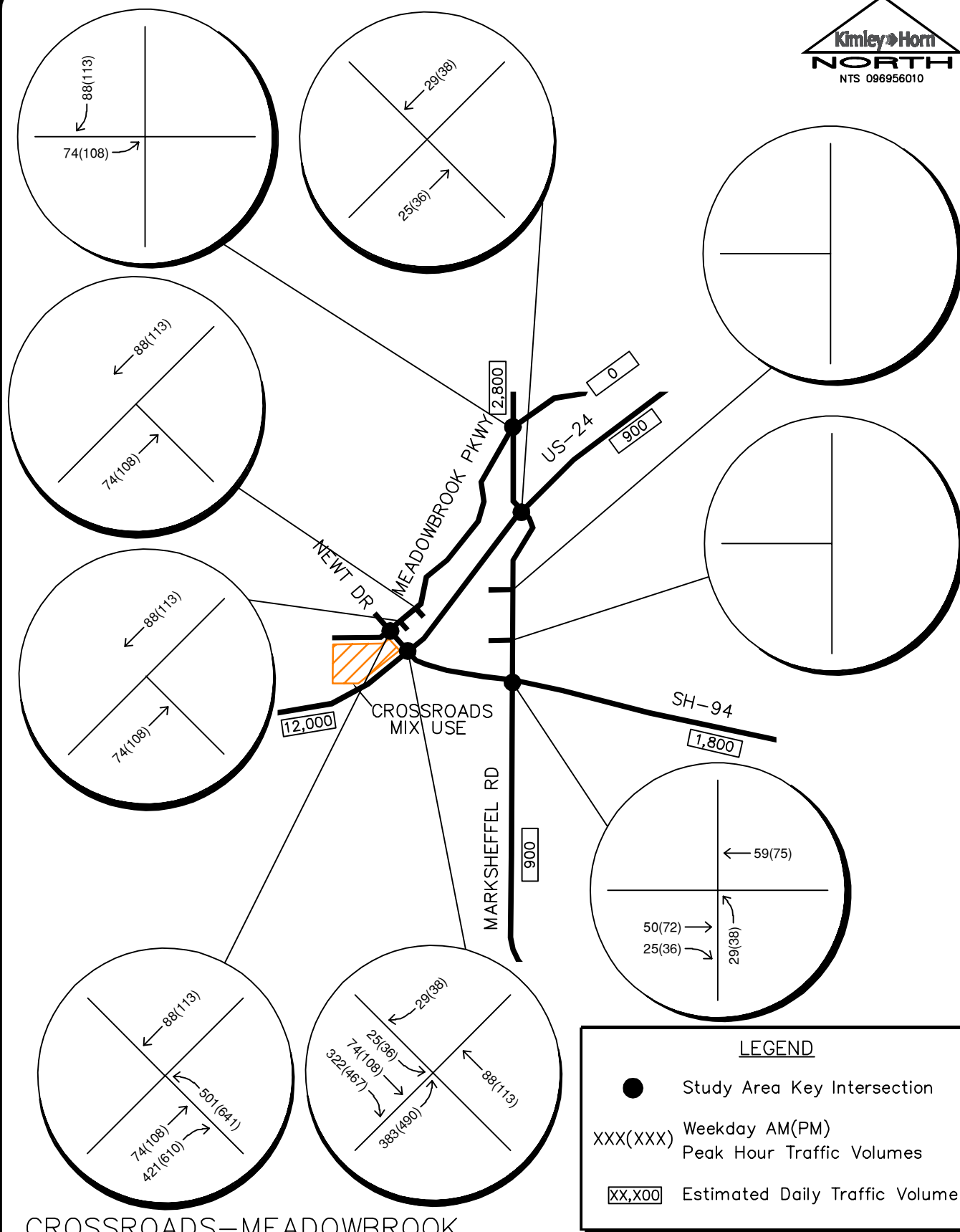
CROSSROADS—MEADOWBROOK
 COLORADO SPRINGS, CO
 MEADOWBROOK PARK
 TRAFFIC ASSIGNMENT

FIGURE 10



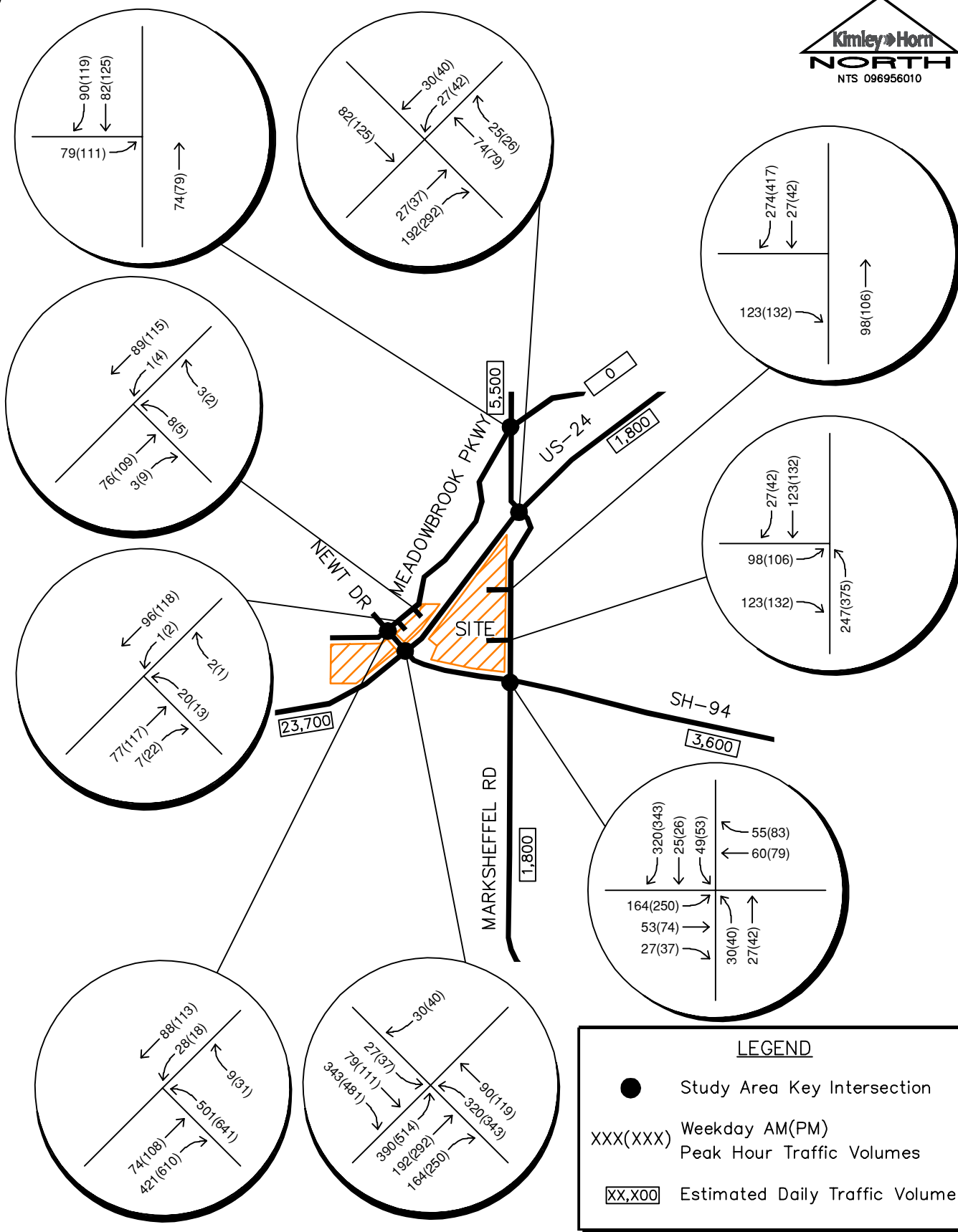
CROSSROADS-MEADOWBROOK
COLORADO SPRINGS, CO
CROSSROADS NORTH
TRAFFIC ASSIGNMENT

FIGURE 11



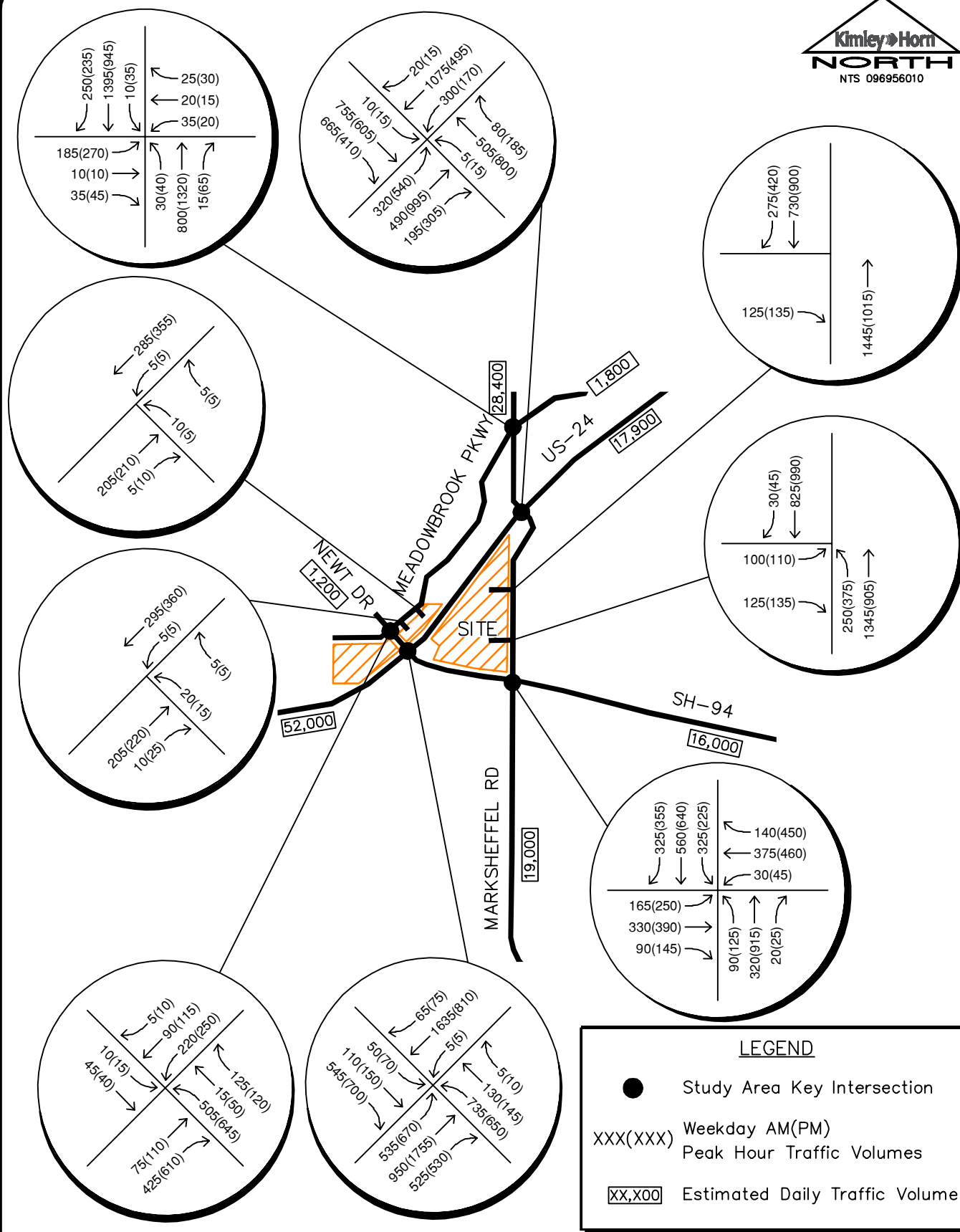
CROSSROADS-MEADOWBROOK
 COLORADO SPRINGS, CO
 CROSSROADS MIX USE
 PROJECT TRAFFIC ASSIGNMENT

FIGURE 12



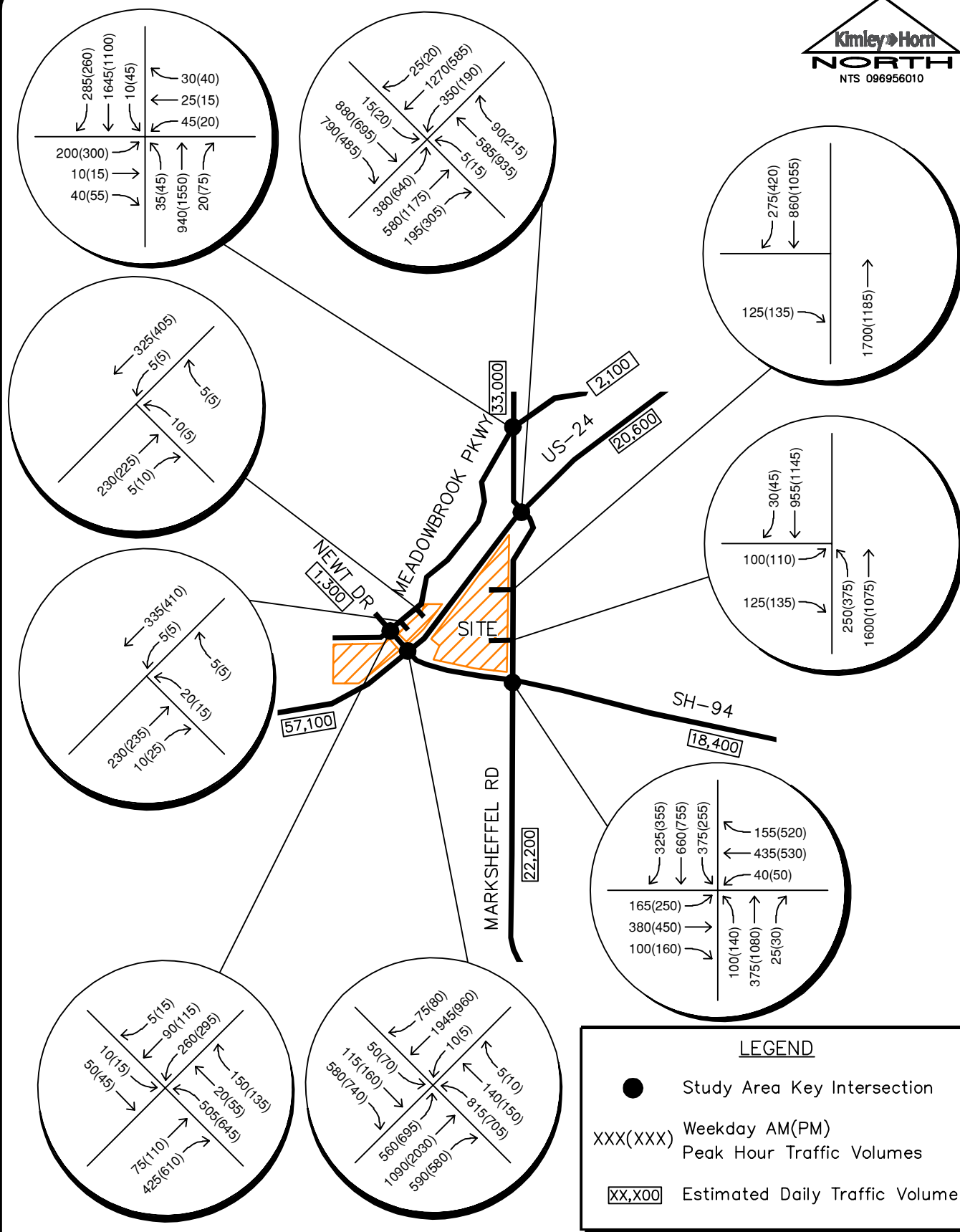
CROSSROADS—MEADOWBROOK
COLORADO SPRINGS, CO
TOTAL PROJECT TRAFFIC ASSIGNMENT

FIGURE 13



CROSSROADS-MEADOWBROOK
COLORADO SPRINGS, CO
2025 TOTAL TRAFFIC VOLUMES

FIGURE 14



CROSSROADS-MEADOWBROOK
COLORADO SPRINGS, CO
2040 TOTAL TRAFFIC VOLUMES

FIGURE 15

5.0 TRAFFIC OPERATIONS ANALYSIS

Kimley-Horn's analysis of traffic operations in the site vicinity was conducted to determine potential capacity deficiencies in the 2025 and 2040 development horizons at the identified key intersections. The acknowledged source for determining overall capacity is the *Highway Capacity Manual*².

5.1 Analysis Methodology

Capacity analysis results are listed in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion). For intersections and roadways in this study area, El Paso County recommends LOS D as the minimum threshold for acceptable operations. **Table 2** shows the definition of level of service for signalized and unsignalized intersections.

Table 2 – Level of Service Definitions

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

Definitions provided from the Highway Capacity Manual, Sixth Edition, Transportation Research Board, 2016.

Study area intersections were analyzed based on average total delay analysis for signalized and unsignalized intersections. Under the unsignalized analysis, the level of service (LOS) for a two-way stop-controlled intersection is determined by the computed or measured control delay and is defined for each minor movement. Level of service for a two-way stop-controlled intersection is not defined for the intersection as a whole. Level of service for a signalized and four-way stop controlled intersection is defined for each approach and for the intersection.

² Transportation Research Board, *Highway Capacity Manual*, Sixth Edition, Washington DC, 2016.

5.2 Key Intersection Operational Analysis

Calculations for the level of service at the key intersections identified for study are provided in **Appendix D**. The existing and background traffic analyses are based on the lane geometry and intersection control shown in **Figure 3**. The signalized intersection analysis utilizes the observed cycle lengths with existing phasing and timing. Based on increased national attention given to appropriate yellow and all-red clearance intervals to improve intersection safety, these have been calculated and are applied for the approaches to the signalized intersections. The increase in the yellow and all red time sacrifices intersection capacity for improved safety. Existing peak hour factors were used for the existing and 2025 background conditions. The standardized peak hour factor of 0.92 was used for 2025 background plus project and 2040 conditions due to the amount of additional project traffic on the street network. Synchro traffic analysis software was used to analyze the study area intersections and access drives for level of service. The Synchro Highway Capacity Manual (HCM) methodology reports were used to analyze intersection delay and level of service.

Meadowbrook Parkway and Marksheffel Road

Meadowbrook Parkway and Marksheffel Road is a four-leg signalized intersection. This intersection currently operates with LOS B during the morning and afternoon peak hours under the existing lane configuration and signal control. With or without the completion of the proposed developments, the intersection is anticipated to operate acceptably with LOS B during both the morning and afternoon peak hours throughout 2040. **Table 3** provides the results of the level of service at this intersection.

Table 3 – Meadowbrook Parkway and Marksheffel Road LOS Results

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
2020 Existing	10.8	B	12.1	B
2025 Background	11.5	B	12.8	B
2025 Background Plus Project	13.2	B	14.8	B
2040 Background	11.9	B	13.3	B
2040 Background Plus Project	14.5	B	16.5	B

Marksheffel Road and US-24

Marksheffel Road and US-24 is a four-leg signalized intersection. Although US-24 is east-west and Marksheffel Road is north-south, the traffic software at this intersection assigned US-24 as north-south. This intersection currently operates with a LOS D during the morning and afternoon peak hours under the existing lane configuration and signal control. With or without the completion of the proposed developments in 2025, the intersection is anticipated to operate acceptably with LOS D during both the morning and afternoon peak hours.

During the morning peak hour in 2040, the intersection may operate with a LOS E with the addition of development project traffic. If future traffic volumes are realized, it is recommended that the eastbound and westbound right turn lanes along US-24 be converted to a shared through/right turn lane. If this occurs, the existing free northbound and southbound right turn movements on the Marksheffel Road approaches will need to be converted to yield control. With these improvements, the intersection is expected to operate with LOS D during both peak hours in the 2040 total condition. **Table 4** provides the results of the level of service at this intersection.

Table 4 – Marksheffel Road and US-24 LOS Results

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
2020 Existing	37.3	D	39.5	D
2025 Background	38.2	D	39.3	D
2025 Background Plus Project	42.4	D	41.9	D
2040 Background	53.5	D	45.0	D
2040 Background Plus Project	61.2	E	52.2	D
2040 Background Plus Project #	43.5	D	43.7	D

Three Through Lanes along US-24 approaches by absorbing existing right turn lanes as through lanes

Newt Drive and Meadowbrook Parkway

The existing intersection of Newt Drive and Meadowbrook Parkway is a three-leg stop-controlled intersection with the east and west legs along Newt Drive providing stop control. This intersection currently operates with all movements at LOS B. In the 2025 background condition the movements at this intersection are anticipated to continue to operate at LOS B. With the completion of the proposed development and specifically the Crossroads Mix Use development area in 2025, a south leg of Meadowbrook Parkway will be constructed. Once this northbound leg is constructed the westbound approach is anticipated to operate at LOS F during both peak hours and the eastbound approach is anticipated to operate at LOS F during the afternoon peak hour. Based on projected traffic volumes, it is recommended that a roundabout with single lane approaches eastbound, northbound and southbound and a shared left turn/through lane with separate right turn lane on westbound Newt Drive be constructed at this intersection in 2025. With the recommended improvements, it is anticipated that the intersection will operate acceptably throughout 2040, with or without the addition of project traffic, with LOS C or better. **Table 5** provides the results of the level of service at this intersection.

Table 5 – Newt Drive and Meadowbrook Parkway LOS Results

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
2020 Existing				
Eastbound Approach	12.5	B	13.7	B
Westbound Approach	12.1	B	13.7	B
2025 Background				
Eastbound Approach	13.3	B	14.6	B
Westbound Approach	12.5	B	14.7	B
2025 Background Plus Project				
Eastbound Approach	25.8	D	58.0	F
Westbound Approach	417.0	F	1007.6	F
Northbound Left	0.0	A	0.0	A
Southbound Left	9.7	A	11.4	B
2025 Background Plus Project #	9.1	A	17.2	C
2040 Background #	4.1	A	4.4	A
2040 Background Plus Project #	9.9	A	20.7	C

Roundabout

SH-94 and US-24

SH-94 and US-24 is a four-leg signalized intersection. Although both highways are east-west, the traffic software at this intersection assigned US-24 as north-south. This intersection currently operates with LOS C during the morning and afternoon peak hours under the existing lane configuration and signal control. With the completion of the proposed development in 2025, the intersection is anticipated to operate poorly during the morning and afternoon peak hours with LOS F. If future project volumes are realized it is recommended that an additional through lane be constructed on the US-24 approaches. The US-24 right turn to eastbound SH-94 is recommended to include a separate right turn lane operating with free movements. The US-24 right turn lane for Newt Drive can be absolved as a shared through/right turn lane. A 150 second cycle length is also needed during the morning peak hour in order to improve operations. It is believed that with these improvements the intersection is at its ultimate configuration. With the ultimate configuration the intersection is anticipated to operate poorly during the morning and afternoon peak hour during the 2040 buildout condition. **Table 6** provides the results of the level of service at this intersection.

Table 6 – SH-94 and US-24 LOS Results

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
2020 Existing	32.4	C	24.0	C
2025 Background	41.0	D	28.6	C
2025 Background Plus Project	183.4	F	121.9	F
2025 Background Plus Project #	70.0	E	48.6	D
2040 Background #	35.1	D	25.3	C
2040 Background Plus Project #	101.4	F	58.5	E

Three northbound through lanes, southbound right turn lane changed to a shared through/right turn lane, eastbound and westbound right turn lane changed from free to yield control. 150 second cycle length for morning peak hour.

SH-94 and Marksheffel Road

The existing intersection of SH-94 and Marksheffel Road is currently a four-leg signalized intersection. This intersection currently operates with LOS C during the morning and afternoon peaks hours with existing traffic volumes and lane configurations. With the completion of the proposed development in 2025 the southbound right turn at this intersection is anticipated to be a free southbound right turn due to CDOT State Highway Access Code guidelines. This intersection is anticipated to operate acceptable with LOS D or better during the 2025 buildout. By 2040 buildout, this intersection operates poorly with LOS E during the afternoon peak hour. For the intersection to operate acceptably during the 2040 buildout, it is recommended to construct dual eastbound left turn lanes with protected only. With this improvement, the intersection is anticipated to operate with LOS D or better in 2040 with project traffic. **Table 7** provides the results of the level of service at this intersection.

Table 7 – SH-94 and Marksheffel Road LOS Results

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
2020 Existing	24.2	C	28.3	C
2025 Background	24.3	C	34.3	C
2025 Background Plus Project #	25.4	C	45.6	D
2040 Background #	22.5	C	30.9	C
2040 Background Plus Project #	44.5	D	74.9	E
2040 Background Plus Project ##	33.8	C	53.2	D

Free southbound right turn

Dual eastbound left turn lanes (protected phasing)

Along with intersection operational analysis roadway link ADT's were analyzed to see if they meet the El Paso County TIS guidelines. It was found that all estimated roadway link ADT's meet the threshold capacities set forth in the El Paso County TIS guidelines with the exception of the segment of US-24 south of SH-94 during the 2040 buildout condition.

5.3 Project Access Operational Analysis

With completion of the Crossroads-Meadowbrook project, the site proposes two project accesses along the west side of Marksheffel Road for the Crossroads North development area and five project accesses along the east side of Meadowbrook Parkway for Meadowbrook Park and Crossroads Mix Use. The north access along Marksheffel Road for Crossroads North is proposed to be restricted to right turn movements only. The south access along Marksheffel Road is proposed to be a full movement signalized access. Four of the five access along Meadowbrook Parkway are proposed to be full movement two-way stop-controlled accesses. The northeastern access along Meadowbrook Parkway for Crossroads Mix Use may be right-in/right-out. The two accesses for Meadowbrook Park to the north of Newt Drive have an existing two-way left turn lane along Meadowbrook Parkway. All project access driveways are recommended to have R1-1 "STOP" signs installed for the exiting approaches, except for the full access along Marksheffel Road which is recommended for signalization.

The north access along Marksheffel Road is proposed as a right-in/right-out driveway. El Paso County uses the CDOT State Highway Access Code for determination of turn lanes. Based on this, a right turn lane is required for any access with a projected peak hour right ingress turning volume of 25 vehicles per hour or greater for principal arterials, therefore it is recommended that a southbound right turn lane be constructed at this intersection due to the volume being 420 vehicles per hour. To identify the restriction of the access to right turn movements only, a R3-2 No Left Turn sign should be placed underneath the STOP sign on the eastbound driveway approach. Due to the absence of a raised median within Marksheffel Road, a raised median island should be incorporated in the throat of this driveway to restrict entering and exiting left turn movements. A R3-2 No Left Turn sign should be placed on the northwest corner of the intersection, visible to northbound drivers along Marksheffel Road to restrict entering left turn movements.

With the recommended lane configurations and two-way stop control, all movements at the project accesses are expected to operate acceptably with LOS D or better during the peak hours in the 2025 and 2040 horizons with exception of the movements at the full movement access along Marksheffel Road which operate at LOS F during the morning and afternoon peak hour. A four-hour vehicle volume signal warrant analysis was performed at this intersection and the 2025 traffic volume projections do warrant signalization. Therefore, it is recommended that

this intersection be signalized with development of Crossroads North. The signal warrant analysis is attached in **Appendix E**. With the improvements at the Full Access along Marksheffel Road the intersection operates acceptably with LOS B or better throughout the 2040 horizon. The operational analysis at the proposed project driveways is summarized in **Table 8** for the short-term 2025 horizon and for the long-term 2040 horizon. Detailed results of the operational analysis are also provided in **Appendix D**.

Table 8 – Project Access LOS Results

Access and Movement	2022 Total Traffic				2040 Total Traffic			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Marksheffel Road & RIRO Access Eastbound Approach	12.7	B	14.5	B	13.9	B	16.4	C
Marksheffel Road & Full Access Eastbound Approach	50.3	F	21.5	C	-	-	-	-
Northbound Left	18.7	C	360.9	F	-	-	-	-
Marksheffel Road & Full Access #	9.4	A	12.0	B	7.3	A	11.3	B
Meadowbrook Parkway & South Access Westbound Approach	11.2	B	11.5	B	11.3	B	11.6	B
Southbound Left	7.7	A	7.8	A	7.7	A	7.8	A
Meadowbrook Parkway & North Access Westbound Approach	10.8	B	10.7	B	10.7	B	10.6	B
Southbound Left	7.7	A	7.7	A	7.7	A	7.7	A

Signalized, free eastbound right turn

5.4 Sight Distance Evaluation

It is recommended that appropriate sight distance triangles be provided at all site access points to give drivers exiting the development areas a clear view of oncoming traffic. Landscaping and objects within sight triangles must not obstruct drivers' views of the adjacent travel lanes. Intersection sight distances for left turn from stop and right turn from stop were analyzed for the proposed project accesses along Marksheffel Road and Meadowbrook Parkway.

With AASHTO standards and a design speed of 55 miles per hour along Marksheffel Road, the intersection sight distance for a vehicle turning left from stop is 610 feet, while the sight distance for a vehicle turning right from stop is 530 feet. Therefore, all obstructions for left turning vehicles from stop should be clear to the right within the triangle created with a vertex point

located 14.5 feet from the edge of the major road traveled way (typical position of the minor road driver's eye when stopped) and a line of sight distance of 555 feet located in the middle of the nearest lane opposite of the center median for both access along Marksheffel Road. Likewise, all obstructions for right turning vehicles from stop should be clear to the left within the triangle created with a vertex point located 14.5 feet from the edge of the major road traveled way and a line of sight distance of 530 feet located in the middle of the nearest lane for both accesses along Marksheffel Road.

Along with the accesses along Marksheffel Road, the accesses along Meadowbrook Parkway were analyzed for sight distance requirements. With AASHTO standards and a design speed of 35 miles per hour along Meadowbrook Parkway, the intersection sight distance for a vehicle turning left from stop is 390 feet, while the sight distance for a vehicle turning right from stop is 335 feet. Therefore, all obstructions for left turning vehicles from stop should be clear to the right within the triangle created with a vertex point located 14.5 feet from the edge of the major road traveled way (typical position of the minor road driver's eye when stopped) and a line of sight distance of 445 feet located in the middle of the nearest lane opposite of the center median for the access along Meadowbrook Parkway. Likewise, all obstructions for right turning vehicles from stop should be clear to the left within the triangle created with a vertex point located 14.5 feet from the edge of the major road traveled way and a line of sight distance of 335 feet located in the middle of the nearest lane for the accesses along Meadowbrook Parkway.

5.5 Bicycle and Pedestrian Access

A bicycle and pedestrian access evaluations were conducted for the Crossroads-Meadowbrook project. This focused on the areas of Meadowbrook Parkway, Marksheffel Road, US-24, and SH-94 adjacent to the site development areas. The following provides a description of the assessment.

Adjacent to the site, Meadowbrook Parkway provides the only sidewalks within the project area along both sides of the street. Pedestrian access is good along Meadowbrook Parkway between Newt Drive and Marksheffel Road with wide sidewalks with minimal gaps and signalized crossings of Marksheffel Road, where a great level of service exists for pedestrians. To the east of Marksheffel Road, Meadowbrook Parkway leads into a neighborhood with no sidewalks on either side of the road. Although the only sidewalks that exist within the study area

are on Meadowbrook Parkway there are very few destinations outside of the ones provided on Meadowbrook Parkway. The only new sidewalks shown on the site plan are along the east side of Meadowbrook Parkway at the Meadowbrook Park development.

Transit within the Colorado Springs area is provided by Mountain Metropolitan Transit. From review of the most recent route map from August 1, 2019 there are currently no transit routes that run through the site area.

5.6 CDOT Access Permit Analysis Need

The threshold for requiring an access permit along CDOT roadways occurs when project traffic is anticipated to increase the existing access traffic volumes by more than 20 percent. Based on traffic projections, the addition of project traffic at the SH-94 and US-24 intersection, along with the project traffic on the north leg of SH-94 and Marksheffel Road is anticipated to increase existing access traffic volumes by more than 20 percent during the peak hour; therefore, it is believed that access permits will be required by CDOT for these approaches in association with this project.

Since US-24 and SH-94 are state owned and maintained facilities, it is recommended that auxiliary turn lanes along US-24 and SH-94 be constructed in accordance with the current CDOT State Highway Access Code (SHAC). CDOT categorizes the segments of US-24 and SH-94 through the study area as E-X: Expressway, Major Bypass. According to the State Highway Access Code for category E-X roadways, the following thresholds apply:

- A left turn deceleration lane and taper with storage length is required for any access with a projected peak hour left ingress turning volume greater than 10 vehicles per hour (vph), a left turn lane with deceleration, storage, and transition taper lengths is required for any access.
- A right turn lane with deceleration and taper lengths is required for any access with a projected peak hour right ingress turning volume greater than 10 vph.
- A right turn lane with acceleration and taper lengths is required for any access with a project peak hour turning volume greater than 10 vph.

Based on traffic projections and the above thresholds, auxiliary turn lane requirements were calculated for SH-94/US-24 intersection and the north leg of the SH-94/Marksheffel Road

intersection. SH-94 provides one lane of travel in each direction and has a posted speed limit of 40 miles per hour at US-24 and 55 miles per hour at Marksheffel Road. US-24 provides two lanes of travel in each direction and has a posted speed limit of 55 miles per hour within the study area. As such, turn lane requirements at the study area intersections along SH-94 and US-24 are as follows:

US-24 and SH-94

- A westbound left turn deceleration lane is warranted along the SH-94 approach to US-24 based on projected 2025 background plus project traffic being 735 westbound left turns during the peak hour and the threshold being 10 vph. Since SH-94 has a category of E-X the left turn lane requirement is deceleration, storage, and taper lengths. There are currently dual westbound left-turn lanes with an average length of 475 and the taper is approximately 300 feet. Based on the 40-mile per hour speed limit, the deceleration lane length is 370 feet plus a 145-foot taper. The storage requirement is 735 feet in two lanes, or 370 feet per lane. Therefore, the existing dual westbound left turn lanes are recommended to be lengthened to 740 feet with a 145 foot taper.
- A northeastbound left turn deceleration lane is warranted along US-24 approach to Newt Drive/SH-94 based on projected 2025 background plus project traffic being 670 left turns during the peak hour. Since US-24 has a category of E-X the left turn lane requirement is deceleration, storage, and taper lengths. Currently the northbound left-turn lane is approximately 900 feet long and the taper is approximately 150 feet. Based on the 55-mile per hour speed limit, the deceleration lane length is 600 feet, plus a 225-foot taper, and 670 feet of storage for a total length of 1,270 feet plus 225-foot taper. However, by 2025 it is recommended that dual northeastbound US-24 left turn lanes be designated at this intersection. Dividing the storage in half results in 935-foot plus 225-foot taper northeastbound dual left turn lanes.
- A northbound right turn deceleration lane is warranted based on projected 2025 background plus project traffic being 530 northbound right turns during the peak hour and the threshold being 10 vph. Since US-24 has a category of E-X the right turn lane requirement is deceleration, and taper lengths. The northbound right turn lane is currently 600 feet with a 225-foot taper, which meets CDOT SHAC standards based on

the 55-mile per hour speed limit. Therefore, no turn lane modifications would be recommended for the northbound right turn lane at this intersection of SH-94 and US-24, but this northeastbound US-24 right turn lane should be maintained and constructed if and when US-24 is converted to three through lanes.

- An eastbound right turn acceleration lane along SH-94 from the northeastbound US-24 right turn **is** warranted based on projected 2025 background plus project traffic being 530 northbound right turns during the peak hour and the threshold being 10 vph. Since US-24 has a category of E-X the right turn lane requirement is acceleration, and taper lengths. The right turn lane currently has a 425-foot acceleration lane with a 350-foot taper. Based on the 40-mile per hour speed limit, the acceleration lane length is 380 feet plus a 145-foot taper. Therefore, the existing northbound right turn acceleration lane meets current CDOT SHAC requirements and no turn lane modifications are anticipated to be needed for this acceleration lane.
- A southwestbound US-24 left turn deceleration lane **is not** warranted based on projected 2040 background plus project traffic being 5 southbound left turns during the peak hour and the threshold being 10 vph.
- A southwestbound US-24 right turn deceleration lane **is** warranted based on projected 2025 background plus project traffic being 75 southbound right turns during the peak hour and the threshold being 10 vph. Since US-24 has a category of E-X the right turn lane requirement is deceleration, and taper lengths. The southbound right turn lane is currently 800 feet long with a 200-foot taper. Based on the 55-mile per hour speed limit, the deceleration lane length is 600 feet plus a 225-foot taper. Therefore, the existing southbound right turn lane meets current CDOT SHAC requirements. Of note, by 2025 this southbound right turn lane may need to be absorbed by the construction of a third southbound through lane.
- A southwestbound acceleration lane along US-24 from the Newt Drive right turn **is** warranted based on projected 2025 background plus project traffic. Since US-24 has a category of E-X and a speed limit of 55 mph the right turn lane requirement is acceleration, and taper lengths. This acceleration lane exists today for a length of 760

feet plus 225-foot taper, which meets current CDOT SHAC requirements. Therefore, no turn lane modifications are recommended for this acceleration lane along southwestbound US-24.

SH-94 and Marksheffel Road

- An eastbound left turn deceleration lane **is** warranted based on projected 2025 background plus project traffic being 250 eastbound left turns during the peak hour and the threshold being 10 vph. Since SH-94 has a category of E-X the left turn lane requirement is deceleration, storage, and taper lengths. Currently the eastbound left-turn lane is approximately 300 feet long and the taper is approximately 125 feet. Based on the 55-mile per hour speed limit, the deceleration lane length is 600 feet, plus a 225-foot taper. It is recommended that this lane be constructed to 850 feet with a 225 foot taper by 2025.
- A westbound right turn deceleration lane **is** warranted based on projected 2025 background plus project traffic being 450 westbound right turns during the peak hour and the threshold being 10 vph. Since SH-94 has a category of E-X the right turn lane requirement is deceleration and taper lengths. The westbound right turn lane is currently 250 feet with a 250-foot taper. Based on the 55-mile per hour speed limit, the deceleration lane length is 600 feet plus a 225-foot taper. Therefore, the existing westbound right turn lane does not meet current CDOT SHAC requirements. It is recommended that this lane be constructed to 600 feet with a 225-foot taper by 2025.
- A westbound acceleration lane along SH-94 from the Marksheffel Road southbound right turn **is** warranted based on projected 2025 background plus project traffic being 450 westbound right turns during the peak hour and the threshold being 10 vph. Since SH-94 has a category of E-X the right turn lane requirement is acceleration, and taper lengths. The right turn lane currently has no acceleration lane. Based on the 50-mile per hour speed limit, a 760-foot acceleration lane with a 225-foot taper is recommended. It is recommended that this acceleration lane be a continuous lane to tie into the outside westbound through lane on the approach to US-24.

5.7 Queuing Analysis

A vehicle queuing analysis was conducted for the study area intersections. The queuing analysis was performed using Synchro presenting the results of the 95th percentile queue lengths. Results are shown in the following **Table 9** with calculations provided within the level of service operational sheets of **Appendix D** for the unsignalized intersections and **Appendix F** for signalized intersections.

Table 9 – Turn Lane Storage Length Analysis Results

Intersection Turn Lane	Existing Turn Lane Length (feet)	2025 Total Queue Length (feet)	2025 Recommended Turn Lane Length (feet)	2040 Total Queue Length (feet)	2040 Recommended Turn Lane Length (feet)
Meadowbrook Pkwy & Marksheffel Rd					
Eastbound Left	150' DL	154' DL	175' DL	168' DL	175' DL
Eastbound Right	150'	10'	150'	20'	150'
Westbound Left	250'	53'	250'	62'	250'
Westbound Right	200'	0'	200'	0'	200'
Northbound Left	425'	24'	425'	24'	425'
Southbound Left	350'	35'	350'	87'	350'
Southbound Right	350'	30'	350'	33'	350'
Marksheffel Rd & US-24					
Marksheffel Eastbound Left	375'	30'	375'	32'	375'
Marksheffel Westbound Left	300'	16'	300'	28'	300'
Marksheffel Westbound Right	375'	0'	375'	0'	375'
US-24 Northbound Left	1000' DL	205' DL	1000' DL	266' DL	1000' DL
US-24 Northbound Right	575'	0'	575'	0' #	C #
US-24 Southbound Left	1000'	322'	1000'	419'	1000'
US-24 Southbound Right	700'	0'	700'	0' #	C #
US-24 & SH-94					
SH-94 Eastbound Left	375' DL	46' DL	375' DL	51' DL	375' DL
SH-94 Westbound Left	475' DL	575' DL	740' (CDOT) DL	695' DL	740' (CDOT) DL
SH-94 Westbound Right	475'	0'	475'	0'	475'
US-24 Northbound Left	900'	428' DL	935' (CDOT) DL	491' DL	935' (CDOT) DL
US-24 Northbound Right	600'	0'	600'	0'	600'
US-24 Southbound Left	800'	10'	800'	15'	800'
US-24 Southbound Right	800'	0' #	C #	0' #	C #
SH-94 & Marksheffel Rd					
Eastbound Left	300'	426'	850' (CDOT)	211' DL	850' CDOT DL
Eastbound Right	250'	18'	250'	41'	250'
Westbound Left	225'	51'	225'	71'	225'
Westbound Right	250'	252'	600' (CDOT)	541'	600' (CDOT)
Northbound Left	375'	101'	375'	103'	375'
Northbound Right	400'	0'	400'	0'	400'
Southbound Left	400'	313'	400'	374'	400'
Southbound Right	400'	0'	C	115'	C
Marksheffel Rd & RIRO Access					
Eastbound Approach	DNE	50'	C	50'	C
Southbound Right	DNE	0'	235'	0'	235'

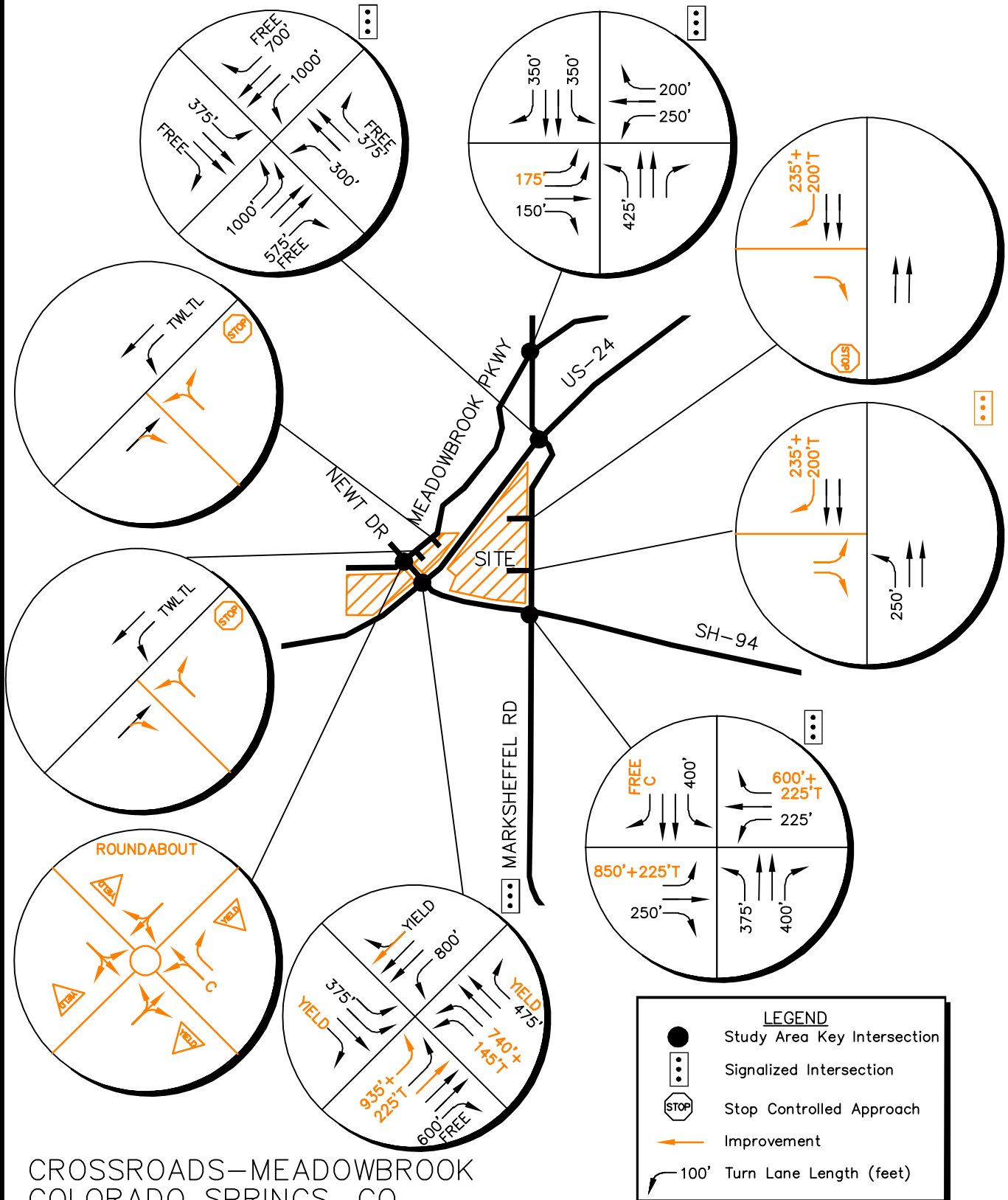
Intersection Turn Lane	Existing Turn Lane Length (feet)	2025 Total Queue Length (feet)	2025 Recommended Turn Lane Length (feet)	2040 Total Queue Length (feet)	2040 Recommended Turn Lane Length (feet)
Marksheffel Rd & Full Access ^					
Eastbound Left	DNE	147'	C	148'	C
Eastbound Right	DNE	0'	C	0'	C
Northbound Left	250'	233'	250'	199'	250'
Southbound Right	DNE	27'	235'	27'	235'
Meadowbrook Pkwy & South Access					
Westbound Approach	DNE	25'	C	25'	C
Southbound Left	TWLTL	25'	TWLTL	25'	TWLTL
Meadowbrook Pkwy & North Access					
Westbound Approach	DNE	25'	C	25'	C
Southbound Left	TWLTL	25'	TWLTL	25'	TWLTL

^ = Signalized, # = Through/Right Turn Lane, DL = Dual Turn Lanes, TWLTL = Two-Way Left Turn Lane, * = Maximum Length, DNE = Does Not Exist, C = Continuous

If future traffic volumes are realized by 2025, the following turn lanes need to be lengthened to accommodate the queues; the eastbound left turn at the intersection of Meadowbrook Parkway and Marksheffel Road needs to be lengthened to 175 feet, the westbound left turn lanes at the intersection of US-24 and SH-94 needs to be lengthened to 740 feet with a 145 foot taper, and the eastbound left turn and westbound right turn lane at the intersection of SH-94 and Marksheffel Road need to be lengthened to 850 feet with a 225 foot taper and 600 feet with a 225 foot taper, respectively per CDOT SHAC requirements.

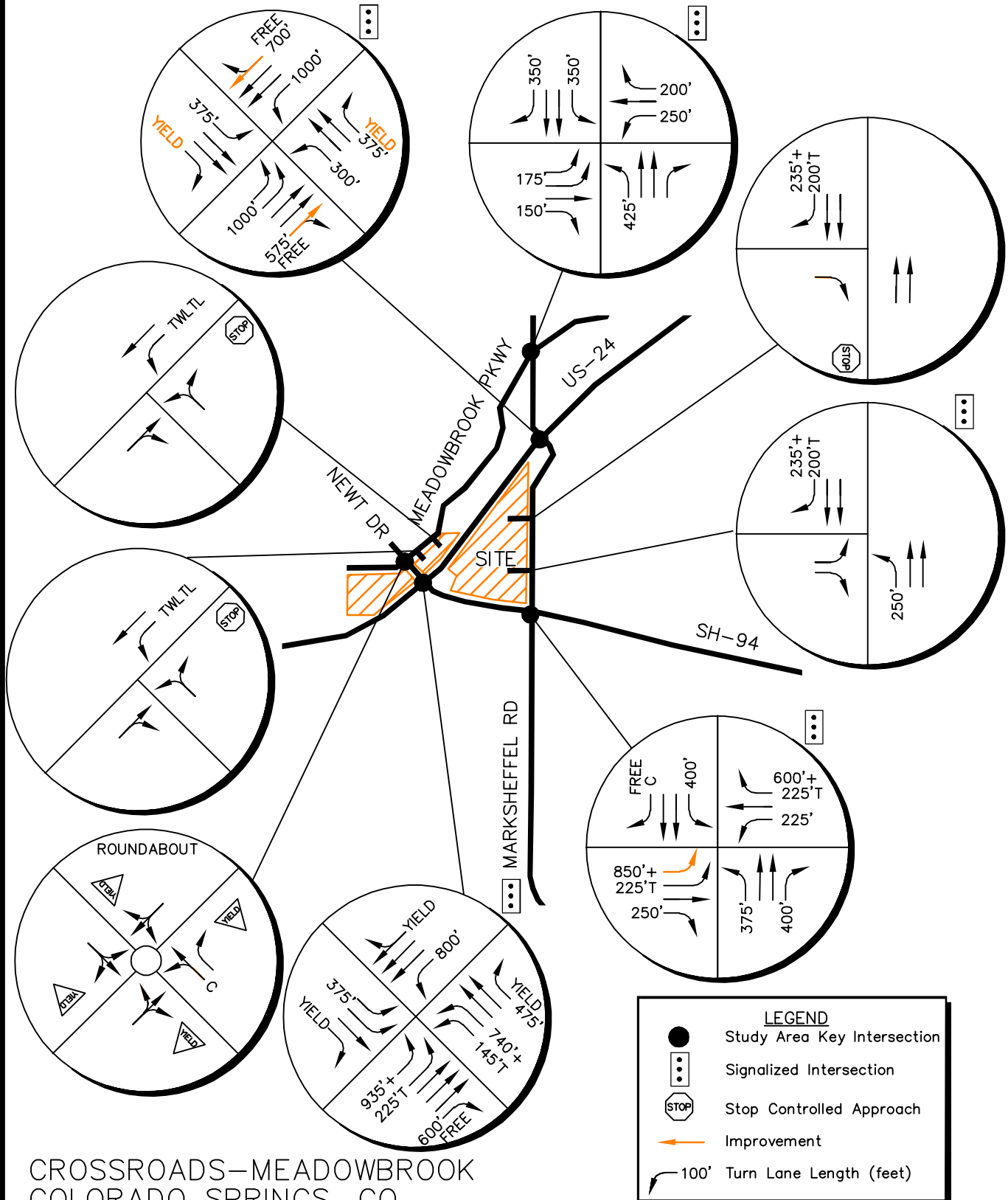
5.8 Intersection Improvement Summary

Based on the results of the level of service operational and turn lane analysis for Crossroads-Meadowbrook, the recommended lane configurations and control of the study area intersections for the 2025 short term build out horizon as well as the 2040 long-term twenty-year horizon are shown in **Figures 16** and **17**, respectively. Likewise, a recommended improvements summary table is provided in **Table 10**. The recommended improvements identified in the table shows all geometry, control, and storage lane improvements along with the project participation percentage and development area associated with that recommended improvement.



CROSSROADS—MEADOWBROOK
COLORADO SPRINGS, CO
2025 RECOMMENDED
LANE CONFIGURATIONS AND CONTROL

FIGURE 16



CROSSROADS—MEADOWBROOK
COLORADO SPRINGS, CO
2040 RECOMMENDED
LANE CONFIGURATIONS AND CONTROL

FIGURE 17

Table 10 - Intersection Improvement Summary

Intersection	Improvements	Project Participation Percentage	Associated Development Area
Meadowbrook Parkway and Marksheffel Road	Extend the eastbound left turn lane to 175 feet	AM Peak $\frac{79}{185}$ 41.1%	Crossroads Mix Use
Newt Drive and Meadowbrook Parkway	Roundabout Control	PM Peak $\frac{1521}{1965}$ 77.4%	Crossroads Mix Use
SH-94 and US-24	Three Northbound Through Lanes with Separate Free Northbound Right Turn Lane	PM Peak $\frac{292}{1,755}$ 16.6%	Background Growth & Crossroads North
	Three Southbound Through Lanes	PM Peak $\frac{0}{810}$ 0.0%	Background Growth
	Construct 935-foot with 225-foot taper Northeastbound dual left turn lanes along US-24	PM Peak $\frac{514}{670}$ 76.4%	Crossroads Mix Use
	Extend the 475-foot Westbound Dual left turn lanes along SH-94 to 740 feet with a 145-foot taper	PM Peak $\frac{343}{650}$ 52.7%	Crossroads North
SH-94 and Marksheffel Road	Extend the 300-foot eastbound left turn lane to 850 feet with a 225-foot taper	PM Peak $\frac{250}{250}$ 100%	Crossroads North
	Extend the 250-foot westbound right turn lane to 600 feet with a 225-foot taper	PM Peak $\frac{83}{450}$ 18.4%	Crossroads North
	Construct Acceleration Lane along Westbound SH-94 from SB Right Turn at Marksheffel Road (free rights)	PM Peak $\frac{343}{355}$ 96.6%	Crossroads North
Marksheffel Road and Full Access	Signalized Control and 250-foot Northbound Left Turn Lane	100%	Crossroads North
Meadowbrook Parkway	Three-Lane Roadway West of Newt Drive	100%	Crossroads Mix Use

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis presented in this report, Kimley-Horn believes the proposed Crossroads-Meadowbrook project areas will be successfully incorporated into the existing and future roadway network. The proposed project development and expected traffic volumes resulted in the following recommendations/conclusions:

2025 Recommendations:

- A CDOT Access Permit will be required for the Newt Drive north leg of the US-24 intersection in association with the Crossroads Mix Use development. Likewise, CDOT Access Permits will be required for the south leg of SH-94 at US-24 and north leg of Marksheffel Road at SH-94 in association with the Crossroads North development.
- It is recommended that a single lane roundabout be constructed at the Meadowbrook Parkway and New Drive intersection with development of the Crossroads Mix Use project. It is recommended that the roundabout have single lane approaches on the eastbound Newt Drive, northbound Meadowbrook Parkway, and southbound Meadowbrook Parkway approaches and a two-lane approach on westbound Newt Drive with a shared left turn/through lane into the roundabout and a separate right turn lane.
- The intersection of SH-94 and US-24 is projected to operate poorly in 2025 with the existing intersection configuration. Therefore, US-24 may need to provide three through lanes in each direction through this intersection. It is recommended that a third northeastbound through lane along US-24 be designated while constructing a separate 600-foot plus 225-foot taper right turn lane to maintain free right turn movements to eastbound SH-94. The third southwestbound through lane along US-24 can be designated by absorbing the existing right turn lane. The six-lane section of US-24 can occur between the Peterson Road interchange to the west and transition back to a four-lane roadway east of SH-94. In addition to these improvements, it is recommended that 935-foot plus 225-foot taper dual left turn lanes be provided on northeastbound US-24 for the turn to Newt Drive. The area for these dual lefts is presently mostly available; however, the lane is striped out which will require restriping and a slight extension may

also need to be constructed. A traffic signal modification will be required at the intersection to incorporate these improvements.

- At the full movement access intersection for Crossroads North along Marksheffel Road, a traffic signal is anticipated to be warranted and needed. Therefore, a traffic signal is recommended for installation at this intersection with development of Crossroads North. A 250-foot with 100-foot taper northbound left turn lane is recommended to be designated along Marksheffel Road at this access intersection. It is also recommended that a 235-foot with 200-foot taper (based on El Paso County standards for 50 mph) southbound right turn lane be constructed at this access intersection along Marksheffel Road due to the volume of traffic entering Crossroads North at this access.
- The northern right-in/right-out access for Crossroads North and all other project access driveways for Meadowbrook Park and Crossroads Mix Use are recommended to be two-way stop-controlled with R1-1 “STOP” signs installed for the exiting approaches.
- The north access along Marksheffel Road for Crossroads North is proposed as a right-in/right-out driveway. To identify the restriction of the access to right turn movements only, a R3-2 No Left Turn sign should be placed underneath the STOP sign on the eastbound driveway approach. Due to the absence of a raised median within Marksheffel Road, a raised median island should be incorporated in the throat of this driveway to further restrict entering and exiting left turn movements. A R3-2 No Left Turn sign should be placed on the northwest corner of the intersection, visible to northbound drivers along Marksheffel Road to restrict entering left turn movements. It is also recommended that a 235-foot with 200-foot taper southbound right turn lane be constructed at this access intersection along Marksheffel Road based on the 50 mph posted speed limit.
- From the CDOT SHAC analysis it was found that a westbound acceleration lane is needed from the southbound right turn at the intersection of SH-94 and Marksheffel Road in association with the Crossroads North project. It is recommended that the acceleration lane be constructed as a continuous lane to tie into the outside through lane on the westbound approach to US-24.

- It is recommended that the following turn lanes be lengthened to CDOT standards and accommodate future projected queue lengths; the 150-foot eastbound left turn at the intersection of Meadowbrook Parkway and Marksheffel Road needs to be lengthened to 175 feet (in association with Crossroads Mix Use), the 475-foot westbound SH-94 dual left turn lanes at the intersection of US-24 and SH-94 need to be lengthened to 740 feet with a 145 foot taper (in association with Crossroads North), and the 300-foot eastbound left turn lane and the 250-foot westbound right turn lane at the intersection of SH-94 and Marksheffel Road need to be lengthened to 850 feet with a 225 foot taper and 600 feet with a 225 foot taper, respectively (in association with Crossroads North).
- Meadowbrook Parkway will be extended along Crossroads Mix Use development project area in association with that project. It is recommended that this roadway be designated as a three-lane roadway with a center two-way left turn lane.

2040 Recommendations:

- If future traffic volume projections are realized, US-24 may need to provide three through lanes in each direction through the Marksheffel Road intersection. If and when this occurs, it is believed that the existing separate eastbound and westbound US-24 right turn lanes could be converted to shared through/right turn lanes.
- At the SH-94 and Marksheffel Road intersection, dual eastbound left turn lanes operating with protected only phasing may be needed to provide acceptable operations.

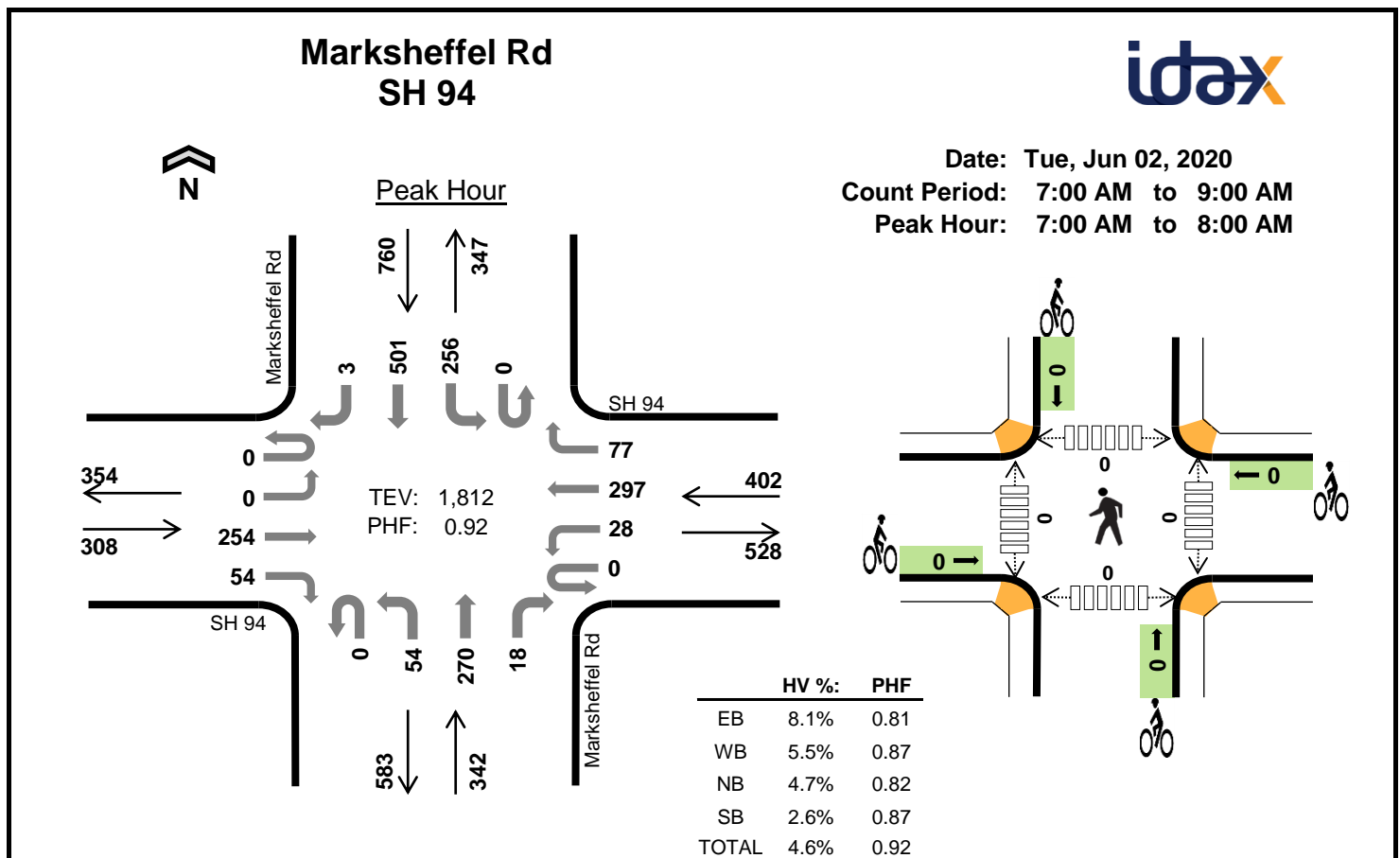
General Recommendations:

- Any on-site and off-site roadway, signing, striping, and signal improvements should be incorporated into the Civil Drawings, and conform to El Paso County and/or CDOT standards as applicable, as well as the Manual on Uniform Traffic Control Devices – 2009 Edition (MUTCD).

APPENDICES

APPENDIX A

Intersection Count Sheets

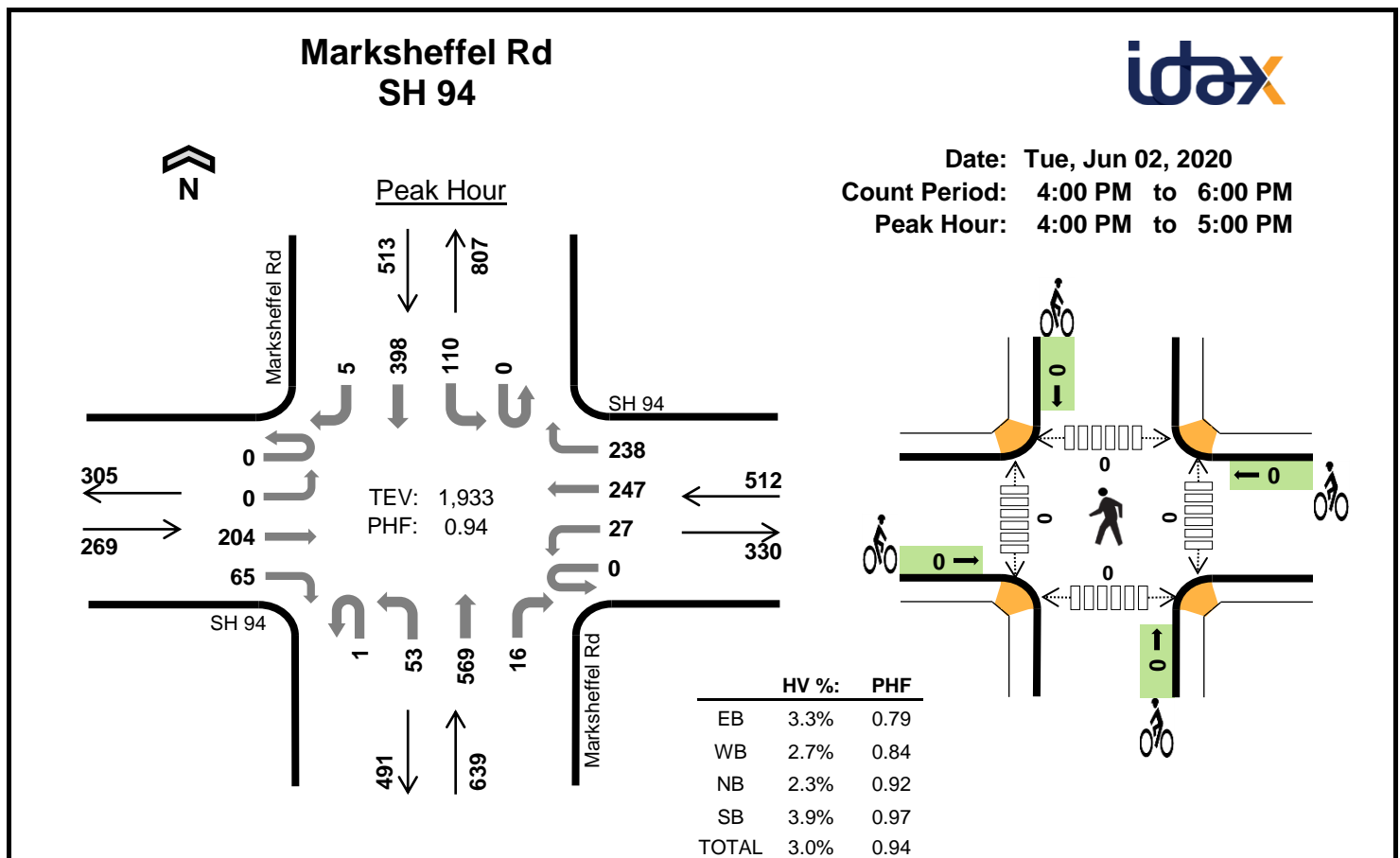


Two-Hour Count Summaries

Interval Start	SH 94				SH 94				Marksheffel Rd				Marksheffel Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	57	8	0	2	73	22	0	11	71	7	0	79	110	0	440	0
7:15 AM	0	0	79	16	0	7	87	21	0	10	51	3	0	74	143	1	492	0
7:30 AM	0	0	61	21	0	8	69	13	0	24	76	4	0	67	133	1	477	0
7:45 AM	0	0	57	9	0	11	68	21	0	9	72	4	0	36	115	1	403	1,812
8:00 AM	0	4	39	14	0	2	43	12	0	10	50	2	0	47	115	1	339	1,711
8:15 AM	0	0	61	11	0	2	49	21	0	8	59	2	0	32	89	0	334	1,553
8:30 AM	0	1	50	15	0	6	67	25	0	9	52	4	0	32	85	1	347	1,423
8:45 AM	0	0	36	14	0	4	44	17	0	14	49	1	0	21	85	2	287	1,307
Count Total	0	5	440	108	0	42	500	152	0	95	480	27	0	388	875	7	3,119	0
Peak Hour	0	0	254	54	0	28	297	77	0	54	270	18	0	256	501	3	1,812	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

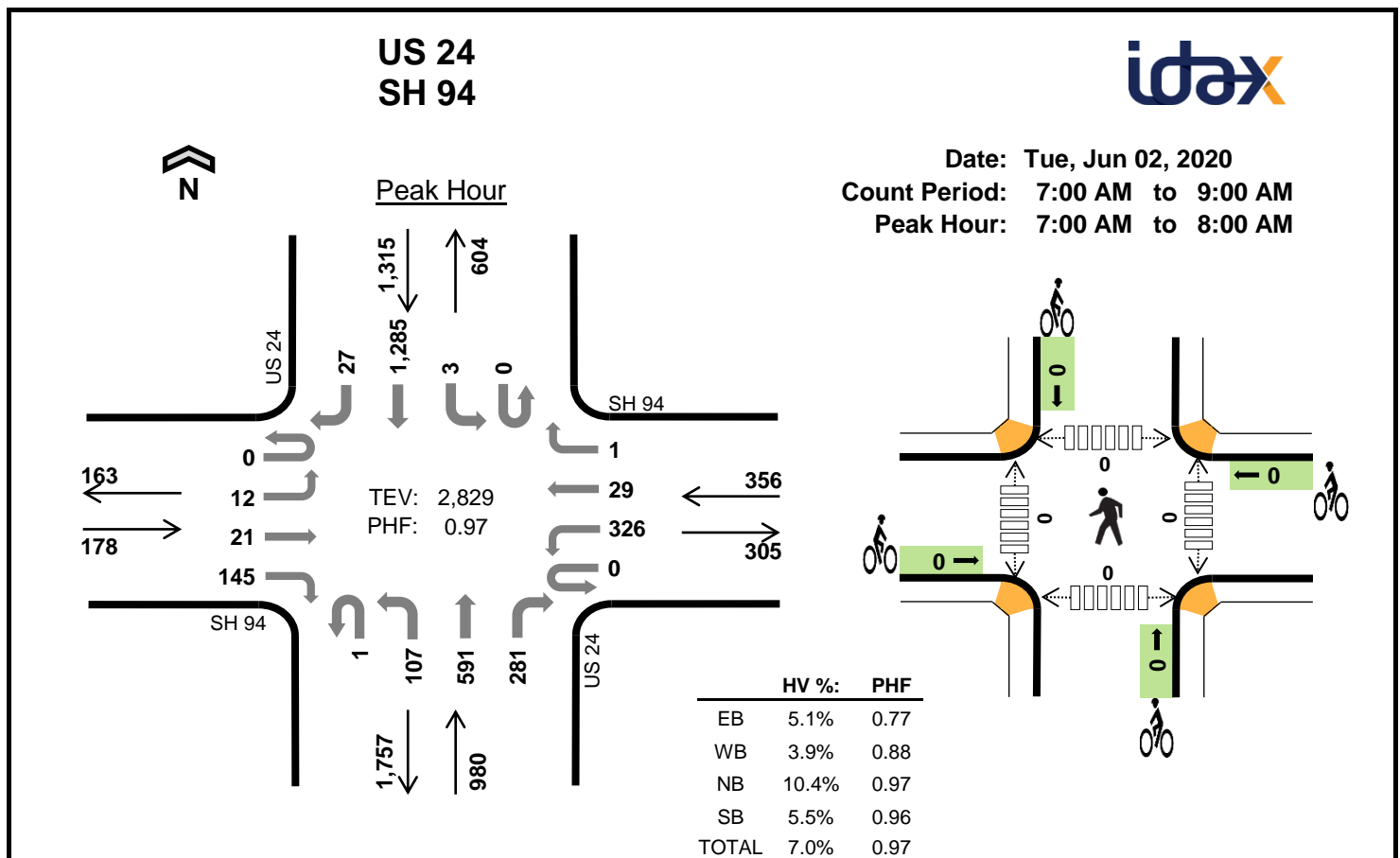
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	4	2	5	5	16	0	0	0	0	0	0	0	0	0	0
7:15 AM	6	4	4	4	18	0	0	0	0	0	0	0	0	0	0
7:30 AM	9	6	4	8	27	0	0	0	0	0	0	0	0	0	0
7:45 AM	6	10	3	3	22	0	0	0	0	0	0	0	0	0	0
8:00 AM	3	7	2	9	21	0	0	0	0	0	0	0	0	0	0
8:15 AM	10	5	2	4	21	0	0	0	0	0	0	0	0	0	0
8:30 AM	8	5	8	7	28	0	0	0	0	0	0	0	0	0	0
8:45 AM	8	6	1	5	20	0	0	0	0	0	0	0	0	0	0
Count Total	54	45	29	45	173	0	0	0	0	0	0	0	0	0	0
Peak Hour	25	22	16	20	83	0	0	0	0	0	0	0	0	0	0

**Two-Hour Count Summaries**

Interval Start	SH 94				SH 94				Marksheffel Rd				Marksheffel Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	58	27	0	7	63	49	0	14	140	2	0	24	94	1	479	0
4:15 PM	0	0	57	15	0	10	65	78	1	10	142	6	0	28	102	1	515	0
4:30 PM	0	0	42	13	0	6	47	62	0	12	159	2	0	25	105	1	474	0
4:45 PM	0	0	47	10	0	4	72	49	0	17	128	6	0	33	97	2	465	1,933
5:00 PM	1	1	72	14	0	5	52	48	0	8	107	2	0	20	84	2	416	1,870
5:15 PM	1	0	73	13	0	5	37	44	0	18	112	3	0	29	110	0	445	1,800
5:30 PM	0	0	69	19	0	1	40	31	0	12	75	3	0	28	115	0	393	1,719
5:45 PM	0	0	47	21	0	0	32	31	0	7	122	2	0	28	110	0	400	1,654
Count Total	2	1	465	132	0	38	408	392	1	98	985	26	0	215	817	7	3,587	0
Peak Hour	0	0	204	65	0	27	247	238	1	53	569	16	0	110	398	5	1,933	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	1	5	4	7	17	0	0	0	0	0	0	0	0	0	0
4:15 PM	2	3	4	4	13	0	0	0	0	0	0	0	0	0	0
4:30 PM	2	4	5	8	19	0	0	0	0	0	0	0	0	0	0
4:45 PM	4	2	2	1	9	0	0	0	0	0	0	0	0	0	0
5:00 PM	1	2	2	4	9	0	0	0	0	0	0	0	0	0	0
5:15 PM	2	1	3	2	8	0	0	1	0	1	0	0	0	0	0
5:30 PM	3	0	2	1	6	0	0	0	0	0	0	0	0	0	0
5:45 PM	1	1	3	4	9	0	0	0	0	0	0	0	0	0	0
Count Total	16	18	25	31	90	0	0	1	0	1	0	0	0	0	0
Peak Hour	9	14	15	20	58	0	0	0	0	0	0	0	0	0	0

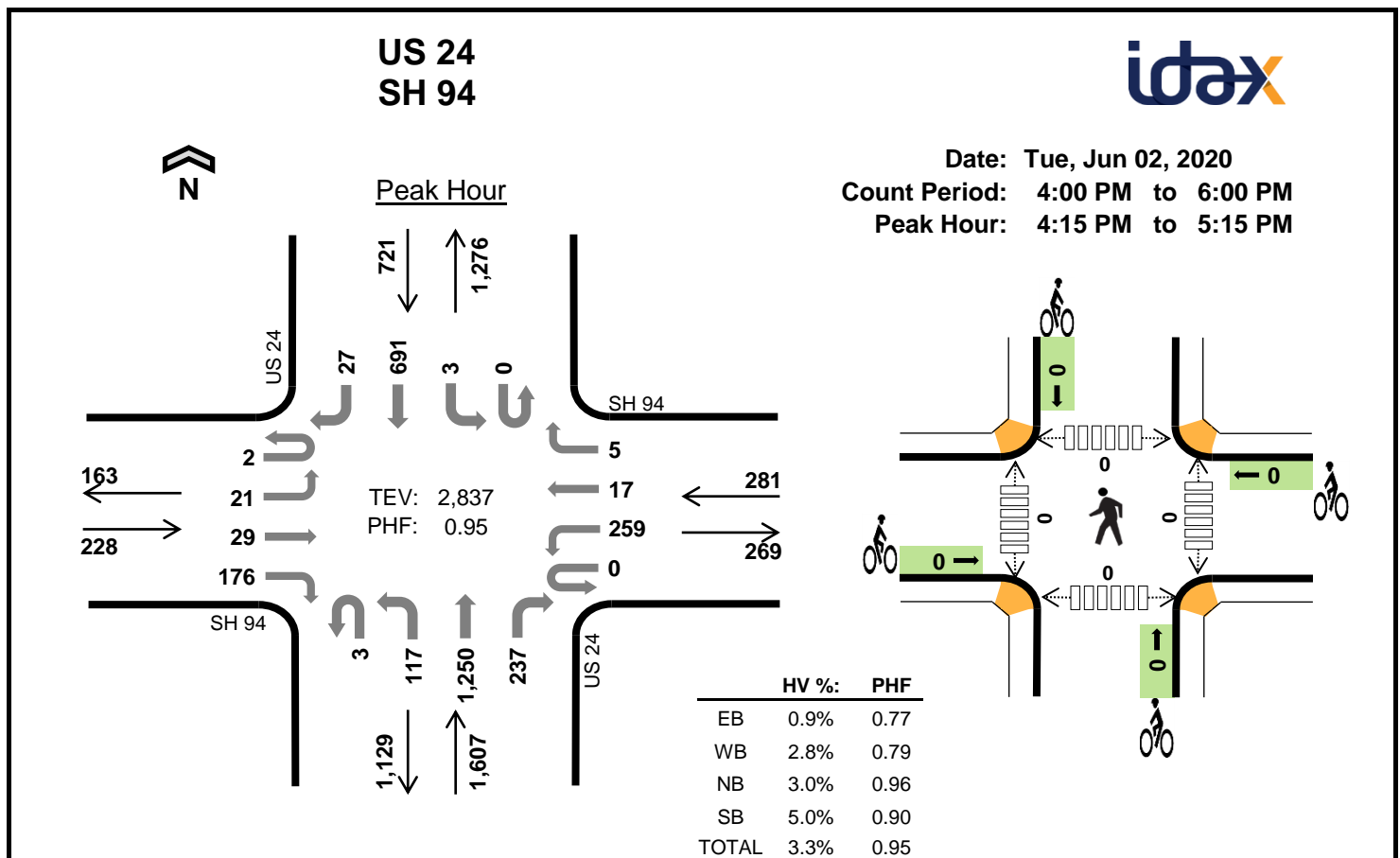


Two-Hour Count Summaries

Interval Start	SH 94				SH 94				US 24				US 24				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	6	45	0	81	10	0	0	27	147	65	0	1	319	7	709	0
7:15 AM	0	6	7	21	0	90	10	1	0	25	145	79	0	0	336	8	728	0
7:30 AM	0	5	6	47	0	85	5	0	0	20	152	80	0	0	310	6	716	0
7:45 AM	0	0	2	32	0	70	4	0	1	35	147	57	0	2	320	6	676	2,829
8:00 AM	0	4	4	25	0	51	7	1	0	28	120	54	0	3	230	5	532	2,652
8:15 AM	0	4	4	34	0	51	6	0	1	17	107	64	0	1	207	10	506	2,430
8:30 AM	0	1	4	26	0	66	2	0	0	25	128	55	0	0	223	4	534	2,248
8:45 AM	0	3	7	29	0	48	6	1	1	23	131	44	0	1	197	9	500	2,072
Count Total	0	24	40	259	0	542	50	3	3	200	1,077	498	0	8	2,142	55	4,901	0
Peak Hour	0	12	21	145	0	326	29	1	1	107	591	281	0	3	1,285	27	2,829	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	4	1	19	20	44	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	5	27	16	48	0	0	0	0	0	0	0	0	0	0
7:30 AM	4	3	31	15	53	0	0	0	0	0	0	0	0	0	0
7:45 AM	1	5	25	21	52	0	0	0	0	0	0	0	0	0	0
8:00 AM	1	8	20	15	44	0	0	0	0	0	0	0	0	0	0
8:15 AM	3	2	24	9	38	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	7	27	13	47	0	0	0	0	0	0	0	0	0	0
8:45 AM	2	5	15	18	40	0	0	0	0	0	0	0	0	0	0
Count Total	15	36	188	127	366	0	0	0	0	0	0	0	0	0	0
Peak Hour	9	14	102	72	197	0	0	0	0	0	0	0	0	0	0



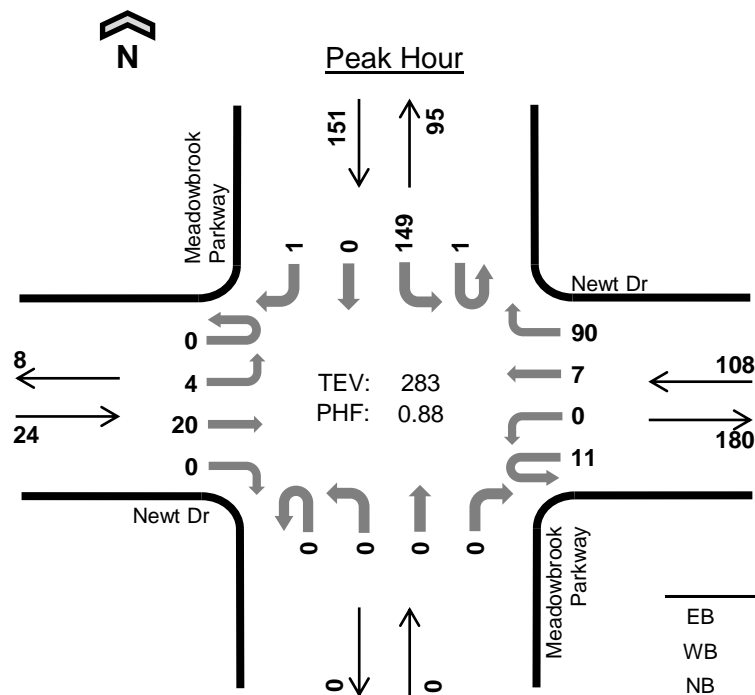
Two-Hour Count Summaries

Interval Start	SH 94				SH 94				US 24				US 24				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	5	4	32	0	73	7	0	1	31	284	80	1	2	177	7	704	0
4:15 PM	0	5	4	45	0	51	2	2	1	30	327	62	0	3	153	7	692	0
4:30 PM	0	4	13	33	0	66	7	0	1	29	300	46	0	0	194	7	700	0
4:45 PM	0	9	1	40	0	83	5	1	0	31	307	53	0	0	158	7	695	2,791
5:00 PM	2	3	11	58	0	59	3	2	1	27	316	76	0	0	186	6	750	2,837
5:15 PM	0	8	7	36	0	49	8	0	0	19	299	80	0	0	170	8	684	2,829
5:30 PM	0	5	4	29	0	44	7	1	0	19	267	85	0	0	183	4	648	2,777
5:45 PM	0	3	8	24	0	38	4	1	0	12	252	62	0	0	142	10	556	2,638
Count Total	2	42	52	297	0	463	43	7	4	198	2,352	544	1	5	1,363	56	5,429	0
Peak Hour	2	21	29	176	0	259	17	5	3	117	1,250	237	0	3	691	27	2,837	0

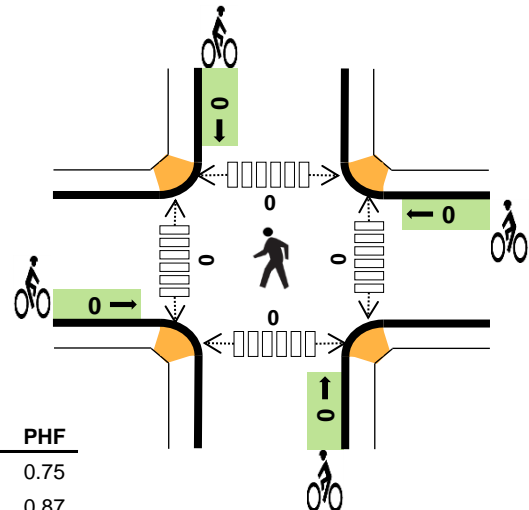
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	4	16	12	32	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	3	11	12	26	0	0	0	0	0	0	0	0	0	0
4:30 PM	1	1	20	12	34	0	0	0	0	0	0	0	0	0	0
4:45 PM	1	1	14	5	21	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	3	4	7	14	0	0	0	0	0	0	0	0	0	0
5:15 PM	1	2	10	6	19	0	0	0	0	0	0	0	0	0	0
5:30 PM	2	1	7	11	21	0	0	0	0	0	0	0	0	0	0
5:45 PM	1	2	3	7	13	0	0	0	0	0	0	0	0	0	0
Count Total	6	17	85	72	180	0	0	0	0	0	0	0	0	0	0
Peak Hour	2	8	49	36	95	0	0	0	0	0	0	0	0	0	0

Meadowbrook Parkway Newt Dr



Date: Tue, Jun 02, 2020
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:00 AM to 8:00 AM



	HV %:	PHF
EB	0.0%	0.75
WB	1.9%	0.87
NB	-	-
SB	6.0%	0.74
TOTAL	3.9%	0.88

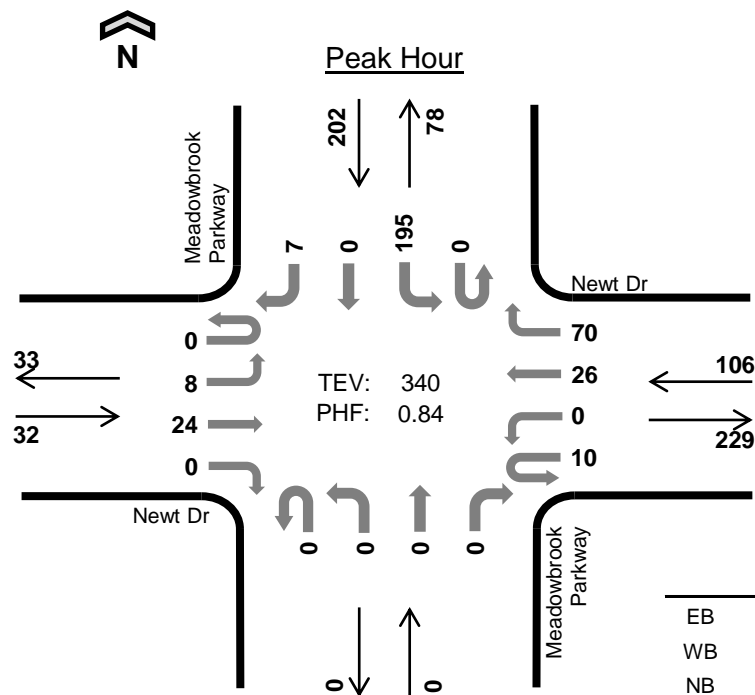
Two-Hour Count Summaries

Interval Start	Newt Dr				Newt Dr				Meadowbrook Parkway				Meadowbrook Parkway				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	3	5	0	4	0	1	21	0	0	0	0	0	41	0	1	76	0
7:15 AM	0	0	5	0	4	0	0	22	0	0	0	0	1	31	0	0	63	0
7:30 AM	0	1	3	0	2	0	4	19	0	0	0	0	0	51	0	0	80	0
7:45 AM	0	0	7	0	1	0	2	28	0	0	0	0	0	26	0	0	64	283
8:00 AM	0	4	2	0	4	0	3	24	0	0	0	0	0	32	0	0	69	276
8:15 AM	0	0	4	0	0	0	3	11	0	0	0	0	0	34	0	0	52	265
8:30 AM	0	0	4	0	4	0	2	18	0	0	0	0	0	25	0	0	53	238
8:45 AM	0	1	5	0	4	0	2	17	0	0	0	0	0	30	0	0	59	233
Count Total	0	9	35	0	23	0	17	160	0	0	0	0	1	270	0	1	516	0
Peak Hour	0	4	20	0	11	0	7	90	0	0	0	0	1	149	0	1	283	0

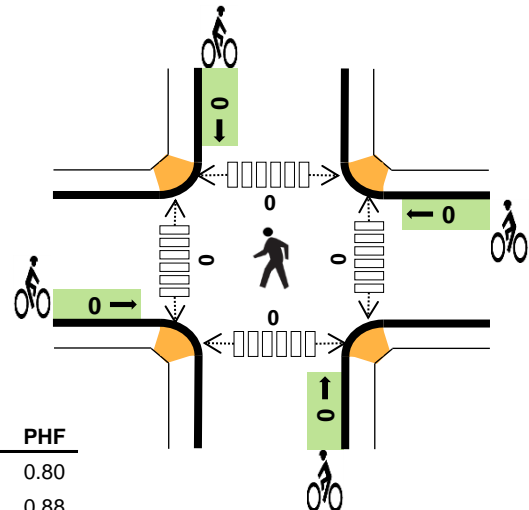
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	1	0	4	5	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	2	0	1	3	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	1	0	3	4	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	1	0	2	3	0	0	0	0	0	0	0	0	0	0
Count Total	0	6	0	15	21	0	0	0	0	0	0	0	0	0	0
Peak Hour	0	2	0	9	11	0	0	0	0	0	0	0	0	0	0

Meadowbrook Parkway Newt Dr



Date: Tue, Jun 02, 2020
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM



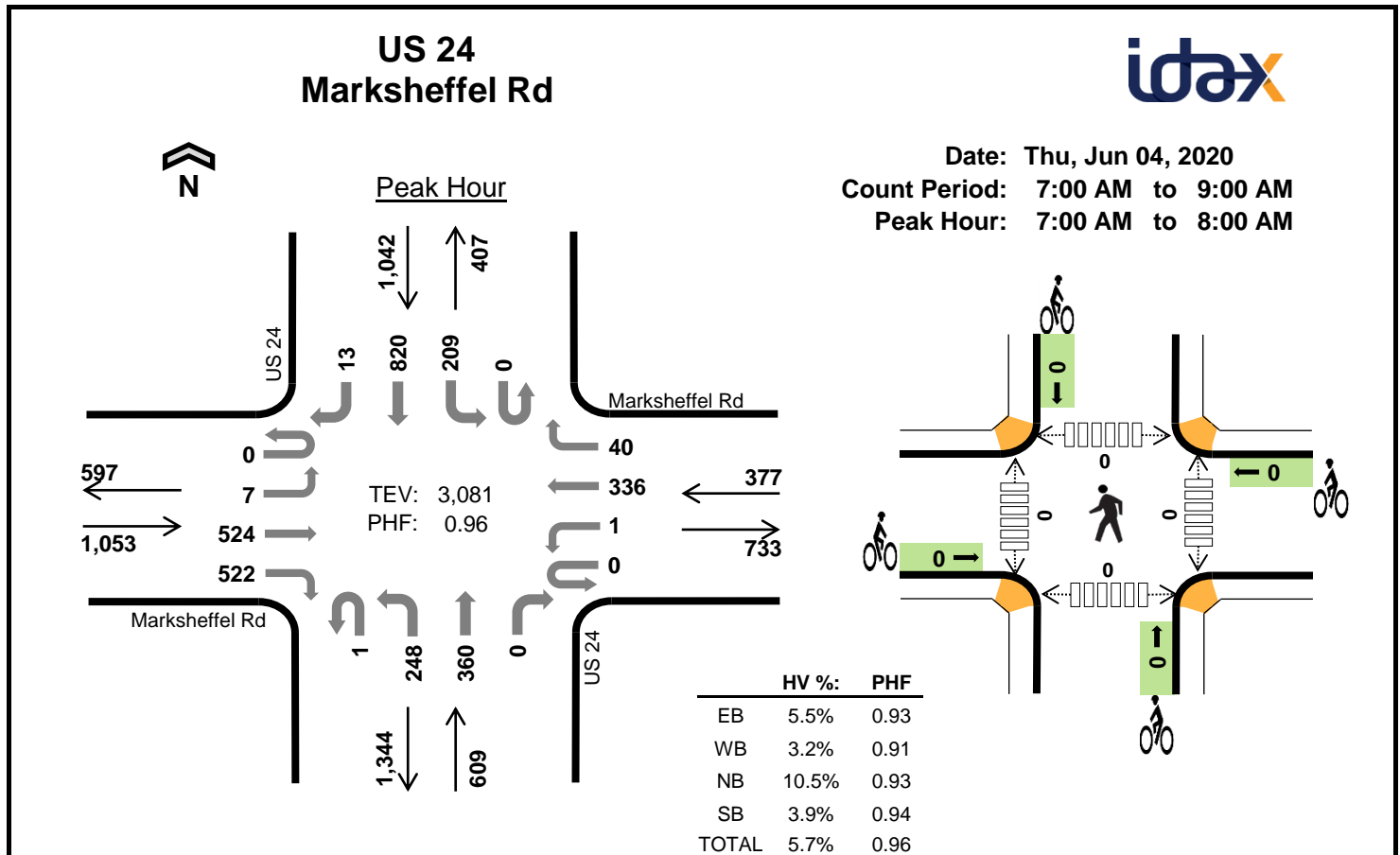
	HV %:	PHF
EB	6.3%	0.80
WB	7.5%	0.88
NB	-	-
SB	1.5%	0.71
TOTAL	3.8%	0.84

Two-Hour Count Summaries

Interval Start	Newt Dr				Newt Dr				Meadowbrook Parkway				Meadowbrook Parkway				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	2	2	0	4	0	6	26	0	0	0	0	0	38	0	0	78	0
4:15 PM	0	2	3	0	4	0	6	15	0	0	0	0	0	44	0	1	75	0
4:30 PM	0	2	6	0	2	0	3	23	0	0	0	0	0	42	0	4	82	0
4:45 PM	0	1	8	0	2	0	7	21	0	0	0	0	0	41	0	0	80	315
5:00 PM	0	2	3	0	4	0	12	9	0	0	0	0	0	70	0	1	101	338
5:15 PM	0	3	7	0	2	0	4	17	0	0	0	0	0	42	0	2	77	340
5:30 PM	0	0	4	0	6	0	4	8	0	0	0	0	0	27	0	0	49	307
5:45 PM	0	1	4	0	2	0	6	7	0	0	0	0	0	29	0	1	50	277
Count Total	0	13	37	0	26	0	48	126	0	0	0	0	0	333	0	9	592	0
Peak Hour	0	8	24	0	10	0	26	70	0	0	0	0	0	195	0	7	340	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	4	0	1	5	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
5:15 PM	2	2	0	1	5	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0
Count Total	2	10	0	5	17	0	0	0	0	0	0	0	0	0	0
Peak Hour	2	8	0	3	13	0	0	0	0	0	0	0	0	0	0

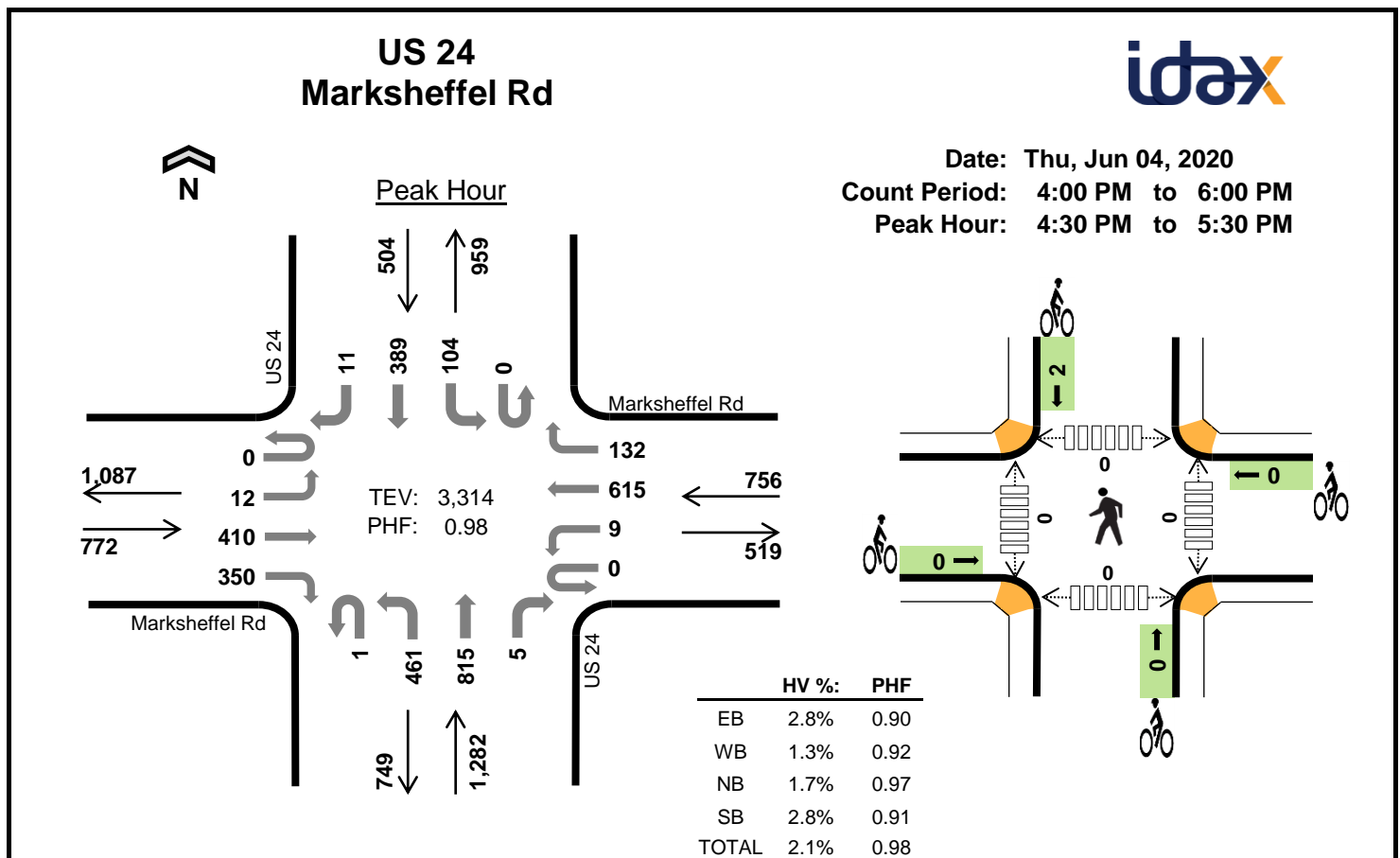


Two-Hour Count Summaries

Interval Start	Marksheffel Rd				Marksheffel Rd				US 24				US 24				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	122	138	0	0	94	6	0	68	96	0	0	50	203	1	778	0
7:15 AM	0	0	155	127	0	0	96	8	1	59	96	0	0	43	213	3	801	0
7:30 AM	0	3	123	142	0	1	80	14	0	62	78	0	0	59	214	5	781	0
7:45 AM	0	4	124	115	0	0	66	12	0	59	90	0	0	57	190	4	721	3,081
8:00 AM	0	8	106	109	0	2	57	17	0	50	75	0	0	37	125	7	593	2,896
8:15 AM	0	1	87	90	0	0	48	16	0	50	73	1	0	42	138	1	547	2,642
8:30 AM	0	3	83	105	0	1	84	13	0	48	71	0	0	30	155	1	594	2,455
8:45 AM	0	0	92	85	0	2	58	8	0	52	91	0	0	39	162	5	594	2,328
Count Total	0	19	892	911	0	6	583	94	1	448	670	1	0	357	1,400	27	5,409	0
Peak Hour	0	7	524	522	0	1	336	40	1	248	360	0	0	209	820	13	3,081	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	18	3	10	8	39	0	0	0	0	0	0	0	0	0	0
7:15 AM	12	3	17	10	42	0	0	0	0	0	0	0	0	0	0
7:30 AM	14	4	21	13	52	0	0	0	0	0	0	0	0	0	0
7:45 AM	14	2	16	10	42	0	0	0	0	0	0	0	0	0	0
8:00 AM	9	3	18	11	41	0	0	0	0	0	0	0	0	0	0
8:15 AM	9	1	12	7	29	0	0	0	0	0	0	0	0	0	0
8:30 AM	9	2	10	9	30	0	0	0	0	0	0	0	0	0	0
8:45 AM	11	4	22	21	58	0	0	0	0	0	0	0	0	0	0
Count Total	96	22	126	89	333	0	0	0	0	0	0	0	0	0	0
Peak Hour	58	12	64	41	175	0	0	0	0	0	0	0	0	0	0

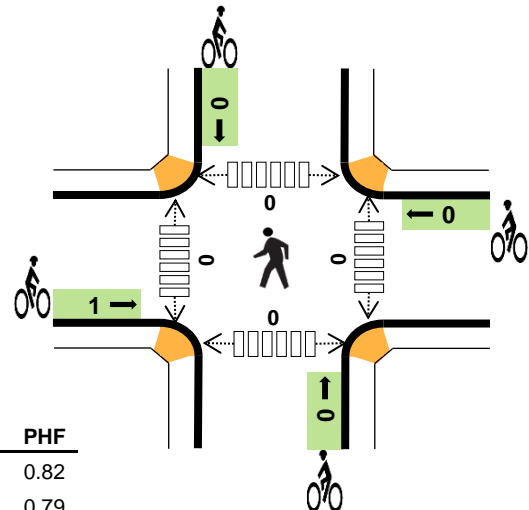
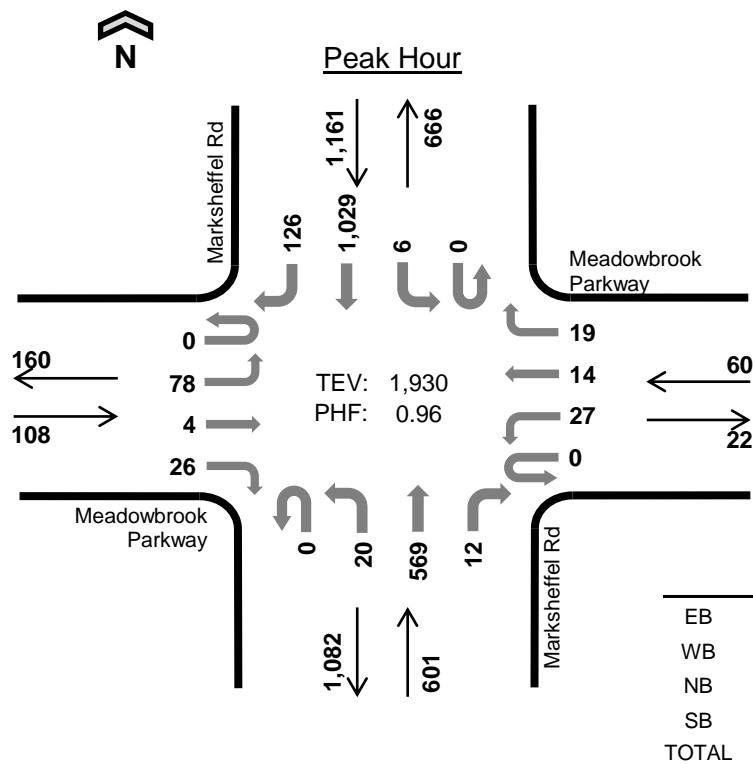
**Two-Hour Count Summaries**

Interval Start	Marksheffel Rd				Marksheffel Rd				US 24				US 24				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	2	102	84	0	3	163	33	0	78	159	0	1	21	132	0	778	0
4:15 PM	0	7	82	73	0	1	172	39	2	131	166	1	0	32	121	4	831	0
4:30 PM	0	4	92	73	0	4	165	37	0	119	207	0	0	23	100	2	826	0
4:45 PM	0	5	117	92	0	1	162	34	0	128	185	4	0	17	90	5	840	3,275
5:00 PM	0	3	96	92	0	2	140	34	1	96	210	1	0	27	101	1	804	3,301
5:15 PM	0	0	105	93	0	2	148	27	0	118	213	0	0	37	98	3	844	3,314
5:30 PM	0	3	111	87	0	1	115	29	0	108	178	1	0	15	109	2	759	3,247
5:45 PM	0	3	78	62	0	6	110	20	0	96	122	0	0	24	91	1	613	3,020
Count Total	0	27	783	656	0	20	1,175	253	3	874	1,440	7	1	196	842	18	6,295	0
Peak Hour	0	12	410	350	0	9	615	132	1	461	815	5	0	104	389	11	3,314	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	12	3	7	8	30	0	0	0	0	0	0	0	0	0	0
4:15 PM	6	2	10	5	23	0	0	0	0	0	0	0	0	0	0
4:30 PM	4	4	6	6	20	0	0	0	1	1	0	0	0	0	0
4:45 PM	6	2	6	1	15	0	0	0	0	0	0	0	0	0	0
5:00 PM	7	2	6	3	18	0	0	0	0	0	0	0	0	0	0
5:15 PM	5	2	4	4	15	0	0	0	1	1	0	0	0	0	0
5:30 PM	6	0	5	5	16	0	0	0	0	0	0	0	0	0	0
5:45 PM	2	2	3	2	9	0	0	0	1	1	0	0	0	0	0
Count Total	48	17	47	34	146	0	0	0	3	3	0	0	0	0	0
Peak Hour	22	10	22	14	68	0	0	0	2	2	0	0	0	0	0

Marksheffel Rd Meadowbrook Parkway



Two-Hour Count Summaries

Interval Start	Meadowbrook Parkway				Meadowbrook Parkway				Marksheffel Rd				Marksheffel Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	12	2	7	0	11	3	5	0	3	167	2	0	0	268	24	504	0
7:15 AM	0	24	1	5	0	5	3	2	0	4	144	4	0	0	256	26	474	0
7:30 AM	0	18	1	5	0	5	4	6	0	8	130	3	0	3	276	38	497	0
7:45 AM	0	24	0	9	0	6	4	6	0	5	128	3	0	3	229	38	455	1,930
8:00 AM	0	25	2	9	0	3	4	6	0	9	100	7	0	5	219	24	413	1,839
8:15 AM	0	21	1	3	0	4	2	8	0	2	98	3	1	3	159	25	330	1,695
8:30 AM	0	7	2	4	0	8	4	5	0	4	127	5	0	2	200	27	395	1,593
8:45 AM	0	24	1	4	0	11	2	6	0	4	103	4	0	2	158	30	349	1,487
Count Total	0	155	10	46	0	53	26	44	0	39	997	31	1	18	1,765	232	3,417	0
Peak Hour	0	78	4	26	0	27	14	19	0	20	569	12	0	6	1,029	126	1,930	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	2	0	8	21	31	0	0	0	0	0	0	0	0	0	0
7:15 AM	3	0	9	14	26	0	0	0	0	0	0	0	0	0	0
7:30 AM	4	0	10	16	30	1	0	0	0	1	0	0	0	0	0
7:45 AM	2	0	13	15	30	0	0	0	0	0	0	0	0	0	0
8:00 AM	3	0	12	10	25	0	0	0	0	0	0	0	0	0	0
8:15 AM	4	0	4	12	20	0	0	0	0	0	0	0	1	0	1
8:30 AM	2	0	6	7	15	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	1	9	12	22	0	0	0	0	0	0	0	0	0	0
Count Total	20	1	71	107	199	1	0	0	0	1	0	0	1	0	1
Peak Hour	11	0	40	66	117	1	0	0	0	1	0	0	0	0	0

APPENDIX B

CDOT Annual Traffic Data

Description: SH 94 E/O Marksheffel Rd, Colorado Springs

Marshoffol and SH 04Marshheffel and SH 94Marshheffel and SH 94

Description: SH 24 NE/O SH 94, Colorado Springs

US 24 and SH 94US 24 and SH 94US 24 and SH 94US 24 and MarksheffelUS 24 andUS 24 and

Reagan Ranch Growth Rate

Station ID	2018 AADT	2040 AADT	Growth Factor	Yearly Growth Rate
103943	10000	13630	1.33	1.30%
103944	11000	14025	1.25	1.02%
Avg Growth Rate				1.16%

APPENDIX C

Trip Generation Worksheets

Trip Generation Planner (ITE 10th Edition) - Summary Report

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name
Project Number

Crossroads-Meadowbrook (Total)
096956010



ITE Code	Internal Capture Land Use	Land Use Description	Independent Variable	Setting/Location	No. of Units	Avg Rate or Eq	Rates			Total Trips						
							Daily Rate	AM Rate	PM Rate	Daily Trips	AM Trips	PM Trips	AM Trips In	AM Trips Out	PM Trips In	PM Trips Out
210	Residential	Single-Family Detached Housing	Dwelling Unit(s)	General Urban/Suburban	70	Avg	9.44	0.74	0.99	662	52	69	13	39	44	25
815	Retail	Free Standing Discount Store	1,000 Sq Ft	General Urban/Suburban	130	Avg	53.12	1.17	4.83	6,906	152	628	105	47	314	314
411	Other	Public Park	Acre(s)	General Urban/Suburban	18.28	Avg	0.78	0.02	0.11	14		2			1	1
444	Cinema/Entertainment	Movie Theater	1,000 Sq Ft	General Urban/Suburban	52	Avg	78.09	0.22	6.17	4,062	11	321	5	6	302	19
820	Retail	Shopping Center	1,000 Sq Ft GLA	General Urban/Suburban	44.942	Avg	37.75	0.94	3.81	1,696	42	171	26	16	82	89
849	Retail	Tire Superstore	1,000 Sq Ft	General Urban/Suburban	7.2	Avg	20.37	1.34	2.11	148	10	15	6	4	7	8
862	Retail	Home Improvement Superstore	1,000 Sq Ft	General Urban/Suburban	127	Avg	30.74	1.57	2.33	3,904	199	296	113	86	145	151
890	Retail	Furniture Store	1,000 Sq Ft	General Urban/Suburban	114	Avg	6.30	0.26	0.52	720	30	59	21	9	28	31
932	Restaurant	High-Turnover (Sit-Down) Restaurant	1,000 Sq Ft	General Urban/Suburban	21.2	Avg	112.18	9.94	9.77	2,380	210	207	116	94	128	79
934	Restaurant	Fast-Food Restaurant w/ D.T.	1,000 Sq Ft	General Urban/Suburban	20.909	Avg	470.95	40.19	32.67	9,850	840	683	428	412	355	328
937	Restaurant	Coffee/Donut Shop w/ D.T.	1,000 Sq Ft	General Urban/Suburban	2.4	Avg	820.38	88.99	43.38	1,968	214	106	109	105	53	53
960	Retail	Gasoline Station w/ Convenience Market	1,000 Sq Ft	General Urban/Suburban	5	Avg	837.58	83.14	69.28	4,188	416	346	208	208	173	173
Grand Total										36,498	2,176	2,903	1,150	1,026	1,632	1,271

- Notes:
- (1) AM and/or PM rates correspond to peak hour of generator
 - (2) Land use was removed in *Trip Generation, 10 Edition*, trip generation data from the ITE *Trip Generation, 9th Edition*

Trip Generation Planner (ITE 10th Edition) - Summary Report

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name
Project Number

Crossroads-Meadowbrook (Crossroads North)
096956010



ITE Code	Internal Capture Land Use	Land Use Description	Independent Variable	Setting/Location	No. of Units	Avg Rate or Eq	Rates			Total Trips						
							Daily Rate	AM Rate	PM Rate	Daily Trips	AM Trips	PM Trips	AM Trips In	AM Trips Out	PM Trips In	PM Trips Out
411	Other	Public Park	Acre(s)	General Urban/Suburban	18.28	Avg	0.78	0.02	0.11	14		2			1	1
444	Cinema/Entertainment	Movie Theater	1,000 Sq Ft	General Urban/Suburban	52	Avg	78.09	0.22	6.17	4,062	11	321	5	6	302	19
849	Retail	Tire Superstore	1,000 Sq Ft	General Urban/Suburban	7.2	Avg	20.37	1.34	2.11	148	10	15	6	4	7	8
862	Retail	Home Improvement Superstore	1,000 Sq Ft	General Urban/Suburban	127	Avg	30.74	1.57	2.33	3,904	199	296	113	86	145	151
890	Retail	Furniture Store	1,000 Sq Ft	General Urban/Suburban	114	Avg	6.30	0.26	0.52	720	30	59	21	9	28	31
932	Restaurant	High-Turnover (Sit-Down) Restaurant	1,000 Sq Ft	General Urban/Suburban	11	Avg	112.18	9.94	9.77	1,234	109	107	60	49	66	41
934	Restaurant	Fast-Food Restaurant w/ D.T.	1,000 Sq Ft	General Urban/Suburban	6.6	Avg	470.95	40.19	32.67	3,110	265	216	135	130	112	104
960	Retail	Gasoline Station w/ Convenience Market	1,000 Sq Ft	General Urban/Suburban	5	Avg	837.58	83.14	69.28	4,188	416	346	208	208	173	173
Grand Total										17,380	1,040	1,362	548	492	834	528

- Notes:
- (1) AM and/or PM rates correspond to peak hour of generator
 - (2) Land use was removed in *Trip Generation, 10 Edition*, trip generation data from the ITE *Trip Generation, 9th Edition*

Trip Generation Planner (ITE 10th Edition) - Summary Report

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name Crossroads-Meadowbrook (Crossroads Mix Use)
Project Number 096956010



ITE Code	Internal Capture Land Use	Land Use Description	Independent Variable	Setting/Location	No. of Units	Avg Rate or Eq	Rates			Total Trips						
							Daily Rate	AM Rate	PM Rate	Daily Trips	AM Trips	PM Trips	AM Trips In	AM Trips Out	PM Trips In	PM Trips Out
815	Retail	Free Standing Discount Store	1,000 Sq Ft	General Urban/Suburban	130	Avg	53.12	1.17	4.83	6,906	152	628	105	47	314	314
820	Retail	Shopping Center	1,000 Sq Ft GLA	General Urban/Suburban	44.942	Avg	37.75	0.94	3.81	1,696	42	171	26	16	82	89
932	Restaurant	High-Turnover (Sit-Down) Restaurant	1,000 Sq Ft	General Urban/Suburban	10.2	Avg	112.18	9.94	9.77	1,146	101	100	56	45	62	38
934	Restaurant	Fast-Food Restaurant w/ D.T.	1,000 Sq Ft	General Urban/Suburban	14.309	Avg	470.95	40.19	32.67	6,740	575	467	293	282	243	224
937	Restaurant	Coffee/Donut Shop w/ D.T.	1,000 Sq Ft	General Urban/Suburban	2.4	Avg	820.38	88.99	43.38	1,968	214	106	109	105	53	53
Grand Total										18,456	1,084	1,472	589	495	754	718

- Notes:
- (1) AM and/or PM rates correspond to peak hour of generator
 - (2) Land use was removed in *Trip Generation, 10 Edition*, trip generation data from the *ITE Trip Generation, 9th Edition*

Project Crossroads-Meadowbrook (Crossroads North)
 Subject Trip Generation - Public Park
 Designed by TES Date June 24, 2020 Job No. 96956010
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations
 Land Use Code - Public Park (411)
 Independent Variable - Acres (X)

Acres 18
 $X = 18$
 $T = \text{Average Vehicle Trip Ends}$

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (400 Series Page 3)

Directional Distribution: 59% ent. 41% exit.
 $(T) = 0.02 (X)$
 $(T) = 0.02 * (18.3)$
 $T = 0$ Average Vehicle Trip Ends
 0 entering 0 exiting
 0 + 0 = 0

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (400 Series Page 4)

Directional Distribution: 55% ent. 45% exit.
 $(T) = 0.11 (X)$
 $(T) = 0.11 * (18.3)$
 $T = 2$ Average Vehicle Trip Ends
 1 entering 1 exiting
 1 + 1 = 2

Weekday (400 Series page 2)

Average Weekday
 $T = 0.78 * (X)$
 $T = 0.78 * 18$
 Directional Distribution: 50% entering, 50% exiting
 $T = 14$ Average Vehicle Trip Ends
 7 entering 7 exiting
 7 + 7 = 14

Project Crossroads-Meadowbrook (Crossroads North)
 Subject Trip Generation for Movie Theater
 Designed by TES Date June 24, 2020 Job No. 96956010
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Movie Theater (444)

Independent Variable - Gross Floor Area

Gross Floor Area = 52,000 Square Feet

X = 52.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (400 Series Page 111)

Directional Distribution: 50% ent. 50% exit.
 T = 0.22 (X) T = 11 Average Vehicle Trip Ends
 T = 0.22 * 52 5 entering 6 exiting
 5 (*) - 6 = 11

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (400 Series Page 112)

Directional Distribution: 94% ent. 6% exit.
 T = 6.17 (X) T = 321 Average Vehicle Trip Ends
 T = 6.17 * 52 302 entering 19 exiting
 302 + 19 = 321

Weekday (400 Series Page 110)

Average Weekday Directional Distribution: 50% entering, 50% exiting
 T = 78.09 (X) T = 4062 Average Vehicle Trip Ends
 T = 78.09* 52 2031 entering 2031 exiting
 2031 + 2031 = 4062

Project Crossroads-Meadowbrook (Crossroads North)
 Subject Trip Generation for Tire Superstore
 Designed by TES Date June 24, 2020 Job No. 96956010
 Checked by _____ Date _____ Sheet No. _____ of _____

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Tire Superstore (849)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = 7,200 Square Feet

X = 7.200

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 262)

		Directional Distribution:	65% ent.	35% exit.
T = 1.34 (X)		T = 10	Average Vehicle Trip Ends	
T = 1.34 *	7.200	6 entering	4	exiting
		6 + 4 (*) =	10	

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series Page 263)

		Directional Distribution:	47% ent.	53% exit.
T = 2.11 (X)		T = 15	Average Vehicle Trip Ends	
T = 2.11 *	7.200	7 entering	8	exiting
		7 + 8 =	15	

Weekday (800 Series Page 261)

Average Weekday		Directional Distribution:	50% entering,	50% exiting
T = 20.37 (X)		T = 148	Average Vehicle Trip Ends	
T = 20.37*	7.200	74 entering	74	exiting
		74 + 74 =	148	

Project Crossroads-Meadowbrook (Crossroads North)
 Subject Trip Generation for Home Improvements Superstore
 Designed by TES Date June 24, 2020 Job No. 96956010
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Home Improvement Superstore (862)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = 127,000 Square Feet

X = 127.000

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 437)

		Directional Distribution:	57% ent.	43% exit.
T = 1.57 (X)		T =	199	Average Vehicle Trip Ends
T = 1.57 *	127.000	113	entering	86 exiting
		113	(*) · 86 =	199

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series Page 438)

		Directional Distribution:	49% ent.	51% exit.
T = 2.33 (X)		T =	296	Average Vehicle Trip Ends
T = 2.33 *	127.000	145	entering	151 exiting
		145	+	151 = 296

Weekday (800 Series Page 436)

Average Weekday		Directional Distribution:	50% entering, 50% exiting	
T = 30.74 (X)		T =	3904 Average Vehicle Trip Ends	
T = 30.74* 127.000		1952	entering 1952 exiting	
		1952	+	1952 = 3904

Project Crossroads-Meadowbrook (Crossroads North)
 Subject Trip Generation for Furniture Store
 Designed by TES Date June 24, 2020 Job No. 96956010
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Furniture Store (890)

Independent Variable - 1000 Square Feet (X)

SF = **114,000**

X = **114.000**

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 585)

(T) = 0.26 (X)		Directional Distribution:	71% ent.	29% exit.
(T) = 0.26 *	(114.0)	T = 30	Average Vehicle Trip Ends	
		21 entering	9 exiting	
		21 + 9 = 30		

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series Page 586)

(T) = 0.52 (X)		Directional Distribution:	47% ent.	53% exit.
(T) = 0.52 *	(114.0)	T = 59	Average Vehicle Trip Ends	
		28 entering	31 exiting	
		28 + 31 = 59		

Weekday (800 Series Page 584)

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 6.30 (X)		T = 720	Average Vehicle Trip Ends	
(T) = 6.30 *	(114.0)	360 entering	360 exiting	
		360 + 360 = 720		

Saturday, Peak Hour of Generator (800 Series Page 590)

Daily Weekday		Directional Distribution:	54% ent.	46% exit.
(T) = 1.10 (X)		T = 125	Average Vehicle Trip Ends	
(T) = 1.10 *	(114.0)	68 entering	57 exiting	
		68 + 57 = 125		

Project Crossroads-Meadowbrook (Crossroads North)
 Subject Trip Generation for High-Turnover (Sit-Down) Restaurant
 Designed by TES Date June 24, 2020 Job No. 096956010
 Checked by _____ Date _____ Sheet No. _____ of _____

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - High Turnover Sit-Down Restaurant (932)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = **11,000** Square Feet

X = 11.000

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series Page 97)

Average Weekday	Directional Distribution:	55% ent.	45% exit.
T = 9.94 (X)	T = 109	Average Vehicle Trip Ends	
T = 9.94 * 11.000	60 entering	49	exiting

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series Page 98)

Average Weekday	Directional Distribution:	62% ent.	38% exit.
T = 9.77 (X)	T = 107	Average Vehicle Trip Ends	
T = 9.77 * 11.000	66 entering	41	exiting

Weekday (900 Series Page 96)

Average Weekday	Directional Distribution:	50% entering, 50% exiting
T = 112.18 (X)	T = 1234	Average Vehicle Trip Ends
T = 112.18 * 11.000	617 entering	617 exiting

P.M. Peak Hour of Generator (900 Series Page 100)

Average Weekday	Directional Distribution:	52% ent.	48% exit.
T = 17.41 (X)	T = 192	Average Vehicle Trip Ends	
T = 17.41 * 11.000	100 entering	92	exiting

Saturday Peak Hour of Generator (900 Series Page 105)

Average Saturday	Directional Distribution:	51% ent.	49% exit.
T = 11.19 (X)	T = 124	Average Vehicle Trip Ends	
T = 11.19 * 11.000	63 entering	61	exiting

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017-Page 207)

AM Peak Hour = 57% Non-Pass By	PM Peak Hour = 57% Non-Pass By
IN Out Total	
AM Peak 34 28 62	
PM Peak 38 23 61	
Daily 352 352 704	PM Peak Hour Rate Applied to Daily

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017 -Page 207)

AM Peak Hour = 43% Pass By	PM Peak Hour = 43% Pass By
IN Out Total	
AM Peak 26 21 48	
PM Peak 28 18 46	
Daily 265 265 530	PM Peak Hour Rate Applied to Daily

Project Crossroads-Meadowbrook (Crossroads North)
 Subject Trip Generation for Fast-Food Restaurant with Drive-Through Window
 Designed by TES Date June 24, 2020 Job No. 96956010
 Checked by _____ Date _____ Sheet No. _____ of _____

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Fast Food Restaurant With Drive-Through Window (934)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = 6,600 Square Feet

X = 6.600

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 158)

Average Weekday
 T = 40.19 (X)
 T = 40.19 * 6.600
 Directional Distribution: 51% ent. 49% exit.
 T = 265 Average Vehicle Trip Ends
 135 entering 130 exiting
 135 + 130 = 265

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 159)

Average Weekday
 T = 32.67 (X)
 T = 32.67 * 6.600
 Directional Distribution: 52% ent. 48% exit.
 T = 216 Average Vehicle Trip Ends
 112 entering 104 exiting
 112 + 104 (*) = 216

Weekday (900 Series page 157)

Average Weekday
 T = 470.95 (X)
 T = 470.95 * 6.600
 Directional Distribution: 50% entering, 50% exiting
 T = 3110 Average Vehicle Trip Ends
 1555 entering 1555 exiting
 1555 + 1555 = 3110

Saturday Peak Hour of Generator (900 Series page 163)

Directional Distribution: 51% ent. 49% exit.
 T = 54.86 (X)
 T = 54.86 * 6.600
 T = 362 Average Vehicle Trip Ends
 185 entering 177 exiting
 185 + 177 = 362

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

AM Peak Hour =	51%	Non-Pass By	PM Peak Hour =	50%	Non-Pass By
	IN	Out	Total		
AM Peak	69	66	135		
PM Peak	56	52	108		
Daily	778	778	1556	PM Peak Hour Rate Applied to Daily	

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

AM Peak Hour =	49%	Pass By	PM Peak Hour =	50%	Pass By
	IN	Out	Total		
AM Peak	66	64	130		
PM Peak	56	52	108		
Daily	777	777	1554	PM Peak Hour Rate Applied to Daily	

Project Crossroads-Meadowbrook (Crossroads North)
 Subject Trip Generation for Super Convenience Market/Gas Station
 Designed by TES Date June 24, 2020 Job No. 096956010
 Checked by _____ Date _____ Sheet No. _____ of _____

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Super Convenience Market/Gas Station (960)

Independant Variable - 1000 Square Feet Gross Leasable Area (X)

Gross Leasable Area = **5,000** Square Feet

X = 5.000

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series Page 404)

		Directional Distribution:	50% ent.	50% exit.
T = 83.14 (X)		T = 416	Average Vehicle Trip Ends	
T = 83.14 *	5.000	208 entering	208 exiting	
		208 + 208 = 416		

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 405)

		Directional Distribution:	50% ent.	50% exit.
T = 69.28 (X)		T = 346	Average Vehicle Trip Ends	
T = 69.28 *	5.000	173 entering	173 exiting	
		173 + 173 = 346		

Weekday (800 Series page 335)

Average Weekday		Directional Distribution:	50% entering, 50% exiting
T = 837.58 (X)		T = 4188	Average Vehicle Trip Ends
T = 837.58 *	5.000	2094 entering	2094 exiting
		2094 + 2094 = 4188	

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

PM Peak Hour = 44% Non-Pass By	AM Peak Hour = 38% Non-Pass By
IN Out Total	* Utilized ITE 945 pass-by calculations
AM Peak 79 79 158	
PM Peak 76 76 152	
Daily 921 921 1842	PM Peak Hour Rate Applied to Daily

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

PM Peak Hour = 56% Pass By	AM Peak Hour = 62% Pass By
IN Out Total	
AM Peak 129 129 258	
PM Peak 97 97 194	
Daily 1173 1173 2346	PM Peak Hour Rate Applied to Daily

Project Crossroads-Meadowbrook (Crossroads North)
 Subject Trip Generation - Public Park
 Designed by TES Date June 24, 2020 Job No. 96956010
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations
 Land Use Code - Public Park (411)
 Independent Variable - Acres (X)

Acres 18
 $X = 18$
 $T = \text{Average Vehicle Trip Ends}$

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (400 Series Page 3)

Directional Distribution: 59% ent. 41% exit.
 $(T) = 0.02 (X)$
 $(T) = 0.02 * (18.3)$
 $T = 0$ Average Vehicle Trip Ends
 0 entering 0 exiting
 0 + 0 = 0

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (400 Series Page 4)

Directional Distribution: 55% ent. 45% exit.
 $(T) = 0.11 (X)$
 $(T) = 0.11 * (18.3)$
 $T = 2$ Average Vehicle Trip Ends
 1 entering 1 exiting
 1 + 1 = 2

Weekday (400 Series page 2)

Average Weekday
 $T = 0.78 * (X)$
 $T = 0.78 * 18$
 Directional Distribution: 50% entering, 50% exiting
 $T = 14$ Average Vehicle Trip Ends
 7 entering 7 exiting
 7 + 7 = 14

Project Crossroads-Meadowbrook (Crossroads North)
 Subject Trip Generation for Movie Theater
 Designed by TES Date June 24, 2020 Job No. 96956010
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Movie Theater (444)

Independent Variable - Gross Floor Area

Gross Floor Area = 52,000 Square Feet

X = 52.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (400 Series Page 111)

Directional Distribution: 50% ent. 50% exit.
 T = 0.22 (X) T = 11 Average Vehicle Trip Ends
 T = 0.22 * 52 5 entering 6 exiting
 5 (*) - 6 = 11

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (400 Series Page 112)

Directional Distribution: 94% ent. 6% exit.
 T = 6.17 (X) T = 321 Average Vehicle Trip Ends
 T = 6.17 * 52 302 entering 19 exiting
 302 + 19 = 321

Weekday (400 Series Page 110)

Average Weekday Directional Distribution: 50% entering, 50% exiting
 T = 78.09 (X) T = 4062 Average Vehicle Trip Ends
 T = 78.09* 52 2031 entering 2031 exiting
 2031 + 2031 = 4062

Project Crossroads-Meadowbrook (Crossroads North)
 Subject Trip Generation for Tire Superstore
 Designed by TES Date June 24, 2020 Job No. 96956010
 Checked by _____ Date _____ Sheet No. _____ of _____

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Tire Superstore (849)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = 7,200 Square Feet

X = 7.200

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 262)

Directional Distribution: 65% ent. 35% exit.
 T = 1.34 (X) T = 10 Average Vehicle Trip Ends
 T = 1.34 * 7.200 6 entering 4 exiting
 6 + 4 (*) = 10

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series Page 263)

Directional Distribution: 47% ent. 53% exit.
 T = 2.11 (X) T = 15 Average Vehicle Trip Ends
 T = 2.11 * 7.200 7 entering 8 exiting
 7 + 8 = 15

Weekday (800 Series Page 261)

Average Weekday
 T = 20.37 (X) Directional Distribution: 50% entering, 50% exiting
 T = 20.37* 7.200 T = 148 Average Vehicle Trip Ends
 74 entering 74 exiting
 74 + 74 = 148

Project Crossroads-Meadowbrook (Crossroads North)
 Subject Trip Generation for Home Improvements Superstore
 Designed by TES Date June 24, 2020 Job No. 96956010
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Home Improvement Superstore (862)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = 127,000 Square Feet

X = 127.000

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 437)

		Directional Distribution:	57% ent.	43% exit.
T = 1.57 (X)		T =	199	Average Vehicle Trip Ends
T = 1.57 *	127.000	113	entering	86 exiting
		113	(*) · 86 =	199

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series Page 438)

		Directional Distribution:	49% ent.	51% exit.
T = 2.33 (X)		T =	296	Average Vehicle Trip Ends
T = 2.33 *	127.000	145	entering	151 exiting
		145	+	151 = 296

Weekday (800 Series Page 436)

Average Weekday		Directional Distribution:	50% entering, 50% exiting	
T = 30.74 (X)		T =	3904 Average Vehicle Trip Ends	
T = 30.74* 127.000		1952	entering 1952 exiting	
		1952	+	1952 = 3904

Project Crossroads-Meadowbrook (Crossroads North)
 Subject Trip Generation for Furniture Store
 Designed by TES Date June 24, 2020 Job No. 96956010
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Furniture Store (890)

Independent Variable - 1000 Square Feet (X)

SF = **114,000**

X = **114.000**

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 585)

(T) = 0.26 (X)		Directional Distribution:	71% ent.	29% exit.
(T) = 0.26 *	(114.0)	T = 30	Average Vehicle Trip Ends	
		21 entering	9	exiting
		21 + 9 = 30		

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series Page 586)

(T) = 0.52 (X)		Directional Distribution:	47% ent.	53% exit.
(T) = 0.52 *	(114.0)	T = 59	Average Vehicle Trip Ends	
		28 entering	31	exiting
		28 + 31 = 59		

Weekday (800 Series Page 584)

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 6.30 (X)		T = 720	Average Vehicle Trip Ends	
(T) = 6.30 *	(114.0)	360 entering	360	exiting
		360 + 360 = 720		

Saturday, Peak Hour of Generator (800 Series Page 590)

Daily Weekday		Directional Distribution:	54% ent.	46% exit.
(T) = 1.10 (X)		T = 125	Average Vehicle Trip Ends	
(T) = 1.10 *	(114.0)	68 entering	57	exiting
		68 + 57 = 125		

Project Crossroads-Meadowbrook (Crossroads North)
 Subject Trip Generation for High-Turnover (Sit-Down) Restaurant
 Designed by TES Date June 24, 2020 Job No. 096956010
 Checked by _____ Date _____ Sheet No. _____ of _____

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - High Turnover Sit-Down Restaurant (932)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = **11,000** Square Feet

X = 11.000

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series Page 97)

Average Weekday	Directional Distribution:	55% ent.	45% exit.
T = 9.94 (X)	T = 109	Average Vehicle Trip Ends	
T = 9.94 * 11.000	60 entering	49	exiting

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series Page 98)

Average Weekday	Directional Distribution:	62% ent.	38% exit.
T = 9.77 (X)	T = 107	Average Vehicle Trip Ends	
T = 9.77 * 11.000	66 entering	41	exiting

Weekday (900 Series Page 96)

Average Weekday	Directional Distribution:	50% entering, 50% exiting
T = 112.18 (X)	T = 1234	Average Vehicle Trip Ends
T = 112.18 * 11.000	617 entering	617 exiting

P.M. Peak Hour of Generator (900 Series Page 100)

Average Weekday	Directional Distribution:	52% ent.	48% exit.
T = 17.41 (X)	T = 192	Average Vehicle Trip Ends	
T = 17.41 * 11.000	100 entering	92	exiting

Saturday Peak Hour of Generator (900 Series Page 105)

Average Saturday	Directional Distribution:	51% ent.	49% exit.
T = 11.19 (X)	T = 124	Average Vehicle Trip Ends	
T = 11.19 * 11.000	63 entering	61	exiting

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017-Page 207)

AM Peak Hour = 57% Non-Pass By	PM Peak Hour = 57% Non-Pass By
IN Out Total	
AM Peak 34 28 62	
PM Peak 38 23 61	
Daily 352 352 704	PM Peak Hour Rate Applied to Daily

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017 -Page 207)

AM Peak Hour = 43% Pass By	PM Peak Hour = 43% Pass By
IN Out Total	
AM Peak 26 21 48	
PM Peak 28 18 46	
Daily 265 265 530	PM Peak Hour Rate Applied to Daily

Project Crossroads-Meadowbrook (Crossroads North)
 Subject Trip Generation for Fast-Food Restaurant with Drive-Through Window
 Designed by TES Date June 24, 2020 Job No. 96956010
 Checked by _____ Date _____ Sheet No. _____ of _____

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Fast Food Restaurant With Drive-Through Window (934)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = 6,600 Square Feet

X = 6.600

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 158)

Average Weekday
 T = 40.19 (X)
 T = 40.19 * 6.600
 Directional Distribution: 51% ent. 49% exit.
 T = 265 Average Vehicle Trip Ends
 135 entering 130 exiting
 135 + 130 = 265

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 159)

Average Weekday
 T = 32.67 (X)
 T = 32.67 * 6.600
 Directional Distribution: 52% ent. 48% exit.
 T = 216 Average Vehicle Trip Ends
 112 entering 104 exiting
 112 + 104 (*) = 216

Weekday (900 Series page 157)

Average Weekday
 T = 470.95 (X)
 T = 470.95 * 6.600
 Directional Distribution: 50% entering, 50% exiting
 T = 3110 Average Vehicle Trip Ends
 1555 entering 1555 exiting
 1555 + 1555 = 3110

Saturday Peak Hour of Generator (900 Series page 163)

Directional Distribution: 51% ent. 49% exit.
 T = 54.86 (X)
 T = 54.86 * 6.600
 T = 362 Average Vehicle Trip Ends
 185 entering 177 exiting
 185 + 177 = 362

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

AM Peak Hour =	51%	Non-Pass By	PM Peak Hour =	50%	Non-Pass By
	IN	Out	Total		
AM Peak	69	66	135		
PM Peak	56	52	108		
Daily	778	778	1556	PM Peak Hour Rate Applied to Daily	

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

AM Peak Hour =	49%	Pass By	PM Peak Hour =	50%	Pass By
	IN	Out	Total		
AM Peak	66	64	130		
PM Peak	56	52	108		
Daily	777	777	1554	PM Peak Hour Rate Applied to Daily	

Project Crossroads-Meadowbrook (Crossroads North)
 Subject Trip Generation for Super Convenience Market/Gas Station
 Designed by TES Date June 24, 2020 Job No. 096956010
 Checked by _____ Date _____ Sheet No. _____ of _____

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Super Convenience Market/Gas Station (960)

Independant Variable - 1000 Square Feet Gross Leasable Area (X)

Gross Leasable Area = **5,000** Square Feet

X = 5.000

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series Page 404)

T = 83.14 (X)		Directional Distribution:	50% ent.	50% exit.
T = 83.14 *	5.000	T = 416	Average Vehicle Trip Ends	
		208 entering	208 exiting	
		208 + 208 = 416		

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 405)

T = 69.28 (X)		Directional Distribution:	50% ent.	50% exit.
T = 69.28 *	5.000	T = 346	Average Vehicle Trip Ends	
		173 entering	173 exiting	
		173 + 173 = 346		

Weekday (800 Series page 335)

Average Weekday		Directional Distribution:	50% entering, 50% exiting
T = 837.58 (X)		T = 4188	Average Vehicle Trip Ends
T = 837.58 *	5.000	2094 entering	2094 exiting
		2094 + 2094 = 4188	

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

PM Peak Hour = 44% Non-Pass By	AM Peak Hour = 38% Non-Pass By
IN Out Total	* Utilized ITE 945 pass-by calculations
AM Peak 79 79 158	
PM Peak 76 76 152	
Daily 921 921 1842	PM Peak Hour Rate Applied to Daily

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

PM Peak Hour = 56% Pass By	AM Peak Hour = 62% Pass By
IN Out Total	
AM Peak 129 129 258	
PM Peak 97 97 194	
Daily 1173 1173 2346	PM Peak Hour Rate Applied to Daily

Project Crossroads-Meadowbrook (Crossroads Mix Use)
 Subject Trip Generation for Free-Standing Discount Store
 Designed by TES Date July 16, 2020 Job No. 96956010
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rates

Land Use Code - Free-Standing Discount Store (815)

Independant Variable - 1000 Square Feet (X)

SF = 130,000

X = 130.000

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 50)

(T) = 1.17 (X)		Directional Distribution:	69% ent.	31% exit.
(T) = 1.17 *	(130.0)	T = 152	Average Vehicle Trip Ends	
		105 entering	47	exiting
		105 + 47 =	152	

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series Page 51)

(T) = 4.83 (X)		Directional Distribution:	50% ent.	50% exit.
(T) = 4.83 *	(130.0)	T = 628	Average Vehicle Trip Ends	
		314 entering	314	exiting
		314 + 314 =	628	

Weekday (800 Series Page 49)

Average Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 53.12 (X)		T = 6906	Average Vehicle Trip Ends	
(T) = 53.12 *	(130.0)	3453 entering	3453	exiting
		3453 + 3453 =	6906	

Saturday, Peak Hour of Generator (800 Series Page 55)

Daily Weekday		Directional Distribution:	51% ent.	49% exit.
(T) = 6.94 (X)		T = 902	Average Vehicle Trip Ends	
(T) = 6.94 *	(130.0)	460 entering	442	exiting
		460 + 442 =	902	

Project Crossroads-Meadowbrook (Crossroads Mix Use)
 Subject Trip Generation for Shopping Center
 Designed by TES Date June 24, 2020 Job No. 096956010
 Checked by Date Sheet No. of

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Shopping Center (820)

Independant Variable - 1000 Square Feet Gross Leasable Area (X)

Gross Leasable Area = **44,942** Square Feet

X = 44.942

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 139)

Average Weekday	Directional Distribution:	62% ent.	38% exit.
T = 0.94 * (X)	T = 42	Average Vehicle Trip Ends	
T = 0.94 * 44.942	26 entering	16 exiting	
	26 + 16 = 42		

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series page 140)

Average Weekday	Directional Distribution:	48% ent.	52% exit.
T = 3.81 * (X)	T = 171	Average Vehicle Trip Ends	
T = 3.81 * 44.942	82 entering	89 exiting	
	82 + 89 = 171		

Weekday (800 Series page 138)

Average Weekday	Directional Distribution:	50% entering, 50% exiting
T = 37.75 * (X)	T = 1696	Average Vehicle Trip Ends
T = 37.75 * 44.942	848 entering	848 exiting
	848 + 848 = 1696	

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017-Page 190)

AM Peak Hour = 66% Non-Pass By	PM Peak Hour = 66% Non-Pass By
IN Out Total	
AM Peak 17 11 28	
PM Peak 54 59 113	
Daily 560 560 1120	PM Peak Hour Rate Applied to Daily

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017 -Page 190)

AM Peak Hour = 34% Pass By	PM Peak Hour = 34% Pass By
IN Out Total	
AM Peak 9 5 15	
PM Peak 28 30 58	
Daily 288 288 576	PM Peak Hour Rate Applied to Daily

Project Crossroads-Meadowbrook (Crossroads Mix Use)
 Subject Trip Generation for High-Turnover (Sit-Down) Restaurant
 Designed by TES Date June 24, 2020 Job No. 096956010
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - High Turnover Sit-Down Restaurant (932)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = **10,200** Square Feet

X = 10.200

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series Page 97)

Average Weekday	Directional Distribution:	55% ent.	45% exit.
T = 9.94 (X)	T = 101	Average Vehicle Trip Ends	
T = 9.94 * 10.200	56 entering	45	exiting

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series Page 98)

Average Weekday	Directional Distribution:	62% ent.	38% exit.
T = 9.77 (X)	T = 100	Average Vehicle Trip Ends	
T = 9.77 * 10.200	62 entering	38	exiting

Weekday (900 Series Page 96)

Average Weekday	Directional Distribution:	50% entering, 50% exiting
T = 112.18 (X)	T = 1146	Average Vehicle Trip Ends
T = 112.18 * 10.200	573 entering	573 exiting

P.M. Peak Hour of Generator (900 Series Page 100)

Average Weekday	Directional Distribution:	52% ent.	48% exit.
T = 17.41 (X)	T = 178	Average Vehicle Trip Ends	
T = 17.41 * 10.200	93 entering	85	exiting

Saturday Peak Hour of Generator (900 Series Page 105)

Average Saturday	Directional Distribution:	51% ent.	49% exit.
T = 11.19 (X)	T = 116	Average Vehicle Trip Ends	
T = 11.19 * 10.200	59 entering	57	exiting

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017-Page 207)

AM Peak Hour = 57% Non-Pass By	PM Peak Hour = 57% Non-Pass By
IN Out Total	
AM Peak 32 26 58	
PM Peak 35 22 57	
Daily 327 327 654	PM Peak Hour Rate Applied to Daily

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017 -Page 207)

AM Peak Hour = 43% Pass By	PM Peak Hour = 43% Pass By
IN Out Total	
AM Peak 24 19 44	
PM Peak 27 16 43	
Daily 246 246 492	PM Peak Hour Rate Applied to Daily

Project Crossroads-Meadowbrook (Crossroads Mix Use)
 Subject Trip Generation for Fast-Food Restaurant with Drive-Through Window
 Designed by TES Date June 24, 2020 Job No. 96956010
 Checked by _____ Date _____ Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Fast Food Restaurant With Drive-Through Window (934)

Independant Variable - 1000 Square Feet Gross Floor Area (X)

Gross Floor Area = 14,309 Square Feet

X = 14.309

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 158)

Average Weekday	Directional Distribution:	51% ent.	49% exit.
T = 40.19 (X)	T = 575	Average Vehicle Trip Ends	
T = 40.19 * 14.309	293 entering	282	exiting
	293 + 282 =	575	

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 159)

Average Weekday	Directional Distribution:	52% ent.	48% exit.
T = 32.67 (X)	T = 467	Average Vehicle Trip Ends	
T = 32.67 * 14.309	243 entering	224	exiting
	243 + 224 =	467	

Weekday (900 Series page 157)

Average Weekday	Directional Distribution:	50% entering, 50% exiting
T = 470.95 (X)	T = 6740	Average Vehicle Trip Ends
T = 470.95 * 14.309	3370 entering	3370 exiting
	3370 + 3370 =	6740

Saturday Peak Hour of Generator (900 Series page 163)

T = 54.86 (X)	Directional Distribution:	51% ent.	49% exit.
T = 54.86 * 14.309	T = 785	Average Vehicle Trip Ends	
	400 entering	385	exiting
	400 + 385 =	785	

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

AM Peak Hour =	51%	Non-Pass By	PM Peak Hour =	50%	Non-Pass By
	IN	Out	Total		
AM Peak	149	144	293		
PM Peak	122	112	234		
Daily	1685	1685	3370	PM Peak Hour Rate Applied to Daily	

Pass-By Trip Volumes (Per ITE Trip Generation Handbook, 3rd Edition September 2017)

AM Peak Hour =	49%	Pass By	PM Peak Hour =	50%	Pass By
	IN	Out	Total		
AM Peak	144	138	282		
PM Peak	122	112	234		
Daily	1685	1685	3370	PM Peak Hour Rate Applied to Daily	

Project Crossroads-Meadowbrook (Crossroads Mix Use)
 Subject Trip Generation for Coffee/Donut Shop with Drive Through
 Designed by TES Date June 24, 2020 Job No. 096956010
 Checked by _____ Date _____ Sheet No. _____ of _____

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Coffee/Donut Shop with Drive Through (937)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = 2,400

X = 2.4

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (Series 900 Page 232)

T = 88.99 (X)	Directional Distribution: 51% ent. 49% exit.
T = 88.99 * 2.4	T = 214 Average Vehicle Trip Ends
	109 entering 105 exiting

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (Series 900 Page 233)

T = 43.38 (X)	Directional Distribution: 50% ent. 50% exit.
T = 43.38 * 2.4	T = 106 Average Vehicle Trip Ends
	53 entering 53 exiting

Weekday (Series 900 Page 231)

Average Weekday	Directional Distribution: 50% entering, 50% exiting
(T) = 820.38 (X)	T = 1968 Average Vehicle Trip Ends
(T) = 820.38 * (2.4)	984 entering 984 exiting
	984 + 984 = 1968

Project Crossroads-Meadowbrook (Meadowbrook Park)
 Subject Trip Generation for Single-Family Detached Housing
 Designed by TES Date June 24, 2020 Job No. 96956010
 Checked by _____ Date _____ Sheet No. _____ of _____

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Single-Family Detached Housing (210)

Independant Variable - Dwelling Units (X)

$$X = 70$$

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (200 Series Page 3)

Average Weekday

$$(T) = 0.74(X)$$

$$(T) = 0.74 * (70.0)$$

Directional Distribution: 25% entering, 75% exiting

$$T = 52 \quad \text{Average Vehicle Trip Ends}$$

$$13 \quad \text{entering} \quad 39 \quad \text{exiting}$$

$$13 + 39 = 52$$

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (200 Series Page 4)

Average Weekday

$$(T) = 0.99(X)$$

$$(T) = 0.99 * (70.0)$$

Directional Distribution: 63% entering, 37% exiting

$$T = 69 \quad \text{Average Vehicle Trip Ends}$$

$$44 \quad \text{entering} \quad 25 \quad \text{exiting}$$

$$44 + 25 = 69$$

Peak Hour of Generator, Saturday (200 Series Page 8)

Average Saturday

$$(T) = 0.93(X)$$

$$(T) = 0.93 * (70.0)$$

Directional Distribution: 54% entering, 46% exiting

$$T = 65 \quad \text{Average Vehicle Trip Ends}$$

$$35 \quad \text{entering} \quad 30 \quad \text{exiting}$$

$$35 + 30 = 65$$

Weekday (200 Series Page 2)

Average Weekday

$$(T) = 9.44(X)$$

$$(T) = 9.44 * (70.0)$$

Directional Distribution: 50% entering, 50% exiting

$$T = 662 \quad \text{Average Vehicle Trip Ends}$$

$$331 \quad \text{entering} \quad 331 \quad \text{exiting}$$

$$331 + 331 = 662$$

APPENDIX D




























Intersection Analysis Worksheets

Timings

2020 Adjusted Existing AM.syn

1: Marksheffel Rd & Meadowbrook Pkwy

06/24/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 							 			 	
Traffic Volume (vph)	94	5	31	32	17	23	24	683	14	7	1235	151
Future Volume (vph)	94	5	31	32	17	23	24	683	14	7	1235	151
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	11.0	24.0	24.0	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	16.0	29.0	29.0	11.0	24.0	24.0	80.0	80.0	80.0	80.0	80.0	80.0
Total Split (%)	13.3%	24.2%	24.2%	9.2%	20.0%	20.0%	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	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 Lost Time (s)	5.0	5.0	5.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effect Green (s)	9.7	8.5	8.5	14.9	7.0	7.0	88.2	88.2	88.2	88.2	88.2	88.2
Actuated g/C Ratio	0.08	0.07	0.07	0.12	0.06	0.06	0.74	0.74	0.74	0.74	0.74	0.74
v/c Ratio	0.45	0.05	0.21	0.20	0.20	0.17	0.13	0.32	0.01	0.02	0.54	0.14
Control Delay	57.8	51.0	2.5	42.4	57.6	2.1	9.0	10.5	0.3	6.1	8.8	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	0.0
Total Delay	57.8	51.0	2.5	42.4	57.6	2.1	9.0	10.5	0.3	6.1	8.8	1.2
LOS	E	D	A	D	E	A	A	B	A	A	A	A
Approach Delay		44.3			33.3			10.2			8.0	
Approach LOS		D			C			B			A	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

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

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 11.8

Intersection LOS: B

Intersection Capacity Utilization 57.1%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Marksheffel Rd & Meadowbrook Pkwy


























HCM 6th Signalized Intersection Summary

1: Marksheffel Rd & Meadowbrook Pkwy

2020 Adjusted Existing AM.syn

06/24/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	5	31	32	17	23	24	683	14	7	1235	151
Future Volume (veh/h)	94	5	31	32	17	23	24	683	14	7	1235	151
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	1752	1752	1752	1870	1870	1870	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	115	6	38	41	22	29	28	785	16	8	1342	164
Peak Hour Factor	0.82	0.82	0.82	0.79	0.79	0.79	0.87	0.87	0.87	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	2	2	2	7	7	7	6	6	6
Cap, veh/h	167	93	79	171	77	65	263	2599	1159	514	2620	1169
Arrive On Green	0.05	0.05	0.05	0.03	0.04	0.04	0.76	0.76	0.76	0.76	0.76	0.76
Sat Flow, veh/h	3237	1752	1485	1781	1870	1585	334	3413	1522	658	3441	1535
Grp Volume(v), veh/h	115	6	38	41	22	29	28	785	16	8	1342	164
Grp Sat Flow(s),veh/h/ln	1618	1752	1485	1781	1870	1585	334	1706	1522	658	1721	1535
Q Serve(g_s), s	4.2	0.4	3.0	2.6	1.4	2.1	4.3	8.6	0.3	0.5	18.3	3.4
Cycle Q Clear(g_c), s	4.2	0.4	3.0	2.6	1.4	2.1	22.6	8.6	0.3	9.0	18.3	3.4
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	167	93	79	171	77	65	263	2599	1159	514	2620	1169
V/C Ratio(X)	0.69	0.06	0.48	0.24	0.29	0.44	0.11	0.30	0.01	0.02	0.51	0.14
Avail Cap(c_a), veh/h	297	350	297	190	281	238	263	2599	1159	514	2620	1169
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	56.0	54.0	55.2	52.9	55.8	56.2	10.0	4.4	3.5	5.8	5.6	3.8
Incr Delay (d2), s/veh	5.0	0.3	4.5	0.7	2.0	4.7	0.8	0.3	0.0	0.1	0.7	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(50%),veh/ln	1.8	0.2	1.2	1.2	0.7	0.9	0.4	2.7	0.1	0.1	5.9	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.0	54.2	59.6	53.6	57.8	60.8	10.8	4.7	3.5	5.9	6.3	4.1
LnGrp LOS	E	D	E	D	E	E	B	A	A	A	A	A
Approach Vol, veh/h	159			92			829			1514		
Approach Delay, s/veh	60.4			56.9			4.9			6.1		
Approach LOS	E			E			A			A		
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	97.9		9.7	12.4		97.9	11.2	10.9				
Change Period (Y+Rc), s	6.5		6.0	* 6		6.5	5.0	6.0				
Max Green Setting (Gmax), s	73.5		5.0	* 24		73.5	11.0	18.0				
Max Q Clear Time (g_c+I1), s	24.6		4.6	5.0		20.3	6.2	4.1				
Green Ext Time (p_c), s	7.7		0.0	0.1		16.6	0.1	0.1				
Intersection Summary												
HCM 6th Ctrl Delay	10.8											
HCM 6th LOS	B											
Notes												

























* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Timings

2020 Adjusted Existing PM.syn

1: Marksheffel Rd & Meadowbrook Pkwy

06/24/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	9	41	15	10	28	34	1167	59	33	773	107
Future Volume (vph)	144	9	41	15	10	28	34	1167	59	33	773	107
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	11.0	24.0	24.0	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	18.0	32.0	32.0	11.0	25.0	25.0	77.0	77.0	77.0	77.0	77.0	77.0
Total Split (%)	15.0%	26.7%	26.7%	9.2%	20.8%	20.8%	64.2%	64.2%	64.2%	64.2%	64.2%	64.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	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 Lost Time (s)	5.0	5.0	5.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effect Green (s)	11.2	13.5	13.5	12.1	6.6	6.6	87.0	87.0	87.0	87.0	87.0	87.0
Actuated g/C Ratio	0.09	0.11	0.11	0.10	0.06	0.06	0.72	0.72	0.72	0.72	0.72	0.72
v/c Ratio	0.53	0.05	0.19	0.14	0.15	0.20	0.09	0.51	0.06	0.16	0.35	0.11
Control Delay	57.5	48.7	3.8	40.5	56.7	2.1	7.1	13.5	0.7	8.8	7.3	1.3
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	57.5	48.7	3.8	40.5	56.7	2.1	7.1	13.5	0.7	8.8	7.3	1.3
LOS	E	D	A	D	E	A	A	B	A	A	A	A
Approach Delay		45.8			23.2			12.8			6.6	
Approach LOS		D			C			B			A	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

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

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 13.5

Intersection LOS: B

Intersection Capacity Utilization 55.2%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Marksheffel Rd & Meadowbrook Pkwy



























HCM 6th Signalized Intersection Summary

1: Marksheffel Rd & Meadowbrook Pkwy

2020 Adjusted Existing PM.syn

06/24/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	9	41	15	10	28	34	1167	59	33	773	107
Future Volume (veh/h)	144	9	41	15	10	28	34	1167	59	33	773	107
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	1841	1841	1841
Adj Flow Rate, veh/h	169	11	48	22	15	42	38	1297	66	38	889	123
Peak Hour Factor	0.85	0.85	0.85	0.67	0.67	0.67	0.90	0.90	0.90	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	4	4	4
Cap, veh/h	229	149	126	157	81	68	426	2646	1180	295	2605	1162
Arrive On Green	0.07	0.08	0.08	0.02	0.04	0.04	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	3456	1870	1585	1781	1870	1585	557	3554	1585	393	3497	1560
Grp Volume(v), veh/h	169	11	48	22	15	42	38	1297	66	38	889	123
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1781	1870	1585	557	1777	1585	393	1749	1560
Q Serve(g_s), s	5.8	0.7	3.4	1.4	0.9	3.1	3.0	17.6	1.3	5.2	10.4	2.6
Cycle Q Clear(g_c), s	5.8	0.7	3.4	1.4	0.9	3.1	13.4	17.6	1.3	22.8	10.4	2.6
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	229	149	126	157	81	68	426	2646	1180	295	2605	1162
V/C Ratio(X)	0.74	0.07	0.38	0.14	0.19	0.61	0.09	0.49	0.06	0.13	0.34	0.11
Avail Cap(c_a), veh/h	374	421	357	192	296	251	426	2646	1180	295	2605	1162
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	55.0	51.1	52.4	53.1	55.4	56.4	7.5	6.2	4.1	10.7	5.2	4.2
Incr Delay (d2), s/veh	4.6	0.2	1.9	0.4	1.1	8.6	0.4	0.7	0.1	0.9	0.4	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	2.7	0.3	1.4	0.6	0.5	1.4	0.4	6.0	0.4	0.5	3.5	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.6	51.4	54.3	53.5	56.5	65.0	8.0	6.8	4.2	11.6	5.6	4.4
LnGrp LOS	E	D	D	D	E	E	A	A	A	B	A	A
Approach Vol, veh/h	228			79			1401			1050		
Approach Delay, s/veh	58.1			60.2			6.7			5.7		
Approach LOS	E			E			A			A		
Timer - Assigned Phs	2			3			4			6		
Phs Duration (G+Y+Rc), s	95.9			8.6			15.5			95.9		
Change Period (Y+Rc), s	6.5			6.0			* 6			6.5		
Max Green Setting (Gmax), s	70.5			5.0			* 27			70.5		
Max Q Clear Time (g_c+I1), s	19.6			3.4			5.4			24.8		
Green Ext Time (p_c), s	15.5			0.0			0.1			9.5		
Intersection Summary												
HCM 6th Ctrl Delay	12.1											
HCM 6th LOS	B											
Notes												
























* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Timings

2025 Background AM.syn

1: Marksheffel Rd & Meadowbrook Pkwy

07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	10	35	35	20	25	30	725	15	10	1310	160
Future Volume (vph)	105	10	35	35	20	25	30	725	15	10	1310	160
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	11.0	24.0	24.0	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	15.0	28.0	28.0	11.0	24.0	24.0	81.0	81.0	81.0	81.0	81.0	81.0
Total Split (%)	12.5%	23.3%	23.3%	9.2%	20.0%	20.0%	67.5%	67.5%	67.5%	67.5%	67.5%	67.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	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 Lost Time (s)	5.0	5.0	5.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effect Green (s)	10.2	9.9	9.9	13.5	7.1	7.1	87.4	87.4	87.4	87.4	87.4	87.4
Actuated g/C Ratio	0.08	0.08	0.08	0.11	0.06	0.06	0.73	0.73	0.73	0.73	0.73	0.73
v/c Ratio	0.47	0.08	0.22	0.24	0.23	0.18	0.18	0.34	0.02	0.03	0.57	0.15
Control Delay	57.7	50.6	3.1	42.8	58.0	2.3	15.5	11.8	2.1	6.4	9.7	1.3
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	57.7	50.6	3.1	42.8	58.0	2.3	15.5	11.8	2.1	6.4	9.7	1.3
LOS	E	D	A	D	E	A	B	B	A	A	A	A
Approach Delay		44.4			33.7			11.7			8.8	
Approach LOS		D			C			B			A	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 89 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.57

Intersection Signal Delay: 13.0

Intersection LOS: B

Intersection Capacity Utilization 59.1%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Marksheffel Rd & Meadowbrook Pkwy



























HCM 6th Signalized Intersection Summary

1: Marksheffel Rd & Meadowbrook Pkwy

2025 Background AM.syn

07/13/2020

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	10	35	35	20	25	30	725	15	10	1310	160
Future Volume (veh/h)	105	10	35	35	20	25	30	725	15	10	1310	160
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	1752	1752	1752	1870	1870	1870	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	128	12	43	44	25	32	34	833	17	11	1424	174
Peak Hour Factor	0.82	0.82	0.82	0.79	0.79	0.79	0.87	0.87	0.87	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	2	2	2	7	7	7	6	6	6
Cap, veh/h	180	99	84	173	78	66	239	2584	1153	486	2605	1162
Arrive On Green	0.06	0.06	0.06	0.03	0.04	0.04	0.76	0.76	0.76	0.76	0.76	0.76
Sat Flow, veh/h	3237	1752	1485	1781	1870	1585	306	3413	1522	628	3441	1535
Grp Volume(v), veh/h	128	12	43	44	25	32	34	833	17	11	1424	174
Grp Sat Flow(s),veh/h/ln	1618	1752	1485	1781	1870	1585	306	1706	1522	628	1721	1535
Q Serve(g_s), s	4.7	0.8	3.4	2.8	1.6	2.4	6.2	9.4	0.3	0.7	20.6	3.7
Cycle Q Clear(g_c), s	4.7	0.8	3.4	2.8	1.6	2.4	26.8	9.4	0.3	10.1	20.6	3.7
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	180	99	84	173	78	66	239	2584	1153	486	2605	1162
V/C Ratio(X)	0.71	0.12	0.51	0.25	0.32	0.49	0.14	0.32	0.01	0.02	0.55	0.15
Avail Cap(c_a), veh/h	270	336	285	190	281	238	239	2584	1153	486	2605	1162
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	55.7	53.8	55.0	52.8	55.9	56.3	11.6	4.7	3.6	6.3	6.0	4.0
Incr Delay (d2), s/veh	5.1	0.5	4.7	0.8	2.4	5.5	1.2	0.3	0.0	0.1	0.8	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(50%),veh/ln	2.0	0.4	1.4	1.3	0.8	1.0	0.5	3.0	0.1	0.1	6.6	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.8	54.3	59.7	53.6	58.2	61.8	12.8	5.0	3.6	6.4	6.9	4.3
LnGrp LOS	E	D	E	D	E	E	B	A	A	A	A	A
Approach Vol, veh/h	183				101				884		1609	
Approach Delay, s/veh	60.1				57.3				5.3		6.6	
Approach LOS	E				E				A		A	
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	97.4		9.8	12.8		97.4		11.7	11.0			
Change Period (Y+Rc), s	6.5		6.0	* 6		6.5		5.0	6.0			
Max Green Setting (Gmax), s	74.5		5.0	* 23		74.5		10.0	18.0			
Max Q Clear Time (g_c+I1), s	28.8		4.8	5.4		22.6		6.7	4.4			
Green Ext Time (p_c), s	8.6		0.0	0.1		18.4		0.1	0.1			
Intersection Summary												
HCM 6th Ctrl Delay	11.5											
HCM 6th LOS	B											
Notes												

Timings

2025 Background PM.syn

1: Marksheffel Rd & Meadowbrook Pkwy

07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	10	45	20	15	30	40	1240	65	35	820	115
Future Volume (vph)	155	10	45	20	15	30	40	1240	65	35	820	115
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	11.0	24.0	24.0	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	18.0	31.0	31.0	11.0	24.0	24.0	78.0	78.0	78.0	78.0	78.0	78.0
Total Split (%)	15.0%	25.8%	25.8%	9.2%	20.0%	20.0%	65.0%	65.0%	65.0%	65.0%	65.0%	65.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	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 Lost Time (s)	5.0	5.0	5.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effect Green (s)	11.7	14.0	14.0	13.0	7.0	7.0	86.1	86.1	86.1	86.1	86.1	86.1
Actuated g/C Ratio	0.10	0.12	0.12	0.11	0.06	0.06	0.72	0.72	0.72	0.72	0.72	0.72
v/c Ratio	0.54	0.06	0.20	0.17	0.20	0.21	0.12	0.54	0.06	0.20	0.38	0.11
Control Delay	57.4	47.9	4.9	40.3	57.7	2.2	1.1	2.8	0.1	10.4	7.9	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.4	47.9	4.9	40.3	57.7	2.2	1.1	2.8	0.1	10.4	7.9	1.4
LOS	E	D	A	D	E	A	A	A	A	B	A	A
Approach Delay		45.7			26.5			2.6			7.2	
Approach LOS		D			C			A			A	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 81 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 8.7

Intersection LOS: A

Intersection Capacity Utilization 57.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Marksheffel Rd & Meadowbrook Pkwy


























HCM 6th Signalized Intersection Summary

1: Marksheffel Rd & Meadowbrook Pkwy

2025 Background PM.syn

07/13/2020

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	10	45	20	15	30	40	1240	65	35	820	115
Future Volume (veh/h)	155	10	45	20	15	30	40	1240	65	35	820	115
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	1841	1841	1841
Adj Flow Rate, veh/h	182	12	53	30	22	45	44	1378	72	40	943	132
Peak Hour Factor	0.85	0.85	0.85	0.67	0.67	0.67	0.90	0.90	0.90	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	4	4	4
Cap, veh/h	242	151	128	168	85	72	397	2625	1171	267	2583	1152
Arrive On Green	0.07	0.08	0.08	0.03	0.05	0.05	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	3456	1870	1585	1781	1870	1585	525	3554	1585	361	3497	1560
Grp Volume(v), veh/h	182	12	53	30	22	45	44	1378	72	40	943	132
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1781	1870	1585	525	1777	1585	361	1749	1560
Q Serve(g_s), s	6.2	0.7	3.8	1.9	1.4	3.3	3.9	19.9	1.5	6.4	11.6	2.9
Cycle Q Clear(g_c), s	6.2	0.7	3.8	1.9	1.4	3.3	15.5	19.9	1.5	26.2	11.6	2.9
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	242	151	128	168	85	72	397	2625	1171	267	2583	1152
V/C Ratio(X)	0.75	0.08	0.41	0.18	0.26	0.62	0.11	0.53	0.06	0.15	0.37	0.11
Avail Cap(c_a), veh/h	374	405	343	195	281	238	397	2625	1171	267	2583	1152
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	54.8	51.0	52.4	52.6	55.3	56.3	8.4	6.7	4.3	12.3	5.6	4.5
Incr Delay (d2), s/veh	4.6	0.2	2.1	0.5	1.6	8.6	0.6	0.8	0.1	1.2	0.4	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	2.9	0.3	1.6	0.9	0.7	1.5	0.5	6.8	0.5	0.6	3.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.4	51.2	54.6	53.1	56.9	64.8	9.0	7.5	4.4	13.5	6.0	4.7
LnGrp LOS	E	D	D	D	E	E	A	A	A	B	A	A
Approach Vol, veh/h	247			97			1494			1115		
Approach Delay, s/veh	58.0			59.4			7.3			6.1		
Approach LOS	E			E			A			A		
Timer - Assigned Phs	2			3			4			6		
Phs Duration (G+Y+Rc), s	95.1			9.2			15.7			95.1		
Change Period (Y+Rc), s	6.5			6.0			* 6			6.5		
Max Green Setting (Gmax), s	71.5			5.0			* 26			71.5		
Max Q Clear Time (g_c+I1), s	21.9			3.9			5.8			28.2		
Green Ext Time (p_c), s	17.2			0.0			0.2			10.4		
Intersection Summary												
HCM 6th Ctrl Delay	12.8											
HCM 6th LOS	B											
Notes												

Timings

2025 Total AM.syn

1: Marksheffel Rd & Meadowbrook Pkwy

07/16/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	10	35	35	20	25	30	800	15	10	1395	250
Future Volume (vph)	185	10	35	35	20	25	30	800	15	10	1395	250
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	11.0	24.0	24.0	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	19.0	31.0	31.0	12.0	24.0	24.0	77.0	77.0	77.0	77.0	77.0	77.0
Total Split (%)	15.8%	25.8%	25.8%	10.0%	20.0%	20.0%	64.2%	64.2%	64.2%	64.2%	64.2%	64.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	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 Lost Time (s)	5.0	5.0	5.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effect Green (s)	12.3	12.9	12.9	11.2	7.0	7.0	87.9	87.9	87.9	87.9	87.9	87.9
Actuated g/C Ratio	0.10	0.11	0.11	0.09	0.06	0.06	0.73	0.73	0.73	0.73	0.73	0.73
v/c Ratio	0.61	0.06	0.16	0.24	0.20	0.12	0.20	0.35	0.01	0.03	0.61	0.23
Control Delay	59.7	46.8	1.5	43.3	57.6	1.2	9.4	8.4	0.0	6.9	10.4	1.3
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	59.7	46.8	1.5	43.3	57.6	1.2	9.4	8.4	0.0	6.9	10.4	1.3
LOS	E	D	A	D	E	A	A	A	A	A	B	A
Approach Delay		50.3			33.9			8.3			9.0	
Approach LOS		D			C			A			A	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

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

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 12.9

Intersection LOS: B

Intersection Capacity Utilization 61.5%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Marksheffel Rd & Meadowbrook Pkwy






























HCM 6th Signalized Intersection Summary

1: Marksheffel Rd & Meadowbrook Pkwy

2025 Total AM.syn

07/16/2020

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 							 			 	
Traffic Volume (veh/h)	185	10	35	35	20	25	30	800	15	10	1395	250
Future Volume (veh/h)	185	10	35	35	20	25	30	800	15	10	1395	250
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	1752	1752	1752	1870	1870	1870	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	201	11	38	38	22	27	33	870	16	11	1516	272
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	2	2	2	7	7	7	6	6	6
Cap, veh/h	258	145	123	169	77	65	193	2502	1116	450	2523	1125
Arrive On Green	0.08	0.08	0.08	0.03	0.04	0.04	0.73	0.73	0.73	0.73	0.73	0.73
Sat Flow, veh/h	3237	1752	1485	1781	1870	1585	254	3413	1522	607	3441	1535
Grp Volume(v), veh/h	201	11	38	38	22	27	33	870	16	11	1516	272
Grp Sat Flow(s),veh/h/ln	1618	1752	1485	1781	1870	1585	254	1706	1522	607	1721	1535
Q Serve(g_s), s	7.3	0.7	2.9	2.4	1.4	2.0	8.5	11.0	0.3	0.8	25.2	6.9
Cycle Q Clear(g_c), s	7.3	0.7	2.9	2.4	1.4	2.0	33.7	11.0	0.3	11.7	25.2	6.9
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	258	145	123	169	77	65	193	2502	1116	450	2523	1125
V/C Ratio(X)	0.78	0.08	0.31	0.22	0.29	0.41	0.17	0.35	0.01	0.02	0.60	0.24
Avail Cap(c_a), veh/h	378	380	322	205	281	238	193	2502	1116	450	2523	1125
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	54.2	50.8	51.8	52.9	55.8	56.1	15.7	5.7	4.3	7.8	7.6	5.2
Incr Delay (d2), s/veh	6.2	0.2	1.4	0.7	2.0	4.1	1.9	0.4	0.0	0.1	1.1	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(50%),veh/ln	3.2	0.3	1.1	1.1	0.7	0.9	0.6	3.6	0.1	0.1	8.5	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.4	51.0	53.2	53.6	57.8	60.2	17.6	6.1	4.3	7.9	8.7	5.7
LnGrp LOS	E	D	D	D	E	E	B	A	A	A	A	A
Approach Vol, veh/h	250		87				919		1799			
Approach Delay, s/veh	58.9		56.7				6.5		8.2			
Approach LOS	E		E				A		A			
Timer - Assigned Phs	2		3		4		6		7		8	
Phs Duration (G+Y+Rc), s	94.5		9.6		15.9		94.5		14.6		10.9	
Change Period (Y+Rc), s	6.5		6.0		* 6		6.5		5.0		6.0	
Max Green Setting (Gmax), s	70.5		6.0		* 26		70.5		14.0		18.0	
Max Q Clear Time (g_c+I1), s	35.7		4.4		4.9		27.2		9.3		4.0	
Green Ext Time (p_c), s	8.8		0.0		0.1		19.9		0.3		0.1	
Intersection Summary												
HCM 6th Ctrl Delay	13.2											
HCM 6th LOS	B											
Notes												

Timings

2025 Total PM.syn

1: Marksheffel Rd & Meadowbrook Pkwy

07/16/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	10	45	20	15	30	40	1320	65	35	945	235
Future Volume (vph)	270	10	45	20	15	30	40	1320	65	35	945	235
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	11.0	24.0	24.0	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	25.0	34.0	34.0	15.0	24.0	24.0	71.0	71.0	71.0	71.0	71.0	71.0
Total Split (%)	20.8%	28.3%	28.3%	12.5%	20.0%	20.0%	59.2%	59.2%	59.2%	59.2%	59.2%	59.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	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 Lost Time (s)	5.0	5.0	5.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effect Green (s)	15.5	15.5	15.5	11.1	6.6	6.6	85.1	85.1	85.1	85.1	85.1	85.1
Actuated g/C Ratio	0.13	0.13	0.13	0.09	0.06	0.06	0.71	0.71	0.71	0.71	0.71	0.71
v/c Ratio	0.66	0.05	0.18	0.14	0.16	0.16	0.13	0.57	0.06	0.21	0.42	0.22
Control Delay	57.0	44.3	3.4	38.4	56.9	1.6	8.4	13.8	1.2	12.3	9.1	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	0.0
Total Delay	57.0	44.3	3.4	38.4	56.9	1.6	8.4	13.8	1.2	12.3	9.1	1.5
LOS	E	D	A	D	E	A	A	B	A	B	A	A
Approach Delay		49.2			25.5			13.1			7.7	
Approach LOS		D			C			B			A	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

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

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 15.1

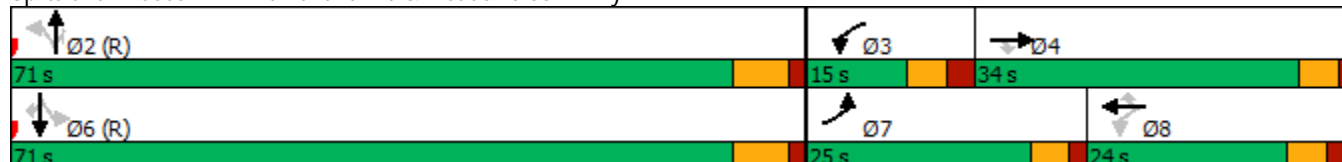
Intersection LOS: B

Intersection Capacity Utilization 62.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Marksheffel Rd & Meadowbrook Pkwy






























HCM 6th Signalized Intersection Summary

1: Marksheffel Rd & Meadowbrook Pkwy

2025 Total PM.syn

07/16/2020

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 							 			 	
Traffic Volume (veh/h)	270	10	45	20	15	30	40	1320	65	35	945	235
Future Volume (veh/h)	270	10	45	20	15	30	40	1320	65	35	945	235
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	1841	1841	1841
Adj Flow Rate, veh/h	293	11	49	22	16	33	43	1435	71	38	1027	255
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	4	4	4
Cap, veh/h	363	217	184	154	77	65	313	2516	1122	235	2477	1105
Arrive On Green	0.10	0.12	0.12	0.02	0.04	0.04	0.71	0.71	0.71	0.71	0.71	0.71
Sat Flow, veh/h	3456	1870	1585	1781	1870	1585	431	3554	1585	342	3497	1560
Grp Volume(v), veh/h	293	11	49	22	16	33	43	1435	71	38	1027	255
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1781	1870	1585	431	1777	1585	342	1749	1560
Q Serve(g_s), s	10.0	0.6	3.4	1.4	1.0	2.4	5.5	23.7	1.6	7.3	14.6	6.8
Cycle Q Clear(g_c), s	10.0	0.6	3.4	1.4	1.0	2.4	20.1	23.7	1.6	31.1	14.6	6.8
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	363	217	184	154	77	65	313	2516	1122	235	2477	1105
V/C Ratio(X)	0.81	0.05	0.27	0.14	0.21	0.51	0.14	0.57	0.06	0.16	0.41	0.23
Avail Cap(c_a), veh/h	576	452	383	249	281	238	313	2516	1122	235	2477	1105
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	52.5	47.2	48.4	53.4	55.6	56.3	11.4	8.6	5.4	16.2	7.2	6.1
Incr Delay (d2), s/veh	4.6	0.1	0.8	0.4	1.3	6.0	0.9	0.9	0.1	1.5	0.5	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(50%),veh/ln	4.5	0.3	1.4	0.6	0.5	1.1	0.6	8.6	0.5	0.7	5.2	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.1	47.3	49.1	53.8	57.0	62.3	12.3	9.5	5.5	17.7	7.8	6.6
LnGrp LOS	E	D	D	D	E	E	B	A	A	B	A	A
Approach Vol, veh/h	353					71		1549		1320		
Approach Delay, s/veh	55.7					58.5		9.4		7.8		
Approach LOS	E					E		A		A		
Timer - Assigned Phs	2		3		4		6		7		8	
Phs Duration (G+Y+Rc), s	91.5		8.6		19.9		91.5		17.6		10.9	
Change Period (Y+Rc), s	6.5		6.0		* 6		6.5		5.0		6.0	
Max Green Setting (Gmax), s	64.5		9.0		* 29		64.5		20.0		18.0	
Max Q Clear Time (g_c+I1), s	25.7		3.4		5.4		33.1		12.0		4.4	
Green Ext Time (p_c), s	17.0		0.0		0.2		11.3		0.6		0.1	
Intersection Summary												
HCM 6th Ctrl Delay			14.8									
HCM 6th LOS			B									
Notes												

Timings

2040 Background AM.syn

1: Marksheffel Rd & Meadowbrook Pkwy

07/16/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	10	40	45	25	30	35	865	20	10	1560	195
Future Volume (vph)	120	10	40	45	25	30	35	865	20	10	1560	195
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	11.0	24.0	24.0	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	15.0	27.0	27.0	13.0	25.0	25.0	80.0	80.0	80.0	80.0	80.0	80.0
Total Split (%)	12.5%	22.5%	22.5%	10.8%	20.8%	20.8%	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	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 Lost Time (s)	5.0	5.0	5.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effect Green (s)	9.3	9.7	9.7	13.0	7.3	7.3	88.2	88.2	88.2	88.2	88.2	88.2
Actuated g/C Ratio	0.08	0.08	0.08	0.11	0.06	0.06	0.74	0.74	0.74	0.74	0.74	0.74
v/c Ratio	0.53	0.08	0.22	0.28	0.24	0.19	0.29	0.38	0.02	0.03	0.68	0.18
Control Delay	61.1	50.9	3.2	45.1	58.2	2.3	14.8	8.7	0.9	5.9	11.1	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	61.1	50.9	3.2	45.1	58.2	2.3	14.8	8.7	0.9	5.9	11.1	1.1
LOS	E	D	A	D	E	A	B	A	A	A	B	A
Approach Delay		47.0			35.4			8.8			9.9	
Approach LOS		D			D			A			A	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

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

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 12.6

Intersection LOS: B

Intersection Capacity Utilization 66.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Marksheffel Rd & Meadowbrook Pkwy






























HCM 6th Signalized Intersection Summary

1: Marksheffel Rd & Meadowbrook Pkwy

2040 Background AM.syn

07/16/2020

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 							 			 	
Traffic Volume (veh/h)	120	10	40	45	25	30	35	865	20	10	1560	195
Future Volume (veh/h)	120	10	40	45	25	30	35	865	20	10	1560	195
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	1752	1752	1752	1870	1870	1870	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	130	11	43	49	27	33	38	940	22	11	1696	212
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	2	2	2	7	7	7	6	6	6
Cap, veh/h	182	96	82	177	78	66	178	2582	1151	435	2603	1161
Arrive On Green	0.06	0.05	0.05	0.03	0.04	0.04	0.76	0.76	0.76	0.76	0.76	0.76
Sat Flow, veh/h	3237	1752	1485	1781	1870	1585	226	3413	1522	565	3441	1535
Grp Volume(v), veh/h	130	11	43	49	27	33	38	940	22	11	1696	212
Grp Sat Flow(s),veh/h/ln	1618	1752	1485	1781	1870	1585	226	1706	1522	565	1721	1535
Q Serve(g_s), s	4.7	0.7	3.4	3.1	1.7	2.4	11.6	11.1	0.4	0.8	28.4	4.7
Cycle Q Clear(g_c), s	4.7	0.7	3.4	3.1	1.7	2.4	40.0	11.1	0.4	11.9	28.4	4.7
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	182	96	82	177	78	66	178	2582	1151	435	2603	1161
V/C Ratio(X)	0.71	0.11	0.53	0.28	0.35	0.50	0.21	0.36	0.02	0.03	0.65	0.18
Avail Cap(c_a), veh/h	270	321	272	220	296	251	178	2582	1151	435	2603	1161
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	55.7	53.9	55.2	52.7	55.9	56.3	16.6	4.9	3.6	6.9	7.0	4.1
Incr Delay (d2), s/veh	5.1	0.5	5.2	0.8	2.7	5.8	2.7	0.4	0.0	0.1	1.3	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(50%),veh/ln	2.1	0.3	1.4	1.4	0.9	1.1	0.7	3.5	0.1	0.1	9.2	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.8	54.5	60.4	53.5	58.6	62.1	19.4	5.3	3.6	7.0	8.3	4.5
LnGrp LOS	E	D	E	D	E	E	B	A	A	A	A	A
Approach Vol, veh/h	184			109			1000			1919		
Approach Delay, s/veh	60.3			57.4			5.8			7.9		
Approach LOS	E			E			A			A		
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	97.3		10.1	12.6		97.3	11.8	11.0				
Change Period (Y+Rc), s	6.5		6.0	* 6		6.5	5.0	6.0				
Max Green Setting (Gmax), s	73.5		7.0	* 22		73.5	10.0	19.0				
Max Q Clear Time (g_c+I1), s	42.0		5.1	5.4		30.4	6.7	4.4				
Green Ext Time (p_c), s	9.8		0.0	0.1		22.9	0.1	0.1				
Intersection Summary												
HCM 6th Ctrl Delay	11.9											
HCM 6th LOS	B											
Notes												

Timings

2040 Background PM.syn

1: Marksheffel Rd & Meadowbrook Pkwy

07/16/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	15	55	20	15	40	45	1470	75	45	975	140
Future Volume (vph)	185	15	55	20	15	40	45	1470	75	45	975	140
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	11.0	24.0	24.0	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	18.0	28.0	28.0	14.0	24.0	24.0	78.0	78.0	78.0	78.0	78.0	78.0
Total Split (%)	15.0%	23.3%	23.3%	11.7%	20.0%	20.0%	65.0%	65.0%	65.0%	65.0%	65.0%	65.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	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 Lost Time (s)	5.0	5.0	5.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effect Green (s)	11.8	14.1	14.1	12.2	6.6	6.6	86.4	86.4	86.4	86.4	86.4	86.4
Actuated g/C Ratio	0.10	0.12	0.12	0.10	0.06	0.06	0.72	0.72	0.72	0.72	0.72	0.72
v/c Ratio	0.60	0.07	0.23	0.14	0.16	0.26	0.15	0.63	0.07	0.34	0.42	0.13
Control Delay	59.3	48.7	6.5	40.4	56.9	4.3	9.3	12.0	3.8	15.9	8.1	1.3
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	59.3	48.7	6.5	40.4	56.9	4.3	9.3	12.0	3.8	15.9	8.1	1.3
LOS	E	D	A	D	E	A	A	B	A	B	A	A
Approach Delay		47.3			24.5			11.5			7.6	
Approach LOS		D			C			B			A	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

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

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 13.3

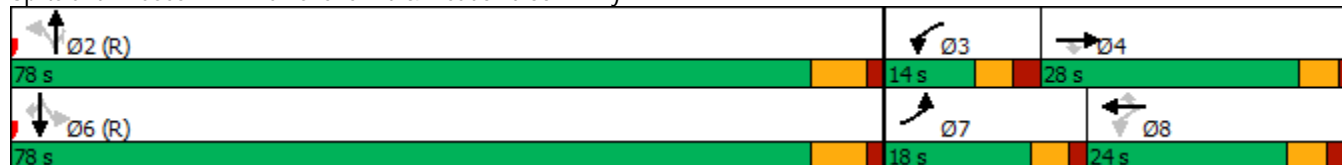
Intersection LOS: B

Intersection Capacity Utilization 64.7%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Marksheffel Rd & Meadowbrook Pkwy



























HCM 6th Signalized Intersection Summary

1: Marksheffel Rd & Meadowbrook Pkwy

2040 Background PM.syn

07/16/2020

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	185	15	55	20	15	40	45	1470	75	45	975	140
Future Volume (veh/h)	185	15	55	20	15	40	45	1470	75	45	975	140
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	1841	1841	1841
Adj Flow Rate, veh/h	201	16	60	22	16	43	49	1598	82	49	1060	152
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	4	4	4
Cap, veh/h	261	168	142	157	82	70	345	2610	1164	210	2569	1146
Arrive On Green	0.08	0.09	0.09	0.02	0.04	0.04	0.73	0.73	0.73	0.73	0.73	0.73
Sat Flow, veh/h	3456	1870	1585	1781	1870	1585	461	3554	1585	289	3497	1560
Grp Volume(v), veh/h	201	16	60	22	16	43	49	1598	82	49	1060	152
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1781	1870	1585	461	1777	1585	289	1749	1560
Q Serve(g_s), s	6.9	0.9	4.3	1.4	1.0	3.2	5.4	26.0	1.7	11.8	13.9	3.4
Cycle Q Clear(g_c), s	6.9	0.9	4.3	1.4	1.0	3.2	19.3	26.0	1.7	37.8	13.9	3.4
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	261	168	142	157	82	70	345	2610	1164	210	2569	1146
V/C Ratio(X)	0.77	0.10	0.42	0.14	0.19	0.62	0.14	0.61	0.07	0.23	0.41	0.13
Avail Cap(c_a), veh/h	374	358	304	237	281	238	345	2610	1164	210	2569	1146
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	54.4	50.2	51.7	53.0	55.3	56.4	9.7	7.7	4.5	16.8	6.1	4.7
Incr Delay (d2), s/veh	5.9	0.2	2.0	0.4	1.1	8.6	0.9	1.1	0.1	2.6	0.5	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	3.2	0.5	1.8	0.6	0.5	1.4	0.6	9.0	0.6	0.9	4.7	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.4	50.4	53.7	53.4	56.5	64.9	10.6	8.8	4.6	19.4	6.6	4.9
LnGrp LOS	E	D	D	D	E	E	B	A	A	B	A	A
Approach Vol, veh/h		277			81			1729			1261	
Approach Delay, s/veh		58.3			60.1			8.6			6.9	
Approach LOS		E			E			A			A	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		94.6	8.6	16.8		94.6	14.1	11.3				
Change Period (Y+Rc), s		6.5	6.0	* 6		6.5	5.0	6.0				
Max Green Setting (Gmax), s		71.5	8.0	* 23		71.5	13.0	18.0				
Max Q Clear Time (g_c+I1), s		28.0	3.4	6.3		39.8	8.9	5.2				
Green Ext Time (p_c), s		21.0	0.0	0.2		11.8	0.2	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			13.3									
HCM 6th LOS			B									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Timings

2040 Total AM.syn

1: Marksheffel Rd & Meadowbrook Pkwy

07/16/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	10	40	45	25	30	35	940	20	10	1645	285
Future Volume (vph)	200	10	40	45	25	30	35	940	20	10	1645	285
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	11.0	24.0	24.0	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	21.0	29.0	29.0	16.0	24.0	24.0	75.0	75.0	75.0	75.0	75.0	75.0
Total Split (%)	17.5%	24.2%	24.2%	13.3%	20.0%	20.0%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	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 Lost Time (s)	5.0	5.0	5.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effect Green (s)	13.2	12.5	12.5	14.1	7.3	7.3	84.3	84.3	84.3	84.3	84.3	84.3
Actuated g/C Ratio	0.11	0.10	0.10	0.12	0.06	0.06	0.70	0.70	0.70	0.70	0.70	0.70
v/c Ratio	0.62	0.06	0.19	0.26	0.24	0.19	0.40	0.43	0.02	0.04	0.75	0.27
Control Delay	58.7	47.8	2.4	40.6	58.2	2.3	30.1	11.2	1.1	7.8	15.1	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	0.0
Total Delay	58.7	47.8	2.4	40.6	58.2	2.3	30.1	11.2	1.1	7.8	15.1	1.5
LOS	E	D	A	D	E	A	C	B	A	A	B	A
Approach Delay		49.4			33.4			11.7			13.1	
Approach LOS		D			C			B			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

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

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 16.0

Intersection LOS: B

Intersection Capacity Utilization 68.4%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Marksheffel Rd & Meadowbrook Pkwy






























HCM 6th Signalized Intersection Summary

2040 Total AM.syn

1: Marksheffel Rd & Meadowbrook Pkwy

07/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 							 			 	
Traffic Volume (veh/h)	200	10	40	45	25	30	35	940	20	10	1645	285
Future Volume (veh/h)	200	10	40	45	25	30	35	940	20	10	1645	285
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	1752	1752	1752	1870	1870	1870	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	217	11	43	49	27	33	38	1022	22	11	1788	310
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	2	2	2	7	7	7	6	6	6
Cap, veh/h	276	147	125	178	78	66	141	2482	1107	380	2503	1116
Arrive On Green	0.09	0.08	0.08	0.03	0.04	0.04	0.73	0.73	0.73	0.73	0.73	0.73
Sat Flow, veh/h	3237	1752	1485	1781	1870	1585	188	3413	1522	523	3441	1535
Grp Volume(v), veh/h	217	11	43	49	27	33	38	1022	22	11	1788	310
Grp Sat Flow(s),veh/h/ln	1618	1752	1485	1781	1870	1585	188	1706	1522	523	1721	1535
Q Serve(g_s), s	7.9	0.7	3.3	3.1	1.7	2.4	17.3	14.0	0.5	1.0	35.4	8.3
Cycle Q Clear(g_c), s	7.9	0.7	3.3	3.1	1.7	2.4	52.7	14.0	0.5	15.0	35.4	8.3
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	276	147	125	178	78	66	141	2482	1107	380	2503	1116
V/C Ratio(X)	0.79	0.07	0.35	0.28	0.35	0.50	0.27	0.41	0.02	0.03	0.71	0.28
Avail Cap(c_a), veh/h	432	350	297	264	281	238	141	2482	1107	380	2503	1116
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	53.8	50.7	51.9	52.7	55.9	56.3	24.2	6.4	4.5	9.3	9.3	5.6
Incr Delay (d2), s/veh	5.0	0.2	1.6	0.8	2.7	5.8	4.6	0.5	0.0	0.1	1.8	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(50%),veh/ln	3.4	0.3	1.3	1.4	0.9	1.1	0.9	4.7	0.1	0.1	12.2	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.8	50.9	53.5	53.5	58.6	62.1	28.9	6.9	4.6	9.4	11.1	6.2
LnGrp LOS	E	D	D	D	E	E	C	A	A	A	B	A
Approach Vol, veh/h	271			109			1082			2109		
Approach Delay, s/veh	57.6			57.4			7.6			10.3		
Approach LOS	E			E			A			B		
Timer - Assigned Phs	2			3			4			6		
Phs Duration (G+Y+Rc), s	93.8			10.2			16.1			93.8		
Change Period (Y+Rc), s	6.5			6.0			* 6			6.5		
Max Green Setting (Gmax), s	68.5			10.0			* 24			68.5		
Max Q Clear Time (g_c+I1), s	54.7			5.1			5.3			37.4		
Green Ext Time (p_c), s	7.3			0.0			0.1			20.8		
Intersection Summary												
HCM 6th Ctrl Delay	14.5											
HCM 6th LOS	B											
Notes												

























* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Timings

2040 Total PM.syn

1: Marksheffel Rd & Meadowbrook Pkwy

07/16/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	300	15	55	20	15	40	45	1550	75	45	1100	260
Future Volume (vph)	300	15	55	20	15	40	45	1550	75	45	1100	260
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	11.0	24.0	24.0	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	28.0	30.0	30.0	22.0	24.0	24.0	68.0	68.0	68.0	68.0	68.0	68.0
Total Split (%)	23.3%	25.0%	25.0%	18.3%	20.0%	20.0%	56.7%	56.7%	56.7%	56.7%	56.7%	56.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.5	1.5	1.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	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 Lost Time (s)	5.0	5.0	5.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effect Green (s)	16.6	18.9	18.9	12.2	6.6	6.6	81.6	81.6	81.6	81.6	81.6	81.6
Actuated g/C Ratio	0.14	0.16	0.16	0.10	0.06	0.06	0.68	0.68	0.68	0.68	0.68	0.68
v/c Ratio	0.69	0.05	0.19	0.13	0.16	0.20	0.20	0.70	0.07	0.47	0.51	0.25
Control Delay	56.7	43.1	5.2	36.4	56.9	2.1	12.4	18.0	1.2	31.5	11.4	1.6
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	56.7	43.1	5.2	36.4	56.9	2.1	12.4	18.0	1.2	31.5	11.4	1.6
LOS	E	D	A	D	E	A	B	B	A	C	B	A
Approach Delay		48.4			22.3			17.1			10.2	
Approach LOS		D			C			B			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

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

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 17.8

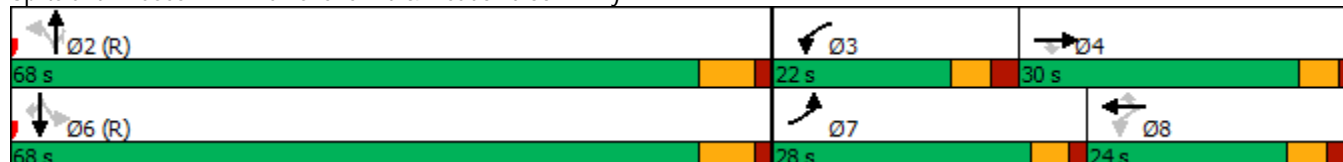
Intersection LOS: B

Intersection Capacity Utilization 70.2%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Marksheffel Rd & Meadowbrook Pkwy






























HCM 6th Signalized Intersection Summary

2040 Total PM.syn

1: Marksheffel Rd & Meadowbrook Pkwy

07/16/2020























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 							 			 	
Traffic Volume (veh/h)	300	15	55	20	15	40	45	1550	75	45	1100	260
Future Volume (veh/h)	300	15	55	20	15	40	45	1550	75	45	1100	260
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	1841	1841	1841
Adj Flow Rate, veh/h	326	16	60	22	16	43	49	1685	82	49	1196	283
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	4	4	4
Cap, veh/h	400	242	205	157	82	70	251	2468	1101	171	2429	1083
Arrive On Green	0.12	0.13	0.13	0.02	0.04	0.04	0.69	0.69	0.69	0.69	0.69	0.69
Sat Flow, veh/h	3456	1870	1585	1781	1870	1585	357	3554	1585	266	3497	1560
Grp Volume(v), veh/h	326	16	60	22	16	43	49	1685	82	49	1196	283
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1781	1870	1585	357	1777	1585	266	1749	1560
Q Serve(g_s), s	11.1	0.9	4.1	1.4	1.0	3.2	8.9	33.1	2.0	15.7	19.0	8.1
Cycle Q Clear(g_c), s	11.1	0.9	4.1	1.4	1.0	3.2	27.9	33.1	2.0	48.8	19.0	8.1
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	400	242	205	157	82	70	251	2468	1101	171	2429	1083
V/C Ratio(X)	0.82	0.07	0.29	0.14	0.19	0.62	0.19	0.68	0.07	0.29	0.49	0.26
Avail Cap(c_a), veh/h	662	390	330	356	281	238	251	2468	1101	171	2429	1083
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	51.8	45.8	47.2	53.0	55.3	56.4	15.0	10.6	5.9	24.8	8.5	6.8
Incr Delay (d2), s/veh	4.1	0.1	0.8	0.4	1.1	8.6	1.7	1.6	0.1	4.1	0.7	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(50%),veh/ln	5.0	0.4	1.7	0.6	0.5	1.4	0.8	12.2	0.7	1.2	6.9	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.9	46.0	48.0	53.4	56.5	64.9	16.7	12.2	6.0	29.0	9.2	7.4
LnGrp LOS	E	D	D	D	E	E	B	B	A	C	A	A
Approach Vol, veh/h		402			81			1816			1528	
Approach Delay, s/veh		54.3			60.1			12.0			9.5	
Approach LOS		D			E			B			A	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		89.8	8.6	21.6		89.8	18.9	11.3				
Change Period (Y+Rc), s		6.5	6.0	* 6		6.5	5.0	6.0				
Max Green Setting (Gmax), s		61.5	16.0	* 25		61.5	23.0	18.0				
Max Q Clear Time (g_c+I1), s		35.1	3.4	6.1		50.8	13.1	5.2				
Green Ext Time (p_c), s		17.2	0.0	0.2		7.3	0.8	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			16.5									
HCM 6th LOS			B									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Timings

2: US-24 & Marksheffel Rd

2020 Adjusted Existing AM.syn

06/24/2020

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	8	629	626	1	403	48	298	432	251	984	16
Future Volume (vph)	8	629	626	1	403	48	298	432	251	984	16
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases			Free			Free			6		Free
Detector Phase	7	4		3	8		5	2	1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	
Minimum Split (s)	10.5	10.5		11.5	11.5		12.0	12.0	12.0	12.0	
Total Split (s)	10.5	44.5		11.5	45.5		31.0	41.0	23.0	33.0	
Total Split (%)	8.8%	37.1%		9.6%	37.9%		25.8%	34.2%	19.2%	27.5%	
Yellow Time (s)	4.5	4.5		5.0	5.0		5.5	5.5	5.5	5.5	
All-Red Time (s)	1.0	1.0		1.5	1.5		1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.5	6.5		7.0	7.0	7.0	7.0	
Lead/Lag	Lag	Lead		Lag	Lead		Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max	None	C-Max	
Act Effect Green (s)	8.1	30.5	120.0	5.6	27.6	120.0	17.4	54.3	63.2	50.1	120.0
Actuated g/C Ratio	0.07	0.25	1.00	0.05	0.23	1.00	0.14	0.45	0.53	0.42	1.00
v/c Ratio	0.08	0.78	0.44	0.01	0.55	0.03	0.70	0.32	0.48	0.72	0.01
Control Delay	42.2	40.0	1.5	49.0	30.1	0.0	50.3	43.0	16.2	34.7	0.0
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	42.2	40.0	1.5	49.0	30.1	0.0	50.3	43.0	16.2	34.7	0.0
LOS	D	D	A	D	C	A	D	D	B	C	A
Approach Delay		20.9			27.0			46.0		30.6	
Approach LOS		C			C			D		C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 97 (81%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 29.9

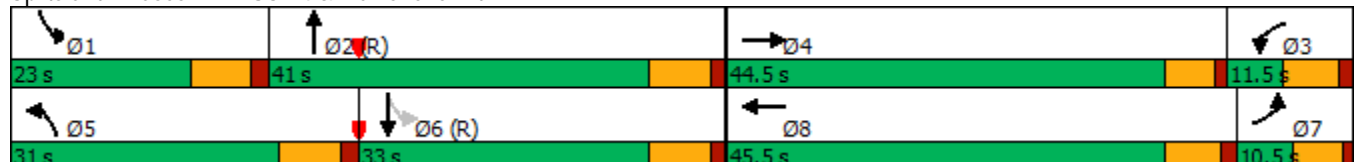
Intersection LOS: C

Intersection Capacity Utilization 69.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 2: US-24 & Marksheffel Rd



























HCM 6th Signalized Intersection Summary

2: US-24 & Marksheffel Rd

2020 Adjusted Existing AM.syn

06/24/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	629	626	1	403	48	298	432	0	251	984	16
Future Volume (veh/h)	8	629	626	1	403	48	298	432	0	251	984	16
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	1811	1811	1811	1856	1856	1856	1737	1737	1737	1841	1841	1841
Adj Flow Rate, veh/h	9	676	0	1	443	0	320	465	0	267	1047	0
Peak Hour Factor	0.93	0.93	0.93	0.91	0.91	0.91	0.93	0.93	0.93	0.94	0.94	0.94
Percent Heavy Veh, %	6	6	6	3	3	3	11	11	11	4	4	4
Cap, veh/h	118	816		2	570		388	1456		561	1483	
Arrive On Green	0.07	0.24	0.00	0.00	0.16	0.00	0.12	0.44	0.00	0.10	0.42	0.00
Sat Flow, veh/h	1725	3441	1535	1767	3526	1572	3209	3300	1472	1753	3497	1560
Grp Volume(v), veh/h	9	676	0	1	443	0	320	465	0	267	1047	0
Grp Sat Flow(s),veh/h/ln	1725	1721	1535	1767	1763	1572	1605	1650	1472	1753	1749	1560
Q Serve(g_s), s	0.6	22.4	0.0	0.1	14.5	0.0	11.7	11.0	0.0	10.2	29.5	0.0
Cycle Q Clear(g_c), s	0.6	22.4	0.0	0.1	14.5	0.0	11.7	11.0	0.0	10.2	29.5	0.0
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	118	816		2	570		388	1456		561	1483	
V/C Ratio(X)	0.08	0.83		0.41	0.78		0.82	0.32		0.48	0.71	
Avail Cap(c_a), veh/h	118	1118		74	1146		642	1456		613	1483	
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	52.4	43.5	0.0	59.9	48.2	0.0	51.5	21.8	0.0	16.3	28.4	0.0
Incr Delay (d2), s/veh	0.3	3.9	0.0	85.9	2.3	0.0	4.4	0.6	0.0	0.6	2.9	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	0.3	9.9	0.0	0.1	6.5	0.0	4.9	4.4	0.0	4.1	12.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.6	47.3	0.0	145.8	50.5	0.0	55.9	22.4	0.0	16.9	31.3	0.0
LnGrp LOS	D	D		F	D		E	C		B	C	
Approach Vol, veh/h	685		A	444		A	785		A	1314		A
Approach Delay, s/veh	47.4			50.7			36.1			28.3		
Approach LOS	D			D			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.5	59.9	6.7	33.9	21.5	57.9	14.7	25.9				
Change Period (Y+Rc), s	7.0	7.0	6.5	5.5	7.0	7.0	6.5	* 6.5				
Max Green Setting (Gmax), s	16.0	34.0	5.0	39.0	24.0	26.0	5.0	* 39				
Max Q Clear Time (g_c+I1), s	12.2	13.0	2.1	24.4	13.7	31.5	2.6	16.5				
Green Ext Time (p_c), s	0.3	3.1	0.0	4.1	0.8	0.0	0.0	3.0				

Intersection Summary

HCM 6th Ctrl Delay 37.3

HCM 6th LOS D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

























Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

2: US-24 & Marksheffel Rd

2020 Adjusted Existing PM.syn

06/24/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	451	385	10	677	145	507	897	6	114	428	12
Future Volume (vph)	13	451	385	10	677	145	507	897	6	114	428	12
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.5	10.5		11.5	11.5		12.0	12.0		12.0	12.0	
Total Split (s)	10.5	49.5		11.5	50.5		44.0	47.0		12.0	15.0	
Total Split (%)	8.8%	41.3%		9.6%	42.1%		36.7%	39.2%		10.0%	12.5%	
Yellow Time (s)	4.5	4.5		5.0	5.0		5.5	5.5		5.5	5.5	
All-Red Time (s)	1.0	1.0		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.5	6.5		7.0	7.0		7.0	7.0	
Lead/Lag	Lag	Lead		Lag	Lead		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	6.6	34.2	120.0	8.5	32.9	120.0	26.1	51.9	120.0	44.7	35.2	120.0
Actuated g/C Ratio	0.06	0.28	1.00	0.07	0.27	1.00	0.22	0.43	1.00	0.37	0.29	1.00
v/c Ratio	0.15	0.50	0.27	0.09	0.77	0.10	0.79	0.69	0.00	0.45	0.45	0.01
Control Delay	50.7	36.6	0.6	35.8	34.9	0.1	39.5	49.1	0.0	28.1	40.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.7	36.6	0.6	35.8	34.9	0.1	39.5	49.1	0.0	28.1	40.0	0.0
LOS	D	D	A	D	C	A	D	D	A	C	D	A
Approach Delay		20.5			28.8			45.5			36.7	
Approach LOS		C			C			D			D	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 97 (81%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 34.5

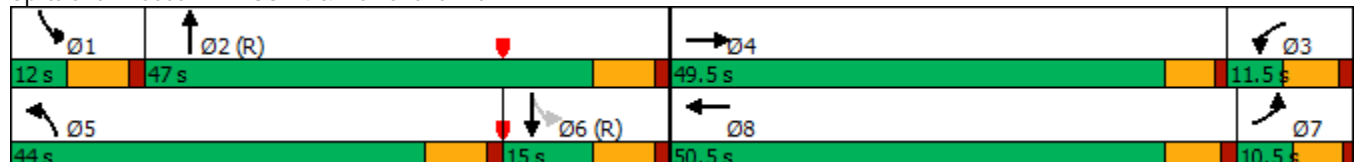
Intersection LOS: C

Intersection Capacity Utilization 66.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 2: US-24 & Marksheffel Rd



























HCM 6th Signalized Intersection Summary

2: US-24 & Marksheffel Rd

2020 Adjusted Existing PM.syn

06/24/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	451	385	10	677	145	507	897	6	114	428	12
Future Volume (veh/h)	13	451	385	10	677	145	507	897	6	114	428	12
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	1811	1811	1811	1856	1856	1856	1737	1737	1737	1841	1841	1841
Adj Flow Rate, veh/h	14	485	0	11	744	0	545	965	0	121	455	0
Peak Hour Factor	0.93	0.93	0.93	0.91	0.91	0.91	0.93	0.93	0.93	0.94	0.94	0.94
Percent Heavy Veh, %	6	6	6	3	3	3	11	11	11	4	4	4
Cap, veh/h	27	619		179	906		631	1521		269	1070	
Arrive On Green	0.02	0.18	0.00	0.10	0.26	0.00	0.20	0.46	0.00	0.04	0.31	0.00
Sat Flow, veh/h	1725	3441	1535	1767	3526	1572	3209	3300	1472	1753	3497	1560
Grp Volume(v), veh/h	14	485	0	11	744	0	545	965	0	121	455	0
Grp Sat Flow(s),veh/h/ln	1725	1721	1535	1767	1763	1572	1605	1650	1472	1753	1749	1560
Q Serve(g_s), s	1.0	16.1	0.0	0.7	23.9	0.0	19.7	26.7	0.0	5.0	12.5	0.0
Cycle Q Clear(g_c), s	1.0	16.1	0.0	0.7	23.9	0.0	19.7	26.7	0.0	5.0	12.5	0.0
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	27	619		179	906		631	1521		269	1070	
V/C Ratio(X)	0.52	0.78		0.06	0.82		0.86	0.63		0.45	0.43	
Avail Cap(c_a), veh/h	72	1262		179	1293		990	1521		269	1070	
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	58.6	47.0	0.0	48.8	42.0	0.0	46.7	24.6	0.0	28.8	33.2	0.0
Incr Delay (d2), s/veh	14.8	2.2	0.0	0.1	2.9	0.0	5.0	2.0	0.0	1.2	1.2	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	0.5	7.1	0.0	0.3	10.7	0.0	8.3	10.7	0.0	0.5	5.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.5	49.2	0.0	48.9	44.9	0.0	51.6	26.7	0.0	30.0	34.5	0.0
LnGrp LOS	E	D		D	D		D	C		C	C	
Approach Vol, veh/h	499		A	755		A	1510		A	576		A
Approach Delay, s/veh	49.9			45.0			35.7			33.5		
Approach LOS	D			D			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.0	62.3	18.6	27.1	30.6	43.7	8.4	37.3				
Change Period (Y+Rc), s	7.0	7.0	6.5	5.5	7.0	7.0	6.5	* 6.5				
Max Green Setting (Gmax), s	5.0	40.0	5.0	44.0	37.0	8.0	5.0	* 44				
Max Q Clear Time (g_c+I1), s	7.0	28.7	2.7	18.1	21.7	14.5	3.0	25.9				
Green Ext Time (p_c), s	0.0	5.2	0.0	3.4	1.9	0.0	0.0	5.0				

Intersection Summary

HCM 6th Ctrl Delay 39.5

HCM 6th LOS D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.























Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

2025 Background AM.syn

2: US-24 & Marksheffel Rd









07/13/2020

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	10	670	665	5	430	55	320	460	270	1045	20
Future Volume (vph)	10	670	665	5	430	55	320	460	270	1045	20
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases			Free			Free			6		Free
Detector Phase	7	4		3	8		5	2	1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	
Minimum Split (s)	10.5	10.5		11.5	11.5		12.0	12.0	12.0	12.0	
Total Split (s)	22.0	46.5		11.5	36.0		33.0	37.0	25.0	29.0	
Total Split (%)	18.3%	38.8%		9.6%	30.0%		27.5%	30.8%	20.8%	24.2%	
Yellow Time (s)	4.5	4.5		5.0	5.0		5.5	5.5	5.5	5.5	
All-Red Time (s)	1.0	1.0		1.5	1.5		1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.5	6.5		7.0	7.0	7.0	7.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max	None	C-Max	
Act Effect Green (s)	6.4	32.6	120.0	5.8	31.4	120.0	18.3	51.1	61.4	47.1	120.0
Actuated g/C Ratio	0.05	0.27	1.00	0.05	0.26	1.00	0.15	0.43	0.51	0.39	1.00
v/c Ratio	0.12	0.78	0.47	0.06	0.52	0.04	0.72	0.36	0.54	0.82	0.01
Control Delay	54.4	39.1	1.7	42.4	25.9	0.0	50.2	48.6	18.6	40.0	0.0
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	54.4	39.1	1.7	42.4	25.9	0.0	50.2	48.6	18.6	40.0	0.0
LOS	D	D	A	D	C	A	D	D	B	D	A
Approach Delay		20.7			23.2			49.2		35.1	
Approach LOS		C			C			D		D	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 96 (80%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 31.5
Intersection Capacity Utilization 72.8%
Analysis Period (min) 15
Intersection LOS: C
ICU Level of Service C

Splits and Phases: 2: US-24 & Marksheffel Rd

























 Ø1	 Ø2(R)	 Ø4	 Ø3
25 s	37 s	46.5 s	11.5 s
 Ø5	 Ø6(R)	 Ø7	 Ø8
33 s	29 s	22 s	36 s

HCM 6th Signalized Intersection Summary

2: US-24 & Marksheffel Rd

2025 Background AM.syn

























07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	670	665	5	430	55	320	460	0	270	1045	20
Future Volume (veh/h)	10	670	665	5	430	55	320	460	0	270	1045	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	1811	1811	1811	1856	1856	1856	1737	1737	1737	1841	1841	1841
Adj Flow Rate, veh/h	11	720	0	5	473	0	344	495	0	287	1112	0
Peak Hour Factor	0.93	0.93	0.93	0.91	0.91	0.91	0.93	0.93	0.93	0.94	0.94	0.94
Percent Heavy Veh, %	6	6	6	3	3	3	11	11	11	4	4	4
Cap, veh/h	22	866		11	865		415	1353		534	1385	
Arrive On Green	0.01	0.25	0.00	0.01	0.25	0.00	0.13	0.41	0.00	0.12	0.40	0.00
Sat Flow, veh/h	1725	3441	1535	1767	3526	1572	3209	3300	1472	1753	3497	1560
Grp Volume(v), veh/h	11	720	0	5	473	0	344	495	0	287	1112	0
Grp Sat Flow(s),veh/h/ln	1725	1721	1535	1767	1763	1572	1605	1650	1472	1753	1749	1560
Q Serve(g_s), s	0.8	23.8	0.0	0.3	14.0	0.0	12.5	12.5	0.0	11.5	33.8	0.0
Cycle Q Clear(g_c), s	0.8	23.8	0.0	0.3	14.0	0.0	12.5	12.5	0.0	11.5	33.8	0.0
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	22	866		11	865		415	1353		534	1385	
V/C Ratio(X)	0.50	0.83		0.44	0.55		0.83	0.37		0.54	0.80	
Avail Cap(c_a), veh/h	237	1176		74	867		695	1353		594	1385	
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	58.9	42.5	0.0	59.4	39.5	0.0	51.0	24.6	0.0	17.9	32.1	0.0
Incr Delay (d2), s/veh	16.3	3.8	0.0	24.8	0.7	0.0	4.3	0.8	0.0	0.8	5.0	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	10.5	0.0	0.2	6.2	0.0	5.3	5.0	0.0	4.7	15.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.2	46.3	0.0	84.2	40.2	0.0	55.3	25.4	0.0	18.7	37.1	0.0
LnGrp LOS	E	D		F	D		E	C		B	D	
Approach Vol, veh/h	731		A	478		A	839		A	1399		A
Approach Delay, s/veh	46.7			40.6			37.6			33.3		
Approach LOS	D			D			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.8	56.2	7.3	35.7	22.5	54.5	7.0	35.9				
Change Period (Y+Rc), s	7.0	7.0	6.5	5.5	7.0	7.0	5.5	6.5				
Max Green Setting (Gmax), s	18.0	30.0	5.0	41.0	26.0	22.0	16.5	29.5				
Max Q Clear Time (g_c+l1), s	13.5	14.5	2.3	25.8	14.5	35.8	2.8	16.0				
Green Ext Time (p_c), s	0.4	3.0	0.0	4.4	1.0	0.0	0.0	2.6				
Intersection Summary												
HCM 6th Ctrl Delay	38.2											
HCM 6th LOS	D											

Timings
2: US-24 & Marksheffel Rd

2025 Background PM.syn

07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	480	410	15	720	155	540	955	10	125	455	15
Future Volume (vph)	15	480	410	15	720	155	540	955	10	125	455	15
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.5	10.5		11.5	11.5		12.0	12.0		12.0	12.0	
Total Split (s)	10.5	39.7		23.3	52.5		21.5	41.0		16.0	35.5	
Total Split (%)	8.8%	33.1%		19.4%	43.8%		17.9%	34.2%		13.3%	29.6%	
Yellow Time (s)	4.5	4.5		5.0	5.0		5.5	5.5		5.5	5.5	
All-Red Time (s)	1.0	1.0		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.5	6.5		7.0	7.0		7.0	7.0	
Lead/Lag	Lag	Lag		Lead	Lead		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	6.8	34.9	120.0	6.7	34.3	120.0	14.5	48.8	120.0	45.4	45.4	120.0
Actuated g/C Ratio	0.06	0.29	1.00	0.06	0.29	1.00	0.12	0.41	1.00	0.38	0.38	1.00
v/c Ratio	0.17	0.52	0.29	0.16	0.78	0.11	1.35	0.68	0.01	0.60	0.38	0.01
Control Delay	51.3	32.2	0.6	68.3	30.1	0.1	191.2	19.9	0.0	41.3	30.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.3	32.2	0.6	68.3	30.1	0.1	191.2	19.9	0.0	41.3	30.7	0.0
LOS	D	C	A	E	C	A	F	B	A	D	C	A
Approach Delay		18.2			25.5			81.2			32.2	
Approach LOS		B			C			F			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 16 (13%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.35

Intersection Signal Delay: 45.5

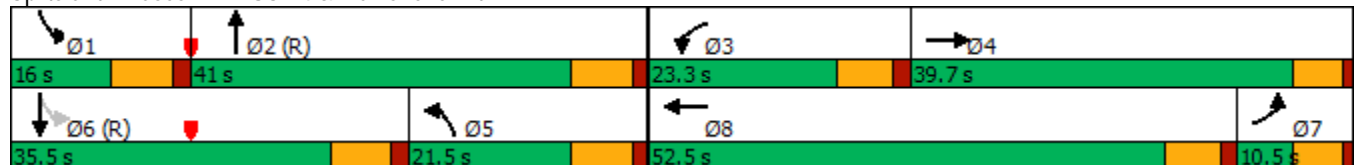
Intersection LOS: D

Intersection Capacity Utilization 70.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 2: US-24 & Marksheffel Rd



























HCM 6th Signalized Intersection Summary

2: US-24 & Marksheffel Rd

2025 Background PM.syn

07/13/2020

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	480	410	15	720	155	540	955	10	125	455	15
Future Volume (veh/h)	15	480	410	15	720	155	540	955	10	125	455	15
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	1856	1856	1856	1870	1870	1870	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	17	533	0	16	783	0	557	985	0	137	500	0
Peak Hour Factor	0.90	0.90	0.90	0.92	0.92	0.92	0.97	0.97	0.97	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	2	2	2	2	2	2	3	3	3
Cap, veh/h	32	949		31	954		896	1499		193	837	
Arrive On Green	0.02	0.27	0.00	0.02	0.27	0.00	0.26	0.42	0.00	0.08	0.24	0.00
Sat Flow, veh/h	1767	3526	1572	1781	3554	1585	3456	3554	1585	1767	3526	1572
Grp Volume(v), veh/h	17	533	0	16	783	0	557	985	0	137	500	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1781	1777	1585	1728	1777	1585	1767	1763	1572
Q Serve(g_s), s	1.1	15.6	0.0	1.1	24.8	0.0	17.1	26.6	0.0	8.1	15.1	0.0
Cycle Q Clear(g_c), s	1.1	15.6	0.0	1.1	24.8	0.0	17.1	26.6	0.0	8.1	15.1	0.0
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	32	949		31	954		896	1499		193	837	
V/C Ratio(X)	0.53	0.56		0.52	0.82		0.62	0.66		0.71	0.60	
Avail Cap(c_a), veh/h	74	1005		249	1362		896	1499		193	837	
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	58.4	37.8	0.0	58.5	41.2	0.0	39.2	27.7	0.0	42.9	40.6	0.0
Incr Delay (d2), s/veh	13.2	0.6	0.0	13.0	2.8	0.0	1.3	2.3	0.0	11.6	3.1	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	0.6	6.8	0.0	0.6	11.2	0.0	7.4	11.6	0.0	4.2	6.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.6	38.4	0.0	71.5	44.0	0.0	40.6	30.0	0.0	54.5	43.8	0.0
LnGrp LOS	E	D		E	D		D	C		D	D	
Approach Vol, veh/h	550		A	799		A	1542		A	637		A
Approach Delay, s/veh	39.4			44.5			33.8			46.1		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.0	57.6	8.6	37.8	38.1	35.5	7.7	38.7				
Change Period (Y+Rc), s	7.0	7.0	6.5	5.5	7.0	7.0	5.5	6.5				
Max Green Setting (Gmax), s	9.0	34.0	16.8	34.2	14.5	28.5	5.0	46.0				
Max Q Clear Time (g_c+l1), s	10.1	28.6	3.1	17.6	19.1	17.1	3.1	26.8				
Green Ext Time (p_c), s	0.0	3.0	0.0	3.3	0.0	2.5	0.0	5.4				
Intersection Summary												
HCM 6th Ctrl Delay	39.3											
HCM 6th LOS	D											

Timings

2: US-24 & Marksheffel Rd

2025 Total AM.syn

08/03/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	755	665	5	505	80	320	490	195	300	1075	20
Future Volume (vph)	10	755	665	5	505	80	320	490	195	300	1075	20
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.5	10.5		11.5	11.5		12.0	12.0		12.0	12.0	
Total Split (s)	10.5	44.5		11.5	45.5		30.0	37.0		27.0	34.0	
Total Split (%)	8.8%	37.1%		9.6%	37.9%		25.0%	30.8%		22.5%	28.3%	
Yellow Time (s)	4.5	4.5		5.0	5.0		5.5	5.5		5.5	5.5	
All-Red Time (s)	1.0	1.0		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.5	6.5		7.0	7.0		7.0	7.0	
Lead/Lag	Lag	Lead		Lag	Lead		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	7.3	34.9	120.0	5.4	32.6	120.0	18.2	46.7	120.0	61.6	45.1	120.0
Actuated g/C Ratio	0.06	0.29	1.00	0.04	0.27	1.00	0.15	0.39	1.00	0.51	0.38	1.00
v/c Ratio	0.11	0.82	0.47	0.06	0.58	0.06	0.72	0.42	0.14	0.63	0.88	0.01
Control Delay	45.6	41.0	1.4	56.0	38.3	0.1	44.4	58.1	0.2	21.2	45.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.6	41.0	1.4	56.0	38.3	0.1	44.4	58.1	0.2	21.2	45.1	0.0
LOS	D	D	A	E	D	A	D	E	A	C	D	A
Approach Delay		22.6			33.2			42.5			39.4	
Approach LOS		C			C			D			D	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 97 (81%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 33.8

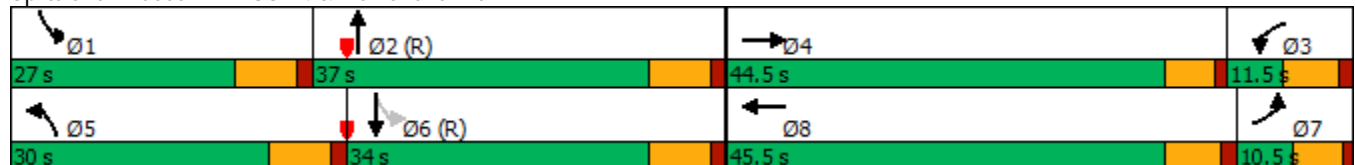
Intersection LOS: C

Intersection Capacity Utilization 76.0%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 2: US-24 & Marksheffel Rd



























HCM 6th Signalized Intersection Summary

2: US-24 & Marksheffel Rd

2025 Total AM.syn

























08/03/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	755	665	5	505	80	320	490	195	300	1075	20
Future Volume (veh/h)	10	755	665	5	505	80	320	490	195	300	1075	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	1811	1811	1811	1856	1856	1856	1737	1737	1737	1841	1841	1841
Adj Flow Rate, veh/h	11	812	0	5	549	0	344	527	0	319	1144	0
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.93	0.93	0.93	0.94	0.94	0.94
Percent Heavy Veh, %	6	6	6	3	3	3	11	11	11	4	4	4
Cap, veh/h	133	944		11	688		411	1227		507	1310	
Arrive On Green	0.08	0.27	0.00	0.01	0.20	0.00	0.13	0.37	0.00	0.13	0.37	0.00
Sat Flow, veh/h	1725	3441	1535	1767	3526	1572	3209	3300	1472	1753	3497	1560
Grp Volume(v), veh/h	11	812	0	5	549	0	344	527	0	319	1144	0
Grp Sat Flow(s),veh/h/ln	1725	1721	1535	1767	1763	1572	1605	1650	1472	1753	1749	1560
Q Serve(g_s), s	0.7	26.9	0.0	0.3	17.8	0.0	12.6	14.3	0.0	13.3	36.5	0.0
Cycle Q Clear(g_c), s	0.7	26.9	0.0	0.3	17.8	0.0	12.6	14.3	0.0	13.3	36.5	0.0
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	133	944		11	688		411	1227		507	1310	
V/C Ratio(X)	0.08	0.86		0.44	0.80		0.84	0.43		0.63	0.87	
Avail Cap(c_a), veh/h	133	1118		74	1146		615	1227		570	1310	
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	51.4	41.4	0.0	59.4	46.0	0.0	51.1	28.2	0.0	19.5	34.9	0.0
Incr Delay (d2), s/veh	0.3	6.1	0.0	24.8	2.2	0.0	6.4	1.1	0.0	1.8	8.3	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	0.3	12.1	0.0	0.2	8.0	0.0	5.4	5.8	0.0	5.6	16.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.7	47.5	0.0	84.2	48.2	0.0	57.5	29.3	0.0	21.3	43.1	0.0
LnGrp LOS	D	D		F	D		E	C		C	D	
Approach Vol, veh/h	823		A	554		A	871		A	1463		A
Approach Delay, s/veh	47.5			48.6			40.4			38.4		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.7	51.6	7.3	38.4	22.4	51.9	15.8	29.9				
Change Period (Y+Rc), s	7.0	7.0	6.5	5.5	7.0	7.0	6.5	* 6.5				
Max Green Setting (Gmax), s	20.0	30.0	5.0	39.0	23.0	27.0	5.0	* 39				
Max Q Clear Time (g_c+l1), s	15.3	16.3	2.3	28.9	14.6	38.5	2.7	19.8				
Green Ext Time (p_c), s	0.4	3.0	0.0	4.0	0.8	0.0	0.0	3.6				
Intersection Summary												
HCM 6th Ctrl Delay	42.4											
HCM 6th LOS	D											
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings
2: US-24 & Marksheffel Rd

2025 Total PM.syn

08/03/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	605	410	15	800	185	540	995	305	170	495	15
Future Volume (vph)	15	605	410	15	800	185	540	995	305	170	495	15
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.5	10.5		11.5	11.5		12.0	12.0		12.0	12.0	
Total Split (s)	10.5	50.2		11.8	51.5		40.0	44.0		14.0	18.0	
Total Split (%)	8.8%	41.8%		9.8%	42.9%		33.3%	36.7%		11.7%	15.0%	
Yellow Time (s)	4.5	4.5		5.0	5.0		5.5	5.5		5.5	5.5	
All-Red Time (s)	1.0	1.0		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.5	6.5		7.0	7.0		7.0	7.0	
Lead/Lag	Lag	Lead		Lag	Lead		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	6.1	34.8	120.0	9.3	37.4	120.0	24.9	42.8	120.0	46.9	32.5	120.0
Actuated g/C Ratio	0.05	0.29	1.00	0.08	0.31	1.00	0.21	0.36	1.00	0.39	0.27	1.00
v/c Ratio	0.18	0.65	0.28	0.12	0.79	0.13	0.78	0.81	0.20	0.66	0.57	0.01
Control Delay	49.4	38.2	0.4	51.3	52.4	0.1	27.1	49.1	0.0	42.6	43.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.4	38.2	0.4	51.3	52.4	0.1	27.1	49.1	0.0	42.6	43.6	0.0
LOS	D	D	A	D	D	A	C	D	A	D	D	A
Approach Delay		23.3			42.7			34.5			42.4	
Approach LOS		C			D			C			D	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 97 (81%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 35.0

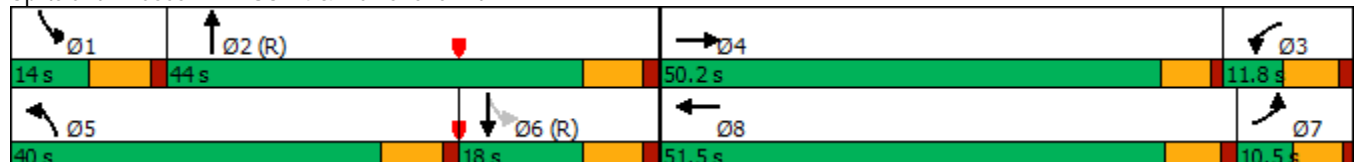
Intersection LOS: C

Intersection Capacity Utilization 76.1%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 2: US-24 & Marksheffel Rd



























HCM 6th Signalized Intersection Summary

2: US-24 & Marksheffel Rd

2025 Total PM.syn























08/03/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	605	410	15	800	185	540	995	305	170	495	15
Future Volume (veh/h)	15	605	410	15	800	185	540	995	305	170	495	15
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	1856	1856	1856	1870	1870	1870	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	16	658	0	16	870	0	557	1026	0	185	538	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	2	2	2	2	2	2	3	3	3
Cap, veh/h	30	816		154	1038		647	1448		254	982	
Arrive On Green	0.02	0.23	0.00	0.09	0.29	0.00	0.19	0.41	0.00	0.06	0.28	0.00
Sat Flow, veh/h	1767	3526	1572	1781	3554	1585	3456	3554	1585	1767	3526	1572
Grp Volume(v), veh/h	16	658	0	16	870	0	557	1026	0	185	538	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1781	1777	1585	1728	1777	1585	1767	1763	1572
Q Serve(g_s), s	1.1	21.2	0.0	1.0	27.5	0.0	18.7	28.9	0.0	7.0	15.6	0.0
Cycle Q Clear(g_c), s	1.1	21.2	0.0	1.0	27.5	0.0	18.7	28.9	0.0	7.0	15.6	0.0
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	30	816		154	1038		647	1448		254	982	
V/C Ratio(X)	0.53	0.81		0.10	0.84		0.86	0.71		0.73	0.55	
Avail Cap(c_a), veh/h	74	1313		154	1333		950	1448		254	982	
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	58.5	43.6	0.0	50.6	39.8	0.0	47.3	29.6	0.0	34.6	36.9	0.0
Incr Delay (d2), s/veh	13.3	2.0	0.0	0.3	3.9	0.0	5.6	3.0	0.0	10.1	2.2	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	0.6	9.4	0.0	0.5	12.5	0.0	8.5	12.8	0.0	2.5	7.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.8	45.5	0.0	50.9	43.7	0.0	52.8	32.6	0.0	44.6	39.1	0.0
LnGrp LOS	E	D		D	D		D	C		D	D	
Approach Vol, veh/h	674		A	886		A	1583		A	723		A
Approach Delay, s/veh	46.2			43.8			39.7			40.5		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	55.9	16.8	33.3	29.5	40.4	8.6	41.5				
Change Period (Y+Rc), s	7.0	7.0	6.5	5.5	7.0	7.0	6.5	* 6.5				
Max Green Setting (Gmax), s	7.0	37.0	5.3	44.7	33.0	11.0	5.0	* 45				
Max Q Clear Time (g_c+I1), s	9.0	30.9	3.0	23.2	20.7	17.6	3.1	29.5				
Green Ext Time (p_c), s	0.0	3.5	0.0	4.6	1.7	0.0	0.0	5.5				
Intersection Summary												
HCM 6th Ctrl Delay	41.9											
HCM 6th LOS	D											
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings
2: US-24 & Marksheffel Rd

2040 Background AM.syn

07/16/2020

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	15	795	790	5	510	65	380	550	320	1240	25
Future Volume (vph)	15	795	790	5	510	65	380	550	320	1240	25
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases			Free			Free			6		Free
Detector Phase	7	4		3	8		5	2	1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	
Minimum Split (s)	10.5	10.5		11.5	11.5		12.0	12.0	12.0	12.0	
Total Split (s)	11.0	36.5		11.5	37.0		23.0	41.0	31.0	49.0	
Total Split (%)	9.2%	30.4%		9.6%	30.8%		19.2%	34.2%	25.8%	40.8%	
Yellow Time (s)	4.5	4.5		5.0	5.0		5.5	5.5	5.5	5.5	
All-Red Time (s)	1.0	1.0		1.5	1.5		1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.5	6.5		7.0	7.0	7.0	7.0	
Lead/Lag	Lag	Lead		Lag	Lead		Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max	None	C-Max	
Act Effect Green (s)	6.1	33.0	120.0	5.0	29.5	120.0	19.4	47.3	63.5	45.8	120.0
Actuated g/C Ratio	0.05	0.28	1.00	0.04	0.25	1.00	0.16	0.39	0.53	0.38	1.00
v/c Ratio	0.18	0.91	0.56	0.07	0.64	0.05	0.81	0.46	0.68	1.00	0.02
Control Delay	51.8	48.6	2.5	61.6	45.3	0.0	61.9	30.5	21.0	61.3	0.0
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	51.8	48.6	2.5	61.6	45.3	0.0	61.9	30.5	21.0	61.3	0.0
LOS	D	D	A	E	D	A	E	C	C	E	A
Approach Delay		25.8			40.4			43.3		52.2	
Approach LOS		C			D			D		D	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 97 (81%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 40.0

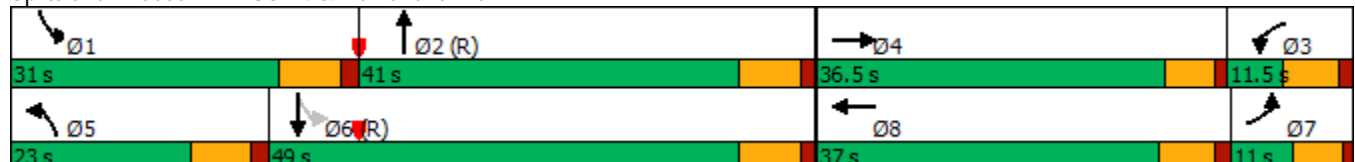
Intersection LOS: D

Intersection Capacity Utilization 83.3%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 2: US-24 & Marksheffel Rd



























HCM 6th Signalized Intersection Summary

2: US-24 & Marksheffel Rd

2040 Background AM.syn

07/16/2020

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	795	790	5	510	65	380	550	0	320	1240	25
Future Volume (veh/h)	15	795	790	5	510	65	380	550	0	320	1240	25
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	1811	1811	1811	1856	1856	1856	1737	1737	1737	1841	1841	1841
Adj Flow Rate, veh/h	16	855	0	5	554	0	409	591	0	340	1319	0
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.93	0.93	0.93	0.94	0.94	0.94
Percent Heavy Veh, %	6	6	6	3	3	3	11	11	11	4	4	4
Cap, veh/h	114	889		11	670		428	1255		502	1347	
Arrive On Green	0.07	0.26	0.00	0.01	0.19	0.00	0.13	0.38	0.00	0.14	0.39	0.00
Sat Flow, veh/h	1725	3441	1535	1767	3526	1572	3209	3300	1472	1753	3497	1560
Grp Volume(v), veh/h	16	855	0	5	554	0	409	591	0	340	1319	0
Grp Sat Flow(s),veh/h/ln	1725	1721	1535	1767	1763	1572	1605	1650	1472	1753	1749	1560
Q Serve(g_s), s	1.0	29.4	0.0	0.3	18.1	0.0	15.2	16.2	0.0	13.9	44.7	0.0
Cycle Q Clear(g_c), s	1.0	29.4	0.0	0.3	18.1	0.0	15.2	16.2	0.0	13.9	44.7	0.0
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	114	889		11	670		428	1255		502	1347	
V/C Ratio(X)	0.14	0.96		0.44	0.83		0.96	0.47		0.68	0.98	
Avail Cap(c_a), veh/h	114	889		74	896		428	1255		610	1347	
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	52.8	43.9	0.0	59.4	46.7	0.0	51.6	28.1	0.0	19.1	36.4	0.0
Incr Delay (d2), s/veh	0.6	21.4	0.0	24.8	4.8	0.0	32.3	1.3	0.0	2.3	20.0	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	0.5	15.0	0.0	0.2	8.4	0.0	8.0	6.6	0.0	5.9	22.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.4	65.3	0.0	84.2	51.5	0.0	83.9	29.3	0.0	21.4	56.4	0.0
LnGrp LOS	D	E		F	D		F	C		C	E	
Approach Vol, veh/h	871			A			559			A		
Approach Delay, s/veh	65.1						51.8			51.7		
Approach LOS	E			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	23.6	52.6	7.3	36.5	23.0	53.2	14.5	29.3				
Change Period (Y+Rc), s	7.0	7.0	6.5	5.5	7.0	7.0	6.5	* 6.5				
Max Green Setting (Gmax), s	24.0	34.0	5.0	31.0	16.0	42.0	5.5	* 31				
Max Q Clear Time (g_c+l1), s	15.9	18.2	2.3	31.4	17.2	46.7	3.0	20.1				
Green Ext Time (p_c), s	0.7	3.6	0.0	0.0	0.0	0.0	0.0	2.7				
Intersection Summary												
HCM 6th Ctrl Delay	53.5											
HCM 6th LOS	D											
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings

2: US-24 & Marksheffel Rd

2040 Background PM.syn

07/16/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	570	485	15	855	185	640	1135	10	145	545	20
Future Volume (vph)	20	570	485	15	855	185	640	1135	10	145	545	20
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.5	10.5		11.5	11.5		12.0	12.0		12.0	12.0	
Total Split (s)	10.5	44.2		11.8	45.5		52.0	52.0		12.0	12.0	
Total Split (%)	8.8%	36.8%		9.8%	37.9%		43.3%	43.3%		10.0%	10.0%	
Yellow Time (s)	4.5	4.5		5.0	5.0		5.5	5.5		5.5	5.5	
All-Red Time (s)	1.0	1.0		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.5	6.5		7.0	7.0		7.0	7.0	
Lead/Lag	Lag	Lead		Lag	Lead		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	5.3	37.0	120.0	8.1	36.8	120.0	29.2	46.0	120.0	37.6	27.2	120.0
Actuated g/C Ratio	0.04	0.31	1.00	0.07	0.31	1.00	0.24	0.38	1.00	0.31	0.23	1.00
v/c Ratio	0.28	0.57	0.34	0.13	0.86	0.13	0.79	0.86	0.01	0.71	0.75	0.01
Control Delay	58.6	43.3	0.8	38.1	36.4	0.2	38.2	57.7	0.0	51.3	52.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.6	43.3	0.8	38.1	36.4	0.2	38.2	57.7	0.0	51.3	52.0	0.0
LOS	E	D	A	D	D	A	D	E	A	D	D	A
Approach Delay		24.4			30.0			50.4			50.4	
Approach LOS		C			C			D			D	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 97 (81%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 39.5

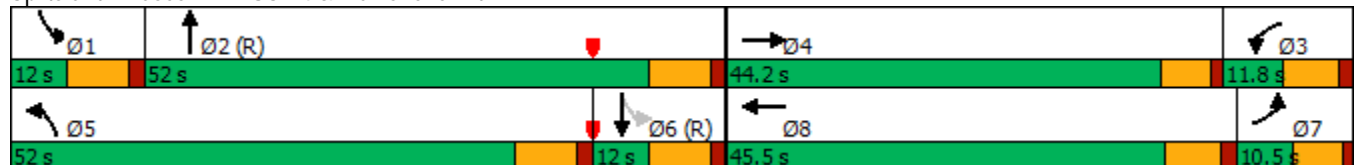
Intersection LOS: D

Intersection Capacity Utilization 80.1%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 2: US-24 & Marksheffel Rd



























HCM 6th Signalized Intersection Summary

2: US-24 & Marksheffel Rd

2040 Background PM.syn

07/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	570	485	15	855	185	640	1135	10	145	545	20
Future Volume (veh/h)	20	570	485	15	855	185	640	1135	10	145	545	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	1856	1856	1856	1870	1870	1870	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	22	620	0	16	929	0	660	1170	0	158	592	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	2	2	2	2	2	2	3	3	3
Cap, veh/h	38	763		195	1050		764	1479		195	834	
Arrive On Green	0.02	0.22	0.00	0.11	0.30	0.00	0.22	0.42	0.00	0.04	0.24	0.00
Sat Flow, veh/h	1767	3526	1572	1781	3554	1585	3456	3554	1585	1767	3526	1572
Grp Volume(v), veh/h	22	620	0	16	929	0	660	1170	0	158	592	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1781	1777	1585	1728	1777	1585	1767	1763	1572
Q Serve(g_s), s	1.5	20.1	0.0	1.0	29.9	0.0	22.1	34.4	0.0	5.0	18.5	0.0
Cycle Q Clear(g_c), s	1.5	20.1	0.0	1.0	29.9	0.0	22.1	34.4	0.0	5.0	18.5	0.0
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	38	763		195	1050		764	1479		195	834	
V/C Ratio(X)	0.57	0.81		0.08	0.88		0.86	0.79		0.81	0.71	
Avail Cap(c_a), veh/h	74	1137		195	1155		1296	1479		195	834	
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	58.2	44.7	0.0	48.0	40.3	0.0	45.0	30.5	0.0	42.6	42.0	0.0
Incr Delay (d2), s/veh	12.9	2.8	0.0	0.2	7.9	0.0	3.3	4.4	0.0	21.8	5.1	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	0.8	9.0	0.0	0.4	14.1	0.0	9.8	15.4	0.0	3.5	8.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.0	47.6	0.0	48.2	48.2	0.0	48.3	34.9	0.0	64.4	47.1	0.0
LnGrp LOS	E	D		D	D		D	C		E	D	
Approach Vol, veh/h	642		A	945		A	1830		A	750		A
Approach Delay, s/veh	48.4			48.2			39.7			50.7		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.0	56.9	19.6	31.5	33.5	35.4	9.1	42.0				
Change Period (Y+Rc), s	7.0	7.0	6.5	5.5	7.0	7.0	6.5	* 6.5				
Max Green Setting (Gmax), s	5.0	45.0	5.3	38.7	45.0	5.0	5.0	* 39				
Max Q Clear Time (g_c+I1), s	7.0	36.4	3.0	22.1	24.1	20.5	3.5	31.9				
Green Ext Time (p_c), s	0.0	5.1	0.0	3.9	2.5	0.0	0.0	3.6				

Intersection Summary

HCM 6th Ctrl Delay	45.0
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

























Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

2: US-24 & Marksheffel Rd

2040 Total AM.syn

08/03/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	880	790	5	585	90	380	580	195	350	1270	25
Future Volume (vph)	15	880	790	5	585	90	380	580	195	350	1270	25
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.5	10.5		11.5	11.5		12.0	12.0		12.0	12.0	
Total Split (s)	11.0	37.5		11.5	38.0		22.0	38.0		33.0	49.0	
Total Split (%)	9.2%	31.3%		9.6%	31.7%		18.3%	31.7%		27.5%	40.8%	
Yellow Time (s)	4.5	4.5		5.0	5.0		5.5	5.5		5.5	5.5	
All-Red Time (s)	1.0	1.0		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.5	6.5		7.0	7.0		7.0	7.0	
Lead/Lag	Lag	Lead		Lag	Lead		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	5.9	34.3	120.0	5.0	31.1	120.0	19.9	42.7	120.0	63.6	44.0	120.0
Actuated g/C Ratio	0.05	0.29	1.00	0.04	0.26	1.00	0.17	0.36	1.00	0.53	0.37	1.00
v/c Ratio	0.19	0.97	0.56	0.07	0.70	0.06	0.78	0.54	0.14	0.76	1.06	0.02
Control Delay	55.4	57.4	2.1	56.8	38.3	0.1	60.2	35.3	0.2	25.7	80.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.4	57.4	2.1	56.8	38.3	0.1	60.2	35.3	0.2	25.7	80.4	0.0
LOS	E	E	A	E	D	A	E	D	A	C	F	A
Approach Delay		31.5			33.3			37.6			67.5	
Approach LOS		C			C			D			E	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 97 (81%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.06

Intersection Signal Delay: 44.5

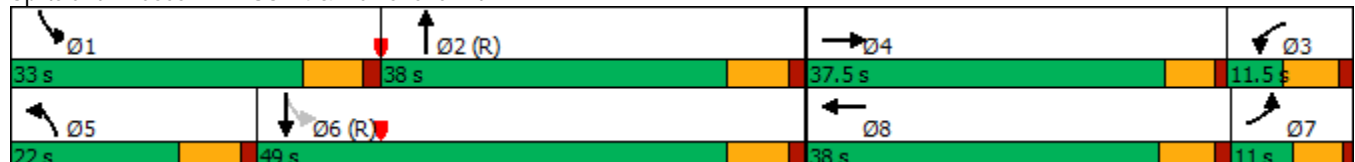
Intersection LOS: D

Intersection Capacity Utilization 86.5%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 2: US-24 & Marksheffel Rd



























HCM 6th Signalized Intersection Summary

2: US-24 & Marksheffel Rd

2040 Total AM.syn

























08/03/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	880	790	5	585	90	380	580	195	350	1270	25
Future Volume (veh/h)	15	880	790	5	585	90	380	580	195	350	1270	25
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	1811	1811	1811	1856	1856	1856	1737	1737	1737	1841	1841	1841
Adj Flow Rate, veh/h	16	946	0	5	636	0	409	624	0	372	1351	0
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.93	0.93	0.93	0.94	0.94	0.94
Percent Heavy Veh, %	6	6	6	3	3	3	11	11	11	4	4	4
Cap, veh/h	89	918		11	752		401	1172		493	1347	
Arrive On Green	0.05	0.27	0.00	0.01	0.21	0.00	0.13	0.36	0.00	0.16	0.39	0.00
Sat Flow, veh/h	1725	3441	1535	1767	3526	1572	3209	3300	1472	1753	3497	1560
Grp Volume(v), veh/h	16	946	0	5	636	0	409	624	0	372	1351	0
Grp Sat Flow(s),veh/h/ln	1725	1721	1535	1767	1763	1572	1605	1650	1472	1753	1749	1560
Q Serve(g_s), s	1.1	32.0	0.0	0.3	20.8	0.0	15.0	18.0	0.0	15.8	46.2	0.0
Cycle Q Clear(g_c), s	1.1	32.0	0.0	0.3	20.8	0.0	15.0	18.0	0.0	15.8	46.2	0.0
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	89	918		11	752		401	1172		493	1347	
V/C Ratio(X)	0.18	1.03		0.44	0.85		1.02	0.53		0.75	1.00	
Avail Cap(c_a), veh/h	89	918		74	925		401	1172		601	1347	
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	54.5	44.0	0.0	59.4	45.3	0.0	52.5	30.8	0.0	20.8	36.9	0.0
Incr Delay (d2), s/veh	1.0	37.9	0.0	24.8	6.2	0.0	50.0	1.7	0.0	4.3	25.2	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	0.5	18.3	0.0	0.2	9.7	0.0	8.8	7.4	0.0	6.9	24.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.4	81.9	0.0	84.2	51.5	0.0	102.5	32.5	0.0	25.2	62.0	0.0
LnGrp LOS	E	F		F	D		F	C		C	F	
Approach Vol, veh/h	962		A	641		A	1033		A	1723		A
Approach Delay, s/veh	81.5			51.7			60.2			54.1		
Approach LOS	F			D			E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	25.6	49.6	7.3	37.5	22.0	53.2	12.7	32.1				
Change Period (Y+Rc), s	7.0	7.0	6.5	5.5	7.0	7.0	6.5	* 6.5				
Max Green Setting (Gmax), s	26.0	31.0	5.0	32.0	15.0	42.0	5.5	* 32				
Max Q Clear Time (g_c+l1), s	17.8	20.0	2.3	34.0	17.0	48.2	3.1	22.8				
Green Ext Time (p_c), s	0.8	3.2	0.0	0.0	0.0	0.0	0.0	2.8				
Intersection Summary												
HCM 6th Ctrl Delay			61.2									
HCM 6th LOS			E									
Notes												

Timings
2: US-24 & Marksheffel Rd

2040 Total PM.syn













08/03/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	695	485	15	935	215	640	1175	305	190	585	20
Future Volume (vph)	20	695	485	15	935	215	640	1175	305	190	585	20
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.5	10.5		11.5	11.5		12.0	12.0		12.0	12.0	
Total Split (s)	10.5	42.2		11.8	43.5		44.0	50.0		16.0	22.0	
Total Split (%)	8.8%	35.2%		9.8%	36.3%		36.7%	41.7%		13.3%	18.3%	
Yellow Time (s)	4.5	4.5		5.0	5.0		5.5	5.5		5.5	5.5	
All-Red Time (s)	1.0	1.0		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.5	6.5		7.0	7.0		7.0	7.0	
Lead/Lag	Lag	Lead		Lag	Lead		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	5.1	39.2	120.0	5.9	36.8	120.0	28.7	43.3	120.0	40.8	27.7	120.0
Actuated g/C Ratio	0.04	0.33	1.00	0.05	0.31	1.00	0.24	0.36	1.00	0.34	0.23	1.00
v/c Ratio	0.30	0.66	0.34	0.19	0.94	0.15	0.80	0.95	0.20	0.79	0.79	0.01
Control Delay	55.5	35.0	0.5	53.0	44.7	0.2	27.1	54.4	0.0	54.5	52.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.5	35.0	0.5	53.0	44.7	0.2	27.1	54.4	0.0	54.5	52.9	0.0
LOS	E	D	A	D	D	A	C	D	A	D	D	A
Approach Delay		21.4			36.6			38.3			52.0	
Approach LOS		C			D			D			D	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 97 (81%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 36.1
Intersection Capacity Utilization 85.9%
Analysis Period (min) 15
Intersection LOS: D
ICU Level of Service E

Splits and Phases: 2: US-24 & Marksheffel Rd

























					
Ø1	Ø2 (R)			Ø4	Ø3
16 s	50 s			42.2 s	11.8 s
					
Ø5	Ø6 (R)			Ø8	Ø7
44 s	22 s			43.5 s	10.5 s

HCM 6th Signalized Intersection Summary

2: US-24 & Marksheffel Rd

2040 Total PM.syn

08/03/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	695	485	15	935	215	640	1175	305	190	585	20
Future Volume (veh/h)	20	695	485	15	935	215	640	1175	305	190	585	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	1856	1856	1856	1870	1870	1870	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	22	755	0	16	1016	0	660	1211	0	207	636	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	2	2	2	2	2	2	3	3	3
Cap, veh/h	38	887		146	1080		757	1331		216	813	
Arrive On Green	0.02	0.25	0.00	0.08	0.30	0.00	0.22	0.37	0.00	0.08	0.23	0.00
Sat Flow, veh/h	1767	3526	1572	1781	3554	1585	3456	3554	1585	1767	3526	1572
Grp Volume(v), veh/h	22	755	0	16	1016	0	660	1211	0	207	636	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1781	1777	1585	1728	1777	1585	1767	1763	1572
Q Serve(g_s), s	1.5	24.5	0.0	1.0	33.4	0.0	22.1	38.8	0.0	9.0	20.3	0.0
Cycle Q Clear(g_c), s	1.5	24.5	0.0	1.0	33.4	0.0	22.1	38.8	0.0	9.0	20.3	0.0
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	38	887		146	1080		757	1331		216	813	
V/C Ratio(X)	0.57	0.85		0.11	0.94		0.87	0.91		0.96	0.78	
Avail Cap(c_a), veh/h	74	1078		146	1096		1066	1331		216	813	
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	58.2	42.8	0.0	51.0	40.7	0.0	45.2	35.6	0.0	39.1	43.3	0.0
Incr Delay (d2), s/veh	12.9	5.7	0.0	0.3	15.0	0.0	5.9	10.8	0.0	49.4	7.4	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	0.8	11.3	0.0	0.5	16.7	0.0	10.1	18.5	0.0	4.8	9.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.0	48.4	0.0	51.3	55.7	0.0	51.2	46.4	0.0	88.5	50.7	0.0
LnGrp LOS	E	D		D	E		D	D		F	D	
Approach Vol, veh/h	777		A	1032		A	1871		A	843		A
Approach Delay, s/veh	49.1			55.7			48.1			60.0		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.0	51.9	16.4	35.7	33.3	34.7	9.1	43.0				
Change Period (Y+Rc), s	7.0	7.0	6.5	5.5	7.0	7.0	6.5	* 6.5				
Max Green Setting (Gmax), s	9.0	43.0	5.3	36.7	37.0	15.0	5.0	* 37				
Max Q Clear Time (g_c+l1), s	11.0	40.8	3.0	26.5	24.1	22.3	3.5	35.4				
Green Ext Time (p_c), s	0.0	1.6	0.0	3.7	2.1	0.0	0.0	1.0				

Intersection Summary

HCM 6th Ctrl Delay 52.2

HCM 6th LOS D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.























Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

2: US-24 & Marksheffel Rd

2040 Total AM Improved.syn

08/03/2020

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	
Lane Configurations											
Traffic Volume (vph)	15	880	790	5	585	90	380	580	350	1270	
Future Volume (vph)	15	880	790	5	585	90	380	580	350	1270	
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	pm+pt	NA	
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases			Free			Free			6		
Detector Phase	7	4		3	8		5	2	1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	
Minimum Split (s)	10.5	10.5		11.5	11.5		12.0	12.0	12.0	12.0	
Total Split (s)	11.0	47.5		11.5	48.0		35.0	29.0	32.0	26.0	
Total Split (%)	9.2%	39.6%		9.6%	40.0%		29.2%	24.2%	26.7%	21.7%	
Yellow Time (s)	4.5	4.5		5.0	5.0		5.5	5.5	5.5	5.5	
All-Red Time (s)	1.0	1.0		1.5	1.5		1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.5	6.5		7.0	7.0	7.0	7.0	
Lead/Lag	Lag	Lead		Lag	Lead		Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max	None	C-Max	
Act Effct Green (s)	7.3	39.8	120.0	5.4	35.1	120.0	20.8	32.8	63.0	37.7	
Actuated g/C Ratio	0.06	0.33	1.00	0.04	0.29	1.00	0.17	0.27	0.52	0.31	
v/c Ratio	0.15	0.84	0.56	0.06	0.62	0.06	0.75	0.65	0.81	0.88	
Control Delay	56.3	43.3	2.1	60.0	45.0	0.1	55.9	40.3	39.8	47.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	56.3	43.3	2.1	60.0	45.0	0.1	55.9	40.3	39.8	47.8	
LOS	E	D	A	E	D	A	E	D	D	D	
Approach Delay		24.1			39.1			45.4		46.1	
Approach LOS		C			D			D		D	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 97 (81%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 37.8









Intersection LOS: D

Intersection Capacity Utilization 76.5%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 2: US-24 & Marksheffel Rd

























			
Ø1	Ø2 (R)	Ø4	Ø3
32 s	29 s	47.5 s	11.5 s
			
Ø5	Ø6 (R)	Ø8	Ø7
35 s	26 s	48 s	11 s

HCM 6th Signalized Intersection Summary

2: US-24 & Marksheffel Rd

2040 Total AM Improved.syn

08/03/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	880	790	5	585	90	380	580	195	350	1270	25
Future Volume (veh/h)	15	880	790	5	585	90	380	580	195	350	1270	25
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	1811	1811	1811	1856	1856	1856	1737	1737	1737	1841	1841	1841
Adj Flow Rate, veh/h	16	946	0	5	636	0	409	624	0	372	1351	0
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.93	0.93	0.93	0.94	0.94	0.94
Percent Heavy Veh, %	6	6	6	3	3	3	11	11	11	4	4	4
Cap, veh/h	151	1075		11	786		483	1415		502	1578	
Arrive On Green	0.09	0.31	0.00	0.01	0.22	0.00	0.15	0.30	0.00	0.17	0.31	0.00
Sat Flow, veh/h	1725	3441	1535	1767	3526	1572	3209	4898	0	1753	5191	0
Grp Volume(v), veh/h	16	946	0	5	636	0	409	624	0	372	1351	0
Grp Sat Flow(s),veh/h/ln	1725	1721	1535	1767	1763	1572	1605	1581	0	1753	1675	0
Q Serve(g_s), s	1.0	31.3	0.0	0.3	20.5	0.0	14.9	12.8	0.0	17.3	30.3	0.0
Cycle Q Clear(g_c), s	1.0	31.3	0.0	0.3	20.5	0.0	14.9	12.8	0.0	17.3	30.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	151	1075		11	786		483	1415		502	1578	
V/C Ratio(X)	0.11	0.88		0.44	0.81		0.85	0.44		0.74	0.86	
Avail Cap(c_a), veh/h	151	1204		74	1219		749	1415		577	1578	
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	50.4	39.1	0.0	59.4	44.2	0.0	49.6	34.0	0.0	23.1	38.6	0.0
Incr Delay (d2), s/veh	0.3	7.2	0.0	24.8	2.4	0.0	5.5	1.0	0.0	4.4	6.2	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	0.5	14.1	0.0	0.2	9.2	0.0	6.3	5.0	0.0	7.7	13.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.7	46.3	0.0	84.2	46.6	0.0	55.1	35.0	0.0	27.5	44.8	0.0
LnGrp LOS	D	D		F	D		E	D		C	D	
Approach Vol, veh/h	962		A	641		A	1033		A	1723		A
Approach Delay, s/veh	46.3			46.9			43.0			41.1		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	26.9	42.8	7.3	43.0	25.1	44.7	17.0	33.3				
Change Period (Y+Rc), s	7.0	7.0	6.5	5.5	7.0	7.0	6.5	* 6.5				
Max Green Setting (Gmax), s	25.0	22.0	5.0	42.0	28.0	19.0	5.5	* 42				
Max Q Clear Time (g_c+l1), s	19.3	14.8	2.3	33.3	16.9	32.3	3.0	22.5				
Green Ext Time (p_c), s	0.6	2.5	0.0	4.2	1.2	0.0	0.0	4.2				

Intersection Summary

HCM 6th Ctrl Delay 43.5

HCM 6th LOS D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.























Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

2: US-24 & Marksheffel Rd

2040 Total PM Improved.syn

08/03/2020

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	
Lane Configurations											
Traffic Volume (vph)	20	695	485	15	935	215	640	1175	190	585	
Future Volume (vph)	20	695	485	15	935	215	640	1175	190	585	
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	pm+pt	NA	
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases			Free			Free			6		
Detector Phase	7	4		3	8		5	2	1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	
Minimum Split (s)	10.5	10.5		11.5	11.5		12.0	12.0	12.0	12.0	
Total Split (s)	10.6	55.2		11.8	56.4		41.0	38.0	15.0	12.0	
Total Split (%)	8.8%	46.0%		9.8%	47.0%		34.2%	31.7%	12.5%	10.0%	
Yellow Time (s)	4.5	4.5		5.0	5.0		5.5	5.5	5.5	5.5	
All-Red Time (s)	1.0	1.0		1.5	1.5		1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.5	6.5		7.0	7.0	7.0	7.0	
Lead/Lag	Lag	Lead		Lag	Lead		Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max	None	C-Max	
Act Effct Green (s)	6.3	42.6	120.0	9.8	43.3	120.0	28.3	34.4	35.2	20.6	
Actuated g/C Ratio	0.05	0.36	1.00	0.08	0.36	1.00	0.24	0.29	0.29	0.17	
v/c Ratio	0.24	0.61	0.34	0.11	0.80	0.15	0.81	1.05	0.72	0.76	
Control Delay	49.4	37.1	0.5	41.9	29.1	0.2	27.1	71.2	51.4	55.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	49.4	37.1	0.5	41.9	29.1	0.2	27.1	71.2	51.4	55.1	
LOS	D	D	A	D	C	A	C	E	D	E	
Approach Delay		22.5			23.9			57.8		54.2	
Approach LOS		C			C			E		D	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 97 (81%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 41.4

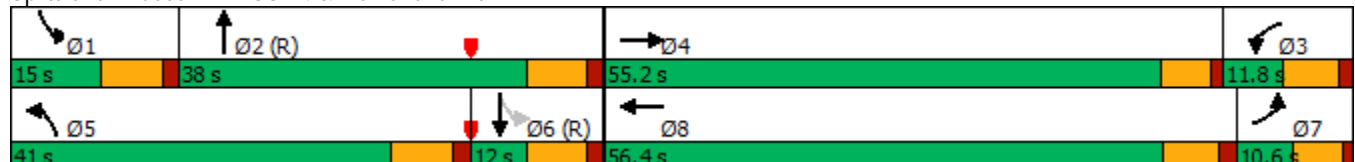
Intersection LOS: D

Intersection Capacity Utilization 83.0%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 2: US-24 & Marksheffel Rd

































HCM 6th Signalized Intersection Summary

2: US-24 & Marksheffel Rd









2040 Total PM Improved.syn

08/03/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 		 	  			  	
Traffic Volume (veh/h)	20	695	485	15	935	215	640	1175	305	190	585	20
Future Volume (veh/h)	20	695	485	15	935	215	640	1175	305	190	585	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	1856	1856	1856	1870	1870	1870	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	22	755	0	16	1016	0	660	1211	0	207	636	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	2	2	2	2	2	2	3	3	3
Cap, veh/h	38	930		185	1199		751	1783		245	1006	
Arrive On Green	0.02	0.26	0.00	0.10	0.34	0.00	0.22	0.35	0.00	0.07	0.20	0.00
Sat Flow, veh/h	1767	3526	1572	1781	3554	1585	3456	5274	0	1767	5233	0
Grp Volume(v), veh/h	22	755	0	16	1016	0	660	1211	0	207	636	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1781	1777	1585	1728	1702	0	1767	1689	0
Q Serve(g_s), s	1.5	24.1	0.0	1.0	31.8	0.0	22.2	24.3	0.0	8.0	13.8	0.0
Cycle Q Clear(g_c), s	1.5	24.1	0.0	1.0	31.8	0.0	22.2	24.3	0.0	8.0	13.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	38	930		185	1199		751	1783		245	1006	
V/C Ratio(X)	0.57	0.81		0.09	0.85		0.88	0.68		0.84	0.63	
Avail Cap(c_a), veh/h	75	1460		185	1478		979	1783		245	1006	
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	58.2	41.4	0.0	48.6	36.9	0.0	45.4	33.3	0.0	41.3	44.1	0.0
Incr Delay (d2), s/veh	12.9	2.0	0.0	0.2	4.0	0.0	7.5	2.1	0.0	22.8	3.0	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	0.8	10.7	0.0	0.4	14.3	0.0	10.2	10.3	0.0	3.9	6.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.0	43.4	0.0	48.8	40.9	0.0	52.9	35.4	0.0	64.1	47.1	0.0
LnGrp LOS	E	D		D	D		D	D		E	D	
Approach Vol, veh/h		777	A		1032	A		1871	A		843	A
Approach Delay, s/veh		44.1			41.0			41.6			51.3	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.0	48.9	18.9	37.2	33.1	30.8	9.1	47.0				
Change Period (Y+Rc), s	7.0	7.0	6.5	5.5	7.0	7.0	6.5	* 6.5				
Max Green Setting (Gmax), s	8.0	31.0	5.3	49.7	34.0	5.0	5.1	* 50				
Max Q Clear Time (g_c+l1), s	10.0	26.3	3.0	26.1	24.2	15.8	3.5	33.8				
Green Ext Time (p_c), s	0.0	3.1	0.0	5.6	1.9	0.0	0.0	6.7				
Intersection Summary												
HCM 6th Ctrl Delay			43.7									
HCM 6th LOS			D									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th TWSC
3: Meadowbrook Pkwy & Newt Dr

2020 Adjusted Existing AM.syn
07/20/2020

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	24	0	0	8	108	0	0	0	179	0	1
Future Vol, veh/h	5	24	0	0	8	108	0	0	0	179	0	1
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	50	-	-	100	-	0	-	-	-	50	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	87	87	87	92	92	92	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	6	6	2
Mvmt Flow	7	32	0	0	9	124	0	0	0	242	0	1









Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	552	485	1	501	485	0	1	0	0	0	0	0
Stage 1	485	485	-	0	0	-	-	-	-	-	-	-
Stage 2	67	0	-	501	485	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.16	-	-
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	-	-	2.254	-	-
Pot Cap-1 Maneuver	444	482	1084	480	482	-	1622	-	-	-	-	-
Stage 1	563	552	-	-	-	-	-	-	-	-	-	-
Stage 2	943	-	-	552	552	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	482	1084	457	482	-	1622	-	-	-	-	-
Mov Cap-2 Maneuver	285	511	-	484	515	-	-	-	-	-	-	-
Stage 1	563	552	-	-	-	-	-	-	-	-	-	-
Stage 2	943	-	-	520	552	-	-	-	-	-	-	-









Approach	EB	WB	NB	SB
HCM Control Delay, s	0			
HCM LOS	-	-	-	-

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1622	-	-	-	511	-	515	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	0.063	-	0.018	-	-	-	-
HCM Control Delay (s)	0	-	-	-	12.5	0	12.1	-	-	-	-
HCM Lane LOS	A	-	-	-	B	A	B	-	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	-	0.1	-	-	-	-

HCM 6th TWSC
3: Meadowbrook Pkwy & Newt Dr

2020 Adjusted Existing PM.syn
07/20/2020









Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	26	0	0	29	77	0	0	0	215	0	8
Future Vol, veh/h	9	26	0	0	29	77	0	0	0	215	0	8
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	50	-	-	100	-	0	-	-	-	50	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	88	88	88	92	92	92	71	71	71
Heavy Vehicles, %	6	6	6	8	8	8	2	2	2	2	2	2
Mvmt Flow	11	33	0	0	33	88	0	0	0	303	0	11
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	673	612	6	628	617	0	11	0	0	0	0	0
Stage 1	612	612	-	0	0	-	-	-	-	-	-	-
Stage 2	61	0	-	628	617	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.56	6.26	7.18	6.58	6.28	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.16	5.56	-	6.18	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.56	-	6.18	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	3.354	3.572	4.072	3.372	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	364	403	1065	387	398	-	1608	-	-	-	-	-
Stage 1	474	478	-	-	-	-	-	-	-	-	-	-
Stage 2	940	-	-	461	472	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	403	1065	365	398	-	1608	-	-	-	-	-
Mov Cap-2 Maneuver	248	444	-	405	446	-	-	-	-	-	-	-
Stage 1	474	478	-	-	-	-	-	-	-	-	-	-
Stage 2	940	-	-	430	472	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	0											
HCM LOS	-		-									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR	
Capacity (veh/h)	1608	-	-	-	444	-	446	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	0.073	-	0.074	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	13.7	0	13.7	-	-	-	-	-
HCM Lane LOS	A	-	-	-	B	A	B	-	-	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	-	0.2	-	-	-	-	-

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	45	0	0	15	115	0	0	0	190	0	5
Future Vol, veh/h	10	45	0	0	15	115	0	0	0	190	0	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	50	-	-	100	-	0	-	-	-	50	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	87	87	87	92	92	92	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	6	6	2
Mvmt Flow	13	60	0	0	17	132	0	0	0	257	0	7

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	593	518	4	548	521	0	7	0	0	0	0	0
Stage 1	518	518	-	0	0	-	-	-	-	-	-	-
Stage 2	75	0	-	548	521	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.16	-	-
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	-	-	2.254	-	-
Pot Cap-1 Maneuver	417	462	1080	447	460	-	1614	-	-	-	-	-
Stage 1	541	533	-	-	-	-	-	-	-	-	-	-
Stage 2	934	-	-	521	532	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	462	1080	405	460	-	1614	-	-	-	-	-
Mov Cap-2 Maneuver	274	494	-	430	498	-	-	-	-	-	-	-
Stage 1	541	533	-	-	-	-	-	-	-	-	-	-
Stage 2	934	-	-	462	532	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0			
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1614	-	-	-	494	-	498	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	0.121	-	0.035	-	-	-	-
HCM Control Delay (s)	0	-	-	-	13.3	0	12.5	-	-	-	-
HCM Lane LOS	A	-	-	-	B	A	B	-	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.4	-	0.1	-	-	-	-

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	40	0	0	50	85	0	0	0	230	0	10
Future Vol, veh/h	15	40	0	0	50	85	0	0	0	230	0	10
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	50	-	-	100	-	0	-	-	-	50	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	88	88	88	92	92	92	71	71	71
Heavy Vehicles, %	6	6	6	8	8	8	2	2	2	2	2	2
Mvmt Flow	19	50	0	0	57	97	0	0	0	324	0	14









Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	732	655	7	680	662	0	14	0	0	0	0	0
Stage 1	655	655	-	0	0	-	-	-	-	-	-	-
Stage 2	77	0	-	680	662	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.56	6.26	7.18	6.58	6.28	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.16	5.56	-	6.18	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.56	-	6.18	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	3.354	3.572	4.072	3.372	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	332	381	1064	357	375	-	1604	-	-	-	-	-
Stage 1	448	457	-	-	-	-	-	-	-	-	-	-
Stage 2	922	-	-	431	450	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	381	1064	325	375	-	1604	-	-	-	-	-
Mov Cap-2 Maneuver	233	426	-	362	428	-	-	-	-	-	-	-
Stage 1	448	457	-	-	-	-	-	-	-	-	-	-
Stage 2	922	-	-	384	450	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0			
HCM LOS	-	-	-	-

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1604	-	-	-	426	-	428	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	0.117	-	0.133	-	-	-	-
HCM Control Delay (s)	0	-	-	-	14.6	0	14.7	-	-	-	-
HCM Lane LOS	A	-	-	-	B	A	B	-	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.4	-	0.5	-	-	-	-

HCM 6th TWSC
3: Meadowbrook Pkwy & Newt Dr

2025 Total AM.syn
07/20/2020

Intersection												
Int Delay, s/veh	179.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	45	0	505	15	125	0	75	425	220	90	5
Future Vol, veh/h	10	45	0	505	15	125	0	75	425	220	90	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	50	-	-	100	-	0	-	-	-	50	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	6	6	2
Mvmt Flow	11	49	0	549	16	136	0	82	462	239	98	5

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	968	1123	101	916	894	313	103	0	0	544	0	0
Stage 1	579	579	-	313	313	-	-	-	-	-	-	-
Stage 2	389	544	-	603	581	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.16	-	-
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	-	-	2.254	-	-
Pot Cap-1 Maneuver	233	206	954	~ 253	280	727	1489	-	-	1005	-	-
Stage 1	501	501	-	698	657	-	-	-	-	-	-	-
Stage 2	635	519	-	~ 486	500	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	149	157	954	~ 172	213	727	1489	-	-	1005	-	-
Mov Cap-2 Maneuver	216	216	-	~ 264	306	-	-	-	-	-	-	-
Stage 1	501	382	-	698	657	-	-	-	-	-	-	-
Stage 2	504	519	-	~ 323	381	-	-	-	-	-	-	-









Approach	EB	WB	NB	SB
HCM Control Delay, s	25.8	\$ 417	0	6.8
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1489	-	-	216	216	264	306	727	1005	-	-
HCM Lane V/C Ratio	-	-	-	0.05	0.226	2.079	0.053	0.187	0.238	-	-
HCM Control Delay (s)	0	-	-	22.5	26.5	\$ 529.3	17.4	11.1	9.7	-	-
HCM Lane LOS	A	-	-	C	D	F	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.8	40.7	0.2	0.7	0.9	-	-

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

HCM 6th TWSC
3: Meadowbrook Pkwy & Newt Dr

2025 Total PM.syn
07/20/2020

Intersection												
Int Delay, s/veh	421											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	40	0	645	50	120	0	110	610	250	115	10
Future Vol, veh/h	15	40	0	645	50	120	0	110	610	250	115	10
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	50	-	-	100	-	0	-	-	-	50	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	6	6	6	8	8	8	2	2	2	2	2	2
Mvmt Flow	16	43	0	701	54	130	0	120	663	272	125	11

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1219	1458	131	1148	1132	452	136	0	0	783	0	0
Stage 1	675	675	-	452	452	-	-	-	-	-	-	-
Stage 2	544	783	-	696	680	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.56	6.26	7.18	6.58	6.28	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.16	5.56	-	6.18	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.56	-	6.18	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	3.354	3.572	4.072	3.372	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	154	127	908	~ 171	198	595	1448	-	-	835	-	-
Stage 1	437	447	-	~ 576	560	-	-	-	-	-	-	-
Stage 2	516	399	-	~ 423	442	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	74	86	908	~ 90	133	595	1448	-	-	835	-	-
Mov Cap-2 Maneuver	83	110	-	~ 189	230	-	-	-	-	-	-	-
Stage 1	437	301	-	~ 576	560	-	-	-	-	-	-	-
Stage 2	364	399	-	~ 244	298	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	58	\$ 1007.6	0	7.6
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1448	-	-	83	110	189	230	595	835	-	-
HCM Lane V/C Ratio	-	-	-	0.196	0.395	3.709	0.236	0.219	0.325	-	-
HCM Control Delay (s)	0	-	-	58.7	57.7	1268.8	25.4	12.7	11.4	-	-
HCM Lane LOS	A	-	-	F	F	F	D	B	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	1.6	67.9	0.9	0.8	1.4	-	-

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

Intersection					
Intersection Delay, s/veh	9.1				
Intersection LOS	A				
Approach	EB	WB		NB	SB
Entry Lanes	1	2		1	1
Conflicting Circle Lanes	1	1		1	1
Adj Approach Flow, veh/h	60	701		544	342
Demand Flow Rate, veh/h	61	715		555	362
Vehicles Circulating, veh/h	917	95		314	576
Vehicles Exiting, veh/h	21	774		664	234
Ped Vol Crossing Leg, #/h	0	0		0	0
Ped Cap Adj	1.000	1.000		1.000	1.000
Approach Delay, s/veh	8.2	6.6		10.9	11.7
Approach LOS	A	A		B	B
Lane	Left	Left	Right	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT	R	LTR	LTR
RT Channelized					
Lane Util	1.000	0.806	0.194	1.000	1.000
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.609
Critical Headway, s	4.976	4.544	4.544	4.976	4.976
Entry Flow, veh/h	61	576	139	555	362
Cap Entry Lane, veh/h	542	1302	1302	1002	767
Entry HV Adj Factor	0.984	0.980	0.978	0.981	0.945
Flow Entry, veh/h	60	565	136	544	342
Cap Entry, veh/h	533	1277	1274	983	725
V/C Ratio	0.113	0.442	0.107	0.554	0.472
Control Delay, s/veh	8.2	7.2	3.7	10.9	11.7
LOS	A	A	A	B	B
95th %tile Queue, veh	0	2	0	4	3

Intersection					
Intersection Delay, s/veh	17.2				
Intersection LOS	C				
Approach	EB	WB		NB	SB
Entry Lanes	1	2		1	1
Conflicting Circle Lanes	1	1		1	1
Adj Approach Flow, veh/h	59	885		783	408
Demand Flow Rate, veh/h	63	955		798	416
Vehicles Circulating, veh/h	1161	139		340	815
Vehicles Exiting, veh/h	69	999		884	279
Ped Vol Crossing Leg, #/h	0	0		0	0
Ped Cap Adj	1.000	1.000		1.000	1.000
Approach Delay, s/veh	11.4	10.8		22.2	22.1
Approach LOS	B	B		C	C
Lane	Left	Left	Right	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT	R	LTR	LTR
RT Channelized					
Lane Util	1.000	0.853	0.147	1.000	1.000
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.609
Critical Headway, s	4.976	4.544	4.544	4.976	4.976
Entry Flow, veh/h	63	815	140	798	416
Cap Entry Lane, veh/h	422	1251	1251	976	601
Entry HV Adj Factor	0.943	0.926	0.929	0.981	0.982
Flow Entry, veh/h	59	755	130	783	408
Cap Entry, veh/h	398	1159	1162	957	590
V/C Ratio	0.149	0.651	0.112	0.818	0.692
Control Delay, s/veh	11.4	12.0	4.0	22.2	22.1
LOS	B	B	A	C	C
95th %tile Queue, veh	1	5	0	9	5

Intersection					
Intersection Delay, s/veh	4.1				
Intersection LOS	A				
Approach	EB	WB		NB	SB
Entry Lanes	1	2		1	1
Conflicting Circle Lanes	1	1		1	1
Adj Approach Flow, veh/h	65	174		0	255
Demand Flow Rate, veh/h	66	177		0	270
Vehicles Circulating, veh/h	265	11		331	22
Vehicles Exiting, veh/h	27	320		0	166
Ped Vol Crossing Leg, #/h	0	0		0	0
Ped Cap Adj	1.000	1.000		1.000	1.000
Approach Delay, s/veh	4.0	3.4		0.0	4.5
Approach LOS	A	A		-	A
Lane	Left	Left	Right	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT	R	LTR	LTR
RT Channelized					
Lane Util	1.000	0.124	0.876	1.000	1.000
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.609
Critical Headway, s	4.976	4.544	4.544	4.976	4.976
Entry Flow, veh/h	66	22	155	0	270
Cap Entry Lane, veh/h	1053	1406	1406	985	1349
Entry HV Adj Factor	0.984	0.980	0.981	1.000	0.944
Flow Entry, veh/h	65	22	152	0	255
Cap Entry, veh/h	1036	1378	1379	985	1274
V/C Ratio	0.063	0.016	0.110	0.000	0.200
Control Delay, s/veh	4.0	2.7	3.5	3.7	4.5
LOS	A	A	A	A	A
95th %tile Queue, veh	0	0	0	0	1

Intersection					
Intersection Delay, s/veh	4.4				
Intersection LOS	A				
Approach	EB	WB		NB	SB
Entry Lanes	1	2		1	1
Conflicting Circle Lanes	1	1		1	1
Adj Approach Flow, veh/h	65	169		0	315
Demand Flow Rate, veh/h	69	183		0	321
Vehicles Circulating, veh/h	305	17		374	65
Vehicles Exiting, veh/h	81	357		0	135
Ped Vol Crossing Leg, #/h	0	0		0	0
Ped Cap Adj	1.000	1.000		1.000	1.000
Approach Delay, s/veh	4.4	3.4		0.0	5.0
Approach LOS	A	A		-	A
Lane	Left	Left	Right	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT	R	LTR	LTR
RT Channelized					
Lane Util	1.000	0.355	0.645	1.000	1.000
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.609
Critical Headway, s	4.976	4.544	4.544	4.976	4.976
Entry Flow, veh/h	69	65	118	0	321
Cap Entry Lane, veh/h	1011	1398	1398	942	1291
Entry HV Adj Factor	0.943	0.926	0.924	1.000	0.981
Flow Entry, veh/h	65	60	109	0	315
Cap Entry, veh/h	953	1295	1292	942	1267
V/C Ratio	0.068	0.046	0.084	0.000	0.249
Control Delay, s/veh	4.4	3.1	3.5	3.8	5.0
LOS	A	A	A	A	A
95th %tile Queue, veh	0	0	0	0	1

Intersection					
Intersection Delay, s/veh	9.9				
Intersection LOS	A				
Approach	EB	WB		NB	SB
Entry Lanes	1	2		1	1
Conflicting Circle Lanes	1	1		1	1
Adj Approach Flow, veh/h	65	734		544	386
Demand Flow Rate, veh/h	66	748		555	409
Vehicles Circulating, veh/h	964	95		366	582
Vehicles Exiting, veh/h	27	826		664	261
Ped Vol Crossing Leg, #/h	0	0		0	0
Ped Cap Adj	1.000	1.000		1.000	1.000
Approach Delay, s/veh	8.8	6.5		12.1	13.3
Approach LOS	A	A		B	B
Lane	Left	Left	Right	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT	R	LTR	LTR
RT Channelized					
Lane Util	1.000	0.778	0.222	1.000	1.000
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.609
Critical Headway, s	4.976	4.544	4.544	4.976	4.976
Entry Flow, veh/h	66	582	166	555	409
Cap Entry Lane, veh/h	516	1302	1302	950	762
Entry HV Adj Factor	0.984	0.980	0.982	0.981	0.944
Flow Entry, veh/h	65	571	163	544	386
Cap Entry, veh/h	508	1277	1279	932	720
V/C Ratio	0.128	0.447	0.127	0.584	0.537
Control Delay, s/veh	8.8	7.3	3.9	12.1	13.3
LOS	A	A	A	B	B
95th %tile Queue, veh	0	2	0	4	3

























Intersection					
Intersection Delay, s/veh	20.7				
Intersection LOS	C				
Approach	EB	WB		NB	SB
Entry Lanes	1	2		1	1
Conflicting Circle Lanes	1	1		1	1
Adj Approach Flow, veh/h	65	908		783	462
Demand Flow Rate, veh/h	69	981		798	471
Vehicles Circulating, veh/h	1211	139		396	822
Vehicles Exiting, veh/h	81	1055		884	298
Ped Vol Crossing Leg, #/h	0	0		0	0
Ped Cap Adj	1.000	1.000		1.000	1.000
Approach Delay, s/veh	12.3	10.8		27.8	29.2
Approach LOS	B	B		D	D
Lane	Left	Left	Right	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT	R	LTR	LTR
RT Channelized					
Lane Util	1.000	0.838	0.162	1.000	1.000
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.609
Critical Headway, s	4.976	4.544	4.544	4.976	4.976
Entry Flow, veh/h	69	822	159	798	471
Cap Entry Lane, veh/h	401	1251	1251	921	597
Entry HV Adj Factor	0.943	0.926	0.925	0.981	0.982
Flow Entry, veh/h	65	761	147	783	462
Cap Entry, veh/h	378	1159	1157	904	586
V/C Ratio	0.172	0.657	0.127	0.866	0.789
Control Delay, s/veh	12.3	12.1	4.2	27.8	29.2
LOS	B	B	A	D	D
95th %tile Queue, veh	1	5	0	11	8

Timings

4: US-24 & Newt Dr/SH-94

2020 Adjusted Existing AM.syn

08/03/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	25	174	391	35	1	128	709	337	4	1542	32
Future Volume (vph)	14	25	174	391	35	1	128	709	337	4	1542	32
Turn Type	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free	2		Free	6		Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5	
Total Split (s)	15.0	24.5		24.5	34.0		17.0	58.0		13.0	54.0	
Total Split (%)	12.5%	20.4%		20.4%	28.3%		14.2%	48.3%		10.8%	45.0%	
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.5	5.5	
All-Red Time (s)	3.0	3.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5		6.0	6.0		7.0	7.0		7.5	7.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		C-Max	Max		C-Max	Max	
Act Effect Green (s)	6.2	7.6	120.0	18.1	21.9	120.0	76.8	66.8	120.0	67.8	62.3	120.0
Actuated g/C Ratio	0.05	0.06	1.00	0.15	0.18	1.00	0.64	0.56	1.00	0.56	0.52	1.00
v/c Ratio	0.11	0.28	0.15	0.87	0.06	0.00	0.68	0.40	0.24	0.01	0.91	0.02
Control Delay	55.3	59.0	0.2	44.2	19.4	0.0	54.9	17.3	0.4	6.0	27.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.3	59.0	0.2	44.2	19.4	0.0	54.9	17.3	0.4	6.0	27.7	0.0
LOS	E	E	A	D	B	A	D	B	A	A	C	A
Approach Delay		10.6			42.0			16.5			27.1	
Approach LOS		B			D			B			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 110 (92%), Referenced to phase 1:SBL and 5:NBL, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 24.3

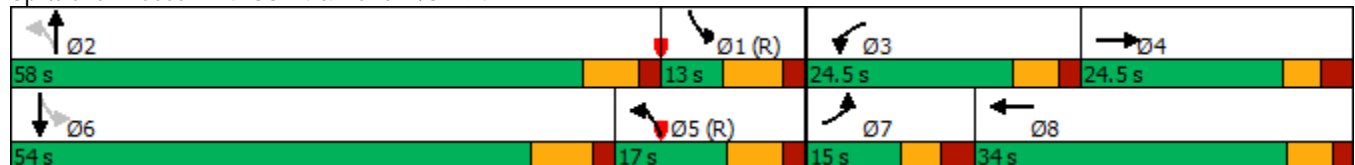
Intersection LOS: C

Intersection Capacity Utilization 84.6%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 4: US-24 & Newt Dr/SH-94



























HCM 6th Signalized Intersection Summary

2020 Adjusted Existing AM.syn

4: US-24 & Newt Dr/SH-94

08/03/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	25	174	391	35	1	128	709	337	4	1542	32
Future Volume (veh/h)	14	25	174	391	35	1	128	709	337	4	1542	32
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	1826	1826	1826	1841	1841	1841	1752	1752	1752	1811	1811	1811
Adj Flow Rate, veh/h	18	32	0	444	40	0	132	731	0	4	1606	0
Peak Hour Factor	0.77	0.77	0.77	0.88	0.88	0.88	0.97	0.97	0.97	0.96	0.96	0.96
Percent Heavy Veh, %	5	5	5	4	4	4	10	10	10	6	6	6
Cap, veh/h	63	72		499	571		171	1934		372	1870	
Arrive On Green	0.02	0.04	0.00	0.15	0.16	0.00	0.04	0.58	0.00	0.01	0.54	0.00
Sat Flow, veh/h	3374	1826	1547	3401	3497	1560	1668	3328	1485	1725	3441	1535
Grp Volume(v), veh/h	18	32	0	444	40	0	132	731	0	4	1606	0
Grp Sat Flow(s),veh/h/ln	1687	1826	1547	1700	1749	1560	1668	1664	1485	1725	1721	1535
Q Serve(g_s), s	0.6	2.1	0.0	15.4	1.2	0.0	1.9	14.2	0.0	0.0	47.9	0.0
Cycle Q Clear(g_c), s	0.6	2.1	0.0	15.4	1.2	0.0	1.9	14.2	0.0	0.0	47.9	0.0
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	63	72		499	571		171	1934		372	1870	
V/C Ratio(X)	0.28	0.44		0.89	0.07		0.77	0.38		0.01	0.86	
Avail Cap(c_a), veh/h	239	274		524	816		242	1934		438	1870	
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	0.00	0.68	0.68	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	58.1	56.3	0.0	50.3	42.5	0.0	52.5	13.5	0.0	19.4	23.5	0.0
Incr Delay (d2), s/veh	2.4	4.2	0.0	12.1	0.0	0.0	9.4	0.6	0.0	0.0	5.4	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	0.3	1.0	0.0	7.4	0.5	0.0	4.3	5.3	0.0	0.1	20.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.5	60.5	0.0	62.4	42.5	0.0	61.9	14.1	0.0	19.4	28.8	0.0
LnGrp LOS	E	E		E	D		E	B		B	C	
Approach Vol, veh/h	50			A			863			A		
Approach Delay, s/veh	60.5			60.8			21.4			28.8		
Approach LOS	E			E			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.4	76.7	23.6	11.3	12.4	72.7	8.8	26.1				
Change Period (Y+Rc), s	7.5	7.0	6.0	6.5	7.5	* 7.5	6.5	* 6.5				
Max Green Setting (Gmax), s	5.5	51.0	18.5	18.0	10.0	* 47	8.5	* 28				
Max Q Clear Time (g_c+I1), s	2.0	16.2	17.4	4.1	3.9	49.9	2.6	3.2				
Green Ext Time (p_c), s	0.0	5.9	0.2	0.1	0.2	0.0	0.0	0.2				

Intersection Summary

HCM 6th Ctrl Delay 32.4

HCM 6th LOS C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

























Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

4: US-24 & Newt Dr/SH-94

2020 Adjusted Existing PM.syn

08/03/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	32	194	285	19	6	129	1375	261	3	760	30
Future Volume (vph)	23	32	194	285	19	6	129	1375	261	3	760	30
Turn Type	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free	2		Free	6		Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5	
Total Split (s)	11.5	24.5		22.0	35.0		17.5	61.0		12.5	56.0	
Total Split (%)	9.6%	20.4%		18.3%	29.2%		14.6%	50.8%		10.4%	46.7%	
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.5	5.5	
All-Red Time (s)	3.0	3.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5		6.0	6.0		7.0	7.0		7.5	7.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		C-Max	Max		C-Max	Max	
Act Effect Green (s)	5.0	8.2	120.0	15.5	20.9	120.0	77.2	66.7	120.0	66.2	61.2	120.0
Actuated g/C Ratio	0.04	0.07	1.00	0.13	0.17	1.00	0.64	0.56	1.00	0.55	0.51	1.00
v/c Ratio	0.21	0.33	0.16	0.82	0.04	0.01	0.31	0.74	0.17	0.02	0.48	0.02
Control Delay	59.2	59.6	0.2	44.3	18.7	0.0	13.8	24.2	0.2	6.3	17.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.2	59.6	0.2	44.3	18.7	0.0	13.8	24.2	0.2	6.3	17.1	0.0
LOS	E	E	A	D	B	A	B	C	A	A	B	A
Approach Delay		13.4			41.8			19.9			16.4	
Approach LOS		B			D			B			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 110 (92%), Referenced to phase 1:SBL and 5:NBL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 20.9

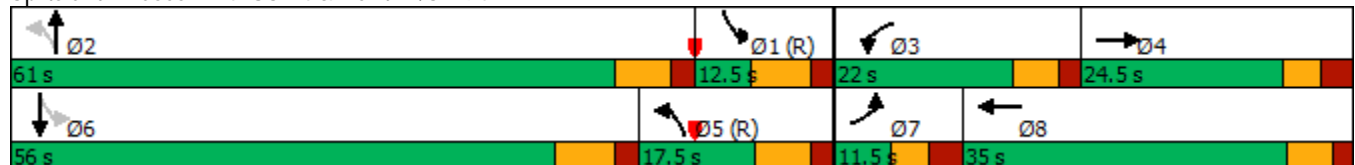
Intersection LOS: C

Intersection Capacity Utilization 74.1%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: US-24 & Newt Dr/SH-94



























HCM 6th Signalized Intersection Summary

2020 Adjusted Existing PM.syn

4: US-24 & Newt Dr/SH-94

08/03/2020

															
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations															
Traffic Volume (veh/h)	23	32	194	285	19	6	129	1375	261	3	760	30			
Future Volume (veh/h)	23	32	194	285	19	6	129	1375	261	3	760	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	1856	1856	1856	1856	1856	1856	1826	1826	1826			
Adj Flow Rate, veh/h	30	42	0	361	24	0	134	1432	0	3	844	0			
Peak Hour Factor	0.77	0.77	0.77	0.79	0.79	0.79	0.96	0.96	0.96	0.90	0.90	0.90			
Percent Heavy Veh, %	2	2	2	3	3	3	3	3	3	5	5	5			
Cap, veh/h	91	75		418	463		414	2147		175	1954				
Arrive On Green	0.03	0.04	0.00	0.12	0.13	0.00	0.05	0.61	0.00	0.00	0.56	0.00			
Sat Flow, veh/h	3456	1870	1585	3428	3526	1572	1767	3526	1572	1739	3469	1547			
Grp Volume(v), veh/h	30	42	0	361	24	0	134	1432	0	3	844	0			
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1714	1763	1572	1767	1763	1572	1739	1735	1547			
Q Serve(g_s), s	1.0	2.6	0.0	12.4	0.7	0.0	0.0	32.1	0.0	0.0	16.8	0.0			
Cycle Q Clear(g_c), s	1.0	2.6	0.0	12.4	0.7	0.0	0.0	32.1	0.0	0.0	16.8	0.0			
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	91	75		418	463		414	2147		175	1954				
V/C Ratio(X)	0.33	0.56		0.86	0.05		0.32	0.67		0.02	0.43				
Avail Cap(c_a), veh/h	144	281		457	852		488	2147		240	1954				
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	0.00	0.69	0.69	0.00	1.00	1.00	0.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh	57.4	56.6	0.0	51.7	45.6	0.0	21.4	15.4	0.0	29.7	15.1	0.0			
Incr Delay (d2), s/veh	2.1	6.5	0.0	10.7	0.0	0.0	0.4	1.7	0.0	0.0	0.7	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	0.5	1.4	0.0	5.9	0.3	0.0	2.6	12.7	0.0	0.1	6.7	0.0			
Unsig. Movement Delay, s/veh															
LnGrp Delay(d),s/veh	59.5	63.0	0.0	62.4	45.6	0.0	21.8	17.1	0.0	29.7	15.8	0.0			
LnGrp LOS	E	E		E	D		C	B		C	B				
Approach Vol, veh/h	72			A			385			A					
Approach Delay, s/veh	61.5						61.4			15.9					
Approach LOS	E						E			B					
Timer - Assigned Phs	1	2	3	4	5	6	7	8							
Phs Duration (G+Y+Rc), s	8.0	80.1	20.6	11.3	13.0	75.1	9.7	22.3							
Change Period (Y+Rc), s	7.5	7.0	6.0	6.5	7.5	* 7.5	6.5	* 6.5							
Max Green Setting (Gmax), s	5.0	54.0	16.0	18.0	10.5	* 49	5.0	* 29							
Max Q Clear Time (g_c+I1), s	2.0	34.1	14.4	4.6	2.0	18.8	3.0	2.7							
Green Ext Time (p_c), s	0.0	11.1	0.2	0.1	0.2	6.8	0.0	0.1							

Intersection Summary

HCM 6th Ctrl Delay 24.0

HCM 6th LOS C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

























Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

4: US-24 & Newt Dr/SH-94

2025 Background AM.syn

08/03/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	30	200	430	40	5	145	755	415	5	1635	35
Future Volume (vph)	20	30	200	430	40	5	145	755	415	5	1635	35
Turn Type	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free	2		Free	6		Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5	
Total Split (s)	15.8	24.5		24.3	33.0		12.2	58.2		13.0	59.0	
Total Split (%)	13.2%	20.4%		20.3%	27.5%		10.2%	48.5%		10.8%	49.2%	
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.5	5.5	
All-Red Time (s)	3.0	3.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5		6.0	6.0		7.0	7.0		7.5	7.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		C-Max	Max		C-Max	Max	
Act Effect Green (s)	6.4	8.0	120.0	18.3	19.7	120.0	71.4	66.2	120.0	72.0	66.5	120.0
Actuated g/C Ratio	0.05	0.07	1.00	0.15	0.16	1.00	0.60	0.55	1.00	0.60	0.55	1.00
v/c Ratio	0.15	0.32	0.17	0.95	0.08	0.00	1.16	0.43	0.29	0.01	0.90	0.02
Control Delay	55.6	59.7	0.2	58.9	22.9	0.0	165.9	18.0	0.5	6.0	22.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.6	59.7	0.2	58.9	22.9	0.0	165.9	18.0	0.5	6.0	22.6	0.0
LOS	E	E	A	E	C	A	F	B	A	A	C	A
Approach Delay		11.8			55.3			28.7			22.0	
Approach LOS		B			E			C			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 110 (92%), Referenced to phase 1:SBL and 5:NBL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.16

Intersection Signal Delay: 28.0

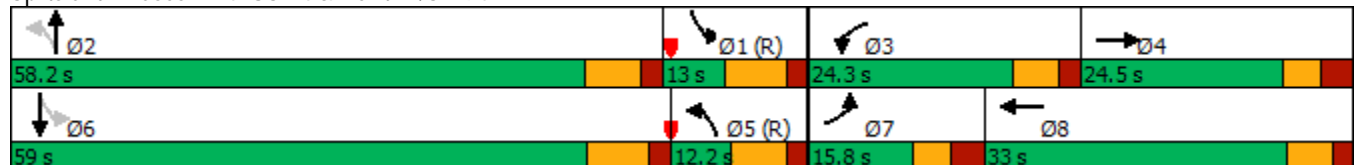
Intersection LOS: C

Intersection Capacity Utilization 89.2%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 4: US-24 & Newt Dr/SH-94



























HCM 6th Signalized Intersection Summary

2025 Background AM.syn

4: US-24 & Newt Dr/SH-94

08/03/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	30	200	430	40	5	145	755	415	5	1635	35
Future Volume (veh/h)	20	30	200	430	40	5	145	755	415	5	1635	35
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	1826	1826	1826	1841	1841	1841	1752	1752	1752	1811	1811	1811
Adj Flow Rate, veh/h	26	39	0	489	45	0	149	778	0	5	1703	0
Peak Hour Factor	0.77	0.77	0.77	0.88	0.88	0.88	0.97	0.97	0.97	0.96	0.96	0.96
Percent Heavy Veh, %	5	5	5	4	4	4	10	10	10	6	6	6
Cap, veh/h	81	74		519	576		153	1770		408	1839	
Arrive On Green	0.02	0.04	0.00	0.15	0.16	0.00	0.04	0.53	0.00	0.05	0.53	0.00
Sat Flow, veh/h	3374	1826	1547	3401	3497	1560	1668	3328	1485	1725	3441	1535
Grp Volume(v), veh/h	26	39	0	489	45	0	149	778	0	5	1703	0
Grp Sat Flow(s),veh/h/ln	1687	1826	1547	1700	1749	1560	1668	1664	1485	1725	1721	1535
Q Serve(g_s), s	0.9	2.5	0.0	17.1	1.3	0.0	4.9	17.1	0.0	0.0	54.7	0.0
Cycle Q Clear(g_c), s	0.9	2.5	0.0	17.1	1.3	0.0	4.9	17.1	0.0	0.0	54.7	0.0
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	81	74		519	576		153	1770		408	1839	
V/C Ratio(X)	0.32	0.53		0.94	0.08		0.98	0.44		0.01	0.93	
Avail Cap(c_a), veh/h	261	274		519	787		153	1770		408	1839	
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	0.00	0.69	0.69	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	57.6	56.4	0.0	50.3	42.4	0.0	55.3	17.2	0.0	19.0	25.8	0.0
Incr Delay (d2), s/veh	2.2	5.7	0.0	20.2	0.0	0.0	65.4	0.8	0.0	0.0	9.5	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	1.3	0.0	8.7	0.6	0.0	7.1	6.6	0.0	0.1	23.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.8	62.1	0.0	70.5	42.4	0.0	120.7	18.0	0.0	19.0	35.3	0.0
LnGrp LOS	E	E		E	D		F	B		B	D	
Approach Vol, veh/h	65			A			534			A		
Approach Delay, s/veh	61.2						68.1			34.5		
Approach LOS	E			E			C			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.5	70.8	24.3	11.4	12.7	71.6	9.4	26.3				
Change Period (Y+Rc), s	7.5	7.0	6.0	6.5	7.5	* 7.5	6.5	* 6.5				
Max Green Setting (Gmax), s	5.5	51.2	18.3	18.0	5.2	* 52	9.3	* 27				
Max Q Clear Time (g_c+I1), s	2.0	19.1	19.1	4.5	6.9	56.7	2.9	3.3				
Green Ext Time (p_c), s	0.0	6.3	0.0	0.1	0.0	0.0	0.0	0.2				

Intersection Summary

HCM 6th Ctrl Delay 41.0

HCM 6th LOS D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

























Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

4: US-24 & Newt Dr/SH-94

2025 Background PM.syn

08/03/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	35	215	370	25	10	155	1460	395	5	810	35
Future Volume (vph)	30	35	215	370	25	10	155	1460	395	5	810	35
Turn Type	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free	2		Free	6		Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5	
Total Split (s)	13.0	24.5		24.5	36.0		17.0	58.0		13.0	54.0	
Total Split (%)	10.8%	20.4%		20.4%	30.0%		14.2%	48.3%		10.8%	45.0%	
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.5	5.5	
All-Red Time (s)	3.0	3.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5		6.0	6.0		7.0	7.0		7.5	7.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		C-Max	Max		C-Max	Max	
Act Effect Green (s)	6.2	8.3	120.0	18.3	22.9	120.0	73.3	63.3	120.0	64.3	58.8	120.0
Actuated g/C Ratio	0.05	0.07	1.00	0.15	0.19	1.00	0.61	0.53	1.00	0.54	0.49	1.00
v/c Ratio	0.22	0.35	0.18	0.90	0.05	0.01	0.42	0.82	0.26	0.04	0.53	0.03
Control Delay	57.5	59.9	0.2	54.2	26.3	0.0	19.5	29.7	0.4	8.0	19.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.5	59.9	0.2	54.2	26.3	0.0	19.5	29.7	0.4	8.0	19.6	0.0
LOS	E	E	A	D	C	A	B	C	A	A	B	A
Approach Delay		13.8			51.1			23.2			18.7	
Approach LOS		B			D			C			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 110 (92%), Referenced to phase 1:SBL and 5:NBL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 24.9

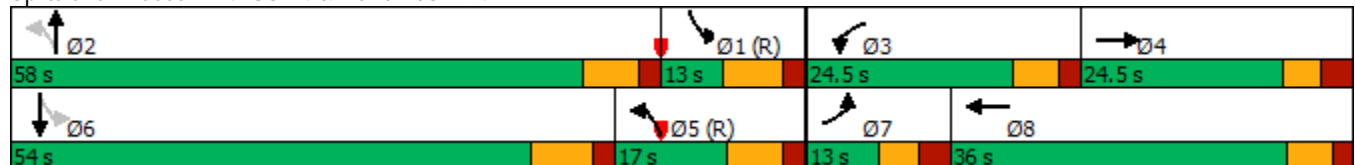
Intersection LOS: C

Intersection Capacity Utilization 78.8%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: US-24 & Newt Dr/SH-94



























HCM 6th Signalized Intersection Summary

2025 Background PM.syn

























4: US-24 & Newt Dr/SH-94

08/03/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	35	215	370	25	10	155	1460	395	5	810	35
Future Volume (veh/h)	30	35	215	370	25	10	155	1460	395	5	810	35
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	1856	1856	1856	1856	1856	1856	1826	1826	1826
Adj Flow Rate, veh/h	39	45	0	468	32	0	161	1521	0	6	900	0
Peak Hour Factor	0.77	0.77	0.77	0.79	0.79	0.79	0.96	0.96	0.96	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	3	3	3	3	3	3	5	5	5
Cap, veh/h	105	76		520	557		363	2026		146	1863	
Arrive On Green	0.03	0.04	0.00	0.15	0.16	0.00	0.04	0.57	0.00	0.01	0.54	0.00
Sat Flow, veh/h	3456	1870	1585	3428	3526	1572	1767	3526	1572	1739	3469	1547
Grp Volume(v), veh/h	39	45	0	468	32	0	161	1521	0	6	900	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1714	1763	1572	1767	1763	1572	1739	1735	1547
Q Serve(g_s), s	1.3	2.8	0.0	16.1	0.9	0.0	0.0	38.7	0.0	0.0	19.5	0.0
Cycle Q Clear(g_c), s	1.3	2.8	0.0	16.1	0.9	0.0	0.0	38.7	0.0	0.0	19.5	0.0
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	105	76		520	557		363	2026		146	1863	
V/C Ratio(X)	0.37	0.59		0.90	0.06		0.44	0.75		0.04	0.48	
Avail Cap(c_a), veh/h	187	281		529	881		437	2026		211	1863	
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	0.00	0.71	0.71	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	57.1	56.6	0.0	50.0	42.9	0.0	27.7	19.1	0.0	36.9	17.4	0.0
Incr Delay (d2), s/veh	2.2	7.1	0.0	14.0	0.0	0.0	0.8	2.6	0.0	0.1	0.9	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	0.6	1.5	0.0	7.9	0.4	0.0	3.7	15.8	0.0	0.1	7.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.2	63.6	0.0	64.0	43.0	0.0	28.6	21.7	0.0	37.1	18.3	0.0
LnGrp LOS	E	E		E	D		C	C		D	B	
Approach Vol, veh/h		84	A		500	A		1682	A		906	A
Approach Delay, s/veh		61.6			62.6			22.4			18.4	
Approach LOS		E			E			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.5	75.9	24.2	11.4	12.5	71.9	10.1	25.4				
Change Period (Y+Rc), s	7.5	7.0	6.0	6.5	7.5	* 7.5	6.5	* 6.5				
Max Green Setting (Gmax), s	5.5	51.0	18.5	18.0	10.0	* 47	6.5	* 30				
Max Q Clear Time (g_c+I1), s	2.0	40.7	18.1	4.8	2.0	21.5	3.3	2.9				
Green Ext Time (p_c), s	0.0	7.3	0.1	0.1	0.2	7.1	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			28.6									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings
4: US-24 & Newt Dr/SH-94

2025 Total AM.syn
08/03/2020

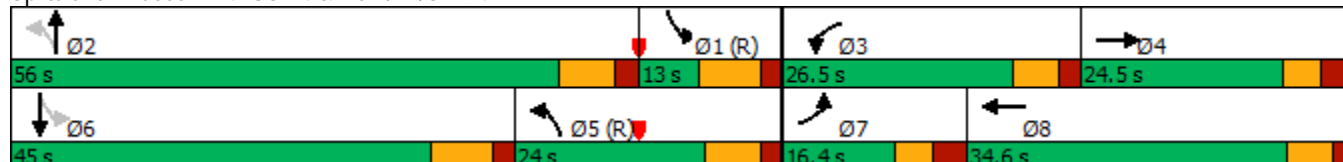
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	110	545	735	130	5	535	950	525	5	1635	65
Future Volume (vph)	50	110	545	735	130	5	535	950	525	5	1635	65
Turn Type	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free	2		Free	6		Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5	
Total Split (s)	16.4	24.5		26.5	34.6		24.0	56.0		13.0	45.0	
Total Split (%)	13.7%	20.4%		22.1%	28.8%		20.0%	46.7%		10.8%	37.5%	
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.5	5.5	
All-Red Time (s)	3.0	3.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5		6.0	6.0		7.0	7.0		7.5	7.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		C-Max	Max		C-Max	Max	
Act Effect Green (s)	7.3	13.2	120.0	20.5	28.7	120.0	66.8	53.8	120.0	47.8	42.3	120.0
Actuated g/C Ratio	0.06	0.11	1.00	0.17	0.24	1.00	0.56	0.45	1.00	0.40	0.35	1.00
v/c Ratio	0.27	0.61	0.38	1.39	0.17	0.00	1.91	0.67	0.37	0.03	1.42	0.04
Control Delay	56.5	63.2	0.7	217.3	32.1	0.0	448.3	29.4	0.7	10.2	217.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	63.2	0.7	217.3	32.1	0.0	448.3	29.4	0.7	10.2	217.7	0.0
LOS	E	E	A	F	C	A	F	C	A	B	F	A
Approach Delay		14.5			188.5			133.5			208.8	
Approach LOS		B			F			F			F	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 110 (92%), Referenced to phase 1:SBL and 5:NBL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.91
 Intersection Signal Delay: 150.5
 Intersection Capacity Utilization 119.6%
 Analysis Period (min) 15

Intersection LOS: F
 ICU Level of Service H

Splits and Phases: 4: US-24 & Newt Dr/SH-94



























HCM 6th Signalized Intersection Summary

2025 Total AM.syn

4: US-24 & Newt Dr/SH-94

08/03/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	110	545	735	130	5	535	950	525	5	1635	65
Future Volume (veh/h)	50	110	545	735	130	5	535	950	525	5	1635	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	1826	1826	1826	1841	1841	1841	1752	1752	1752	1811	1811	1811
Adj Flow Rate, veh/h	54	120	0	799	141	0	552	979	0	5	1703	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97	0.96	0.96	0.96
Percent Heavy Veh, %	5	5	5	4	4	4	10	10	10	6	6	6
Cap, veh/h	117	153		581	754		296	1566		232	1289	
Arrive On Green	0.03	0.08	0.00	0.06	0.07	0.00	0.14	0.47	0.00	0.05	0.37	0.00
Sat Flow, veh/h	3374	1826	1547	3401	3497	1560	1668	3328	1485	1725	3441	1535
Grp Volume(v), veh/h	54	120	0	799	141	0	552	979	0	5	1703	0
Grp Sat Flow(s),veh/h/ln	1687	1826	1547	1700	1749	1560	1668	1664	1485	1725	1721	1535
Q Serve(g_s), s	1.9	7.7	0.0	20.5	4.6	0.0	17.0	26.5	0.0	0.0	45.0	0.0
Cycle Q Clear(g_c), s	1.9	7.7	0.0	20.5	4.6	0.0	17.0	26.5	0.0	0.0	45.0	0.0
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	117	153		581	754		296	1566		232	1289	
V/C Ratio(X)	0.46	0.79		1.38	0.19		1.86	0.63		0.02	1.32	
Avail Cap(c_a), veh/h	278	274		581	834		296	1566		232	1289	
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	0.00	0.89	0.89	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	56.8	53.9	0.0	56.6	45.8	0.0	49.8	23.8	0.0	38.4	37.5	0.0
Incr Delay (d2), s/veh	2.8	8.6	0.0	178.4	0.1	0.0	400.9	1.9	0.0	0.0	150.0	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	0.8	3.9	0.0	23.8	2.1	0.0	41.4	10.7	0.0	0.1	45.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.6	62.5	0.0	235.0	45.9	0.0	450.7	25.7	0.0	38.4	187.5	0.0
LnGrp LOS	E	E		F	D		F	C		D	F	
Approach Vol, veh/h	174			A			940			A		
Approach Delay, s/veh	61.6			206.7			178.9			187.1		
Approach LOS	E			F			F			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.5	63.5	26.5	16.5	24.5	52.5	10.7	32.4				
Change Period (Y+Rc), s	7.5	7.0	6.0	6.5	7.5	* 7.5	6.5	* 6.5				
Max Green Setting (Gmax), s	5.5	49.0	20.5	18.0	17.0	* 38	9.9	* 29				
Max Q Clear Time (g_c+I1), s	2.0	28.5	22.5	9.7	19.0	47.0	3.9	6.6				
Green Ext Time (p_c), s	0.0	7.3	0.0	0.3	0.0	0.0	0.0	0.8				

Intersection Summary

HCM 6th Ctrl Delay 183.4

HCM 6th LOS F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

























Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

4: US-24 & Newt Dr/SH-94

2025 Total PM.syn

08/03/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	150	700	650	145	10	670	1755	530	5	810	75
Future Volume (vph)	70	150	700	650	145	10	670	1755	530	5	810	75
Turn Type	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free	2		Free	6		Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5	
Total Split (s)	13.0	24.5		24.0	35.5		39.5	59.0		12.5	32.0	
Total Split (%)	10.8%	20.4%		20.0%	29.6%		32.9%	49.2%		10.4%	26.7%	
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.5	5.5	
All-Red Time (s)	3.0	3.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.5	6.5		6.0	6.0		7.0	7.0		7.5	7.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		C-Max	Max		C-Max	Max	
Act Effect Green (s)	6.4	15.0	120.0	18.0	29.1	120.0	67.5	55.0	120.0	32.5	27.5	120.0
Actuated g/C Ratio	0.05	0.12	1.00	0.15	0.24	1.00	0.56	0.46	1.00	0.27	0.23	1.00
v/c Ratio	0.42	0.70	0.48	1.39	0.19	0.01	1.30	1.14	0.35	0.04	1.12	0.05
Control Delay	62.2	66.0	1.0	225.0	33.6	0.0	184.2	102.3	0.6	11.8	104.2	0.1
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	62.2	66.0	1.0	225.0	33.6	0.0	184.2	102.3	0.6	11.8	104.2	0.1
LOS	E	E	A	F	C	A	F	F	A	B	F	A
Approach Delay		16.3			187.7			102.6			94.9	
Approach LOS		B			F			F			F	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 110 (92%), Referenced to phase 1:SBL and 5:NBL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.39

Intersection Signal Delay: 99.4

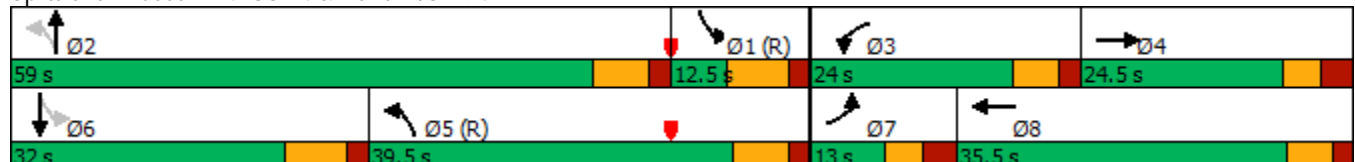
Intersection LOS: F

Intersection Capacity Utilization 108.4%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 4: US-24 & Newt Dr/SH-94
































HCM 6th Signalized Intersection Summary

2025 Total PM.syn

4: US-24 & Newt Dr/SH-94

08/03/2020























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 			 	 			 			 	
Traffic Volume (veh/h)	70	150	700	650	145	10	670	1755	530	5	810	75
Future Volume (veh/h)	70	150	700	650	145	10	670	1755	530	5	810	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	1856	1856	1856	1856	1856	1856	1826	1826	1826
Adj Flow Rate, veh/h	76	163	0	707	158	0	698	1828	0	5	880	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	3	3	3	3	3	3	5	5	5
Cap, veh/h	133	197		514	749		539	1671		140	850	
Arrive On Green	0.04	0.11	0.00	0.05	0.07	0.00	0.27	0.47	0.00	0.05	0.24	0.00
Sat Flow, veh/h	3456	1870	1585	3428	3526	1572	1767	3526	1572	1739	3469	1547
Grp Volume(v), veh/h	76	163	0	707	158	0	698	1828	0	5	880	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1714	1763	1572	1767	1763	1572	1739	1735	1547
Q Serve(g_s), s	2.6	10.3	0.0	18.0	5.1	0.0	32.5	56.9	0.0	0.0	29.4	0.0
Cycle Q Clear(g_c), s	2.6	10.3	0.0	18.0	5.1	0.0	32.5	56.9	0.0	0.0	29.4	0.0
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	133	197		514	749		539	1671		140	850	
V/C Ratio(X)	0.57	0.83		1.37	0.21		1.30	1.09		0.04	1.04	
Avail Cap(c_a), veh/h	187	281		514	867		539	1671		140	850	
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	0.00	0.89	0.89	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	56.7	52.6	0.0	57.0	46.3	0.0	41.9	31.6	0.0	54.6	45.3	0.0
Incr Delay (d2), s/veh	3.9	13.1	0.0	179.4	0.1	0.0	146.5	52.3	0.0	0.1	40.5	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	1.2	5.5	0.0	21.1	2.3	0.0	36.7	35.4	0.0	0.1	17.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.6	65.7	0.0	236.4	46.4	0.0	188.4	83.8	0.0	54.7	85.8	0.0
LnGrp LOS	E	E		F	D		F	F		D	F	
Approach Vol, veh/h	239		A	865		A	2526		A	885		A
Approach Delay, s/veh	64.1			201.7			112.7			85.6		
Approach LOS	E			F			F			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.0	63.9	24.0	19.1	40.0	36.9	11.1	32.0				
Change Period (Y+Rc), s	7.5	7.0	6.0	6.5	7.5	* 7.5	6.5	* 6.5				
Max Green Setting (Gmax), s	5.0	52.0	18.0	18.0	32.5	* 25	6.5	* 30				
Max Q Clear Time (g_c+I1), s	2.0	58.9	20.0	12.3	34.5	31.4	4.6	7.1				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			121.9									
HCM 6th LOS			F									
Notes												

Timings

4: US-24 & Newt Dr/SH-94

2025 Total AM Improved.syn

08/03/2020

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	50	110	545	735	130	5	535	950	525	5	1635
Future Volume (vph)	50	110	545	735	130	5	535	950	525	5	1635
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	pm+pt	NA
Protected Phases	7	4		3	8		5	2		1	6
Permitted Phases			Free			Free			Free	6	
Detector Phase	7	4		3	8		5	2		1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5
Total Split (s)	14.7	24.5		39.3	49.1		31.2	73.0		13.2	55.0
Total Split (%)	9.8%	16.3%		26.2%	32.7%		20.8%	48.7%		8.8%	36.7%
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.5	5.5
All-Red Time (s)	3.0	3.0		2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	6.5	6.5		6.0	6.0		7.0	7.0		7.5	7.5
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes
Recall Mode	None	None		None	None		C-Max	Max		C-Max	Max
Act Effect Green (s)	7.4	14.6	150.0	33.3	43.0	150.0	24.2	69.4	150.0	56.6	50.9
Actuated g/C Ratio	0.05	0.10	1.00	0.22	0.29	1.00	0.16	0.46	1.00	0.38	0.34
v/c Ratio	0.33	0.68	0.38	1.07	0.14	0.00	1.08	0.45	0.37	0.03	1.07
Control Delay	74.1	84.2	0.7	107.4	40.7	0.0	119.4	28.6	0.7	19.8	90.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.1	84.2	0.7	107.4	40.7	0.0	119.4	28.6	0.7	19.8	90.7
LOS	E	F	A	F	D	A	F	C	A	B	F
Approach Delay		19.0			96.8			45.5			90.5
Approach LOS		B			F			D			F

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 1:SBL and 5:NBL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.08

Intersection Signal Delay: 65.0

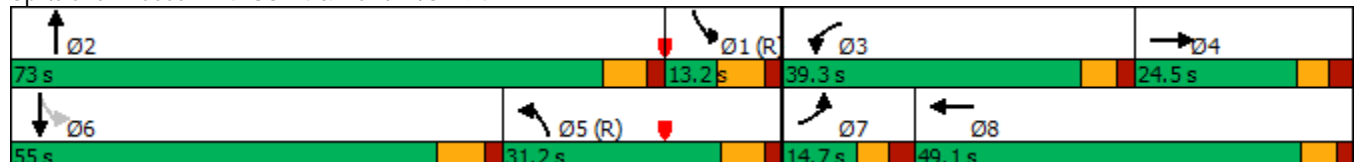
Intersection LOS: E

Intersection Capacity Utilization 93.0%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 4: US-24 & Newt Dr/SH-94



























HCM 6th Signalized Intersection Summary

2025 Total AM Improved.syn

4: US-24 & Newt Dr/SH-94

08/03/2020























																														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR																		
Lane Configurations																														
Traffic Volume (veh/h)	50	110	545	735	130	5	535	950	525	5	1635	65																		
Future Volume (veh/h)	50	110	545	735	130	5	535	950	525	5	1635	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	1826	1826	1826	1841	1841	1841	1752	1752	1752	1811	1811	1811																		
Adj Flow Rate, veh/h	54	120	0	799	141	0	552	979	0	5	1703	0																		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97	0.96	0.96	0.96																		
Percent Heavy Veh, %	5	5	5	4	4	4	10	10	10	6	6	6																		
Cap, veh/h	101	146		755	939		522	2281		241	1748																			
Arrive On Green	0.03	0.08	0.00	0.22	0.27	0.00	0.16	0.48	0.00	0.04	0.35	0.00																		
Sat Flow, veh/h	3374	1826	1547	3401	3497	1560	3237	4782	1485	1725	5107	0																		
Grp Volume(v), veh/h	54	120	0	799	141	0	552	979	0	5	1703	0																		
Grp Sat Flow(s),veh/h/ln	1687	1826	1547	1700	1749	1560	1618	1594	1485	1725	1648	0																		
Q Serve(g_s), s	2.4	9.7	0.0	33.3	4.6	0.0	24.2	20.2	0.0	0.0	50.9	0.0																		
Cycle Q Clear(g_c), s	2.4	9.7	0.0	33.3	4.6	0.0	24.2	20.2	0.0	0.0	50.9	0.0																		
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.00																		
Lane Grp Cap(c), veh/h	101	146		755	939		522	2281		241	1748																			
V/C Ratio(X)	0.54	0.82		1.06	0.15		1.06	0.43		0.02	0.97																			
Avail Cap(c_a), veh/h	184	219		755	1005		522	2281		241	1748																			
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)	0.90	0.90	0.00	0.89	0.89	0.00	1.00	1.00	0.00	1.00	1.00	0.00																		
Uniform Delay (d), s/veh	71.7	68.0	0.0	58.3	41.8	0.0	62.9	25.8	0.0	41.4	47.8	0.0																		
Incr Delay (d2), s/veh	4.0	13.0	0.0	47.5	0.1	0.0	55.3	0.6	0.0	0.0	16.2	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	1.1	5.1	0.0	19.3	2.0	0.0	14.0	7.9	0.0	0.1	23.4	0.0																		
Unsig. Movement Delay, s/veh																														
LnGrp Delay(d),s/veh	75.7	81.0	0.0	105.8	41.9	0.0	118.2	26.4	0.0	41.4	64.0	0.0																		
LnGrp LOS	E	F		F	D		F	C		D	E																			
Approach Vol, veh/h	174		A	940		A	1531		A	1708		A																		
Approach Delay, s/veh	79.4			96.2			59.5			63.9																				
Approach LOS	E			F			E			E																				
Timer - Assigned Phs	1	2	3	4	5	6	7	8																						
Phs Duration (G+Y+Rc), s	13.7	78.5	39.3	18.5	31.7	60.5	11.0	46.8																						
Change Period (Y+Rc), s	7.5	7.0	6.0	6.5	7.5	* 7.5	6.5	* 6.5																						
Max Green Setting (Gmax), s	5.7	66.0	33.3	18.0	24.2	* 48	8.2	* 43																						
Max Q Clear Time (g_c+I1), s	2.0	22.2	35.3	11.7	26.2	52.9	4.4	6.6																						
Green Ext Time (p_c), s	0.0	8.9	0.0	0.2	0.0	0.0	0.0	0.9																						
Intersection Summary																														
HCM 6th Ctrl Delay	70.0																													
HCM 6th LOS	E																													
Notes																														
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.																														
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.																														

Timings

2025 Total PM Improved.syn

4: US-24 & Newt Dr/SH-94

08/03/2020

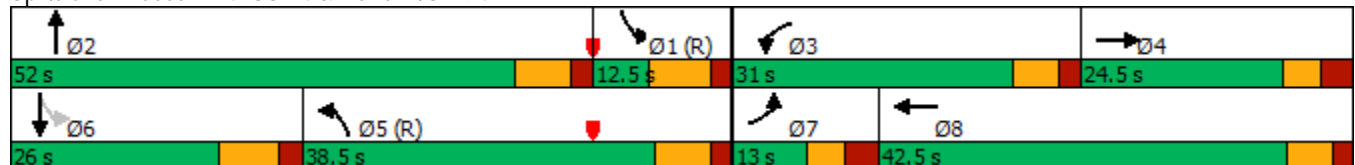
											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	70	150	700	650	145	10	670	1755	530	5	810
Future Volume (vph)	70	150	700	650	145	10	670	1755	530	5	810
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	pm+pt	NA
Protected Phases	7	4		3	8		5	2		1	6
Permitted Phases			Free			Free			Free	6	
Detector Phase	7	4		3	8		5	2		1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5
Total Split (s)	13.0	24.5		31.0	42.5		38.5	52.0		12.5	26.0
Total Split (%)	10.8%	20.4%		25.8%	35.4%		32.1%	43.3%		10.4%	21.7%
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.5	5.5
All-Red Time (s)	3.0	3.0		2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	6.5	6.5		6.0	6.0		7.0	7.0		7.5	7.5
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes
Recall Mode	None	None		None	None		C-Max	Max		C-Max	Max
Act Effect Green (s)	6.4	15.0	120.0	25.0	36.1	120.0	31.5	48.0	120.0	26.5	21.5
Actuated g/C Ratio	0.05	0.12	1.00	0.21	0.30	1.00	0.26	0.40	1.00	0.22	0.18
v/c Ratio	0.42	0.70	0.48	1.00	0.15	0.01	0.78	0.91	0.35	0.04	1.09
Control Delay	70.3	59.4	0.8	75.7	28.8	0.0	48.3	42.2	0.6	15.2	95.2
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	70.3	59.4	0.8	75.7	28.8	0.0	48.3	42.2	0.6	15.2	95.2
LOS	E	E	A	E	C	A	D	D	A	B	F
Approach Delay		15.6			66.3			36.1			94.8
Approach LOS		B			E			D			F

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 110 (92%), Referenced to phase 1:SBL and 5:NBL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.09
 Intersection Signal Delay: 46.7
 Intersection Capacity Utilization 87.0%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 4: US-24 & Newt Dr/SH-94



























HCM 6th Signalized Intersection Summary

2025 Total PM Improved.syn

4: US-24 & Newt Dr/SH-94































08/03/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	150	700	650	145	10	670	1755	530	5	810	75
Future Volume (veh/h)	70	150	700	650	145	10	670	1755	530	5	810	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	1856	1856	1856	1856	1856	1856	1826	1826	1826
Adj Flow Rate, veh/h	76	163	0	707	158	0	698	1828	0	5	880	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	3	3	3	3	3	3	5	5	5
Cap, veh/h	133	197		714	955		777	2287		78	1150	
Arrive On Green	0.04	0.11	0.00	0.07	0.09	0.00	0.23	0.45	0.00	0.01	0.23	0.00
Sat Flow, veh/h	3456	1870	1585	3428	3526	1572	3428	5066	1572	1739	5149	0
Grp Volume(v), veh/h	76	163	0	707	158	0	698	1828	0	5	880	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1714	1763	1572	1714	1689	1572	1739	1662	0
Q Serve(g_s), s	2.6	10.3	0.0	24.7	5.0	0.0	23.7	37.2	0.0	0.0	19.8	0.0
Cycle Q Clear(g_c), s	2.6	10.3	0.0	24.7	5.0	0.0	23.7	37.2	0.0	0.0	19.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	133	197		714	955		777	2287		78	1150	
V/C Ratio(X)	0.57	0.83		0.99	0.17		0.90	0.80		0.06	0.77	
Avail Cap(c_a), veh/h	187	281		714	1072		900	2287		132	1150	
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)	0.47	0.47	0.00	0.89	0.89	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	56.7	52.6	0.0	55.7	42.1	0.0	45.0	28.2	0.0	58.8	43.1	0.0
Incr Delay (d2), s/veh	1.8	6.6	0.0	29.2	0.1	0.0	10.7	3.0	0.0	0.3	4.9	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	1.2	5.2	0.0	14.3	2.2	0.0	11.2	15.3	0.0	0.2	8.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.6	59.2	0.0	84.9	42.2	0.0	55.8	31.3	0.0	59.1	48.0	0.0
LnGrp LOS	E	E		F	D		E	C		E	D	
Approach Vol, veh/h		239	A		865	A		2526	A		885	A
Approach Delay, s/veh		59.0			77.1			38.0			48.1	
Approach LOS		E			E			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.7	61.2	31.0	19.1	34.7	35.2	11.1	39.0				
Change Period (Y+Rc), s	7.5	7.0	6.0	6.5	7.5	* 7.5	6.5	* 6.5				
Max Green Setting (Gmax), s	5.0	45.0	25.0	18.0	31.5	* 19	6.5	* 37				
Max Q Clear Time (g_c+I1), s	2.0	39.2	26.7	12.3	25.7	21.8	4.6	7.0				
Green Ext Time (p_c), s	0.0	4.9	0.0	0.4	1.5	0.0	0.0	1.0				
Intersection Summary												
HCM 6th Ctrl Delay			48.6									
HCM 6th LOS			D									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings
4: US-24 & Newt Dr/SH-94

2040 Background AM.syn

08/03/2020

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	 			 	 		 	  			  
Traffic Volume (vph)	20	35	235	495	50	5	170	895	425	10	1945
Future Volume (vph)	20	35	235	495	50	5	170	895	425	10	1945
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	pm+pt	NA
Protected Phases	7	4		3	8		5	2		1	6
Permitted Phases			Free			Free			Free	6	
Detector Phase	7	4		3	8		5	2		1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5
Total Split (s)	14.0	24.6		34.4	45.0		21.0	78.0		13.0	70.0
Total Split (%)	9.3%	16.4%		22.9%	30.0%		14.0%	52.0%		8.7%	46.7%
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.5	5.5
All-Red Time (s)	3.0	3.0		2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	6.5	6.5		6.0	6.0		7.0	7.0		7.5	7.5
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes
Recall Mode	None	None		None	None		C-Max	Max		C-Max	Max
Act Effect Green (s)	6.4	8.5	150.0	27.1	31.6	150.0	14.0	84.3	150.0	81.3	75.8
Actuated g/C Ratio	0.04	0.06	1.00	0.18	0.21	1.00	0.09	0.56	1.00	0.54	0.51
v/c Ratio	0.15	0.37	0.17	0.89	0.07	0.00	0.59	0.35	0.30	0.03	0.84
Control Delay	71.2	77.4	0.2	77.1	47.1	0.0	74.0	19.3	0.5	13.1	37.0
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	71.2	77.4	0.2	77.1	47.1	0.0	74.0	19.3	0.5	13.1	37.0
LOS	E	E	A	E	D	A	E	B	A	B	D
Approach Delay		14.5			73.7			20.2			36.9
Approach LOS		B			E			C			D

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 1:SBL and 5:NBL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 34.5

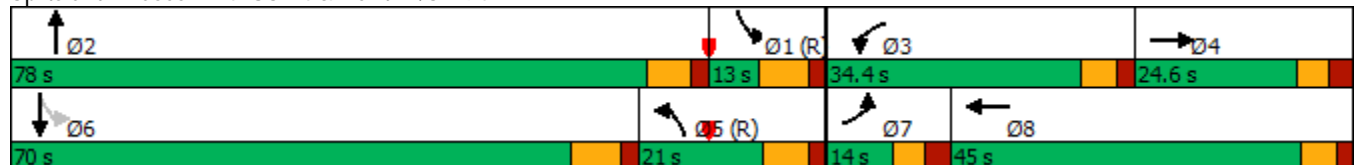
Intersection LOS: C

Intersection Capacity Utilization 81.3%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: US-24 & Newt Dr/SH-94



























HCM 6th Signalized Intersection Summary

2040 Background AM.syn

4: US-24 & Newt Dr/SH-94































08/03/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	35	235	495	50	5	170	895	425	10	1945	45
Future Volume (veh/h)	20	35	235	495	50	5	170	895	425	10	1945	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			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1841	1841	1841	1752	1752	1752	1811	1811	1811
Adj Flow Rate, veh/h	22	38	0	538	54	0	175	923	0	10	2026	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97	0.96	0.96	0.96
Percent Heavy Veh, %	5	5	5	4	4	4	10	10	10	6	6	6
Cap, veh/h	67	62		589	644		220	2860		334	2677	
Arrive On Green	0.02	0.03	0.00	0.17	0.18	0.00	0.07	0.60	0.00	0.01	0.54	0.00
Sat Flow, veh/h	3374	1826	1547	3401	3497	1560	3237	4782	1485	1725	5107	0
Grp Volume(v), veh/h	22	38	0	538	54	0	175	923	0	10	2026	0
Grp Sat Flow(s),veh/h/ln	1687	1826	1547	1700	1749	1560	1618	1594	1485	1725	1648	0
Q Serve(g_s), s	1.0	3.1	0.0	23.3	1.9	0.0	8.0	14.4	0.0	0.0	47.8	0.0
Cycle Q Clear(g_c), s	1.0	3.1	0.0	23.3	1.9	0.0	8.0	14.4	0.0	0.0	47.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	67	62		589	644		220	2860		334	2677	
V/C Ratio(X)	0.33	0.61		0.91	0.08		0.80	0.32		0.03	0.76	
Avail Cap(c_a), veh/h	169	220		644	909		302	2860		372	2677	
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)	0.98	0.98	0.00	0.65	0.65	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	72.5	71.5	0.0	60.9	50.7	0.0	68.9	15.0	0.0	22.3	26.7	0.0
Incr Delay (d2), s/veh	2.7	9.1	0.0	11.9	0.0	0.0	9.9	0.3	0.0	0.0	2.1	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	1.6	0.0	11.1	0.9	0.0	3.6	5.4	0.0	0.2	19.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.2	80.6	0.0	72.8	50.8	0.0	78.8	15.3	0.0	22.3	28.8	0.0
LnGrp LOS	E	F		E	D		E	B		C	C	
Approach Vol, veh/h	60		A	592		A	1098		A	2036		A
Approach Delay, s/veh	78.6			70.7			25.4			28.7		
Approach LOS	E			E			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.7	96.7	32.0	11.6	17.7	88.7	9.5	34.1				
Change Period (Y+Rc), s	7.5	7.0	6.0	6.5	7.5	* 7.5	6.5	* 6.5				
Max Green Setting (Gmax), s	5.5	71.0	28.4	18.1	14.0	* 63	7.5	* 39				
Max Q Clear Time (g_c+I1), s	2.0	16.4	25.3	5.1	10.0	49.8	3.0	3.9				
Green Ext Time (p_c), s	0.0	8.4	0.7	0.1	0.2	10.4	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay	35.1											
HCM 6th LOS	D											
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings
4: US-24 & Newt Dr/SH-94

2040 Background PM.syn

08/03/2020

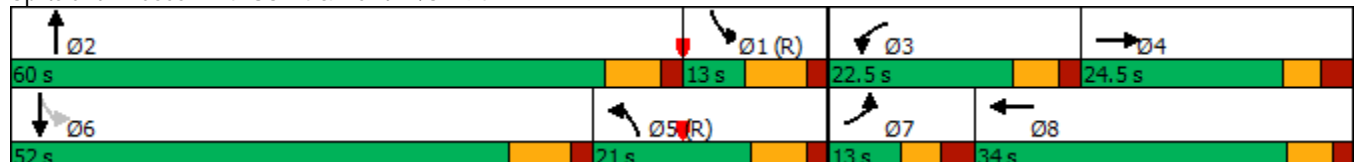
											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	 			 	 		 	  			  
Traffic Volume (vph)	30	45	255	360	30	10	180	1735	330	5	960
Future Volume (vph)	30	45	255	360	30	10	180	1735	330	5	960
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	pm+pt	NA
Protected Phases	7	4		3	8		5	2		1	6
Permitted Phases			Free			Free			Free	6	
Detector Phase	7	4		3	8		5	2		1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5
Total Split (s)	13.0	24.5		22.5	34.0		21.0	60.0		13.0	52.0
Total Split (%)	10.8%	20.4%		18.8%	28.3%		17.5%	50.0%		10.8%	43.3%
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.5	5.5
All-Red Time (s)	3.0	3.0		2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	6.5	6.5		6.0	6.0		7.0	7.0		7.5	7.5
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes
Recall Mode	None	None		None	None		C-Max	Max		C-Max	Max
Act Effect Green (s)	6.2	8.5	120.0	16.1	21.0	120.0	14.0	65.2	120.0	62.2	56.7
Actuated g/C Ratio	0.05	0.07	1.00	0.13	0.18	1.00	0.12	0.54	1.00	0.52	0.47
v/c Ratio	0.19	0.37	0.17	0.86	0.05	0.01	0.47	0.66	0.22	0.04	0.47
Control Delay	51.4	58.0	0.2	45.0	25.1	0.0	53.9	22.0	0.3	7.8	19.8
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	51.4	58.0	0.2	45.0	25.1	0.0	53.9	22.0	0.3	7.8	19.8
LOS	D	E	A	D	C	A	D	C	A	A	B
Approach Delay		12.8			42.4			21.4			19.8
Approach LOS		B			D			C			B

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 110 (92%), Referenced to phase 1:SBL and 5:NBL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 22.4
 Intersection Capacity Utilization 71.7%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 4: US-24 & Newt Dr/SH-94



























HCM 6th Signalized Intersection Summary

4: US-24 & Newt Dr/SH-94

2040 Background PM.syn

08/03/2020































																															
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR																			
Lane Configurations																															
Traffic Volume (veh/h)	30	45	255	360	30	10	180	1735	330	5	960	40																			
Future Volume (veh/h)	30	45	255	360	30	10	180	1735	330	5	960	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	1856	1856	1856	1856	1856	1856	1826	1826	1826																			
Adj Flow Rate, veh/h	33	49	0	391	33	0	188	1807	0	5	1043	0																			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92																			
Percent Heavy Veh, %	2	2	2	3	3	3	3	3	3	5	5	5																			
Cap, veh/h	96	79		446	496		250	3019		148	2618																				
Arrive On Green	0.03	0.04	0.00	0.13	0.14	0.00	0.07	0.60	0.00	0.01	0.53	0.00																			
Sat Flow, veh/h	3456	1870	1585	3428	3526	1572	3428	5066	1572	1739	5149	0																			
Grp Volume(v), veh/h	33	49	0	391	33	0	188	1807	0	5	1043	0																			
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1714	1763	1572	1714	1689	1572	1739	1662	0																			
Q Serve(g_s), s	1.1	3.1	0.0	13.4	1.0	0.0	6.5	26.9	0.0	0.0	15.1	0.0																			
Cycle Q Clear(g_c), s	1.1	3.1	0.0	13.4	1.0	0.0	6.5	26.9	0.0	0.0	15.1	0.0																			
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.00																			
Lane Grp Cap(c), veh/h	96	79		446	496		250	3019		148	2618																				
V/C Ratio(X)	0.34	0.62		0.88	0.07		0.75	0.60		0.03	0.40																				
Avail Cap(c_a), veh/h	187	281		471	823		400	3019		216	2618																				
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)	0.97	0.97	0.00	0.66	0.66	0.00	1.00	1.00	0.00	1.00	1.00	0.00																			
Uniform Delay (d), s/veh	57.3	56.5	0.0	51.2	44.7	0.0	54.5	15.2	0.0	29.3	17.1	0.0																			
Incr Delay (d2), s/veh	2.0	7.3	0.0	11.5	0.0	0.0	4.5	0.9	0.0	0.1	0.5	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	0.5	1.6	0.0	6.5	0.4	0.0	2.9	10.2	0.0	0.1	5.8	0.0																			
Unsig. Movement Delay, s/veh																															
LnGrp Delay(d),s/veh	59.3	63.8	0.0	62.7	44.8	0.0	59.0	16.1	0.0	29.4	17.6	0.0																			
LnGrp LOS	E	E		E	D		E	B		C	B																				
Approach Vol, veh/h	82			A			424			A																					
Approach Delay, s/veh	62.0						61.3			20.2																					
Approach LOS	E						E			C																					
Timer - Assigned Phs	1	2	3	4	5	6	7	8																							
Phs Duration (G+Y+Rc), s	8.3	78.5	21.6	11.6	16.3	70.5	9.8	23.4																							
Change Period (Y+Rc), s	7.5	7.0	6.0	6.5	7.5	* 7.5	6.5	* 6.5																							
Max Green Setting (Gmax), s	5.5	53.0	16.5	18.0	14.0	* 45	6.5	* 28																							
Max Q Clear Time (g_c+I1), s	2.0	28.9	15.4	5.1	8.5	17.1	3.1	3.0																							
Green Ext Time (p_c), s	0.0	15.4	0.2	0.1	0.3	8.6	0.0	0.1																							
Intersection Summary																															
HCM 6th Ctrl Delay	25.3																														
HCM 6th LOS	C																														
Notes																															
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.																															
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.																															

Timings

4: US-24 & Newt Dr/SH-94

2040 Total AM.syn

08/03/2020

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	 			 	 		 	  			  
Traffic Volume (vph)	50	115	580	815	140	5	560	1090	590	10	1945
Future Volume (vph)	50	115	580	815	140	5	560	1090	590	10	1945
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	pm+pt	NA
Protected Phases	7	4		3	8		5	2		1	6
Permitted Phases			Free			Free			Free	6	
Detector Phase	7	4		3	8		5	2		1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5
Total Split (s)	14.8	25.9		37.0	48.1		28.1	74.1		13.0	59.0
Total Split (%)	9.9%	17.3%		24.7%	32.1%		18.7%	49.4%		8.7%	39.3%
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.5	5.5
All-Red Time (s)	3.0	3.0		2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	6.5	6.5		6.0	6.0		7.0	7.0		7.5	7.5
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes
Recall Mode	None	None		None	None		C-Max	Max		C-Max	Max
Act Effect Green (s)	7.4	15.2	150.0	31.0	41.3	150.0	21.1	71.3	150.0	61.2	55.7
Actuated g/C Ratio	0.05	0.10	1.00	0.21	0.28	1.00	0.14	0.48	1.00	0.41	0.37
v/c Ratio	0.33	0.68	0.41	1.27	0.16	0.00	1.29	0.50	0.41	0.06	1.16
Control Delay	74.0	83.0	0.8	181.4	42.1	0.0	195.9	28.5	0.9	19.6	122.2
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	74.0	83.0	0.8	181.4	42.1	0.0	195.9	28.5	0.9	19.6	122.2
LOS	E	F	A	F	D	A	F	C	A	B	F
Approach Delay		18.4			160.3			63.1			121.8
Approach LOS		B			F			E			F

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 1:SBL and 5:NBL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.29

Intersection Signal Delay: 93.2

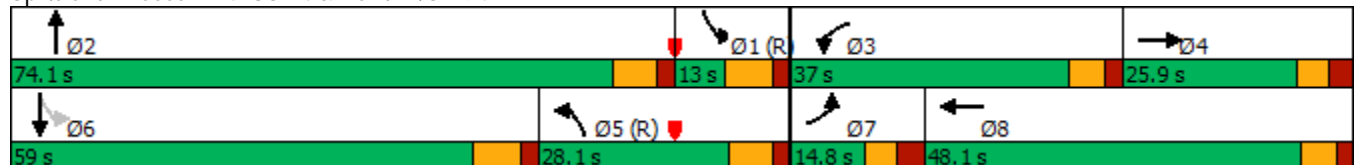
Intersection LOS: F

Intersection Capacity Utilization 102.2%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 4: US-24 & Newt Dr/SH-94



























HCM 6th Signalized Intersection Summary

4: US-24 & Newt Dr/SH-94

2040 Total AM.syn

08/03/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	115	580	815	140	5	560	1090	590	10	1945	75
Future Volume (veh/h)	50	115	580	815	140	5	560	1090	590	10	1945	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	1826	1826	1826	1841	1841	1841	1752	1752	1752	1811	1811	1811
Adj Flow Rate, veh/h	54	125	0	886	152	0	577	1124	0	10	2026	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97	0.96	0.96	0.96
Percent Heavy Veh, %	5	5	5	4	4	4	10	10	10	6	6	6
Cap, veh/h	101	151		703	896		455	2346		229	1912	
Arrive On Green	0.03	0.08	0.00	0.21	0.26	0.00	0.14	0.49	0.00	0.04	0.39	0.00
Sat Flow, veh/h	3374	1826	1547	3401	3497	1560	3237	4782	1485	1725	5107	0
Grp Volume(v), veh/h	54	125	0	886	152	0	577	1124	0	10	2026	0
Grp Sat Flow(s),veh/h/ln	1687	1826	1547	1700	1749	1560	1618	1594	1485	1725	1648	0
Q Serve(g_s), s	2.4	10.1	0.0	31.0	5.1	0.0	21.1	23.5	0.0	0.0	58.0	0.0
Cycle Q Clear(g_c), s	2.4	10.1	0.0	31.0	5.1	0.0	21.1	23.5	0.0	0.0	58.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	101	151		703	896		455	2346		229	1912	
V/C Ratio(X)	0.54	0.83		1.26	0.17		1.27	0.48		0.04	1.06	
Avail Cap(c_a), veh/h	187	236		703	982		455	2346		229	1912	
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)	0.87	0.87	0.00	0.78	0.78	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	71.7	67.7	0.0	59.5	43.4	0.0	64.4	25.4	0.0	40.8	46.0	0.0
Incr Delay (d2), s/veh	3.8	11.4	0.0	126.2	0.1	0.0	136.8	0.7	0.0	0.1	38.6	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	1.1	5.2	0.0	25.7	2.2	0.0	17.4	9.1	0.0	0.3	30.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.6	79.1	0.0	185.7	43.4	0.0	201.2	26.1	0.0	40.9	84.6	0.0
LnGrp LOS	E	E		F	D		F	C		D	F	
Approach Vol, veh/h	179			A			1038			A		
Approach Delay, s/veh	78.0			164.9			85.5			84.4		
Approach LOS	E			F			F			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.5	80.6	37.0	18.9	28.6	65.5	11.0	44.9				
Change Period (Y+Rc), s	7.5	7.0	6.0	6.5	7.5	* 7.5	6.5	* 6.5				
Max Green Setting (Gmax), s	5.5	67.1	31.0	19.4	21.1	* 52	8.3	* 42				
Max Q Clear Time (g_c+I1), s	2.0	25.5	33.0	12.1	23.1	60.0	4.4	7.1				
Green Ext Time (p_c), s	0.0	10.6	0.0	0.3	0.0	0.0	0.0	1.0				

Intersection Summary

HCM 6th Ctrl Delay 101.4

HCM 6th LOS F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.































Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

4: US-24 & Newt Dr/SH-94

2040 Total PM.syn

08/03/2020

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	 			 	 		 	  			  
Traffic Volume (vph)	70	160	740	705	150	10	695	2030	580	5	960
Future Volume (vph)	70	160	740	705	150	10	695	2030	580	5	960
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	pm+pt	NA
Protected Phases	7	4		3	8		5	2		1	6
Permitted Phases			Free			Free			Free	6	
Detector Phase	7	4		3	8		5	2		1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Minimum Split (s)	11.5	24.5		11.0	24.0		12.0	25.0		12.5	25.5
Total Split (s)	13.0	24.5		30.0	41.5		39.5	53.0		12.5	26.0
Total Split (%)	10.8%	20.4%		25.0%	34.6%		32.9%	44.2%		10.4%	21.7%
Yellow Time (s)	3.5	3.5		4.0	4.0		5.0	5.0		5.5	5.5
All-Red Time (s)	3.0	3.0		2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	6.5	6.5		6.0	6.0		7.0	7.0		7.5	7.5
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes
Recall Mode	None	None		None	None		C-Max	Max		C-Max	Max
Act Effect Green (s)	6.4	15.4	120.0	24.0	35.5	120.0	32.5	48.6	120.0	26.1	21.1
Actuated g/C Ratio	0.05	0.13	1.00	0.20	0.30	1.00	0.27	0.40	1.00	0.22	0.18
v/c Ratio	0.42	0.73	0.51	1.13	0.16	0.01	0.79	1.04	0.39	0.04	1.31
Control Delay	68.8	61.4	0.8	102.9	19.6	0.0	47.7	65.8	0.7	13.4	176.2
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	68.8	61.4	0.8	102.9	19.6	0.0	47.7	65.8	0.7	13.4	176.2
LOS	E	E	A	F	B	A	D	E	A	B	F
Approach Delay		15.7			87.3			50.6			175.5
Approach LOS		B			F			D			F

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 110 (92%), Referenced to phase 1:SBL and 5:NBL, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.31

Intersection Signal Delay: 71.8

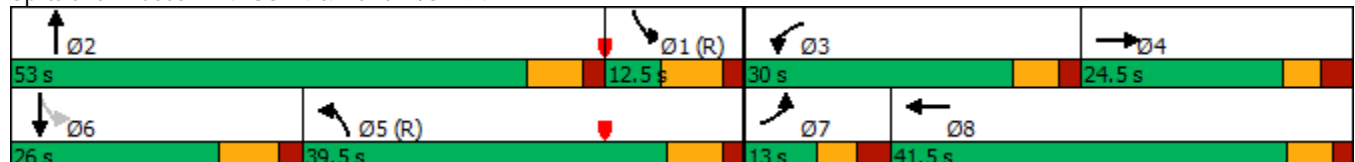
Intersection LOS: E

Intersection Capacity Utilization 94.4%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 4: US-24 & Newt Dr/SH-94



























HCM 6th Signalized Intersection Summary

4: US-24 & Newt Dr/SH-94

2040 Total PM.syn

08/03/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	160	740	705	150	10	695	2030	580	5	960	80
Future Volume (veh/h)	70	160	740	705	150	10	695	2030	580	5	960	80
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	1856	1856	1856	1856	1856	1856	1826	1826	1826
Adj Flow Rate, veh/h	76	174	0	766	163	0	724	2115	0	5	1043	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	3	3	3	3	3	3	5	5	5
Cap, veh/h	133	207		686	946		805	2302		77	1123	
Arrive On Green	0.04	0.11	0.00	0.07	0.09	0.00	0.23	0.45	0.00	0.01	0.23	0.00
Sat Flow, veh/h	3456	1870	1585	3428	3526	1572	3428	5066	1572	1739	5149	0
Grp Volume(v), veh/h	76	174	0	766	163	0	724	2115	0	5	1043	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1714	1763	1572	1714	1689	1572	1739	1662	0
Q Serve(g_s), s	2.6	10.9	0.0	24.0	5.1	0.0	24.6	46.9	0.0	0.0	24.6	0.0
Cycle Q Clear(g_c), s	2.6	10.9	0.0	24.0	5.1	0.0	24.6	46.9	0.0	0.0	24.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	133	207		686	946		805	2302		77	1123	
V/C Ratio(X)	0.57	0.84		1.12	0.17		0.90	0.92		0.07	0.93	
Avail Cap(c_a), veh/h	187	281		686	1043		929	2302		132	1123	
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)	0.30	0.30	0.00	0.53	0.53	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	56.7	52.3	0.0	56.0	42.4	0.0	44.6	30.7	0.0	58.8	45.5	0.0
Incr Delay (d2), s/veh	1.2	5.1	0.0	63.7	0.0	0.0	10.6	7.3	0.0	0.4	14.4	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	1.2	5.4	0.0	17.1	2.3	0.0	11.6	20.1	0.0	0.2	11.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.9	57.5	0.0	119.7	42.4	0.0	55.2	38.0	0.0	59.2	59.9	0.0
LnGrp LOS	E	E		F	D		E	D		E	E	
Approach Vol, veh/h		250	A		929	A		2839	A		1048	A
Approach Delay, s/veh		57.6			106.2			42.4			59.9	
Approach LOS		E			F			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.7	61.5	30.0	19.8	35.7	34.5	11.1	38.7				
Change Period (Y+Rc), s	7.5	7.0	6.0	6.5	7.5	* 7.5	6.5	* 6.5				
Max Green Setting (Gmax), s	5.0	46.0	24.0	18.0	32.5	* 19	6.5	* 36				
Max Q Clear Time (g_c+I1), s	2.0	48.9	26.0	12.9	26.6	26.6	4.6	7.1				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.4	1.6	0.0	0.0	1.0				
Intersection Summary												
HCM 6th Ctrl Delay			58.5									
HCM 6th LOS			E									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Timings

5: Marksheffel Rd & SH-94

2020 Adjusted Existing AM.syn

06/24/2020

	→	↘	↙	←	↖	↗	↑	↘	↙	↓	↖
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↗	↘	↑	↗	↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	254	54	28	297	77	54	270	18	256	501	3
Future Volume (vph)	254	54	28	297	77	54	270	18	256	501	3
Turn Type	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4			8		5	2		1	6	
Permitted Phases		4	8		8	2		2	6		6
Detector Phase	4	4	8	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.5	11.5	11.5	11.5	11.5	11.5
Total Split (s)	51.0	51.0	51.0	51.0	51.0	16.0	32.0	32.0	37.0	53.0	53.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%	13.3%	26.7%	26.7%	30.8%	44.2%	44.2%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	29.0	29.0	29.0	29.0	29.0	64.9	57.6	57.6	78.2	67.1	67.1
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.24	0.54	0.48	0.48	0.65	0.56	0.56
v/c Ratio	0.74	0.14	0.24	0.79	0.19	0.14	0.20	0.03	0.42	0.29	0.00
Control Delay	48.6	0.6	38.3	55.3	1.2	10.9	20.7	0.1	6.8	6.2	0.0
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	48.6	0.6	38.3	55.3	1.2	10.9	20.7	0.1	6.8	6.2	0.0
LOS	D	A	D	E	A	B	C	A	A	A	A
Approach Delay	40.2			43.7			18.1			6.4	
Approach LOS	D			D			B			A	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 28 (23%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 22.8

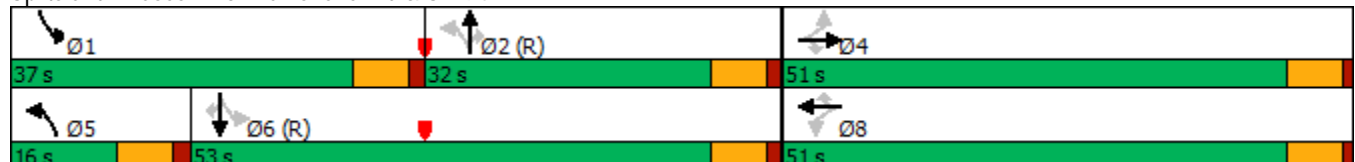
Intersection LOS: C

Intersection Capacity Utilization 60.7%

ICU Level of Service B

Analysis Period (min) 15

























Splits and Phases: 5: Marksheffel Rd & SH-94



HCM 6th Signalized Intersection Summary
5: Marksheffel Rd & SH-94

2020 Adjusted Existing AM.syn

06/24/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	254	54	28	297	77	54	270	18	256	501	3
Future Volume (veh/h)	0	254	54	28	297	77	54	270	18	256	501	3
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	1781	1781	1781	1811	1811	1811	1826	1826	1826	1856	1856	1856
Adj Flow Rate, veh/h	0	314	67	32	341	89	66	329	22	294	576	3
Peak Hour Factor	0.81	0.81	0.81	0.87	0.87	0.87	0.82	0.82	0.82	0.87	0.87	0.87
Percent Heavy Veh, %	8	8	8	6	6	6	5	5	5	3	3	3
Cap, veh/h	60	394	334	127	400	339	534	1820	812	715	2057	918
Arrive On Green	0.00	0.44	0.44	0.22	0.22	0.22	0.04	0.52	0.52	0.10	0.58	0.58
Sat Flow, veh/h	912	1781	1510	970	1811	1535	1739	3469	1547	1767	3526	1572
Grp Volume(v), veh/h	0	314	67	32	341	89	66	329	22	294	576	3
Grp Sat Flow(s),veh/h/ln	912	1781	1510	970	1811	1535	1739	1735	1547	1767	1763	1572
Q Serve(g_s), s	0.0	18.2	3.3	3.8	21.7	5.8	2.1	6.0	0.8	8.7	9.8	0.1
Cycle Q Clear(g_c), s	0.0	18.2	3.3	22.0	21.7	5.8	2.1	6.0	0.8	8.7	9.8	0.1
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	60	394	334	127	400	339	534	1820	812	715	2057	918
V/C Ratio(X)	0.00	0.80	0.20	0.25	0.85	0.26	0.12	0.18	0.03	0.41	0.28	0.00
Avail Cap(c_a), veh/h	200	668	566	276	679	576	607	1820	812	994	2057	918
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)	0.00	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	0.0	31.2	27.0	53.8	44.9	38.6	12.0	15.0	13.8	9.8	12.4	10.4
Incr Delay (d2), s/veh	0.0	3.7	0.3	1.0	5.3	0.4	0.1	0.2	0.1	0.4	0.3	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	0.0	6.6	1.2	1.0	10.3	2.2	0.8	2.4	0.3	3.3	3.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	34.8	27.3	54.8	50.1	39.1	12.1	15.2	13.8	10.2	12.8	10.4
LnGrp LOS	A	C	C	D	D	D	B	B	B	B	B	B
Approach Vol, veh/h	381			462			417			873		
Approach Delay, s/veh	33.5			48.3			14.6			11.9		
Approach LOS	C			D			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	18.0	69.5		32.5	10.9	76.5		32.5				
Change Period (Y+Rc), s	6.5	6.5		6.0	6.5	6.5		6.0				
Max Green Setting (Gmax), s	30.5	25.5		45.0	9.5	46.5		45.0				
Max Q Clear Time (g_c+l1), s	10.7	8.0		20.2	4.1	11.8		24.0				
Green Ext Time (p_c), s	0.8	2.0		2.1	0.0	4.4		2.5				
Intersection Summary												
HCM 6th Ctrl Delay	24.2											
HCM 6th LOS	C											

Timings
5: Marksheffel Rd & SH-94

2020 Adjusted Existing PM.syn

06/24/2020

	→	↘	↙	←	↖	↗	↑	↘	↙	↓	↖
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↗	↘	↑	↗	↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	294	94	39	356	343	76	819	23	158	573	7
Future Volume (vph)	294	94	39	356	343	76	819	23	158	573	7
Turn Type	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4			8		5	2		1	6	
Permitted Phases		4	8		8	2		2	6		6
Detector Phase	4	4	8	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.5	11.5	11.5	11.5	11.5	11.5
Total Split (s)	51.0	51.0	51.0	51.0	51.0	16.0	32.0	32.0	37.0	53.0	53.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%	13.3%	26.7%	26.7%	30.8%	44.2%	44.2%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	35.1	35.1	35.1	35.1	35.1	61.9	53.8	53.8	69.6	57.9	57.9
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.52	0.45	0.45	0.58	0.48	0.48
v/c Ratio	0.71	0.21	0.28	0.78	0.54	0.22	0.65	0.04	0.57	0.39	0.01
Control Delay	41.8	1.9	34.8	49.1	5.6	13.9	30.6	0.1	16.0	15.5	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.8	1.9	34.8	49.1	5.6	13.9	30.6	0.1	16.0	15.5	0.3
LOS	D	A	C	D	A	B	C	A	B	B	A
Approach Delay	32.1			28.1			28.4			15.5	
Approach LOS	C			C			C			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 28 (23%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 25.6

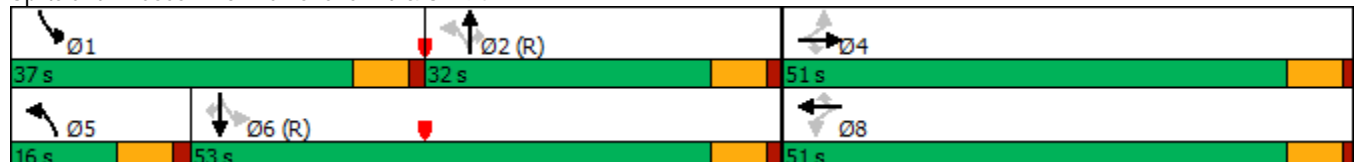
Intersection LOS: C

Intersection Capacity Utilization 75.1%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 5: Marksheffel Rd & SH-94



























HCM 6th Signalized Intersection Summary

5: Marksheffel Rd & SH-94

2020 Adjusted Existing PM.syn

06/24/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	294	94	39	356	343	76	819	23	158	573	7
Future Volume (veh/h)	0	294	94	39	356	343	76	819	23	158	573	7
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	1781	1781	1781	1811	1811	1811	1826	1826	1826	1856	1856	1856
Adj Flow Rate, veh/h	0	363	116	45	409	394	93	999	28	182	659	8
Peak Hour Factor	0.81	0.81	0.81	0.87	0.87	0.87	0.82	0.82	0.82	0.87	0.87	0.87
Percent Heavy Veh, %	8	8	8	6	6	6	5	5	5	3	3	3
Cap, veh/h	60	520	441	192	529	448	429	1656	738	333	1788	797
Arrive On Green	0.00	0.58	0.58	0.29	0.29	0.29	0.04	0.48	0.48	0.07	0.51	0.51
Sat Flow, veh/h	646	1781	1510	887	1811	1535	1739	3469	1547	1767	3526	1572
Grp Volume(v), veh/h	0	363	116	45	409	394	93	999	28	182	659	8
Grp Sat Flow(s),veh/h/ln	646	1781	1510	887	1811	1535	1739	1735	1547	1767	1763	1572
Q Serve(g_s), s	0.0	17.2	4.5	5.5	24.8	29.3	3.3	25.4	1.2	6.2	13.6	0.3
Cycle Q Clear(g_c), s	0.0	17.2	4.5	22.6	24.8	29.3	3.3	25.4	1.2	6.2	13.6	0.3
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	60	520	441	192	529	448	429	1656	738	333	1788	797
V/C Ratio(X)	0.00	0.70	0.26	0.23	0.77	0.88	0.22	0.60	0.04	0.55	0.37	0.01
Avail Cap(c_a), veh/h	113	668	566	266	679	576	493	1656	738	654	1788	797
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)	0.00	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	21.2	18.6	45.8	38.8	40.4	15.1	23.0	16.7	17.6	17.9	14.6
Incr Delay (d2), s/veh	0.0	2.2	0.3	0.6	4.2	12.0	0.3	1.6	0.1	1.4	0.6	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	0.0	5.3	1.5	1.2	11.6	12.5	1.3	10.6	0.4	2.6	5.6	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	23.4	18.9	46.4	43.0	52.5	15.4	24.7	16.8	19.0	18.5	14.7
LnGrp LOS	A	C	B	D	D	D	B	C	B	B	B	B
Approach Vol, veh/h	479			848			1120			849		
Approach Delay, s/veh	22.3			47.6			23.7			18.6		
Approach LOS	C			D			C			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.2	63.8		41.1	11.6	67.4		41.1				
Change Period (Y+Rc), s	6.5	6.5		6.0	6.5	6.5		6.0				
Max Green Setting (Gmax), s	30.5	25.5		45.0	9.5	46.5		45.0				
Max Q Clear Time (g_c+I1), s	8.2	27.4		19.2	5.3	15.6		31.3				
Green Ext Time (p_c), s	0.5	0.0		2.7	0.1	5.1		3.7				
Intersection Summary												
HCM 6th Ctrl Delay	28.3											
HCM 6th LOS	C											

Timings 5: Marksheffel Rd & SH-94

2025 Background AM.syn

07/13/2020

	→	↘	↙	←	↖	↗	↑	↘	↙	↓	↖
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↗	↖	↑	↗	↖	↑↑	↗	↖	↑↑	↗
Traffic Volume (vph)	275	60	30	315	85	60	290	20	275	535	5
Future Volume (vph)	275	60	30	315	85	60	290	20	275	535	5
Turn Type	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4			8		5	2		1	6	
Permitted Phases		4	8		8	2		2	6		6
Detector Phase	4	4	8	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.5	11.5	11.5	11.5	11.5	11.5
Total Split (s)	54.0	54.0	54.0	54.0	54.0	16.0	30.0	30.0	36.0	50.0	50.0
Total Split (%)	45.0%	45.0%	45.0%	45.0%	45.0%	13.3%	25.0%	25.0%	30.0%	41.7%	41.7%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	30.8	30.8	30.8	30.8	30.8	62.2	54.6	54.6	76.6	65.1	65.1
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.26	0.52	0.46	0.46	0.64	0.54	0.54
v/c Ratio	0.75	0.15	0.26	0.79	0.20	0.16	0.23	0.03	0.47	0.32	0.01
Control Delay	47.5	0.6	37.7	53.5	1.8	12.1	23.0	0.1	7.9	7.3	0.0
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	47.5	0.6	37.7	53.5	1.8	12.1	23.0	0.1	7.9	7.3	0.0
LOS	D	A	D	D	A	B	C	A	A	A	A
Approach Delay	39.2			42.2			20.0			7.4	
Approach LOS	D			D			C			A	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 28 (23%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 23.1

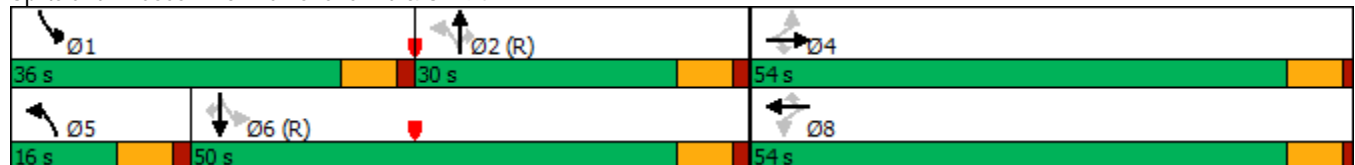
Intersection LOS: C

Intersection Capacity Utilization 64.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 5: Marksheffel Rd & SH-94



























HCM 6th Signalized Intersection Summary

2025 Background AM.syn

5: Marksheffel Rd & SH-94

07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	275	60	30	315	85	60	290	20	275	535	5
Future Volume (veh/h)	0	275	60	30	315	85	60	290	20	275	535	5
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	1781	1781	1781	1811	1811	1811	1826	1826	1826	1856	1856	1856
Adj Flow Rate, veh/h	0	340	74	34	362	98	73	354	24	316	615	6
Peak Hour Factor	0.81	0.81	0.81	0.87	0.87	0.87	0.82	0.82	0.82	0.87	0.87	0.87
Percent Heavy Veh, %	8	8	8	6	6	6	5	5	5	3	3	3
Cap, veh/h	60	422	357	130	429	363	499	1730	772	688	1999	892
Arrive On Green	0.00	0.47	0.47	0.24	0.24	0.24	0.04	0.50	0.50	0.11	0.57	0.57
Sat Flow, veh/h	888	1781	1510	941	1811	1535	1739	3469	1547	1767	3526	1572
Grp Volume(v), veh/h	0	340	74	34	362	98	73	354	24	316	615	6
Grp Sat Flow(s),veh/h/ln	888	1781	1510	941	1811	1535	1739	1735	1547	1767	1763	1572
Q Serve(g_s), s	0.0	19.5	3.4	4.2	22.9	6.2	2.4	6.8	0.9	9.9	11.0	0.2
Cycle Q Clear(g_c), s	0.0	19.5	3.4	23.7	22.9	6.2	2.4	6.8	0.9	9.9	11.0	0.2
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	60	422	357	130	429	363	499	1730	772	688	1999	892
V/C Ratio(X)	0.00	0.81	0.21	0.26	0.84	0.27	0.15	0.20	0.03	0.46	0.31	0.01
Avail Cap(c_a), veh/h	205	713	604	284	724	614	570	1730	772	935	1999	892
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)	0.00	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	0.0	29.3	25.0	53.4	43.7	37.3	13.5	16.8	15.3	10.9	13.6	11.3
Incr Delay (d2), s/veh	0.0	3.6	0.3	1.1	4.6	0.4	0.1	0.3	0.1	0.5	0.4	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	0.0	6.9	1.2	1.0	10.7	2.4	1.0	2.8	0.4	3.8	4.4	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	32.9	25.3	54.4	48.3	37.7	13.6	17.1	15.4	11.4	14.0	11.3
LnGrp LOS	A	C	C	D	D	D	B	B	B	B	B	B
Approach Vol, veh/h	414			494			451			937		
Approach Delay, s/veh	31.5			46.6			16.4			13.1		
Approach LOS	C			D			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.3	66.3		34.4	11.1	74.5		34.4				
Change Period (Y+Rc), s	6.5	6.5		6.0	6.5	6.5		6.0				
Max Green Setting (Gmax), s	29.5	23.5		48.0	9.5	43.5		48.0				
Max Q Clear Time (g_c+l1), s	11.9	8.8		21.5	4.4	13.0		25.7				
Green Ext Time (p_c), s	0.9	2.0		2.4	0.1	4.7		2.7				
Intersection Summary												
HCM 6th Ctrl Delay	24.3											
HCM 6th LOS	C											

Timings

2025 Background PM.syn

5: Marksheffel Rd & SH-94

07/13/2020

	→	↘	↙	←	↖	↗	↑	↘	↙	↓	↖
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↗	↘	↑	↗	↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	315	105	45	380	365	85	870	25	170	610	10
Future Volume (vph)	315	105	45	380	365	85	870	25	170	610	10
Turn Type	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4			8		5	2		1	6	
Permitted Phases		4	8		8	2		2	6		6
Detector Phase	4	4	8	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.5	11.5	11.5	11.5	11.5	11.5
Total Split (s)	51.2	51.2	51.2	51.2	51.2	12.5	57.0	57.0	11.8	56.3	56.3
Total Split (%)	42.7%	42.7%	42.7%	42.7%	42.7%	10.4%	47.5%	47.5%	9.8%	46.9%	46.9%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	37.0	37.0	37.0	37.0	37.0	58.7	58.7	58.7	56.4	56.4	56.4
Actuated g/C Ratio	0.31	0.31	0.31	0.31	0.31	0.49	0.49	0.49	0.47	0.47	0.47
v/c Ratio	0.70	0.23	0.34	0.79	0.73	0.27	0.55	0.03	0.59	0.39	0.01
Control Delay	46.2	6.3	36.3	48.2	29.1	20.7	24.1	0.1	28.1	12.9	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	46.2	6.3	36.3	48.2	29.1	20.7	24.1	0.1	28.1	12.9	0.2
LOS	D	A	D	D	C	C	C	A	C	B	A
Approach Delay	36.2			38.7			23.2			16.0	
Approach LOS	D			D			C			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 77 (64%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 27.9

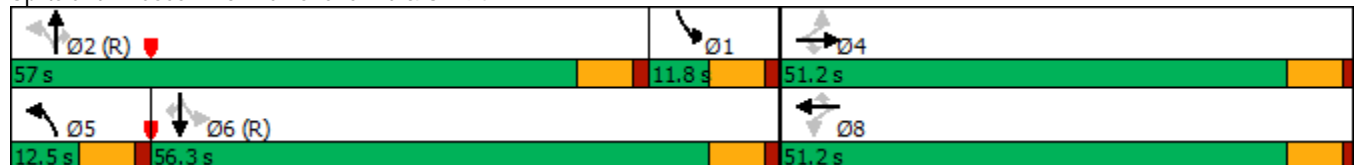
Intersection LOS: C

Intersection Capacity Utilization 78.5%

ICU Level of Service D

Analysis Period (min) 15

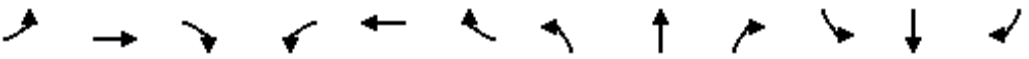












Splits and Phases: 5: Marksheffel Rd & SH-94



HCM 6th Signalized Intersection Summary 5: Marksheffel Rd & SH-94

2025 Background PM.syn

07/13/2020

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	315	105	45	380	365	85	870	25	170	610	10
Future Volume (veh/h)	0	315	105	45	380	365	85	870	25	170	610	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	1856	1856	1856	1856	1856	1856	1870	1870	1870	1841	1841	1841
Adj Flow Rate, veh/h	0	399	133	54	452	435	92	946	27	175	629	10
Peak Hour Factor	0.79	0.79	0.79	0.84	0.84	0.84	0.92	0.92	0.92	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	2	2	2	4	4	4
Cap, veh/h	60	579	491	167	579	491	307	1496	667	361	1685	751
Arrive On Green	0.00	0.31	0.31	0.31	0.31	0.31	0.05	0.42	0.42	0.11	0.48	0.48
Sat Flow, veh/h	622	1856	1572	865	1856	1572	1781	3554	1585	1753	3497	1560
Grp Volume(v), veh/h	0	399	133	54	452	435	92	946	27	175	629	10
Grp Sat Flow(s),veh/h/ln	622	1856	1572	865	1856	1572	1781	1777	1585	1753	1749	1560
Q Serve(g_s), s	0.0	22.6	7.6	7.0	26.6	31.6	4.0	25.2	1.2	0.0	13.6	0.4
Cycle Q Clear(g_c), s	0.0	22.6	7.6	29.6	26.6	31.6	4.0	25.2	1.2	0.0	13.6	0.4
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	60	579	491	167	579	491	307	1496	667	361	1685	751
V/C Ratio(X)	0.00	0.69	0.27	0.32	0.78	0.89	0.30	0.63	0.04	0.48	0.37	0.01
Avail Cap(c_a), veh/h	100	699	592	223	699	592	311	1496	667	361	1685	751
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)	0.00	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	36.2	31.0	49.2	37.5	39.3	25.2	27.4	20.5	40.3	19.6	16.2
Incr Delay (d2), s/veh	0.0	2.2	0.3	1.1	4.7	13.3	0.5	2.0	0.1	1.0	0.6	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	0.0	10.5	2.9	1.6	12.7	13.9	1.8	11.0	0.5	4.8	5.7	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	38.4	31.3	50.3	42.3	52.5	25.8	29.5	20.6	41.3	20.3	16.3
LnGrp LOS	A	D	C	D	D	D	C	C	C	D	C	B
Approach Vol, veh/h	532			941			1065			814		
Approach Delay, s/veh	36.6			47.5			28.9			24.8		
Approach LOS	D			D			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.6	57.0		43.4	12.2	64.3		43.4				
Change Period (Y+Rc), s	6.5	6.5		6.0	6.5	6.5		6.0				
Max Green Setting (Gmax), s	5.3	50.5		45.2	6.0	49.8		45.2				
Max Q Clear Time (g_c+I1), s	2.0	27.2		24.6	6.0	15.6		33.6				
Green Ext Time (p_c), s	0.1	7.4		2.9	0.0	4.9		3.9				
Intersection Summary												
HCM 6th Ctrl Delay	34.3											
HCM 6th LOS	C											

Timings

5: Marksheffel Rd & SH-94

2025 Total AM.syn

08/03/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	330	90	30	375	140	90	320	20	325	560	325
Future Volume (vph)	165	330	90	30	375	140	90	320	20	325	560	325
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		Free
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.5	11.5	11.5	11.5	11.5	11.5
Total Split (s)	58.0	58.0	58.0	58.0	58.0	58.0	15.8	27.0	27.0	35.0	46.2	
Total Split (%)	48.3%	48.3%	48.3%	48.3%	48.3%	48.3%	13.2%	22.5%	22.5%	29.2%	38.5%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	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 Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	
Act Effect Green (s)	38.8	38.8	38.8	38.8	38.8	38.8	51.3	43.1	43.1	68.3	53.9	120.0
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.32	0.32	0.43	0.36	0.36	0.57	0.45	1.00
v/c Ratio	1.12	0.63	0.17	0.17	0.70	0.26	0.25	0.28	0.03	0.57	0.39	0.23
Control Delay	136.7	34.5	0.6	26.7	41.2	4.5	18.2	32.8	0.1	14.3	17.1	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	136.7	34.5	0.6	26.7	41.2	4.5	18.2	32.8	0.1	14.3	17.1	0.3
LOS	F	C	A	C	D	A	B	C	A	B	B	A
Approach Delay		58.1			31.0			28.2			11.9	
Approach LOS		E			C			C			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 28 (23%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.12

Intersection Signal Delay: 27.9

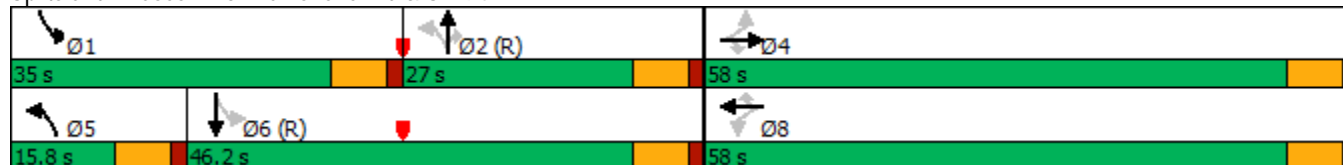
Intersection LOS: C

Intersection Capacity Utilization 76.6%

ICU Level of Service D

























Analysis Period (min) 15

Splits and Phases: 5: Marksheffel Rd & SH-94



HCM 6th Signalized Intersection Summary 5: Marksheffel Rd & SH-94

2025 Total AM.syn
08/03/2020

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	330	90	30	375	140	90	320	20	325	560	325
Future Volume (veh/h)	165	330	90	30	375	140	90	320	20	325	560	325
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	1781	1781	1781	1811	1811	1811	1826	1826	1826	1856	1856	1856
Adj Flow Rate, veh/h	179	359	33	33	408	70	98	348	22	353	609	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	8	8	6	6	6	5	5	5	3	3	3
Cap, veh/h	255	710	601	377	721	611	362	989	441	546	1371	
Arrive On Green	0.80	0.80	0.80	0.40	0.40	0.40	0.05	0.29	0.29	0.16	0.39	0.00
Sat Flow, veh/h	873	1781	1510	961	1811	1535	1739	3469	1547	1767	3526	1572
Grp Volume(v), veh/h	179	359	33	33	408	70	98	348	22	353	609	0
Grp Sat Flow(s),veh/h/ln	873	1781	1510	961	1811	1535	1739	1735	1547	1767	1763	1572
Q Serve(g_s), s	23.1	8.2	0.6	2.9	21.0	3.5	4.7	9.6	1.2	16.2	15.3	0.0
Cycle Q Clear(g_c), s	44.1	8.2	0.6	11.1	21.0	3.5	4.7	9.6	1.2	16.2	15.3	0.0
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	255	710	601	377	721	611	362	989	441	546	1371	
V/C Ratio(X)	0.70	0.51	0.05	0.09	0.57	0.11	0.27	0.35	0.05	0.65	0.44	
Avail Cap(c_a), veh/h	286	772	654	410	785	665	402	989	441	686	1371	
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	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.7	8.2	7.4	27.9	28.0	22.8	27.8	34.1	31.1	22.7	27.1	0.0
Incr Delay (d2), s/veh	6.1	0.5	0.0	0.1	0.8	0.1	0.4	1.0	0.2	1.4	1.0	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	4.3	2.3	0.2	0.7	9.2	1.3	2.0	4.2	0.5	6.9	6.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.7	8.7	7.4	28.0	28.8	22.8	28.2	35.1	31.3	24.2	28.1	0.0
LnGrp LOS	C	A	A	C	C	C	C	D	C	C	C	
Approach Vol, veh/h	571			511			468			962		
Approach Delay, s/veh	14.6			28.0			33.5			26.7		
Approach LOS	B			C			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.5	40.7		53.8	13.0	53.2		53.8				
Change Period (Y+Rc), s	6.5	6.5		6.0	6.5	6.5		6.0				
Max Green Setting (Gmax), s	28.5	20.5		52.0	9.3	39.7		52.0				
Max Q Clear Time (g_c+l1), s	18.2	11.6		46.1	6.7	17.3		23.0				
Green Ext Time (p_c), s	0.8	1.5		1.7	0.0	4.3		3.1				
Intersection Summary												
HCM 6th Ctrl Delay	25.4											
HCM 6th LOS	C											

Timings

5: Marksheffel Rd & SH-94

2025 Total PM.syn

08/03/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	390	145	45	460	450	125	915	25	225	640	355
Future Volume (vph)	250	390	145	45	460	450	125	915	25	225	640	355
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		Free
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.5	11.5	11.5	11.5	11.5	11.5
Total Split (s)	58.3	58.3	58.3	58.3	58.3	58.3	16.6	44.7	44.7	17.0	45.1	
Total Split (%)	48.6%	48.6%	48.6%	48.6%	48.6%	48.6%	13.8%	37.3%	37.3%	14.2%	37.6%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	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 Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	
Act Effect Green (s)	52.3	52.3	52.3	52.3	52.3	52.3	47.6	38.2	38.2	49.8	39.3	120.0
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.44	0.44	0.40	0.32	0.32	0.42	0.33	1.00
v/c Ratio	1.15	0.53	0.20	0.17	0.62	0.60	0.45	0.88	0.05	1.09	0.58	0.24
Control Delay	133.1	22.9	1.6	22.6	30.4	15.8	24.3	49.4	0.2	113.2	31.9	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	133.1	22.9	1.6	22.6	30.4	15.8	24.3	49.4	0.2	113.2	31.9	0.3
LOS	F	C	A	C	C	B	C	D	A	F	C	A
Approach Delay		54.1			23.2			45.3			37.7	
Approach LOS		D			C			D			D	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 28 (23%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.15

Intersection Signal Delay: 39.5

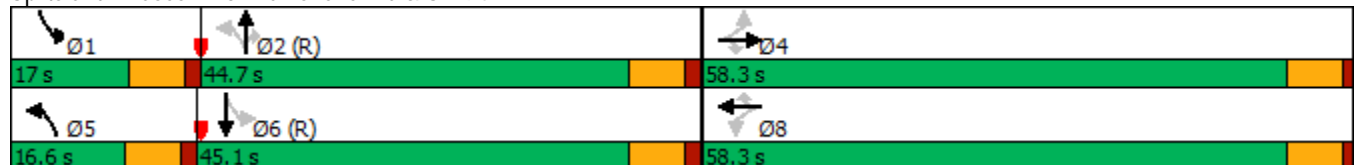
Intersection LOS: D

Intersection Capacity Utilization 96.7%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 5: Marksheffel Rd & SH-94



























HCM 6th Signalized Intersection Summary

5: Marksheffel Rd & SH-94

2025 Total PM.syn

08/03/2020

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	250	390	145	45	460	450	125	915	25	225	640	355	
Future Volume (veh/h)	250	390	145	45	460	450	125	915	25	225	640	355	
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	1856	1856	1856	1856	1856	1856	1870	1870	1870	1841	1841	1841	
Adj Flow Rate, veh/h	272	424	49	49	500	239	136	995	27	232	660	0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97	
Percent Heavy Veh, %	3	3	3	3	3	3	2	2	2	4	4	4	
Cap, veh/h	223	809	685	366	809	685	323	1131	505	242	1184		
Arrive On Green	0.73	0.73	0.73	0.44	0.44	0.44	0.07	0.32	0.32	0.09	0.34	0.00	
Sat Flow, veh/h	714	1856	1572	913	1856	1572	1781	3554	1585	1753	3497	1560	
Grp Volume(v), veh/h	272	424	49	49	500	239	136	995	27	232	660	0	
Grp Sat Flow(s),veh/h/ln	714	1856	1572	913	1856	1572	1781	1777	1585	1753	1749	1560	
Q Serve(g_s), s	27.3	12.1	1.1	4.5	25.0	12.1	6.1	31.8	1.4	10.5	18.5	0.0	
Cycle Q Clear(g_c), s	52.3	12.1	1.1	16.6	25.0	12.1	6.1	31.8	1.4	10.5	18.5	0.0	
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	223	809	685	366	809	685	323	1131	505	242	1184		
V/C Ratio(X)	1.22	0.52	0.07	0.13	0.62	0.35	0.42	0.88	0.05	0.96	0.56		
Avail Cap(c_a), veh/h	223	809	685	366	809	685	353	1131	505	242	1184		
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	
Uniform Delay (d), s/veh	32.5	10.9	9.4	28.0	26.1	22.5	25.8	38.7	28.4	30.9	32.4	0.0	
Incr Delay (d2), s/veh	130.9	0.6	0.0	0.2	1.4	0.3	0.9	9.8	0.2	45.9	1.9	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	14.4	3.8	0.4	1.0	11.2	4.5	2.7	15.2	0.6	7.6	8.1	0.0	
Unsig. Movement Delay, s/veh													
LnGrp Delay(d),s/veh	163.4	11.4	9.4	28.2	27.6	22.8	26.7	48.6	28.6	76.8	34.2	0.0	
LnGrp LOS	F	B	A	C	C	C	C	D	C	E	C		
Approach Vol, veh/h	745				788		1158			892			A
Approach Delay, s/veh	66.8				26.2		45.5			45.3			
Approach LOS	E				C		D			D			
Timer - Assigned Phs	1	2	4		5	6	8						
Phs Duration (G+Y+Rc), s	17.0	44.7	58.3		14.6	47.1	58.3						
Change Period (Y+Rc), s	6.5	6.5	6.0		6.5	6.5	6.0						
Max Green Setting (Gmax), s	10.5	38.2	52.3		10.1	38.6	52.3						
Max Q Clear Time (g_c+l1), s	12.5	33.8	54.3		8.1	20.5	27.0						
Green Ext Time (p_c), s	0.0	2.6	0.0		0.1	4.3	4.6						

Intersection Summary

HCM 6th Ctrl Delay 45.6

HCM 6th LOS D

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Timings 5: Marksheffel Rd & SH-94

2040 Background AM.syn

08/03/2020

	→	↘	↙	←	↖	↗	↑	↘	↙	↓	↖	
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø7
Lane Configurations	↑	↗	↙	↑	↗	↙	↑↑	↗	↙	↑↑	↗	
Traffic Volume (vph)	325	70	40	375	100	70	345	25	325	635	5	
Future Volume (vph)	325	70	40	375	100	70	345	25	325	635	5	
Turn Type	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free	
Protected Phases	4			8		5	2		1	6		7
Permitted Phases		4	8		8	2		2	6		Free	
Detector Phase	4	4	8	8	8	5	2	2	1	6		
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.5	11.5	11.5	11.5	11.5		9.5
Total Split (s)	61.9	61.9	51.9	51.9	51.9	13.1	23.1	23.1	35.0	45.0		10.0
Total Split (%)	51.6%	51.6%	43.3%	43.3%	43.3%	10.9%	19.3%	19.3%	29.2%	37.5%		8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5		
Lead/Lag			Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max		None
Act Effect Green (s)	33.8	33.8	33.8	33.8	33.8	55.1	47.3	47.3	73.7	61.8	120.0	
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28	0.46	0.39	0.39	0.61	0.52	1.00	
v/c Ratio	0.71	0.14	0.28	0.81	0.19	0.20	0.28	0.04	0.54	0.38	0.00	
Control Delay	46.2	0.6	35.6	52.2	0.8	14.7	28.7	0.1	32.2	38.4	0.0	
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	46.2	0.6	35.6	52.2	0.8	14.7	28.7	0.1	32.2	38.4	0.0	
LOS	D	A	D	D	A	B	C	A	C	D	A	
Approach Delay	38.1			40.9			24.8			36.1		
Approach LOS	D			D			C			D		

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

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

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 35.4

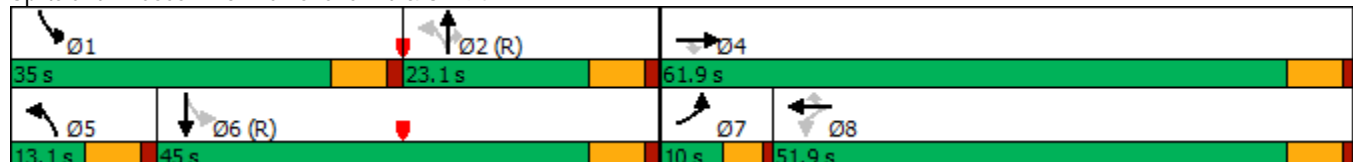
Intersection LOS: D

Intersection Capacity Utilization 71.0%

ICU Level of Service C

Analysis Period (min) 15

























Splits and Phases: 5: Marksheffel Rd & SH-94



HCM 6th Signalized Intersection Summary 5: Marksheffel Rd & SH-94

2040 Background AM.syn

08/03/2020

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	0	325	70	40	375	100	70	345	25	325	635	5	
Future Volume (veh/h)	0	325	70	40	375	100	70	345	25	325	635	5	
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	1781	1781	1781	1811	1811	1811	1826	1826	1826	1856	1856	1856	
Adj Flow Rate, veh/h	0	353	11	43	408	27	76	375	27	353	690	0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	8	8	8	6	6	6	5	5	5	3	3	3	
Cap, veh/h	1	468	397	139	476	403	451	1532	683	667	1906		
Arrive On Green	0.00	0.26	0.26	0.26	0.26	0.26	0.04	0.44	0.44	0.27	1.00	0.00	
Sat Flow, veh/h	1697	1781	1510	986	1811	1535	1739	3469	1547	1767	3526	1572	
Grp Volume(v), veh/h	0	353	11	43	408	27	76	375	27	353	690	0	
Grp Sat Flow(s),veh/h/ln	1697	1781	1510	986	1811	1535	1739	1735	1547	1767	1763	1572	
Q Serve(g_s), s	0.0	21.9	0.6	5.0	25.7	1.6	2.9	8.1	1.2	13.6	0.0	0.0	
Cycle Q Clear(g_c), s	0.0	21.9	0.6	26.9	25.7	1.6	2.9	8.1	1.2	13.6	0.0	0.0	
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	1	468	397	139	476	403	451	1532	683	667	1906		
V/C Ratio(X)	0.00	0.75	0.03	0.31	0.86	0.07	0.17	0.24	0.04	0.53	0.36		
Avail Cap(c_a), veh/h	78	830	703	257	693	587	480	1532	683	844	1906		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	
Upstream Filter(I)	0.00	0.96	0.96	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.00	
Uniform Delay (d), s/veh	0.0	40.7	32.9	53.0	42.1	33.2	17.0	21.0	19.0	11.1	0.0	0.0	
Incr Delay (d2), s/veh	0.0	2.4	0.0	1.2	7.3	0.1	0.2	0.4	0.1	0.6	0.5	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	0.0	9.9	0.2	1.3	12.4	0.6	1.2	3.4	0.5	3.9	0.1	0.0	
Unsig. Movement Delay, s/veh													
LnGrp Delay(d),s/veh	0.0	43.1	32.9	54.3	49.4	33.3	17.1	21.3	19.1	11.7	0.5	0.0	
LnGrp LOS	A	D	C	D	D	C	B	C	B	B	A		
Approach Vol, veh/h	364					478	478			1043			A
Approach Delay, s/veh	42.8					48.9	20.6			4.3			
Approach LOS	D					D	C			A			
Timer - Assigned Phs	1	2	4		5	6	7	8					
Phs Duration (G+Y+Rc), s	23.0	59.5	37.5		11.1	71.4	0.0	37.5					
Change Period (Y+Rc), s	6.5	6.5	6.0		6.5	6.5	4.5	6.0					
Max Green Setting (Gmax), s	28.5	16.6	55.9		6.6	38.5	5.5	45.9					
Max Q Clear Time (g_c+I1), s	15.6	10.1	23.9		4.9	2.0	0.0	28.9					
Green Ext Time (p_c), s	0.9	1.3	2.4		0.0	5.5	0.0	2.6					
Intersection Summary													
HCM 6th Ctrl Delay			22.5										
HCM 6th LOS			C										
Notes													

Timings
5: Marksheffel Rd & SH-94

2040 Background PM.syn

08/03/2020

	→	↘	↙	←	↖	↗	↑	↘	↙	↓	↖	
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø7
Lane Configurations	↑	↗	↙	↑	↗	↙	↑↑	↗	↙	↑↑	↗	
Traffic Volume (vph)	375	120	50	450	435	100	1035	30	200	725	10	
Future Volume (vph)	375	120	50	450	435	100	1035	30	200	725	10	
Turn Type	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free	
Protected Phases	4			8		5	2		1	6		7
Permitted Phases		4	8		8	2		2	6		Free	
Detector Phase	4	4	8	8	8	5	2	2	1	6		
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.5	11.5	11.5	11.5	11.5		9.5
Total Split (s)	57.0	57.0	47.0	47.0	47.0	14.0	44.0	44.0	19.0	49.0		10.0
Total Split (%)	47.5%	47.5%	39.2%	39.2%	39.2%	11.7%	36.7%	36.7%	15.8%	40.8%		8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5		
Lead/Lag			Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max		None
Act Effect Green (s)	40.0	40.0	40.0	40.0	40.0	54.6	46.5	46.5	66.6	52.8	120.0	
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33	0.46	0.39	0.39	0.56	0.44	1.00	
v/c Ratio	0.66	0.21	0.30	0.80	0.66	0.31	0.82	0.05	0.75	0.49	0.01	
Control Delay	37.2	3.6	31.5	45.6	16.5	17.6	40.9	0.1	55.5	18.2	0.0	
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	37.2	3.6	31.5	45.6	16.5	17.6	40.9	0.1	55.5	18.2	0.0	
LOS	D	A	C	D	B	B	D	A	E	B	A	
Approach Delay	29.1			31.3			37.8			26.0		
Approach LOS	C			C			D			C		

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

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

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 31.8

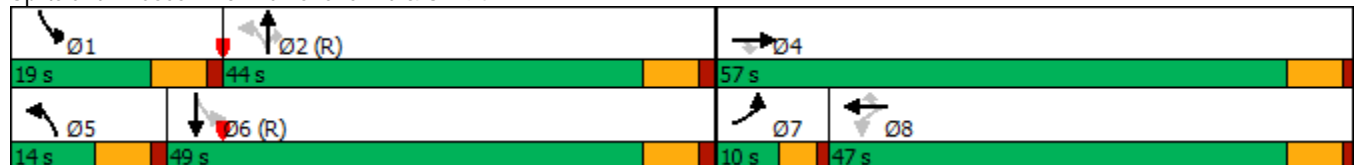
Intersection LOS: C

Intersection Capacity Utilization 87.1%

ICU Level of Service E

Analysis Period (min) 15

























Splits and Phases: 5: Marksheffel Rd & SH-94



HCM 6th Signalized Intersection Summary 5: Marksheffel Rd & SH-94

2040 Background PM.syn

08/03/2020

























													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	0	375	120	50	450	435	100	1035	30	200	725	10	
Future Volume (veh/h)	0	375	120	50	450	435	100	1035	30	200	725	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	1856	1856	1856	1856	1856	1856	1870	1870	1870	1841	1841	1841	
Adj Flow Rate, veh/h	0	408	21	54	489	223	109	1125	33	206	747	0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97	
Percent Heavy Veh, %	3	3	3	3	3	3	2	2	2	4	4	4	
Cap, veh/h	1	544	461	184	544	461	384	1675	747	304	1754		
Arrive On Green	0.00	0.59	0.59	0.29	0.29	0.29	0.05	0.47	0.47	0.05	0.34	0.00	
Sat Flow, veh/h	1767	1856	1572	951	1856	1572	1781	3554	1585	1753	3497	1560	
Grp Volume(v), veh/h	0	408	21	54	489	223	109	1125	33	206	747	0	
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	951	1856	1572	1781	1777	1585	1753	1749	1560	
Q Serve(g_s), s	0.0	19.5	0.7	6.3	30.4	14.0	3.8	29.4	1.3	7.1	19.9	0.0	
Cycle Q Clear(g_c), s	0.0	19.5	0.7	25.8	30.4	14.0	3.8	29.4	1.3	7.1	19.9	0.0	
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	1	544	461	184	544	461	384	1675	747	304	1754		
V/C Ratio(X)	0.00	0.75	0.05	0.29	0.90	0.48	0.28	0.67	0.04	0.68	0.43		
Avail Cap(c_a), veh/h	81	789	668	230	634	537	411	1675	747	351	1754		
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	
Upstream Filter(I)	0.00	0.98	0.98	1.00	1.00	1.00	1.00	1.00	1.00	0.96	0.96	0.00	
Uniform Delay (d), s/veh	0.0	21.6	17.7	48.1	40.7	34.9	16.1	24.5	17.1	20.9	26.5	0.0	
Incr Delay (d2), s/veh	0.0	2.3	0.0	0.9	14.4	0.8	0.4	2.2	0.1	4.1	0.7	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	0.0	6.2	0.3	1.5	15.9	5.5	1.6	12.6	0.5	3.3	9.0	0.0	
Unsig. Movement Delay, s/veh													
LnGrp Delay(d),s/veh	0.0	23.9	17.7	49.0	55.1	35.7	16.5	26.7	17.2	25.0	27.2	0.0	
LnGrp LOS	A	C	B	D	E	D	B	C	B	C	C		
Approach Vol, veh/h	429			766			1267			953			A
Approach Delay, s/veh	23.6			49.0			25.6			26.7			
Approach LOS	C			D			C			C			
Timer - Assigned Phs	1	2		4	5	6	7	8					
Phs Duration (G+Y+Rc), s	15.8	63.1		41.2	12.2	66.7	0.0	41.2					
Change Period (Y+Rc), s	6.5	6.5		6.0	6.5	6.5	4.5	6.0					
Max Green Setting (Gmax), s	12.5	37.5		51.0	7.5	42.5	5.5	41.0					
Max Q Clear Time (g_c+I1), s	9.1	31.4		21.5	5.8	21.9	0.0	32.4					
Green Ext Time (p_c), s	0.2	3.8		2.8	0.0	5.3	0.0	2.8					
Intersection Summary													
HCM 6th Ctrl Delay	30.9												
HCM 6th LOS	C												

Timings

5: Marksheffel Rd & SH-94

2040 Total AM.syn

08/03/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	380	100	40	435	155	100	375	25	375	660	325
Future Volume (vph)	165	380	100	40	435	155	100	375	25	375	660	325
Turn Type	Prot	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases			4	8		8	2		2	6		Free
Detector Phase	7	4	4	8	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	11.0	11.0	11.0	11.0	11.0	11.5	11.5	11.5	11.5	11.5	11.5
Total Split (s)	28.5	73.0	73.0	44.5	44.5	44.5	12.0	16.0	16.0	31.0	35.0	
Total Split (%)	23.8%	60.8%	60.8%	37.1%	37.1%	37.1%	10.0%	13.3%	13.3%	25.8%	29.2%	
Yellow Time (s)	3.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	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 Lost Time (s)	4.5	6.0	6.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	
Act Effect Green (s)	17.9	58.6	58.6	36.2	36.2	36.2	24.0	16.0	16.0	48.9	34.5	120.0
Actuated g/C Ratio	0.15	0.49	0.49	0.30	0.30	0.30	0.20	0.13	0.13	0.41	0.29	1.00
v/c Ratio	0.72	0.48	0.14	0.15	0.88	0.28	0.53	0.89	0.07	0.90	0.71	0.23
Control Delay	64.2	21.6	1.1	30.6	57.5	4.0	42.8	74.6	0.4	68.0	59.3	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	64.2	21.6	1.1	30.6	57.5	4.0	42.8	74.6	0.4	68.0	59.3	0.3
LOS	E	C	A	C	E	A	D	E	A	E	E	A
Approach Delay		29.3			42.7			64.5			47.6	
Approach LOS		C			D			E			D	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

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

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 45.6

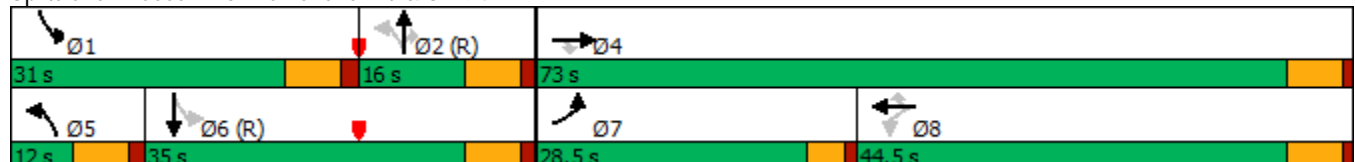
Intersection LOS: D

Intersection Capacity Utilization 82.8%

ICU Level of Service E

























Analysis Period (min) 15

Splits and Phases: 5: Marksheffel Rd & SH-94



HCM 6th Signalized Intersection Summary 5: Marksheffel Rd & SH-94

2040 Total AM.syn
08/03/2020

























													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	165	380	100	40	435	155	100	375	25	375	660	325	
Future Volume (veh/h)	165	380	100	40	435	155	100	375	25	375	660	325	
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	1781	1781	1781	1811	1811	1811	1826	1826	1826	1856	1856	1856	
Adj Flow Rate, veh/h	179	413	44	43	473	86	109	408	27	408	717	0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	8	8	8	6	6	6	5	5	5	3	3	3	
Cap, veh/h	208	793	672	311	516	437	253	721	322	490	1237		
Arrive On Green	0.12	0.45	0.45	0.28	0.28	0.28	0.05	0.21	0.21	0.06	0.12	0.00	
Sat Flow, veh/h	1697	1781	1510	905	1811	1535	1739	3469	1547	1767	3526	1572	
Grp Volume(v), veh/h	179	413	44	43	473	86	109	408	27	408	717	0	
Grp Sat Flow(s),veh/h/ln	1697	1781	1510	905	1811	1535	1739	1735	1547	1767	1763	1572	
Q Serve(g_s), s	12.4	20.1	2.0	4.3	30.3	5.1	5.5	12.7	1.7	20.3	23.1	0.0	
Cycle Q Clear(g_c), s	12.4	20.1	2.0	5.2	30.3	5.1	5.5	12.7	1.7	20.3	23.1	0.0	
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	208	793	672	311	516	437	253	721	322	490	1237		
V/C Ratio(X)	0.86	0.52	0.07	0.14	0.92	0.20	0.43	0.57	0.08	0.83	0.58		
Avail Cap(c_a), veh/h	339	995	843	344	581	492	253	721	322	517	1237		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	
Upstream Filter(I)	0.89	0.89	0.89	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.00	
Uniform Delay (d), s/veh	51.6	24.1	19.0	32.9	41.5	32.5	36.3	42.7	38.3	32.8	44.7	0.0	
Incr Delay (d2), s/veh	10.6	0.5	0.0	0.2	18.3	0.2	1.2	3.2	0.5	10.2	1.9	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	5.9	8.5	0.7	1.0	16.0	1.9	2.6	5.8	0.7	10.9	11.3	0.0	
Unsig. Movement Delay, s/veh													
LnGrp Delay(d),s/veh	62.2	24.5	19.1	33.1	59.8	32.7	37.4	45.9	38.8	43.0	46.6	0.0	
LnGrp LOS	E	C	B	C	E	C	D	D	D	D	D		
Approach Vol, veh/h	636			602			544			1125			A
Approach Delay, s/veh	34.8			54.0			43.8			45.3			
Approach LOS	C			D			D			D			
Timer - Assigned Phs	1	2		4	5	6	7	8					
Phs Duration (G+Y+Rc), s	29.2	31.4		59.4	12.0	48.6	19.2	40.2					
Change Period (Y+Rc), s	6.5	6.5		6.0	6.5	6.5	4.5	6.0					
Max Green Setting (Gmax), s	24.5	9.5		67.0	5.5	28.5	24.0	38.5					
Max Q Clear Time (g_c+l1), s	22.3	14.7		22.1	7.5	25.1	14.4	32.3					
Green Ext Time (p_c), s	0.3	0.0		3.1	0.0	1.5	0.3	1.9					
Intersection Summary													
HCM 6th Ctrl Delay	44.5												
HCM 6th LOS	D												

Timings

5: Marksheffel Rd & SH-94

2040 Total PM.syn

08/03/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	450	160	50	530	520	140	1080	30	255	755	355
Future Volume (vph)	250	450	160	50	530	520	140	1080	30	255	755	355
Turn Type	Prot	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases			4	8		8	2		2	6		Free
Detector Phase	7	4	4	8	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	11.0	11.0	11.0	11.0	11.0	11.5	11.5	11.5	11.5	11.5	
Total Split (s)	19.0	57.0	57.0	38.0	38.0	38.0	12.0	47.0	47.0	16.0	51.0	
Total Split (%)	15.8%	47.5%	47.5%	31.7%	31.7%	31.7%	10.0%	39.2%	39.2%	13.3%	42.5%	
Yellow Time (s)	3.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	6.0	6.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	
Act Effect Green (s)	14.5	51.0	51.0	32.0	32.0	32.0	46.0	40.5	40.5	54.0	44.5	120.0
Actuated g/C Ratio	0.12	0.42	0.42	0.27	0.27	0.27	0.38	0.34	0.34	0.45	0.37	1.00
v/c Ratio	1.29	0.62	0.23	0.23	1.17	1.10	0.63	0.98	0.05	1.33	0.60	0.24
Control Delay	204.9	26.9	3.5	37.7	136.4	101.7	34.9	62.0	0.2	214.6	30.6	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	204.9	26.9	3.5	37.7	136.4	101.7	34.9	62.0	0.2	214.6	30.6	0.3
LOS	F	C	A	D	F	F	C	E	A	F	C	A
Approach Delay		74.3			115.6			57.5			57.1	
Approach LOS		E			F			E			E	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

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

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.33

Intersection Signal Delay: 74.8

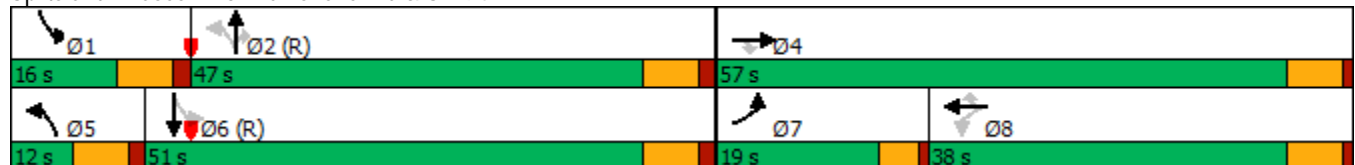
Intersection LOS: E

Intersection Capacity Utilization 105.3%

ICU Level of Service G

























Analysis Period (min) 15

Splits and Phases: 5: Marksheffel Rd & SH-94



HCM 6th Signalized Intersection Summary 5: Marksheffel Rd & SH-94

2040 Total PM.syn
08/03/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	250	450	160	50	530	520	140	1080	30	255	755	355
Future Volume (veh/h)	250	450	160	50	530	520	140	1080	30	255	755	355
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	1856	1856	1856	1856	1856	1856	1870	1870	1870	1841	1841	1841
Adj Flow Rate, veh/h	272	489	65	54	576	315	152	1174	33	263	778	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	2	2	2	4	4	4
Cap, veh/h	214	789	668	286	495	419	263	1199	535	204	1297	
Arrive On Green	0.24	0.85	0.85	0.27	0.27	0.27	0.05	0.34	0.34	0.05	0.25	0.00
Sat Flow, veh/h	1767	1856	1572	848	1856	1572	1781	3554	1585	1753	3497	1560
Grp Volume(v), veh/h	272	489	65	54	576	315	152	1174	33	263	778	0
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	848	1856	1572	1781	1777	1585	1753	1749	1560
Q Serve(g_s), s	14.5	10.0	0.8	6.0	32.0	22.0	5.5	39.2	1.7	9.5	23.6	0.0
Cycle Q Clear(g_c), s	14.5	10.0	0.8	6.0	32.0	22.0	5.5	39.2	1.7	9.5	23.6	0.0
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	214	789	668	286	495	419	263	1199	535	204	1297	
V/C Ratio(X)	1.27	0.62	0.10	0.19	1.16	0.75	0.58	0.98	0.06	1.29	0.60	
Avail Cap(c_a), veh/h	214	789	668	286	495	419	263	1199	535	204	1297	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	0.89	0.89	0.89	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.92	0.00
Uniform Delay (d), s/veh	45.5	5.9	5.2	34.5	44.0	40.3	30.3	39.3	26.9	33.0	37.2	0.0
Incr Delay (d2), s/veh	151.6	1.3	0.1	0.3	94.1	7.4	3.1	21.4	0.2	160.6	1.9	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	14.5	2.5	0.3	1.3	27.5	9.4	1.5	20.4	0.7	13.0	10.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	197.1	7.3	5.3	34.8	138.1	47.8	33.5	60.7	27.1	193.6	39.1	0.0
LnGrp LOS	F	A	A	C	F	D	C	E	C	F	D	
Approach Vol, veh/h	826			945			1359			1041		
Approach Delay, s/veh	69.6			102.1			56.9			78.1		
Approach LOS	E			F			E			E		
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.0	47.0		57.0	12.0	51.0	19.0	38.0				
Change Period (Y+Rc), s	6.5	6.5		6.0	6.5	6.5	4.5	6.0				
Max Green Setting (Gmax), s	9.5	40.5		51.0	5.5	44.5	14.5	32.0				
Max Q Clear Time (g_c+l1), s	11.5	41.2		12.0	7.5	25.6	16.5	34.0				
Green Ext Time (p_c), s	0.0	0.0		3.8	0.0	5.3	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay 74.9
HCM 6th LOS E

Notes

























Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Timings

5: Marksheffel Rd & SH-94

2040 Total AM Improved.syn

08/03/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	380	100	40	435	155	100	375	25	375	660	325
Future Volume (vph)	165	380	100	40	435	155	100	375	25	375	660	325
Turn Type	Prot	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	11.0	11.0	11.0	11.0	11.0	11.5	11.5	11.5	11.5	11.5	11.5
Total Split (s)	18.0	63.0	63.0	45.0	45.0	45.0	16.0	24.0	24.0	33.0	41.0	41.0
Total Split (%)	15.0%	52.5%	52.5%	37.5%	37.5%	37.5%	13.3%	20.0%	20.0%	27.5%	34.2%	34.2%
Yellow Time (s)	3.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	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 Lost Time (s)	4.5	6.0	6.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	11.5	51.8	51.8	35.7	35.7	35.7	33.6	24.8	24.8	55.7	40.4	40.4
Actuated g/C Ratio	0.10	0.43	0.43	0.30	0.30	0.30	0.28	0.21	0.21	0.46	0.34	0.34
v/c Ratio	0.58	0.54	0.15	0.16	0.89	0.29	0.41	0.57	0.06	0.81	0.61	0.46
Control Delay	59.2	27.6	1.4	31.0	59.3	4.0	27.7	49.0	0.2	49.7	35.2	7.9
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	59.2	27.6	1.4	31.0	59.3	4.0	27.7	49.0	0.2	49.7	35.2	7.9
LOS	E	C	A	C	E	A	C	D	A	D	D	A
Approach Delay		31.6			44.0			42.3			32.7	
Approach LOS		C			D			D			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

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

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 36.3

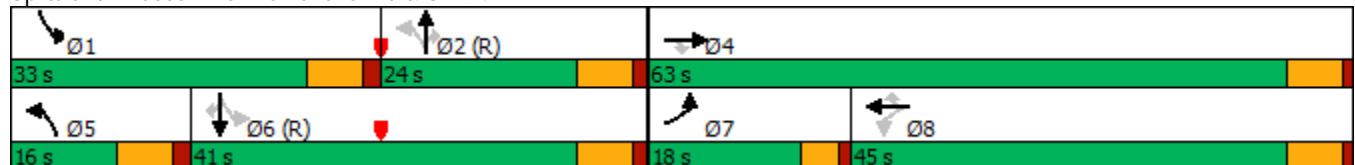
Intersection LOS: D

Intersection Capacity Utilization 78.3%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 5: Marksheffel Rd & SH-94


























HCM 6th Signalized Intersection Summary

2040 Total AM Improved.syn

5: Marksheffel Rd & SH-94

08/03/2020

























													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	165	380	100	40	435	155	100	375	25	375	660	325	
Future Volume (veh/h)	165	380	100	40	435	155	100	375	25	375	660	325	
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	1781	1781	1781	1811	1811	1811	1826	1826	1826	1856	1856	1856	
Adj Flow Rate, veh/h	179	413	44	43	473	86	109	408	27	408	717	0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	8	8	8	6	6	6	5	5	5	3	3	3	
Cap, veh/h	237	704	596	252	517	438	349	887	396	546	1359		
Arrive On Green	0.07	0.40	0.40	0.29	0.29	0.29	0.06	0.26	0.26	0.32	0.64	0.00	
Sat Flow, veh/h	3291	1781	1510	905	1811	1535	1739	3469	1547	1767	3526	1572	
Grp Volume(v), veh/h	179	413	44	43	473	86	109	408	27	408	717	0	
Grp Sat Flow(s),veh/h/ln	1646	1781	1510	905	1811	1535	1739	1735	1547	1767	1763	1572	
Q Serve(g_s), s	6.4	21.9	2.2	4.7	30.3	5.1	5.5	11.9	1.6	20.4	13.2	0.0	
Cycle Q Clear(g_c), s	6.4	21.9	2.2	13.5	30.3	5.1	5.5	11.9	1.6	20.4	13.2	0.0	
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	237	704	596	252	517	438	349	887	396	546	1359		
V/C Ratio(X)	0.76	0.59	0.07	0.17	0.91	0.20	0.31	0.46	0.07	0.75	0.53		
Avail Cap(c_a), veh/h	370	846	717	288	589	499	381	887	396	598	1359		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67	
Upstream Filter(I)	0.89	0.89	0.89	1.00	1.00	1.00	1.00	1.00	1.00	0.89	0.89	0.00	
Uniform Delay (d), s/veh	54.7	28.6	22.6	39.1	41.4	32.4	29.9	37.7	33.8	20.2	15.5	0.0	
Incr Delay (d2), s/veh	4.4	0.7	0.0	0.3	17.6	0.2	0.5	1.7	0.3	4.2	1.3	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	2.8	9.4	0.8	1.1	15.9	1.9	2.4	5.3	0.6	7.4	4.4	0.0	
Unsig. Movement Delay, s/veh													
LnGrp Delay(d),s/veh	59.0	29.3	22.7	39.4	59.1	32.7	30.4	39.4	34.2	24.4	16.8	0.0	
LnGrp LOS	E	C	C	D	E	C	C	D	C	C	B		
Approach Vol, veh/h	636			602			544			1125			A
Approach Delay, s/veh	37.2			53.9			37.3			19.6			
Approach LOS	D			D			D			B			
Timer - Assigned Phs	1	2		4	5	6	7	8					
Phs Duration (G+Y+Rc), s	29.4	37.2		53.4	13.8	52.8	13.1	40.3					
Change Period (Y+Rc), s	6.5	6.5		6.0	6.5	6.5	4.5	6.0					
Max Green Setting (Gmax), s	26.5	17.5		57.0	9.5	34.5	13.5	39.0					
Max Q Clear Time (g_c+l1), s	22.4	13.9		23.9	7.5	15.2	8.4	32.3					
Green Ext Time (p_c), s	0.6	0.9		3.0	0.0	4.9	0.2	2.0					
Intersection Summary													
HCM 6th Ctrl Delay	33.8												
HCM 6th LOS	C												

Timings

2040 Total PM Improved.syn

5: Marksheffel Rd & SH-94







08/03/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	450	160	50	530	520	140	1080	30	255	755	355
Future Volume (vph)	250	450	160	50	530	520	140	1080	30	255	755	355
Turn Type	Prot	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases			4	8		8	2		2	6		Free
Detector Phase	7	4	4	8	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	11.0	11.0	11.0	11.0	11.0	11.5	11.5	11.5	11.5	11.5	
Total Split (s)	13.6	53.6	53.6	40.0	40.0	40.0	19.0	49.4	49.4	17.0	47.4	
Total Split (%)	11.3%	44.7%	44.7%	33.3%	33.3%	33.3%	15.8%	41.2%	41.2%	14.2%	39.5%	
Yellow Time (s)	3.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	6.0	6.0	6.0	6.0	6.0	6.5	6.5	6.5	6.5	6.5	
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	
Act Effect Green (s)	9.1	47.6	47.6	34.0	34.0	34.0	53.6	42.9	42.9	53.2	42.7	120.0
Actuated g/C Ratio	0.08	0.40	0.40	0.28	0.28	0.28	0.45	0.36	0.36	0.44	0.36	1.00
v/c Ratio	1.06	0.67	0.24	0.27	1.10	0.96	0.50	0.93	0.05	1.23	0.63	0.24
Control Delay	127.2	32.8	5.3	38.1	111.3	57.3	22.7	50.6	0.1	169.0	30.2	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	127.2	32.8	5.3	38.1	111.3	57.3	22.7	50.6	0.1	169.0	30.2	0.3
LOS	F	C	A	D	F	E	C	D	A	F	C	A
Approach Delay		55.2			82.5			46.2			48.4	
Approach LOS		E			F			D			D	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.23
Intersection Signal Delay: 57.4
Intersection Capacity Utilization 98.6%
Analysis Period (min) 15
Intersection LOS: E
ICU Level of Service F

Splits and Phases: 5: Marksheffel Rd & SH-94
























 Ø1	 Ø2 (R)	 Ø4
17 s	49.4 s	53.6 s
 Ø5	 Ø6 (R)	 Ø7
19 s	47.4 s	13.6 s
		40 s

HCM 6th Signalized Intersection Summary

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2040 Total PM Improved.syn

08/03/2020






													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	250	450	160	50	530	520	140	1080	30	255	755	355	
Future Volume (veh/h)	250	450	160	50	530	520	140	1080	30	255	755	355	
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	1856	1856	1856	1856	1856	1856	1870	1870	1870	1841	1841	1841	
Adj Flow Rate, veh/h	272	489	65	54	576	315	152	1174	33	263	778	0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97	
Percent Heavy Veh, %	3	3	3	3	3	3	2	2	2	4	4	4	
Cap, veh/h	260	736	624	299	526	446	376	1270	567	232	1309		
Arrive On Green	0.15	0.79	0.79	0.28	0.28	0.28	0.07	0.36	0.36	0.17	0.75	0.00	
Sat Flow, veh/h	3428	1856	1572	848	1856	1572	1781	3554	1585	1753	3497	1560	
Grp Volume(v), veh/h	272	489	65	54	576	315	152	1174	33	263	778	0	
Grp Sat Flow(s),veh/h/ln	1714	1856	1572	848	1856	1572	1781	1777	1585	1753	1749	1560	
Q Serve(g_s), s	9.1	13.8	1.1	5.9	34.0	21.5	6.4	38.0	1.6	10.5	12.1	0.0	
Cycle Q Clear(g_c), s	9.1	13.8	1.1	6.1	34.0	21.5	6.4	38.0	1.6	10.5	12.1	0.0	
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	260	736	624	299	526	446	376	1270	567	232	1309		
V/C Ratio(X)	1.05	0.66	0.10	0.18	1.10	0.71	0.40	0.92	0.06	1.13	0.59		
Avail Cap(c_a), veh/h	260	736	624	299	526	446	435	1270	567	232	1309		
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	
Upstream Filter(I)	0.89	0.89	0.89	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.92	0.00	
Uniform Delay (d), s/veh	50.9	8.9	7.6	33.1	43.0	38.5	22.0	37.0	25.3	26.8	11.0	0.0	
Incr Delay (d2), s/veh	65.3	2.0	0.1	0.3	67.9	5.1	0.7	12.6	0.2	97.7	1.8	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	5.9	3.6	0.4	1.2	25.3	8.9	2.8	18.5	0.7	10.0	3.4	0.0	
Unsig. Movement Delay, s/veh													
LnGrp Delay(d),s/veh	116.2	10.9	7.7	33.4	110.9	43.6	22.7	49.6	25.5	124.5	12.8	0.0	
LnGrp LOS	F	B	A	C	F	D	C	D	C	F	B		
Approach Vol, veh/h	826		945				1359			1041			A
Approach Delay, s/veh	45.3		84.0				46.0			41.0			
Approach LOS	D		F				D			D			
Timer - Assigned Phs	1	2		4	5	6	7	8					
Phs Duration (G+Y+Rc), s	17.0	49.4		53.6	15.0	51.4	13.6	40.0					
Change Period (Y+Rc), s	6.5	6.5		6.0	6.5	6.5	4.5	6.0					
Max Green Setting (Gmax), s	10.5	42.9		47.6	12.5	40.9	9.1	34.0					
Max Q Clear Time (g_c+l1), s	12.5	40.0		15.8	8.4	14.1	11.1	36.0					
Green Ext Time (p_c), s	0.0	2.0		3.7	0.1	6.0	0.0	0.0					
Intersection Summary													
HCM 6th Ctrl Delay	53.2												
HCM 6th LOS	D												
Notes													

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↗↗	↗↗	↗
Traffic Vol, veh/h	0	125	0	1445	730	275
Future Vol, veh/h	0	125	0	1445	730	275
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	136	0	1571	793	299
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	397	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	602	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	602	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.7	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT EBLn1		SBT	SBR		
Capacity (veh/h)	- 602		-	-		
HCM Lane V/C Ratio	- 0.226		-	-		
HCM Control Delay (s)	- 12.7		-	-		
HCM Lane LOS	- B		-	-		
HCM 95th %tile Q(veh)	- 0.9		-	-		

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↗	↗	↗
Traffic Vol, veh/h	0	135	0	1015	900	420
Future Vol, veh/h	0	135	0	1015	900	420
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	147	0	1103	978	457
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	489	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	525	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	525	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.5	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT EBLn1		SBT	SBR		
Capacity (veh/h)	- 525		-	-		
HCM Lane V/C Ratio	- 0.28		-	-		
HCM Control Delay (s)	- 14.5		-	-		
HCM Lane LOS	- B		-	-		
HCM 95th %tile Q(veh)	- 1.1		-	-		

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↗	↗	↗
Traffic Vol, veh/h	0	125	0	1700	860	275
Future Vol, veh/h	0	125	0	1700	860	275
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
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	136	0	1848	935	299
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	468	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	542	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	542	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.9	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT EBLn1		SBT	SBR		
Capacity (veh/h)	- 542		-	-		
HCM Lane V/C Ratio	- 0.251		-	-		
HCM Control Delay (s)	- 13.9		-	-		
HCM Lane LOS	- B		-	-		
HCM 95th %tile Q(veh)	- 1		-	-		

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↗	↗	↗
Traffic Vol, veh/h	0	135	0	1185	1055	420
Future Vol, veh/h	0	135	0	1185	1055	420
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	147	0	1288	1147	457
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	574	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	462	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	462	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	16.4	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT EBLn1		SBT	SBR		
Capacity (veh/h)	- 462		-	-		
HCM Lane V/C Ratio	- 0.318		-	-		
HCM Control Delay (s)	- 16.4		-	-		
HCM Lane LOS	- C		-	-		
HCM 95th %tile Q(veh)	- 1.4		-	-		






Intersection						
Int Delay, s/veh	5.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	100	125	250	1345	825	30
Future Vol, veh/h	100	125	250	1345	825	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	150
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	109	136	272	1462	897	33

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2172	449	930	0	-	0
Stage 1	897	-	-	-	-	-
Stage 2	1275	-	-	-	-	-
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	*~ 74	557	731	-	-	-
Stage 1	*358	-	-	-	-	-
Stage 2	*499	-	-	-	-	-
Platoon blocked, %	1			-	-	-
Mov Cap-1 Maneuver	*~ 47	557	731	-	-	-
Mov Cap-2 Maneuver	*197	-	-	-	-	-
Stage 1	*225	-	-	-	-	-
Stage 2	*499	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	50.3	2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	731	-	307	-	-
HCM Lane V/C Ratio	0.372	-	0.797	-	-
HCM Control Delay (s)	12.8	-	50.3	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q(veh)	1.7	-	6.4	-	-

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













Intersection						
Int Delay, s/veh	37.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	110	135	375	905	990	45
Future Vol, veh/h	110	135	375	905	990	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	150
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	120	147	408	984	1076	49
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2384	538	1125	0	-	0
Stage 1	1076	-	-	-	-	-
Stage 2	1308	-	-	-	-	-
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	~ 31	488	617	-	-	-
Stage 1	289	-	-	-	-	-
Stage 2	413	-	-	-	-	-
Platoon blocked, %	1			-	-	-
Mov Cap-1 Maneuver	~ 10	488	617	-	-	-
Mov Cap-2 Maneuver	~ 90	-	-	-	-	-
Stage 1	~ 98	-	-	-	-	-
Stage 2	413	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	360.9	6.3		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	617	-	163	-	-	
HCM Lane V/C Ratio	0.661	-	1.634	-	-	
HCM Control Delay (s)	21.5	360.9		-	-	
HCM Lane LOS	C	-	F	-	-	
HCM 95th %tile Q(veh)	4.9	-	18.4	-	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Timings

2025 Total AM Improved.syn

7: Marksheffel Rd & Full Access

08/04/2020

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	100	125	250	1345	825	30
Future Volume (vph)	100	125	250	1345	825	30
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	27.0	27.0	32.0	93.0	61.0	61.0
Total Split (%)	22.5%	22.5%	26.7%	77.5%	50.8%	50.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	12.7	12.7	98.3	98.3	83.9	83.9
Actuated g/C Ratio	0.11	0.11	0.82	0.82	0.70	0.70
v/c Ratio	0.58	0.47	0.53	0.50	0.36	0.03
Control Delay	63.0	13.4	8.1	5.1	6.3	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	13.4	8.1	5.1	6.3	1.5
LOS	E	B	A	A	A	A
Approach Delay	35.4			5.6	6.2	
Approach LOS	D			A	A	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.58
Intersection Signal Delay: 8.3
Intersection Capacity Utilization 53.4%
Analysis Period (min) 15
Intersection LOS: A
ICU Level of Service A

Splits and Phases: 7: Marksheffel Rd & Full Access















HCM 6th Signalized Intersection Summary

7: Marksheffel Rd & Full Access

2025 Total AM Improved.syn

08/04/2020













						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	100	125	250	1345	825	30
Future Volume (veh/h)	100	125	250	1345	825	30
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	109	136	272	1462	897	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	187	167	544	2914	2570	1146
Arrive On Green	0.11	0.11	0.06	0.82	0.72	0.72
Sat Flow, veh/h	1781	1585	1781	3647	3647	1585
Grp Volume(v), veh/h	109	136	272	1462	897	33
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1777	1777	1585
Q Serve(g_s), s	7.0	10.1	4.3	15.1	11.2	0.7
Cycle Q Clear(g_c), s	7.0	10.1	4.3	15.1	11.2	0.7
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	187	167	544	2914	2570	1146
V/C Ratio(X)	0.58	0.82	0.50	0.50	0.35	0.03
Avail Cap(c_a), veh/h	334	297	847	2914	2570	1146
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.86	0.86	1.00	1.00
Uniform Delay (d), s/veh	51.2	52.6	4.2	3.3	6.2	4.7
Incr Delay (d2), s/veh	2.9	9.3	0.6	0.5	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	9.0	1.3	4.1	3.9	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	54.0	61.9	4.8	3.8	6.5	4.7
LnGrp LOS	D	E	A	A	A	A
Approach Vol, veh/h	245			1734	930	
Approach Delay, s/veh	58.4			4.0	6.5	
Approach LOS	E			A	A	
Timer - Assigned Phs	2		4		5	6
Phs Duration (G+Y+Rc), s	102.9		17.1		11.6	91.3
Change Period (Y+Rc), s	4.5		4.5		4.5	4.5
Max Green Setting (Gmax), s	88.5		22.5		27.5	56.5
Max Q Clear Time (g_c+I1), s	17.1		12.1		6.3	13.2
Green Ext Time (p_c), s	18.6		0.5		0.8	8.1
Intersection Summary						
HCM 6th Ctrl Delay			9.4			
HCM 6th LOS			A			

Timings

2025 Total PM Improved.syn

7: Marksheffel Rd & Full Access

08/04/2020

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	110	135	375	905	990	45
Future Volume (vph)	110	135	375	905	990	45
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	27.0	27.0	39.0	93.0	54.0	54.0
Total Split (%)	22.5%	22.5%	32.5%	77.5%	45.0%	45.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	13.4	13.4	97.6	97.6	69.0	69.0
Actuated g/C Ratio	0.11	0.11	0.81	0.81	0.58	0.58
v/c Ratio	0.61	0.48	0.73	0.34	0.53	0.05
Control Delay	63.2	12.7	13.3	8.9	15.1	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.2	12.7	13.3	8.9	15.1	4.2
LOS	E	B	B	A	B	A
Approach Delay	35.4			10.2	14.6	
Approach LOS	D			B	B	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 14.4
Intersection Capacity Utilization 65.5%
Analysis Period (min) 15
Intersection LOS: B
ICU Level of Service C

Splits and Phases: 7: Marksheffel Rd & Full Access









HCM 6th Signalized Intersection Summary

2025 Total PM Improved.syn

08/04/2020

7: Marksheffel Rd & Full Access















Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	110	135	375	905	990	45
Future Volume (veh/h)	110	135	375	905	990	45
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	120	147	408	984	1076	49
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	200	178	494	2889	2439	1088
Arrive On Green	0.11	0.11	0.09	0.81	0.69	0.69
Sat Flow, veh/h	1781	1585	1781	3647	3647	1585
Grp Volume(v), veh/h	120	147	408	984	1076	49
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1777	1777	1585
Q Serve(g_s), s	7.7	10.9	7.4	8.6	16.4	1.2
Cycle Q Clear(g_c), s	7.7	10.9	7.4	8.6	16.4	1.2
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	200	178	494	2889	2439	1088
V/C Ratio(X)	0.60	0.83	0.83	0.34	0.44	0.05
Avail Cap(c_a), veh/h	334	297	847	2889	2439	1088
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.42	0.42	1.00	1.00
Uniform Delay (d), s/veh	50.7	52.1	10.7	2.9	8.5	6.1
Incr Delay (d2), s/veh	2.9	9.3	1.5	0.1	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	9.7	5.1	2.3	6.0	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	53.6	61.5	12.3	3.0	9.1	6.2
LnGrp LOS	D	E	B	A	A	A
Approach Vol, veh/h	267			1392	1125	
Approach Delay, s/veh	57.9			5.7	8.9	
Approach LOS	E			A	A	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	102.0			18.0	15.2	86.8
Change Period (Y+Rc), s	4.5			4.5	4.5	4.5
Max Green Setting (Gmax), s	88.5			22.5	34.5	49.5
Max Q Clear Time (g_c+l1), s	10.6			12.9	9.4	18.4
Green Ext Time (p_c), s	9.4			0.6	1.3	9.7
Intersection Summary						
HCM 6th Ctrl Delay			12.0			
HCM 6th LOS			B			

Timings 7: Marksheffel Rd & Full Access

2040 Total AM.syn

08/04/2020

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	100	125	250	1600	955	30
Future Volume (vph)	100	125	250	1600	955	30
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	25.0	25.0	30.0	95.0	65.0	65.0
Total Split (%)	20.8%	20.8%	25.0%	79.2%	54.2%	54.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	12.7	12.7	98.3	98.3	83.1	83.1
Actuated g/C Ratio	0.11	0.11	0.82	0.82	0.69	0.69
v/c Ratio	0.58	0.47	0.59	0.60	0.42	0.03
Control Delay	63.1	13.4	13.0	4.3	4.8	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	13.4	13.0	4.3	4.8	0.5
LOS	E	B	B	A	A	A
Approach Delay	35.5			5.5	4.6	
Approach LOS	D			A	A	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 7.4
Intersection Capacity Utilization 57.3%
Analysis Period (min) 15

Intersection LOS: A

ICU Level of Service B

Splits and Phases: 7: Marksheffel Rd & Full Access



HCM 6th Signalized Intersection Summary

7: Marksheffel Rd & Full Access

2040 Total AM.syn

08/04/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	100	125	250	1600	955	30
Future Volume (veh/h)	100	125	250	1600	955	30
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	109	136	272	1739	1038	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	186	166	492	2915	2555	1140
Arrive On Green	0.10	0.10	0.13	1.00	0.72	0.72
Sat Flow, veh/h	1781	1585	1781	3647	3647	1585
Grp Volume(v), veh/h	109	136	272	1739	1038	33
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1777	1777	1585
Q Serve(g_s), s	7.0	10.1	4.9	0.0	13.9	0.7
Cycle Q Clear(g_c), s	7.0	10.1	4.9	0.0	13.9	0.7
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	186	166	492	2915	2555	1140
V/C Ratio(X)	0.59	0.82	0.55	0.60	0.41	0.03
Avail Cap(c_a), veh/h	304	271	756	2915	2555	1140
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.63	0.63	1.00	1.00
Uniform Delay (d), s/veh	51.2	52.6	4.6	0.0	6.7	4.8
Incr Delay (d2), s/veh	2.9	9.7	0.6	0.6	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	9.0	1.2	0.2	4.9	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	54.1	62.3	5.2	0.6	7.2	4.9
LnGrp LOS	D	E	A	A	A	A
Approach Vol, veh/h	245			2011	1071	
Approach Delay, s/veh	58.7			1.2	7.1	
Approach LOS	E			A	A	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		102.9		17.1	12.2	90.8
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		90.5		20.5	25.5	60.5
Max Q Clear Time (g_c+l1), s		2.0		12.1	6.9	15.9
Green Ext Time (p_c), s		27.9		0.5	0.7	9.9
Intersection Summary						
HCM 6th Ctrl Delay			7.3			
HCM 6th LOS			A			













Notes

User approved volume balancing among the lanes for turning movement.

Timings
7: Marksheffel Rd & Full Access

2040 Total PM.syn

08/04/2020

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	110	135	375	1075	1145	45
Future Volume (vph)	110	135	375	1075	1145	45
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	38.0	96.0	58.0	58.0
Total Split (%)	20.0%	20.0%	31.7%	80.0%	48.3%	48.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	13.4	13.4	97.6	97.6	67.0	67.0
Actuated g/C Ratio	0.11	0.11	0.81	0.81	0.56	0.56
v/c Ratio	0.61	0.48	0.77	0.41	0.63	0.05
Control Delay	63.2	12.7	22.5	4.2	18.9	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.2	12.7	22.5	4.2	18.9	5.1
LOS	E	B	C	A	B	A
Approach Delay	35.4			8.9	18.4	
Approach LOS	D			A	B	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 15.1
Intersection Capacity Utilization 69.8%
Analysis Period (min) 15
Intersection LOS: B
ICU Level of Service C

Splits and Phases: 7: Marksheffel Rd & Full Access



HCM 6th Signalized Intersection Summary

7: Marksheffel Rd & Full Access

2040 Total PM.syn

08/04/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱	↰	↗↗	↗↗	↰
Traffic Volume (veh/h)	110	135	375	1075	1145	45
Future Volume (veh/h)	110	135	375	1075	1145	45
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	120	147	408	1168	1245	49
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	198	176	457	2892	2387	1065
Arrive On Green	0.11	0.11	0.21	1.00	0.67	0.67
Sat Flow, veh/h	1781	1585	1781	3647	3647	1585
Grp Volume(v), veh/h	120	147	408	1168	1245	49
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1777	1777	1585
Q Serve(g_s), s	7.7	10.9	9.3	0.0	21.2	1.3
Cycle Q Clear(g_c), s	7.7	10.9	9.3	0.0	21.2	1.3
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	198	176	457	2892	2387	1065
V/C Ratio(X)	0.61	0.83	0.89	0.40	0.52	0.05
Avail Cap(c_a), veh/h	289	258	768	2892	2387	1065
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.09	0.09	1.00	1.00
Uniform Delay (d), s/veh	50.8	52.2	12.9	0.0	9.9	6.7
Incr Delay (d2), s/veh	3.0	14.1	0.8	0.0	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	9.9	7.3	0.0	8.0	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	53.8	66.3	13.7	0.0	10.8	6.8
LnGrp LOS	D	E	B	A	B	A
Approach Vol, veh/h	267			1576	1294	
Approach Delay, s/veh	60.7			3.6	10.6	
Approach LOS	E			A	B	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	102.2			17.8	17.0	85.1
Change Period (Y+Rc), s	4.5			4.5	4.5	4.5
Max Green Setting (Gmax), s	91.5			19.5	33.5	53.5
Max Q Clear Time (g_c+l1), s	2.0			12.9	11.3	23.2
Green Ext Time (p_c), s	12.5			0.4	1.3	11.7
Intersection Summary						
HCM 6th Ctrl Delay			11.3			
HCM 6th LOS			B			
Notes						

HCM 6th TWSC
11: Meadowbrook Pkwy & South Access

2025 Total AM.syn
07/16/2020





Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	T	T
Traffic Vol, veh/h	20	5	205	10	5	295
Future Vol, veh/h	20	5	205	10	5	295
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	-	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	5	223	11	5	321
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	560	229	0	0	234	0
Stage 1	229	-	-	-	-	-
Stage 2	331	-	-	-	-	-
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	489	810	-	-	1333	-
Stage 1	809	-	-	-	-	-
Stage 2	728	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	487	810	-	-	1333	-
Mov Cap-2 Maneuver	569	-	-	-	-	-
Stage 1	809	-	-	-	-	-
Stage 2	725	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	11.2	0	0.1			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	605	1333	-	
HCM Lane V/C Ratio	-	-	0.045	0.004	-	
HCM Control Delay (s)	-	-	11.2	7.7	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

HCM 6th TWSC
11: Meadowbrook Pkwy & South Access

2025 Total PM.syn
07/16/2020

Intersection

Int Delay, s/veh 0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	5	220	25	5	360
Future Vol, veh/h	15	5	220	25	5	360
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	-	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	5	239	27	5	391

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	654	253	0
Stage 1	253	-	-
Stage 2	401	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	431	786	-
Stage 1	789	-	-
Stage 2	676	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	429	786	-
Mov Cap-2 Maneuver	524	-	-
Stage 1	789	-	-
Stage 2	673	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.5	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	572	1298
HCM Lane V/C Ratio	-	-	0.038	0.004
HCM Control Delay (s)	-	-	11.5	7.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 6th TWSC
11: Meadowbrook Pkwy & South Access

2040 Total AM.syn
07/16/2020

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑		↔	↑
Traffic Vol, veh/h	20	5	230	10	5	335
Future Vol, veh/h	20	5	230	10	5	335
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	-	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	5	250	11	5	364

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	630	256	0	0	261
Stage 1	256	-	-	-	-
Stage 2	374	-	-	-	-
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	*471	*894	-	-	*1338
Stage 1	*843	-	-	-	-
Stage 2	*696	-	-	-	-
Platoon blocked, %	1	1	-	-	1
Mov Cap-1 Maneuver	*469	*894	-	-	*1338
Mov Cap-2 Maneuver	*556	-	-	-	-
Stage 1	*843	-	-	-	-
Stage 2	*693	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	601	*1338
HCM Lane V/C Ratio	-	-	0.045	0.004
HCM Control Delay (s)	-	-	11.3	7.7
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0





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

HCM 6th TWSC
11: Meadowbrook Pkwy & South Access

2040 Total PM.syn
07/16/2020

Intersection

Int Delay, s/veh 0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	5	235	25	5	410
Future Vol, veh/h	15	5	235	25	5	410
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	-	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	5	255	27	5	446





Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	725	269	0
Stage 1	269	-	-
Stage 2	456	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	403	887	-
Stage 1	838	-	-
Stage 2	638	-	-
Platoon blocked, %	1	1	-
Mov Cap-1 Maneuver	402	887	-
Mov Cap-2 Maneuver	506	-	-
Stage 1	838	-	-
Stage 2	635	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.6	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	567	1313
HCM Lane V/C Ratio	-	-	0.038	0.004
HCM Control Delay (s)	-	-	11.6	7.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0





HCM 6th TWSC
12: Meadowbrook Pkwy & North Access

2025 Total AM.syn
07/16/2020

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	5	205	5	5	285
Future Vol, veh/h	10	5	205	5	5	285
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	5	223	5	5	310
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	546	226	0	0	228	0
Stage 1	226	-	-	-	-	-
Stage 2	320	-	-	-	-	-
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	499	813	-	-	1340	-
Stage 1	812	-	-	-	-	-
Stage 2	736	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	497	813	-	-	1340	-
Mov Cap-2 Maneuver	577	-	-	-	-	-
Stage 1	812	-	-	-	-	-
Stage 2	733	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	10.8	0	0.1			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	639	1340	-	
HCM Lane V/C Ratio	-	-	0.026	0.004	-	
HCM Control Delay (s)	-	-	10.8	7.7	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

HCM 6th TWSC
12: Meadowbrook Pkwy & North Access

2025 Total PM.syn
07/16/2020

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	210	10	5	355
Future Vol, veh/h	5	5	210	10	5	355
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	5	228	11	5	386
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	630	234	0	0	239	0
Stage 1	234	-	-	-	-	-
Stage 2	396	-	-	-	-	-
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	446	805	-	-	1328	-
Stage 1	805	-	-	-	-	-
Stage 2	680	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	444	805	-	-	1328	-
Mov Cap-2 Maneuver	535	-	-	-	-	-
Stage 1	805	-	-	-	-	-
Stage 2	677	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	10.7	0	0.1			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	643	1328	-	
HCM Lane V/C Ratio	-	-	0.017	0.004	-	
HCM Control Delay (s)	-	-	10.7	7.7	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

HCM 6th TWSC
12: Meadowbrook Pkwy & North Access

2040 Total AM.syn
07/16/2020

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑		↔	↑
Traffic Vol, veh/h	10	5	230	5	5	325
Future Vol, veh/h	10	5	230	5	5	325
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	5	250	5	5	353

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	616	253	0	0	255
Stage 1	253	-	-	-	-
Stage 2	363	-	-	-	-
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	*482	*894	-	-	*1338
Stage 1	*843	-	-	-	-
Stage 2	*704	-	-	-	-
Platoon blocked, %	1	1	-	-	1
Mov Cap-1 Maneuver	*480	*894	-	-	*1338
Mov Cap-2 Maneuver	*564	-	-	-	-
Stage 1	*843	-	-	-	-
Stage 2	*701	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	643	*1338
HCM Lane V/C Ratio	-	-	0.025	0.004
HCM Control Delay (s)	-	-	10.7	7.7
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

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

HCM 6th TWSC
12: Meadowbrook Pkwy & North Access

2040 Total PM.syn
07/16/2020

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑		↔	↑
Traffic Vol, veh/h	5	5	225	10	5	405
Future Vol, veh/h	5	5	225	10	5	405
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	5	245	11	5	440

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	701	251	0	0	256
Stage 1	251	-	-	-	-
Stage 2	450	-	-	-	-
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	*420	*894	-	-	*1338
Stage 1	*843	-	-	-	-
Stage 2	*642	-	-	-	-
Platoon blocked, %	1	1	-	-	1
Mov Cap-1 Maneuver	*418	*894	-	-	*1338
Mov Cap-2 Maneuver	*514	-	-	-	-
Stage 1	*843	-	-	-	-
Stage 2	*639	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.6	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	653	* 1338
HCM Lane V/C Ratio	-	-	0.017	0.004
HCM Control Delay (s)	-	-	10.6	7.7
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

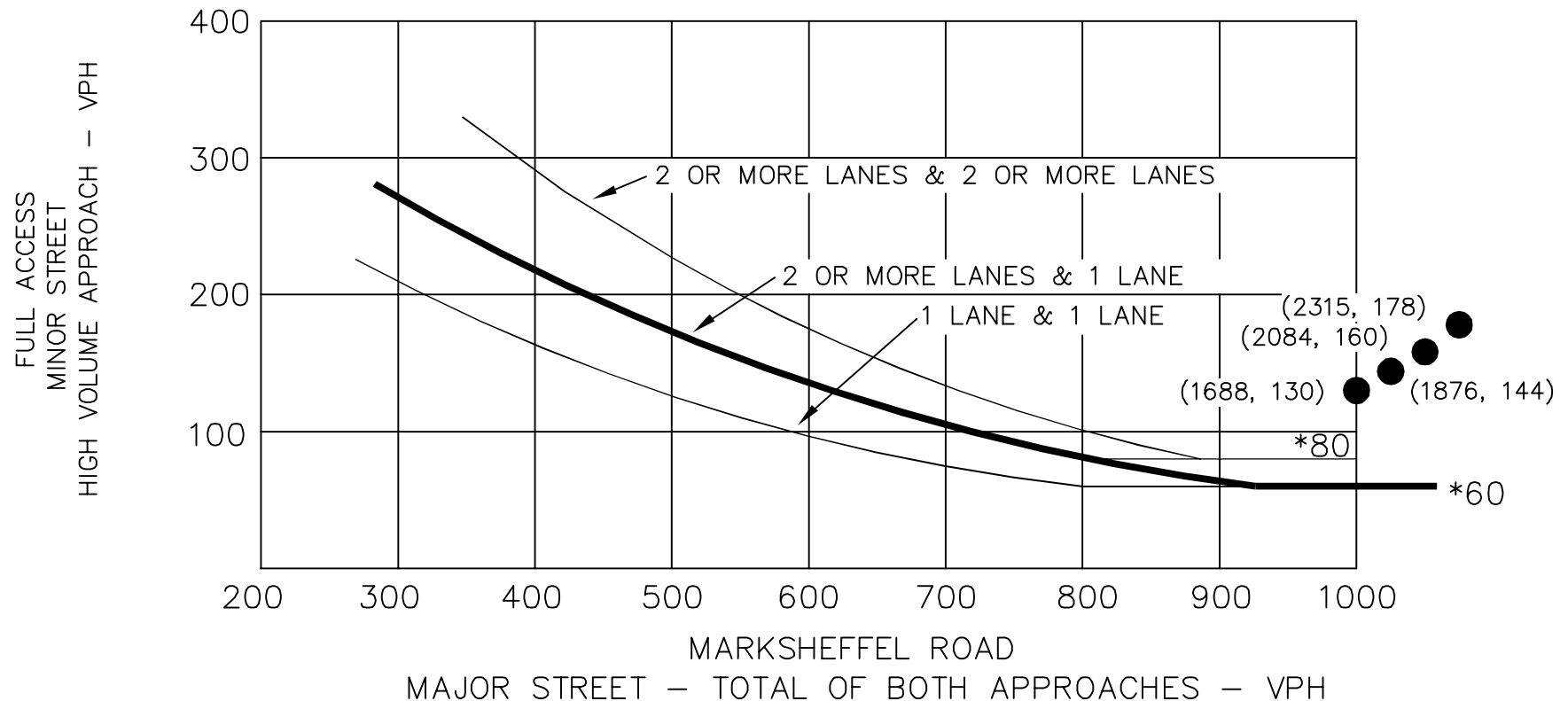
Notes			
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

APPENDIX E

Signal Warrant Analysis

WARRANT 2 - FOUR HOUR VEHICULAR VOLUME (70% FACTOR)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h (40 mph) ON MAJOR STREET)



* NOTE: 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 60 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

MARKSHEFFEL RD AND FULL ACCESS

CROSSROADS–MEADOWBROOK

FOUR HOUR VOLUME WARRANT

● 2025 PM Peak Hour Traffic Volume Projections

Source: Manual of Uniform Traffic Control Devices 2009

Kimley»Horn

APPENDIX F













Queueing Analysis Worksheets

Queues

2025 Total AM.syn

1: Marksheffel Rd & Meadowbrook Pkwy

07/16/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	201	11	38	38	22	27	33	870	16	11	1516	272
v/c Ratio	0.61	0.06	0.16	0.24	0.20	0.12	0.20	0.35	0.01	0.03	0.61	0.23
Control Delay	59.7	46.8	1.5	43.3	57.6	1.2	9.4	8.4	0.0	6.9	10.4	1.3
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	59.7	46.8	1.5	43.3	57.6	1.2	9.4	8.4	0.0	6.9	10.4	1.3
Queue Length 50th (ft)	77	8	0	24	17	0	14	194	0	2	310	0
Queue Length 95th (ft)	117	26	0	53	44	0	m21	177	m0	10	417	28
Internal Link Dist (ft)	333			407			398			517		
Turn Bay Length (ft)	150		150	250		200	425			350		350
Base Capacity (vph)	373	374	385	159	279	349	167	2470	1138	401	2494	1188
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	0.54	0.03	0.10	0.24	0.08	0.08	0.20	0.35	0.01	0.03	0.61	0.23

Intersection Summary













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

Queues

2025 Total PM.syn

1: Marksheffel Rd & Meadowbrook Pkwy

07/16/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	293	11	49	22	16	33	43	1435	71	38	1027	255
v/c Ratio	0.66	0.05	0.18	0.14	0.16	0.16	0.13	0.57	0.06	0.21	0.42	0.22
Control Delay	57.0	44.3	3.4	38.4	56.9	1.6	8.4	13.8	1.2	12.3	9.1	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	0.0
Total Delay	57.0	44.3	3.4	38.4	56.9	1.6	8.4	13.8	1.2	12.3	9.1	1.5
Queue Length 50th (ft)	112	8	0	13	12	0	17	331	3	10	178	0
Queue Length 95th (ft)	154	25	10	34	35	0	m24	304	m10	35	257	30
Internal Link Dist (ft)		333			407			398			517	
Turn Bay Length (ft)	150		150	250		200	425			350		350
Base Capacity (vph)	572	450	447	194	279	349	326	2508	1159	180	2460	1175
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	0.51	0.02	0.11	0.11	0.06	0.09	0.13	0.57	0.06	0.21	0.42	0.22

Intersection Summary













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

Queues

2040 Total AM.syn

07/16/2020

1: Marksheffel Rd & Meadowbrook Pkwy

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	217	11	43	49	27	33	38	1022	22	11	1788	310
v/c Ratio	0.62	0.06	0.19	0.26	0.24	0.19	0.40	0.43	0.02	0.04	0.75	0.27
Control Delay	58.7	47.8	2.4	40.6	58.2	2.3	29.8	10.7	1.2	7.8	15.1	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	0.0
Total Delay	58.7	47.8	2.4	40.6	58.2	2.3	29.8	10.7	1.2	7.8	15.1	1.5
Queue Length 50th (ft)	84	8	0	31	20	0	14	195	0	3	440	0
Queue Length 95th (ft)	122	26	4	62	51	0	m21	238	m1	10	616	31
Internal Link Dist (ft)	333			407			398			517		
Turn Bay Length (ft)	150		150	250		200	425			350		350
Base Capacity (vph)	424	345	362	219	279	310	94	2371	1084	313	2393	1163
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	0.51	0.03	0.12	0.22	0.10	0.11	0.40	0.43	0.02	0.04	0.75	0.27

Intersection Summary













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

Queues

2040 Total PM.syn

07/16/2020

1: Marksheffel Rd & Meadowbrook Pkwy

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	326	16	60	22	16	43	49	1685	82	49	1196	283
v/c Ratio	0.69	0.05	0.19	0.13	0.16	0.20	0.20	0.70	0.07	0.47	0.51	0.25
Control Delay	56.7	43.1	5.2	36.4	56.9	2.1	12.4	18.0	1.2	31.5	11.4	1.6
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	56.7	43.1	5.2	36.4	56.9	2.1	12.4	18.0	1.2	31.5	11.4	1.6
Queue Length 50th (ft)	125	11	0	13	12	0	15	381	2	17	231	0
Queue Length 95th (ft)	168	31	20	33	35	0	m24	m443	m3	#87	331	33
Internal Link Dist (ft)		333			407			398			517	
Turn Bay Length (ft)	150		150	250		200	425			350		350
Base Capacity (vph)	657	393	401	300	279	349	240	2405	1116	104	2359	1146
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	0.50	0.04	0.15	0.07	0.06	0.12	0.20	0.70	0.07	0.47	0.51	0.25

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.

Queues

2025 Total AM.syn

2: US-24 & Marksheffel Rd

08/03/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	11	812	715	5	549	87	344	527	210	319	1144	21
v/c Ratio	0.11	0.82	0.47	0.06	0.58	0.06	0.72	0.42	0.14	0.63	0.88	0.01
Control Delay	45.6	41.0	1.4	56.0	38.3	0.1	44.4	58.1	0.2	21.2	45.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.6	41.0	1.4	56.0	38.3	0.1	44.4	58.1	0.2	21.2	45.1	0.0
Queue Length 50th (ft)	8	282	4	3	195	0	146	228	0	116	423	0
Queue Length 95th (ft)	m11	273	17	m16	m208	m0	186	288	0	228	#774	0
Internal Link Dist (ft)		711			1080			2518			924	
Turn Bay Length (ft)	375			300		375	1000		575	1000		700
Base Capacity (vph)	104	1106	1524	78	1139	1568	604	1266	1455	559	1303	1553
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	0.11	0.73	0.47	0.06	0.48	0.06	0.57	0.42	0.14	0.57	0.88	0.01

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.

Queues

2025 Total PM.syn

2: US-24 & Marksheffel Rd

08/03/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	16	658	446	16	870	201	557	1026	314	185	538	16
v/c Ratio	0.18	0.65	0.28	0.12	0.79	0.13	0.78	0.81	0.20	0.66	0.57	0.01
Control Delay	49.4	38.2	0.4	51.3	52.4	0.1	27.1	49.1	0.0	42.6	43.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.4	38.2	0.4	51.3	52.4	0.1	27.1	49.1	0.0	42.6	43.6	0.0
Queue Length 50th (ft)	12	161	0	11	315	0	188	450	0	65	177	0
Queue Length 95th (ft)	m30	250	0	m14	m314	m0	m205	m401	m0	#322	#408	0
Internal Link Dist (ft)		711			1080			2518			924	
Turn Bay Length (ft)	375			300		375	1000		575	1000		700
Base Capacity (vph)	88	1305	1568	137	1327	1583	944	1263	1583	281	947	1568
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	0.18	0.50	0.28	0.12	0.66	0.13	0.59	0.81	0.20	0.66	0.57	0.01

Intersection Summary

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

Queue shown is maximum after two cycles.

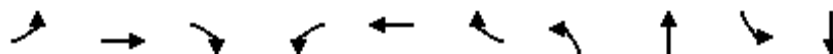
m Volume for 95th percentile queue is metered by upstream signal.

Queues

2040 Total AM Improved.syn

2: US-24 & Marksheffel Rd

08/03/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	16	946	849	5	636	98	409	834	372	1378
v/c Ratio	0.15	0.84	0.56	0.06	0.62	0.06	0.75	0.65	0.81	0.88
Control Delay	56.3	43.3	2.1	60.0	45.0	0.1	55.9	40.3	39.8	47.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.3	43.3	2.1	60.0	45.0	0.1	55.9	40.3	39.8	47.8
Queue Length 50th (ft)	11	239	9	3	226	0	156	198	185	364
Queue Length 95th (ft)	m14	365	24	m7	328	m0	201	#309	#419	#658
Internal Link Dist (ft)		711			1080			2518		924
Turn Bay Length (ft)	375			300		375	1000		1000	
Base Capacity (vph)	104	1211	1524	78	1212	1568	736	1275	476	1562
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.78	0.56	0.06	0.52	0.06	0.56	0.65	0.78	0.88

Intersection Summary

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

Queue shown is maximum after two cycles.

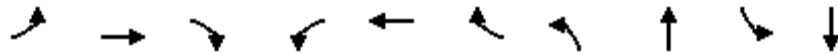
m Volume for 95th percentile queue is metered by upstream signal.

Queues

2040 Total PM Improved.syn

2: US-24 & Marksheffel Rd

08/03/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	22	755	527	16	1016	234	660	1525	207	658
v/c Ratio	0.24	0.61	0.34	0.11	0.80	0.15	0.81	1.05	0.72	0.76
Control Delay	49.4	37.1	0.5	41.9	29.1	0.2	27.1	71.2	51.4	55.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.4	37.1	0.5	41.9	29.1	0.2	27.1	71.2	51.4	55.1
Queue Length 50th (ft)	16	128	0	11	269	0	282	~520	113	~202
Queue Length 95th (ft)	m32	293	0	m28	326	0	m266	m#492	#359	#415
Internal Link Dist (ft)		711			1080			2518		924
Turn Bay Length (ft)	375			300		375	1000		1000	
Base Capacity (vph)	91	1495	1568	144	1471	1583	972	1449	288	864
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.51	0.34	0.11	0.69	0.15	0.68	1.05	0.72	0.76

Intersection Summary

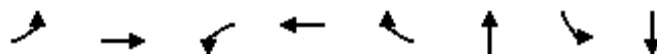
- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

2025 Total AM Improved.syn

3: Meadowbrook Pkwy & Newt Dr

07/23/2020



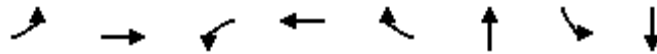
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	11	49	549	16	136	544	239	103
v/c Ratio	0.03	0.10	0.81	0.03	0.27	0.44	0.52	0.09
Control Delay	30.6	32.2	51.5	30.7	6.5	3.1	16.4	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	32.2	51.5	30.7	6.5	3.1	16.4	8.0
Queue Length 50th (ft)	6	29	204	9	0	25	88	25
Queue Length 95th (ft)	20	57	257	26	46	78	183	52
Internal Link Dist (ft)		163		610		142		169
Turn Bay Length (ft)	50		100				50	
Base Capacity (vph)	423	566	796	566	576	1247	462	1189
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	0.09	0.69	0.03	0.24	0.44	0.52	0.09
Intersection Summary								

Queues

2025 Total PM Improved.syn

07/23/2020

3: Meadowbrook Pkwy & Newt Dr



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	16	43	701	54	130	783	272	136
v/c Ratio	0.05	0.09	1.04	0.11	0.26	0.63	0.93	0.11
Control Delay	32.9	33.5	79.6	38.2	11.8	6.5	59.3	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	33.5	79.6	38.2	11.8	6.5	59.3	7.6
Queue Length 50th (ft)	9	25	~187	23	10	105	172	34
Queue Length 95th (ft)	28	55	m#387	m35	m33	211	#375	58
Internal Link Dist (ft)		163		610		142		169
Turn Bay Length (ft)	50		100				50	
Base Capacity (vph)	350	485	673	476	499	1245	292	1206
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	0.09	1.04	0.11	0.26	0.63	0.93	0.11

Intersection Summary

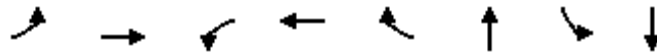
- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

2040 Total AM.syn

07/23/2020

3: Meadowbrook Pkwy & Newt Dr



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	11	54	549	22	163	544	283	103
v/c Ratio	0.04	0.14	0.99	0.06	0.35	0.42	0.55	0.08
Control Delay	38.1	39.5	83.5	38.2	8.2	2.0	13.0	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.1	39.5	83.5	38.2	8.2	2.0	13.0	5.2
Queue Length 50th (ft)	7	34	220	14	0	17	92	21
Queue Length 95th (ft)	23	70	#338	37	57	50	169	37
Internal Link Dist (ft)		163		610		142		169
Turn Bay Length (ft)	50		100				50	
Base Capacity (vph)	294	395	554	395	464	1307	517	1271
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	0.14	0.99	0.06	0.35	0.42	0.55	0.08

Intersection Summary

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

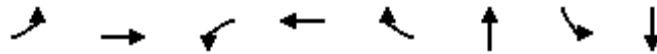
Queue shown is maximum after two cycles.

Queues

2040 Total PM.syn

07/23/2020

3: Meadowbrook Pkwy & Newt Dr



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	16	49	701	60	147	783	321	141
v/c Ratio	0.05	0.11	1.12	0.13	0.30	0.62	1.03	0.11
Control Delay	34.5	35.2	101.4	36.2	9.8	5.6	81.0	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.5	35.2	101.4	36.2	9.8	5.6	81.0	6.7
Queue Length 50th (ft)	9	29	~297	25	7	84	~265	32
Queue Length 95th (ft)	28	62	m#401	m38	m34	181	#448	55
Internal Link Dist (ft)		163		610		142		169
Turn Bay Length (ft)	50		100				50	
Base Capacity (vph)	327	455	628	447	489	1272	312	1232
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	0.11	1.12	0.13	0.30	0.62	1.03	0.11

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.

Queues

2025 Total AM Improved.syn

4: US-24 & Newt Dr/SH-94

08/03/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	54	120	592	799	141	5	552	979	541	5	1771
v/c Ratio	0.33	0.68	0.38	1.07	0.14	0.00	1.08	0.45	0.37	0.03	1.07
Control Delay	74.1	84.2	0.7	107.4	40.7	0.0	119.4	28.6	0.7	19.8	90.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.1	84.2	0.7	107.4	40.7	0.0	119.4	28.6	0.7	19.8	90.7
Queue Length 50th (ft)	26	115	0	~444	55	0	~308	236	0	2	~709
Queue Length 95th (ft)	51	183	0	#575	83	0	#428	287	0	10	#840
Internal Link Dist (ft)		610			2306			785			727
Turn Bay Length (ft)	375			475		475	900		600	800	
Base Capacity (vph)	182	217	1538	747	1026	1553	513	2180	1468	191	1652
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	0.30	0.55	0.38	1.07	0.14	0.00	1.08	0.45	0.37	0.03	1.07

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.

Queues

2025 Total PM Improved.syn

4: US-24 & Newt Dr/SH-94

08/03/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	76	163	761	707	158	11	698	1828	552	5	962
v/c Ratio	0.42	0.70	0.48	1.00	0.15	0.01	0.78	0.91	0.35	0.04	1.09
Control Delay	70.3	59.4	0.8	75.7	28.8	0.0	48.3	42.2	0.6	15.2	95.2
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	70.3	59.4	0.8	75.7	28.8	0.0	48.3	42.2	0.6	15.2	95.2
Queue Length 50th (ft)	31	120	0	256	42	0	259	487	0	3	~310
Queue Length 95th (ft)	m46	m169	m0	#410	64	m0	330	#618	0	m3	#446
Internal Link Dist (ft)		610			2306			785			727
Turn Bay Length (ft)	375			475		475	900		600	800	
Base Capacity (vph)	185	279	1583	708	1096	1568	892	2012	1568	131	881
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	0.41	0.58	0.48	1.00	0.14	0.01	0.78	0.91	0.35	0.04	1.09

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.

Queues

2040 Total AM.syn

4: US-24 & Newt Dr/SH-94

08/03/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	54	125	630	886	152	5	577	1124	608	10	2104
v/c Ratio	0.33	0.68	0.41	1.27	0.16	0.00	1.29	0.50	0.41	0.06	1.16
Control Delay	74.0	83.0	0.8	181.4	42.1	0.0	195.9	28.5	0.9	19.6	122.2
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	74.0	83.0	0.8	181.4	42.1	0.0	195.9	28.5	0.9	19.6	122.2
Queue Length 50th (ft)	26	120	0	~562	61	0	~369	274	0	4	~898
Queue Length 95th (ft)	51	188	0	#695	90	0	#491	334	0	15	#1038
Internal Link Dist (ft)		610			2306			785			727
Turn Bay Length (ft)	375			475		475	900		600	800	
Base Capacity (vph)	184	234	1538	695	998	1553	447	2239	1468	175	1807
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	0.29	0.53	0.41	1.27	0.15	0.00	1.29	0.50	0.41	0.06	1.16

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.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	76	174	804	766	163	11	724	2115	604	5	1130
v/c Ratio	0.42	0.73	0.51	1.13	0.16	0.01	0.79	1.04	0.39	0.04	1.31
Control Delay	68.8	61.4	0.8	102.9	19.6	0.0	47.7	65.8	0.7	13.4	176.2
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	68.8	61.4	0.8	102.9	19.6	0.0	47.7	65.8	0.7	13.4	176.2
Queue Length 50th (ft)	31	129	0	~342	39	0	268	~658	0	1	~436
Queue Length 95th (ft)	m46	m175	m0	m#353	m49	m0	340	#773	0	m2	#554
Internal Link Dist (ft)		610			2306			785			727
Turn Bay Length (ft)	375			475		475	900		600	800	
Base Capacity (vph)	185	279	1583	680	1069	1568	920	2039	1568	132	865
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	0.41	0.62	0.51	1.13	0.15	0.01	0.79	1.04	0.39	0.04	1.31

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.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	179	359	98	33	408	152	98	348	22	353	609	353
v/c Ratio	1.12	0.63	0.17	0.17	0.70	0.26	0.25	0.28	0.03	0.57	0.39	0.23
Control Delay	136.7	34.5	0.6	26.7	41.2	4.5	18.2	32.8	0.1	14.3	17.1	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	136.7	34.5	0.6	26.7	41.2	4.5	18.2	32.8	0.1	14.3	17.1	0.3
Queue Length 50th (ft)	~154	184	0	18	272	0	33	101	0	93	103	0
Queue Length 95th (ft)	#264	217	0	38	325	39	76	183	0	157	198	0
Internal Link Dist (ft)		2306			1405			5693			958	
Turn Bay Length (ft)	300		250	225		250	375		400	400		400
Base Capacity (vph)	215	762	732	268	776	746	409	1233	644	692	1575	1568
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	0.47	0.13	0.12	0.53	0.20	0.24	0.28	0.03	0.51	0.39	0.23













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.

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	272	424	158	49	500	489	136	995	27	232	660	366
v/c Ratio	1.15	0.53	0.20	0.17	0.62	0.60	0.45	0.88	0.05	1.09	0.58	0.24
Control Delay	133.1	22.9	1.6	22.6	30.4	15.8	24.3	49.4	0.2	113.2	31.9	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	133.1	22.9	1.6	22.6	30.4	15.8	24.3	49.4	0.2	113.2	31.9	0.3
Queue Length 50th (ft)	~249	183	0	23	294	141	60	383	0	~154	251	0
Queue Length 95th (ft)	#426	339	18	51	411	252	101	#498	0	#313	287	0
Internal Link Dist (ft)	2306			1405			5693			958		
Turn Bay Length (ft)	300		250	225		250	375		400	400		400
Base Capacity (vph)	237	804	772	296	804	818	313	1126	562	212	1135	1553
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	1.15	0.53	0.20	0.17	0.62	0.60	0.43	0.88	0.05	1.09	0.58	0.24

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.

Queues

2040 Total AM Improved.syn

5: Marksheffel Rd & SH-94

08/03/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	179	413	109	43	473	168	109	408	27	408	717	353
v/c Ratio	0.58	0.54	0.15	0.16	0.89	0.29	0.41	0.57	0.06	0.81	0.61	0.46
Control Delay	59.2	27.6	1.4	31.0	59.3	4.0	27.7	49.0	0.2	49.7	35.2	7.9
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	59.2	27.6	1.4	31.0	59.3	4.0	27.7	49.0	0.2	49.7	35.2	7.9
Queue Length 50th (ft)	69	221	0	24	337	0	50	163	0	190	184	14
Queue Length 95th (ft)	106	305	13	53	#501	36	90	#237	0	#374	260	115
Internal Link Dist (ft)	2306				1405				5693		958	
Turn Bay Length (ft)	300			250	225			250	375			400
Base Capacity (vph)	364	835	788	302	583	624	279	710	465	525	1180	762
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	0.49	0.49	0.14	0.14	0.81	0.27	0.39	0.57	0.06	0.78	0.61	0.46

Intersection Summary

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













Queue shown is maximum after two cycles.

Queues

2040 Total PM Improved.syn

5: Marksheffel Rd & SH-94

08/03/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	272	489	174	54	576	565	152	1174	33	263	778	366
v/c Ratio	1.06	0.67	0.24	0.27	1.10	0.96	0.50	0.93	0.05	1.23	0.63	0.24
Control Delay	127.2	32.8	5.3	38.1	111.3	57.3	22.7	50.6	0.1	169.0	30.2	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	127.2	32.8	5.3	38.1	111.3	57.3	22.7	50.6	0.1	169.0	30.2	0.3
Queue Length 50th (ft)	~120	259	5	33	~507	305	62	456	0	~195	222	0
Queue Length 95th (ft)	#211	388	41	71	#728	#541	103	#595	0	#371	273	0
Internal Link Dist (ft)	2306			1405			5693			958		
Turn Bay Length (ft)	300		250	225		250	375		400	400		400
Base Capacity (vph)	257	731	726	198	522	586	330	1265	647	213	1235	1553
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	1.06	0.67	0.24	0.27	1.10	0.96	0.46	0.93	0.05	1.23	0.63	0.24

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.



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	109	136	272	1462	897	33
v/c Ratio	0.58	0.47	0.53	0.50	0.36	0.03
Control Delay	63.0	13.4	8.1	5.1	6.3	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	13.4	8.1	5.1	6.3	1.5
Queue Length 50th (ft)	82	0	30	111	86	0
Queue Length 95th (ft)	137	57	m117	338	292	m6
Internal Link Dist (ft)	256			958	890	
Turn Bay Length (ft)			150			150
Base Capacity (vph)	331	407	703	2899	2475	1115
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.33	0.39	0.50	0.36	0.03

Intersection Summary

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

Queues

2025 Total PM Improved.syn

7: Marksheffel Rd & Full Access

08/04/2020



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	120	147	408	984	1076	49
v/c Ratio	0.61	0.48	0.73	0.34	0.53	0.05
Control Delay	63.2	12.7	13.3	8.9	15.1	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.2	12.7	13.3	8.9	15.1	4.2
Queue Length 50th (ft)	90	0	175	253	308	4
Queue Length 95th (ft)	147	58	m233	m286	442	m27
Internal Link Dist (ft)	256			958	890	
Turn Bay Length (ft)			150			150
Base Capacity (vph)	331	416	687	2877	2034	923
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.35	0.59	0.34	0.53	0.05

Intersection Summary

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



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	109	136	272	1739	1038	33
v/c Ratio	0.58	0.47	0.59	0.60	0.42	0.03
Control Delay	63.1	13.4	13.0	4.3	4.8	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	13.4	13.0	4.3	4.8	0.5
Queue Length 50th (ft)	82	0	31	108	65	0
Queue Length 95th (ft)	137	57	m102	184	m167	m0
Internal Link Dist (ft)	256			958	890	
Turn Bay Length (ft)			150			150
Base Capacity (vph)	302	383	630	2899	2451	1104
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.36	0.43	0.60	0.42	0.03

Intersection Summary

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

Queues

2040 Total PM.syn

7: Marksheffel Rd & Full Access

08/04/2020



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	120	147	408	1168	1245	49
v/c Ratio	0.61	0.48	0.77	0.41	0.63	0.05
Control Delay	63.2	12.7	22.5	4.2	18.9	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.2	12.7	22.5	4.2	18.9	5.1
Queue Length 50th (ft)	90	0	208	125	391	2
Queue Length 95th (ft)	147	58	m201	m150	595	m28
Internal Link Dist (ft)	256			958	890	
Turn Bay Length (ft)			150			150
Base Capacity (vph)	287	380	624	2877	1974	895
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.39	0.65	0.41	0.63	0.05

Intersection Summary

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

APPENDIX G

Conceptual Site Plan



N. MARKSHEFFEL RD

HIGHWAY 24

COLORADO HWY 94

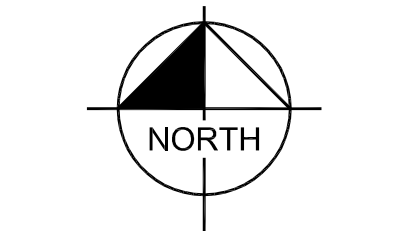
MEADOWBROOK PARKWAY

MEADOWBROOK PARKWAY

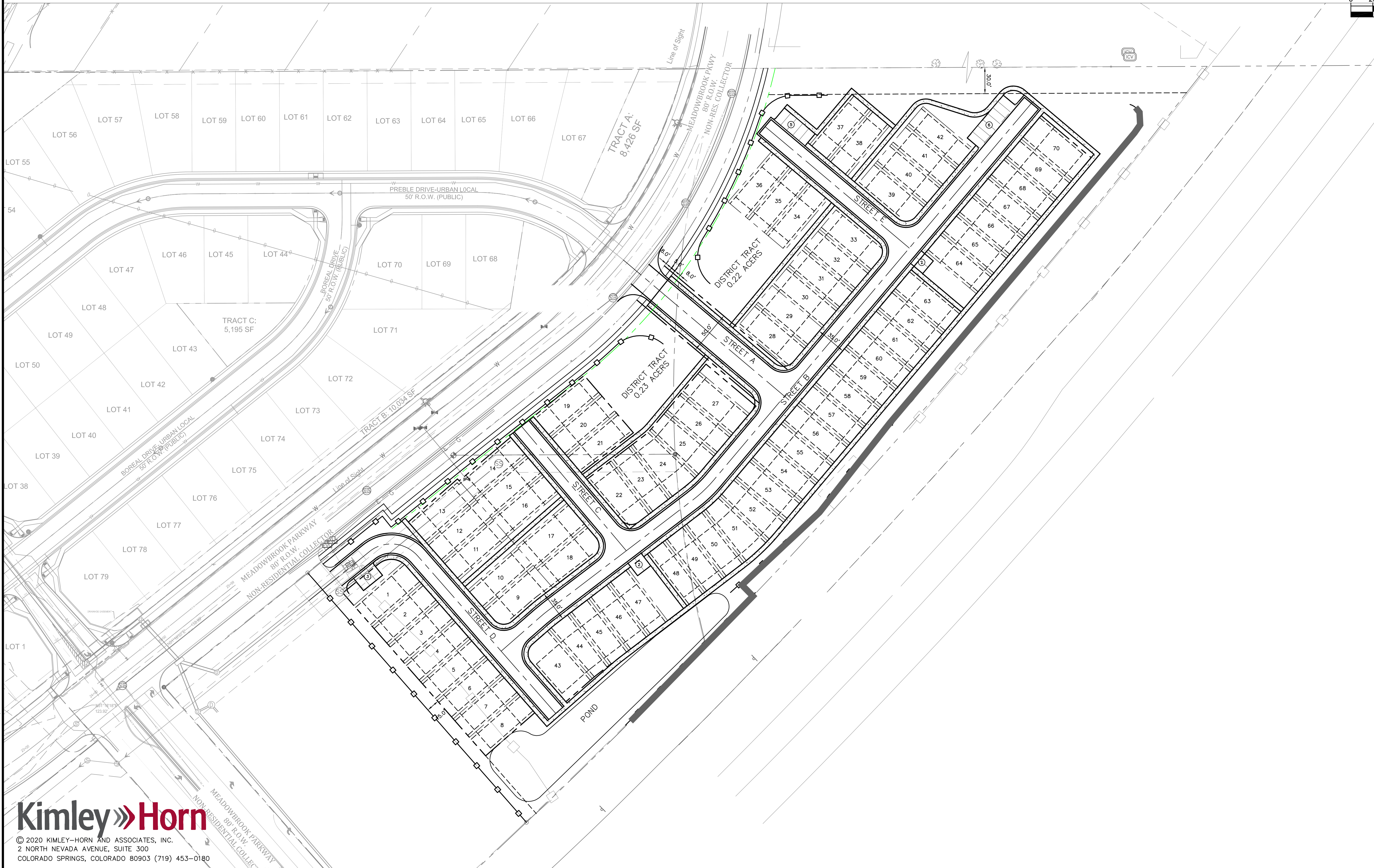
HIGHWAY 24



MEADOWBROOK
CONCEPT PLAN



GRAPHIC SCALE IN FEET
0 25 50 100



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