# Memorandum

**To:** Tarren Barrett, EIT

**From:** S&ME, Inc.

**Cc:** Mike Reynolds, AICP, Knoxville-Knox County Planning
Mike Conger, PE, Knoxville-Knox County Planning
Curtis Williams, PE, City of Knoxville
Evan Hoffman, City of Knoxville
Duane Rainbolt, TDOT
Bryan Bartnik, PE, TDOT
Nathan Vatter, PE, TDOT

**Date:** September 23, 2019

**Subject:** Response to comments received on September 18, 2019 from City of Knoxville concerning the Revised Traffic Impact Study for Middlebrook Pike Medical Park.

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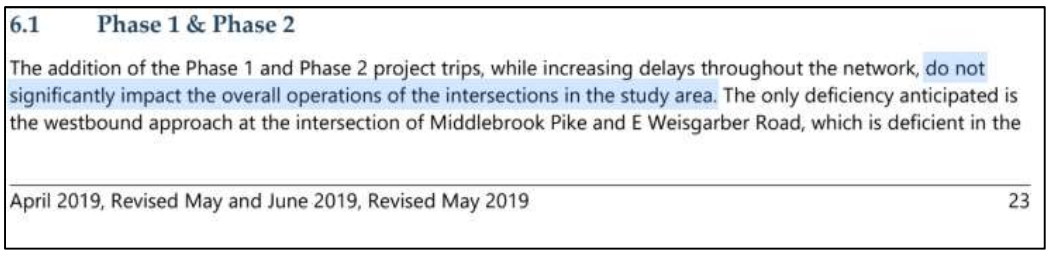
This memo serves a comment response letter for the comments received on

1 **On page 25, please correct the following:**

a. **Section 6.0 – The report stating that "the project trips do not contribute significantly to the delays at the surrounding intersections" should not be stated. Please remove this statement since there is plenty of data within the report that states otherwise.**

- *S&ME: This statement has been removed and the conclusions clarified.* **Planning: The statement that was clarified (in 6.1 pg 23) needs to be modified or removed since the development does have an "impact on the overall operations of the intersections in the study area," due to the increase of delay and LOS.** *S&ME: The statement has been modified to acknowledge the impact of the development to the surrounding conditions.* **Planning: Please see our previous comment & image below.**



6.1 Phase 1 & Phase 2

The addition of the Phase 1 and Phase 2 project trips, while increasing delays throughout the network, do not significantly impact the overall operations of the intersections in the study area. The only deficiency anticipated is the westbound approach at the intersection of Middlebrook Pike and E Weisgarber Road, which is deficient in the

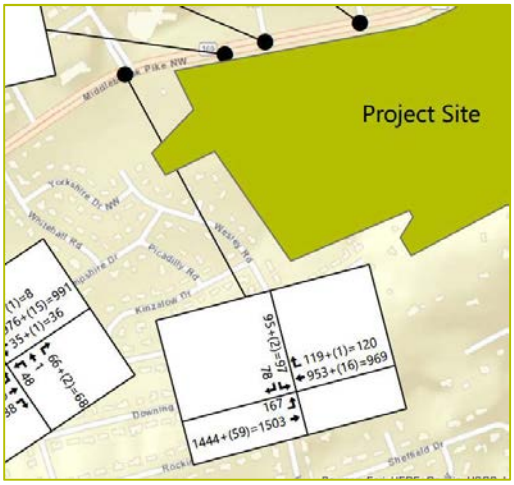
April 2019, Revised May and June 2019, Revised May 2019 23

Response: We have corrected the sentence to represent the correct conclusion, see screen shot below:

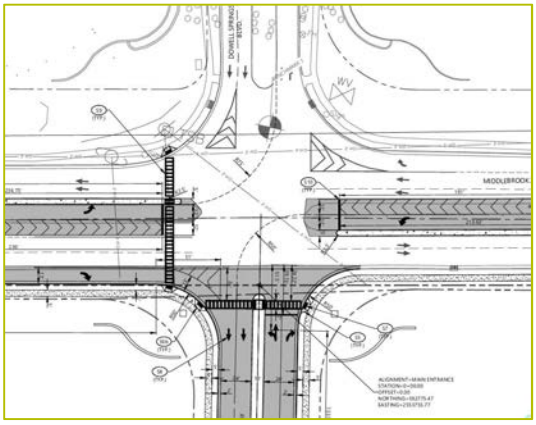
### 6.1 Phase 1 & Phase 2

The addition of the Phase 1 and Phase 2 project trips, increases delays throughout the network and does significantly impact the overall operations of the intersections in the study area. The only deficiency anticipated is the westbound approach at the intersection of Middlebrook Pike and E Weisgarber Road, which is deficient in the

2 **Figure 4-6: Middlebrook & Lake Brook: The diagram for the intersection was not updated and is identical to the diagram for this intersection on Figure 4-4. Please update to correct values. All values were correct in Appendix & analyses.** *S&ME: The figure was updated in the report.* **Planning: This was not corrected, please revise from the attached Figure 4-6 comments.**
Response: We have corrected the Figure, see screen shot below:



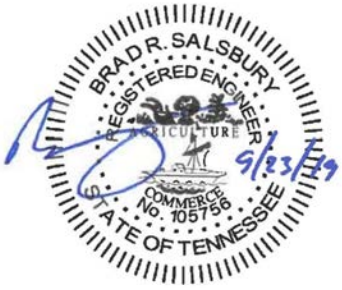

3 **Will there be pedestrian improvements across Middlebrook Pike between Dowell Springs and the new development? There are walking trails in the Dowell Springs development north of Middlebrook, and a greenway south of Middlebrook.** *S&ME: Yes, a pedestrian crossing will be installed on Middlebrook Pike.* **Planning: Please add a figure identifying how the pedestrian crossing will work across Middlebrook Pike. Planning, City & TDOT staff need to review this to understand if there will be pedestrian refuges, etc. considered with the long crosswalk across Middlebrook Pike.**
Response: We have added the permit drawing that shows the cross walk to Appendix II. See screen Shot below:



A PDF of the Signed and Sealed letter and a PDF of the full revised TIS is included with this submittal. If you have any questions or comments please contact the undersigned at (865) 970-0003 or BSalsbury@smeinc.com,

Sincerely,

Brad Salsbury, PE
Senior Engineer and Project Manager



# Tennova Middlebrook Pike Medical Park
# Traffic Impact Study
# Knoxville, TN
# S&ME Project No. 514318012

PREPARED FOR:

**Community Health Systems**
**4000 Meridian Blvd**
**Franklin, TN 37067**

PREPARED BY:

**S&ME, Inc.**
**6515 Nightingale Lane**
**Knoxville, TN 37909**

**April 2019, Revised May, June, and September 2019**

June 10, 2019

Community Health Systems Professional Services Corporation
4000 Meridian Blvd
Franklin, TN 37067

Attention: Mr. Dean Tiratto

Reference: **Tennova Middlebrook Pike Medical Park**
**Traffic Impact Study**
Knoxville, TN
S&ME Project No. 514318012

Dear Mr. Tiratto:

The planned development of the Tennova Middlebrook Pike Medical Park site includes the construction of two hospitals (one 150-bed hospital and one 100-bed hospital), an 11,000 square foot free-standing emergency room, and 230,000 square feet of medical office building, to be constructed in three phases. This report documents the traffic impact assessment completed for the proposed project, following a methodology coordinated with the City of Knoxville and Knoxville-Knox County Planning.

Based on the analysis, the proposed project is anticipated to generate a net total of 13,096 daily trips, with 955 trips in the AM peak period, and 1,001 trips in the PM peak period. The existing traffic volumes, no-build traffic volumes (for each phase year: 2020, 2023, and 2027), and build-out traffic volumes were analyzed using Synchro to determine the impacts of the project on the local roadway network. The major deficiency noted throughout the study is at the intersection of Middlebrook Pike/Weisgarber Road, where the westbound left-turn lane operates at LOS F in the AM peak period in both the existing and future conditions. However, the proposed project trips do not cause additional impacts over the impacts caused by the growth in background traffic.

Please contact us with any questions or comments related to this report or the project design.

Sincerely,

**S&ME, Inc.**

Stephanie Shealey, PE, PTP
Project Engineer

Brad Salsbury, PE
Project Manager

# Table of Contents

# Appendices

# List of Figures

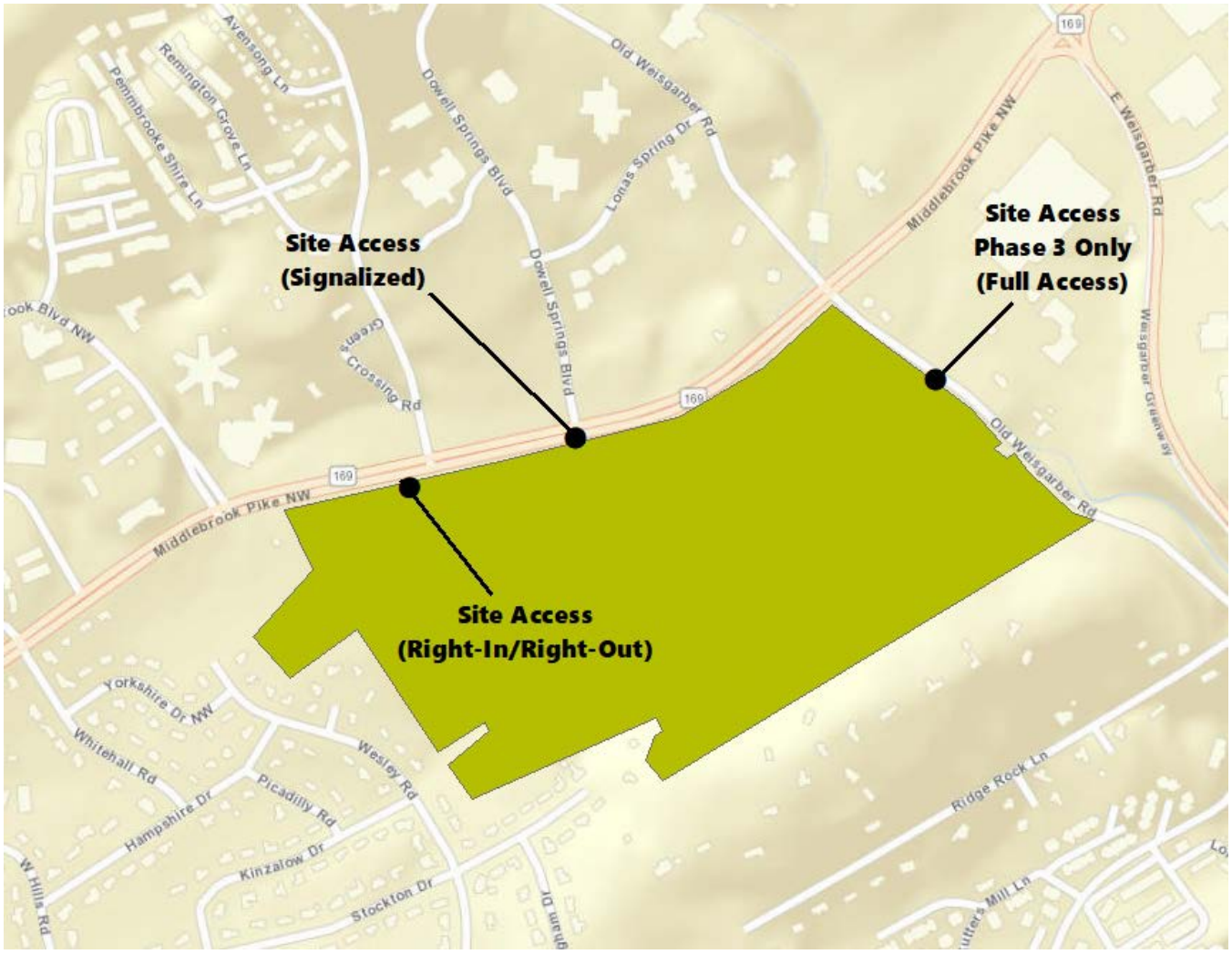


# List of Tables

# 1.0 Introduction

This traffic impact study has been prepared to evaluate impacts to the existing roadway network that may result from the development of the Tennova Middlebrook Pike Medical Park site in Knoxville, Tennessee. The project site is located on the south side of Middlebrook Pike (SR 169), west of Old Weisgarber Road (see **Figure 1-1**). The proposed development is planned to include two hospitals (150-beds and 100-beds), an 11,000 square foot Free-Standing Emergency Room, and 230,000 square feet of medical office building. The methodology and study requirements for this study were coordinated with Knoxville-Knox County Planning and City of Knoxville Engineering staff, with the methodology letter and methodology comments included as **Appendix I**. The conceptual site plan is included as **Appendix II**.

## Figure 1-1 – Project Location & Proposed Access



# 2.0 Existing Conditions

## 2.1 Data Collection

Turning movement counts were collected from 7-9AM and 4-6PM on Tuesday, March 5th, 2019 at the following intersections.

- Middlebrook Pike – Whitehall Road
- Middlebrook Pike – Lake Brook Boulevard
- Middlebrook Pike – Dick Lonas Road
- Middlebrook Pike – Dowell Springs Boulevard
- Middlebrook Pike – Old Weisgarber Road
- Middlebrook Pike – E. Weisgarber Road
- E. Weisgarber Road – Lonas Drive
- Old Weisgarber Road – Lonas Drive

Based on comments received on the methodology, counts were also taken from 7-9AM and 4-6PM on Tuesday, April 2nd, 2019, at the intersection of Middlebrook Pike and Vanosdale Road/Francis Road. The traffic counts are shown on **Figure 2-1**. Existing signal timings for the signalized intersections were obtained from the local jurisdiction and copies of both the traffic data and signal timings are included in **Appendix III**.

## 2.2 Analysis of Existing Conditions

Each of the existing study intersections were evaluated with the existing geometrics using Synchro 10 software, (which uses Highway Capacity Manual methodologies) and coded to represent the study network.

At the intersection of Middlebrook Pike and Whitehall Road, the eastbound direction does not have a left-turn lane. However, as the median is wide enough for one car to queue without blocking the through lane, a 25' left-turn lane (with no taper) was added at the intersection to model the existing conditions. The existing conditions Level of Service results are summarized in **Table 2-1**, and printouts of the Synchro reports are included in **Appendix IV**. All of the intersections operate at or above capacity (level of service E or better) in both the AM and PM peak periods. However, there is one approach that operates at level of service (LOS) F, which is discussed below.

*Middlebrook Pike @ E Weisgarber Road*

The westbound approach of Middlebrook Pike at E. Weisgarber Road fails in the AM peak period, due to the westbound left-turn movement. The volume of left-turns is over 600 vehicles in the peak hour, which per the FHWA Signalized Intersection Guide, is a rule-of-thumb for when 3 left lanes should be considered. However, this improvement would also require a third receiving lane on E. Weisgarber Road south of the intersection.

N

AM (PM) Counts

Project Site

Timbercrest

Middlebrook Pike NW

E Weisgarber Rd

Old Weisgarber Rd

Lonas Spring Dr

Dowell Springs Blvd

Dick Lonas Rd

Fourth Creek

Weisbrook Ln

Francis Station Dr

Francis Rd NW

Ashburton Dr NW

Cardan Dr NW

Bearden View Ln

Bailey Cove Rd

Grenoble Dr

Great Oaks Way

Heatherly Way

Remington Grove Ln

Avensong Ln

Lake Brook Blvd NW

Toxaway Dr

Park Hill Cir

W Park Dr

Francis Rd NW

Woodview Ln

Kewood Blvd

Yorkshire Dr NW

Whitehall Rd

Hampshire Dr

Picadilly Rd

Wesley Rd

Wellswood Ln

Stockton Dr

Rockingham Dr

Sheffield Dr

Londontown Way

Londontown Apartments

Red Salle Rd NW

Kirbury Ln

Jammer Ln NW

N Weisgarber Rd

Weisgarber Greenway

Old Weisgarber Rd

Bennington Dr

Shadycrest Ln

Crest Trl

Zoo Way

Brookvale Ln

Wellington Ln

Greens Crossing Rd

169

40

75

383

| | | | |
|---|---|---|---|
| 84 (129) 72 (98) | 109 (70) 841 (1227) | 65 (70) 54 (57) | 86 (68) 895 (1228) |
| 154 (107) 1233 (777) | | 39 (24) 1269 (871) | |
| 34 (146) 30 (179) | 207 (24) 951 (1122) | 22 (169) 5 (60) 7 (48) | 170 (29) 1025 (1007) |
| 204 (25) 1136 (925) | | 44 (7) 1019 (997) 97 (59) | 24 (19) 7 (8) 55 (14) 108 (83) |
| 16 (108) 17 (112) 7 (25) | 79 (27) 856 (734) | 164 (109) 790 (1031) 43 (41) | 110 (104) 59 (64) 69 (174) |
| 21 (9) 582 (807) 425 (381) | 652 (511) 431 (517) 99 (9) 409 (313) | 43 (39) 75 (61) 277 (309) | 145 (64) 1048 (579) 261 (233) |
| 256 (72) 205 (149) 150 (78) | 64 (96) 601 (1094) 185 (217) | 91 (126) 44 (23) | 158 (107) 206 (229) |
| 38 (122) 1057 (853) 217 (262) | 331 (139) 111 (201) 90 (237) | 28 (24) 301 (285) | |
| 30 (26) 12 (14) 3 (2) | 6 (11) 864 (1320) 31 (56) | 22 (29) 1315 (846) 35 (24) | 57 (27) 1 (3) 44 (30) |



**Figure 2-1**

Existing Turning Movement Counts

**Tennova Middlebrook Pike Medical Center**
**Traffic Impact Study**
Knoxville, TN
S&ME Project No. 514318012

## Table 2-1 – Existing Level of Service

| | Intersection | Stop Control | Intersection Conditions | Approach | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Overall | EB | WB | NB | SB |
| AM Peak Period | Middlebrook @ Vanosdale | Signal | LOS | C | C | D | D | C |
| | | | Delay (sec/veh) | 34.6 | 33.2 | 36.6 | 41.4 | 28.9 |
| | Middlebrook @ Whitehall | TWSC | LOS | | A* | A* | C | B |
| | | | Delay (sec/veh) | | 8.3* | 9.6* | 17.5 | 12.7 |
| | Middlebrook @ Lake Brook | Signal | LOS | A | A | A | | D |
| | | | Delay (sec/veh) | 4.6 | 1.0 | 1.9 | | 53.1 |
| | Middlebrook @ Dick Lonas | TWSC | LOS | | A* | - | | B |
| | | | Delay (sec/veh) | | 8.7* | - | | 14.8 |
| | Middlebrook @ Dowell Springs | Signal | LOS | A | A | A | | D |
| | | | Delay (sec/veh) | 3.7 | 1.2 | 3.8 | | 54.2 |
| | Middlebrook @ Old Weisgarber | Signal | LOS | B | C | B | D | D |
| | | | Delay (sec/veh) | 18.2 | 20.4 | 10.7 | 52.5 | 41.8 |
| | Middlebrook @ E. Weisgarber | Signal | LOS | E | B | F | D | D |
| | | | Delay (sec/veh) | 65.8 | 19.4 | 89.6 | 47.7 | 53.9 |
| | E. Weisgarber @ Lonas | Signal | LOS | B | D | D | B | B |
| | | | Delay (sec/veh) | 13.9 | 42.1 | 43.6 | 11.3 | 10.5 |
| | Old Weisgarber @ Lonas | TWSC | LOS | | A* | - | | C |
| | | | Delay (sec/veh) | | 8.2* | - | | 16.9 |
| PM Peak Period | Middlebrook @ Vanosdale | Signal | LOS | D | C | D | C | D |
| | | | Delay (sec/veh) | 36.2 | 24.9 | 45.7 | 33.6 | 44.0 |
| | Middlebrook @ Whitehall | TWSC | LOS | | A* | A* | B | B |
| | | | Delay (sec/veh) | | 9.5* | 8.4* | 14.6 | 13.7 |
| | Middlebrook @ Lake Brook | Signal | LOS | A | A | A | | E |
| | | | Delay (sec/veh) | 6.4 | 0.6 | 1.7 | | 56.2 |
| | Middlebrook @ Dick Lonas | TWSC | LOS | | A* | - | | C |
| | | | Delay (sec/veh) | | 9.8* | - | | 17.4 |
| | Middlebrook @ Dowell Springs | Signal | LOS | C | A | C | | D |
| | | | Delay (sec/veh) | 21.0 | 0.8 | 30.3 | | 47.5 |
| | Middlebrook @ Old Weisgarber | Signal | LOS | B | B | B | D | D |
| | | | Delay (sec/veh) | 17.7 | 10.5 | 14.8 | 49.9 | 44.5 |
| | Middlebrook @ E. Weisgarber | Signal | LOS | D | D | C | D | E |
| | | | Delay (sec/veh) | 40.2 | 52.4 | 23.4 | 48.8 | 75.7 |
| | E. Weisgarber @ Lonas | Signal | LOS | B | C | D | B | B |
| | | | Delay (sec/veh) | 20.0 | 34.5 | 41.7 | 14.4 | 18.5 |
| | Old Weisgarber @ Lonas | TWSC | LOS | | A* | - | | C |
| | | | Delay (sec/veh) | | 8.3* | - | | 19.3 |

*Left turn movement only

# 3.0 Trip Generation

The trip generation for this development was estimated using the 10th Edition of the ITE Trip Generation Manual, for each phase of development, as shown in **Table 3-1**. A transit reduction of 2% was applied to the trips from the development due to the presence of two bus routes adjacent to the property, which are detailed in **Section 5.8** of this report. Copies of the associated data from the ITE Trip Generation Manual are included as **Appendix V**.

## Table 3-1 – Trip Generation

| Land Use | ITE Code | Intensity | Daily Trip Ends | AM Peak Period | | | | | PM Peak Period | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | In | | Out | | | In | | Out | | |
| | | | | % | Trips | % | Trips | Total | % | Trips | % | Trips | Total |
| ***Phase 1*** | | | | | | | | | | | | | |
| Hospital | 610 | 250 Beds | 5,580 | *72%* | *345* | *28%* | *134* | 479 | *28%* | *116* | *72%* | *300* | 416 |
| Free-Standing Emergency Room | 650 | 11.0 KSF | 274 | *50%* | *6* | *50%* | *6* | 12 | *46%* | *8* | *54%* | *9* | 17 |
| *Transit reduction (2%)* | | | *(117)* | | *(7)* | | *(3)* | *(10)* | | *(2)* | | *(6)* | *(9)* |
| **Phase 1 Sub-Total** | | | **5,737** | | **344** | | **137** | **481** | | **122** | | **303** | **424** |
| ***Phase 2*** | | | | | | | | | | | | | |
| Medical/Dental Office | 720 | 110.0 KSF | 4,139 | *78%* | *190* | *22%* | *53* | 243 | *28%* | *107* | *72%* | *274* | 381 |
| *Transit reduction (2%)* | | | *(83)* | | *(4)* | | *(1)* | *(5)* | | *(2)* | | *(5)* | *(8)* |
| **Phase 2 Sub-Total** | | | **4,056** | | **186** | | **52** | **238** | | **105** | | **269** | **373** |
| ***Phase 3*** | | | | | | | | | | | | | |
| Medical/Dental Office | 720 | 120.0 KSF | 4,523 | *78%* | *205* | *22%* | *58* | 263 | *28%* | *116* | *72%* | *299* | 415 |
| *Transit reduction (2%)* | | | *(90)* | | *(4)* | | *(1)* | *(5)* | | *(2)* | | *(6)* | *(8)* |
| **Phase 3 Sub-Total** | | | **4,433** | | **201** | | **57** | **258** | | **114** | | **293** | **407** |
| ***Total*** | | | ***14,226*** | | ***731*** | | ***246*** | ***977*** | | ***341*** | | ***865*** | ***1,204*** |

*Source: ITE Trip Generation Manual, 10th Edition*

# 4.0 Trip Distribution

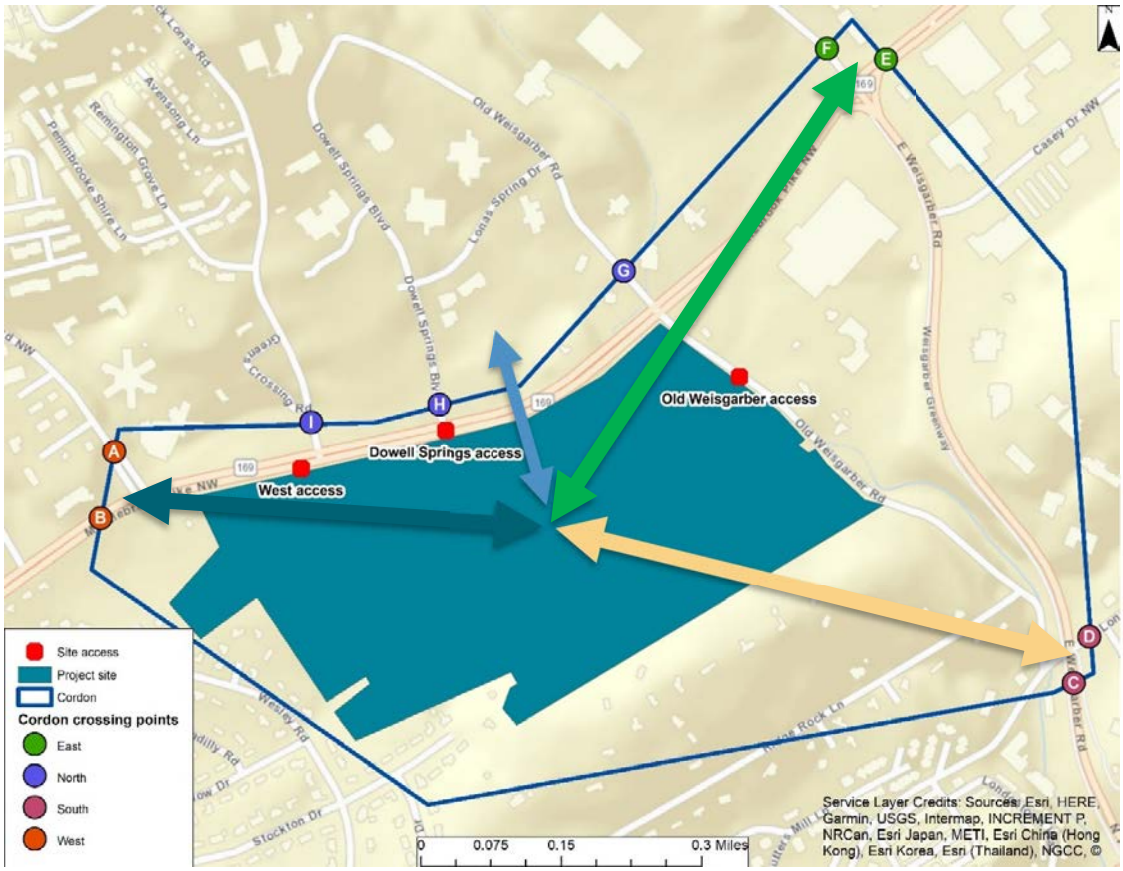
## 4.1 Network Distribution

The project trip distribution for the proposed development was determined based on the existing distribution of vehicular trips in the study network, with adjustments made to the trip distribution based on coordination with the Knoxville-Knox County Planning and City of Knoxville. A cordon was drawn around the medical park campus with nine defined crossing points, shown in **Table 4-1** and **Figure 4-1**. The crossing points were classified by direction relative to the site (west, south, east, and north). For each crossing point, the existing approach volume was calculated based on the turning movement counts at the adjacent intersection. Each of these volumes then was divided by the total of these volumes to determine a percentage for each crossing point. Based on feedback from the Knoxville-Knox County Planning and City of Knoxville, the resulting study distribution reduced the percentages from the 'minor' streets, and added them to the major movements, using the same distribution in the AM and PM peak period, as shown in **Table 4-2**.

## Table 4-1 – Cordon Locations

| Crossing ID | Direction | Description |
|---|---|---|
| A | West | Lake Brook Blvd |
| B | West | Middlebrook Pike (west) |
| C | South | East Weisgarber Rd (south) |
| D | South | Lonas Dr (east) |
| E | East | Middlebrook Pike (east) |
| F | East | East Weisgarber Rd (north) |
| G | North | Old Weisgarber Road (north) |
| H | North | Dowell Springs Blvd |
| I | North | Dick Lonas Rd |

## Figure 4-1 – Cordon Map



## Table 4-2 – Global Trip Distribution

**AM Peak**

| Direction | Crossing point | Segment | Inbound Volume | Outbound Volume | Total Volume | Approach % | Direction Total | Study Distribution | |
|---|---|---|---|---|---|---|---|---|---|
| West | A | Lake Brook, N of Middlebrook | 156 | 263 | 419 | 4.3% | 27.8% | 32% | 1% |
| West | B | Middlebrook, W of Lake Brook | 1,387 | 913 | 2,300 | 23.5% | | | 31% |
| South | C | Weisgarber, S of Lonas | 1,454 | 1,136 | 2,590 | 26.4% | 32.7% | 33% | 31% |
| South | D | Lonas, E of Weisgarber | 238 | 384 | 622 | 6.3% | | | 2% |
| East | E | Middlebrook, E of Weisgarber | 1,587 | 1,029 | 2,616 | 26.7% | 29.1% | 32% | 31% |
| East | F | Weisgarber, N of Middlebrook | 40 | 199 | 239 | 2.4% | | | 1% |
| North | G | Old Weisgarber, N of Middlebrook | 34 | 269 | 303 | 3.1% | 10.4% | 3% | 1% |
| North | H | Dowell Springs, N of Middlebrook | 64 | 411 | 475 | 4.8% | | | 1% |
| North | I | Dick Lonas Rd, N of Middlebrook | 119 | 125 | 244 | 2.5% | | | 1% |
| **Total** | | | **5,079** | **4,729** | **9,808** | **100%** | **100%** | **100%** | **100%** |

**PM Peak**

| Direction | Crossing point | Segment | Inbound Volume | Outbound Volume | Total Volume | Approach % | Direction Total | Study Distribution | |
|---|---|---|---|---|---|---|---|---|---|
| West | A | Lake Brook, N of Middlebrook | 227 | 177 | 404 | 4.3% | 28% | 32% | 1% |
| West | B | Middlebrook, W of Lake Brook | 884 | 1,325 | 2,209 | 23.3% | | | 31% |
| South | C | Weisgarber, S of Lonas | 876 | 1,514 | 2,390 | 25.2% | 31.2% | 33% | 31% |
| South | D | Lonas, E of Weisgarber | 342 | 234 | 576 | 6.1% | | | 2% |
| East | E | Middlebrook, E of Weisgarber | 1,272 | 1,432 | 2,704 | 28.5% | 32% | 32% | 31% |
| East | F | Weisgarber, N of Middlebrook | 245 | 45 | 290 | 3.1% | | | 1% |
| North | G | Old Weisgarber, N of Middlebrook | 277 | 50 | 327 | 3.4% | 9.7% | 3% | 1% |
| North | H | Dowell Springs, N of Middlebrook | 325 | 49 | 374 | 3.9% | | | 1% |
| North | I | Dick Lonas Rd, N of Middlebrook | 127 | 92 | 219 | 2.3% | | | 1% |
| **Total** | | | **4,575** | **4,918** | **9,493** | **100%** | **100%** | **100%** | **100%** |

At the two intersections west of the cordon analysis, Lake Brook Blvd and Lake Brook Blvd/Whitehall Rd, 1% of trips were assigned to each of the minor street approaches, with the remaining assigned to Middlebrook Pike. At the intersection of Middlebrook Pike/Vanosdale Road/Francis Road, the trips were assigned based on the existing distribution of trips on the westbound approach for each peak period.

## 4.2 Vehicular Access

The project will have three driveways – two on Middlebrook Pike one located just west of Dick Lonas Road and one aligned with Dowell Springs Boulevard, and one on Old Weisgarber Road. The Old Weisgarber Road access will be constructed for Phase 3 of the development. The resulting distribution at each intersection are shown in **Figure 4-2** and **Figure 4-3**.

N

**Inbound Distribution**

**Outbound Distribution**

*Distribution percentages shown are rounded, and thus rounding error may be present when comparing adjacent percentages.*

Project Site

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

**Figure 4-2**

Trip Distribution (Phases 1 & 2)

**Tennova Middlebrook Pike Medical Park**
**Traffic Impact Study**
Knoxville, TN
S&ME Project No. 514318012

N

**Inbound Distribution**

**Outbound Distribution**

*Distribution percentages shown are rounded, and thus rounding error may be present when comparing adjacent percentages.*

Project Site

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

**Figure 4-3**

Trip Distribution (Phase 3)

**Tennova Middlebrook Pike Medical Park**
**Traffic Impact Study**
Knoxville, TN
S&ME Project No. 514318012

**Access Distribution – Phases 1 & 2**

In Phases 1 & 2, only the access points on Middlebrook Pike will be constructed. The western access is a right-in/right-out from eastbound Middlebrook Pike, while full access to/from Middlebrook Pike is provided at Dowell Springs Boulevard. The Dowell Springs Boulevard access is planned to have dual left-turn lanes into the site from westbound Middlebrook Pike, and a left-turn and a through-right lane on the northbound approach.

*Right-in/Right-out Access Point*

Due to the configuration of this access point, only trips from west of the project site are able to access this driveway into the campus. Thus, for purposes of analysis, 75% of the inbound project trips from the west of the campus (crossing points A & B) will be assigned to this driveway. For outbound trips from the site, 25% of the outbound trips will be assigned to this access point, as it still requires a u-turn or left-turn off of Middlebrook Pike for trips to the west/north access points, and is the further access point for trips to the east and south.

*Dowell Springs Access Point*

The Dowell Springs access point is the main access point for the campus. Inbound, all of the trips from the north, east, and south are assigned to this access point, along with 25% of the inbound trips from the west.

Outbound, 75% of all project trips will exit via this access point. There will also be some eastbound u-turns/left-turns at this intersection for the vehicles exiting at the Right-In/Right-Out access that are heading towards the west and north.

*Old Weisgarber Road*

Although no access is proposed via Old Weisgarber Road for phases 1 & 2, it was assumed that approximately 35% of the trips to/from the south would utilize Lonas Road/Old Weisgarber Road to access Middlebrook Pike in lieu of traveling through the Middlebrook Pike/Weisgarber Road intersection.

**Access Distribution – Phase 3**

For Phase 3, an additional access point will be added on Old Weisgarber Road. As all of the Phase 3 development is located between of Dowell Springs Boulevard and Old Weisgarber Road within the site, only the Dowell Springs Boulevard and Old Weisgarber Road access points were used for Phase 3 traffic.

*Right-in/Right-out Access Point*

The right-in/right-out access point will only include the trips assigned during Phases 1& 2, due to the location of the Phase 3 development within the project site.

*Dowell Springs Access Point*

For the Phase 3 traffic, 100% of the inbound and outbound traffic from/to the west and north (Dick Lonas Rd/Dowell Springs Blvd) are assumed to use the Dowell Springs access. From the east (and including the Old Weisgarber Road North traffic), 50% of the inbound and outbound traffic will be assigned to the Dowell Springs

access point. To and from the south, 25% of the inbound and outbound traffic will be assigned to the Dowell Springs access.

*Old Weisgarber Road*

For trips from the east (including the Old Weisgarber Road north traffic), 25% of the inbound and outbound traffic will be assigned to the Old Weisgarber Road access point. To and from the south, 35% of the inbound and outbound traffic will be assigned to the Old Weisgarber Road access, with all of this traffic using Lonas/Old Weisgarber to bypass the Middlebrook Pike/Old Weisgarber Road access.

Furthermore, the trips from Phases 1 & 2 previously assumed to use Lonas Road/Old Weisgarber Road between Middlebrook Pike and Weisgarber Road were also all moved to use the Old Weisgarber Road access both inbound and outbound.

## 4.3 Future Traffic

An estimate of 2% annual growth was used to grow the background trips throughout the network to each of the build-out years. This rate provides a conservative estimate of background traffic growth for transportation impact studies, especially when projecting more than 5 years into the future. However, this was compared to the 10-year growth on both Middlebrook Pike and Weisgarber Road. Based on the counts from 2008-2017, Middlebrook Pike had approximately 1.3% annual growth while Weisgarber Road had approximately 3.34% annual growth. An assumption of 2% is thus in line with the historic growth rates in the area. The future background volume was combined with the project trips, and the resulting traffic volumes are shown on **Figures 4-4** through **4-9**, with calculations, for both the intersection turning movement volumes and background growth, included in **Appendix VI**.

N

Background + (Project) = Total Volume

Project Site

Timbercrest

Westavia Woods

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

**Figure 4-4**

Phase 1 Turning Movement Volumes - AM Peak Period

**Tennova Middlebrook Pike Medical Park**
**Traffic Impact Study**
Knoxville, TN
S&ME Project No. 514318012

N

Background + (Project) = Total Volume

Project Site

Timbercrest

Westavia Woods

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

**Figure 4-5**

Phase 1 Turning Movement Volumes - PM Peak Period

**Tennova Middlebrook Pike Medical Park**
**Traffic Impact Study**
Knoxville, TN
S&ME Project No. 514318012

N

Background + (Project) = Total Volume

Project Site

Timbercrest

Westavia Woods

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

**Figure 4-6**

Phase 2 Turning Movement Volumes - AM Peak Period

**Tennova Middlebrook Pike Medical Park**
**Traffic Impact Study**
Knoxville, TN
S&ME Project No. 514318012

N

**Background* + (Project) = Total Volume**

**Includes project trips from previous phases*

1+(1)=2 194
158
26
1214
82+(71)=153

27
1078+(69)=1147
11+(10)=21
3+(3)=6
102+(90)=192
127+(112)=239

53+(1)=54
95
183
31
1154+(56)=1210
21

11+(3)=14
1240+(142)=1382
104+(36)=140
9
15
106+(14)=120

28+(1)=29
117
121
29
833+(33)=866
553

13+(3)=16
970+(85)=1055
474+(55)=529
560
10
364+(21)=385

77+(1)=78
62
77+(3)=80
1428+(88)=1516

26
1030+(78)=1108

1490+(88)=1578

979+(9)=988
30+(26)=56
77+(69)=146

80+(2)=82
161
84
110+(5)=115
1249+(58)=1307
254+(16)=270

132
949+(22)=971
284
218
257
157+(6)=163

5+(1)=6
28
2
15+(3)=18
1519+(79)=1598
64+(3)=67

31
952+(31)=983
26
32
3
30+(1)=31

141+(1)=142
106
79+(3)=82
1424+(85)=1509

116
879+(33)=912

1178+(55)=1233
118
44
113
71+(2)=73
188

42
72+(5)=77
368+(30)=398
69
652+(21)=673
266+(12)=278

176+(36)=212
25
132+(14)=146
248

26
308

Project Site

Timbercrest

Westavia Woods

Middlebrook Pike NW

Old Weisgarber Rd

E Weisgarber Rd

Casey Dr NW

Timbercrest Trl

Lonas Dr NW

Lonas Spring Dr

Dowell Springs Blvd

Lake Brook Blvd NW

Toxaway Dr

Cardan Dr NW

Bearden View Ln

Bailey Cove

Pennbrooke Shire Ln

Fourth Creek

Crossing Rd

Francis Rd NW

W Park Dr

Francis Cir

Woodview Ln

Yorkshire Dr NW

Wellswood Ln

Picadilly Rd

Wesley Rd

Kinzalow Dr

Ridge Rock Ln

Sutters Mill Ln

Gate Ln

Londontown Apartments

Sheffield Dr

Red Sail Way

Kirbury Ln

Hammer Ln NW

Brookvale Ln

169

40



**Figure 4-7**

Phase 2 Turning Movement Volumes - PM Peak Period

**Tennova Middlebrook Pike Medical Park**
**Traffic Impact Study**
Knoxville, TN
S&ME Project No. 514318012

**Background* + (Project)** = Total Volume**
**Includes project trips from previous phases*
***Includes redistribution of trips from Phase 1 and Phase 2 now using Old Weisgarber Rd*

Project Site

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

**Figure 4-8**
Phase 3 Turning Movement Volumes - AM Peak Period

**Tennova Middlebrook Pike Medical park**
**Traffic Impact Study**
Knoxville, TN
S&ME Project No. 514318012

**Background* + (Project)** = Total Volume**
**Includes project trips from previous phases*
***Includes redistribution of trips from Phase 1 and Phase 2 now using Old Weisgarber Rd*

Project Site

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

**Figure 4-9**
Phase 3 Turning Movement Volumes - PM Peak Period

**Tennova Middlebrook Pike Medical Park**
**Traffic Impact Study**
Knoxville, TN
S&ME Project No. 5143180012

# 5.0 Analysis

## 5.1 Intersection Analysis

The roadway network was analyzed for the following scenarios:

- Phase 1 No-Build (includes background growth to 2020)
- Phase 1 Build-Out (includes background growth to 2020 and Phase 1 traffic)
- Phase 2 No-Build (includes background growth to 2023 and Phase 1 traffic)
- Phase 2 Build-Out (includes background growth to 2023 and Phase 1 & 2 traffic)
- Phase 3 No-Build (includes background growth to 2027 and Phase 1 & 2 traffic)
- Phase 3 Build-Out (includes background growth to 2027 and Phase 1, 2, & 3 traffic)

Each of the study intersections was evaluated using Synchro 10 software, using Highway Capacity Manual methodologies, coded to represent the study network. All of the intersections were analyzed with the existing geometrics. A summary of each scenario is included as **Table 5-1**, with an overview of intersection level of service and delays for the existing conditions, Phase II and Phase III scenarios included as **Table 5-2**, and detailed intersection level of service and delays shown with the Synchro documentation in **Appendix VII – XII.** For brevity, the Phase I build out scenario were not included with Table 5-2, but can be found in the appendices.

Throughout the study periods, all of the intersections operate at or above capacity (level of service E or better) overall in both the AM and PM peak periods, until the Phase 3 No-Build Scenario, when the intersection of Middlebrook Pike and E Weisgarber Road operates at LOS F overall. However, the western approach to this intersection operates at LOS F in the AM peak period in all scenarios.

Significant improvements have been made at the intersection of Middlebrook Pike and E. Weisgarber Road in the past few years. These include extension of the eastbound right-turn lane (from a taper), and the addition of a second dedicated left-turn lane on the northbound approach. However, throughout all of the scenarios (including the existing conditions), the westbound Middlebrook Pike approach to E Weisgarber Road operates at LOS F in the AM peak period due to the volume of westbound left-turn vehicles. The volume in the AM peak period is projected to increase to 764 vehicles by Phase 3, and no project trips are assigned to the westbound left-turn movement. Based on FHWA 'rules of thumb', a triple left-turn lane should be considered when the volume is over 600 vehicles per hour, as it is at this intersection in the AM peak period; but due to the lack of space for a third receiving lane on the south leg of the intersection, this improvement is unlikely.

In the Phase 3 No-Build and Build-Out Scenarios, two additional approaches operate at LOS F in the PM Peak period, both at unsignalized intersections. The southbound Dick Lonas Road approach to Middlebrook Pike and the southbound Old Weisgarber Road approach to Lonas Road both operate at LOS F in the PM peak period for both the Phase 3 scenarios. For the Middlebrook Pike/Dick Lonas Road intersection, the volumes on Middlebrook Pike increase too high to provide sufficient gaps for the southbound left-turn. Signalization would be the only way to improve the level of service for the southbound approach, but without signalization, commuter traffic would learn that the left-turn is not feasible at this intersection and either change their primary route, or just make a right-turn onto Middlebrook Pike and find a place to u-turn further downstream. At the Old Weisgarber Road/Lonas Road intersection, the short distance between Old Weisgarber Road and E Weisgarber Road limits the opportunities for the southbound left-turn movement. However, with the average delay of ~150 seconds in the Phase 3 Build-Out Scenario, most vehicles making the turn from Old Weisgarber Road onto Lonas Drive are able

to do so within 1-2 signal cycles, or the traffic pattern will change due to the delays and vehicles will take alternate routes to avoid the delay.

## Table 5-1 – Summary of Scenarios and Findings

| Scenario | Summary |
|---|---|
| Existing Conditions | • Current traffic volumes (2019)<br>• Existing deficiency at Middlebrook Pike @ East Weisgarber Rd<br>o Westbound approach in AM peak period |
| Phase 1 No Build | • Background traffic grown to 2020<br>• Slight increase in delays. No new intersection approach deficiencies |
| Phase 1 Build Out | • Phase 1 projects, along with two Middlebrook site entrances, added to network<br>• Slight increase in delays. No new intersection approach deficiencies |
| Phase 2 No Build | • Background traffic grown to 2023, includes Phase 1 project trips<br>• Slight increase in delays. No new intersection approach deficiencies |
| Phase 2 Build Out | • Phase 2 project trips added to the network<br>• Slight increase in delays. No new intersection approach deficiencies |
| Phase 3 No Build | • Background traffic grown to 2027, includes Phase 1 & 2 project trips<br>• New deficiencies at Middlebrook Pike @ Vanosdale Rd / Francis Rd<br>o Eastbound approach in AM peak period<br>o Westbound approach in PM peak period<br>• New deficiencies at Middlebrook Pike @ East Weisgarber Rd<br>o Overall intersection in AM peak period<br>o Westbound approach in PM peak period<br>• New deficiencies at Lonas Dr @ Old Weisgarber Rd<br>o Southbound approach in PM peak period<br>• New deficiencies at Middlebrook Pike @ Dick Lonas Rd<br>o Southbound approach in PM peak period |
| Phase 3 Build Out | • Phase 3 project traffic, along with Old Weisgarber site entrance, added to network<br>• New deficiencies at Middlebrook Pike @ East Weisgarber Rd<br>o Eastbound approach in PM peak period |

## Table 5-2 – Analysis Summary

| | Intersection | Stop Control | Intersection Conditions | Existing Scenario | | | | | Phase 2 Build-Out | | | | | Phase 3 No-Build | | | | | Phase 3 Build-Out | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Overall | EB | WB | NB | SB | Overall | EB | WB | NB | SB | Overall | EB | WB | NB | SB | Overall | EB | WB | NB | SB |
| AM Peak Period | Middlebrook @ Vanosdale | Signal | LOS | C | C | D | D | C | D | E | C | D | C | E | F | D | D | C | E | F | D | E | C |
| | | | Delay (sec/veh) | 34.6 | 33.2 | 36.6 | 41.4 | 28.9 | 46.0 | 58.0 | 34.3 | 50.4 | 31.7 | 59.6 | 87.9 | 36.1 | 53.8 | 34.4 | 66.0 | 101.8 | 36.5 | 56.1 | 34.9 |
| | Middlebrook @ Whitehall | TWSC | LOS | | A* | A* | C | B | | A* | B* | C | C | | A* | B* | D | C | | A* | B* | E | C |
| | | | Delay (sec/veh) | | 8.3* | 9.6* | 17.5 | 12.7 | | 8.6* | 10.9* | 24.9 | 16.7 | | 8.8* | 11.8* | 32.0 | 20.2 | | 8.9* | 12.4* | 35.9 | 22.9 |
| | Middlebrook @ Lake Brook | Signal | LOS | A | A | A | | D | A | A | A | | D | A | A | A | | D | A | A | A | | D |
| | | | Delay (sec/veh) | 4.6 | 1.0 | 1.9 | | 53.1 | 4.8 | 1.3 | 2.6 | | 52.3 | 5.0 | 2.1 | 3.1 | | 44.2 | 5.1 | 1.5 | 3.3 | | 52.0 |
| | Middlebrook @ West Access | TWSC | LOS | | | | | | | - | - | B | | | - | - | B | | | - | - | C | |
| | | | Delay (sec/veh) | | | | | | | - | - | 13.2 | | | - | - | 14.5 | | | - | - | 15.2 | |
| | Middlebrook @ Dick Lonas | TWSC | LOS | | A* | - | | B | | A* | - | | C | | A* | - | | C | | A* | - | | C |
| | | | Delay (sec/veh) | | 8.7* | - | | 14.8 | | 9.1* | - | | 18.5 | | 9.4* | - | | 22.3 | | 9.5* | - | | 24.8 |
| | Middlebrook @ Dowell Springs[1] | Signal | LOS | A | A | A | | D | C | C | C | E | E | D | D | C | E | E | C | D | B | E | E |
| | | | Delay (sec/veh) | 3.7 | 1.2 | 3.8 | | 54.2 | 33.3 | 31.1 | 31.0 | 66.3 | 58.0 | 35.6 | 35.5 | 31.4 | 66.3 | 61.4 | 29.1 | 39.5 | 10.6 | 70.0 | 62.1 |
| | Middlebrook @ Dowell Springs[2] | Signal | LOS | A | A | A | | D | C | B | D | E | D | C | B | D | E | E | B | B | B | E | E |
| | | | Delay (sec/veh) | 3.7 | 1.2 | 3.8 | | 54.2 | 30.0 | 16.0 | 40.8 | 62.9 | 54.8 | 31.1 | 18.0 | 40.9 | 66.3 | 61.4 | 18.9 | 18.1 | 12.1 | 70.0 | 56.3 |
| | Middlebrook @ Old Weisgarber | Signal | LOS | B | C | B | D | D | C | D | C | D | D | C | D | C | E | D | B | A | C | D | D |
| | | | Delay (sec/veh) | 18.2 | 20.4 | 10.7 | 52.5 | 41.8 | 29.6 | 35.8 | 20.4 | 52.4 | 35.3 | 31.9 | 37.6 | 23.0 | 55.4 | 35.1 | 17.7 | 2.9 | 25.6 | 49.6 | 38.8 |
| | Middlebrook @ E Weisgarber | Signal | LOS | E | B | F | D | D | E | C | F | D | D | F | B | F | D | D | F | D | F | D | D |
| | | | Delay (sec/veh) | 65.8 | 19.4 | 89.6 | 47.7 | 53.9 | 77.2 | 24.8 | 106.6 | 51.7 | 51.6 | 88.3 | 15.4 | 129.4 | 52.1 | 54.3 | 96.3 | 45.7 | 131.5 | 54.0 | 52.0 |
| | E Weisgarber @ Lonas | Signal | LOS | B | D | D | B | B | B | D | D | B | B | C | D | D | C | B | C | D | D | C | B |
| | | | Delay (sec/veh) | 13.9 | 42.1 | 43.6 | 11.3 | 10.5 | 17.6 | 41.6 | 43.0 | 15.9 | 14.1 | 21.4 | 40.9 | 42.5 | 21.0 | 16.9 | 23.3 | 41.0 | 42.4 | 23.9 | 17.8 |
| | Old Weisgarber @ Lonas | TWSC | LOS | | A* | - | | C | | A* | - | | C | | A* | - | | D | | A* | - | | D |
| | | | Delay (sec/veh) | | 8.2* | - | | 16.9 | | 8.6* | - | | 23.3 | | 8.7* | - | | 28.5 | | 8.8* | - | | 31.3 |
| | Old Weisgarber @ Project Access | TWSC | LOS | | | | | | | | | | | | | | | | | B | | A* | A |
| | | | Delay (sec/veh) | | | | | | | | | | | | | | | | | 10.9 | | 7.9* | 0.0 |
| PM Peak Period | Middlebrook @ Vanosdale | Signal | LOS | D | C | D | C | D | D | C | E | C | D | E | D | F | C | D | E | D | F | C | D |
| | | | Delay (sec/veh) | 36.2 | 24.9 | 45.7 | 33.6 | 44.0 | 48.4 | 31.4 | 68.7 | 33.6 | 44.7 | 63.0 | 41.2 | 95.1 | 34.6 | 45.7 | 73.9 | 50.9 | 112.0 | 34.3 | 45.7 |
| | Middlebrook @ Whitehall | TWSC | LOS | | A* | A* | B | B | | B* | A* | C | C | | B* | A* | C | C | | B* | A* | C | C |
| | | | Delay (sec/veh) | | 9.5* | 8.4* | 14.6 | 13.7 | | 10.8* | 8.8* | 18.0 | 17.8 | | 11.8* | 9.0* | 21.9 | 20.7 | | 12.4* | 9.1* | 24.5 | 23.8 |
| | Middlebrook @ Lake Brook | Signal | LOS | A | A | A | | E | A | A | A | | E | A | A | A | | E | A | A | A | | E |
| | | | Delay (sec/veh) | 6.4 | 0.6 | 1.7 | | 56.2 | 6.9 | 0.7 | 2.9 | | 58.9 | 8.9 | 1.0 | 5.7 | | 61.3 | 9.3 | 1.2 | 6.7 | | 61.4 |
| | Middlebrook @ West Access | TWSC | LOS | | | | | | | - | - | B | | | - | - | B | | | - | - | B | |
| | | | Delay (sec/veh) | | | | | | | - | - | 11.8 | | | - | - | 12.2 | | | - | - | 12.6 | |
| | Middlebrook @ Dick Lonas | TWSC | LOS | | A* | - | | C | | B* | - | | D | | C* | - | | F | | C* | - | | F |
| | | | Delay (sec/veh) | | 9.8* | - | | 17.4 | | 11.7* | - | | 34.2 | | 19.0* | - | | 367.5 | | 20.7* | - | | 481.7 |
| | Middlebrook @ Dowell Springs[1] | Signal | LOS | C | A | C | | D | C | C | B | E | E | D | C | C | E | E | C | C | C | E | E |
| | | | Delay (sec/veh) | 21.0 | 0.8 | 30.3 | | 47.5 | 30.4 | 26.8 | 14.4 | 63.8 | 63.3 | 36.2 | 33.4 | 23.3 | 63.8 | 63.3 | 34.2 | 30.5 | 20.3 | 61.4 | 69.0 |
| | Middlebrook @ Dowell Springs[2] | Signal | LOS | C | A | C | | D | C | C | B | E | E | C | C | C | E | E | C | C | C | E | E |
| | | | Delay (sec/veh) | 21.0 | 0.8 | 30.3 | | 47.5 | 29.4 | 20.8 | 17.2 | 63.8 | 63.3 | 34.3 | 25.3 | 25.4 | 63.8 | 63. 3 | 33.8 | 23.3 | 26.1 | 61.4 | 65.6 |
| | Middlebrook @ Old Weisgarber | Signal | LOS | B | B | B | D | D | B | A | B | D | D | B | A | C | D | D | B | A | C | D | D |
| | | | Delay (sec/veh) | 17.7 | 10.5 | 14.8 | 49.9 | 44.5 | 14.5 | 2.3 | 19.8 | 48.0 | 39.4 | 15.4 | 3.2 | 20.9 | 48.8 | 38.6 | 15.7 | 2.3 | 21.5 | 48.6 | 43.0 |
| | Middlebrook @ E Weisgarber | Signal | LOS | D | D | C | D | E | D | E | C | D | E | E | E | E | E | E | E | F | D | D | E |
| | | | Delay (sec/veh) | 40.2 | 52.4 | 23.4 | 48.8 | 75.7 | 48.2 | 60.6 | 33.6 | 50.6 | 74.3 | 62.1 | 73.4 | 55.7 | 55.3 | 62.0 | 76.7 | 115.8 | 54.6 | 54.9 | 64.3 |
| | E Weisgarber @ Lonas | Signal | LOS | B | C | D | B | B | C | C | D | C | D | D | C | D | C | E | D | C | D | C | E |
| | | | Delay (sec/veh) | 20.0 | 34.5 | 41.7 | 14.4 | 18.5 | 31.5 | 32.8 | 41.1 | 23.3 | 35.7 | 46.5 | 32.9 | 45.0 | 28.3 | 61.4 | 54.0 | 33.0 | 46.0 | 31.2 | 73.8 |
| | Old Weisgarber @ Lonas | TWSC | LOS | | A* | - | | C | | A* | - | | E | | A* | - | | F | | A* | - | | F |
| | | | Delay (sec/veh) | | 8.3* | - | | 19.3 | | 8.5* | - | | 37.3 | | 8.8* | - | | 98.4 | | 8.8* | - | | 153.3 |
| | Old Weisgarber @ Project Access | TWSC | LOS | | | | | | | | | | | | | | | | | B | | A* | A |
| | | | Delay (sec/veh) | | | | | | | | | | | | | | | | | 12.5 | | 7.9* | 0.0 |

[1]With single left-turn lane on westbound approach [2]With double left-turn lane on westbound approach *Left turn movement only

## 5.2 Queue Analysis

Queue lengths for the turn lanes were analyzed at the Dowell Springs Road, Old Weisgarber Road, and East Weisgarber Road intersections on Middlebrook Pike. The existing turn bay length, as well as the 95th percentile queues for each turn lane are shown in **Table 5-2** and **Table 5-3**, with documentation provided in **Appendix VII-XII**.

### Table 5-3 – 95th Percentile Queues

| Intersection | Turn Lane | Existing Length | 95th Percentile Queue (ft) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Existing | Phase 1 No-Build | Phase 1 Build-Out | Phase 2 No-Build | Phase 2 Build-Out | Phase 3 No-Build | Phase 3 Build-Out |
| AM Peak | | | | | | | | | |
| Middlebrook @ Dowell Springs[1] | Eastbound Left-Turn | 235 | 34 | 41 | 161 | 130 | 193 | 209 | 203 |
| | Westbound Left-Turn | N/A | N/A | N/A | 181 | 165 | 279 | 239 | 334 |
| Middlebrook @ Dowell Springs[2] | Eastbound Left-Turn | 235 | 34 | 41 | 127 | 108 | 170 | 176 | 180 |
| | Westbound Left-Turn | N/A | N/A | N/A | 120 | 113 | 156 | 146 | 164 |
| Middlebrook @ Old Weisgarber | Eastbound Left-Turn | 75 | 21 | 21 | 31 | 29 | 25 | 24 | 27 |
| | Westbound Left-Turn | 120 | 6 | 5 | 9 | 10 | 9 | 9 | 15 |
| Middlebrook @ East Weisgarber | Eastbound Left-Turn | 120 | 34 | 34 | 32 | 30 | 29 | 28 | 26 |
| | Westbound Left-Turn | 210 | 445 | 456 | 456 | 492 | 492 | 542 | 542 |
| | Northbound Left-Turn | 145 | 201 | 204 | 236 | 249 | 269 | 293 | 338 |
| | Southbound Left-Turn | 110 | 35 | 35 | 35 | 36 | 36 | 40 | 40 |
| PM Peak | | | | | | | | | |
| Middlebrook @ Dowell Springs[1] | Eastbound Left-Turn | 235 | 5 | 5 | 25 | 27 | 34 | 37 | 35 |
| | Westbound Left-Turn | N/A | N/A | N/A | 34 | 42 | 170 | 171 | 206 |
| Middlebrook @ Dowell Springs[2] | Eastbound Left-Turn | 235 | 5 | 5 | 24 | 25 | 31 | 34 | 34 |
| | Westbound Left-Turn | N/A | N/A | N/A | 53 | 53 | 110 | 110 | 127 |
| Middlebrook @ Old Weisgarber | Eastbound Left-Turn | 75 | 6 | 6 | 7 | 9 | 10 | 10 | 9 |
| | Westbound Left-Turn | 120 | 8 | 8 | 8 | 1 | 10 | 9 | 15 |
| Middlebrook @ East Weisgarber | Eastbound Left-Turn | 120 | 14 | 14 | 16 | 16 | 16 | 16 | 18 |
| | Westbound Left-Turn | 210 | 308 | 317 | 317 | 345 | 391 | 431 | 420 |
| | Northbound Left-Turn | 145 | 163 | 165 | 176 | 184 | 193 | 214 | 223 |
| | Southbound Left-Turn | 110 | 137 | 139 | 139 | 145 | 145 | 154 | 154 |

[1]With single left-turn lane on westbound approach [2]With double left-turn lane on westbound approach

Of the three intersections, the only one in which the queue length exceeds the existing turn bay length is Middlebrook Pike & East Weisgarber Road. Such is the case for all scenarios. During both peak periods, this phenomenon is observed for the westbound and northbound left turning movements, and during the PM Peak hour, this also occurs with the southbound left turn lane. Queue lengths are often metered by an upstream signal, which explains some fluctuation in queue length as scenarios progress, despite volumes increasing.

At the intersection of Middlebrook Pike/Dowell Springs Boulevard, the eastbound left turn queue length shows noticeable increase with the introduction of the development, it remains well below the existing turn bay length. For the westbound left turning movement, a single turn lane of approximately 350 feet can accommodate the demand.

## 5.3 Turn Lane Warrants

The two stop-controlled access points into the site – the west access near Dick Lonas Rd and the access point on Old Weisgarber Rd – were evaluated using to determine if new turn lanes are warranted. The warrant analysis was performed in accordance with Report 457 of the National Highway Cooperative Research Program (NCHRP). For the west access, because it would be "right in, right out," it was only evaluated for a right turn bay warrant. For the Old Weisgarber access, the warrant analysis was performed for both types of turn bays. The turn lane warrant tables are shown in **Appendix XIII.**

For the west access on Middlebrook Pike, a right turn bay is warranted during both the AM and PM Peak periods for all phases. This is due to the high speed and volume of Middlebrook Pike as well as the trips generated from west of the campus.

For the Old Weisgarber access point, a northbound left turn bay is warranted due to anticipated demand during the AM Peak period. A right turn bay is not warranted during either peak period.

## 5.4 Pedestrian & Bicycle Accommodations

There are no existing sidewalks on Middlebrook Pike. Pedestrian accommodations will be provided within the site connecting the various land uses and parking lots, and along Middlebrook Pike as the project develops. There are no bicycle facilities within the study area.

## 5.5 Transit Availability

There are two bus routes surrounding the proposed project site. Detailed information on the bus routes, including full route maps and a detailed map of route near the project site, is included in **Appendix XIV**.

Route 19 serves the area surrounding I-40/75 between Weisgarber Rd/Northside Dr and I-640. There is an existing bus stop on the north side of Middlebrook Pike, just east of Old Weisgarber Road. Route 90 serves the area on the northwest side of Knoxville, from West Town Mall to Knoxville Center Mall. Connections are available from this route into downtown Knoxville. There are existing bus stops on both sides of Middlebrook Pike at Dowell Springs Boulevard, and on the north side of Middlebrook Pike, just east of Old Weisgarber Road.

The developer will coordinate with Knoxville Area Transit (KAT) to determine if either route can include a stop within the medical campus.

## 5.6 Sight Distance

A separate summary report detailing the project sight distances was prepared to document the sight distance at the project access points. Sight distance for the proposed intersections was measured in the field in general accordance with AASHTO guidelines. The summary report has been included as **Appendix XV**.

## 5.7 Internal Circulation

The site is planned to have two primary connector roadways which provide access to the various uses within the project site. The main access drive will align with Dowell Springs Road at Middlebrook Pike. A secondary roadway will begin at the entrance west of Dick Lonas Road and connect to the Dowell Springs Road Access. In Phase 3, this roadway will be extended to Old Weisgarber Road. At the intersection of these two roadways, a small roundabout is proposed. An analysis of roundabout operations, using the Sidra analysis software with HCM methodologies, was completed for the Phase 3 scenario, to ensure that the roundabout can handle the internal site traffic. Although there will be some traffic which enters a parking lot prior to arriving at the roundabout, for purposes of a conservative analysis, it was assumed that all trips on the site would reach the roundabout. As shown in **Appendix XVI**, the roundabout operates at LOS A overall in both the AM and PM conditions, with all approaches operating at LOS A in both peak period (other than the eastern leg, from Old Weisgarber Road, which operates at LOS B in the PM peak period). Thus, a small single-lane roundabout should be sufficient to circulate traffic within the site. The Dowell Springs Entrance will be accessed via 2 lanes to the traffic circle with the right lane dedicated as a right turn for the loop road and access to the internal lots to the west. The exit at Dowell Springs will have 2 outbound lanes, one left/through and one as a dedicated right-turn onto Middlebrook Pike; the dedicated right-turn will have roughly 150 feet of storage.

## 5.8 Emergency Services

The proposed uses of the site are medically related and during public meetings, questions about the frequency of ambulance traffic within the surrounding neighborhoods has been brought up. The proposed rehabilitation/FSED uses do not typically rely on emergency vehicles for transport to/from their facilities. When needed, the most direct route to local hospitals will be down Middlebrook Pike/E. Weisgarber to the interstate. Historical data from similar facilities designed by S&ME staff, indicate relative few daily trips (1-5) by ambulatory services. Given this history and proposed usage, the ambulatory trips generated by the proposed development will be negligible compared to existing conditions within the area.

# 6.0 Recommendations

The combination of background growth and project trips leads to additional delays throughout the study area in each Phase. Due to the unpredictability of forecasting background growth with historical growth rates and project traffic volumes based off of published rates, it is proposed that the traffic study be updated prior to Phase 3, to verify the background growth and Phase 1 & 2 project trips.

## 6.1 Phase 1 & Phase 2

The addition of the Phase 1 and Phase 2 project trips, increases delays throughout the network and does significantly impact the overall operations of the intersections in the study area. The only deficiency anticipated is the westbound approach at the intersection of Middlebrook Pike and E Weisgarber Road, which is deficient in the

existing condition. The deficiency is caused by delays on the westbound left-turn movement, which has over 650 vehicles in the peak hour in the existing condition, and is estimated to grow to 706 by the Phase 2 build-out. The projected growth is completely based on background growth, as no project trips are included on the deficient movement. Recent improvements by TDOT have improved the eastbound and northbound legs of this intersection, which improves the operation of the overall intersection, leaving the westbound left-turn movement as the main deficiency.

## 6.2 Phase 3

In the Phase 3 No-Build and Build-Out Scenario, two stop-controlled intersections operate at LOS F. This is primarily due to an increase in volume on the through movements, which limit gaps for the stop-controlled intersections. At Dick Lonas Road, the Department of Transportation has indicated that a traffic signal would not be allowed; however, as traffic increases on Middlebrook Pike, and delays increase, it is anticipated that southbound left-turn vehicles would either make a right-turn and find a place to u-turn, or use Amherst Road, as an alternate route. At Old Weisgarber Road/Lonas Road, the southbound left-turn backs up due to the signal at Weisgarber Road/Lonas Road. While vehicles are expected to back-up along Old Weisgarber Road, they do not block any other intersections, and are able to clear through the Old Weisgarber Road/Lonas Road intersection when gaps are provided by the signal at Weisgarber Road/Lonas Road. As delays increase for this movement, it is anticipated that some vehicles which use Old Weisgarber Road as a cut-through from Middlebrook Pike to I-75 would find an alternative route.

## 6.3 Access Design

There are three proposed access points for the project site. Based on the results of the analysis, the proposed intersection geometry is as follows:

- West Entrance (west of Dick Lonas Road)
    - Right-in/Right-out
    - Single lane inbound and outbound
    - Right-turn lane proposed on Middlebrook Pike
- Dowell Springs Boulevard
    - Full access intersection
    - Two inbound lanes (one dedicated right-turn and one through at the traffic circle), two outbound lanes (dedicated one dedicated right-turn and one through/left-turn lane)
    - Build dual westbound left-turn lanes on Middlebrook Pike, but stripe it as a single left-turn lane until turning movement volumes warrant the second left-turn lane. The eastbound left-turn lane should be offset to the north to provide sight distance after the implementation of the projected dual left-turn lanes
- Old Weisgarber Road (Phase 3 only)
    - Full access intersection
    - Single lane inbound and outbound
    - Northbound left-turn lane

## 6.4 Summary

There are some deficiencies seen in the network resulting from a combination of background conditions and the proposed project trips. For Phases 1 & 2, deficiencies are generally resulting from background growth and increases from project trips are mitigated through proposed improvements on Middlebrook PIke. Site related improvements will occur on Middlebrook Pike at both the west access and Dowell Springs Boulevard access. It is recommended that revised counts be performed during the completion of Phase II to evaluate the need for the dual westbound left-turn lanes at the Middlebrook Pike/Dowell Springs intersection.

Due to the uncertainty as far as the ultimate uses and the resulting traffic volumes generated by Phase 1&2, it is suggested that the traffic study be updated prior to the approval of Phase 3 to determine the specific impacts that will be associated with the development, and to fully develop improvements to Old Weisgarber Road.

# Appendices

# Appendix I – Methodology

# Memorandum

**To:** Curtis Williams, City of Knoxville

**From:** Stephanie Shealey, PE, PTP

**Cc:** Brad Salsbury, PE
Evan Hoffman, City of Knoxville
Mike Conger, Knox MPC
Tarren Barrett, Knox MPC

**Date:** March 7, 2019

**Subject:** Methodology for Traffic Impact Study for Middlebrook Medical Park

The purpose of this Methodology Statement is to document the scope and requirements for the Traffic Impact Study required by the Knoxville-Knox County Metropolitan Planning Commission to obtain approval for a proposed medical park located on the south side of Middlebrook Pike (TN-169) between Dick Lonas Road and Old Weisgarber Road. The proposed development will consist of a two proposed hospital related facilities with an aggregate of 250 beds, an 11,000 square foot free-standing emergency department (FSED), and approximately 230,000 square feet of medical office space, which is to be developed in three phases. The proposed methodology for this project is based on the requirements for a Level III Traffic Study, from Appendix B of the Administrative Rules and Procedures of the Knoxville-Knox County Metropolitan Planning Commission (dated June 14, 2018).

## ♦ Proposed Project

The proposed project will provide a medical park on approximately 60 acres off of Middlebrook Pike in Knoxville. The proposed medical campus may provide up to 250 hospital beds, an 11,000 square foot FSED, and approximately 230,000 square feet of medical office space. It will be divided into three phases, with the first phase consisting of the hospital and FSED, and the latter two phases consisting of medical office space. Phase 2 will have consist of the development of 110,000 square feet of medical office, while Phase 3 will complete the remaining120,000 square feet of the project. Two connections to Middlebrook Pike are proposed during Phase 1, at Dick Lonas Road and Dowell Springs Road. Additionally, in Phase 3, a connection would be added to Old Weisgarber Road. The traffic study will measure the impacts of the proposed development on the existing roadway network surrounding the proposed development.

## ♦ Trip Generation

The trip generation for this development was estimated using the 10th Edition of the Trip Generation Manual of the Institute of Transportation Engineers (ITE), as shown in **Table 1** below. No pass-by or internal capture trips are assumed due to the nature of the site. Because two bus routes (90 and 19 of Knoxville Area Transit (KAT)) run outside of the site, a corresponding 5% transit reduction was assumed. At buildout, the project is projected to generate a total of approximately 13,790 daily trips, with 947 AM peak hour trips and 1,168 PM peak hour trips.

### Table 1 – Trip Generation

| Land Use | ITE Code | Intensity | Daily Trip Ends | AM Peak Period | | | | | PM Peak Period | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | In | | Out | | | In | | Out | | |
| | | | | % | Trips | % | Trips | Total | % | Trips | % | Trips | Total |
| ***Phase 1*** | | | | | | | | | | | | | |
| Hospital | 610 | 250 Beds | 5,580 | *72%* | *345* | *28%* | *134* | 479 | *28%* | *116* | *72%* | *300* | 416 |
| Free-Standing Emergency Room | 650 | 11 KSF | 274 | *50%* | *6* | *50%* | *6* | 12 | *46%* | *8* | *54%* | *9* | 17 |
| **Phase 1 Sub-Total** | | | **5,854** | | **351** | | **140** | **491** | | **124** | | **309** | **433** |
| ***Phase 2*** | | | | | | | | | | | | | |
| Medical/Dental Office | 720 | 110 KSF | 4,139 | *78%* | *190* | *22%* | *53* | 243 | *28%* | *107* | *72%* | *274* | 381 |
| ***Phase 3*** | | | | | | | | | | | | | |
| Medical/Dental Office | 720 | 120 KSF | 4,523 | *78%* | *205* | *22%* | *58* | 263 | *28%* | *116* | *72%* | *299* | 415 |
| ***Subtotal (Phases 1-3)*** | | | ***14,516*** | | ***746*** | | ***251*** | ***997*** | | ***347*** | | ***882*** | ***1,229*** |
| Transit reduction (5%) | | | 726 | | *37* | | *13* | 50 | | *17* | | *44* | 61 |
| ***Total New Trips to Network*** | | | ***13,790*** | | ***709*** | | ***238*** | ***947*** | | ***330*** | | ***838*** | ***1,168*** |

*Source: ITE Trip Generation Manual, 10th Edition*

## ♦ Study Area

Per the Administrative Rules and Procedures, the proposed development meets the criteria for a Level III analysis, with projected daily trips over 6,000. Per Appendix B (June 4, 2018) of the Administrative Rules and Procedures of the Knoxville-Knox County Metropolitan Planning Commission the Level III definition and methodology are proposed below.

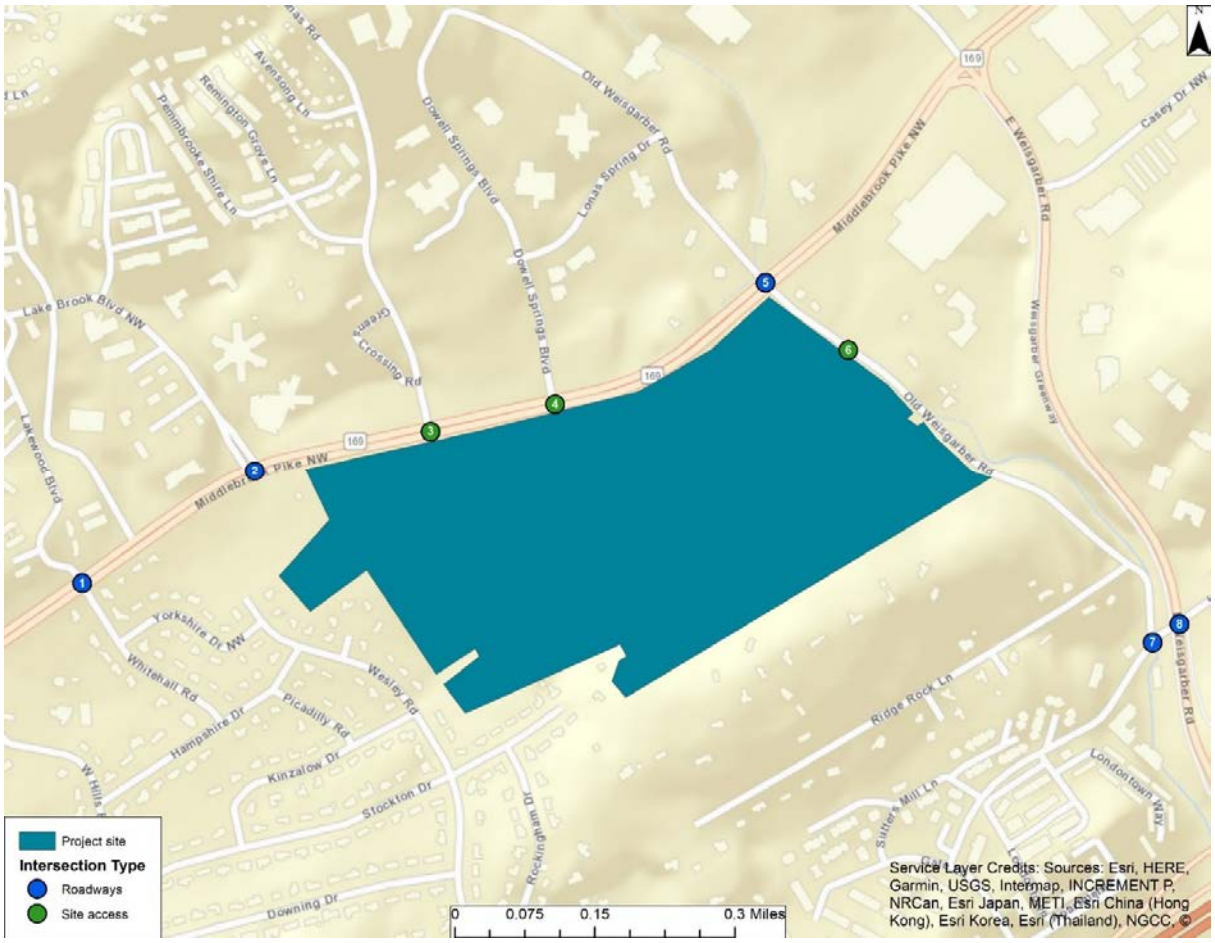
> ***Level III*** *studies require a complete traffic access and impact study, addressing each access point, the first control point beyond each access point, and the nearest collector/collector intersection or street of higher classification or as determined by MPC staff. The exact area to be studied will be determined by MPC with input from the study preparer. Level III studies are uncommon, as they are usually warranted only with very large mixed-use and commercial developments.*

Thus, per the requirements, the intersections to be included in the study are as follows:

1. Middlebrook Pike at Whitehall Rd / Lake Brook Blvd.
2. Middlebrook Pike at Lake Brook Blvd.
3. Middlebrook Pike at Dick Lonas Rd NW – first site access
4. Middlebrook Pike at Dowell Springs Blvd – second site access
5. Middlebrook Pike at Old Weisgarber Rd
6. Old Weisgarber Rd site access point
7. Lonas Dr at Old Weisgarber Rd.
8. Lonas Dr at E. Weisgarber Rd (only for Phase 3, when the connection is made)

The proposed study area is shown in **Figure 1**.

## Figure 1 – Proposed Study Area



## Scenarios & Analysis Methodology

There are seven scenarios being proposed for analysis with this project: .

- Existing Conditions
  - Existing traffic counts, signal timings, and roadway network
- Phase 1 Background (2020)
  - Background volumes grown to 2020
- Phase 1 Build-Out (2020)
  - Background growth + Phase 1 project traffic
- Phase 2 Background (2023)
  - Background volumes grown to 2023 + Phase 1 project traffic
- Phase 2 Build-Out (2023)
  - Background growth + Phase 1 & 2 project traffic
- Phase 3 Background (2027)
  - Background volumes grown to 2027 + Phase 1 & 2 project traffic
- Phase 3 Build-Out (2027)
  - Background growth + Phase 1, 2, & 3 project traffic

The intersections within the study area will be analyzed during the AM and PM peak period, using Synchro 10 with methodologies from the 2010 edition of the Highway Capacity Manual (HCM). Measures reviewed for the intersections will include level of service (LOS). Recommendations will be provided to mitigate any identified deficiencies caused by the addition of project trips on the network.

The intersection and roadway geometry will also be analyzed, considering distances from side streets, alignment with existing streets, intersection layout, sight distance, right-of-way width, and lane widths. The two access points on Middlebrook Pike will be aligned with Dick Lonas Rd and Dowell Springs Blvd.

Site circulation and pedestrian facilities will be addressed within the study. A sidewalk presently exists on Middlebrook Pike on the side opposite of the site, as well as on both sides of Dowell Springs Blvd. School bus stops will not be analyzed, as there is no residential development as part of this project. Public bus stops on Route 90 of Knoxville Area Transit (KAT) exist on Middlebrook Pike in front of the site, and stops along Route 19 also occur on nearby streets.

## Data Collection

Turning movement counts will be collected for all intersections identified above, except for the proposed site access point on Old Weisgarber Rd. (which does not currently exist), during the AM and PM peak periods (7-9am, 4-6pm) on a typical weekday. All count data will be provided in the submittal.

## ♦ Trip Distribution & Assignment

The project trips will be distributed and assigned to the roadway network based on the existing distribution of vehicular trips at the intersections surrounding the project site. Existing, project, and total traffic will be shown at all affected links and intersections. Links will show average daily traffic (ADT), while intersections will show turning movement counts. Project traffic will be analyzed by project phase.

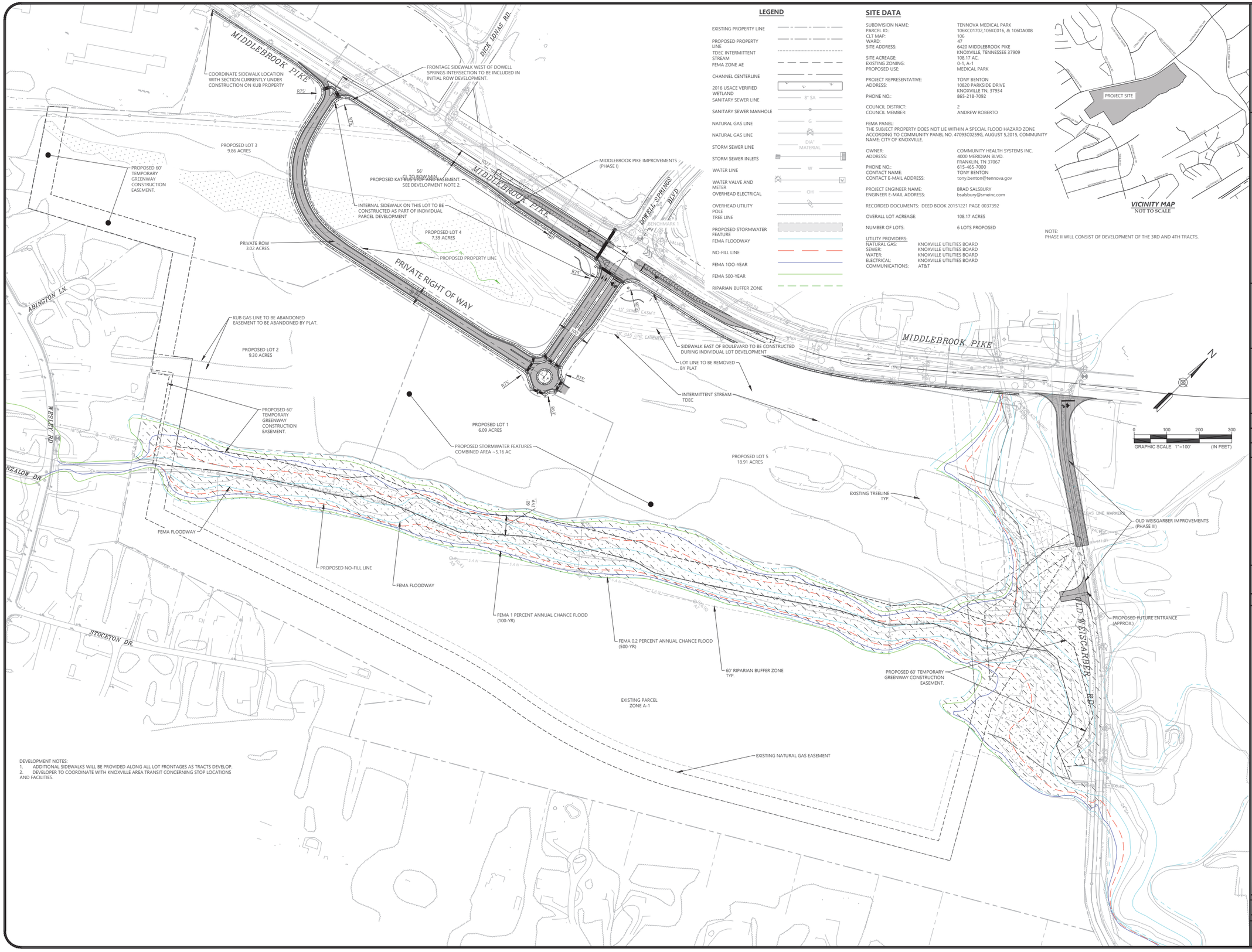
## ♦ Recommendations

Recommendations will be made based on findings in the study, including those pertaining to site access, intersection improvements, and off-site improvements. Previously developed MPC comments (12-A-13-UR, dated 12/06/2013) related to site access and safety will be included as applicable. The project phase of each recommendation will be specified.

## ♦ Documentation

The Traffic Access and Impact Study shall closely follow the recommended format/outline that is provided in the Traffic Impact Study Guidelines. Ten (10) copies of the completed draft traffic study will be submitted along with the development application.

# Appendix II- Conceptual Site Plan




## LEGEND

- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE
- TDEC INTERMITTENT STREAM
- FEMA ZONE AE
- CHANNEL CENTERLINE
- 2016 USACE VERIFIED WETLAND
- SANITARY SEWER LINE (8" SA)
- SANITARY SEWER MANHOLE
- NATURAL GAS LINE (G)
- NATURAL GAS LINE (DIA" MATERIAL)
- STORM SEWER LINE
- STORM SEWER INLETS
- WATER LINE (W)
- WATER VALVE AND METER
- OVERHEAD ELECTRICAL (OH)
- OVERHEAD UTILITY POLE
- TREE LINE
- PROPOSED STORMWATER FEATURE
- FEMA FLOODWAY
- NO-FILL LINE
- FEMA 100-YEAR
- FEMA 500-YEAR
- RIPARIAN BUFFER ZONE

## SITE DATA

| | |
|---|---|
| SUBDIVISION NAME: | TENNOVA MEDICAL PARK |
| PARCEL ID.: | 106KC01702,106KC016, & 106DA008 |
| CLT MAP: | 106 |
| WARD: | 47 |
| SITE ADDRESS: | 6420 MIDDLEBROOK PIKE KNOXVILLE, TENNESSEE 37909 |
| SITE ACREAGE: | 108.17 AC. |
| EXISTING ZONING: | O-1, A-1 |
| PROPOSED USE: | MEDICAL PARK |
| PROJECT REPRESENTATIVE: | TONY BENTON |
| ADDRESS: | 10820 PARKSIDE DRIVE KNOXVILLE TN, 37934 |
| PHONE NO.: | 865-218-7092 |
| COUNCIL DISTRICT: | 2 |
| COUNCIL MEMBER: | ANDREW ROBERTO |

FEMA PANEL:
THE SUBJECT PROPERTY DOES NOT LIE WITHIN A SPECIAL FLOOD HAZARD ZONE ACCORDING TO COMMUNITY PANEL NO. 47093C0259G, AUGUST 5,2015, COMMUNITY NAME: CITY OF KNOXVILLE.

| | |
|---|---|
| OWNER: | COMMUNITY HEALTH SYSTEMS INC. |
| ADDRESS: | 4000 MERIDIAN BLVD. FRANKLIN, TN 37067 |
| PHONE NO.: | 615-465-7000 |
| CONTACT NAME: | TONY BENTON |
| CONTACT E-MAIL ADDRESS: | tony.benton@tennova.gov |
| PROJECT ENGINEER NAME: | BRAD SALSBURY |
| ENGINEER E-MAIL ADDRESS: | bsalsbury@smeinc.com |

RECORDED DOCUMENTS: DEED BOOK 20151221 PAGE 0037392

| | |
|---|---|
| OVERALL LOT ACREAGE: | 108.17 ACRES |
| NUMBER OF LOTS: | 6 LOTS PROPOSED |

UTILITY PROVIDERS:

| | |
|---|---|
| NATURAL GAS: | KNOXVILLE UTILITIES BOARD |
| SEWER: | KNOXVILLE UTILITIES BOARD |
| WATER: | KNOXVILLE UTILITIES BOARD |
| ELECTRICAL: | KNOXVILLE UTILITIES BOARD |
| COMMUNICATIONS: | AT&T |




VICINITY MAP
NOT TO SCALE

NOTE:
PHASE II WILL CONSIST OF DEVELOPMENT OF THE 3RD AND 4TH TRACTS.

DEVELOPMENT NOTES:
1. ADDITIONAL SIDEWALKS WILL BE PROVIDED ALONG ALL LOT FRONTAGES AS TRACTS DEVELOP.
2. DEVELOPER TO COORDINATE WITH KNOXVILLE AREA TRANSIT CONCERNING STOP LOCATIONS AND FACILITIES.

6515 NIGHTINGALE LANE
KNOXVILLE, TN 37909
(865) 934-6023

COMMUNITY HEALTH SYSTEMS INC.
4000 MERIDIAN BLVD
FRANKLIN, TN 37067

NOT FOR CONSTRUCTION

| NO. | DATE | DESCRIPTION | BY | CHK |
|---|---|---|---|---|
| 1 | 09/23/2019 | PHASE 2 DISCRIPTION | DJR | BRS |
| 2 | 6/10/2019 | PLANNING COMMENTS | DJR | CLS |
| 3 | 5/28/2019 | PLANNING COMMENTS | DJR | CLS |
| 4 | 4/5/2019 | POC COMMENTS | DJR | BRS |
| 5 | 2/25/2019 | PRELIMINAL | DJR | CLS |

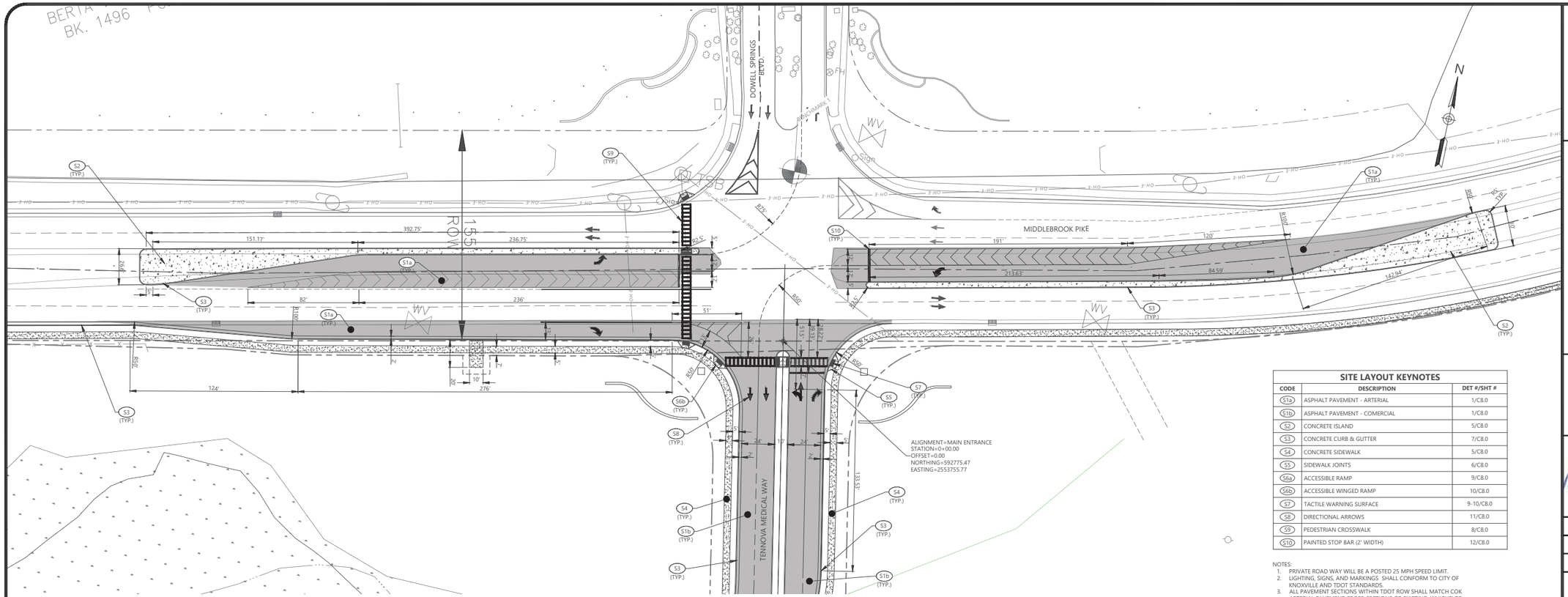
CONCEPT PLAN OF TENNOVA MEDICAL PARK

CONSTRUCTION DOCUMENTS
TENNOVA MEDICAL PARK
KNOXVILLE, KNOX COUNTY, TENNESSEE

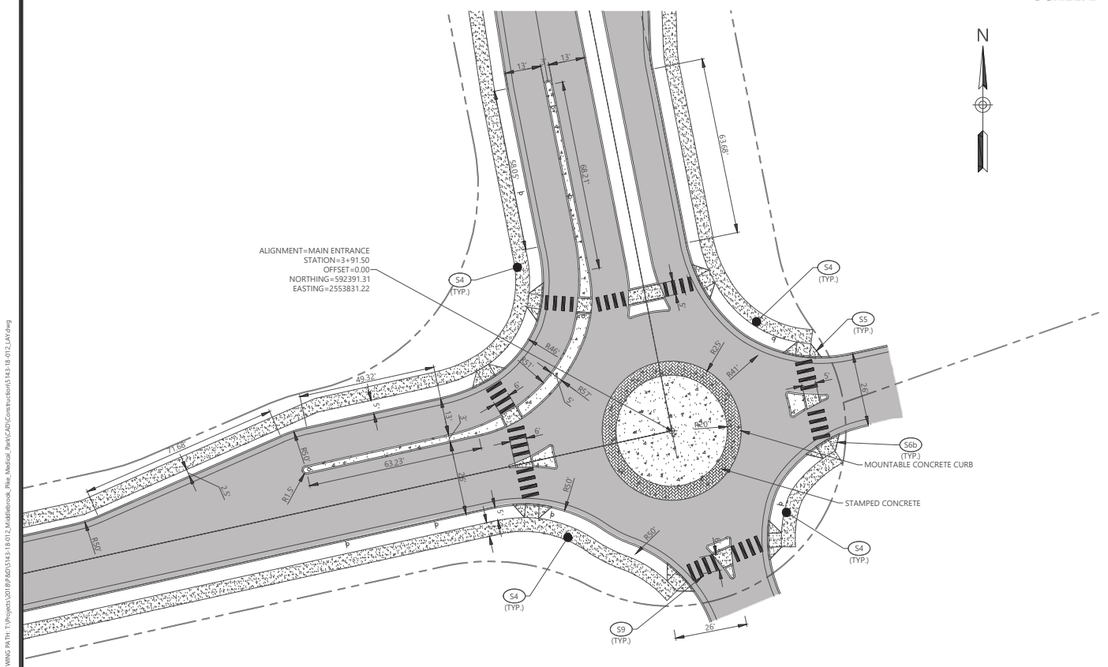
PROJECT NUMBER
5143-18-012

DRAWING NUMBER
CP-1

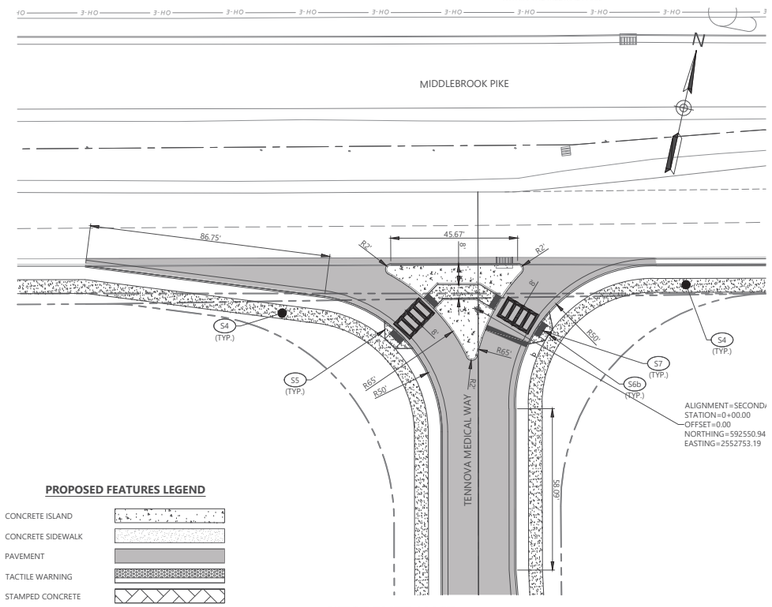
DRAWING PATH: T:\Projects\2018\P&D\5143-18-012_Middlebrook_Pike_Medical_Park\CAD\Construction\5143-18-012_cp1_concept.dwg




MIDDLEBROOK PIKE AT DOWELL SPRINGS
SCALE: 1" = 30'




INTERSECTION DETAIL
SCALE: 1" = 20'




WEST ENTRANCE
SCALE: 1" = 20'

**PROPOSED FEATURES LEGEND**

- CONCRETE ISLAND
- CONCRETE SIDEWALK
- PAVEMENT
- TACTILE WARNING
- STAMPED CONCRETE
- PAINTED STRIPE
- CONCRETE CURB
- CENTERLINE
- SIGN

**SITE LAYOUT KEYNOTES**

| CODE | DESCRIPTION | DET #/SHT # |
|---|---|---|
| S1a | ASPHALT PAVEMENT - ARTERIAL | 1/C8.0 |
| S1b | ASPHALT PAVEMENT - COMERCIAL | 1/C8.0 |
| S2 | CONCRETE ISLAND | 5/C8.0 |
| S3 | CONCRETE CURB & GUTTER | 7/C8.0 |
| S4 | CONCRETE SIDEWALK | 5/C8.0 |
| S5 | SIDEWALK JOINTS | 6/C8.0 |
| S6a | ACCESSIBLE RAMP | 9/C8.0 |
| S6b | ACCESSIBLE WINGED RAMP | 10/C8.0 |
| S7 | TACTILE WARNING SURFACE | 9-10/C8.0 |
| S8 | DIRECTIONAL ARROWS | 11/C8.0 |
| S9 | PEDESTRIAN CROSSWALK | 8/C8.0 |
| S10 | PAINTED STOP BAR (2' WIDTH) | 12/C8.0 |

NOTES:
1. PRIVATE ROAD WAY WILL BE A POSTED 25 MPH SPEED LIMIT.
2. LIGHTING, SIGNS, AND MARKINGS SHALL CONFORM TO CITY OF KNOXVILLE AND TDOT STANDARDS.
3. ALL PAVEMENT SECTIONS WITHIN TDOT ROW SHALL MATCH COK ARTERIAL PAVEMENT CROSS-SECTIONS OR EXISTING, WHICHEVER IS GREATER.
4. SIGNALIZED INTERSECTION DESIGN WILL BE SUBMITTED UNDER SEPARATE COVER PRIOR TO DEVELOPMENT INTERIOR LOTS WITHIN THE MEDICAL PARK.

GRAPHIC SCALE 1"=30' (IN FEET) 0 30 60 90

GRAPHIC SCALE 1"=20' (IN FEET) 0 20 40 60


6515 NIGHTINGALE LANE
KNOXVILLE, TN 37909
(865) 934-6023


COMMUNITY HEALTH SYSTEMS INC.
4000 MERIDIAN BLVD
FRANKLIN, TN 37067

NOT FOR CONSTRUCTION

BRAD R. SALSBURY
REGISTERED ENGINEER
9/5/19
STATE OF TENNESSEE

| NO | DATE | DESCRIPTION | |
|---|---|---|---|
| 1 | 9/13/2019 | ORIGINAL | BRS |

DJB BY | CLS CHK | BRS APV

INTERSECTION LAYOUT

CONSTRUCTION DOCUMENTS
TENNOVA MEDICAL PARK
KNOXVILLE, KNOX COUNTY, TENNESSEE

PROJECT NUMBER
5143-18-012

DRAWING NUMBER
C5.2

DRAWING PATH: T:\Projects\2018\P\SD\5143-18-012_Middlebrook_Pike_Medical_Park\CAD\Construction\5143-18-012_LAY.dwg

DESIGN
VEHICLE: WB-62

FULLY MOUNTABLE ISLAND

MIDDLEBROOK PIKE

140' ROW

155' ROW

DOWNTOWN

0 100 200
GRAPHIC SCALE (IN FEET)

# TURNING TEMPLATES

TENNOVA MEDICAL PARK
0 MIDDLEBROOK PIKE
KNOXVILLE, TENNESSEE 37909

| | |
|---|---|
| SCALE: | 1" = 100' |
| DATE: | 6/10/19 |
| PROJECT NUMBER | 5143-18-012 |
| FIGURE NO. | 2 |

Drawing path: t:\Projects\2018\P&D\5143-18-012_middlebrook_pike_medical_park\CAD\construction\5143-18-012_sd_EXHIBIT.dwg

DESIGN
VEHICLE: SU-40

DOWELL SPRINGS

155' ROW

OSign

OSign

SU-40 - Single Unit Truck

SU-40 - Single Unit Truck

SU-40 - Single Unit Truck

0 40 80

GRAPHIC SCALE (IN FEET)

# TURNING TEMPLATES - LEFT AT DOWELL SPRINGS

TENNOVA MEDICAL PARK
0 MIDDLEBROOK PIKE
KNOXVILLE, TENNESSEE 37909

| | |
|---|---|
| SCALE: | 1"=40' |
| DATE: | 6/10/19 |
| PROJECT NUMBER | 5143-18-012 |
| FIGURE NO. | 3 |

Drawing path: t:\Projects\2018\P&D\5143-18-012_middlebrook_pike_medical_park\CAD\construction\5143-18-012_sd_EXHIBIT.dwg

# Appendix III – Turning Movement Counts & Signal Timing Sheets

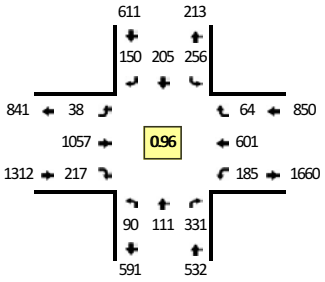
Type of peak hour being reported: Intersection Peak

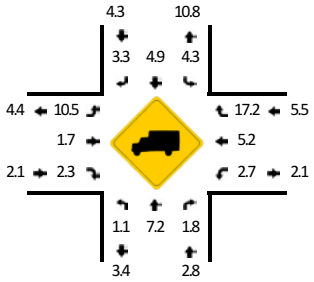
Method for determining peak hour: Total Entering Volume

**LOCATION:** Francis Rd/Vanosdale Rd -- Middlebrook Pike
**CITY/STATE:** Knox, TN

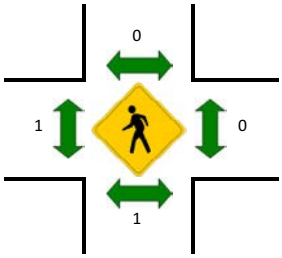
**QC JOB #:** 14939001
**DATE:** Tue, Apr 2 2019

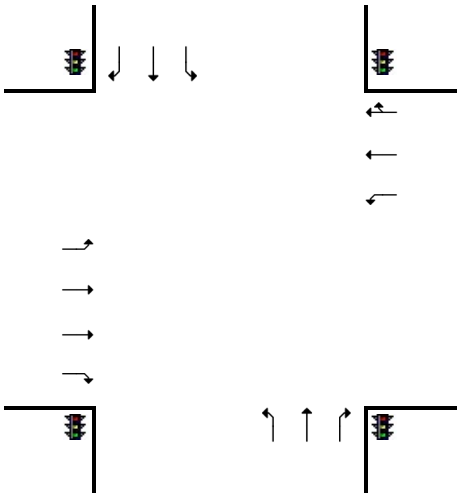
**Peak-Hour: 7:30 AM -- 8:30 AM**
**Peak 15-Min: 8:15 AM -- 8:30 AM**

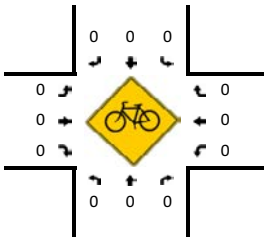


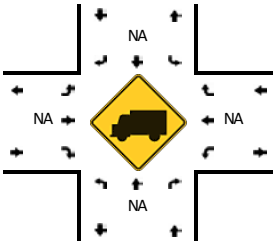



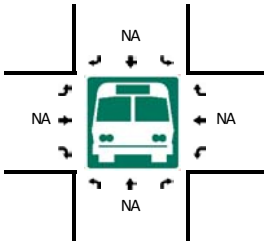

Quality Counts
DATA THAT DRIVES COMMUNITIES






| 15-Min Count Period Beginning At | Francis Rd/Vanosdale Rd (Northbound) | | | | Francis Rd/Vanosdale Rd (Southbound) | | | | Middlebrook Pike (Eastbound) | | | | Middlebrook Pike (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 7:00 AM | 9 | 14 | 35 | 0 | 21 | 41 | 18 | 0 | 4 | 123 | 56 | 0 | 26 | 70 | 7 | 0 | 424 | |
| 7:15 AM | 24 | 25 | 53 | 0 | 28 | 59 | 35 | 0 | 5 | 214 | 73 | 0 | 32 | 103 | 11 | 0 | 662 | |
| 7:30 AM | 39 | 33 | 78 | 0 | 61 | 31 | 39 | 0 | 7 | 253 | 60 | 0 | 33 | 147 | 15 | 4 | 800 | |
| 7:45 AM | 25 | 34 | 97 | 0 | 60 | 40 | 36 | 0 | 10 | 288 | 50 | 0 | 32 | 136 | 14 | 2 | 824 | 2710 |
| 8:00 AM | 14 | 17 | 85 | 0 | 70 | 66 | 40 | 0 | 11 | 256 | 52 | 0 | 56 | 135 | 16 | 2 | 820 | 3106 |
| 8:15 AM | 12 | 27 | 71 | 0 | 65 | 68 | 35 | 0 | 10 | 260 | 55 | 0 | 48 | 183 | 19 | 8 | 861 | 3305 |
| 8:30 AM | 20 | 20 | 36 | 0 | 40 | 42 | 27 | 0 | 12 | 158 | 42 | 0 | 38 | 160 | 18 | 0 | 613 | 3118 |
| 8:45 AM | 24 | 14 | 21 | 0 | 18 | 35 | 28 | 0 | 8 | 190 | 48 | 0 | 29 | 145 | 6 | 0 | 566 | 2860 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 48 | 108 | 284 | 0 | 260 | 272 | 140 | 0 | 40 | 1040 | 220 | 0 | 192 | 732 | 76 | 32 | 3444 |
| Heavy Trucks | 4 | 12 | 12 | | 8 | 28 | 4 | | 4 | 28 | 8 | | 4 | 32 | 8 | | 152 |
| Pedestrians | | 4 | | | | 0 | | | | 0 | | | | 0 | | | 4 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Railroad Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 4/4/2019 12:13 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

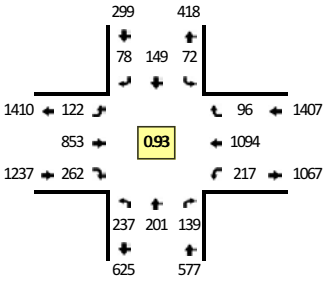
Type of peak hour being reported: Intersection Peak

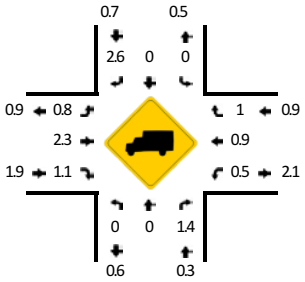
Method for determining peak hour: Total Entering Volume

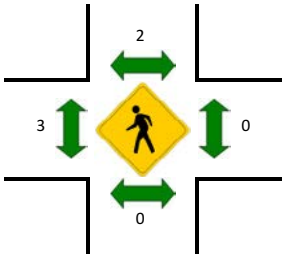
**LOCATION:** Francis Rd/Vanosdale Rd -- Middlebrook Pike
**CITY/STATE:** Knox, TN

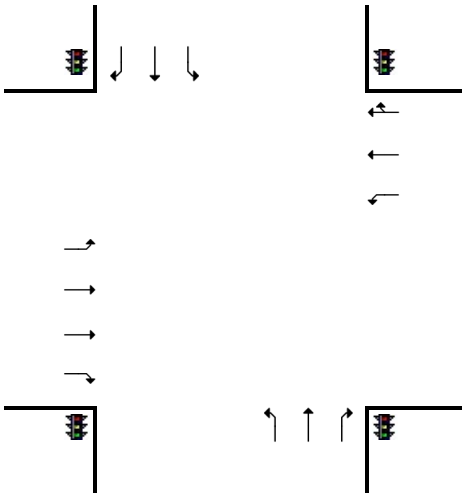
**QC JOB #:** 14939002
**DATE:** Tue, Apr 2 2019

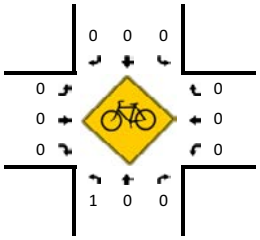
**Peak-Hour: 5:00 PM -- 6:00 PM**
**Peak 15-Min: 5:15 PM -- 5:30 PM**

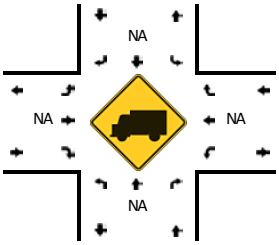


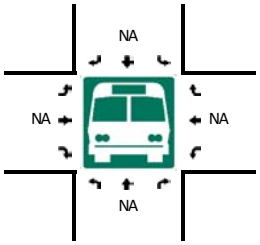






| 15-Min Count Period Beginning At | Francis Rd/Vanosdale Rd (Northbound) | | | | Francis Rd/Vanosdale Rd (Southbound) | | | | Middlebrook Pike (Eastbound) | | | | Middlebrook Pike (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 4:00 PM | 53 | 47 | 36 | 0 | 24 | 30 | 27 | 0 | 24 | 172 | 51 | 0 | 37 | 220 | 27 | 0 | 748 | |
| 4:15 PM | 45 | 43 | 33 | 0 | 16 | 34 | 15 | 0 | 29 | 154 | 38 | 0 | 33 | 189 | 17 | 0 | 646 | |
| 4:30 PM | 54 | 46 | 34 | 0 | 19 | 30 | 24 | 0 | 30 | 161 | 64 | 0 | 43 | 229 | 23 | 0 | 757 | |
| 4:45 PM | 62 | 35 | 32 | 0 | 17 | 34 | 9 | 0 | 28 | 179 | 65 | 0 | 37 | 213 | 13 | 0 | 724 | 2875 |
| 5:00 PM | 53 | 44 | 31 | 0 | 18 | 35 | 21 | 0 | 28 | 199 | 70 | 0 | 55 | 300 | 26 | 3 | 883 | 3010 |
| 5:15 PM | 61 | 59 | 31 | 0 | 19 | 35 | 22 | 0 | 32 | 235 | 76 | 0 | 60 | 298 | 21 | 0 | 949 | 3313 |
| 5:30 PM | 66 | 48 | 40 | 0 | 18 | 33 | 15 | 0 | 31 | 201 | 58 | 1 | 49 | 274 | 24 | 0 | 858 | 3414 |
| 5:45 PM | 57 | 50 | 37 | 0 | 17 | 46 | 20 | 0 | 30 | 218 | 58 | 0 | 50 | 222 | 25 | 0 | 830 | 3520 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 244 | 236 | 124 | 0 | 76 | 140 | 88 | 0 | 128 | 940 | 304 | 0 | 240 | 1192 | 84 | 0 | 3796 |
| Heavy Trucks | 0 | 0 | 4 | | 0 | 0 | 8 | | 0 | 12 | 4 | | 0 | 16 | 4 | | 48 |
| Pedestrians | | 0 | | | | 0 | | | | 0 | | | | 0 | | | 0 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Railroad Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 4/4/2019 12:13 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

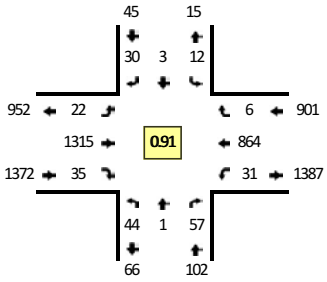
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

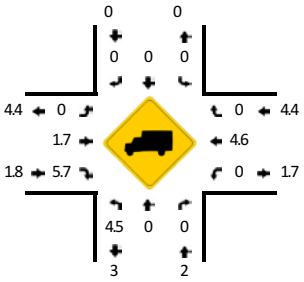
**LOCATION:** Whitehall Rd -- Middlebrook Pike
**CITY/STATE:** Knoxville, TN

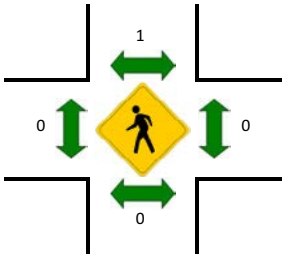
**QC JOB #:** 14915001
**DATE:** Tue, Mar 5 2019

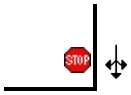
**Peak-Hour: 7:30 AM -- 8:30 AM**
**Peak 15-Min: 7:45 AM -- 8:00 AM**

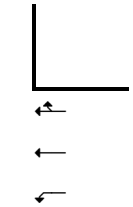


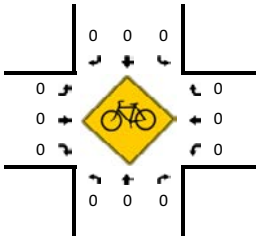

Quality Counts
DATA THAT DRIVES COMMUNITIES

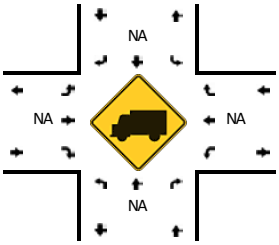


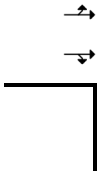



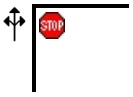



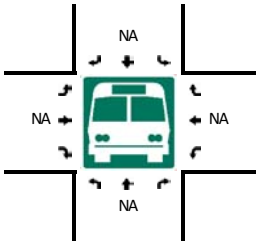








| 15-Min Count Period Beginning At | Whitehall Rd (Northbound) | | | | Whitehall Rd (Southbound) | | | | Middlebrook Pike (Eastbound) | | | | Middlebrook Pike (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 7:00 AM | 1 | 0 | 1 | 0 | 0 | 0 | 11 | 0 | 4 | 181 | 6 | 0 | 1 | 91 | 0 | 0 | 296 | |
| 7:15 AM | 6 | 0 | 9 | 0 | 2 | 0 | 10 | 0 | 4 | 262 | 4 | 1 | 10 | 146 | 2 | 2 | 458 | |
| 7:30 AM | 8 | 0 | 15 | 0 | 3 | 1 | 9 | 0 | 2 | 300 | 12 | 2 | 7 | 191 | 1 | 0 | 551 | |
| 7:45 AM | 15 | 0 | 16 | 0 | 3 | 0 | 8 | 0 | 3 | 371 | 8 | 5 | 8 | 226 | 1 | 1 | 665 | 1970 |
| 8:00 AM | 11 | 0 | 16 | 0 | 1 | 1 | 5 | 0 | 3 | 331 | 7 | 5 | 8 | 238 | 3 | 1 | 630 | 2304 |
| 8:15 AM | 10 | 1 | 10 | 0 | 5 | 1 | 8 | 0 | 0 | 313 | 8 | 2 | 5 | 209 | 1 | 1 | 574 | 2420 |
| 8:30 AM | 2 | 0 | 5 | 0 | 6 | 0 | 5 | 1 | 0 | 210 | 6 | 0 | 8 | 147 | 1 | 1 | 392 | 2261 |
| 8:45 AM | 2 | 0 | 5 | 0 | 2 | 1 | 5 | 0 | 0 | 187 | 6 | 1 | 6 | 160 | 1 | 0 | 376 | 1972 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 60 | 0 | 64 | 0 | 12 | 0 | 32 | 0 | 12 | 1484 | 32 | 20 | 32 | 904 | 4 | 4 | 2660 |
| Heavy Trucks | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 4 | 4 | | 0 | 76 | 0 | | 84 |
| Pedestrians | | 0 | | | | 0 | | | | 0 | | | | 0 | | | 0 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Railroad Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 5/21/2019 9:11 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

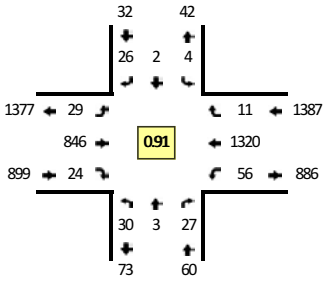
Type of peak hour being reported: Intersection Peak

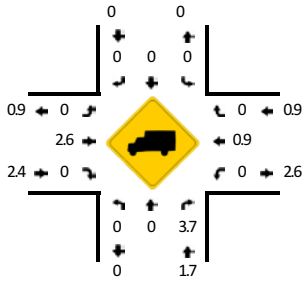
Method for determining peak hour: Total Entering Volume

**LOCATION:** Whitehall Rd -- Middlebrook Pike
**CITY/STATE:** Knoxville, TN

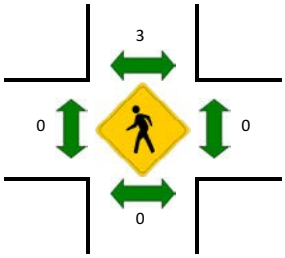
**QC JOB #:** 14915002
**DATE:** Tue, Mar 5 2019

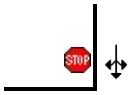
**Peak-Hour: 4:30 PM -- 5:30 PM**
**Peak 15-Min: 5:00 PM -- 5:15 PM**

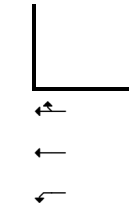


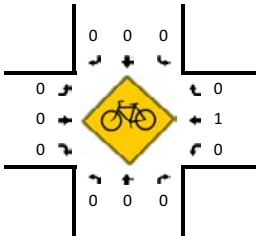



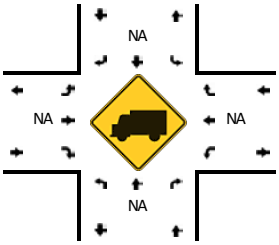

Quality Counts
DATA THAT DRIVES COMMUNITIES

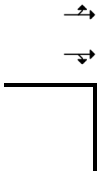


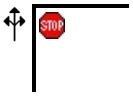



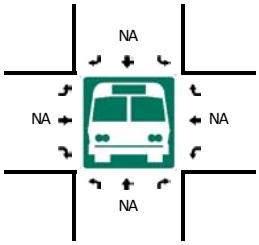








| 15-Min Count Period Beginning At | Whitehall Rd (Northbound) | | | | Whitehall Rd (Southbound) | | | | Middlebrook Pike (Eastbound) | | | | Middlebrook Pike (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 4:00 PM | 5 | 0 | 11 | 0 | 3 | 0 | 1 | 0 | 4 | 167 | 3 | 0 | 9 | 244 | 1 | 2 | 450 | |
| 4:15 PM | 4 | 0 | 9 | 0 | 2 | 0 | 7 | 0 | 8 | 200 | 5 | 0 | 9 | 252 | 0 | 1 | 497 | |
| 4:30 PM | 6 | 1 | 10 | 0 | 2 | 0 | 8 | 0 | 8 | 206 | 8 | 0 | 9 | 310 | 1 | 0 | 569 | |
| 4:45 PM | 7 | 1 | 2 | 0 | 0 | 0 | 8 | 0 | 7 | 202 | 4 | 0 | 10 | 294 | 5 | 1 | 541 | 2057 |
| 5:00 PM | 7 | 1 | 8 | 0 | 1 | 0 | 4 | 0 | 7 | 214 | 4 | 1 | 8 | 387 | 3 | 8 | 653 | 2260 |
| 5:15 PM | 10 | 0 | 7 | 0 | 1 | 2 | 6 | 0 | 6 | 224 | 8 | 0 | 20 | 329 | 2 | 0 | 615 | 2378 |
| 5:30 PM | 7 | 2 | 9 | 0 | 2 | 2 | 5 | 0 | 8 | 210 | 3 | 0 | 13 | 268 | 4 | 1 | 534 | 2343 |
| 5:45 PM | 6 | 1 | 6 | 0 | 1 | 0 | 2 | 0 | 2 | 233 | 5 | 0 | 6 | 238 | 3 | 1 | 504 | 2306 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 28 | 4 | 32 | 0 | 4 | 0 | 16 | 0 | 28 | 856 | 16 | 4 | 32 | 1548 | 12 | 32 | 2612 |
| Heavy Trucks | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 28 | 0 | | 0 | 12 | 0 | | 40 |
| Pedestrians | | 0 | | | | 4 | | | | 0 | | | | 0 | | | 4 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 5/21/2019 9:11 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

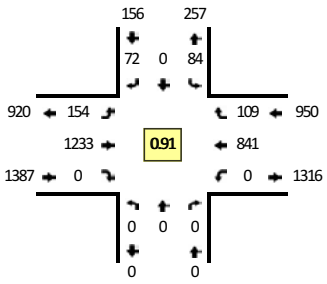
Type of peak hour being reported: Intersection Peak

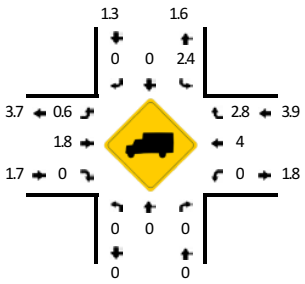
Method for determining peak hour: Total Entering Volume

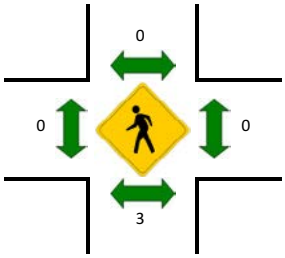
**LOCATION:** Lake Brook Blvd -- Middlebrook Pike
**CITY/STATE:** Knoxville, TN

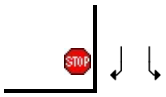
**QC JOB #:** 14915003
**DATE:** Tue, Mar 5 2019

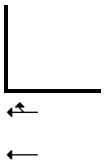
**Peak-Hour: 7:30 AM -- 8:30 AM**
**Peak 15-Min: 7:45 AM -- 8:00 AM**

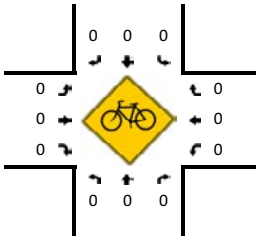


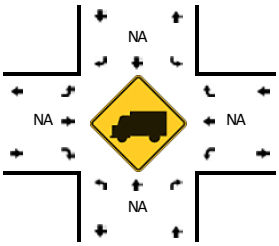



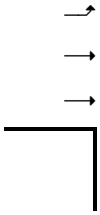



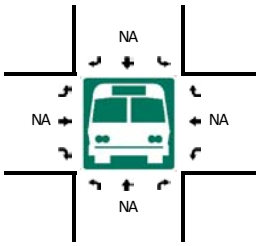






| 15-Min Count Period Beginning At | Lake Brook Blvd (Northbound) | | | | Lake Brook Blvd (Southbound) | | | | Middlebrook Pike (Eastbound) | | | | Middlebrook Pike (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 7:00 AM | 0 | 0 | 0 | 0 | 13 | 0 | 13 | 0 | 15 | 157 | 0 | 0 | 0 | 84 | 8 | 0 | 290 | |
| 7:15 AM | 0 | 0 | 0 | 0 | 27 | 0 | 17 | 0 | 16 | 236 | 0 | 3 | 0 | 130 | 12 | 0 | 441 | |
| 7:30 AM | 0 | 0 | 0 | 0 | 21 | 0 | 17 | 1 | 36 | 279 | 0 | 0 | 0 | 185 | 30 | 0 | 569 | |
| 7:45 AM | 0 | 0 | 0 | 0 | 20 | 0 | 18 | 0 | 54 | 337 | 0 | 3 | 0 | 228 | 24 | 0 | 684 | 1984 |
| 8:00 AM | 0 | 0 | 0 | 0 | 25 | 0 | 20 | 0 | 32 | 316 | 0 | 1 | 0 | 235 | 30 | 0 | 659 | 2353 |
| 8:15 AM | 0 | 0 | 0 | 0 | 17 | 0 | 17 | 0 | 25 | 301 | 0 | 3 | 0 | 193 | 25 | 0 | 581 | 2493 |
| 8:30 AM | 0 | 0 | 0 | 0 | 20 | 0 | 8 | 0 | 23 | 210 | 0 | 1 | 0 | 140 | 22 | 0 | 424 | 2348 |
| 8:45 AM | 0 | 0 | 0 | 0 | 12 | 0 | 10 | 0 | 12 | 178 | 0 | 0 | 0 | 156 | 12 | 0 | 380 | 2044 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 0 | 0 | 0 | 0 | 80 | 0 | 72 | 0 | 216 | 1348 | 0 | 12 | 0 | 912 | 96 | 0 | 2736 |
| Heavy Trucks | 0 | 0 | 0 | | 8 | 0 | 0 | | 4 | 0 | 0 | | 0 | 52 | 8 | | 72 |
| Pedestrians | | 0 | | | | 0 | | | | 0 | | | | 0 | | | 0 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Railroad Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 5/21/2019 9:11 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

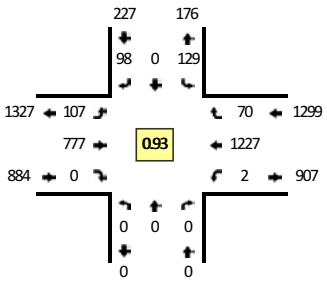
Type of peak hour being reported: Intersection Peak

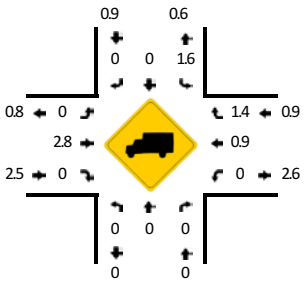
Method for determining peak hour: Total Entering Volume

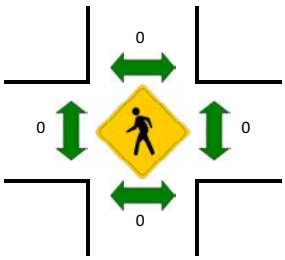
**LOCATION:** Lake Brook Blvd -- Middlebrook Pike
**CITY/STATE:** Knoxville, TN

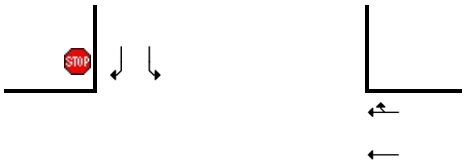
**QC JOB #:** 14915004
**DATE:** Tue, Mar 5 2019

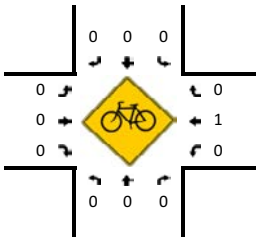
**Peak-Hour: 4:30 PM -- 5:30 PM**
**Peak 15-Min: 5:00 PM -- 5:15 PM**

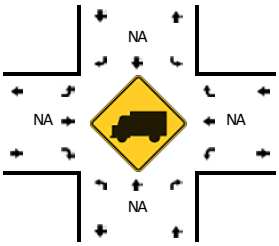


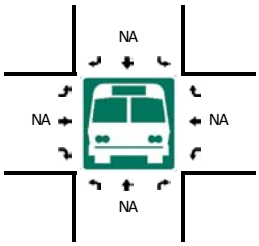








| 15-Min Count Period Beginning At | Lake Brook Blvd (Northbound) | | | | Lake Brook Blvd (Southbound) | | | | Middlebrook Pike (Eastbound) | | | | Middlebrook Pike (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 4:00 PM | 0 | 0 | 0 | 0 | 26 | 0 | 19 | 1 | 25 | 175 | 0 | 0 | 0 | 220 | 11 | 0 | 477 | |
| 4:15 PM | 0 | 0 | 0 | 0 | 26 | 0 | 19 | 0 | 25 | 167 | 0 | 1 | 0 | 241 | 12 | 0 | 491 | |
| 4:30 PM | 0 | 0 | 0 | 0 | 22 | 0 | 34 | 0 | 24 | 200 | 0 | 0 | 0 | 300 | 16 | 2 | 598 | |
| 4:45 PM | 0 | 0 | 0 | 0 | 23 | 0 | 19 | 0 | 22 | 180 | 0 | 0 | 0 | 272 | 24 | 0 | 540 | 2106 |
| 5:00 PM | 0 | 0 | 0 | 0 | 49 | 0 | 23 | 1 | 29 | 198 | 0 | 0 | 0 | 335 | 13 | 0 | 648 | 2277 |
| 5:15 PM | 0 | 0 | 0 | 0 | 34 | 0 | 22 | 0 | 30 | 199 | 0 | 2 | 0 | 320 | 17 | 0 | 624 | 2410 |
| 5:30 PM | 0 | 0 | 0 | 0 | 18 | 0 | 13 | 0 | 18 | 202 | 0 | 0 | 0 | 277 | 24 | 0 | 552 | 2364 |
| 5:45 PM | 0 | 0 | 0 | 0 | 11 | 0 | 17 | 0 | 40 | 209 | 0 | 0 | 0 | 230 | 20 | 0 | 527 | 2351 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 0 | 0 | 0 | 0 | 196 | 0 | 92 | 4 | 116 | 792 | 0 | 0 | 0 | 1340 | 52 | 0 | 2592 |
| Heavy Trucks | 0 | 0 | 0 | | 4 | 0 | 0 | | 0 | 28 | 0 | | 0 | 12 | 0 | | 44 |
| Pedestrians | | 0 | | | | 0 | | | | 0 | | | | 0 | | | 0 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Railroad Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 5/21/2019 9:11 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

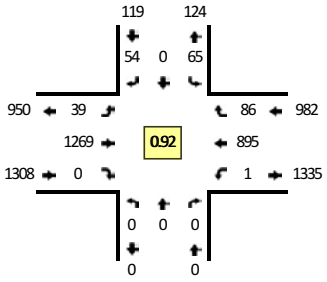
Type of peak hour being reported: Intersection Peak

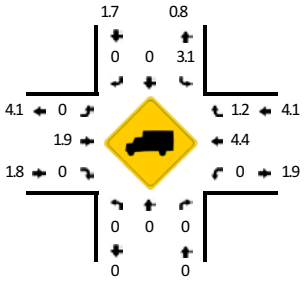
Method for determining peak hour: Total Entering Volume

**LOCATION:** Dick Lonas Rd NW -- Middlebrook Pike
**CITY/STATE:** Knoxville, TN

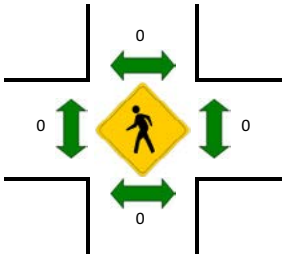
**QC JOB #:** 14915005
**DATE:** Tue, Mar 5 2019

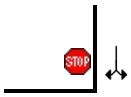
**Peak-Hour: 7:30 AM -- 8:30 AM**
**Peak 15-Min: 7:45 AM -- 8:00 AM**

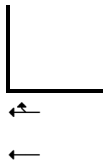


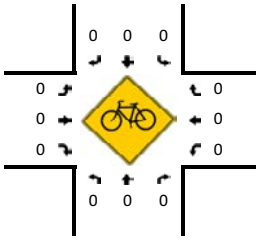



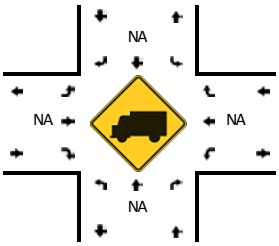

Quality Counts
DATA THAT DRIVES COMMUNITIES

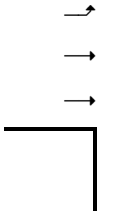


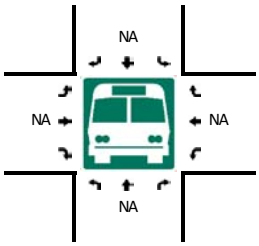








| 15-Min Count Period Beginning At | Dick Lonas Rd NW (Northbound) | | | | Dick Lonas Rd NW (Southbound) | | | | Middlebrook Pike (Eastbound) | | | | Middlebrook Pike (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 7:00 AM | 0 | 0 | 0 | 0 | 14 | 0 | 7 | 0 | 6 | 173 | 0 | 0 | 0 | 89 | 14 | 0 | 303 | |
| 7:15 AM | 0 | 0 | 0 | 0 | 12 | 0 | 7 | 0 | 8 | 272 | 0 | 1 | 0 | 148 | 16 | 1 | 465 | |
| 7:30 AM | 0 | 0 | 0 | 0 | 15 | 0 | 12 | 0 | 10 | 299 | 0 | 0 | 0 | 205 | 18 | 0 | 559 | |
| 7:45 AM | 0 | 0 | 0 | 0 | 14 | 0 | 17 | 0 | 12 | 339 | 0 | 1 | 0 | 243 | 28 | 0 | 654 | 1981 |
| 8:00 AM | 0 | 0 | 0 | 0 | 21 | 0 | 13 | 0 | 11 | 325 | 0 | 0 | 0 | 247 | 20 | 0 | 637 | 2315 |
| 8:15 AM | 0 | 0 | 0 | 0 | 15 | 0 | 12 | 0 | 5 | 306 | 0 | 0 | 0 | 200 | 20 | 1 | 559 | 2409 |
| 8:30 AM | 0 | 0 | 0 | 0 | 13 | 0 | 9 | 0 | 5 | 203 | 0 | 0 | 0 | 149 | 6 | 0 | 385 | 2235 |
| 8:45 AM | 0 | 0 | 0 | 0 | 9 | 0 | 7 | 0 | 5 | 187 | 0 | 1 | 0 | 164 | 5 | 0 | 378 | 1959 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 0 | 0 | 0 | 0 | 56 | 0 | 68 | 0 | 48 | 1356 | 0 | 4 | 0 | 972 | 112 | 0 | 2616 |
| Heavy Trucks | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 8 | 0 | | 0 | 64 | 0 | | 72 |
| Pedestrians | | 0 | | | | 0 | | | | 0 | | | | 0 | | | 0 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 5/21/2019 9:11 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

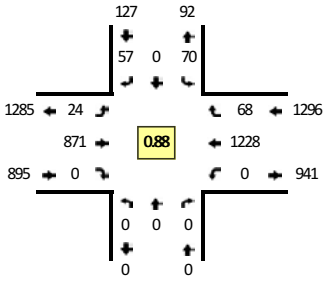
Type of peak hour being reported: Intersection Peak

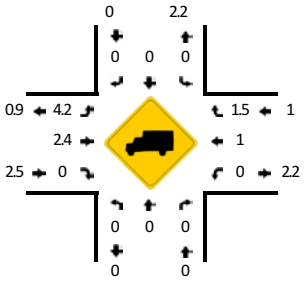
Method for determining peak hour: Total Entering Volume

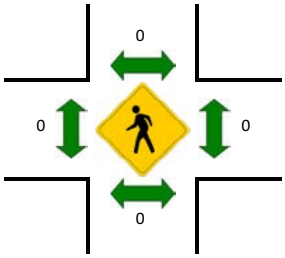
**LOCATION:** Dick Lonas Rd NW -- Middlebrook Pike
**CITY/STATE:** Knoxville, TN

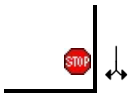
**QC JOB #:** 14915006
**DATE:** Tue, Mar 5 2019

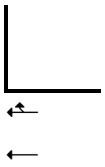
**Peak-Hour: 4:30 PM -- 5:30 PM**
**Peak 15-Min: 5:00 PM -- 5:15 PM**

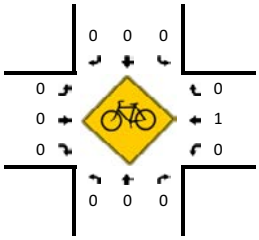


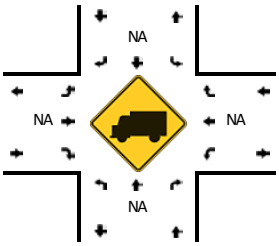



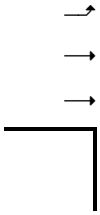



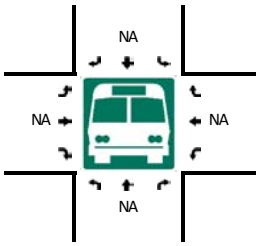






| 15-Min Count Period Beginning At | Dick Lonas Rd NW (Northbound) | | | | Dick Lonas Rd NW (Southbound) | | | | Middlebrook Pike (Eastbound) | | | | Middlebrook Pike (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 4:00 PM | 0 | 0 | 0 | 0 | 17 | 0 | 14 | 0 | 6 | 186 | 0 | 0 | 0 | 216 | 9 | 1 | 449 | |
| 4:15 PM | 0 | 0 | 0 | 0 | 10 | 0 | 3 | 0 | 6 | 208 | 0 | 0 | 0 | 259 | 8 | 0 | 494 | |
| 4:30 PM | 0 | 0 | 0 | 0 | 32 | 0 | 21 | 0 | 10 | 204 | 0 | 0 | 0 | 283 | 7 | 0 | 557 | |
| 4:45 PM | 0 | 0 | 0 | 0 | 16 | 0 | 10 | 0 | 5 | 197 | 0 | 0 | 0 | 273 | 13 | 0 | 514 | 2014 |
| 5:00 PM | 0 | 0 | 0 | 0 | 12 | 0 | 14 | 0 | 4 | 249 | 0 | 0 | 0 | 351 | 27 | 0 | 657 | 2222 |
| 5:15 PM | 0 | 0 | 0 | 0 | 10 | 0 | 12 | 0 | 5 | 221 | 0 | 0 | 0 | 321 | 21 | 0 | 590 | 2318 |
| 5:30 PM | 0 | 0 | 0 | 0 | 11 | 0 | 7 | 0 | 11 | 212 | 0 | 0 | 0 | 280 | 13 | 0 | 534 | 2295 |
| 5:45 PM | 0 | 0 | 0 | 0 | 7 | 0 | 8 | 0 | 13 | 203 | 0 | 0 | 0 | 225 | 3 | 0 | 459 | 2240 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 0 | 0 | 0 | 0 | 48 | 0 | 56 | 0 | 16 | 996 | 0 | 0 | 0 | 1404 | 108 | 0 | 2628 |
| Heavy Trucks | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 32 | 0 | | 0 | 4 | 0 | | 36 |
| Pedestrians | | 0 | | | | 0 | | | | 0 | | | | 0 | | | 0 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 1 | 0 | | 1 |
| Railroad Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 5/21/2019 9:11 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

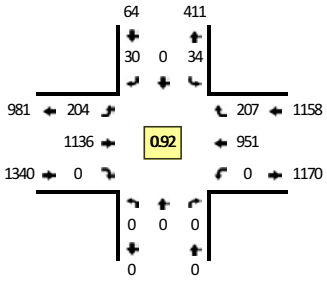
Type of peak hour being reported: Intersection Peak

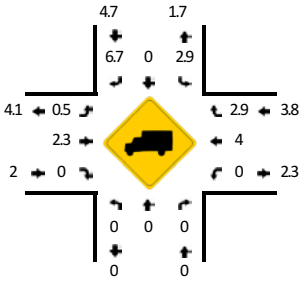
Method for determining peak hour: Total Entering Volume

**LOCATION:** Dowell Springs Blvd -- Middlebrook Pike
**CITY/STATE:** Knoxville, TN

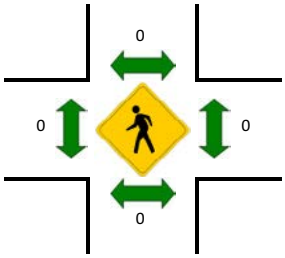
**QC JOB #:** 14915007
**DATE:** Tue, Mar 5 2019

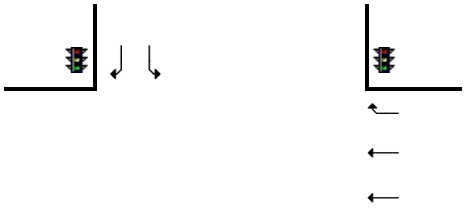
**Peak-Hour: 7:30 AM -- 8:30 AM**
**Peak 15-Min: 8:00 AM -- 8:15 AM**

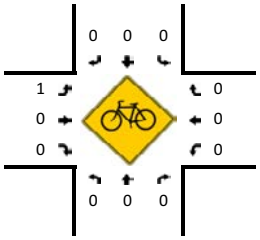


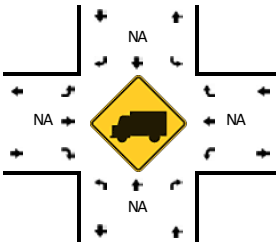



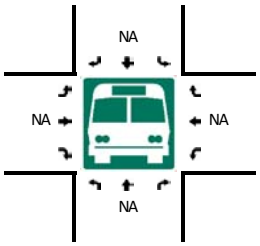

Quality Counts
DATA THAT DRIVES COMMUNITIES






| 15-Min Count Period Beginning At | Dowell Springs Blvd (Northbound) | | | | Dowell Springs Blvd (Southbound) | | | | Middlebrook Pike (Eastbound) | | | | Middlebrook Pike (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 7:00 AM | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 0 | 35 | 139 | 0 | 0 | 0 | 90 | 33 | 0 | 302 | |
| 7:15 AM | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 0 | 39 | 237 | 0 | 1 | 0 | 158 | 38 | 0 | 478 | |
| 7:30 AM | 0 | 0 | 0 | 0 | 3 | 0 | 4 | 0 | 39 | 267 | 0 | 0 | 0 | 210 | 46 | 0 | 569 | |
| 7:45 AM | 0 | 0 | 0 | 0 | 9 | 0 | 8 | 0 | 61 | 299 | 0 | 0 | 0 | 255 | 48 | 0 | 680 | 2029 |
| 8:00 AM | 0 | 0 | 0 | 0 | 9 | 0 | 10 | 0 | 53 | 295 | 0 | 0 | 0 | 268 | 58 | 0 | 693 | 2420 |
| 8:15 AM | 0 | 0 | 0 | 0 | 13 | 0 | 8 | 0 | 51 | 275 | 0 | 0 | 0 | 218 | 55 | 0 | 620 | 2562 |
| 8:30 AM | 0 | 0 | 0 | 0 | 15 | 0 | 11 | 0 | 38 | 199 | 0 | 0 | 0 | 157 | 46 | 1 | 467 | 2460 |
| 8:45 AM | 0 | 0 | 0 | 0 | 13 | 0 | 12 | 0 | 34 | 166 | 0 | 0 | 0 | 151 | 50 | 0 | 426 | 2206 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 0 | 0 | 0 | 0 | 36 | 0 | 40 | 0 | 212 | 1180 | 0 | 0 | 0 | 1072 | 232 | 0 | 2772 |
| Heavy Trucks | 0 | 0 | 0 | | 0 | 0 | 4 | | 4 | 20 | 0 | | 0 | 36 | 0 | | 64 |
| Pedestrians | | 0 | | | | 0 | | | | 0 | | | | 0 | | | 0 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Railroad Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 5/21/2019 9:11 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

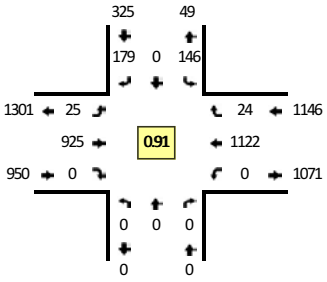
Type of peak hour being reported: Intersection Peak

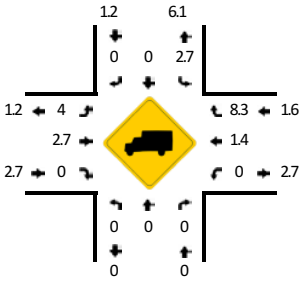
Method for determining peak hour: Total Entering Volume

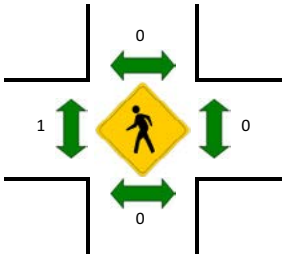
**LOCATION:** Dowell Springs Blvd -- Middlebrook Pike
**CITY/STATE:** Knoxville, TN

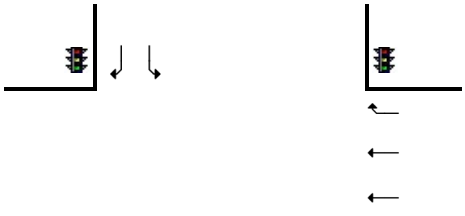
**QC JOB #:** 14915008
**DATE:** Tue, Mar 5 2019

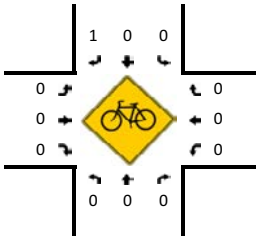
**Peak-Hour: 4:30 PM -- 5:30 PM**
**Peak 15-Min: 5:00 PM -- 5:15 PM**

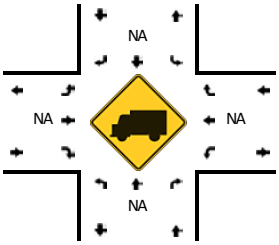


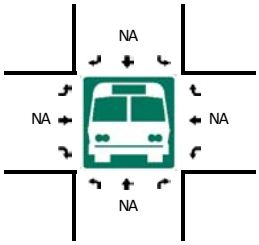






| 15-Min Count Period Beginning At | Dowell Springs Blvd (Northbound) | | | | Dowell Springs Blvd (Southbound) | | | | Middlebrook Pike (Eastbound) | | | | Middlebrook Pike (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 4:00 PM | 0 | 0 | 0 | 0 | 42 | 0 | 41 | 0 | 9 | 207 | 0 | 0 | 0 | 195 | 12 | 0 | 506 | |
| 4:15 PM | 0 | 0 | 0 | 0 | 31 | 0 | 29 | 0 | 5 | 191 | 0 | 0 | 0 | 224 | 12 | 1 | 493 | |
| 4:30 PM | 0 | 0 | 0 | 0 | 44 | 0 | 47 | 0 | 9 | 229 | 0 | 0 | 0 | 248 | 10 | 0 | 587 | |
| 4:45 PM | 0 | 0 | 0 | 0 | 31 | 0 | 34 | 0 | 2 | 223 | 0 | 0 | 0 | 252 | 6 | 0 | 548 | 2134 |
| 5:00 PM | 0 | 0 | 0 | 0 | 46 | 0 | 59 | 0 | 7 | 241 | 0 | 0 | 0 | 306 | 4 | 0 | 663 | 2291 |
| 5:15 PM | 0 | 0 | 0 | 0 | 25 | 0 | 39 | 0 | 7 | 232 | 0 | 0 | 0 | 316 | 4 | 0 | 623 | 2421 |
| 5:30 PM | 0 | 0 | 0 | 0 | 11 | 0 | 18 | 0 | 5 | 222 | 0 | 0 | 0 | 279 | 1 | 0 | 536 | 2370 |
| 5:45 PM | 0 | 0 | 0 | 0 | 17 | 0 | 16 | 0 | 7 | 196 | 0 | 0 | 0 | 223 | 4 | 0 | 463 | 2285 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 0 | 0 | 0 | 0 | 184 | 0 | 236 | 0 | 28 | 964 | 0 | 0 | 0 | 1224 | 16 | 0 | 2652 |
| Heavy Trucks | 0 | 0 | 0 | | 12 | 0 | 0 | | 4 | 36 | 0 | | 0 | 16 | 8 | | 76 |
| Pedestrians | | 0 | | | | 0 | | | | 4 | | | | 0 | | | 4 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 1 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 1 |
| Railroad Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 5/21/2019 9:11 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

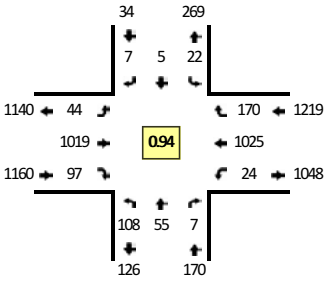
Type of peak hour being reported: Intersection Peak

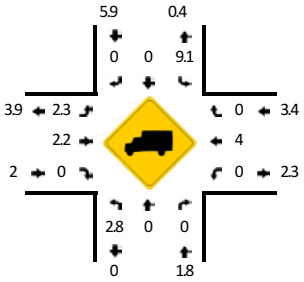
Method for determining peak hour: Total Entering Volume

**LOCATION:** Old Weisgarber Rd -- Middlebrook Pike
**CITY/STATE:** Knoxville, TN

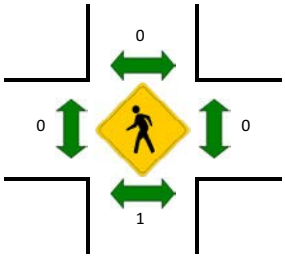
**QC JOB #:** 14915009
**DATE:** Tue, Mar 5 2019

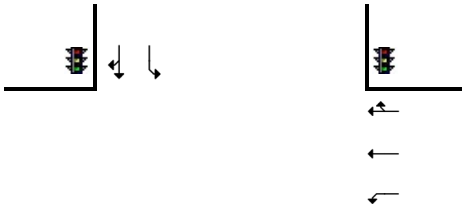
**Peak-Hour: 7:30 AM -- 8:30 AM**
**Peak 15-Min: 8:00 AM -- 8:15 AM**

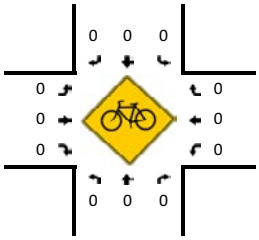


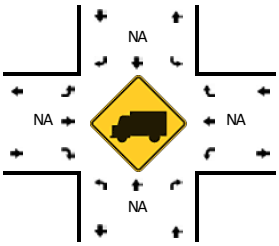



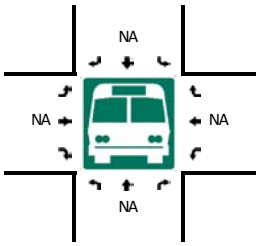

Quality Counts
DATA THAT DRIVES COMMUNITIES






| 15-Min Count Period Beginning At | Old Weisgarber Rd (Northbound) | | | | Old Weisgarber Rd (Southbound) | | | | Middlebrook Pike (Eastbound) | | | | Middlebrook Pike (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 7:00 AM | 8 | 2 | 0 | 0 | 2 | 0 | 1 | 0 | 4 | 126 | 9 | 0 | 1 | 124 | 31 | 0 | 308 | |
| 7:15 AM | 11 | 12 | 3 | 0 | 3 | 0 | 1 | 0 | 9 | 206 | 10 | 0 | 4 | 180 | 42 | 0 | 481 | |
| 7:30 AM | 28 | 10 | 1 | 0 | 5 | 1 | 0 | 0 | 7 | 246 | 15 | 0 | 7 | 227 | 41 | 0 | 588 | |
| 7:45 AM | 27 | 16 | 3 | 0 | 4 | 1 | 1 | 0 | 15 | 267 | 28 | 0 | 5 | 273 | 45 | 0 | 685 | 2062 |
| 8:00 AM | 36 | 15 | 1 | 0 | 5 | 2 | 1 | 0 | 11 | 260 | 27 | 0 | 4 | 275 | 49 | 0 | 686 | 2440 |
| 8:15 AM | 17 | 14 | 2 | 0 | 8 | 1 | 5 | 0 | 11 | 246 | 27 | 0 | 8 | 250 | 35 | 0 | 624 | 2583 |
| 8:30 AM | 14 | 10 | 0 | 0 | 11 | 7 | 5 | 0 | 7 | 206 | 22 | 0 | 4 | 196 | 33 | 0 | 515 | 2510 |
| 8:45 AM | 10 | 8 | 1 | 0 | 10 | 3 | 3 | 0 | 7 | 157 | 13 | 0 | 2 | 184 | 32 | 0 | 430 | 2255 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 144 | 60 | 4 | 0 | 20 | 8 | 4 | 0 | 44 | 1040 | 108 | 0 | 16 | 1100 | 196 | 0 | 2744 |
| Heavy Trucks | 4 | 0 | 0 | | 8 | 0 | 0 | | 4 | 20 | 0 | | 0 | 24 | 0 | | 60 |
| Pedestrians | | 4 | | | | 0 | | | | 0 | | | | 0 | | | 4 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 5/21/2019 9:11 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

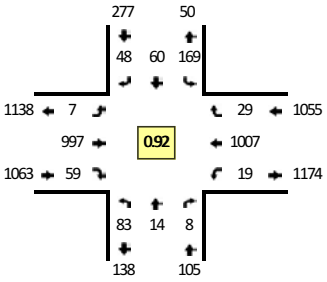
Type of peak hour being reported: Intersection Peak

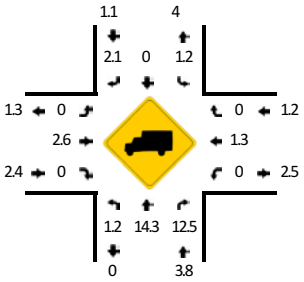
Method for determining peak hour: Total Entering Volume

**LOCATION:** Old Weisgarber Rd -- Middlebrook Pike
**CITY/STATE:** Knoxville, TN

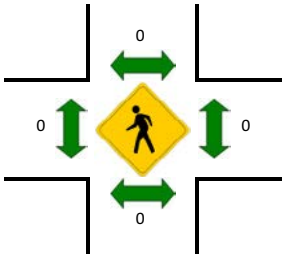
**QC JOB #:** 14915010
**DATE:** Tue, Mar 5 2019

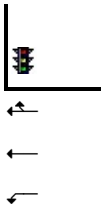
**Peak-Hour: 4:30 PM -- 5:30 PM**
**Peak 15-Min: 5:00 PM -- 5:15 PM**

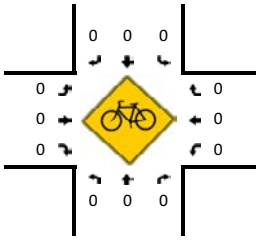


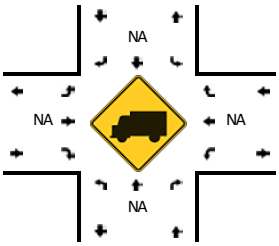



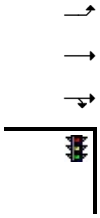

Quality Counts
DATA THAT DRIVES COMMUNITIES

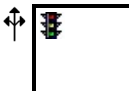


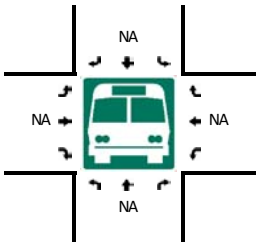










| 15-Min Count Period Beginning At | Old Weisgarber Rd (Northbound) | | | | Old Weisgarber Rd (Southbound) | | | | Middlebrook Pike (Eastbound) | | | | Middlebrook Pike (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 4:00 PM | 14 | 3 | 1 | 0 | 28 | 12 | 5 | 0 | 3 | 228 | 24 | 0 | 1 | 181 | 10 | 0 | 510 | |
| 4:15 PM | 12 | 2 | 2 | 0 | 34 | 5 | 5 | 0 | 4 | 213 | 18 | 0 | 2 | 222 | 8 | 1 | 528 | |
| 4:30 PM | 17 | 5 | 2 | 0 | 41 | 16 | 12 | 0 | 1 | 244 | 19 | 0 | 6 | 233 | 10 | 0 | 606 | |
| 4:45 PM | 17 | 5 | 2 | 0 | 37 | 15 | 8 | 0 | 3 | 232 | 14 | 0 | 4 | 233 | 7 | 0 | 577 | 2221 |
| 5:00 PM | 27 | 2 | 3 | 0 | 50 | 18 | 17 | 0 | 3 | 276 | 13 | 0 | 2 | 262 | 7 | 0 | 680 | 2391 |
| 5:15 PM | 22 | 2 | 1 | 0 | 41 | 11 | 11 | 0 | 0 | 245 | 13 | 0 | 7 | 279 | 5 | 0 | 637 | 2500 |
| 5:30 PM | 14 | 1 | 2 | 0 | 25 | 8 | 5 | 0 | 2 | 229 | 15 | 0 | 1 | 271 | 7 | 1 | 581 | 2475 |
| 5:45 PM | 17 | 0 | 0 | 0 | 12 | 5 | 9 | 0 | 1 | 200 | 8 | 0 | 2 | 202 | 4 | 0 | 460 | 2358 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 108 | 8 | 12 | 0 | 200 | 72 | 68 | 0 | 12 | 1104 | 52 | 0 | 8 | 1048 | 28 | 0 | 2720 |
| Heavy Trucks | 0 | 4 | 0 | | 8 | 0 | 4 | | 0 | 36 | 0 | | 0 | 20 | 0 | | 72 |
| Pedestrians | | 0 | | | | 0 | | | | 0 | | | | 0 | | | 0 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 5/21/2019 9:11 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

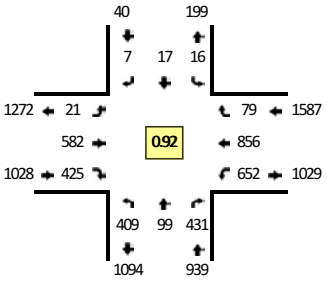
Type of peak hour being reported: Intersection Peak

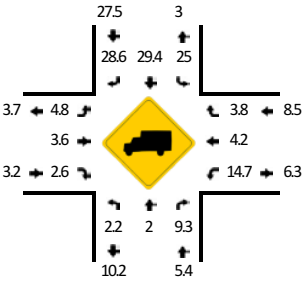
Method for determining peak hour: Total Entering Volume

**LOCATION:** E Weisgarber Rd -- Middlebrook Pike
**CITY/STATE:** Knoxville, TN

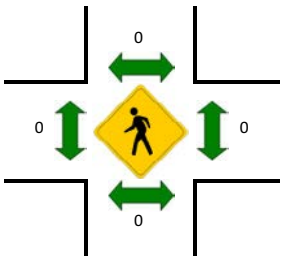
**QC JOB #:** 14915015
**DATE:** Tue, Mar 5 2019

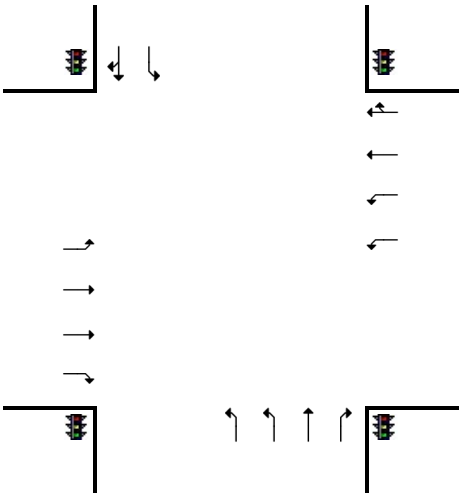
**Peak-Hour: 7:30 AM -- 8:30 AM**
**Peak 15-Min: 7:45 AM -- 8:00 AM**

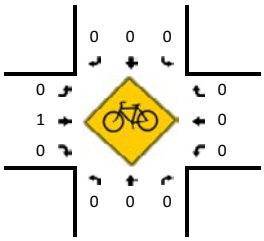


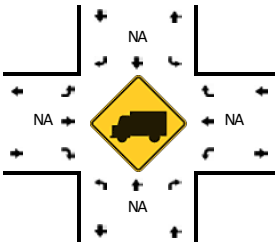



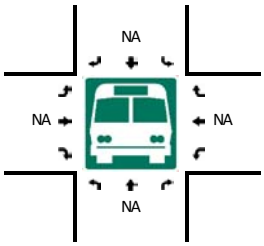

Quality Counts
DATA THAT DRIVES COMMUNITIES






| 15-Min Count Period Beginning At | E Weisgarber Rd (Northbound) | | | | E Weisgarber Rd (Southbound) | | | | Middlebrook Pike (Eastbound) | | | | Middlebrook Pike (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 7:00 AM | 47 | 11 | 78 | 0 | 0 | 2 | 2 | 0 | 6 | 89 | 35 | 0 | 106 | 89 | 11 | 0 | 476 | |
| 7:15 AM | 87 | 29 | 96 | 0 | 4 | 3 | 1 | 0 | 3 | 122 | 90 | 0 | 104 | 148 | 17 | 0 | 704 | |
| 7:30 AM | 93 | 28 | 114 | 0 | 4 | 2 | 0 | 0 | 1 | 132 | 98 | 0 | 149 | 203 | 15 | 0 | 839 | |
| 7:45 AM | 113 | 29 | 121 | 0 | 2 | 2 | 1 | 0 | 8 | 151 | 111 | 0 | 168 | 241 | 26 | 0 | 973 | 2992 |
| 8:00 AM | 111 | 29 | 106 | 0 | 6 | 8 | 5 | 0 | 9 | 149 | 114 | 0 | 163 | 218 | 25 | 0 | 943 | 3459 |
| 8:15 AM | 92 | 13 | 90 | 0 | 4 | 5 | 1 | 0 | 3 | 150 | 102 | 0 | 172 | 194 | 13 | 0 | 839 | 3594 |
| 8:30 AM | 62 | 19 | 92 | 0 | 2 | 3 | 2 | 0 | 6 | 128 | 87 | 0 | 131 | 153 | 11 | 1 | 697 | 3452 |
| 8:45 AM | 78 | 8 | 77 | 0 | 3 | 6 | 3 | 0 | 2 | 99 | 63 | 0 | 152 | 147 | 5 | 0 | 643 | 3122 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 452 | 116 | 484 | 0 | 8 | 8 | 4 | 0 | 32 | 604 | 444 | 0 | 672 | 964 | 104 | 0 | 3892 |
| Heavy Trucks | 20 | 4 | 16 | | 0 | 4 | 4 | | 0 | 8 | 12 | | 104 | 52 | 0 | | 224 |
| Pedestrians | | 0 | | | | 0 | | | | 0 | | | | 0 | | | 0 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Railroad Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 5/21/2019 9:11 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

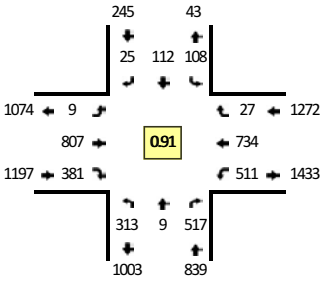
Type of peak hour being reported: Intersection Peak

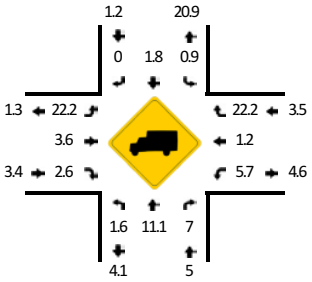
Method for determining peak hour: Total Entering Volume

**LOCATION:** E Weisgarber Rd -- Middlebrook Pike
**CITY/STATE:** Knoxville, TN

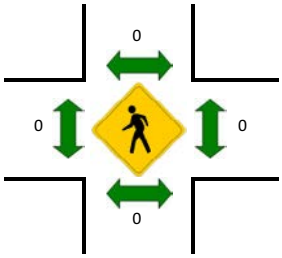
**QC JOB #:** 14915016
**DATE:** Tue, Mar 5 2019

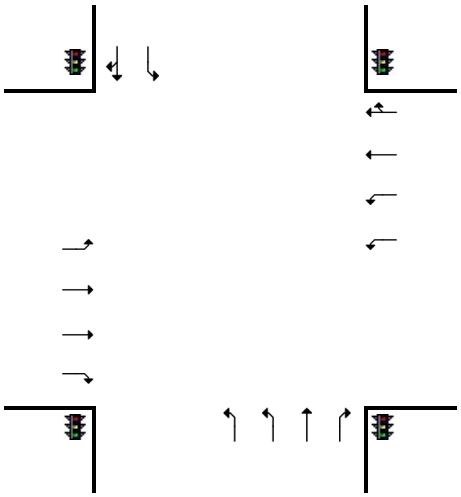
**Peak-Hour: 4:30 PM -- 5:30 PM**
**Peak 15-Min: 5:00 PM -- 5:15 PM**

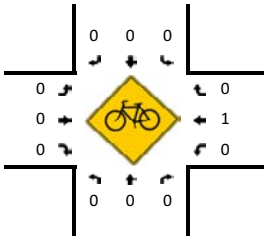


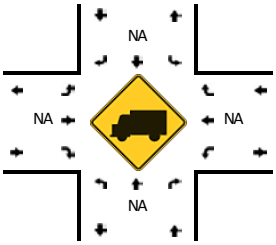



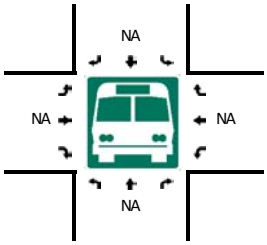

Quality Counts
DATA THAT DRIVES COMMUNITIES






| 15-Min Count Period Beginning At | E Weisgarber Rd (Northbound) | | | | E Weisgarber Rd (Southbound) | | | | Middlebrook Pike (Eastbound) | | | | Middlebrook Pike (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 4:00 PM | 53 | 9 | 97 | 0 | 16 | 13 | 8 | 0 | 1 | 169 | 95 | 0 | 112 | 135 | 4 | 0 | 712 | |
| 4:15 PM | 62 | 10 | 106 | 0 | 16 | 15 | 8 | 0 | 4 | 181 | 88 | 0 | 117 | 158 | 7 | 0 | 772 | |
| 4:30 PM | 81 | 2 | 107 | 0 | 39 | 42 | 9 | 0 | 2 | 203 | 105 | 0 | 101 | 176 | 8 | 0 | 875 | |
| 4:45 PM | 54 | 2 | 118 | 0 | 34 | 24 | 2 | 0 | 1 | 190 | 79 | 1 | 121 | 175 | 5 | 1 | 807 | 3166 |
| 5:00 PM | 84 | 1 | 163 | 0 | 26 | 29 | 11 | 0 | 2 | 209 | 97 | 1 | 160 | 184 | 4 | 0 | 971 | 3425 |
| 5:15 PM | 94 | 4 | 129 | 0 | 9 | 17 | 3 | 0 | 2 | 205 | 100 | 0 | 128 | 199 | 10 | 0 | 900 | 3553 |
| 5:30 PM | 70 | 7 | 113 | 0 | 12 | 24 | 2 | 0 | 0 | 182 | 66 | 0 | 103 | 201 | 8 | 0 | 788 | 3466 |
| 5:45 PM | 61 | 5 | 104 | 0 | 8 | 18 | 1 | 1 | 0 | 158 | 61 | 0 | 87 | 146 | 4 | 0 | 654 | 3313 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 336 | 4 | 652 | 0 | 104 | 116 | 44 | 0 | 8 | 836 | 388 | 4 | 640 | 736 | 16 | 0 | 3884 |
| Heavy Trucks | 8 | 0 | 16 | | 0 | 0 | 0 | | 4 | 40 | 16 | | 16 | 12 | 4 | | 116 |
| Pedestrians | | 0 | | | | 0 | | | | 0 | | | | 0 | | | 0 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 1 | 0 | | 1 |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 5/21/2019 9:11 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

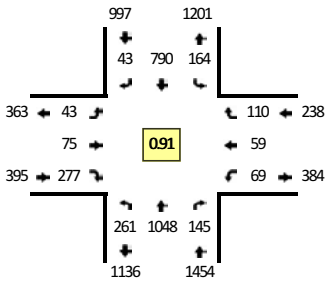
Type of peak hour being reported: Intersection Peak

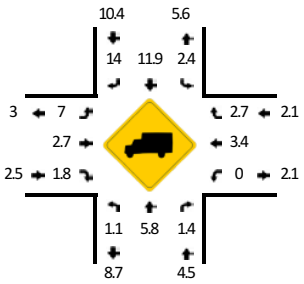
Method for determining peak hour: Total Entering Volume

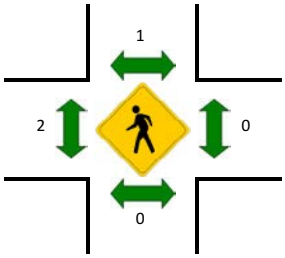
**LOCATION:** E Weisgarber Rd -- Lonas Dr
**CITY/STATE:** Knoxville, TN

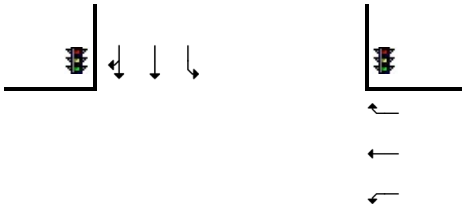
**QC JOB #:** 14915011
**DATE:** Tue, Mar 5 2019

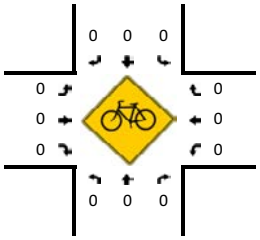
**Peak-Hour: 7:30 AM -- 8:30 AM**
**Peak 15-Min: 7:45 AM -- 8:00 AM**

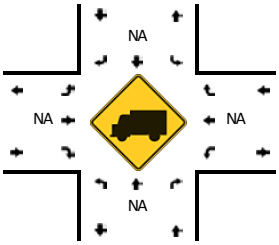


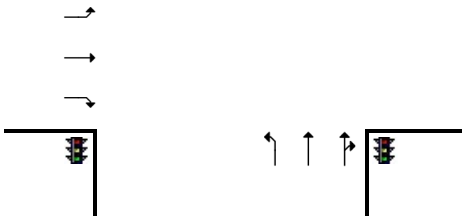



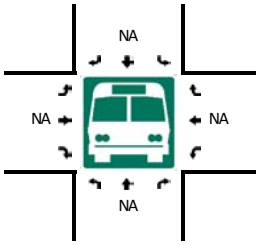








| 15-Min Count Period Beginning At | E Weisgarber Rd (Northbound) | | | | E Weisgarber Rd (Southbound) | | | | Lonas Dr (Eastbound) | | | | Lonas Dr (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 7:00 AM | 28 | 179 | 14 | 0 | 9 | 112 | 7 | 0 | 11 | 7 | 40 | 0 | 8 | 7 | 8 | 0 | 430 | |
| 7:15 AM | 51 | 229 | 26 | 0 | 16 | 155 | 6 | 0 | 12 | 4 | 63 | 0 | 17 | 8 | 20 | 0 | 607 | |
| 7:30 AM | 58 | 257 | 27 | 0 | 29 | 200 | 7 | 0 | 8 | 16 | 77 | 0 | 10 | 15 | 19 | 0 | 723 | |
| 7:45 AM | 79 | 295 | 50 | 0 | 42 | 194 | 10 | 0 | 17 | 23 | 66 | 0 | 21 | 19 | 28 | 0 | 844 | 2604 |
| 8:00 AM | 68 | 275 | 43 | 0 | 54 | 186 | 15 | 0 | 8 | 18 | 55 | 0 | 23 | 14 | 45 | 0 | 804 | 2978 |
| 8:15 AM | 56 | 221 | 25 | 0 | 39 | 210 | 11 | 0 | 10 | 18 | 79 | 0 | 15 | 11 | 18 | 0 | 713 | 3084 |
| 8:30 AM | 59 | 192 | 21 | 0 | 16 | 190 | 16 | 0 | 6 | 7 | 62 | 0 | 13 | 12 | 16 | 0 | 610 | 2971 |
| 8:45 AM | 52 | 192 | 20 | 0 | 14 | 179 | 12 | 0 | 2 | 6 | 65 | 0 | 21 | 8 | 10 | 0 | 581 | 2708 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 316 | 1180 | 200 | 0 | 168 | 776 | 40 | 0 | 68 | 92 | 264 | 0 | 84 | 76 | 112 | 0 | 3376 |
| Heavy Trucks | 4 | 32 | 4 | | 0 | 76 | 8 | | 4 | 0 | 8 | | 0 | 0 | 8 | | 144 |
| Pedestrians | | 0 | | | | 4 | | | | 4 | | | | 0 | | | 8 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Railroad Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 5/21/2019 9:11 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

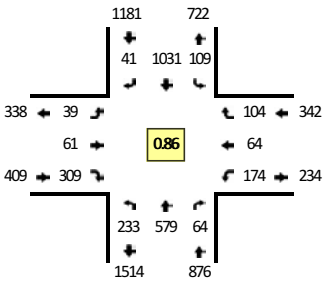
Type of peak hour being reported: Intersection Peak

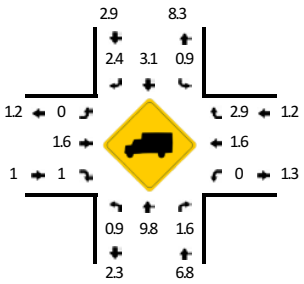
Method for determining peak hour: Total Entering Volume

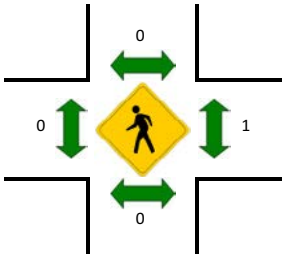
**LOCATION:** E Weisgarber Rd -- Lonas Dr
**CITY/STATE:** Knoxville, TN

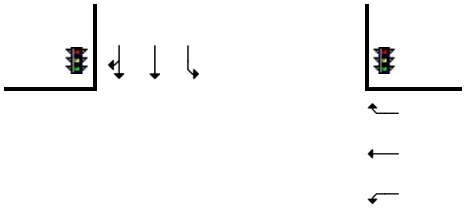
**QC JOB #:** 14915012
**DATE:** Tue, Mar 5 2019

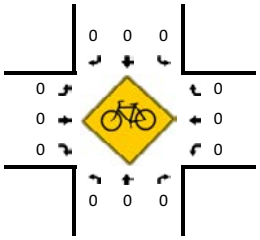
**Peak-Hour: 4:30 PM -- 5:30 PM**
**Peak 15-Min: 5:00 PM -- 5:15 PM**

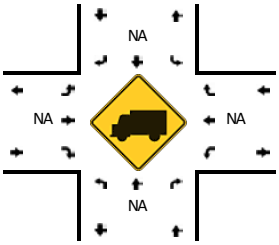


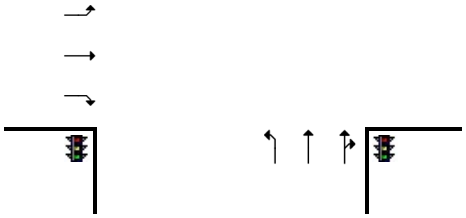



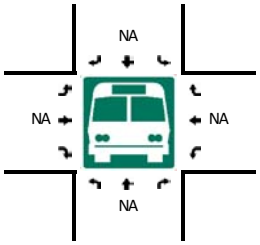








| 15-Min Count Period Beginning At | E Weisgarber Rd (Northbound) | | | | E Weisgarber Rd (Southbound) | | | | Lonas Dr (Eastbound) | | | | Lonas Dr (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 4:00 PM | 63 | 141 | 14 | 0 | 26 | 216 | 11 | 0 | 10 | 14 | 81 | 0 | 22 | 14 | 20 | 0 | 632 | |
| 4:15 PM | 49 | 122 | 10 | 0 | 26 | 219 | 18 | 0 | 5 | 6 | 77 | 0 | 25 | 8 | 15 | 0 | 580 | |
| 4:30 PM | 51 | 147 | 9 | 0 | 23 | 267 | 11 | 0 | 8 | 9 | 82 | 0 | 24 | 15 | 20 | 0 | 666 | |
| 4:45 PM | 51 | 138 | 16 | 0 | 30 | 201 | 10 | 0 | 8 | 16 | 68 | 0 | 37 | 11 | 18 | 0 | 604 | 2482 |
| 5:00 PM | 66 | 148 | 17 | 0 | 26 | 313 | 14 | 0 | 9 | 21 | 79 | 0 | 68 | 22 | 37 | 0 | 820 | 2670 |
| 5:15 PM | 65 | 146 | 22 | 0 | 30 | 250 | 6 | 0 | 14 | 15 | 80 | 0 | 45 | 16 | 29 | 0 | 718 | 2808 |
| 5:30 PM | 72 | 129 | 18 | 0 | 27 | 221 | 7 | 0 | 5 | 7 | 62 | 0 | 37 | 9 | 22 | 0 | 616 | 2758 |
| 5:45 PM | 42 | 122 | 24 | 0 | 22 | 147 | 13 | 0 | 7 | 8 | 54 | 0 | 39 | 14 | 20 | 0 | 512 | 2666 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 264 | 592 | 68 | 0 | 104 | 1252 | 56 | 0 | 36 | 84 | 316 | 0 | 272 | 88 | 148 | 0 | 3280 |
| Heavy Trucks | 4 | 36 | 0 | | 0 | 24 | 0 | | 0 | 4 | 0 | | 0 | 4 | 0 | | 72 |
| Pedestrians | | 0 | | | | 0 | | | | 0 | | | | 0 | | | 0 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Railroad Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 5/21/2019 9:11 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

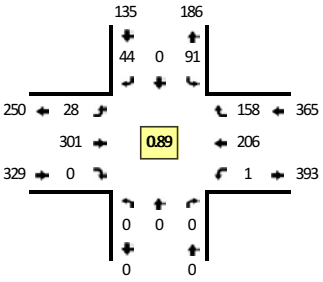
Type of peak hour being reported: Intersection Peak

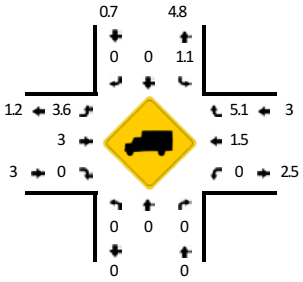
Method for determining peak hour: Total Entering Volume

**LOCATION:** Old Weisgarber Rd -- Lonas Dr
**CITY/STATE:** Knoxville, TN

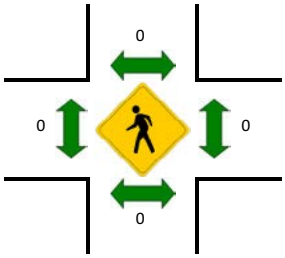
**QC JOB #:** 14915013
**DATE:** Tue, Mar 5 2019

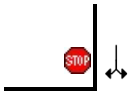
**Peak-Hour: 7:30 AM -- 8:30 AM**
**Peak 15-Min: 7:45 AM -- 8:00 AM**

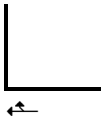


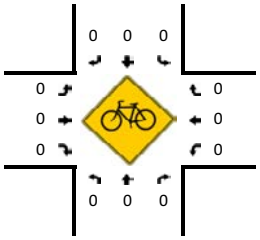



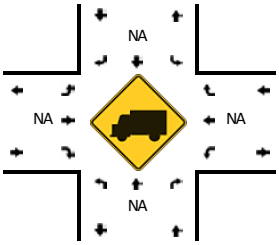

Quality Counts
DATA THAT DRIVES COMMUNITIES

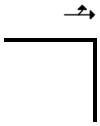


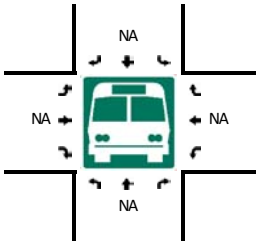






| 15-Min Count Period Beginning At | Old Weisgarber Rd (Northbound) | | | | Old Weisgarber Rd (Southbound) | | | | Lonas Dr (Eastbound) | | | | Lonas Dr (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 7:00 AM | 0 | 0 | 0 | 0 | 9 | 0 | 2 | 0 | 3 | 47 | 0 | 0 | 0 | 26 | 14 | 0 | 101 | |
| 7:15 AM | 0 | 0 | 0 | 0 | 17 | 0 | 3 | 0 | 1 | 59 | 0 | 0 | 0 | 34 | 33 | 0 | 147 | |
| 7:30 AM | 0 | 0 | 0 | 0 | 21 | 0 | 6 | 0 | 8 | 79 | 0 | 0 | 0 | 37 | 38 | 0 | 189 | |
| 7:45 AM | 0 | 0 | 0 | 0 | 23 | 0 | 12 | 0 | 6 | 82 | 0 | 0 | 0 | 58 | 52 | 0 | 233 | 670 |
| 8:00 AM | 0 | 0 | 0 | 0 | 23 | 0 | 14 | 0 | 8 | 61 | 0 | 0 | 0 | 60 | 39 | 0 | 205 | 774 |
| 8:15 AM | 0 | 0 | 0 | 0 | 24 | 0 | 12 | 0 | 6 | 79 | 0 | 0 | 0 | 51 | 29 | 1 | 202 | 829 |
| 8:30 AM | 0 | 0 | 0 | 0 | 28 | 0 | 10 | 0 | 2 | 49 | 0 | 0 | 0 | 54 | 28 | 0 | 171 | 811 |
| 8:45 AM | 0 | 0 | 0 | 0 | 16 | 0 | 5 | 0 | 5 | 58 | 0 | 0 | 0 | 53 | 25 | 0 | 162 | 740 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 0 | 0 | 0 | 0 | 92 | 0 | 48 | 0 | 24 | 328 | 0 | 0 | 0 | 232 | 208 | 0 | 932 |
| Heavy Trucks | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 16 | 0 | | 0 | 0 | 12 | | 28 |
| Pedestrians | | 0 | | | | 0 | | | | 0 | | | | 0 | | | 0 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Railroad Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 5/21/2019 9:11 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

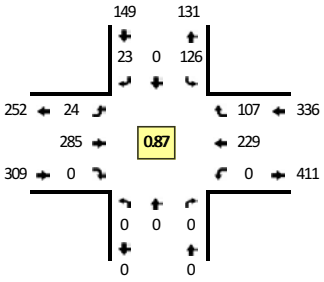
Type of peak hour being reported: Intersection Peak

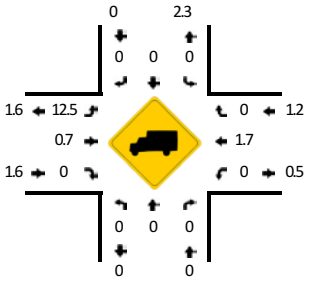
Method for determining peak hour: Total Entering Volume

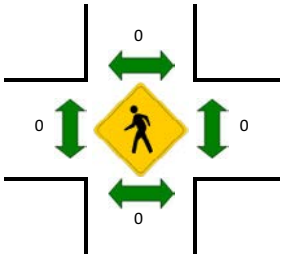
**LOCATION:** Old Weisgarber Rd -- Lonas Dr
**CITY/STATE:** Knoxville, TN

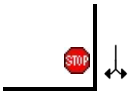
**QC JOB #:** 14915014
**DATE:** Tue, Mar 5 2019

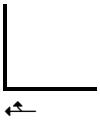
**Peak-Hour: 4:30 PM -- 5:30 PM**
**Peak 15-Min: 5:00 PM -- 5:15 PM**

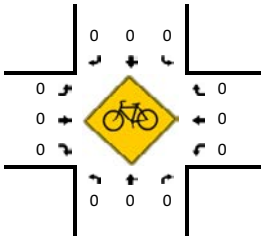


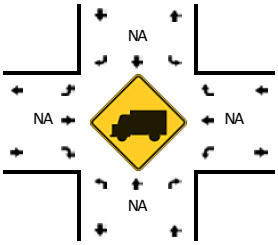



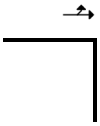



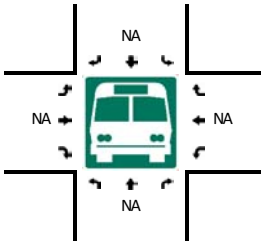






| 15-Min Count Period Beginning At | Old Weisgarber Rd (Northbound) | | | | Old Weisgarber Rd (Southbound) | | | | Lonas Dr (Eastbound) | | | | Lonas Dr (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 4:00 PM | 0 | 0 | 0 | 0 | 32 | 0 | 4 | 0 | 2 | 67 | 0 | 0 | 0 | 56 | 21 | 0 | 182 | |
| 4:15 PM | 0 | 0 | 0 | 0 | 22 | 0 | 8 | 0 | 3 | 67 | 0 | 0 | 0 | 61 | 27 | 0 | 188 | |
| 4:30 PM | 0 | 0 | 0 | 0 | 34 | 0 | 7 | 0 | 8 | 66 | 0 | 0 | 0 | 52 | 25 | 0 | 192 | |
| 4:45 PM | 0 | 0 | 0 | 0 | 34 | 0 | 5 | 0 | 4 | 64 | 0 | 0 | 0 | 39 | 25 | 0 | 171 | 733 |
| 5:00 PM | 0 | 0 | 0 | 0 | 27 | 0 | 5 | 0 | 9 | 75 | 0 | 0 | 0 | 78 | 34 | 0 | 228 | 779 |
| 5:15 PM | 0 | 0 | 0 | 0 | 31 | 0 | 6 | 0 | 3 | 80 | 0 | 0 | 0 | 60 | 23 | 0 | 203 | 794 |
| 5:30 PM | 0 | 0 | 0 | 0 | 20 | 0 | 7 | 0 | 4 | 58 | 0 | 0 | 0 | 62 | 22 | 0 | 173 | 775 |
| 5:45 PM | 0 | 0 | 0 | 0 | 11 | 0 | 7 | 0 | 4 | 56 | 0 | 0 | 0 | 59 | 21 | 0 | 158 | 762 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 0 | 0 | 0 | 0 | 108 | 0 | 20 | 0 | 36 | 300 | 0 | 0 | 0 | 312 | 136 | 0 | 912 |
| Heavy Trucks | 0 | 0 | 0 | | 0 | 0 | 0 | | 4 | 4 | 0 | | 0 | 8 | 0 | | 16 |
| Pedestrians | | 0 | | | | 0 | | | | 0 | | | | 0 | | | 0 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 5/21/2019 9:11 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

**Intersection Name : Middlebrook Pike & Vanosdale Road/Francis Road**

| Basic Timing (seconds) | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 5 | Phase 6 | Phase 7 | Phase 8 |
|---|---|---|---|---|---|---|---|---|
| Min Green | 5 | 15 | 6 | 6 | 5 | 15 | 6 | 6 |
| Gap / Extension | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 |
| Max 1 | 25 | 50 | 25 | 30 | 25 | 50 | 25 | 30 |
| Max 2 | 30 | 60 | 30 | 35 | 30 | 60 | 30 | 35 |
| Yellow Clearance | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Red Clearance | 1 | 2 | 1 | 2.0 | 1 | 2 | 1 | 1 |
| Walk | | 6 | | 6 | | 6 | | 6 |
| Pedestrian Clearance | | 18 | | 15 | | 18 | | 15 |
| Max Recall | | X | | | | X | | |
| Active (Enable) Phases | X | X | X | X | X | X | X | X |
| Flashing Yellow Arrow | | | | | | | | |
| Overlaps (1-4) | | | | | | | | |

**Coordination Timing/(seconds)**

| Split # | Coord. Phase | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 5 | Phase 6 | Phase 7 | Phase 8 |
|---|---|---|---|---|---|---|---|---|---|
| Split 1 | 2/6 | 15 | 48 | 21 | 26 | 20 | 43 | 17 | 30 |
| Split 2 | 2/6 | 13 | 37 | 14 | 26 | 18 | 32 | 14 | 26 |
| Split 3 | 2/6 | 15 | 51 | 15 | 29 | 24 | 42 | 21 | 23 |
| Split 4 | | | | | | | | | |
| Split 5 | | | | | | | | | |
| Split 6 | | | | | | | | | |

| Pattern Table | | | | | Lead / Lag | | Fixed / Floating | Fixed |
|---|---|---|---|---|---|---|---|---|
| Pattern# | Cycle | Offset | Split | Seq. # | Phase # | | End / Beginning | Beginning |
| 1 | 110 | 28 | 1 | 2 | | 1 | Intersection ID# | |
| 2 | 90 | 82 | 2 | 3 | | 5 | I/P Address | |
| 3 | 110 | 77 | 3 | 1 | | | Hub Address | |
| 4 | | | | | | | Radio Address | |
| 5 | | | | | | | Comm. Type | |
| 6 | | | | | | | Detection | Loops |

**Day Plan Events**

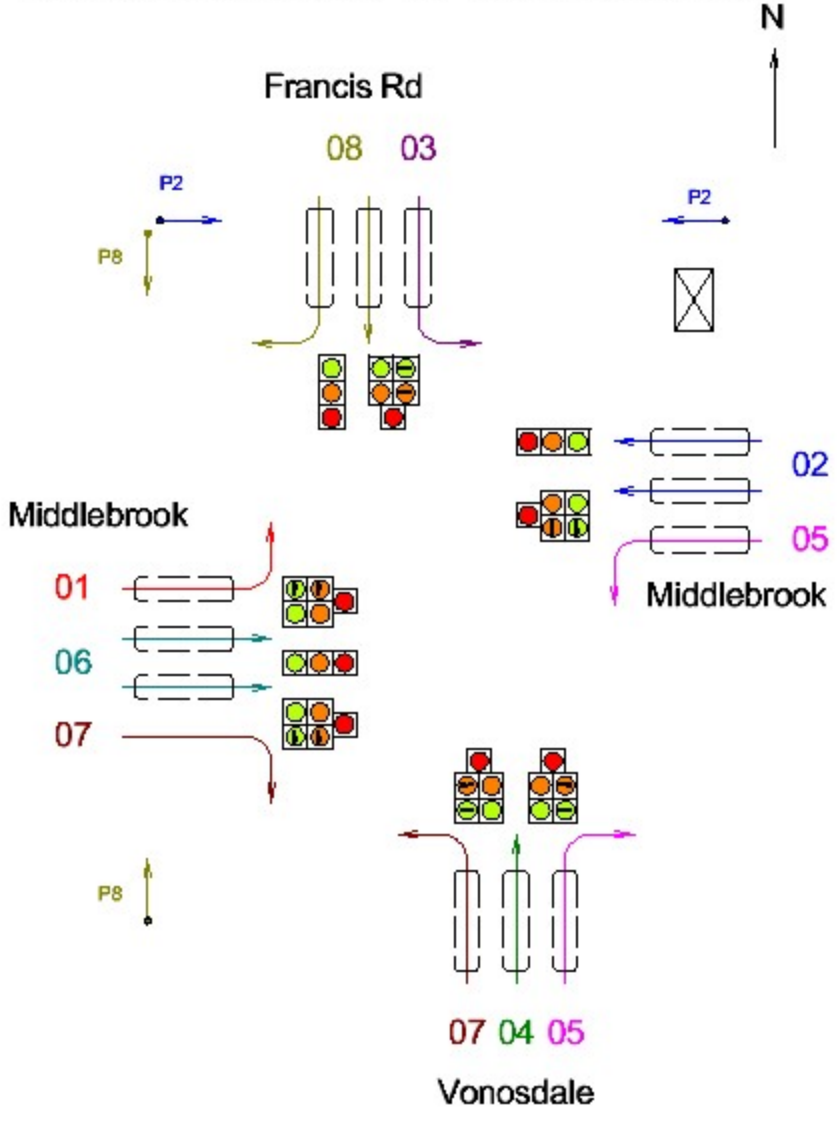
| Day Plan | HH:MM | Pattern | Day Plan | HH:MM | Pattern |
|---|---|---|---|---|---|
| 1 | 0:00 | FREE | 2 | 0:00 | FREE |
| | 6:00 | 1 | | 5:00 | 2 |
| | 9:00 | 2 | | 22:00 | FREE |
| | 15:00 | 3 | | | |
| | 19:00 | FREE | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Year Plan Scheduler**

| Plan | Month of Year: 01 - 12 | Day of Month: 01 - 31 | Plan |
|---|---|---|---|
| M - F | 01-12 | 01-31 | 1 |
| SAT | 01-12 | 01-31 | 2 |
| SUN | 01-12 | 01-31 | 2 |

**Notes :**

# Middlebrook & Vanosdale



**Intersection Name : Middlebrook Pike & Lake Brook Boulevard**

| Basic Timing (seconds) | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 5 | Phase 6 | Phase 7 | Phase 8 |
|---|---|---|---|---|---|---|---|---|
| Min Green | 5 | 15 | | 5 | | 15 | | |
| Gap / Extension | 2 | 3 | | 2 | | 3 | | |
| Max 1 | 20 | 45 | | 25 | | 45 | | |
| Max 2 | 25 | 70 | | 35 | | 70 | | |
| Yellow Clearance | 4 | 4 | | 4 | | 4 | | |
| Red Clearance | 1 | 2 | | 2 | | 2 | | |
| Walk | | | | | | | | |
| Pedestrian Clearance | | | | | | | | |
| Max Recall | | X | | | | X | | |
| Active (Enable) Phases | X | X | | X | | X | | |
| Flashing Yellow Arrow | | | | | | | | |
| Overlaps (1-4) | | | | | | | | |

**Coordination Timing/(seconds)**

| Split # | Coord. Phase | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 5 | Phase 6 | Phase 7 | Phase 8 |
|---|---|---|---|---|---|---|---|---|---|
| Split 1 | 2/6 | 15 | 69 | | 26 | | 84 | | 26 |
| Split 2 | 2/6 | 15 | 54 | | 21 | | 69 | | 21 |
| Split 3 | 2/6 | 15 | 75 | | 20 | | 90 | | 20 |
| Split 4 | | | | | | | | | |
| Split 5 | | | | | | | | | |
| Split 6 | | | | | | | | | |

| Pattern Table | | | | | Lead / Lag | | Fixed / Floating | Fixed |
|---|---|---|---|---|---|---|---|---|
| Pattern# | Cycle | Offset | Split | Seq. # | Phase # | | End / Beginning | Beginning |
| 1 | 110 | 73 | 1 | 2 | | 1 | Intersection ID# | |
| 2 | 90 | 37 | 2 | 1 | | | I/P Address | |
| 3 | 110 | 109 | 3 | 1 | | | Hub Address | |
| 4 | | | | | | | Radio Address | |
| 5 | | | | | | | Comm. Type | |
| 6 | | | | | | | Detection | Loops |

**Day Plan Events**

| Day Plan | HH:MM | Pattern | Day Plan | HH:MM | Pattern |
|---|---|---|---|---|---|
| 1 | 0:00 | FREE | 2 | 0:00 | FREE |
| | 6:00 | 1 | | 5:00 | 2 |
| | 9:00 | 2 | | 22:00 | FREE |
| | 15:00 | 3 | | | |
| | 19:00 | FREE | | | |
| | | | | | |
| | | | | | |
| | | | | | |

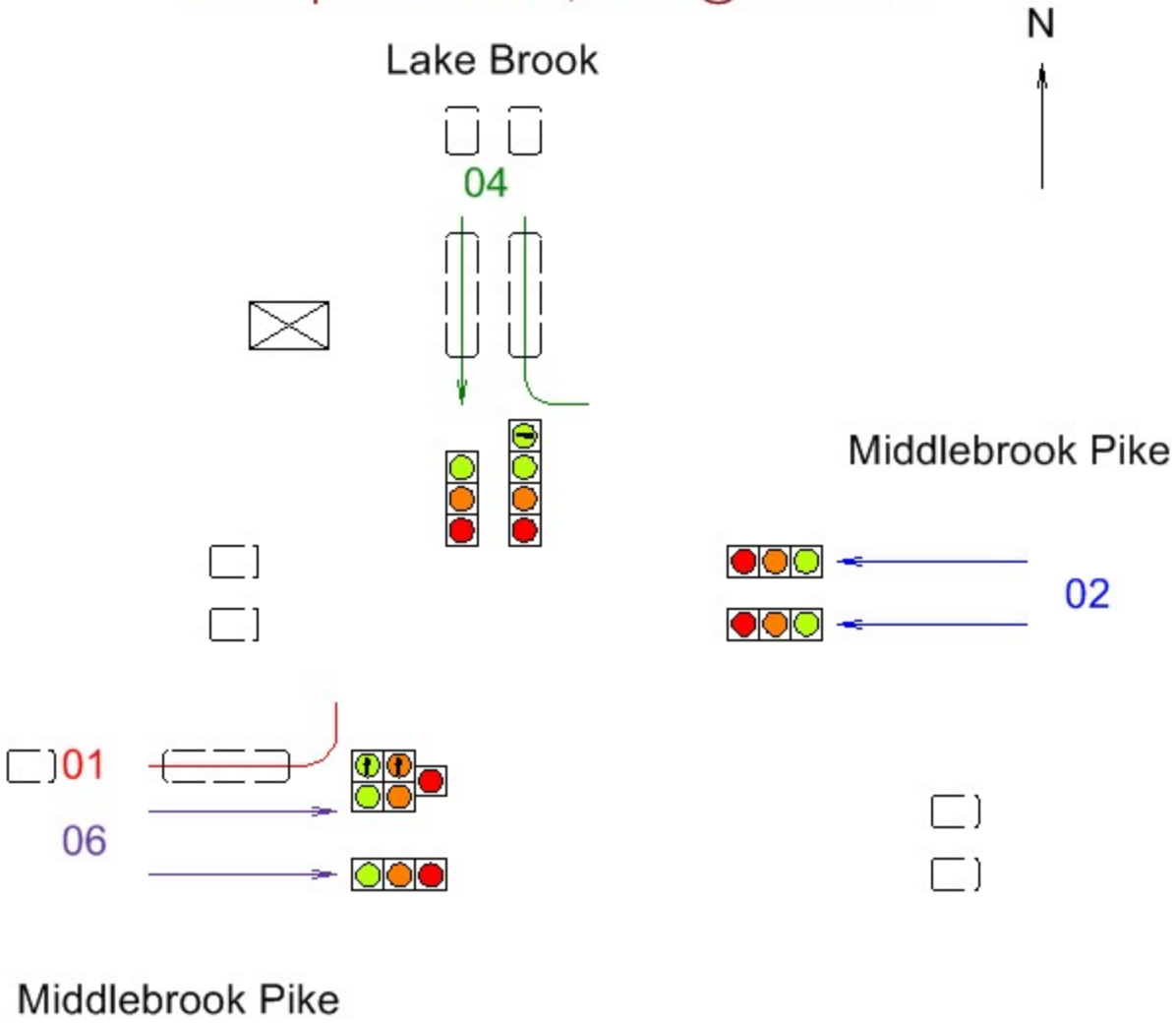
**Year Plan Scheduler**

| Plan | Month of Year: 01 - 12 | Day of Month: 01 - 31 | Plan |
|---|---|---|---|
| M - F | 01-12 | 01-31 | 1 |
| SAT | 01-12 | 01-31 | 2 |
| SUN | 01-12 | 01-31 | 2 |

Notes :

# Middlebrook Pk & Lake Brook

On Stop & Go Oct. 6, 2003 @ 11:00 AM



**Intersection Name : Middlebrook Pike & Dowell Springs Boulevard**

| Basic Timing (seconds) | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 5 | Phase 6 | Phase 7 | Phase 8 |
|---|---|---|---|---|---|---|---|---|
| Min Green | 5 | 15 | | 5 | | 15 | | |
| Gap / Extension | 2 | 3 | | 2 | | 3 | | |
| Max 1 | 20 | 45 | | 25 | | 45 | | |
| Max 2 | 25 | 70 | | 35 | | 70 | | |
| Yellow Clearance | 4 | 4 | | 4 | | 4 | | |
| Red Clearance | 1 | 2 | | 1 | | 2 | | |
| Walk | | | | | | | | |
| Pedestrian Clearance | | | | | | | | |
| Max Recall | | X | | | | X | | |
| Active (Enable) Phases | X | X | | X | | X | | |
| Flashing Yellow Arrow | | | | | | | | |
| Overlaps (1-4) | | | | | | | | |

**Coordination Timing/(seconds)**

| Split # | Coord. Phase | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 5 | Phase 6 | Phase 7 | Phase 8 |
|---|---|---|---|---|---|---|---|---|---|
| Split 1 | 2/6 | 18 | 77 | | 15 | | 95 | | 15 |
| Split 2 | 2/6 | 14 | 54 | | 22 | | 68 | | 22 |
| Split 3 | 2/6 | 12 | 62 | | 36 | | 74 | | 36 |
| Split 4 | | | | | | | | | |
| Split 5 | | | | | | | | | |
| Split 6 | | | | | | | | | |

| Pattern Table | | | | | Lead / Lag | | Fixed / Floating | Fixed |
|---|---|---|---|---|---|---|---|---|
| Pattern# | Cycle | Offset | Split | Seq. # | Phase # | | End / Beginning | Beginning |
| 1 | 110 | 52 | 1 | 2 | | 1 | Intersection ID# | |
| 2 | 90 | 21 | 2 | 2 | | 1 | I/P Address | |
| 3 | 110 | 0 | 3 | 2 | | 1 | Hub Address | |
| 4 | | | | | | | Radio Address | |
| 5 | | | | | | | Comm. Type | |
| 6 | | | | | | | Detection | Loops |

**Day Plan Events**

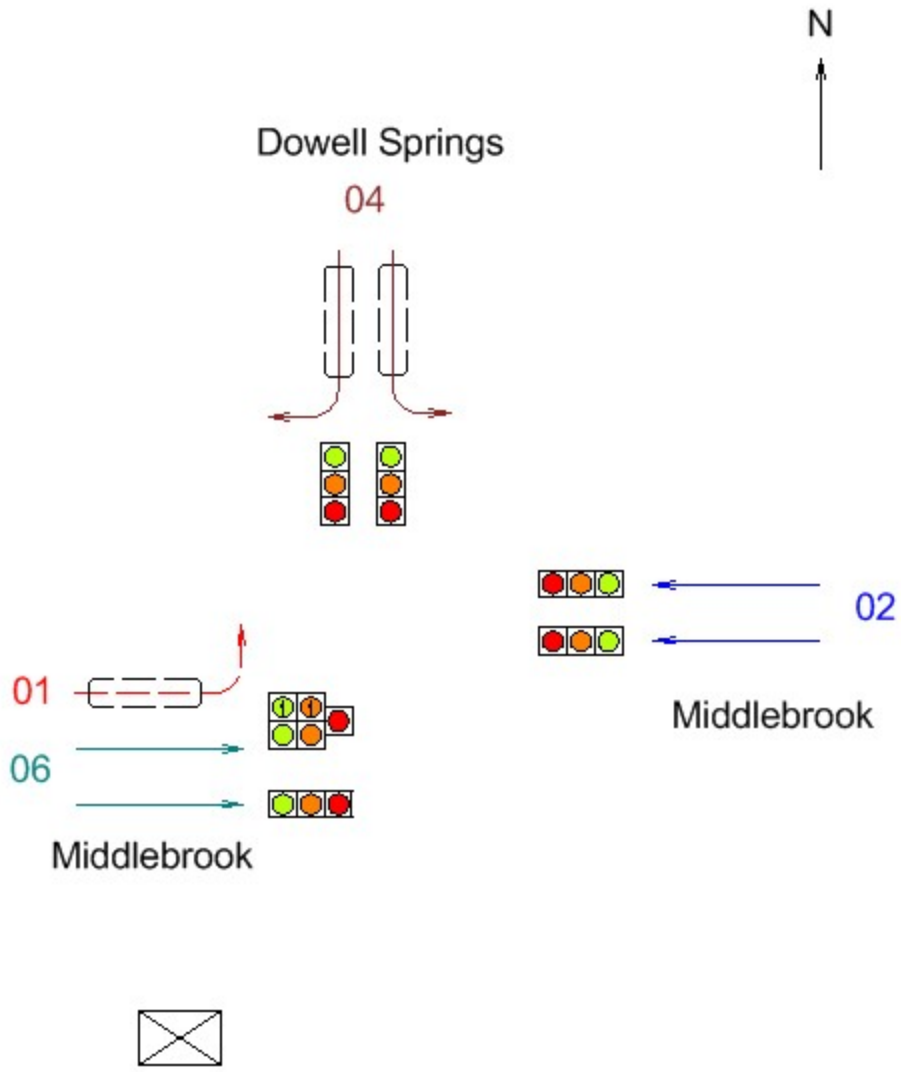
| Day Plan | HH:MM | Pattern | Day Plan | HH:MM | Pattern |
|---|---|---|---|---|---|
| 1 | 0:00 | FREE | 2 | 0:00 | FREE |
| | 6:00 | 1 | | 5:00 | 2 |
| | 9:00 | 2 | | 22:00 | FREE |
| | 15:00 | 3 | | | |
| | 19:00 | FREE | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Year Plan Scheduler**

| Plan | Month of Year: 01 - 12 | Day of Month: 01 - 31 | Plan |
|---|---|---|---|
| M - F | 01-12 | 01-31 | 1 |
| SAT | 01-12 | 01-31 | 2 |
| SUN | 01-12 | 01-31 | 2 |

**Notes :**

# Middlebrook & Dowell Springs



**Intersection Name : Middlebrook Pike & Old Weisgarber Road**

| Basic Timing (seconds) | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 5 | Phase 6 | Phase 7 | Phase 8 |
|---|---|---|---|---|---|---|---|---|
| Min Green | 5 | 15 | | 5 | 5 | 15 | | 5 |
| Gap / Extension | 3 | 3 | | 2 | 3 | 3 | | 2 |
| Max 1 | 20 | 45 | | 25 | 20 | 45 | | 25 |
| Max 2 | 25 | 70 | | 35 | 25 | 70 | | 35 |
| Yellow Clearance | 4 | 4 | | 4 | 4 | 4 | | 4 |
| Red Clearance | 1 | 2 | | 2 | 1 | 2 | | 2 |
| Walk | | | | | | | | |
| Pedestrian Clearance | | | | | | | | |
| Max Recall | | X | | | | X | | |
| Active (Enable) Phases | X | X | | X | X | X | | X |
| Flashing Yellow Arrow | | | | | | | | |
| Overlaps (1-4) | | | | | | | | |

**Coordination Timing/(seconds)**

| Split # | Coord. Phase | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 5 | Phase 6 | Phase 7 | Phase 8 |
|---|---|---|---|---|---|---|---|---|---|
| Split 1 | 2/6 | 14 | 74 | | 22 | 12 | 76 | | 22 |
| Split 2 | 2/6 | 12 | 50 | | 28 | 12 | 50 | | 28 |
| Split 3 | 2/6 | 14 | 71 | | 25 | 14 | 71 | | 25 |
| Split 4 | | | | | | | | | |
| Split 5 | | | | | | | | | |
| Split 6 | | | | | | | | | |

| Pattern Table | | | | | Lead / Lag | | Fixed / Floating | Fixed |
|---|---|---|---|---|---|---|---|---|
| Pattern# | Cycle | Offset | Split | Seq. # | Phase # | | End / Beginning | Beginning |
| 1 | 110 | 5 | 1 | 4 | | 5 | Intersection ID# | |
| 2 | 90 | 71 | 2 | 4 | | 5 | I/P Address | |
| 3 | 110 | 81 | 3 | 2 | | 1 | Hub Address | |
| 4 | | | | | | | Radio Address | |
| 5 | | | | | | | Comm. Type | |
| 6 | | | | | | | Detection | Loops |

**Day Plan Events**

| Day Plan | HH:MM | Pattern | Day Plan | HH:MM | Pattern |
|---|---|---|---|---|---|
| 1 | 0:00 | FREE | 2 | 0:00 | FREE |
| | 6:00 | 1 | | 5:00 | 2 |
| | 9:00 | 2 | | 22:00 | FREE |
| | 15:00 | 3 | | | |
| | 19:00 | FREE | | | |
| | | | | | |
| | | | | | |
| | | | | | |

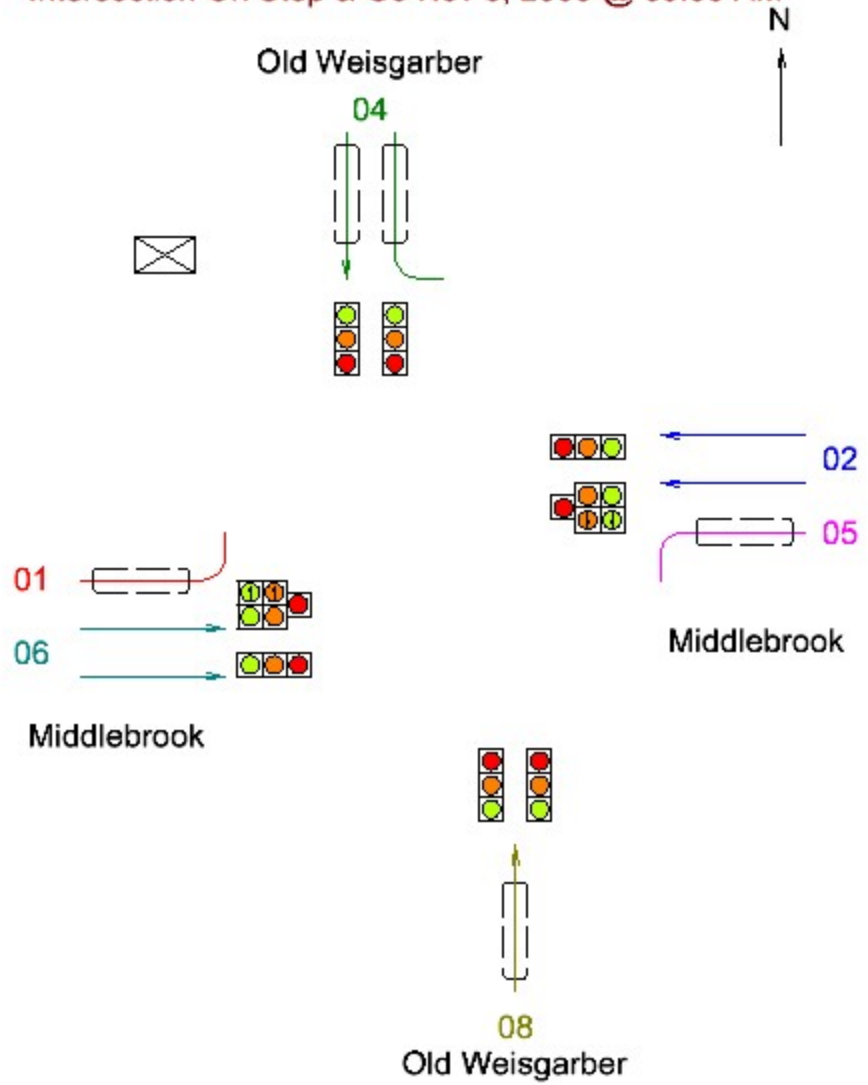
**Year Plan Scheduler**

| Plan | Month of Year: 01 - 12 | Day of Month: 01 - 31 | Plan |
|---|---|---|---|
| M - F | 01-12 | 01-31 | 1 |
| SAT | 01-12 | 01-31 | 2 |
| SUN | 01-12 | 01-31 | 2 |

**Notes : NB phase 8 loop out**

# Middlebrook & Old Weisgarber

Intersection On Stop & Go Nov 5, 2003 @ 09:30 AM



**Intersection Name : Middlebrook Pike & E. Weisgarber Road**

| Basic Timing (seconds) | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 5 | Phase 6 | Phase 7 | Phase 8 |
|---|---|---|---|---|---|---|---|---|
| Min Green | 5 | 15 | 6 | 6 | 6 | 15 | 6 | 6 |
| Gap / Extension | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 |
| Max 1 | 25 | 45 | 25 | 15 | 25 | 45 | 25 | 15 |
| Max 2 | 35 | 50 | 35 | 25 | 35 | 50 | 35 | 25 |
| Yellow Clearance | 4 | 5 | 4 | 4 | 4 | 5 | 4 | 4 |
| Red Clearance | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 |
| Walk | | 5 | | 5 | | 5 | | 5 |
| Pedestrian Clearance | | 20 | | 24 | | 22 | | 24 |
| Max Recall | | X | | | | X | | |
| Active (Enable) Phases | X | X | X | X | X | X | X | X |
| Flashing Yellow Arrow | | | | | | | | |
| Overlaps (1-4) | | | | | | | | |

**Coordination Timing/(seconds)**

| Split # | Coord. Phase | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 5 | Phase 6 | Phase 7 | Phase 8 |
|---|---|---|---|---|---|---|---|---|---|
| Split 1 | 2/6 | 26 | 41 | 30 | 13 | 14 | 53 | 30 | 13 |
| Split 2 | 2/6 | 24 | 31 | 22 | 13 | 14 | 41 | 22 | 13 |
| Split 3 | 2/6 | 26 | 40 | 28 | 16 | 14 | 52 | 28 | 16 |
| Split 4 | | | | | | | | | |
| Split 5 | | | | | | | | | |
| Split 6 | | | | | | | | | |

| Pattern Table | | | | | Lead / Lag | | Fixed / Floating | Floating |
|---|---|---|---|---|---|---|---|---|
| Pattern# | Cycle | Offset | Split | Seq. # | Phase # | | End / Beginning | Beginning |
| 1 | 110 | 38 | 1 | 1 | | 5 | Intersection ID# | 724 |
| 2 | 90 | 72 | 2 | 4 | | 1/5 | I/P Address | |
| 3 | 110 | 40 | 3 | 2 | | 1 | Hub Address | |
| 4 | | | | | | | Radio Address | |
| 5 | | | | | | | Comm. Type | Radio |
| 6 | | | | | | | Detection | Radar |

**Day Plan Events**

| Day Plan | HH:MM | Pattern | Day Plan | HH:MM | Pattern |
|---|---|---|---|---|---|
| 1 | 0:00 | FREE | 2 | 0:00 | FREE |
| | 6:00 | 1 | | 5:00 | 2 |
| | 9:00 | 2 | | 22:00 | FREE |
| | 15:00 | 3 | | | |
| | 19:00 | FREE | | | |
| | | | | | |
| | | | | | |
| | | | | | |

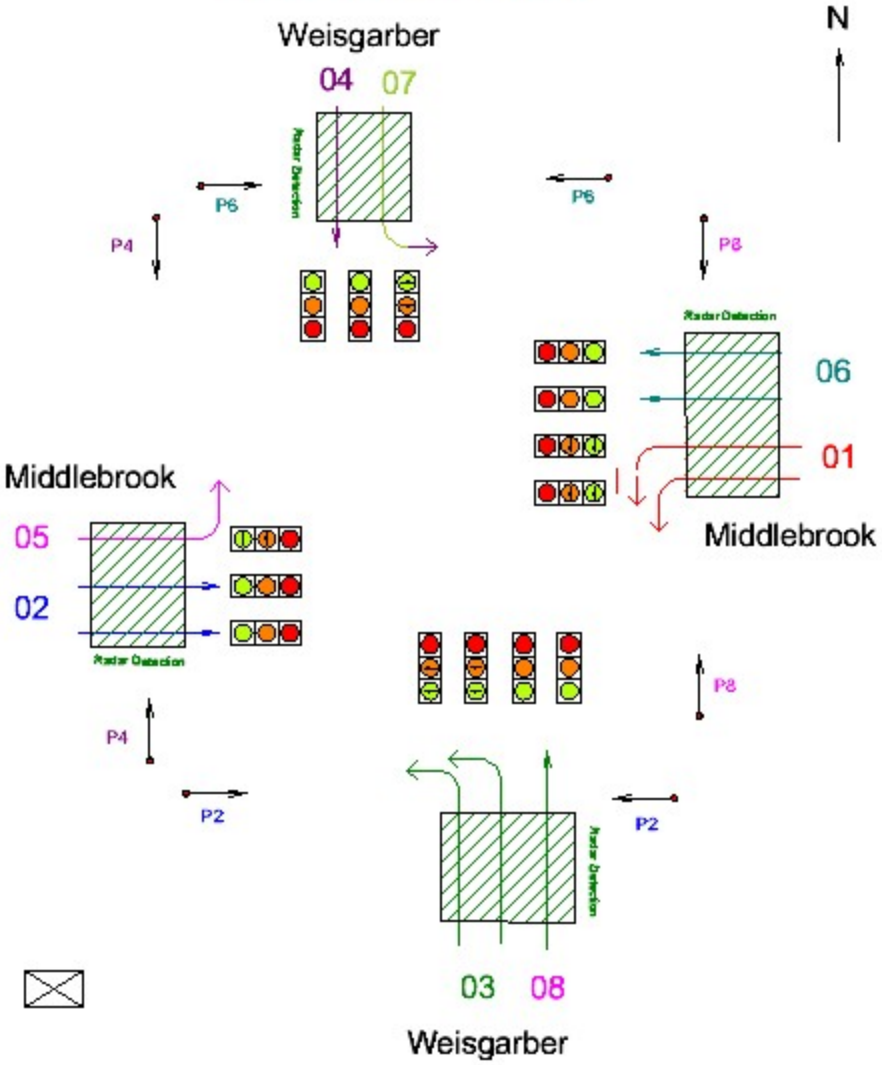
**Year Plan Scheduler**

| Plan | Month of Year: 01 - 12 | Day of Month: 01 - 31 | Plan |
|---|---|---|---|
| M - F | 01-12 | 01-31 | 1 |
| SAT | 01-12 | 01-31 | 2 |
| SUN | 01-12 | 01-31 | 2 |

**Notes :**

# Middlebrook & Weisgarber

Intersection Rebuilt in 2018



Local: 0000000, Weisga & Lonas, Page: 1

```
SEQUENCE CONFIGURATION
VALUE(YES/NO)              1 1 1 1 1 1 1
FUNC\PH  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 RING 1  X X X X
 RING 2          X X X X
 RING 3
 RING 4
         PGDN FOR CO PHASES/XPED

SEQUENCE CONFIGURATION >>PGDN FOR MORE<<
VALUE(YES/NO) RINGS(0-4)   1 1 1 1 1 1 1
FUNC\PH  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
  RINGS  1 1 1 1 2 2 2 2
CO PH 1  X X     X X
CO PH 2      X X     X X
CO PH 3
CO PH 4

SEQUENCE CONFIGURATION >>PGDN FOR XPED<<
VALUE(YES/NO) RINGS(0-4)   1 1 1 1 1 1 1
FUNC\PH  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
  RINGS  1 1 1 1 2 2 2 2
CO PH 5
CO PH 6
CO PH 7
CO PH 8

EXCLUSIVE PED 1            VALUE(YES/NO)
XPED IN: N  PED 1: N  PED 3: N    TOD: N
                           1 1 1 1 1 1 1
FUNC\PH  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 XPED PH
 OUTPUTS
SOFT RET
        PGDN FOR EXCLUSIVE PED 2

EXCLUSIVE PED 2            VALUE(YES/NO)
XPED IN: N  PED 1: N  PED 3: N    TOD: N
                           1 1 1 1 1 1 1
FUNC\PH  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 XPED PH
 OUTPUTS
SOFT RET


PHASE FUNCTIONS (1 OF 2)   VALUE(YES/NO)
                           1 1 1 1 1 1 1
FUNC\PH  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
   CNA I   X       X
  CNA II
  CNA IA
 CNA IIA
     WRM X X X X X X X X

PHASE FUNCTIONS (2 OF 2)   VALUE(YES/NO)
                           1 1 1 1 1 1 1
FUNC\PH  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 INH MAX X X X X X X X X
PED RECY X X X X X X X X
 FL WALK
FDW->YEL
FDW->RED
```

```
DYNAMIC RCLS GRP 2(5 OF 8) VALUE(YES/NO)
 GRP 2 INPUT: N            1 1 1 1 1 1 1 1
FUNC\PH  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
RCL  PHS
IF PH ON
   OR
 IF  O/L A B C D E F G H I J K L M N O P
   GRN

DYNAMIC RCLS GRP 2(6 OF 8) VALUE(YES/NO)
 GRP 2 INPUT: N            1 1 1 1 1 1 1 1
FUNC\PH  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
RCL  PHS
IF PH ON
   OR
 IF  O/L A B C D E F G H I J K L M N O P
   GRN

DYNAMIC RCLS GRP 2(7 OF 8) VALUE(YES/NO)
 GRP 2 INPUT: N            1 1 1 1 1 1 1 1
FUNC\PH  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
RCL  PHS
IF PH ON
   OR
 IF  O/L A B C D E F G H I J K L M N O P
   GRN

DYNAMIC RCLS GRP 2(8 OF 8) VALUE(YES/NO)
 GRP 2 INPUT: N            1 1 1 1 1 1 1 1
FUNC\PH  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
RCL  PHS
IF PH ON
   OR
 IF  O/L A B C D E F G H I J K L M N O P
   GRN

DUAL ENTRY ( 1 OF 4)       VALUE(YES/NO)
DUAL ENTRY ENABLE: N
                           1 1 1 1 1 1 1 1
FUNC\PH  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PH  1            X
PH  2              X
PH  3                X
PH  4                  X

DUAL ENTRY ( 2 OF 4)       VALUE(YES/NO)
DUAL ENTRY ENABLE: N
                           1 1 1 1 1 1 1 1
FUNC\PH  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PH  5    X
PH  6      X
PH  7        X
PH  8          X

DUAL ENTRY ( 3 OF 4)       VALUE(YES/NO)
DUAL ENTRY ENABLE: N
                           1 1 1 1 1 1 1 1
FUNC\PH  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PH  9
PH 10
PH 11
PH 12
```

DUAL ENTRY ( 4 OF 4)  VALUE(YES/NO)
DUAL ENTRY ENABLE: N
                      1 1 1 1 1 1 1
FUNC\PH  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PH 13
PH 14
PH 15
PH 16

PHASE FUNCTIONS  VALUE(YES/NO)
TIMING PLAN: 1  1 1 1 1 1 1 1
FUNC\PH  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 MIN RCL   X       X
 MAX RCL
 PED RCL
SOFT RCL
NON-LOCK X   X   X   X

PHASE FUNCTIONS  VALUE(YES/NO)
TIMING PLAN: 1  1 1 1 1 1 1 1
FUNC\PH  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
VEH OMIT     X       X
PED OMIT X   X   X   X

PHASE FUNCTIONS  VALUE(YES/NO)
TIMING PLAN: 2  1 1 1 1 1 1 1
FUNC\PH  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 MIN RCL
 MAX RCL
 PED RCL
SOFT RCL
NON-LOCK

PHASE FUNCTIONS  VALUE(YES/NO)
TIMING PLAN: 2  1 1 1 1 1 1 1
FUNC\PH  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
VEH OMIT
PED OMIT

PHASE FUNCTIONS  VALUE(YES/NO)
TIMING PLAN: 3  1 1 1 1 1 1 1
FUNC\PH  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 MIN RCL
 MAX RCL
 PED RCL
SOFT RCL
NON-LOCK

PHASE FUNCTIONS  VALUE(YES/NO)
TIMING PLAN: 3  1 1 1 1 1 1 1
FUNC\PH  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
VEH OMIT
PED OMIT

MAX OUTS TO ADJUST MX3 VALUE(0-255)

| PH | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

GAP OUTS TO ADJUST MX3

| PH | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

SHIFT-LT.<- TO VIEW OR ENTER PHASES 1-8

INITIAL:(0-255) TIMING PLAN: 1

| PH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| | 6 | 25 | 8 | 10 | 6 | 25 | 8 | 10 |

PASSAGE:(0-25.5)

| PH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| | 2.5 | 4.5 | 2.5 | 2.5 | 2.5 | 4.5 | 2.5 | 2.5 |

SHIFT-RT.-> TO VIEW OR ENTER PHASES 9-16

INITIAL:(0-255) TIMING PLAN: 1

| PH | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

PASSAGE:(0-25.5)

| PH | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|
| | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

SHIFT-LT.<- TO VIEW OR ENTER PHASES 1-8

YELLOW:(0-25.5) TIMING PLAN: 1

| PH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| | 4.0 | 4.5 | 4.0 | 4.0 | 4.0 | 4.5 | 4.0 | 4.0 |

RED:(0-25.5)

| PH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| | 1.0 | 2.0 | 1.5 | 1.5 | 1.0 | 2.0 | 1.5 | 1.5 |

SHIFT-RT.-> TO VIEW OR ENTER PHASES 9-16

YELLOW:(0-25.5) TIMING PLAN: 1

| PH | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|
| | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

RED:(0-25.5)

| PH | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|
| | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

SHIFT-LT.<- TO VIEW OR ENTER PHASES 1-8

WALK:(0-255) TIMING PLAN: 1

| PH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| | 0 | 7 | 0 | 7 | 0 | 7 | 0 | 7 |

PED CLR:(0-255)

| PH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| | 0 | 28 | 0 | 29 | 0 | 29 | 0 | 30 |

SHIFT-RT.-> TO VIEW OR ENTER PHASES 9-16

WALK:(0-255) TIMING PLAN: 1

| PH | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

PED CLR:(0-255)

| PH | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

SHIFT-LT.<- TO VIEW OR ENTER PHASES 1-8

```
MAX 1:(0-255)              TIMING PLAN: 1
PH  1    2    3    4    5    6    7    8
   20   45   20   30   20   45   20   30

MAX 2:(0-255)
PH  1    2    3    4    5    6    7    8
   20   45   20   20   20   45   20   20
SHIFT-RT.-> TO VIEW OR ENTER PHASES 9-16

MAX 1:(0-255)              TIMING PLAN: 1
PH  9   10   11   12   13   14   15   16
    0    0    0    0    0    0    0    0

MAX 2:(0-255)
PH  9   10   11   12   13   14   15   16
    0    0    0    0    0    0    0    0
SHIFT-LT.<- TO VIEW OR ENTER PHASES  1-8

MAX 3 LIMIT:(0-255)        TIMING PLAN: 1
PH  1    2    3    4    5    6    7    8
    0    0    0    0    0    0    0    0

MX 3 ADJ:(0-255)
PH  1    2    3    4    5    6    7    8
    0    0    0    0    0    0    0    0
SHIFT-RT.-> TO VIEW OR ENTER PHASES 9-16

MAX 3 LIMIT:(0-255)        TIMING PLAN: 1
PH  9   10   11   12   13   14   15   16
    0    0    0    0    0    0    0    0

MX 3 ADJ:(0-255)
PH  9   10   11   12   13   14   15   16
    0    0    0    0    0    0    0    0
SHIFT-LT.<- TO VIEW OR ENTER PHASES  1-8

INITIAL:(0-255)            TIMING PLAN: 2
PH  1    2    3    4    5    6    7    8
    0    0    0    0    0    0    0    0

PASSAGE:(0-25.5)
PH  1    2    3    4    5    6    7    8
  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
SHIFT-RT.-> TO VIEW OR ENTER PHASES 9-16

INITIAL:(0-255)            TIMING PLAN: 2
PH  9   10   11   12   13   14   15   16
    0    0    0    0    0    0    0    0

PASSAGE:(0-25.5)
PH  9   10   11   12   13   14   15   16
  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
SHIFT-LT.<- TO VIEW OR ENTER PHASES  1-8

YELLOW:(0-25.5)            TIMING PLAN: 2
PH  1    2    3    4    5    6    7    8
  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0

RED:(0-25.5)
PH  1    2    3    4    5    6    7    8
  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
SHIFT-RT.-> TO VIEW OR ENTER PHASES 9-16
```

Local: 0000000, Weisga & Lonas, Page: 18

MIN GAP:(0-25.5)  TIMING PLAN: 4

| PH | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|
| | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

SHIFT-LT.<- TO VIEW OR ENTER PHASES 1-8

ADDED INIT/ACT:(0-25.5)  TIMING PLAN: 4

| PH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

MAX INITIAL:(0-255)

| PH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

SHIFT-RT.-> TO VIEW OR ENTER PHASES 9-16

ADDED INIT/ACT:(0-25.5)  TIMING PLAN: 4

| PH | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|
| | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

MAX INITIAL:(0-255)

| PH | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

SHIFT-LT.<- TO VIEW OR ENTER PHASES 1-8

DETECTOR ASSIGNMENTS  VALUE(YES/NO)

| | | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DET\PH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | | X | | | | | | | | | | | | | | |
| 2 | | | X | | | | | | | | | | | | | |
| 3 | | | | X | | | | | | | | | | | | |
| 4 | | | | | X | | | | | | | | | | | |

PGDN FOR MORE DETECTORS

DETECTOR ASSIGNMENTS  VALUE(YES/NO)

| | | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DET\PH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| 5 | | | | | X | | | | | | | | | | | |
| 6 | | | | | | X | | | | | | | | | | |
| 7 | | | | | | | X | | | | | | | | | |
| 8 | | | | | | | | X | | | | | | | | |

PGDN FOR MORE DETECTORS

DETECTOR ASSIGNMENTS  VALUE(YES/NO)

| | | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DET\PH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| 9 | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | |

PGDN FOR MORE DETECTORS

DETECTOR ASSIGNMENTS  VALUE(YES/NO)

| | | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DET\PH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| 13 | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | | |

PGDN FOR MORE DETECTORS

CONTROLLER OPTIONS VALUE(YES/NO)
RED REVERT TIME: 0.0 (0-25.5 SECS)

| AUTO PED CLR WITH MCE | PASSAGE SEQUENTIAL | MINIMUM RED REVERT |
|---|---|---|
| N | N | N |

CONTROLLER OPTIONS VALUE(YES/NO)
START-UP FLASH: 0 (0-255 SECS)
START-UP INTERVAL: 2 START-UP RED: 0.0
(0=RED, 1=YEL, 2=GRN) (0-25.5 SECS)

| FUNC\PH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START-UP | X | | | | X | | | | | | | | | | | |

CONTROLLER OPTIONS VALUE(YES/NO)
UCF OVERRIDE HOLD: N
UCF TEST A OR B: 0 (0=NEITHER A OR B,
1=A, 2=B)

| FUNC\PH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UCF LAST | | | X | | | | | | X | | | | | | | |
| UCF EXIT | X | | | | X | | | | | | | | | | | |

(TOD, CL, INTER, UNDER COORD OP MODES)

CONTROLLER OPTIONS VALUE(YES/NO)
SIMULTANEOUS GAP-OUT ENABLE: N

| FUNC\PH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SIMU GAP | | | | | | | | | | | | | | | | |

PHASE DIMMING VALUE(Y/N)

| FUNC\PH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RED | | | | | | | | | | | | | | | | |
| YELLOW | | | | | | | | | | | | | | | | |
| GREEN | | | | | | | | | | | | | | | | |
| DONT WK | | | | | | | | | | | | | | | | |
| PED CLR | | | | | | | | | | | | | | | | |
| WALK | | | | | | | | | | | | | | | | |

OVERLAP DIMMING VALUE(Y/N)

| FUNC\OL | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RED | | | | | | | | | | | | | | | | |
| YELLOW | | | | | | | | | | | | | | | | |
| GREEN | | | | | | | | | | | | | | | | |
| DONT WK | | | | | | | | | | | | | | | | |
| PED CLR | | | | | | | | | | | | | | | | |
| WALK | | | | | | | | | | | | | | | | |

LEAD/LAG PATTERNS VALUE(1-16= PHS 1-16)
(MODE: 0=TOD/COORD, 1=COORD, 2=TOD
3=BY INPUT, 4=ALWAYS ON, 5=ALWAYS OFF)

| PATT | MODE | PH_S | PH_S | PH_S | PH_S |
|---|---|---|---|---|---|
| 1 | 0 | 1--1 | 1--1 | 1--1 | 1--1 |
| 2 | 0 | 1--1 | 1--1 | 1--1 | 1--1 |
| 3 | 0 | 1--1 | 1--1 | 1--1 | 1--1 |
| 4 | 0 | 1--1 | 1--1 | 1--1 | 1--1 |

Local: 0000000, Weisga & Lonas, Page: 36

LEAD/LAG PATTERNS  VALUE(1-16= PHS 1-16)
(MODE: 0=TOD/COORD, 1=COORD, 2=TOD
3=BY INPUT, 4=ALWAYS ON, 5=ALWAYS OFF)

| PATT | MODE | PH_S | PH_S | PH_S | PH_S |
|---|---|---|---|---|---|
| 5 | 0 | 1--1 | 1--1 | 1--1 | 1--1 |
| 6 | 0 | 1--1 | 1--1 | 1--1 | 1--1 |
| 7 | 0 | 1--1 | 1--1 | 1--1 | 1--1 |
| 8 | 0 | 1--1 | 1--1 | 1--1 | 1--1 |

SOFT FLASH   VALUE(0= DARK, 1= FL Y WIG,
2= FL Y WAG, 3= FL R WIG, 4= FL R WAG)
UCF SOFT FLASH: N          1 1 1 1 1 1 1
  PHASE  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
   MODE

OVERLAP  A B C D E F G H I J K L M N O P
   MODE

OPERATING MODES

(0= TOD, 1= CL, 2= INT)
 CYCLE SOURCE: 0       FREE SOURCE:   0
 SPLIT SOURCE: 0      FLASH SOURCE:   0
OFFSET SOURCE: 0  INTER TOD REVERT:   0
                        (0-255 SEC)
  PGDN FOR MORE COORD OPERATING MODES

OPERATING MODES            VALUE(YES/NO)
      AUTO PERM: Y  OFFSET ENTRY IN %: Y
 END OF MAIN ST: Y PERM-PA ENTRY IN %: Y
  ENHANCED PERM: N     INVERT FREE IN: N
FIXED FORCE-OFF: N       SPLIT MATRIX: Y
  YELLOW OFFSET: N     4 SPLITS/CYCLE: N
CENTRAL OVERIDE: N NO EARLY COORD PED: N
PGDN FOR PERM TYPE/OFFSET SEEK/PED PERM

  TYPE OF PERM:   2(0=YIELD, 1=SINGLE,
                        2=MULTIPLE)
OFFSET SEEKING:   2(0=ADD ONLY, 1=DWELL,
                        2= SHORT ROUTE)
PED PERMISSIVE:   0(0=AUTO, 1-255 SECS)
 YIELD PERCENT:   0(0-100%)
   EGB PERCENT:   0(0-100%)
 PGDN FOR TOD/CL/INTER/CITY 0/ABSOLUTE

OPERATING MODES

SYNC SOURCE: 0 (0=TOD/CL/INTER, 1= CITY
                ZERO, 2= ABSOLUTE)

(0-CYCLE TIME-1 FOR CITY ZERO/ABSOLUTE)
CYCLE 1:   0  CYCLE 2:   0  CYCLE 3:   0
CYCLE 4:   0  CYCLE 5:   0  CYCLE 6:   0

COORD PHASES   VALUE(Y/N)  1 1 1 1 1 1 1
  CYCLE  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
    1      X       X
    2      X       X
    3      X       X
    4      X       X
    5      X       X
    6      X       X

```
SPLIT  1 ALL CYCLES       VALUE(%:0-100)
PHASE ALLOCATIONS      4 SPLITS/CYCLE: N
PHASE      1   2   3   4   5   6   7   8
SPLIT  1  22  50   0  28  22  50   0  28

PHASE      1   2   3   4   5   6   7   8
SPLIT  2  19  45   0  36  21  43   0  36
SHIFT-RT.-> TO VIEW OR ENTER PHASES 9-16

SPLIT  1 ALL CYCLES       VALUE(%:0-100)
PHASE ALLOCATIONS      4 SPLITS/CYCLE: N
PHASE      9  10  11  12  13  14  15  16
SPLIT  1   0   0   0   0   0   0   0   0

PHASE      9  10  11  12  13  14  15  16
SPLIT  2   0   0   0   0   0   0   0   0
SHIFT-LT.<- TO VIEW OR ENTER PHASES  1-8

SPLIT  3 ALL CYCLES       VALUE(%:0-100)
PHASE ALLOCATIONS      4 SPLITS/CYCLE: N
PHASE      1   2   3   4   5   6   7   8
SPLIT  3  20  40   0  40  20  50   0  40

PHASE      1   2   3   4   5   6   7   8
SPLIT  4  18  52   0  30  25  45   0  30
SHIFT-RT.-> TO VIEW OR ENTER PHASES 9-16

SPLIT  3 ALL CYCLES       VALUE(%:0-100)
PHASE ALLOCATIONS      4 SPLITS/CYCLE: N
PHASE      9  10  11  12  13  14  15  16
SPLIT  3   0   0   0   0   0   0   0   0

PHASE      9  10  11  12  13  14  15  16
SPLIT  4   0   0   0   0   0   0   0   0
SHIFT-LT.<- TO VIEW OR ENTER PHASES  1-8

SPLIT  5 ALL CYCLES       VALUE(%:0-100)
PHASE ALLOCATIONS      4 SPLITS/CYCLE: N
PHASE      1   2   3   4   5   6   7   8
SPLIT  5  18  45   0  37  23  40   0  37

PHASE      1   2   3   4   5   6   7   8
SPLIT  6   0   0   0   0   0   0   0   0
SHIFT-RT.-> TO VIEW OR ENTER PHASES 9-16

SPLIT  5 ALL CYCLES       VALUE(%:0-100)
PHASE ALLOCATIONS      4 SPLITS/CYCLE: N
PHASE      9  10  11  12  13  14  15  16
SPLIT  5   0   0   0   0   0   0   0   0

PHASE      9  10  11  12  13  14  15  16
SPLIT  6   0   0   0   0   0   0   0   0
SHIFT-LT.<- TO VIEW OR ENTER PHASES  1-8

SPLIT  7 ALL CYCLES       VALUE(%:0-100)
PHASE ALLOCATIONS      4 SPLITS/CYCLE: N
PHASE      1   2   3   4   5   6   7   8
SPLIT  7   0   0   0   0   0   0   0   0

PHASE      1   2   3   4   5   6   7   8
SPLIT  8   0   0   0   0   0   0   0   0
SHIFT-RT.-> TO VIEW OR ENTER PHASES 9-16
```

OFFSETS VALUE(%:0-100)

| CYCLE | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| OFFSET 1 | 75 | 42 | 73 | 0 | 0 | 0 |
| OFFSET 2 | 0 | 0 | 54 | 0 | 0 | 0 |
| OFFSET 3 | 0 | 0 | 54 | 0 | 0 | 0 |
| OFFSET 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| OFFSET 5 | 0 | 0 | 0 | 0 | 0 | 0 |

ENABLE SPLIT MATRIX: Y VALUE(0-24)
4 SPLITS/CYCLE: N

| CYCLE | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| OFFSET 1 | 1 | 2 | 3 | 0 | 0 | 0 |
| OFFSET 2 | 0 | 0 | 4 | 0 | 0 | 0 |
| OFFSET 3 | 0 | 0 | 5 | 0 | 0 | 0 |
| OFFSET 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| OFFSET 5 | 0 | 0 | 0 | 0 | 0 | 0 |

NO EARLY RELEASE VALUE(YES/NO)
SPLIT 1 ALL CYCLES 4 SPLITS/CYCLE: N

| SPLIT | 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 |
|---|---|
| | 1 1 1 1 1 1 1 1 1 2 3 4 5 6 7 8 |
| 1 | |
| 2 | |
| 3 | |
| 4 | |

NO EARLY RELEASE VALUE(YES/NO)
SPLIT 5 ALL CYCLES 4 SPLITS/CYCLE: N

| SPLIT | 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 |
|---|---|
| | 1 1 1 1 1 1 1 1 1 2 3 4 5 6 7 8 |
| 5 | |
| 6 | |
| 7 | |
| 8 | |

NO EARLY RELEASE VALUE(YES/NO)
SPLIT 9 ALL CYCLES 4 SPLITS/CYCLE: N

| SPLIT | 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 |
|---|---|
| | 1 1 1 1 1 1 1 1 1 2 3 4 5 6 7 8 |
| 9 | |
| 10 | |
| 11 | |
| 12 | |

NO EARLY RELEASE VALUE(YES/NO)
SPLIT 13 ALL CYCLES 4 SPLITS/CYCLE: N

| SPLIT | 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 |
|---|---|
| | 1 1 1 1 1 1 1 1 1 2 3 4 5 6 7 8 |
| 13 | |
| 14 | |
| 15 | |
| 16 | |

NO EARLY RELEASE VALUE(YES/NO)
SPLIT 17 ALL CYCLES 4 SPLITS/CYCLE: N

| SPLIT | 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 |
|---|---|
| | 1 1 1 1 1 1 1 1 1 2 3 4 5 6 7 8 |
| 17 | |
| 18 | |
| 19 | |
| 20 | |

Local: 0000000, Weisga & Lonas, Page: 45

NO EARLY RELEASE VALUE(YES/NO)
SPLIT 21 ALL CYCLES 4 SPLITS/CYCLE: N

```
                          1 1 1 1 1 1 1
  SPLIT  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
    21
    22
    23
    24
```

COS/FRE TO TOD CKTS VALUE:CKTS 0-255
0= NO CKT, DONT CARE C/O/S/FRE= 7/6/25/2

| # | C/O/ | S/FRE | CKT | CKT | CKT | CKT | CKT |
|---|---|---|---|---|---|---|---|
| 1 | / / | / | 0 | | | | |
| 2 | / / | / | 0 | | | | |
| 3 | / / | / | 0 | | | | |
| 4 | / / | / | 0 | | | | |
| 5 | / / | / | 0 | | | | |

COS/FRE TO TOD CKTS VALUE:CKTS 0-255
0= NO CKT, DONT CARE C/O/S/FRE= 7/6/25/2

| # | C/O/ | S/FRE | CKT | CKT | CKT | CKT | CKT |
|---|---|---|---|---|---|---|---|
| 6 | / / | / | 0 | | | | |
| 7 | / / | / | 0 | | | | |
| 8 | / / | / | 0 | | | | |
| 9 | / / | / | 0 | | | | |
| 10 | / / | / | 0 | | | | |

SPLIT TO TIME PLAN VALUE(0-4)
SPLITS 4 SPLITS/CYCLE: N

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

PGDN FOR COS TO LEAD/LAG

CYCLE/OFFSET/SPLIT TO LEAD/LAG
DON'T CARE C/O/S = 7/6/25, L/L PATT= 0-8

| # | C/O/ | S | L/L PATT | # | C/O/ | S | L/L PATT |
|---|---|---|---|---|---|---|---|
| 1 | / / | | | 6 | / / | | |
| 2 | / / | | | 7 | / / | | |
| 3 | / / | | | 8 | / / | | |
| 4 | / / | | | 9 | / / | | |
| 5 | / / | | | 10 | / / | | |

DAY PLAN 1

| HH:MM | (1-50) CIRCUIT-PLAN | (6/5/4) C/O/S | (1-255) CKT-ON/OFF |
|---|---|---|---|
| 00:00 | | / / | FRE ON |
| 05:30 | | 3/1/3 | |
| 05:30 | | / / | FRE OFF |
| 10:00 | | 2/1/2 | |

USE (YES/NO) TO TOGGLE ON/OFF

DAY PLAN 1

| HH:MM | (1-50) CIRCUIT-PLAN | (6/5/4) C/O/S | (1-255) CKT-ON/OFF |
|---|---|---|---|
| 15:00 | | 3/2/4 | |
| 17:00 | | 3/3/1 | |
| 17:20 | | 3/2/1 | |
| 19:30 | | 1/1/1 | |

USE (YES/NO) TO TOGGLE ON/OFF

WEEK PLANS 1-20 VALUE:DAY PLANS 0-32
(0 & 1 = DP 1)

| PLAN | SUN | MON | TUE | WED | THU | FRI | SAT |
|---|---|---|---|---|---|---|---|
| 11 | | | | | | | |
| 12 | | | | | | | |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | |

WEEK PLANS 1-20 VALUE:DAY PLANS 0-32
(0 & 1 = DP 1)

| PLAN | SUN | MON | TUE | WED | THU | FRI | SAT |
|---|---|---|---|---|---|---|---|
| 16 | | | | | | | |
| 17 | | | | | | | |
| 18 | | | | | | | |
| 19 | | | | | | | |
| 20 | | | | | | | |

YEAR PLAN VALUE:WEEK PLANS 1-20

| WEEK OF YEAR | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1: | 1 | 2: | 1 | 3: | 1 | 4: | 1 | 5: | 1 | |
| 6: | 1 | 7: | 1 | 8: | 1 | 9: | 1 | 10: | 1 | |
| 11: | 1 | 12: | 1 | 13: | 1 | 14: | 1 | 15: | 1 | |
| 16: | 1 | 17: | 1 | 18: | 1 | 19: | 1 | 20: | 1 | |
| 21: | 1 | 22: | 1 | 23: | 1 | 24: | 1 | 25: | 1 | |
| 26: | 1 | 27: | 1 | 28: | 1 | 29: | 1 | 30: | 1 | |

YEAR PLAN VALUE:WEEK PLANS 1-20

| WEEK OF YEAR | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 31: | 1 | 32: | 1 | 33: | 1 | | | | | |
| 34: | 1 | 35: | 1 | 36: | 1 | 37: | 1 | 38: | 1 | |
| 39: | 1 | 40: | 1 | 41: | 1 | 42: | 1 | 43: | 1 | |
| 44: | 1 | 45: | 1 | 46: | 1 | 47: | 1 | 48: | 1 | |
| 49: | 1 | 50: | 1 | 51: | 1 | 52: | 1 | 53: | 1 | |

EXCEPTION DAYS 1-50 WOM=5 IS LAST WK

| EXC DAY | (0-12) MONTH | (0-31,0-7) DOM-DOW | (0-5) WOM | (0-32) DAY-PLAN |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |

EXCEPTION DAYS 1-50 WOM=5 IS LAST WK

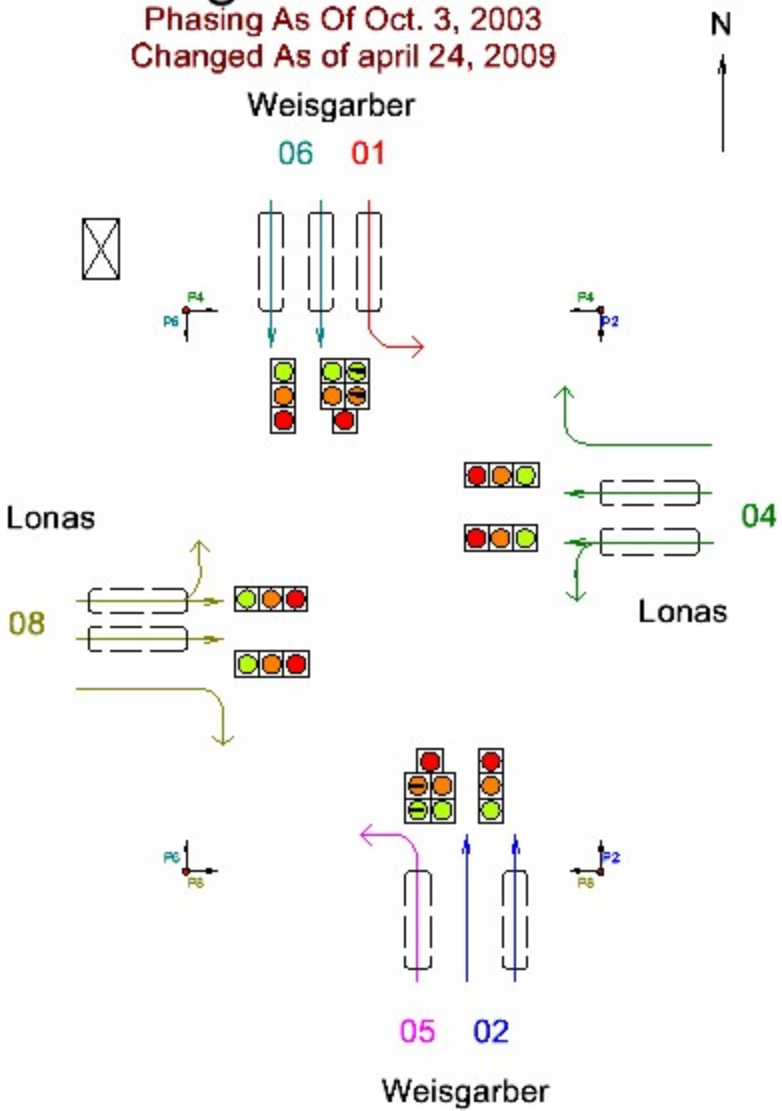
| EXC DAY | (0-12) MONTH | (0-31,0-7) DOM-DOW | (0-5) WOM | (0-32) DAY-PLAN |
|---|---|---|---|---|
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |

EXCEPTION DAYS 1-50 WOM=5 IS LAST WK

| EXC DAY | (0-12) MONTH | (0-31,0-7) DOM-DOW | (0-5) WOM | (0-32) DAY-PLAN |
|---|---|---|---|---|
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |

# Weisgarber & Lonas

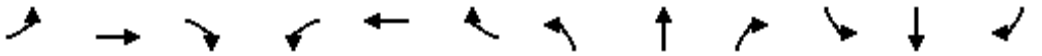
Phasing As Of Oct. 3, 2003
Changed As of april 24, 2009



# Appendix IV – Existing Analysis Synchro Reports

# HCM 6th Signalized Intersection Summary
## 1: Vanosdale Rd/Francis Rd & Middlebrook Pike

05/23/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 38 | 1057 | 217 | 185 | 601 | 64 | 90 | 111 | 331 | 256 | 205 | 150 |
| Future Volume (veh/h) | 38 | 1057 | 217 | 185 | 601 | 64 | 90 | 111 | 331 | 256 | 205 | 150 |
| 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 | 1737 | 1870 | 1870 | 1856 | 1826 | 1826 | 1885 | 1796 | 1870 | 1841 | 1826 | 1856 |
| Adj Flow Rate, veh/h | 40 | 1101 | 226 | 193 | 626 | 67 | 94 | 116 | 345 | 267 | 214 | 156 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 11 | 2 | 2 | 3 | 5 | 5 | 1 | 7 | 2 | 4 | 5 | 3 |
| Cap, veh/h | 349 | 1358 | 696 | 239 | 1207 | 129 | 336 | 327 | 444 | 421 | 479 | 412 |
| Arrive On Green | 0.09 | 0.38 | 0.38 | 0.07 | 0.26 | 0.26 | 0.06 | 0.18 | 0.18 | 0.14 | 0.26 | 0.26 |
| Sat Flow, veh/h | 1654 | 3554 | 1585 | 1767 | 3162 | 338 | 1795 | 1796 | 1585 | 1753 | 1826 | 1572 |
| Grp Volume(v), veh/h | 40 | 1101 | 226 | 193 | 343 | 350 | 94 | 116 | 345 | 267 | 214 | 156 |
| Grp Sat Flow(s),veh/h/ln | 1654 | 1777 | 1585 | 1767 | 1735 | 1765 | 1795 | 1796 | 1585 | 1753 | 1826 | 1572 |
| Q Serve(g_s), s | 0.0 | 30.5 | 10.3 | 8.7 | 18.7 | 18.7 | 4.6 | 6.2 | 20.0 | 13.1 | 10.8 | 6.5 |
| Cycle Q Clear(g_c), s | 0.0 | 30.5 | 10.3 | 8.7 | 18.7 | 18.7 | 4.6 | 6.2 | 20.0 | 13.1 | 10.8 | 6.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.19 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 349 | 1358 | 696 | 239 | 662 | 674 | 336 | 327 | 444 | 421 | 479 | 412 |
| V/C Ratio(X) | 0.11 | 0.81 | 0.32 | 0.81 | 0.52 | 0.52 | 0.28 | 0.36 | 0.78 | 0.63 | 0.45 | 0.38 |
| Avail Cap(c_a), veh/h | 351 | 1358 | 696 | 306 | 662 | 674 | 429 | 327 | 444 | 435 | 479 | 412 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 0.67 | 0.67 | 0.67 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 30.0 | 30.4 | 20.2 | 30.4 | 32.2 | 32.3 | 33.6 | 39.4 | 36.4 | 28.9 | 33.9 | 17.7 |
| Incr Delay (d2), s/veh | 0.1 | 5.3 | 1.2 | 11.6 | 2.9 | 2.8 | 0.2 | 0.2 | 7.7 | 2.1 | 0.2 | 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 | 0.8 | 13.0 | 4.0 | 4.4 | 8.5 | 8.7 | 2.0 | 2.8 | 9.4 | 5.7 | 4.8 | 2.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 30.1 | 35.8 | 21.4 | 42.0 | 35.1 | 35.1 | 33.8 | 39.6 | 44.1 | 31.0 | 34.2 | 18.0 |
| LnGrp LOS | C | D | C | D | D | D | C | D | D | C | C | B |
| Approach Vol, veh/h | | 1367 | | | 886 | | | 555 | | | 637 | |
| Approach Delay, s/veh | | 33.2 | | | 36.6 | | | 41.4 | | | 28.9 | |
| Approach LOS | | C | | | D | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.9 | 48.0 | 20.1 | 26.0 | 15.8 | 48.0 | 11.3 | 34.8 |
| Change Period (Y+Rc), s | 6.0 | * 6 | 5.0 | 6.0 | 5.0 | 6.0 | 5.0 | * 6 |
| Max Green Setting (Gmax), s | 10.0 | * 42 | 16.0 | 20.0 | 15.0 | 37.0 | 12.0 | * 25 |
| Max Q Clear Time (g_c+I1), s | 2.0 | 20.7 | 15.1 | 22.0 | 10.7 | 32.5 | 6.6 | 12.8 |
| Green Ext Time (p_c), s | 0.0 | 2.2 | 0.0 | 0.0 | 0.2 | 2.2 | 0.0 | 0.9 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 34.6 |
| HCM 6th LOS | C |

**Notes**

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

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.1 |

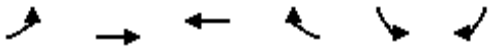
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 22 | 1315 | 35 | 31 | 864 | 6 | 44 | 1 | 57 | 12 | 3 | 30 |
| Future Vol, veh/h | 22 | 1315 | 35 | 31 | 864 | 6 | 44 | 1 | 57 | 12 | 3 | 30 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 25 | - | - | 128 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 1 | - | - | 1 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, % | 0 | 2 | 6 | 0 | 5 | 0 | 4 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 24 | 1445 | 38 | 34 | 949 | 7 | 48 | 1 | 63 | 13 | 3 | 33 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 956 | 0 | 0 | 1483 | 0 | 0 | 2056 | 2536 | 742 | 1792 | 2552 | 478 |
| Stage 1 | - | - | - | - | - | - | 1512 | 1512 | - | 1021 | 1021 | - |
| Stage 2 | - | - | - | - | - | - | 544 | 1024 | - | 771 | 1531 | - |
| Critical Hdwy | 4.1 | - | - | 4.1 | - | - | 7.58 | 6.5 | 6.9 | 7.5 | 6.5 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.58 | 5.5 | - | 6.5 | 5.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.58 | 5.5 | - | 6.5 | 5.5 | - |
| Follow-up Hdwy | 2.2 | - | - | 2.2 | - | - | 3.54 | 4 | 3.3 | 3.5 | 4 | 3.3 |
| Pot Cap-1 Maneuver | 1106 | - | - | *824 | - | - | *143 | 30 | *549 | *410 | 29 | *746 |
| Stage 1 | - | - | - | - | - | - | *482 | 433 | - | *609 | 553 | - |
| Stage 2 | - | - | - | - | - | - | *696 | 551 | - | *517 | 418 | - |
| Platoon blocked, % | 1 | - | - | 1 | - | - | 1 | 1 | 1 | 1 | 1 | 1 |
| Mov Cap-1 Maneuver | 1106 | - | - | *824 | - | - | *128 | 28 | *549 | *345 | 27 | *746 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | *300 | 223 | - | *364 | 212 | - |
| Stage 1 | - | - | - | - | - | - | *471 | 424 | - | *595 | 531 | - |
| Stage 2 | - | - | - | - | - | - | *634 | 528 | - | *447 | 408 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.1 | 0.3 | 17.5 | 12.7 |
| HCM LOS | | | C | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 400 | 1106 | - | - | * 824 | - | - | 515 |
| HCM Lane V/C Ratio | 0.28 | 0.022 | - | - | 0.041 | - | - | 0.096 |
| HCM Control Delay (s) | 17.5 | 8.3 | - | - | 9.6 | - | - | 12.7 |
| HCM Lane LOS | C | A | - | - | A | - | - | B |
| HCM 95th %tile Q(veh) | 1.1 | 0.1 | - | - | 0.1 | - | - | 0.3 |

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



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 154 | 1233 | 841 | 109 | 84 | 72 |
| Future Volume (veh/h) | 154 | 1233 | 841 | 109 | 84 | 72 |
| 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 | 1885 | 1870 | 1841 | 1841 | 1870 | 1900 |
| Adj Flow Rate, veh/h | 169 | 1355 | 924 | 120 | 92 | 79 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 1 | 2 | 4 | 4 | 2 | 0 |
| Cap, veh/h | 715 | 2917 | 1783 | 231 | 125 | 113 |
| Arrive On Green | 0.26 | 1.00 | 1.00 | 1.00 | 0.07 | 0.07 |
| Sat Flow, veh/h | 1795 | 3647 | 3205 | 404 | 1781 | 1610 |
| Grp Volume(v), veh/h | 169 | 1355 | 519 | 525 | 92 | 79 |
| Grp Sat Flow(s),veh/h/ln | 1795 | 1777 | 1749 | 1768 | 1781 | 1610 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 0.0 | 5.6 | 5.3 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 0.0 | 5.6 | 5.3 |
| Prop In Lane | 1.00 | | | 0.23 | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 715 | 2917 | 1002 | 1013 | 125 | 113 |
| V/C Ratio(X) | 0.24 | 0.46 | 0.52 | 0.52 | 0.74 | 0.70 |
| Avail Cap(c_a), veh/h | 715 | 2917 | 1002 | 1013 | 324 | 293 |
| HCM Platoon Ratio | 1.33 | 1.33 | 2.00 | 2.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 4.5 | 0.0 | 0.0 | 0.0 | 50.1 | 50.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.5 | 1.9 | 1.9 | 3.1 | 2.9 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.9 | 0.2 | 0.5 | 0.5 | 2.6 | 2.2 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d),s/veh | 4.6 | 0.5 | 1.9 | 1.9 | 53.3 | 52.9 |
| LnGrp LOS | A | A | A | A | D | D |
| Approach Vol, veh/h | | 1524 | 1044 | | 171 | |
| Approach Delay, s/veh | | 1.0 | 1.9 | | 53.1 | |
| Approach LOS | | A | A | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 27.3 | 69.0 | | 13.7 | | 96.3 |
| Change Period (Y+Rc), s | 6.0 | * 6 | | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | 10.0 | * 63 | | 20.0 | | 78.0 |
| Max Q Clear Time (g_c+I1), s | 2.0 | 2.0 | | 7.6 | | 2.0 |
| Green Ext Time (p_c), s | 0.1 | 7.3 | | 0.2 | | 12.9 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 4.6 |
| HCM 6th LOS | A |

Notes

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

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.9 |

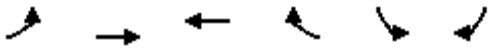
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 39 | 1269 | 895 | 86 | 65 | 54 |
| Future Vol, veh/h | 39 | 1269 | 895 | 86 | 65 | 54 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 124 | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 0 | 2 | 4 | 1 | 3 | 0 |
| Mvmt Flow | 42 | 1379 | 973 | 93 | 71 | 59 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1066 | 0 | - | 0 | 1794 | 533 |
| Stage 1 | - | - | - | - | 1020 | - |
| Stage 2 | - | - | - | - | 774 | - |
| Critical Hdwy | 4.1 | - | - | - | 6.86 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.86 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.86 | - |
| Follow-up Hdwy | 2.2 | - | - | - | 3.53 | 3.3 |
| Pot Cap-1 Maneuver | 1021 | - | - | - | *289 | *718 |
| Stage 1 | - | - | - | - | *672 | - |
| Stage 2 | - | - | - | - | *540 | - |
| Platoon blocked, % | 1 | - | - | - | 1 | 1 |
| Mov Cap-1 Maneuver | 1021 | - | - | - | *277 | *718 |
| Mov Cap-2 Maneuver | - | - | - | - | *393 | - |
| Stage 1 | - | - | - | - | *644 | - |
| Stage 2 | - | - | - | - | *540 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.3 | 0 | 14.8 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1021 | - | - | - | 495 |
| HCM Lane V/C Ratio | 0.042 | - | - | - | 0.261 |
| HCM Control Delay (s) | 8.7 | - | - | - | 14.8 |
| HCM Lane LOS | A | - | - | - | B |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 1 |

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



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 204 | 1136 | 951 | 207 | 34 | 30 |
| Future Volume (veh/h) | 204 | 1136 | 951 | 207 | 34 | 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 | 1900 | 1870 | 1841 | 1856 | 1856 | 1796 |
| Adj Flow Rate, veh/h | 222 | 1235 | 1034 | 0 | 37 | 33 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 0 | 2 | 4 | 3 | 3 | 7 |
| Cap, veh/h | 664 | 3056 | 2257 | | 71 | 61 |
| Arrive On Green | 0.32 | 1.00 | 0.86 | 0.00 | 0.04 | 0.04 |
| Sat Flow, veh/h | 1810 | 3647 | 3589 | 1572 | 1767 | 1522 |
| Grp Volume(v), veh/h | 222 | 1235 | 1034 | 0 | 37 | 33 |
| Grp Sat Flow(s),veh/h/ln | 1810 | 1777 | 1749 | 1572 | 1767 | 1522 |
| Q Serve(g_s), s | 0.0 | 0.0 | 7.6 | 0.0 | 2.3 | 2.3 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 7.6 | 0.0 | 2.3 | 2.3 |
| Prop In Lane | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 664 | 3056 | 2257 | | 71 | 61 |
| V/C Ratio(X) | 0.33 | 0.40 | 0.46 | | 0.52 | 0.54 |
| Avail Cap(c_a), veh/h | 664 | 3056 | 2257 | | 161 | 138 |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.33 | 1.33 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.81 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 5.2 | 0.0 | 3.3 | 0.0 | 51.8 | 51.8 |
| Incr Delay (d2), s/veh | 0.1 | 0.4 | 0.5 | 0.0 | 2.2 | 2.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.3 | 0.2 | 1.8 | 0.0 | 1.0 | 0.9 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d),s/veh | 5.3 | 0.4 | 3.8 | 0.0 | 54.0 | 54.5 |
| LnGrp LOS | A | A | A | | D | D |
| Approach Vol, veh/h | | 1457 | 1034 | A | 70 | |
| Approach Delay, s/veh | | 1.2 | 3.8 | | 54.2 | |
| Approach LOS | | A | A | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 23.6 | 77.0 | | 9.4 | | 100.6 |
| Change Period (Y+Rc), s | 6.0 | * 6 | | 5.0 | | 6.0 |
| Max Green Setting (Gmax), s | 13.0 | * 71 | | 10.0 | | 89.0 |
| Max Q Clear Time (g_c+I1), s | 2.0 | 9.6 | | 4.3 | | 2.0 |
| Green Ext Time (p_c), s | 0.2 | 8.2 | | 0.0 | | 11.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 3.7 |
| HCM 6th LOS | A |

Notes

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 44 | 1019 | 97 | 24 | 1025 | 170 | 108 | 55 | 7 | 22 | 5 | 7 |
| Future Volume (veh/h) | 44 | 1019 | 97 | 24 | 1025 | 170 | 108 | 55 | 7 | 22 | 5 | 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 | 1870 | 1870 | 1870 | 1900 | 1841 | 1841 | 1900 | 1900 | 1900 | 1767 | 1900 | 1900 |
| Adj Flow Rate, veh/h | 47 | 1084 | 103 | 26 | 1090 | 181 | 115 | 59 | 7 | 23 | 5 | 7 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 0 | 4 | 4 | 0 | 0 | 0 | 9 | 0 | 0 |
| Cap, veh/h | 288 | 2087 | 198 | 361 | 2026 | 336 | 182 | 70 | 8 | 224 | 97 | 136 |
| Arrive On Green | 0.02 | 0.43 | 0.43 | 0.06 | 0.67 | 0.67 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 |
| Sat Flow, veh/h | 1781 | 3280 | 311 | 1810 | 3003 | 497 | 946 | 515 | 59 | 1261 | 716 | 1003 |
| Grp Volume(v), veh/h | 47 | 587 | 600 | 26 | 634 | 637 | 181 | 0 | 0 | 23 | 0 | 12 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1777 | 1814 | 1810 | 1749 | 1751 | 1520 | 0 | 0 | 1261 | 0 | 1719 |
| Q Serve(g_s), s | 1.2 | 26.8 | 26.8 | 0.0 | 20.3 | 20.5 | 12.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 |
| Cycle Q Clear(g_c), s | 1.2 | 26.8 | 26.8 | 0.0 | 20.3 | 20.5 | 12.9 | 0.0 | 0.0 | 1.9 | 0.0 | 0.7 |
| Prop In Lane | 1.00 | | 0.17 | 1.00 | | 0.28 | 0.64 | | 0.04 | 1.00 | | 0.58 |
| Lane Grp Cap(c), veh/h | 288 | 1131 | 1155 | 361 | 1180 | 1182 | 260 | 0 | 0 | 224 | 0 | 234 |
| V/C Ratio(X) | 0.16 | 0.52 | 0.52 | 0.07 | 0.54 | 0.54 | 0.70 | 0.00 | 0.00 | 0.10 | 0.00 | 0.05 |
| Avail Cap(c_a), veh/h | 373 | 1131 | 1155 | 361 | 1180 | 1182 | 275 | 0 | 0 | 236 | 0 | 250 |
| HCM Platoon Ratio | 0.67 | 0.67 | 0.67 | 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 | 0.80 | 0.80 | 0.80 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 11.3 | 19.1 | 19.2 | 18.3 | 9.1 | 9.1 | 46.8 | 0.0 | 0.0 | 41.9 | 0.0 | 41.4 |
| Incr Delay (d2), s/veh | 0.2 | 1.6 | 1.5 | 0.1 | 1.4 | 1.4 | 5.6 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.4 | 11.8 | 12.0 | 0.4 | 6.6 | 6.6 | 5.2 | 0.0 | 0.0 | 0.6 | 0.0 | 0.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 11.6 | 20.7 | 20.7 | 18.4 | 10.5 | 10.6 | 52.5 | 0.0 | 0.0 | 42.0 | 0.0 | 41.4 |
| LnGrp LOS | B | C | C | B | B | B | D | A | A | D | A | D |
| Approach Vol, veh/h | | 1234 | | | 1297 | | | 181 | | | 35 | |
| Approach Delay, s/veh | | 20.4 | | | 10.7 | | | 52.5 | | | 41.8 | |
| Approach LOS | | C | | | B | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.8 | 80.2 | | 21.0 | 13.0 | 76.0 | | 21.0 |
| Change Period (Y+Rc), s | 5.0 | 6.0 | | 6.0 | 6.0 | * 6 | | 6.0 |
| Max Green Setting (Gmax), s | 3.8 | 68.0 | | 16.0 | 7.0 | * 70 | | 16.0 |
| Max Q Clear Time (g_c+I1), s | 3.2 | 22.5 | | 3.9 | 2.0 | 28.8 | | 14.9 |
| Green Ext Time (p_c), s | 0.0 | 9.9 | | 0.0 | 0.0 | 8.6 | | 0.1 |

| Intersection Summary | | |
|---|---|---|
| HCM 6th Ctrl Delay | 18.2 | |
| HCM 6th LOS | B | |

Notes

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 21 | 582 | 425 | 652 | 856 | 79 | 409 | 99 | 431 | 16 | 17 | 7 |
| Future Volume (veh/h) | 21 | 582 | 425 | 652 | 856 | 79 | 409 | 99 | 431 | 16 | 17 | 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 | 1826 | 1841 | 1856 | 1678 | 1841 | 1841 | 1870 | 1870 | 1870 | 1530 | 1470 | 1470 |
| Adj Flow Rate, veh/h | 23 | 633 | 0 | 709 | 930 | 86 | 445 | 108 | 0 | 17 | 18 | 8 |
| 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, % | 5 | 4 | 3 | 15 | 4 | 4 | 2 | 2 | 2 | 25 | 29 | 29 |
| Cap, veh/h | 278 | 1418 | | 564 | 1383 | 128 | 517 | 339 | | 32 | 52 | 23 |
| Arrive On Green | 0.21 | 0.54 | 0.00 | 0.18 | 0.43 | 0.43 | 0.15 | 0.18 | 0.00 | 0.02 | 0.05 | 0.05 |
| Sat Flow, veh/h | 1739 | 3497 | 1572 | 3100 | 3236 | 299 | 3456 | 1870 | 0 | 1457 | 964 | 429 |
| Grp Volume(v), veh/h | 23 | 633 | 0 | 709 | 503 | 513 | 445 | 108 | 0 | 17 | 0 | 26 |
| Grp Sat Flow(s),veh/h/ln | 1739 | 1749 | 1572 | 1550 | 1749 | 1787 | 1728 | 1870 | 0 | 1457 | 0 | 1393 |
| Q Serve(g_s), s | 1.2 | 12.1 | 0.0 | 20.0 | 25.4 | 25.4 | 13.8 | 5.5 | 0.0 | 1.3 | 0.0 | 2.0 |
| Cycle Q Clear(g_c), s | 1.2 | 12.1 | 0.0 | 20.0 | 25.4 | 25.4 | 13.8 | 5.5 | 0.0 | 1.3 | 0.0 | 2.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.17 | 1.00 | | 0.00 | 1.00 | | 0.31 |
| Lane Grp Cap(c), veh/h | 278 | 1418 | | 564 | 747 | 763 | 517 | 339 | | 32 | 0 | 75 |
| V/C Ratio(X) | 0.08 | 0.45 | | 1.26 | 0.67 | 0.67 | 0.86 | 0.32 | | 0.53 | 0.00 | 0.35 |
| Avail Cap(c_a), veh/h | 278 | 1418 | | 564 | 747 | 763 | 785 | 339 | | 331 | 0 | 89 |
| HCM Platoon Ratio | 1.33 | 1.33 | 1.33 | 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 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 36.8 | 17.8 | 0.0 | 45.0 | 25.3 | 25.3 | 45.7 | 39.1 | 0.0 | 53.2 | 0.0 | 50.2 |
| Incr Delay (d2), s/veh | 0.0 | 0.9 | 0.0 | 130.0 | 4.8 | 4.7 | 4.1 | 0.2 | 0.0 | 4.9 | 0.0 | 1.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 4.3 | 0.0 | 17.5 | 10.7 | 10.9 | 6.1 | 2.5 | 0.0 | 0.5 | 0.0 | 0.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 36.9 | 18.7 | 0.0 | 175.0 | 30.1 | 30.0 | 49.8 | 39.3 | 0.0 | 58.1 | 0.0 | 51.2 |
| LnGrp LOS | D | B | | F | C | C | D | D | | E | A | D |
| Approach Vol, veh/h | | 656 | A | | 1725 | | | 553 | A | | 43 | |
| Approach Delay, s/veh | | 19.4 | | | 89.6 | | | 47.7 | | | 53.9 | |
| Approach LOS | | B | | | F | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 26.0 | 50.6 | 21.5 | 11.9 | 23.6 | 53.0 | 7.4 | 26.0 |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 | 6.0 | 5.0 | * 6 |
| Max Green Setting (Gmax), s | 20.0 | 35.0 | 25.0 | 7.0 | 8.0 | 47.0 | 25.0 | * 8 |
| Max Q Clear Time (g_c+I1), s | 22.0 | 14.1 | 15.8 | 4.0 | 3.2 | 27.4 | 3.3 | 7.5 |
| Green Ext Time (p_c), s | 0.0 | 3.7 | 0.6 | 0.0 | 0.0 | 5.8 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 65.8 |
| HCM 6th LOS | E |

Notes

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 43 | 75 | 277 | 69 | 59 | 110 | 261 | 1048 | 145 | 164 | 790 | 43 |
| Future Volume (veh/h) | 43 | 75 | 277 | 69 | 59 | 110 | 261 | 1048 | 145 | 164 | 790 | 43 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1796 | 1856 | 1870 | 1900 | 1856 | 1856 | 1885 | 1811 | 1811 | 1870 | 1722 | 1722 |
| Adj Flow Rate, veh/h | 47 | 82 | 0 | 76 | 65 | 0 | 287 | 1152 | 159 | 180 | 868 | 47 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 7 | 3 | 2 | 0 | 3 | 3 | 1 | 6 | 6 | 2 | 12 | 12 |
| Cap, veh/h | 185 | 223 | | 178 | 223 | | 516 | 1976 | 272 | 361 | 1992 | 108 |
| Arrive On Green | 0.12 | 0.12 | 0.00 | 0.12 | 0.12 | 0.00 | 0.08 | 0.65 | 0.65 | 0.06 | 0.63 | 0.63 |
| Sat Flow, veh/h | 1284 | 1856 | 1585 | 1337 | 1856 | 1572 | 1795 | 3038 | 418 | 1781 | 3157 | 171 |
| Grp Volume(v), veh/h | 47 | 82 | 0 | 76 | 65 | 0 | 287 | 651 | 660 | 180 | 450 | 465 |
| Grp Sat Flow(s),veh/h/ln | 1284 | 1856 | 1585 | 1337 | 1856 | 1572 | 1795 | 1721 | 1736 | 1781 | 1636 | 1691 |
| Q Serve(g_s), s | 3.5 | 4.1 | 0.0 | 5.5 | 3.2 | 0.0 | 5.5 | 21.3 | 21.5 | 3.5 | 14.0 | 14.0 |
| Cycle Q Clear(g_c), s | 6.7 | 4.1 | 0.0 | 9.6 | 3.2 | 0.0 | 5.5 | 21.3 | 21.5 | 3.5 | 14.0 | 14.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.24 | 1.00 | | 0.10 |
| Lane Grp Cap(c), veh/h | 185 | 223 | | 178 | 223 | | 516 | 1119 | 1129 | 361 | 1033 | 1067 |
| V/C Ratio(X) | 0.25 | 0.37 | | 0.43 | 0.29 | | 0.56 | 0.58 | 0.58 | 0.50 | 0.44 | 0.44 |
| Avail Cap(c_a), veh/h | 474 | 640 | | 479 | 640 | | 643 | 1119 | 1129 | 522 | 1033 | 1067 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 43.2 | 40.5 | 0.0 | 44.9 | 40.1 | 0.0 | 6.8 | 9.8 | 9.9 | 8.7 | 9.4 | 9.4 |
| Incr Delay (d2), s/veh | 0.5 | 0.8 | 0.0 | 1.2 | 0.5 | 0.0 | 0.7 | 2.2 | 2.2 | 0.8 | 1.3 | 1.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.1 | 1.9 | 0.0 | 1.9 | 1.5 | 0.0 | 1.7 | 7.3 | 7.5 | 1.2 | 4.9 | 5.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 43.7 | 41.3 | 0.0 | 46.1 | 40.7 | 0.0 | 7.5 | 12.0 | 12.1 | 9.5 | 10.7 | 10.7 |
| LnGrp LOS | D | D | | D | D | | A | B | B | A | B | B |
| Approach Vol, veh/h | | 129 | A | | 141 | A | | 1598 | | | 1095 | |
| Approach Delay, s/veh | | 42.1 | | | 43.6 | | | 11.3 | | | 10.5 | |
| Approach LOS | | D | | | D | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.0 | 71.5 | | 17.5 | 12.9 | 69.6 | | 17.5 | | | | |
| Change Period (Y+Rc), s | 5.0 | 6.5 | | 5.5 | 5.0 | 6.5 | | 5.5 | | | | |
| Max Green Setting (Gmax), s | 15.0 | 33.5 | | 34.5 | 15.0 | 33.5 | | 34.5 | | | | |
| Max Q Clear Time (g_c+I1), s | 15.5 | 23.5 | | 11.6 | 7.5 | 16.0 | | 8.7 | | | | |
| Green Ext Time (p_c), s | 0.2 | 7.5 | | 0.4 | 0.4 | 8.6 | | 0.4 | | | | |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 13.9 |
| HCM 6th LOS | B |

Notes

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

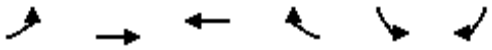
| Intersection | |
|---|---|
| Int Delay, s/veh | 3 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 28 | 301 | 206 | 158 | 91 | 44 |
| Future Vol, veh/h | 28 | 301 | 206 | 158 | 91 | 44 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 89 | 89 | 89 | 89 | 89 | 89 |
| Heavy Vehicles, % | 4 | 3 | 1 | 5 | 1 | 0 |
| Mvmt Flow | 31 | 338 | 231 | 178 | 102 | 49 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 409 | 0 | - | 0 | 720 | 320 |
| Stage 1 | - | - | - | - | 320 | - |
| Stage 2 | - | - | - | - | 400 | - |
| Critical Hdwy | 4.14 | - | - | - | 6.41 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.41 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.41 | - |
| Follow-up Hdwy | 2.236 | - | - | - | 3.509 | 3.3 |
| Pot Cap-1 Maneuver | 1139 | - | - | - | 396 | 725 |
| Stage 1 | - | - | - | - | 738 | - |
| Stage 2 | - | - | - | - | 679 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1139 | - | - | - | 383 | 725 |
| Mov Cap-2 Maneuver | - | - | - | - | 383 | - |
| Stage 1 | - | - | - | - | 713 | - |
| Stage 2 | - | - | - | - | 679 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.7 | 0 | 16.9 |
| HCM LOS | | | C |

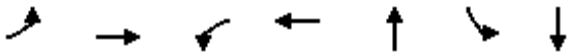
| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1139 | - | - | - | 453 |
| HCM Lane V/C Ratio | 0.028 | - | - | - | 0.335 |
| HCM Control Delay (s) | 8.2 | 0 | - | - | 16.9 |
| HCM Lane LOS | A | A | - | - | C |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 1.5 |



| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 222 | 1235 | 1034 | 225 | 37 | 33 |
| v/c Ratio | 0.40 | 0.40 | 0.43 | 0.20 | 0.34 | 0.26 |
| Control Delay | 5.4 | 1.8 | 10.3 | 5.2 | 57.0 | 21.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 5.4 | 1.8 | 10.3 | 5.2 | 57.0 | 21.1 |
| Queue Length 50th (ft) | 14 | 50 | 213 | 47 | 26 | 0 |
| Queue Length 95th (ft) | 34 | 72 | 240 | m64 | 59 | 31 |
| Internal Link Dist (ft) | | 638 | 1347 | | 539 | |
| Turn Bay Length (ft) | 235 | | | 65 | 465 | |
| Base Capacity (vph) | 561 | 3065 | 2400 | 1126 | 159 | 167 |
| 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 | 0.40 | 0.40 | 0.43 | 0.20 | 0.23 | 0.20 |

Intersection Summary

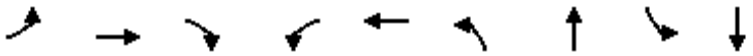
m Volume for 95th percentile queue is metered by upstream signal.



| Lane Group | EBL | EBT | WBL | WBT | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 47 | 1187 | 26 | 1271 | 181 | 23 | 12 |
| v/c Ratio | 0.17 | 0.49 | 0.07 | 0.56 | 0.88 | 0.15 | 0.05 |
| Control Delay | 7.2 | 7.2 | 4.4 | 7.2 | 84.0 | 43.8 | 28.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 7.2 | 7.2 | 4.4 | 7.2 | 84.0 | 43.8 | 28.3 |
| Queue Length 50th (ft) | 10 | 138 | 5 | 233 | 125 | 14 | 3 |
| Queue Length 95th (ft) | 21 | 158 | m6 | 216 | #248 | 39 | 21 |
| Internal Link Dist (ft) | | 1347 | | 1583 | 334 | | 424 |
| Turn Bay Length (ft) | 75 | | 120 | | | 125 | |
| Base Capacity (vph) | 316 | 2410 | 380 | 2290 | 217 | 162 | 258 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.15 | 0.49 | 0.07 | 0.56 | 0.83 | 0.14 | 0.05 |

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.



| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 23 | 633 | 462 | 709 | 1016 | 445 | 576 | 17 | 26 |
| v/c Ratio | 0.22 | 0.57 | 0.57 | 1.28 | 0.59 | 0.52 | 1.01 | 0.20 | 0.21 |
| Control Delay | 39.9 | 21.9 | 12.0 | 178.0 | 22.0 | 39.7 | 68.9 | 54.5 | 40.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 39.9 | 21.9 | 12.0 | 178.0 | 22.0 | 39.7 | 68.9 | 54.5 | 40.0 |
| Queue Length 50th (ft) | 16 | 221 | 213 | ~328 | 224 | 156 | 299 | 12 | 12 |
| Queue Length 95th (ft) | m34 | 255 | 336 | #445 | 373 | 201 | #634 | 35 | 41 |
| Internal Link Dist (ft) | | 1583 | | | 865 | | 1309 | | 808 |
| Turn Bay Length (ft) | 120 | | 200 | 210 | | 145 | | 110 | |
| Base Capacity (vph) | 125 | 1104 | 813 | 553 | 1730 | 942 | 573 | 328 | 128 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.18 | 0.57 | 0.57 | 1.28 | 0.59 | 0.47 | 1.01 | 0.05 | 0.20 |

Intersection Summary

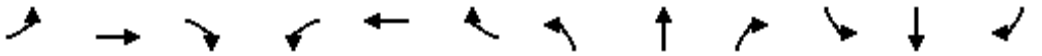
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 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.

# HCM 6th Signalized Intersection Summary
## 1: Vanosdale Rd/Francis Rd & Middlebrook Pike

05/23/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 122 | 853 | 262 | 217 | 1094 | 96 | 237 | 201 | 139 | 72 | 149 | 78 |
| Future Volume (veh/h) | 122 | 853 | 262 | 217 | 1094 | 96 | 237 | 201 | 139 | 72 | 149 | 78 |
| 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 | 1885 | 1870 | 1885 | 1900 | 1900 | 1900 | 1885 | 1885 | 1885 | 1900 | 1900 | 1856 |
| Adj Flow Rate, veh/h | 131 | 917 | 282 | 233 | 1176 | 103 | 255 | 216 | 149 | 77 | 160 | 84 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 3 |
| Cap, veh/h | 219 | 1463 | 869 | 331 | 1493 | 131 | 402 | 465 | 541 | 309 | 311 | 257 |
| Arrive On Green | 0.06 | 0.41 | 0.41 | 0.03 | 0.15 | 0.15 | 0.13 | 0.25 | 0.25 | 0.05 | 0.16 | 0.16 |
| Sat Flow, veh/h | 1795 | 3554 | 1598 | 1810 | 3358 | 294 | 1795 | 1885 | 1598 | 1810 | 1900 | 1572 |
| Grp Volume(v), veh/h | 131 | 917 | 282 | 233 | 631 | 648 | 255 | 216 | 149 | 77 | 160 | 84 |
| Grp Sat Flow(s),veh/h/ln | 1795 | 1777 | 1598 | 1810 | 1805 | 1847 | 1795 | 1885 | 1598 | 1810 | 1900 | 1572 |
| Q Serve(g_s), s | 4.6 | 22.5 | 10.8 | 7.7 | 37.1 | 37.2 | 12.5 | 10.7 | 7.5 | 3.8 | 8.5 | 5.2 |
| Cycle Q Clear(g_c), s | 4.6 | 22.5 | 10.8 | 7.7 | 37.1 | 37.2 | 12.5 | 10.7 | 7.5 | 3.8 | 8.5 | 5.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.16 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 219 | 1463 | 869 | 331 | 803 | 821 | 402 | 465 | 541 | 309 | 311 | 257 |
| V/C Ratio(X) | 0.60 | 0.63 | 0.32 | 0.70 | 0.79 | 0.79 | 0.63 | 0.46 | 0.28 | 0.25 | 0.51 | 0.33 |
| Avail Cap(c_a), veh/h | 275 | 1463 | 869 | 476 | 803 | 821 | 426 | 465 | 541 | 384 | 311 | 257 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 23.8 | 25.6 | 13.9 | 21.6 | 41.9 | 41.9 | 30.8 | 35.3 | 26.5 | 35.6 | 42.0 | 40.6 |
| Incr Delay (d2), s/veh | 2.6 | 2.0 | 1.0 | 2.7 | 7.7 | 7.6 | 2.0 | 3.3 | 1.3 | 0.2 | 6.0 | 3.4 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.9 | 9.2 | 4.0 | 3.5 | 19.4 | 19.9 | 5.6 | 5.3 | 3.0 | 1.7 | 4.5 | 2.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 26.5 | 27.7 | 14.9 | 24.3 | 49.6 | 49.5 | 32.8 | 38.6 | 27.8 | 35.7 | 48.0 | 44.0 |
| LnGrp LOS | C | C | B | C | D | D | C | D | C | D | D | D |
| Approach Vol, veh/h | | 1330 | | | 1512 | | | 620 | | | 321 | |
| Approach Delay, s/veh | | 24.9 | | | 45.7 | | | 33.6 | | | 44.0 | |
| Approach LOS | | C | | | D | | | C | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.5 | 54.9 | 10.4 | 33.1 | 15.2 | 51.3 | 19.6 | 24.0 |
| Change Period (Y+Rc), s | 5.0 | 6.0 | 5.0 | 6.0 | 5.0 | 6.0 | 5.0 | * 6 |
| Max Green Setting (Gmax), s | 10.0 | 45.0 | 10.0 | 23.0 | 19.0 | 36.0 | 16.0 | * 18 |
| Max Q Clear Time (g_c+I1), s | 6.6 | 39.2 | 5.8 | 12.7 | 9.7 | 24.5 | 14.5 | 10.5 |
| Green Ext Time (p_c), s | 0.1 | 2.6 | 0.0 | 0.8 | 0.4 | 3.4 | 0.1 | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 36.2 |
| HCM 6th LOS | D |

**Notes**

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

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.9 |

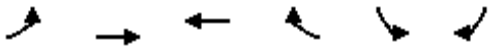
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 29 | 846 | 24 | 56 | 1320 | 11 | 30 | 3 | 27 | 4 | 2 | 26 |
| Future Vol, veh/h | 29 | 846 | 24 | 56 | 1320 | 11 | 30 | 3 | 27 | 4 | 2 | 26 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 25 | - | - | 128 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 1 | - | - | 1 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, % | 0 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 0 | 0 |
| Mvmt Flow | 32 | 930 | 26 | 62 | 1451 | 12 | 33 | 3 | 30 | 4 | 2 | 29 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1463 | 0 | 0 | 956 | 0 | 0 | 1858 | 2594 | 478 | 2112 | 2601 | 732 |
| Stage 1 | - | - | - | - | - | - | 1007 | 1007 | - | 1581 | 1581 | - |
| Stage 2 | - | - | - | - | - | - | 851 | 1587 | - | 531 | 1020 | - |
| Critical Hdwy | 4.1 | - | - | 4.1 | - | - | 7.5 | 6.5 | 6.98 | 7.5 | 6.5 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.5 | 5.5 | - | 6.5 | 5.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.5 | 5.5 | - | 6.5 | 5.5 | - |
| Follow-up Hdwy | 2.2 | - | - | 2.2 | - | - | 3.5 | 4 | 3.34 | 3.5 | 4 | 3.3 |
| Pot Cap-1 Maneuver | *824 | - | - | 1106 | - | - | *346 | 27 | *737 | *193 | 27 | *549 |
| Stage 1 | - | - | - | - | - | - | *625 | 564 | - | *407 | 379 | - |
| Stage 2 | - | - | - | - | - | - | *517 | 374 | - | *703 | 554 | - |
| Platoon blocked, % | 1 | - | - | 1 | - | - | 1 | 1 | 1 | 1 | 1 | 1 |
| Mov Cap-1 Maneuver | *824 | - | - | 1106 | - | - | *302 | 25 | *737 | *170 | 24 | *549 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | *357 | 195 | - | *287 | 196 | - |
| Stage 1 | - | - | - | - | - | - | *601 | 542 | - | *391 | 358 | - |
| Stage 2 | - | - | - | - | - | - | *460 | 353 | - | *645 | 532 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.5 | 0.3 | 14.6 | 13.7 |
| HCM LOS | | | B | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 441 | * 824 | - | - | 1106 | - | - | 448 |
| HCM Lane V/C Ratio | 0.15 | 0.039 | - | - | 0.056 | - | - | 0.078 |
| HCM Control Delay (s) | 14.6 | 9.5 | 0.2 | - | 8.4 | - | - | 13.7 |
| HCM Lane LOS | B | A | A | - | A | - | - | B |
| HCM 95th %tile Q(veh) | 0.5 | 0.1 | - | - | 0.2 | - | - | 0.3 |

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



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 107 | 777 | 1227 | 70 | 129 | 98 |
| Future Volume (veh/h) | 107 | 777 | 1227 | 70 | 129 | 98 |
| 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 | 1900 | 1856 | 1885 | 1885 | 1870 | 1900 |
| Adj Flow Rate, veh/h | 115 | 835 | 1319 | 75 | 139 | 105 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 0 | 3 | 1 | 1 | 2 | 0 |
| Cap, veh/h | 423 | 2803 | 2431 | 138 | 171 | 154 |
| Arrive On Green | 0.09 | 1.00 | 1.00 | 1.00 | 0.10 | 0.10 |
| Sat Flow, veh/h | 1810 | 3618 | 3540 | 196 | 1781 | 1610 |
| Grp Volume(v), veh/h | 115 | 835 | 684 | 710 | 139 | 105 |
| Grp Sat Flow(s),veh/h/ln | 1810 | 1763 | 1791 | 1850 | 1781 | 1610 |
| Q Serve(g_s), s | 1.8 | 0.0 | 0.0 | 0.0 | 8.4 | 6.9 |
| Cycle Q Clear(g_c), s | 1.8 | 0.0 | 0.0 | 0.0 | 8.4 | 6.9 |
| Prop In Lane | 1.00 | | | 0.11 | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 423 | 2803 | 1263 | 1305 | 171 | 154 |
| V/C Ratio(X) | 0.27 | 0.30 | 0.54 | 0.54 | 0.81 | 0.68 |
| Avail Cap(c_a), veh/h | 508 | 2803 | 1263 | 1305 | 227 | 205 |
| HCM Platoon Ratio | 2.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 3.1 | 0.0 | 0.0 | 0.0 | 48.8 | 48.1 |
| Incr Delay (d2), s/veh | 0.1 | 0.3 | 1.7 | 1.6 | 11.6 | 2.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.4 | 0.1 | 0.6 | 0.6 | 4.3 | 2.9 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d),s/veh | 3.2 | 0.3 | 1.7 | 1.6 | 60.4 | 50.6 |
| LnGrp LOS | A | A | A | A | E | D |
| Approach Vol, veh/h | | 950 | 1394 | | 244 | |
| Approach Delay, s/veh | | 0.6 | 1.7 | | 56.2 | |
| Approach LOS | | A | A | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.9 | 83.6 | | 16.5 | | 93.5 |
| Change Period (Y+Rc), s | 5.0 | 6.0 | | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | 10.0 | 69.0 | | 14.0 | | 84.0 |
| Max Q Clear Time (g_c+I1), s | 3.8 | 2.0 | | 10.4 | | 2.0 |
| Green Ext Time (p_c), s | 0.1 | 11.9 | | 0.1 | | 6.1 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 6.4 |
| HCM 6th LOS | A |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.1 |

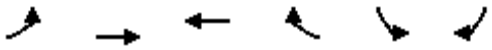
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 24 | 871 | 1228 | 68 | 70 | 57 |
| Future Vol, veh/h | 24 | 871 | 1228 | 68 | 70 | 57 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 124 | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, % | 4 | 2 | 1 | 1 | 0 | 0 |
| Mvmt Flow | 27 | 990 | 1395 | 77 | 80 | 65 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1472 | 0 | - | 0 | 1983 | 736 |
| Stage 1 | - | - | - | - | 1434 | - |
| Stage 2 | - | - | - | - | 549 | - |
| Critical Hdwy | 4.18 | - | - | - | 6.8 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.8 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.8 | - |
| Follow-up Hdwy | 2.24 | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 772 | - | - | - | *220 | *577 |
| Stage 1 | - | - | - | - | *519 | - |
| Stage 2 | - | - | - | - | *703 | - |
| Platoon blocked, % | 1 | - | - | - | 1 | 1 |
| Mov Cap-1 Maneuver | 772 | - | - | - | *213 | *577 |
| Mov Cap-2 Maneuver | - | - | - | - | *360 | - |
| Stage 1 | - | - | - | - | *501 | - |
| Stage 2 | - | - | - | - | *703 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.3 | 0 | 17.4 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 772 | - | - | - | 433 |
| HCM Lane V/C Ratio | 0.035 | - | - | - | 0.333 |
| HCM Control Delay (s) | 9.8 | - | - | - | 17.4 |
| HCM Lane LOS | A | - | - | - | C |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 1.4 |

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



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 24 | 925 | 1122 | 24 | 146 | 179 |
| Future Volume (veh/h) | 24 | 925 | 1122 | 24 | 146 | 179 |
| 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 | 1841 | 1856 | 1885 | 1781 | 1900 | 1856 |
| Adj Flow Rate, veh/h | 26 | 1016 | 1233 | 0 | 160 | 197 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 4 | 3 | 1 | 8 | 0 | 3 |
| Cap, veh/h | 488 | 2661 | 1823 | | 263 | 228 |
| Arrive On Green | 0.38 | 1.00 | 0.34 | 0.00 | 0.15 | 0.15 |
| Sat Flow, veh/h | 1753 | 3618 | 3676 | 1510 | 1810 | 1572 |
| Grp Volume(v), veh/h | 26 | 1016 | 1233 | 0 | 160 | 197 |
| Grp Sat Flow(s),veh/h/ln | 1753 | 1763 | 1791 | 1510 | 1810 | 1572 |
| Q Serve(g_s), s | 0.0 | 0.0 | 32.4 | 0.0 | 9.1 | 13.5 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 32.4 | 0.0 | 9.1 | 13.5 |
| Prop In Lane | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 488 | 2661 | 1823 | | 263 | 228 |
| V/C Ratio(X) | 0.05 | 0.38 | 0.68 | | 0.61 | 0.86 |
| Avail Cap(c_a), veh/h | 488 | 2661 | 1823 | | 510 | 443 |
| HCM Platoon Ratio | 2.00 | 2.00 | 0.67 | 0.67 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.89 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 16.5 | 0.0 | 28.5 | 0.0 | 44.1 | 45.9 |
| Incr Delay (d2), s/veh | 0.0 | 0.4 | 1.8 | 0.0 | 0.8 | 3.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 0.2 | 14.6 | 0.0 | 4.1 | 5.5 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d),s/veh | 16.5 | 0.4 | 30.3 | 0.0 | 44.9 | 49.7 |
| LnGrp LOS | B | A | C | | D | D |
| Approach Vol, veh/h | | 1042 | 1233 | A | 357 | |
| Approach Delay, s/veh | | 0.8 | 30.3 | | 47.5 | |
| Approach LOS | | A | C | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 27.0 | 62.0 | | 21.0 | | 89.0 |
| Change Period (Y+Rc), s | 6.0 | * 6 | | 5.0 | | 6.0 |
| Max Green Setting (Gmax), s | 7.0 | * 56 | | 31.0 | | 68.0 |
| Max Q Clear Time (g_c+I1), s | 2.0 | 34.4 | | 15.5 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 8.4 | | 0.5 | | 8.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 21.0 |
| HCM 6th LOS | C |

Notes

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 7 | 997 | 59 | 19 | 1007 | 29 | 83 | 14 | 8 | 169 | 60 | 48 |
| Future Volume (veh/h) | 7 | 997 | 59 | 19 | 1007 | 29 | 83 | 14 | 8 | 169 | 60 | 48 |
| 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 | 1900 | 1856 | 1856 | 1900 | 1885 | 1885 | 1693 | 1693 | 1693 | 1885 | 1900 | 1900 |
| Adj Flow Rate, veh/h | 8 | 1084 | 64 | 21 | 1095 | 32 | 90 | 15 | 9 | 184 | 60 | 52 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 1.00 | 0.92 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 0 | 1 | 1 | 14 | 14 | 14 | 1 | 0 | 0 |
| Cap, veh/h | 418 | 2245 | 132 | 286 | 2100 | 61 | 159 | 24 | 11 | 303 | 151 | 131 |
| Arrive On Green | 0.09 | 0.66 | 0.66 | 0.02 | 0.59 | 0.59 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |
| Sat Flow, veh/h | 1810 | 3383 | 200 | 1810 | 3554 | 104 | 623 | 150 | 66 | 1398 | 939 | 814 |
| Grp Volume(v), veh/h | 8 | 565 | 583 | 21 | 552 | 575 | 114 | 0 | 0 | 184 | 0 | 112 |
| Grp Sat Flow(s),veh/h/ln | 1810 | 1763 | 1820 | 1810 | 1791 | 1866 | 840 | 0 | 0 | 1398 | 0 | 1753 |
| Q Serve(g_s), s | 0.0 | 17.4 | 17.5 | 0.6 | 20.0 | 20.0 | 9.3 | 0.0 | 0.0 | 0.0 | 0.0 | 6.3 |
| Cycle Q Clear(g_c), s | 0.0 | 17.4 | 17.5 | 0.6 | 20.0 | 20.0 | 15.6 | 0.0 | 0.0 | 13.0 | 0.0 | 6.3 |
| Prop In Lane | 1.00 | | 0.11 | 1.00 | | 0.06 | 0.79 | | 0.08 | 1.00 | | 0.46 |
| Lane Grp Cap(c), veh/h | 418 | 1170 | 1207 | 286 | 1058 | 1103 | 193 | 0 | 0 | 303 | 0 | 281 |
| V/C Ratio(X) | 0.02 | 0.48 | 0.48 | 0.07 | 0.52 | 0.52 | 0.59 | 0.00 | 0.00 | 0.61 | 0.00 | 0.40 |
| Avail Cap(c_a), veh/h | 418 | 1170 | 1207 | 395 | 1058 | 1103 | 208 | 0 | 0 | 320 | 0 | 303 |
| 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) | 0.91 | 0.91 | 0.91 | 0.85 | 0.85 | 0.85 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 15.4 | 9.2 | 9.2 | 12.4 | 13.3 | 13.3 | 47.7 | 0.0 | 0.0 | 44.2 | 0.0 | 41.4 |
| Incr Delay (d2), s/veh | 0.0 | 1.3 | 1.3 | 0.1 | 1.6 | 1.5 | 2.2 | 0.0 | 0.0 | 2.0 | 0.0 | 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 | 0.1 | 5.8 | 6.0 | 0.2 | 7.4 | 7.7 | 3.2 | 0.0 | 0.0 | 4.9 | 0.0 | 2.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 15.4 | 10.5 | 10.4 | 12.5 | 14.9 | 14.8 | 49.9 | 0.0 | 0.0 | 46.2 | 0.0 | 41.8 |
| LnGrp LOS | B | B | B | B | B | B | D | A | A | D | A | D |
| Approach Vol, veh/h | | 1156 | | | 1148 | | | 114 | | | 296 | |
| Approach Delay, s/veh | | 10.5 | | | 14.8 | | | 49.9 | | | 44.5 | |
| Approach LOS | | B | | | B | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.4 | 71.0 | | 23.6 | 7.4 | 79.0 | | 23.6 |
| Change Period (Y+Rc), s | 6.0 | * 6 | | 6.0 | 5.0 | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | 9.0 | * 65 | | 19.0 | 9.0 | 65.0 | | 19.0 |
| Max Q Clear Time (g_c+I1), s | 2.0 | 22.0 | | 15.0 | 2.6 | 19.5 | | 17.6 |
| Green Ext Time (p_c), s | 0.0 | 7.9 | | 0.3 | 0.0 | 8.2 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 17.7 |
| HCM 6th LOS | B |

Notes

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 9 | 807 | 381 | 511 | 734 | 27 | 313 | 9 | 517 | 108 | 112 | 25 |
| Future Volume (veh/h) | 9 | 807 | 381 | 511 | 734 | 27 | 313 | 9 | 517 | 108 | 112 | 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 | 1574 | 1841 | 1856 | 1811 | 1885 | 1885 | 1870 | 1737 | 1737 | 1885 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 10 | 887 | 0 | 562 | 807 | 30 | 344 | 10 | 0 | 119 | 123 | 27 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 22 | 4 | 3 | 6 | 1 | 1 | 2 | 11 | 11 | 1 | 2 | 2 |
| Cap, veh/h | 22 | 1081 | | 907 | 1992 | 74 | 414 | 220 | | 151 | 135 | 30 |
| Arrive On Green | 0.00 | 0.10 | 0.00 | 0.27 | 0.57 | 0.57 | 0.12 | 0.13 | 0.00 | 0.08 | 0.09 | 0.09 |
| Sat Flow, veh/h | 1499 | 3497 | 1572 | 3346 | 3522 | 131 | 3456 | 1737 | 0 | 1795 | 1486 | 326 |
| Grp Volume(v), veh/h | 10 | 887 | 0 | 562 | 410 | 427 | 344 | 10 | 0 | 119 | 0 | 150 |
| Grp Sat Flow(s),veh/h/ln | 1499 | 1749 | 1572 | 1673 | 1791 | 1862 | 1728 | 1737 | 0 | 1795 | 0 | 1812 |
| Q Serve(g_s), s | 0.7 | 27.3 | 0.0 | 16.2 | 14.2 | 14.2 | 10.7 | 0.6 | 0.0 | 7.2 | 0.0 | 9.0 |
| Cycle Q Clear(g_c), s | 0.7 | 27.3 | 0.0 | 16.2 | 14.2 | 14.2 | 10.7 | 0.6 | 0.0 | 7.2 | 0.0 | 9.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.07 | 1.00 | | 0.00 | 1.00 | | 0.18 |
| Lane Grp Cap(c), veh/h | 22 | 1081 | | 907 | 1013 | 1053 | 414 | 220 | | 151 | 0 | 165 |
| V/C Ratio(X) | 0.46 | 0.82 | | 0.62 | 0.40 | 0.41 | 0.83 | 0.05 | | 0.79 | 0.00 | 0.91 |
| Avail Cap(c_a), veh/h | 109 | 1081 | | 907 | 1013 | 1053 | 723 | 220 | | 375 | 0 | 165 |
| HCM Platoon Ratio | 0.33 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.83 | 0.83 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.3 | 46.4 | 0.0 | 35.1 | 13.5 | 13.5 | 47.3 | 42.2 | 0.0 | 49.4 | 0.0 | 49.6 |
| Incr Delay (d2), s/veh | 4.7 | 5.9 | 0.0 | 1.3 | 1.2 | 1.2 | 1.7 | 0.0 | 0.0 | 3.4 | 0.0 | 44.3 |
| 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 | 0.3 | 13.6 | 0.0 | 6.4 | 5.4 | 5.6 | 4.6 | 0.2 | 0.0 | 3.3 | 0.0 | 6.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 59.1 | 52.3 | 0.0 | 36.4 | 14.7 | 14.6 | 49.0 | 42.2 | 0.0 | 52.8 | 0.0 | 93.9 |
| LnGrp LOS | E | D | | D | B | B | D | D | | D | A | F |
| Approach Vol, veh/h | | 897 | A | | 1399 | | | 354 | A | | 269 | |
| Approach Delay, s/veh | | 52.4 | | | 23.4 | | | 48.8 | | | 75.7 | |
| Approach LOS | | D | | | C | | | D | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 35.8 | 40.0 | 18.2 | 16.0 | 7.6 | 68.2 | 14.3 | 19.9 |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 | 6.0 | 5.0 | * 6 |
| Max Green Setting (Gmax), s | 20.0 | 34.0 | 23.0 | 10.0 | 8.0 | 46.0 | 23.0 | * 11 |
| Max Q Clear Time (g_c+I1), s | 18.2 | 29.3 | 12.7 | 11.0 | 2.7 | 16.2 | 9.2 | 2.6 |
| Green Ext Time (p_c), s | 0.4 | 2.2 | 0.5 | 0.0 | 0.0 | 4.9 | 0.1 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 40.2 |
| HCM 6th LOS | D |

Notes

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 39 | 61 | 309 | 174 | 64 | 104 | 233 | 579 | 64 | 109 | 1031 | 41 |
| Future Volume (veh/h) | 39 | 61 | 309 | 174 | 64 | 104 | 233 | 579 | 64 | 109 | 1031 | 41 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1900 | 1870 | 1885 | 1900 | 1870 | 1856 | 1885 | 1752 | 1752 | 1885 | 1856 | 1856 |
| Adj Flow Rate, veh/h | 45 | 71 | 0 | 202 | 74 | 0 | 271 | 673 | 74 | 127 | 1199 | 48 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Percent Heavy Veh, % | 0 | 2 | 1 | 0 | 2 | 3 | 1 | 10 | 10 | 1 | 3 | 3 |
| Cap, veh/h | 297 | 374 | | 299 | 374 | | 365 | 1729 | 190 | 500 | 1869 | 75 |
| Arrive On Green | 0.20 | 0.20 | 0.00 | 0.20 | 0.20 | 0.00 | 0.09 | 0.57 | 0.57 | 0.06 | 0.54 | 0.54 |
| Sat Flow, veh/h | 1347 | 1870 | 1598 | 1350 | 1870 | 1572 | 1795 | 3024 | 332 | 1795 | 3455 | 138 |
| Grp Volume(v), veh/h | 45 | 71 | 0 | 202 | 74 | 0 | 271 | 370 | 377 | 127 | 611 | 636 |
| Grp Sat Flow(s),veh/h/ln | 1347 | 1870 | 1598 | 1350 | 1870 | 1572 | 1795 | 1664 | 1692 | 1795 | 1763 | 1831 |
| Q Serve(g_s), s | 2.9 | 3.2 | 0.0 | 14.6 | 3.3 | 0.0 | 6.6 | 12.2 | 12.3 | 3.1 | 24.4 | 24.4 |
| Cycle Q Clear(g_c), s | 6.2 | 3.2 | 0.0 | 17.8 | 3.3 | 0.0 | 6.6 | 12.2 | 12.3 | 3.1 | 24.4 | 24.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.20 | 1.00 | | 0.08 |
| Lane Grp Cap(c), veh/h | 297 | 374 | | 299 | 374 | | 365 | 952 | 967 | 500 | 953 | 990 |
| V/C Ratio(X) | 0.15 | 0.19 | | 0.67 | 0.20 | | 0.74 | 0.39 | 0.39 | 0.25 | 0.64 | 0.64 |
| Avail Cap(c_a), veh/h | 331 | 421 | | 333 | 421 | | 510 | 952 | 967 | 700 | 953 | 990 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 35.9 | 33.3 | 0.0 | 40.7 | 33.3 | 0.0 | 15.4 | 11.8 | 11.8 | 9.2 | 16.1 | 16.2 |
| Incr Delay (d2), s/veh | 0.2 | 0.2 | 0.0 | 4.1 | 0.2 | 0.0 | 2.9 | 1.2 | 1.2 | 0.2 | 3.3 | 3.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 1.4 | 0.0 | 5.1 | 1.5 | 0.0 | 2.7 | 4.4 | 4.5 | 1.1 | 10.1 | 10.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 36.1 | 33.4 | 0.0 | 44.8 | 33.5 | 0.0 | 18.3 | 13.0 | 13.0 | 9.4 | 19.5 | 19.3 |
| LnGrp LOS | D | C | | D | C | | B | B | B | A | B | B |
| Approach Vol, veh/h | | 116 | A | | 276 | A | | 1018 | | | 1374 | |
| Approach Delay, s/veh | | 34.5 | | | 41.7 | | | 14.4 | | | 18.5 | |
| Approach LOS | | C | | | D | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.8 | 63.7 | | 25.5 | 13.9 | 60.6 | | 25.5 | | | | |
| Change Period (Y+Rc), s | 5.0 | 6.5 | | 5.5 | 5.0 | 6.5 | | 5.5 | | | | |
| Max Green Setting (Gmax), s | 17.3 | 43.5 | | 22.5 | 17.0 | 43.5 | | 22.5 | | | | |
| Max Q Clear Time (g_c+I1), s | 15.1 | 14.3 | | 19.8 | 8.6 | 26.4 | | 8.2 | | | | |
| Green Ext Time (p_c), s | 0.2 | 8.2 | | 0.2 | 0.4 | 11.4 | | 0.3 | | | | |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 20.0 |
| HCM 6th LOS | B |

**Notes**

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

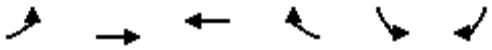
| Intersection | |
|---|---|
| Int Delay, s/veh | 3.9 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 24 | 285 | 229 | 107 | 126 | 23 |
| Future Vol, veh/h | 24 | 285 | 229 | 107 | 126 | 23 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 87 | 87 | 87 | 87 | 87 | 87 |
| Heavy Vehicles, % | 12 | 1 | 2 | 0 | 0 | 0 |
| Mvmt Flow | 28 | 328 | 263 | 123 | 145 | 26 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 386 | 0 | - | 0 | 709 | 325 |
| Stage 1 | - | - | - | - | 325 | - |
| Stage 2 | - | - | - | - | 384 | - |
| Critical Hdwy | 4.22 | - | - | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | 2.308 | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 1120 | - | - | - | 404 | 721 |
| Stage 1 | - | - | - | - | 737 | - |
| Stage 2 | - | - | - | - | 693 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1120 | - | - | - | 391 | 721 |
| Mov Cap-2 Maneuver | - | - | - | - | 391 | - |
| Stage 1 | - | - | - | - | 714 | - |
| Stage 2 | - | - | - | - | 693 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.6 | 0 | 19.3 |
| HCM LOS | | | C |

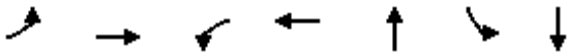
| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1120 | - | - | - | 421 |
| HCM Lane V/C Ratio | 0.025 | - | - | - | 0.407 |
| HCM Control Delay (s) | 8.3 | 0 | - | - | 19.3 |
| HCM Lane LOS | A | A | - | - | C |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 1.9 |



| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 26 | 1016 | 1233 | 26 | 160 | 197 |
| v/c Ratio | 0.07 | 0.38 | 0.49 | 0.02 | 0.69 | 0.60 |
| Control Delay | 2.0 | 2.0 | 9.1 | 3.1 | 60.4 | 21.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 2.0 | 2.0 | 9.1 | 3.1 | 60.4 | 21.7 |
| Queue Length 50th (ft) | 1 | 33 | 268 | 1 | 110 | 35 |
| Queue Length 95th (ft) | m5 | 47 | 494 | m8 | 170 | 103 |
| Internal Link Dist (ft) | | 638 | 1347 | | 539 | |
| Turn Bay Length (ft) | 235 | | | 65 | 465 | |
| Base Capacity (vph) | 359 | 2702 | 2521 | 1057 | 508 | 544 |
| 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 | 0.07 | 0.38 | 0.49 | 0.02 | 0.31 | 0.36 |

Intersection Summary

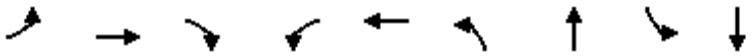
m Volume for 95th percentile queue is metered by upstream signal.



| Lane Group | EBL | EBT | WBL | WBT | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 8 | 1148 | 21 | 1127 | 114 | 184 | 112 |
| v/c Ratio | 0.02 | 0.48 | 0.06 | 0.45 | 0.57 | 0.86 | 0.37 |
| Control Delay | 7.9 | 12.7 | 4.8 | 5.4 | 53.0 | 80.1 | 31.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 7.9 | 12.7 | 4.8 | 5.4 | 53.0 | 80.1 | 31.6 |
| Queue Length 50th (ft) | 2 | 258 | 0 | 10 | 72 | 126 | 48 |
| Queue Length 95th (ft) | m6 | 344 | m8 | 130 | 132 | #242 | 102 |
| Internal Link Dist (ft) | | 1347 | | 1580 | 334 | | 424 |
| Turn Bay Length (ft) | 75 | | 120 | | | 125 | |
| Base Capacity (vph) | 427 | 2411 | 371 | 2521 | 219 | 233 | 330 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.02 | 0.48 | 0.06 | 0.45 | 0.52 | 0.79 | 0.34 |

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.



| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 10 | 887 | 419 | 562 | 837 | 344 | 578 | 119 | 150 |
| v/c Ratio | 0.12 | 0.76 | 0.54 | 0.94 | 0.43 | 0.72 | 0.87 | 0.63 | 0.61 |
| Control Delay | 44.8 | 44.4 | 17.5 | 69.0 | 16.7 | 53.9 | 23.2 | 61.0 | 53.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 44.8 | 44.4 | 17.5 | 69.0 | 16.7 | 53.9 | 23.2 | 61.0 | 53.7 |
| Queue Length 50th (ft) | 7 | 323 | 103 | 203 | 175 | 121 | 56 | 82 | 93 |
| Queue Length 95th (ft) | m14 | 392 | m229 | #308 | 288 | 163 | #278 | 137 | #179 |
| Internal Link Dist (ft) | | 1580 | | | 812 | | 1309 | | 808 |
| Turn Bay Length (ft) | 120 | | 200 | 210 | | 145 | | 110 | |
| Base Capacity (vph) | 107 | 1170 | 781 | 600 | 1943 | 717 | 665 | 373 | 247 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.09 | 0.76 | 0.54 | 0.94 | 0.43 | 0.48 | 0.87 | 0.32 | 0.61 |

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.

# Appendix V – Trip Generation Information

# Hospital
## (610)

**Vehicle Trip Ends vs:** **Beds**
**On a:** **Weekday**

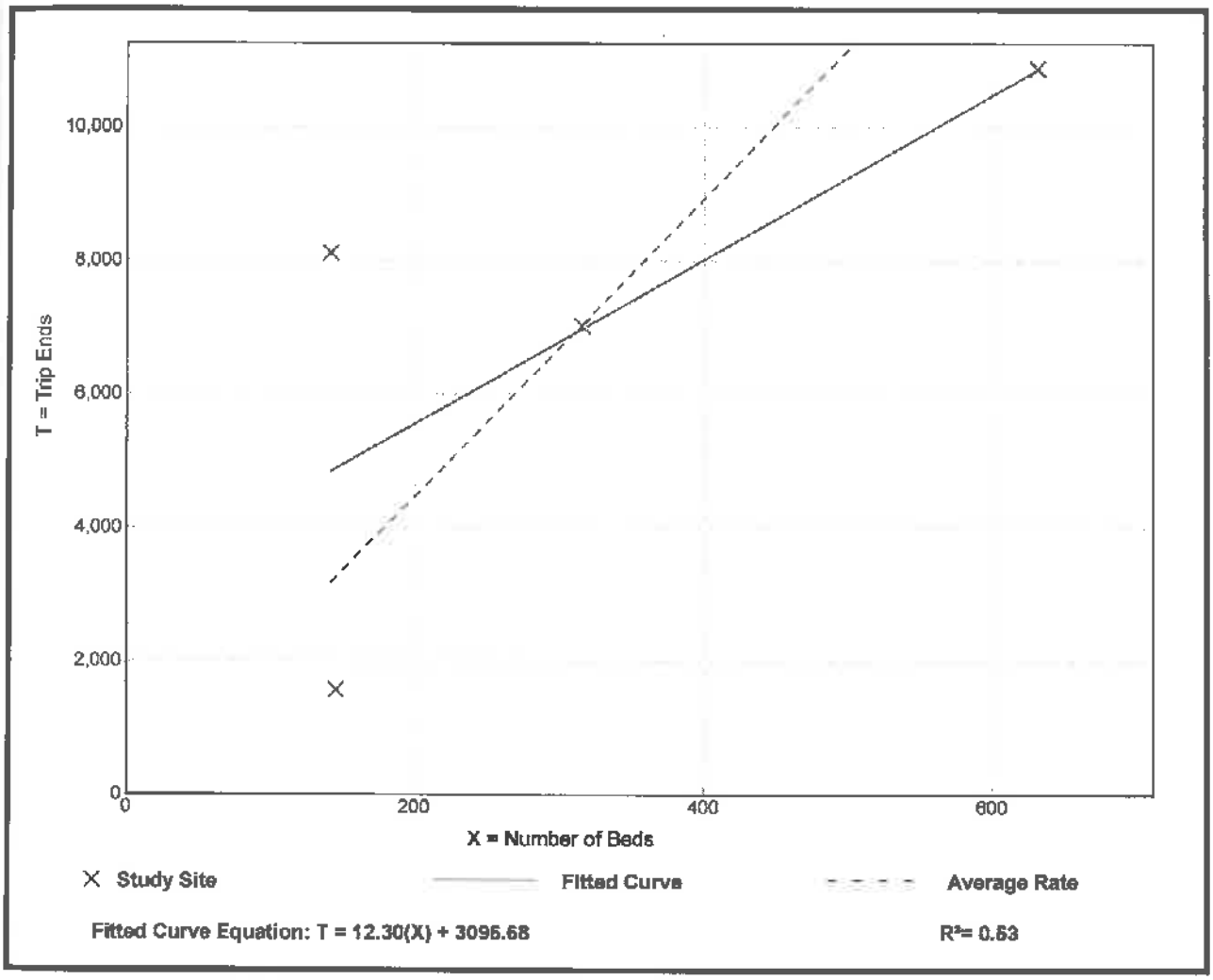
**Setting/Location:** **General Urban/Suburban**
Number of Studies: 4
Avg. Num. of Beds: 309
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per Bed

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 22.32 | 10.77 - 57.13 | 14.98 |

## Data Plot and Equation

***Caution – Small Sample Size***




**Fitted Curve Equation: T = 12.30(X) + 3096.68**

**$R^2$= 0.53**

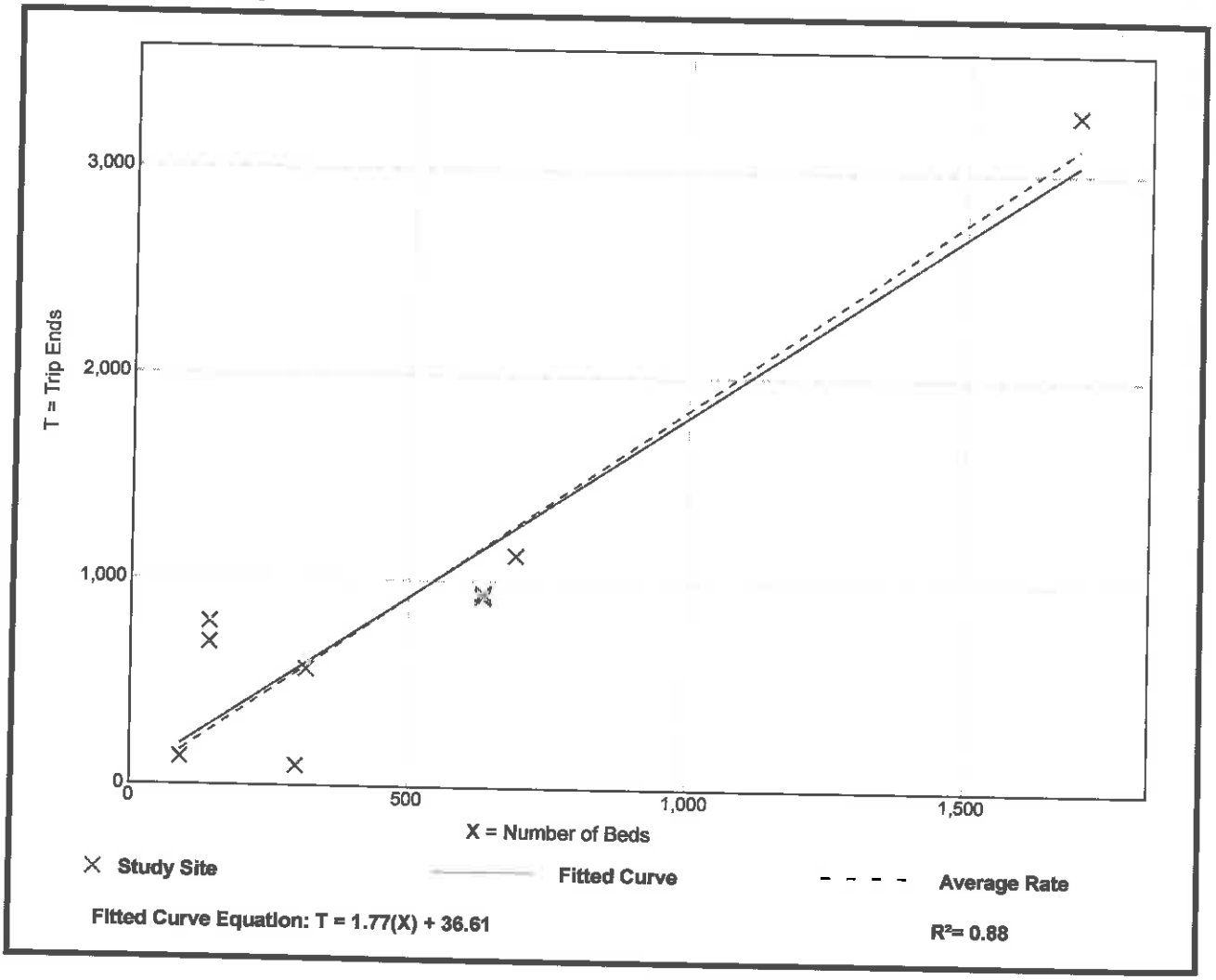
# Hospital
## (610)

**Vehicle Trip Ends vs:** **Beds**
**On a:** **Weekday,**
**Peak Hour of Adjacent Street Traffic,**
**One Hour Between 7 and 9 a.m.**
**Setting/Location:** **General Urban/Suburban**
Number of Studies: 9
Avg. Num. of Beds: 516
Directional Distribution: 72% entering, 28% exiting

## Vehicle Trip Generation per Bed

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 1.84 | 0.32 - 5.59 | 1.01 |

## Data Plot and Equation



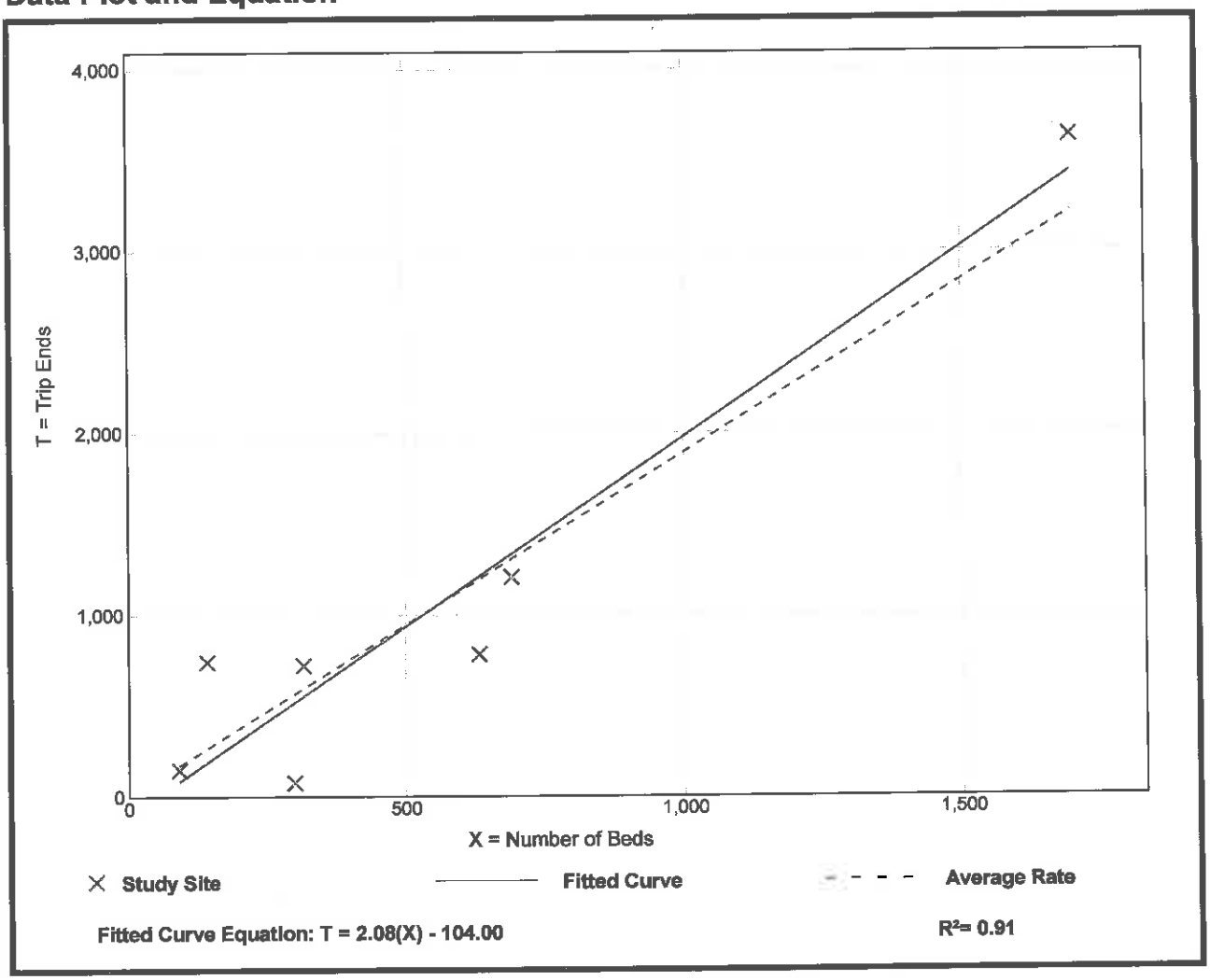
# Hospital
## (610)

**Vehicle Trip Ends vs:** **Beds**
**On a:** **Weekday,**
**Peak Hour of Adjacent Street Traffic,**
**One Hour Between 4 and 6 p.m.**
**Setting/Location:** **General Urban/Suburban**
Number of Studies: 7
Avg. Num. of Beds: 553
Directional Distribution: 28% entering, 72% exiting

## Vehicle Trip Generation per Bed

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 1.89 | 0.26 - 5.22 | 0.92 |

## Data Plot and Equation



# Free-Standing Emergency Room
## (650)

**Vehicle Trip Ends vs:** **1000 Sq. Ft. GFA**
**On a:** **Weekday**

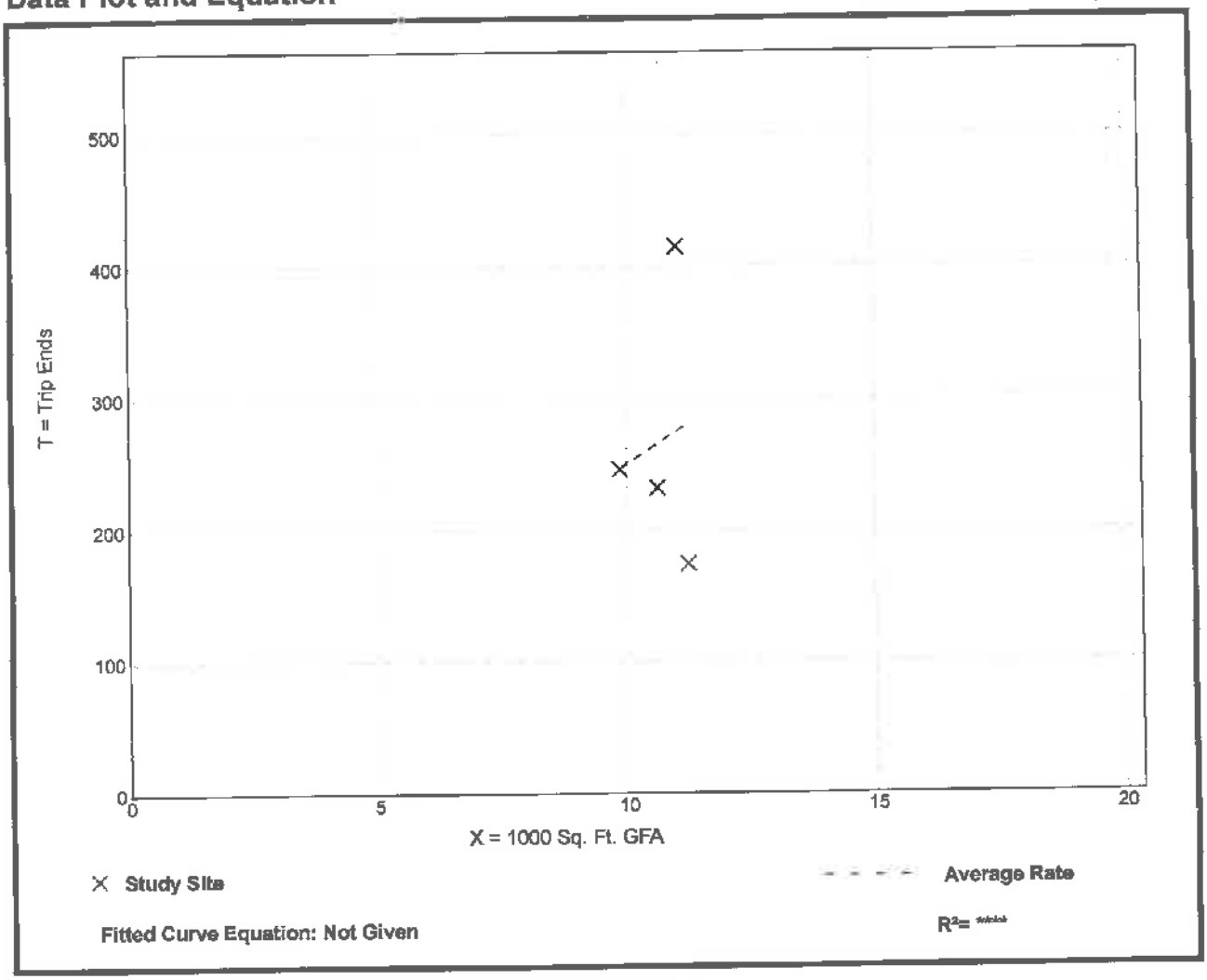
**Setting/Location:** **General Urban/Suburban**
Number of Studies: 4
1000 Sq. Ft. GFA: **11**
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 24.94 | 15.49 - 37.57 | 9.45 |

## Data Plot and Equation

***Caution – Small Sample Size***




**Fitted Curve Equation: Not Given**

$R^2$= ****

# Free-Standing Emergency Room
## (650)

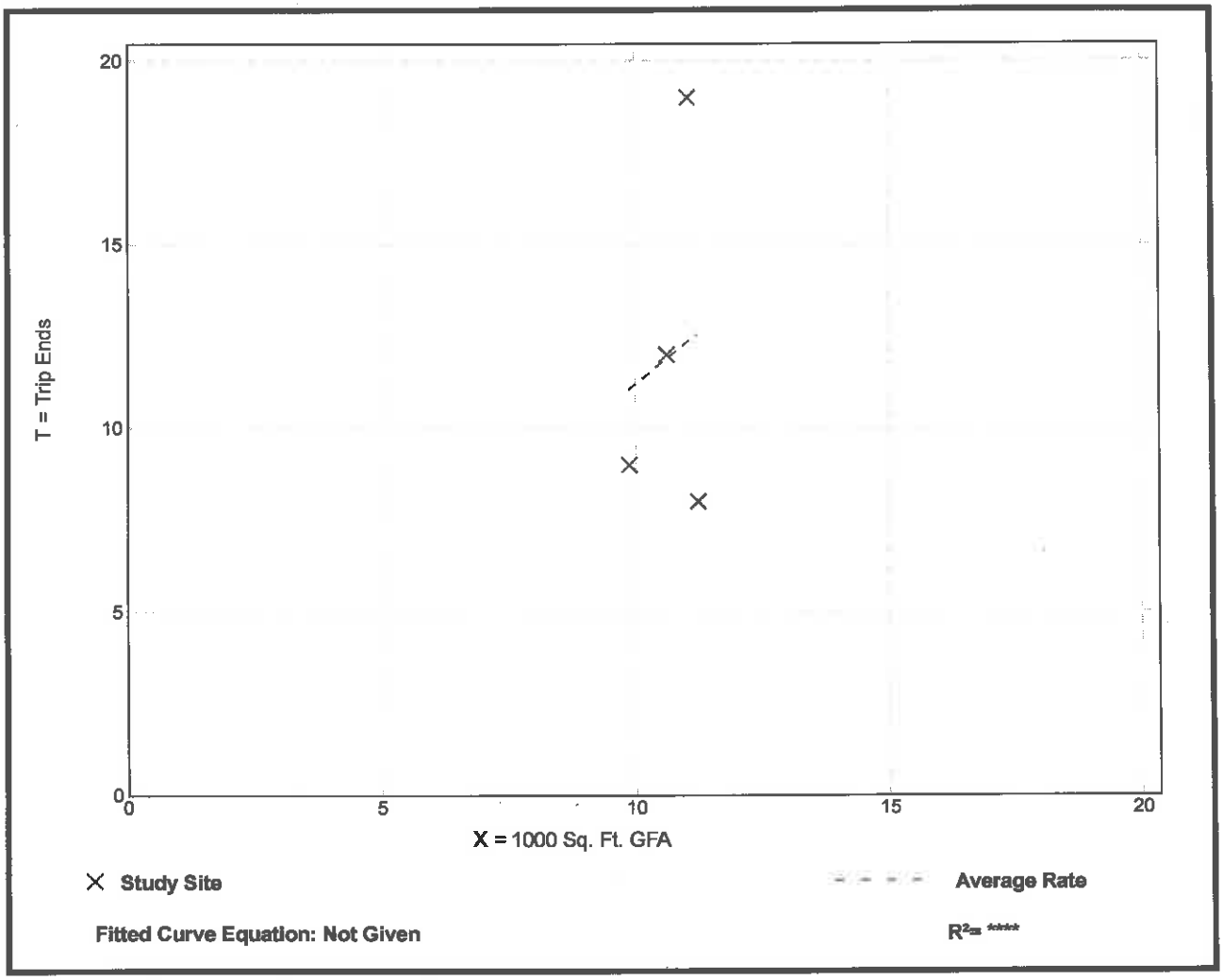
**Vehicle Trip Ends vs:** **1000 Sq. Ft. GFA**
**On a:** **Weekday,**
**Peak Hour of Adjacent Street Traffic,**
**One Hour Between 7 and 9 a.m.**
**Setting/Location:** **General Urban/Suburban**
Number of Studies: 4
1000 Sq. Ft. GFA: 11
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 1.12 | 0.71 - 1.72 | 0.44 |

## Data Plot and Equation

***Caution – Small Sample Size***



# Free-Standing Emergency Room
## (650)

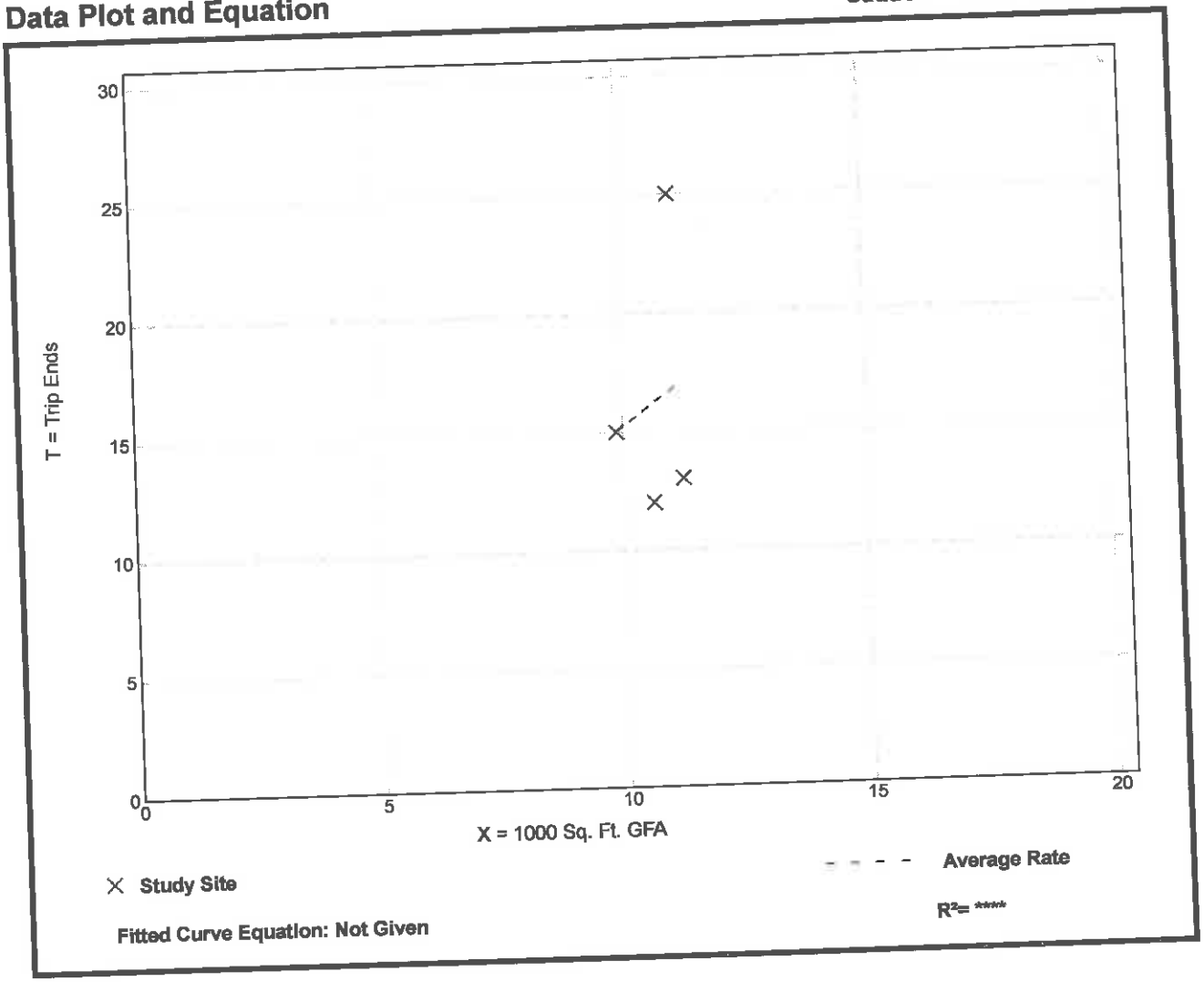
**Vehicle Trip Ends vs:** 1000 Sq. Ft. GFA
**On a:** Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
**Setting/Location:** General Urban/Suburban
Number of Studies: 4
1000 Sq. Ft. GFA: 11
Directional Distribution: 46% entering, 54% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 1.52 | 1.13 - 2.26 | 0.54 |

## Data Plot and Equation

***Caution – Small Sample Size***



# Medical-Dental Office Building
# (720)

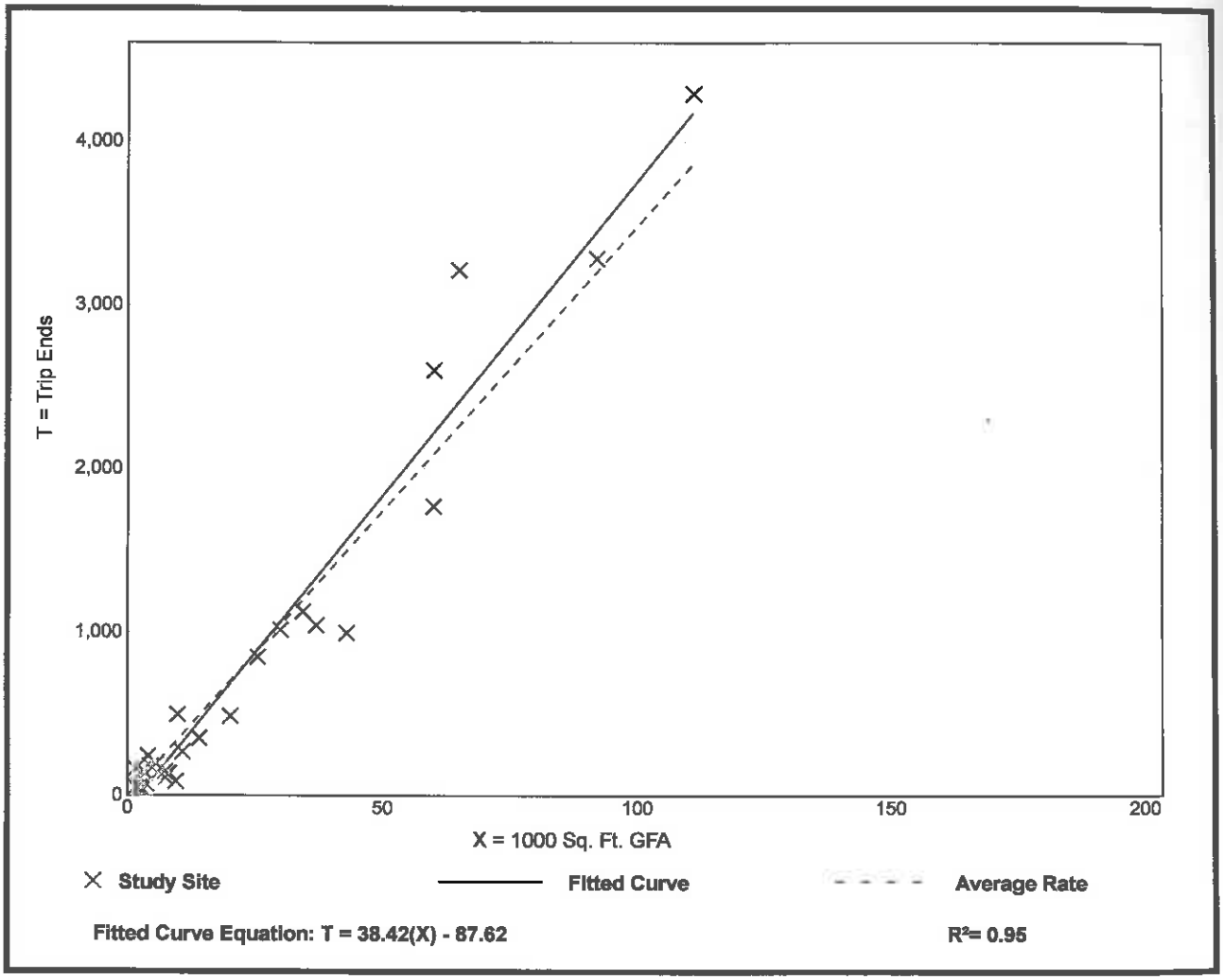
**Vehicle Trip Ends vs:** **1000 Sq. Ft. GFA**
**On a:** **Weekday**

**Setting/Location:** **General Urban/Suburban**
Number of Studies: 28
1000 Sq. Ft. GFA: 24
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 34.80 | 9.14 - 100.75 | 9.79 |

## Data Plot and Equation




**Fitted Curve Equation: T = 38.42(X) - 87.62**

**$R^2$= 0.95**

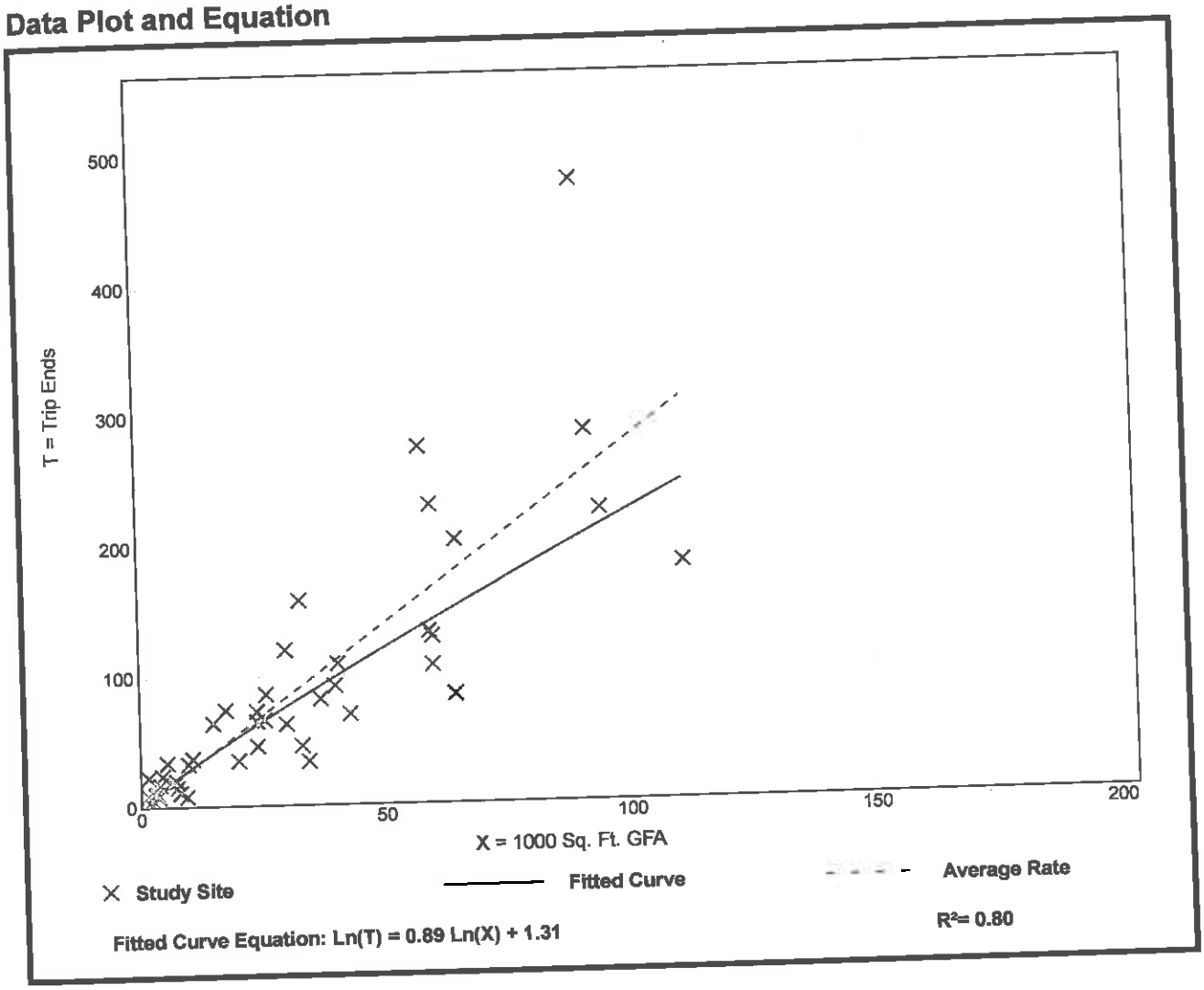
# Medical-Dental Office Building
## (720)

**Vehicle Trip Ends vs:** **1000 Sq. Ft. GFA**
**On a:** **Weekday,**
**Peak Hour of Adjacent Street Traffic,**
**One Hour Between 7 and 9 a.m.**
**Setting/Location:** **General Urban/Suburban**
Number of Studies: 44
1000 Sq. Ft. GFA: 32
Directional Distribution: 78% entering, 22% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 2.78 | 0.85 - 14.30 | 1.28 |

## Data Plot and Equation



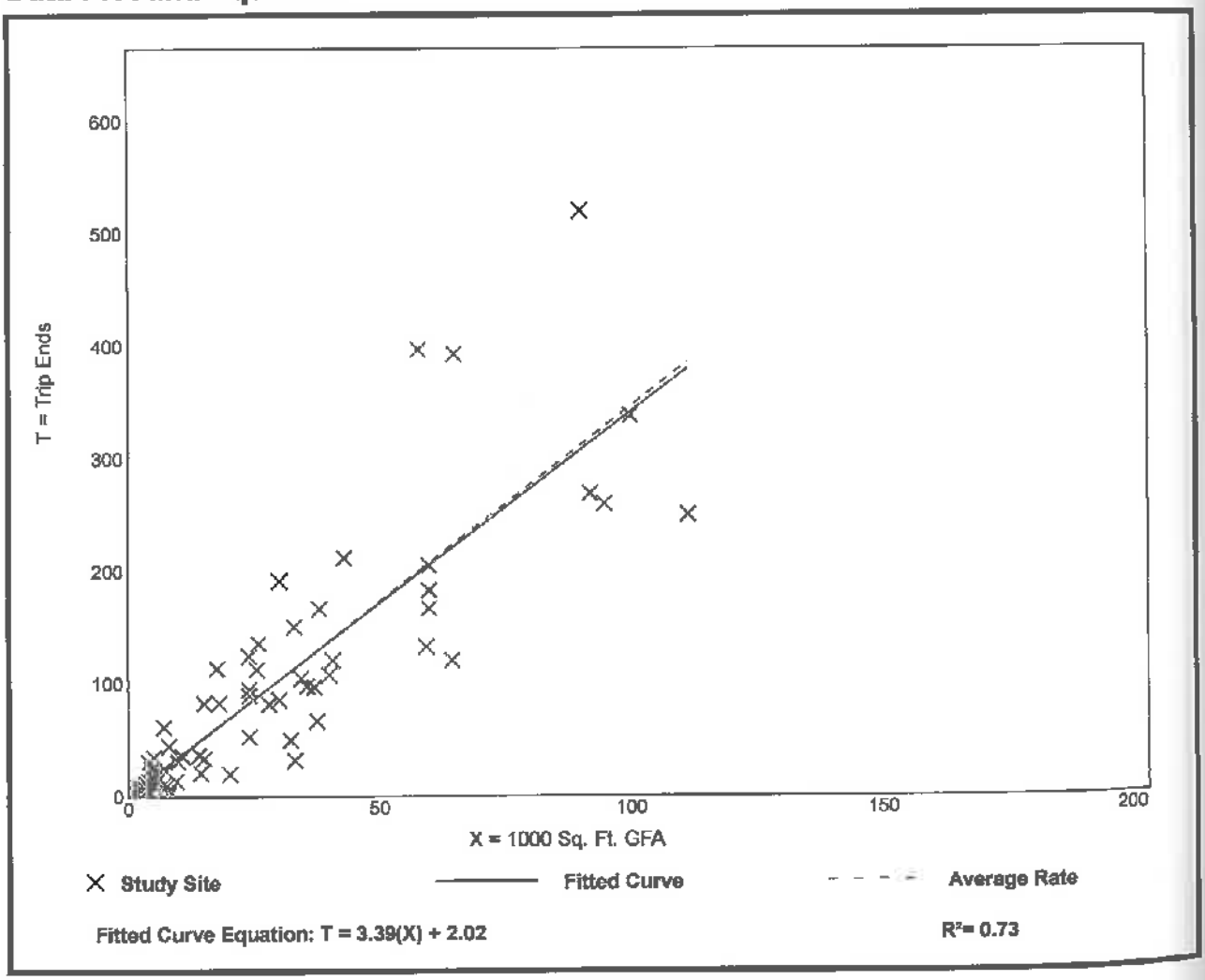
# Medical-Dental Office Building
(720)

**Vehicle Trip Ends vs:** **1000 Sq. Ft. GFA**
**On a:** **Weekday,**
**Peak Hour of Adjacent Street Traffic,**
**One Hour Between 4 and 6 p.m.**
**Setting/Location:** **General Urban/Suburban**
Number of Studies: 65
1000 Sq. Ft. GFA: 28
Directional Distribution: 28% entering, 72% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 3.46 | 0.25 - 8.86 | 1.58 |

## Data Plot and Equation




**Fitted Curve Equation: T = 3.39(X) + 2.02**

**$R^2$= 0.73**

# Appendix VI – Future Turning Movement Calculations

AM Peak Period -
Turning Movement Counts

| ID | Intersection | Stop Control | Intersection Conditions | Eastbound | | | Westbound | | | Northbound | | | Southbound | | | PHF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Lt | Th | Rt | Lt | Th | Rt | Lt | Th | Rt | Lt | Th | Rt | |
| 1 | Middlebrook Pike @ Vanosdale Rd / Francis Rd | Signal | Existing Counts | 38 | 1057 | 217 | 185 | 601 | 64 | 90 | 111 | 331 | 256 | 205 | 150 | 0.96 |
| | | | Percent Heavy Vehicles | 11 | 2 | 2 | 3 | 5 | 17 | 1 | 7 | 2 | 4 | 5 | 3 | |
| | | | Phase 1 No Build Volume | 39 | 1078 | 221 | 189 | 613 | 65 | 92 | 113 | 338 | 261 | 209 | 153 | |
| | | | Inbound Trip Distribution | | 21% | | | | | | | 6% | 2% | | | |
| | | | Outbound Trip Distribution | | | | 6% | 21% | 2% | | | | | | | |
| | | | Phase 1 Project Traffic | 0 | 74 | 0 | 8 | 29 | 3 | 0 | 0 | 21 | 7 | 0 | 0 | |
| | | | Phase 1 Build-Out Volume | 39 | 1152 | 221 | 197 | 642 | 68 | 92 | 113 | 359 | 268 | 209 | 153 | |
| | | | Phase 2 No Build Volume | 41 | 1218 | 235 | 208 | 680 | 72 | 97 | 120 | 379 | 284 | 222 | 162 | |
| | | | Inbound Trip Distribution | | 21% | | | | | | | 6% | 2% | | | |
| | | | Outbound Trip Distribution | | | | 6% | 21% | 2% | | | | | | | |
| | | | Phase 2 Project Traffic | 0 | 40 | 0 | 3 | 11 | 1 | 0 | 0 | 11 | 4 | 0 | 0 | |
| | | | Phase 2 Build-Out Volume | 41 | 1258 | 235 | 211 | 691 | 73 | 97 | 120 | 390 | 288 | 222 | 162 | |
| | | | Phase 3 No Build Volume | 45 | 1352 | 254 | 228 | 744 | 79 | 105 | 130 | 420 | 311 | 240 | 176 | |
| | | | Inbound Trip Distribution | | 21% | | | | | | | 6% | 2% | | | |
| | | | Outbound Trip Distribution | | | | 6% | 21% | 2% | | | | | | | |
| | | | Phase 3 Project Traffic | | 43 | | 3 | 12 | 1 | | | 12 | 4 | | | |
| | | | P1-P2 Diverted Trips | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | Phase 3 Build-Out Volume | 45 | 1395 | 254 | 231 | 756 | 80 | 105 | 130 | 432 | 315 | 240 | 176 | |
| 2 | Middlebrook Pike @ Whitehall Rd / Lake Brook Blvd | TWSC | Existing Counts | 22 | 1315 | 35 | 31 | 864 | 6 | 44 | 1 | 57 | 12 | 3 | 30 | 0.91 |
| | | | Percent Heavy Vehicles | 0.0 | 1.7 | 5.7 | 0.0 | 4.6 | 0.0 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| | | | Phase 1 No Build Volume | 22 | 1341 | 36 | 32 | 881 | 6 | 45 | 1 | 58 | 12 | 3 | 31 | |
| | | | Inbound Trip Distribution | | 29% | | | | | | | 1% | 1% | | | |
| | | | Outbound Trip Distribution | | | | 1% | 29% | 1% | | | | | | | |
| | | | Phase 1 Project Traffic | 0 | 102 | 0 | 1 | 41 | 1 | 0 | 0 | 4 | 4 | 0 | 0 | |
| | | | Phase 1 Build-Out Volume | 22 | 1443 | 36 | 33 | 922 | 7 | 45 | 1 | 62 | 16 | 3 | 31 | |
| | | | Phase 2 No Build Volume | 24 | 1525 | 38 | 35 | 976 | 7 | 48 | 1 | 66 | 17 | 3 | 32 | |
| | | | Inbound Trip Distribution | | 29% | | | | | | | 1% | 1% | | | |
| | | | Outbound Trip Distribution | | | | 1% | 29% | 1% | | | | | | | |
| | | | Phase 2 Project Traffic | | 55 | | 1 | 15 | 1 | | | 2 | 2 | | | |
| | | | Phase 2 Build-Out Volume | 24 | 1580 | 38 | 36 | 991 | 8 | 48 | 1 | 68 | 19 | 3 | 32 | |
| | | | Phase 3 No Build Volume | 26 | 1698 | 41 | 38 | 1068 | 9 | 52 | 1 | 73 | 20 | 4 | 35 | |
| | | | Inbound Trip Distribution | | 29% | | | | | | | 1% | 1% | | | |
| | | | Outbound Trip Distribution | | | | 1% | 29% | 1% | | | | | | | |
| | | | Phase 3 Project Traffic | | 59 | | 1 | 17 | 1 | | | 2 | 2 | | | |
| | | | P1-P2 Diverted Trips | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | Phase 3 Build-Out Volume | 26 | 1757 | 41 | 39 | 1085 | 10 | 52 | 1 | 75 | 22 | 4 | 35 | |

AM Peak Period -
Turning Movement Counts

| ID | Intersection | Stop Control | Intersection Conditions | Eastbound | | | Westbound | | | Northbound | | | Southbound | | | PHF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Lt | Th | Rt | Lt | Th | Rt | Lt | Th | Rt | Lt | Th | Rt | |
| 3 | Middlebrook Pike @ Lake Brook Blvd | Signal | Existing Counts | 154 | 1233 | | | 841 | 109 | | | | 84 | | 72 | 0.91 |
| | | | Percent Heavy Vehicles | 0.6 | 1.8 | | | 4.0 | 2.8 | | | | 2.4 | | 0.0 | |
| | | | Phase 1 No Build Volume | 157 | 1258 | | | 858 | 111 | | | | 86 | | 73 | |
| | | | Inbound Trip Distribution | | 31% | | | | | | | | 1% | | | |
| | | | Outbound Trip Distribution | | | | | 31% | 1% | | | | | | | |
| | | | Phase 1 Project Traffic | 0 | 109 | | | 43 | 1 | | | | 4 | | 0 | |
| | | | Phase 1 Build-Out Volume | 157 | 1367 | | | 901 | 112 | | | | 90 | | 73 | |
| | | | Phase 2 No Build Volume | 167 | 1444 | | | 953 | 119 | | | | 95 | | 78 | |
| | | | Inbound Trip Distribution | | 31% | | | | | | | | 1% | | | |
| | | | Outbound Trip Distribution | | | | | 31% | 1% | | | | | | | |
| | | | Phase 2 Project Traffic | 0 | 59 | | | 16 | 1 | | | | 2 | | 0 | |
| | | | Phase 2 Build-Out Volume | 167 | 1503 | | | 969 | 120 | | | | 97 | | 78 | |
| | | | Phase 3 No Build Volume | 180 | 1613 | | | 1044 | 130 | | | | 104 | | 84 | |
| | | | Inbound Trip Distribution | | 31% | | | | | | | | 1% | | | |
| | | | Outbound Trip Distribution | | | | | 31% | 1% | | | | | | | |
| | | | Phase 3 Project Traffic | | 64 | | | 18 | 1 | | | | 2 | | | |
| | | | P1-P2 Diverted Trips | 0 | 0 | | | 0 | 0 | | | | 0 | | 0 | |
| | | | Phase 3 Build-Out Volume | 180 | 1677 | | | 1062 | 131 | | | | 106 | | 84 | |
| 10 | Middlebrook Pike @ West access | TWSC | Existing Counts | | 1308 | | | 949 | | | | | | | | 0.92 |
| | | | Percent Heavy Vehicles | | 1.9 | | | 4.4 | | | | | | | | |
| | | | Phase 1 No Build Volume | | 1334 | | | 968 | | | | | | | | |
| | | | Inbound Trip Distribution | | 8.0% | 24.0% | | | | | | | | | | |
| | | | Outbound Trip Distribution | | | | | 32.0% | | | | 25.0% | | | | |
| | | | Phase 1 Project Traffic | | 28 | 84 | | 45 | | | | 35 | | | | |
| | | | Phase 1 Build-Out Volume | | 1362 | 84 | | 1013 | | | | 35 | | | | |
| | | | Phase 2 No Build Volume | | 1444 | 84 | | 1072 | | | | 35 | | | | |
| | | | Inbound Trip Distribution | | 8.0% | 24.0% | | | | | | | | | | |
| | | | Outbound Trip Distribution | | | | | 32.0% | | | | 25.0% | | | | |
| | | | Phase 2 Project Traffic | | 15 | 46 | | 17 | | | | 13 | | | | |
| | | | Phase 2 Build-Out Volume | | 1459 | 130 | | 1089 | | | | 48 | | | | |
| | | | Phase 3 No Build Volume | | 1576 | 130 | | 1174 | | | | 48 | | | | |
| | | | Inbound Trip Distribution | | 32.0% | | | | | | | | | | | |
| | | | Outbound Trip Distribution | | | | | 32.0% | | | | | | | | |
| | | | Phase 3 Project Traffic | | 66 | | | 19 | | | | | | | | |
| | | | P1-P2 Diverted Trips | | 0 | 0 | | 0 | | | | 0 | | | | |
| | | | Phase 3 Build-Out Volume | | 1642 | 130 | | 1193 | | | | 48 | | | | |

AM Peak Period -
Turning Movement Counts

| ID | Intersection | Stop Control | Intersection Conditions | Eastbound | | | Westbound | | | Northbound | | | Southbound | | | PHF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Lt | Th | Rt | Lt | Th | Rt | Lt | Th | Rt | Lt | Th | Rt | |
| 4 | Middlebrook Pike @ Dick Lonas Rd | TWSC | Existing Counts | 39 | 1269 | | | 895 | 86 | | | | 65 | | 54 | 0.92 |
| | | | Percent Heavy Vehicles | 0.0 | 1.9 | | | 4.4 | 1.2 | | | | 3.1 | | 0.0 | |
| | | | Phase 1 No Build Volume | 40 | 1294 | | | 913 | 88 | | | | 66 | | 55 | |
| | | | Inbound Trip Distribution | | 8.0% | | | | | | | | 1.0% | | | |
| | | | Outbound Trip Distribution | | 25.0% | | | 32.0% | 1.0% | | | | | | | |
| | | | Phase 1 Project Traffic | 0 | 63 | | | 45 | 1 | | | | 4 | | 0 | |
| | | | Phase 1 Build-Out Volume | 40 | 1357 | | | 958 | 89 | | | | 70 | | 55 | |
| | | | Phase 2 No Build Volume | 42 | 1437 | | | 1014 | 94 | | | | 74 | | 58 | |
| | | | Inbound Trip Distribution | | 8.0% | | | | | | | | 1.0% | | | |
| | | | Outbound Trip Distribution | | 25.0% | | | 32.0% | 1.0% | | | | | | | |
| | | | Phase 2 Project Traffic | 0 | 28 | | | 17 | 1 | | | | 2 | | | |
| | | | Phase 2 Build-Out Volume | 42 | 1465 | | | 1031 | 95 | | | | 76 | | 58 | |
| | | | Phase 3 No Build Volume | 46 | 1578 | | | 1111 | 103 | | | | 82 | | 63 | |
| | | | Inbound Trip Distribution | | 32.0% | | | | | | | | 1.0% | | | |
| | | | Outbound Trip Distribution | | | | | 32.0% | 1.0% | | | | | | | |
| | | | Phase 3 Project Traffic | | 66 | | | 19 | 1 | | | | 2 | | | |
| | | | P1-P2 Diverted Trips | 0 | 0 | | | 0 | 0 | | | | 0 | | 0 | |
| | | | Phase 3 Build-Out Volume | 46 | 1644 | | | 1130 | 104 | | | | 84 | | 63 | |
| 5 | Middlebrook Pike @ Dowell Springs Blvd | Signal | Existing Counts | 204 | 1136 | | | 951 | 207 | | | | 34 | | 30 | 0.92 |
| | | | Percent Heavy Vehicles | 0.5 | 2.3 | | | 4.0 | 2.9 | | | | 2.9 | | 6.7 | |
| | | | Phase 1 No Build Volume | 208 | 1159 | | | 970 | 211 | | | | 35 | | 31 | |
| | | | Inbound Trip Distribution | | | 9.0% | 66.0% | | | | | | | 1.0% | | |
| | | | Outbound Trip Distribution | | 25.0% | | | | | 33.0% | 1.0% | 41.0% | | | | |
| | | | Phase 1 Project Traffic | 0 | 35 | 32 | 232 | 0 | 0 | 46 | 1 | 57 | 0 | 4 | 0 | |
| | | | Phase 1 Build-Out Volume | 208 | 1194 | 32 | 232 | 970 | 211 | 46 | 1 | 57 | 35 | 4 | 31 | |
| | | | Phase 2 No Build Volume | 221 | 1265 | 32 | 232 | 1029 | 224 | 46 | 1 | 57 | 37 | 4 | 32 | |
| | | | Inbound Trip Distribution | | | 9.0% | 66.0% | | | | | | | 1.0% | | |
| | | | Outbound Trip Distribution | | 25.0% | | | | | 33.0% | 1.0% | 41.0% | | | | |
| | | | Phase 2 Project Traffic | 0 | 13 | 17 | 125 | | 0 | 17 | 1 | 22 | 0 | 2 | 0 | |
| | | | Phase 2 Build-Out Volume | 221 | 1278 | 49 | 357 | 1029 | 224 | 63 | 2 | 79 | 37 | 6 | 32 | |
| | | | Phase 3 No Build Volume | 239 | 1379 | 49 | 357 | 1114 | 243 | 63 | 2 | 79 | 40 | 6 | 35 | |
| | | | Inbound Trip Distribution | | | 33.0% | 39.0% | | | | | | | 1.0% | | |
| | | | Outbound Trip Distribution | | | | | | | 33.0% | 1.0% | 39.0% | | | | |
| | | | Phase 3 Project Traffic | | | 68 | 80 | | | 19 | 1 | 23 | | 2 | | |
| | | | P1-P2 Diverted Trips | 0 | 0 | 0 | -71 | 0 | 0 | 0 | 0 | -25 | 0 | 0 | 0 | |
| | | | Phase 3 Build-Out Volume | 239 | 1379 | 117 | 366 | 1114 | 243 | 82 | 3 | 77 | 40 | 8 | 35 | |

AM Peak Period -
Turning Movement Counts

| ID | Intersection | Stop Control | Intersection Conditions | Eastbound | | | Westbound | | | Northbound | | | Southbound | | | PHF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Lt | Th | Rt | Lt | Th | Rt | Lt | Th | Rt | Lt | Th | Rt | |
| 6 | Middlebrook Pike @ Old Weisgarber Rd | Signal | Existing Counts | 44 | 1019 | 97 | 24 | 1025 | 170 | 108 | 55 | 7 | 22 | 5 | 7 | 0.94 |
| | | | Percent Heavy Vehicles | 2.3 | 2.2 | 0.0 | 0.0 | 4.0 | 0.0 | 2.8 | 0.0 | 0.0 | 9.1 | 0.0 | 0.0 | |
| | | | Phase 1 No Build Volume | 45 | 1039 | 99 | 24 | 1046 | 173 | 110 | 56 | 7 | 22 | 5 | 7 | |
| | | | Inbound Trip Distribution | | | | | 52.0% | | 13.0% | | | | | 1.0% | |
| | | | Outbound Trip Distribution | 1.0% | 52.0% | 13.0% | | | | | | | | | | |
| | | | Phase 1 Project Traffic | 1 | 73 | 18 | 0 | 183 | 0 | 46 | 0 | 0 | 0 | 0 | 4 | |
| | | | Phase 1 Build-Out Volume | 46 | 1112 | 117 | 24 | 1229 | 173 | 156 | 56 | 7 | 22 | 5 | 11 | |
| | | | Phase 2 No Build Volume | 49 | 1176 | 123 | 26 | 1292 | 184 | 163 | 60 | 8 | 24 | 5 | 12 | |
| | | | Inbound Trip Distribution | | | | | 52.0% | | 13.0% | | | | | 1.0% | |
| | | | Outbound Trip Distribution | 1.0% | 52.0% | 13.0% | | | | | | | | | | |
| | | | Phase 2 Project Traffic | 1 | 28 | 7 | | 99 | | 25 | | | | | 2 | |
| | | | Phase 2 Build-Out Volume | 50 | 1204 | 130 | 26 | 1391 | 184 | 188 | 60 | 8 | 24 | 5 | 14 | |
| | | | Phase 3 No Build Volume | 54 | 1295 | 139 | 28 | 1483 | 199 | 198 | 64 | 8 | 26 | 6 | 14 | |
| | | | Inbound Trip Distribution | | | | 13.0% | 39.0% | | | | | | 1.0% | 0.0% | |
| | | | Outbound Trip Distribution | 0.0% | 39.0% | | | | | | 1.0% | 13.0% | | | | |
| | | | Phase 3 Project Traffic | 0 | 23 | | 27 | 80 | | | 1 | 8 | | 2 | 0 | |
| | | | P1-P2 Diverted Trips | 0 | 0 | -25 | 0 | 0 | 0 | -71 | 0 | 0 | 0 | 0 | 0 | |
| | | | Phase 3 Build-Out Volume | 54 | 1318 | 114 | 55 | 1563 | 199 | 127 | 65 | 16 | 26 | 8 | 14 | |
| 7 | Middlebrook Pike @ East Weisgarber Rd | Signal | Existing Counts | 21 | 582 | 425 | 652 | 856 | 79 | 409 | 99 | 431 | 16 | 17 | 7 | 0.92 |
| | | | Percent Heavy Vehicles | 4.8 | 3.6 | 2.6 | 14.7 | 4.2 | 3.8 | 2.2 | 2.0 | 9.3 | 25.0 | 29.0 | 28.6 | |
| | | | Phase 1 No Build Volume | 21 | 594 | 434 | 665 | 873 | 81 | 417 | 101 | 440 | 16 | 17 | 7 | |
| | | | Inbound Trip Distribution | | | | | 31.0% | | 20.0% | | | | | 1.0% | |
| | | | Outbound Trip Distribution | 1.0% | 31.0% | 20.0% | | | | | | | | | | |
| | | | Phase 1 Project Traffic | 1 | 43 | 28 | 0 | 109 | 0 | 70 | 0 | 0 | 0 | 0 | 4 | |
| | | | Phase 1 Build-Out Volume | 22 | 637 | 462 | 665 | 982 | 81 | 487 | 101 | 440 | 16 | 17 | 11 | |
| | | | Phase 2 No Build Volume | 24 | 673 | 488 | 706 | 1036 | 86 | 513 | 107 | 467 | 17 | 18 | 12 | |
| | | | Inbound Trip Distribution | | | | | 31.0% | | 20.0% | | | | | 1.0% | |
| | | | Outbound Trip Distribution | 1.0% | 31.0% | 20.0% | | | | | | | | | | |
| | | | Phase 2 Project Traffic | 1 | 16 | 11 | | 59 | | 38 | | | | | 2 | |
| | | | Phase 2 Build-Out Volume | 25 | 689 | 499 | 706 | 1095 | 86 | 551 | 107 | 467 | 17 | 18 | 14 | |
| | | | Phase 3 No Build Volume | 27 | 741 | 537 | 764 | 1171 | 93 | 587 | 116 | 505 | 19 | 20 | 14 | |
| | | | Inbound Trip Distribution | | | | | 31.0% | | 20.0% | | | | | 1.0% | |
| | | | Outbound Trip Distribution | 1.0% | 31.0% | 20.0% | | | | | | | | | | |
| | | | Phase 3 Project Traffic | 1 | 18 | 12 | | 64 | | 41 | | | | | 2 | |
| | | | P1-P2 Diverted Trips | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | Phase 3 Build-Out Volume | 28 | 759 | 549 | 764 | 1235 | 93 | 628 | 116 | 505 | 19 | 20 | 16 | |

AM Peak Period -
Turning Movement Counts

| ID | Intersection | Stop Control | Intersection Conditions | Eastbound | | | Westbound | | | Northbound | | | Southbound | | | PHF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Lt | Th | Rt | Lt | Th | Rt | Lt | Th | Rt | Lt | Th | Rt | |
| 8 | E Weisgarber Rd / N Weisgarber Rd @ Lonas Dr | Signal | Existing Counts | 43 | 75 | 277 | 69 | 59 | 110 | 261 | 1048 | 145 | 164 | 790 | 43 | 0.91 |
| | | | Percent Heavy Vehicles | 7.0 | 2.7 | 1.8 | 0.0 | 3.4 | 2.7 | 1.1 | 5.8 | 1.4 | 2.4 | 11.9 | 14.0 | |
| | | | Phase 1 No Build Volume | 44 | 77 | 283 | 70 | 60 | 112 | 266 | 1069 | 148 | 167 | 806 | 44 | |
| | | | Inbound Trip Distribution | | | | | 2.0% | | 11.0% | 20.0% | | | | | |
| | | | Outbound Trip Distribution | | 2.0% | 11.0% | | | | | | | | 20.0% | | |
| | | | Phase 1 Project Traffic | 0 | 3 | 15 | 0 | 7 | 0 | 39 | 70 | 0 | 0 | 28 | 0 | |
| | | | Phase 1 Build-Out Volume | 44 | 80 | 298 | 70 | 67 | 112 | 305 | 1139 | 148 | 167 | 834 | 44 | |
| | | | Phase 2 No Build Volume | 47 | 84 | 315 | 75 | 71 | 119 | 322 | 1204 | 157 | 178 | 883 | 47 | |
| | | | Inbound Trip Distribution | | | | | 2.0% | 0.0% | 11.0% | 20.0% | | | | | |
| | | | Outbound Trip Distribution | | 2.0% | 11.0% | | | | | | | 0.0% | 20.0% | | |
| | | | Phase 2 Project Traffic | | 1 | 6 | | 4 | 0 | 21 | 38 | | 0 | 11 | | |
| | | | Phase 2 Build-Out Volume | 47 | 85 | 321 | 75 | 75 | 119 | 343 | 1242 | 157 | 178 | 894 | 47 | |
| | | | Phase 3 No Build Volume | 50 | 92 | 346 | 81 | 80 | 129 | 366 | 1336 | 170 | 192 | 965 | 50 | |
| | | | Inbound Trip Distribution | | | | | 2.0% | 0.0% | 11.0% | 20.0% | | | | | |
| | | | Outbound Trip Distribution | | 2.0% | 11.0% | | | | | | | 0.0% | 20.0% | | |
| | | | Phase 3 Project Traffic | | 1 | 6 | | 4 | 0 | 23 | 41 | | 0 | 12 | | |
| | | | P1-P2 Diverted Trips | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | Phase 3 Build-Out Volume | 50 | 93 | 352 | 81 | 84 | 129 | 389 | 1377 | 170 | 192 | 977 | 50 | |
| 9 | Lonas Dr @ Old Weisgarber Rd | TWSC | Existing Counts | 28 | 301 | | | 206 | 158 | | | | 91 | | 44 | 0.89 |
| | | | Percent Heavy Vehicles | 3.6 | 3.0 | | | 1.5 | 5.1 | | | | 1.1 | | 0.0 | |
| | | | Phase 1 No Build Volume | 29 | 307 | | | 210 | 161 | | | | 93 | | 45 | |
| | | | Inbound Trip Distribution | | | | | | 13.0% | | | | | | | |
| | | | Outbound Trip Distribution | | | | | | | | | | 13.0% | | | |
| | | | Phase 1 Project Traffic | 0 | 0 | | | 0 | 46 | | | | 18 | | 0 | |
| | | | Phase 1 Build-Out Volume | 29 | 307 | | | 210 | 207 | | | | 111 | | 45 | |
| | | | Phase 2 No Build Volume | 30 | 326 | | | 223 | 217 | | | | 117 | | 48 | |
| | | | Inbound Trip Distribution | | | | | | 13.0% | | | | | | | |
| | | | Outbound Trip Distribution | | | | | | | | | | 13.0% | | | |
| | | | Phase 2 Project Traffic | | | | | | 25 | | | | 7 | | | |
| | | | Phase 2 Build-Out Volume | 30 | 326 | | | 223 | 242 | | | | 124 | | 48 | |
| | | | Phase 3 No Build Volume | 33 | 353 | | | 241 | 256 | | | | 132 | | 52 | |
| | | | Inbound Trip Distribution | | | | | | 13.0% | | | | | | | |
| | | | Outbound Trip Distribution | | | | | | | | | | 13.0% | | | |
| | | | Phase 3 Project Traffic | | | | | | 27 | | | | 8 | | | |
| | | | P1-P2 Diverted Trips | 0 | 0 | | | 0 | 0 | | | | 0 | | 0 | |
| | | | Phase 3 Build-Out Volume | 33 | 353 | | | 241 | 283 | | | | 140 | | 52 | |
| 10 | Old Weisgarber Rd @ East Entrance | TWSC | Phase 3 No Build Volume | | | | | | | | 289 | | | 173 | | 0.92 |
| | | | Inbound Trip Distribution | | | | | | | 13.0% | | | | | 14.0% | |
| | | | Outbound Trip Distribution | 14.0% | | 13.0% | | | | | | | | | | |
| | | | Phase 1 & 2 Project Traffic | | | | | | | | 71 | | | 25 | | |
| | | | Phase 3 Project Traffic | 8 | | 8 | | | | 27 | | | | | 29 | |
| | | | P1-P2 Diverted Trips | | | 25 | | | | 71 | -71 | | | -25 | | |
| | | | Phase 3 Build-Out Volume | 8 | 0 | 33 | 0 | 0 | 0 | 98 | 289 | 0 | 0 | 173 | 29 | |

PM Peak Period -
Turning Movement Counts

| ID | Intersection | Stop Control | Intersection Conditions | Eastbound | | | Westbound | | | Northbound | | | Southbound | | | PHF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Lt | Th | Rt | Lt | Th | Rt | Lt | Th | Rt | Lt | Th | Rt | |
| 1 | Middlebrook Pike @ Vanosdale Rd / Francis Rd | Signal | Existing Counts | 122 | 853 | 262 | 217 | 1094 | 96 | 237 | 201 | 139 | 72 | 149 | 78 | 0.93 |
| | | | Percent Heavy Vehicles | 1 | 2 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 3 | |
| | | | Phase 1 No Build Volume | 124 | 870 | 267 | 221 | 1116 | 98 | 242 | 205 | 142 | 73 | 152 | 80 | |
| | | | Inbound Trip Distribution | | 21.0% | | | | | | | 6.0% | 2.0% | | | |
| | | | Outbound Trip Distribution | | | | 6.0% | 21.0% | 2.0% | | | | | | | |
| | | | Phase 1 Project Traffic | 0 | 26 | 0 | 19 | 65 | 6 | 0 | 0 | 7 | 2 | 0 | 0 | |
| | | | Phase 1 Build-Out Volume | 124 | 896 | 267 | 240 | 1181 | 104 | 242 | 205 | 149 | 75 | 152 | 80 | |
| | | | Phase 2 No Build Volume | 132 | 949 | 284 | 254 | 1249 | 110 | 257 | 218 | 157 | 80 | 161 | 84 | |
| | | | Inbound Trip Distribution | | 21.0% | | | | | | | 6.0% | 2.0% | | | |
| | | | Outbound Trip Distribution | | | | 6.0% | 21.0% | 2.0% | | | | | | | |
| | | | Phase 2 Project Traffic | | 22 | | 16 | 58 | 5 | | | 6 | 2 | | | |
| | | | Phase 2 Build-Out Volume | 132 | 971 | 284 | 270 | 1307 | 115 | 257 | 218 | 163 | 82 | 161 | 84 | |
| | | | Phase 3 No Build Volume | 143 | 1047 | 307 | 289 | 1405 | 123 | 278 | 236 | 176 | 88 | 175 | 91 | |
| | | | Inbound Trip Distribution | | 21.0% | | | | | | | 6.0% | 2.0% | | | |
| | | | Outbound Trip Distribution | | | | 6.0% | 21.0% | 2.0% | | | | | | | |
| | | | Phase 3 Project Traffic | | 24 | | 18 | 63 | 6 | | | 7 | 2 | | | |
| | | | P1-P2 Diverted Trips | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | Phase 3 Build-Out Volume | 143 | 1071 | 307 | 307 | 1468 | 129 | 278 | 236 | 183 | 90 | 175 | 91 | |
| 2 | Middlebrook Pike @ Whitehall Rd / Lake Brook Blvd | TWSC | Existing Counts | 29 | 846 | 24 | 56 | 1320 | 11 | 30 | 3 | 27 | 4 | 2 | 26 | 0.91 |
| | | | Percent Heavy Vehicles | 0.0 | 2.6 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 | 0.0 | 3.7 | 0.0 | 0.0 | 0.0 | |
| | | | Phase 1 No Build Volume | 30 | 863 | 24 | 57 | 1346 | 11 | 31 | 3 | 28 | 4 | 2 | 27 | |
| | | | Inbound Trip Distribution | | 29.0% | | | | | | | 1.0% | 1.0% | | | |
| | | | Outbound Trip Distribution | | | | 1.0% | 29.0% | 1.0% | | | | | | | |
| | | | Phase 1 Project Traffic | 0 | 36 | 0 | 3 | 90 | 3 | 0 | 0 | 1 | 1 | 0 | 0 | |
| | | | Phase 1 Build-Out Volume | 30 | 899 | 24 | 60 | 1436 | 14 | 31 | 3 | 29 | 5 | 2 | 27 | |
| | | | Phase 2 No Build Volume | 31 | 952 | 26 | 64 | 1519 | 15 | 32 | 3 | 30 | 5 | 2 | 28 | |
| | | | Inbound Trip Distribution | | 29.0% | | | | | | | 1.0% | 1.0% | | | |
| | | | Outbound Trip Distribution | | | | 1.0% | 29.0% | 1.0% | | | | | | | |
| | | | Phase 2 Project Traffic | 0 | 31 | 0 | 3 | 79 | 3 | 0 | 0 | 1 | 1 | 0 | 0 | |
| | | | Phase 2 Build-Out Volume | 31 | 983 | 26 | 67 | 1598 | 18 | 32 | 3 | 31 | 6 | 2 | 28 | |
| | | | Phase 3 No Build Volume | 34 | 1058 | 28 | 72 | 1716 | 19 | 35 | 4 | 34 | 7 | 2 | 30 | |
| | | | Inbound Trip Distribution | | 29.0% | | | | | | | 1.0% | 1.0% | | | |
| | | | Outbound Trip Distribution | | | | 1.0% | 29.0% | 1.0% | | | | | | | |
| | | | Phase 3 Project Traffic | | 34 | | 3 | 87 | 3 | | | 1 | 1 | | | |
| | | | P1-P2 Diverted Trips | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | Phase 3 Build-Out Volume | 34 | 1092 | 28 | 75 | 1803 | 22 | 35 | 4 | 35 | 8 | 2 | 30 | |

PM Peak Period -
Turning Movement Counts

| ID | Intersection | Stop Control | Intersection Conditions | Eastbound | | | Westbound | | | Northbound | | | Southbound | | | PHF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Lt | Th | Rt | Lt | Th | Rt | Lt | Th | Rt | Lt | Th | Rt | |
| 3 | Middlebrook Pike @ Lake Brook Blvd | Signal | Existing Counts | 107 | 777 | | | 1227 | 70 | | | | 129 | | 98 | 0.93 |
| | | | Percent Heavy Vehicles | 0.0 | 2.8 | | | 0.9 | 1.4 | | | | 1.6 | | 0.0 | |
| | | | Phase 1 No Build Volume | 109 | 793 | | | 1252 | 71 | | | | 132 | | 100 | |
| | | | Inbound Trip Distribution | | 31.0% | | | | | | | | 1.0% | | | |
| | | | Outbound Trip Distribution | | | | | 31.0% | 1.0% | | | | | | | |
| | | | Phase 1 Project Traffic | 0 | 38 | | | 96 | 3 | | | | 1 | | 0 | |
| | | | Phase 1 Build-Out Volume | 109 | 831 | | | 1348 | 74 | | | | 133 | | 100 | |
| | | | Phase 2 No Build Volume | 116 | 879 | | | 1424 | 79 | | | | 141 | | 106 | |
| | | | Inbound Trip Distribution | | 31.0% | | | | | | | | 1.0% | | | |
| | | | Outbound Trip Distribution | | | | | 31.0% | 1.0% | | | | | | | |
| | | | Phase 2 Project Traffic | 0 | 33 | | | 85 | 3 | | | | 1 | | 0 | |
| | | | Phase 2 Build-Out Volume | 116 | 912 | | | 1509 | 82 | | | | 142 | | 106 | |
| | | | Phase 3 No Build Volume | 125 | 981 | | | 1619 | 88 | | | | 153 | | 115 | |
| | | | Inbound Trip Distribution | | 31.0% | | | | | | | | 1.0% | | | |
| | | | Outbound Trip Distribution | | | | | 31.0% | 1.0% | | | | | | | |
| | | | Phase 3 Project Traffic | | 36 | | | 93 | 3 | | | | 1 | | | |
| | | | P1-P2 Diverted Trips | 0 | 0 | | | 0 | 0 | | | | 0 | | 0 | |
| | | | Phase 3 Build-Out Volume | 125 | 1017 | | | 1712 | 91 | | | | 154 | | 115 | |
| 11 | Middlebrook Pike @ West access | TWSC | Existing Counts | | 895 | | | 1285 | | | | | | | | |
| | | | Percent Heavy Vehicles | | 2.4 | | | 1.0 | | | | | | | | |
| | | | Phase 1 No Build Volume | | 913 | | | 1311 | | | | | | | | |
| | | | Inbound Trip Distribution | | 8.0% | 24.0% | | | | | | | | | | |
| | | | Outbound Trip Distribution | | | | | 32.0% | | | | 25.0% | | | | |
| | | | Phase 1 Project Traffic | | 10 | 30 | | 99 | | | | 77 | | | | |
| | | | Phase 1 Build-Out Volume | | 923 | 30 | | 1410 | | | | 77 | | | | |
| | | | Phase 2 No Build Volume | | 979 | 30 | | 1490 | | | | 77 | | | | |
| | | | Inbound Trip Distribution | | 8.0% | 24.0% | | | | | | | | | | |
| | | | Outbound Trip Distribution | | | | | 32.0% | | | | 25.0% | | | | |
| | | | Phase 2 Project Traffic | | 9 | 26 | | 88 | | | | 69 | | | | |
| | | | Phase 2 Build-Out Volume | | 988 | 56 | | 1578 | | | | 146 | | | | |
| | | | Phase 3 No Build Volume | | 1068 | 56 | | 1693 | | | | 146 | | | | |
| | | | Inbound Trip Distribution | | 32.0% | | | | | | | | | | | |
| | | | Outbound Trip Distribution | | | | | 32.0% | | | | | | | | |
| | | | Phase 3 Project Traffic | | 37 | | | 96 | | | | | | | | |
| | | | P1-P2 Diverted Trips | | | | | | | | | 0 | | | | |
| | | | Phase 3 Build-Out Volume | | 1105 | 56 | | 1789 | | | | 146 | | | | |

PM Peak Period -
Turning Movement Counts

| ID | Intersection | Stop Control | Intersection Conditions | Eastbound | | | Westbound | | | Northbound | | | Southbound | | | PHF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Lt | Th | Rt | Lt | Th | Rt | Lt | Th | Rt | Lt | Th | Rt | |
| 4 | Middlebrook Pike @ Dick Lonas Rd | TWSC | Existing Counts | 24 | 871 | | | 1228 | 68 | | | | 70 | | 57 | 0.88 |
| | | | Percent Heavy Vehicles | 4.2 | 2.4 | | | 1.0 | 1.5 | | | | 0.0 | | 0.0 | |
| | | | Phase 1 No Build Volume | 24 | 888 | | | 1253 | 69 | | | | 71 | | 58 | |
| | | | Inbound Trip Distribution | | 8.0% | | | | | | | | 1.0% | | | |
| | | | Outbound Trip Distribution | | 25.0% | | | 32.0% | 1.0% | | | | | | | |
| | | | Phase 1 Project Traffic | 0 | 87 | | | 99 | 3 | | | | 1 | | 0 | |
| | | | Phase 1 Build-Out Volume | 24 | 975 | | | 1352 | 72 | | | | 72 | | 58 | |
| | | | Phase 2 No Build Volume | 26 | 1030 | | | 1428 | 77 | | | | 77 | | 62 | |
| | | | Inbound Trip Distribution | | 8.0% | | | | | | | | 1.0% | | | |
| | | | Outbound Trip Distribution | | 25.0% | | | 32.0% | 1.0% | | | | | | | |
| | | | Phase 2 Project Traffic | | 78 | | | 88 | 3 | | | | 1 | | 0 | |
| | | | Phase 2 Build-Out Volume | 26 | 1108 | | | 1516 | 80 | | | | 78 | | 62 | |
| | | | Phase 3 No Build Volume | 28 | 1186 | | | 1626 | 86 | | | | 84 | | 67 | |
| | | | Inbound Trip Distribution | | 32.0% | | | | | | | | 1.0% | | | |
| | | | Outbound Trip Distribution | | | | | 32.0% | 1.0% | | | | | | | |
| | | | Phase 3 Project Traffic | | 37 | | | 96 | 3 | | | | 1 | | | |
| | | | P1-P2 Diverted Trips | 0 | 0 | | | 0 | 0 | | | | | | | |
| | | | Phase 3 Build-Out Volume | 28 | 1223 | | | 1722 | 89 | | | | 85 | | 67 | |
| 5 | Middlebrook Pike @ Dowell Springs Blvd | Signal | Existing Counts | 25 | 925 | | | 1122 | 24 | | | | 146 | | 179 | 0.91 |
| | | | Percent Heavy Vehicles | 4.0 | 2.7 | | | 1.4 | 8.3 | | | | 0.0 | | 2.7 | |
| | | | Phase 1 No Build Volume | 26 | 944 | | | 1144 | 24 | | | | 149 | | 183 | |
| | | | Inbound Trip Distribution | | | 9.0% | 66.0% | | | | | | | 1.0% | | |
| | | | Outbound Trip Distribution | | 25.0% | | | | | 33.0% | 1.0% | 41.0% | | | | |
| | | | Phase 1 Project Traffic | 0 | 77 | 11 | 82 | 0 | 0 | 102 | 3 | 127 | 0 | 1 | 0 | |
| | | | Phase 1 Build-Out Volume | 26 | 1021 | 11 | 82 | 1144 | 24 | 102 | 3 | 127 | 149 | 1 | 183 | |
| | | | Phase 2 No Build Volume | 27 | 1078 | 11 | 82 | 1214 | 26 | 102 | 3 | 127 | 158 | 1 | 194 | |
| | | | Inbound Trip Distribution | | | 9.0% | 66.0% | | | | | | | 1.0% | | |
| | | | Outbound Trip Distribution | | 25.0% | | | | | 33.0% | 1.0% | 41.0% | | | | |
| | | | Phase 2 Project Traffic | | 69 | 10 | 71 | | | 90 | 3 | 112 | | 1 | | |
| | | | Phase 2 Build-Out Volume | 27 | 1147 | 21 | 153 | 1214 | 26 | 192 | 6 | 239 | 158 | 2 | 194 | |
| | | | Phase 3 No Build Volume | 29 | 1153 | 21 | 153 | 1315 | 28 | 192 | 6 | 239 | 171 | 2 | 210 | |
| | | | Inbound Trip Distribution | | | 33.0% | 39.0% | | | | | | | 1.0% | | |
| | | | Outbound Trip Distribution | | | | | | | 33.0% | 1.0% | 39.0% | | | | |
| | | | Phase 3 Project Traffic | | | 38 | 45 | | | 99 | 3 | 117 | | 1 | | |
| | | | P1-P2 Diverted Trips | 0 | 0 | 0 | -30 | 0 | 0 | 0 | 0 | -76 | 0 | 0 | 0 | |
| | | | Phase 3 Build-Out Volume | 29 | 1153 | 59 | 168 | 1315 | 28 | 291 | 9 | 280 | 171 | 3 | 210 | |

PM Peak Period -
Turning Movement Counts

| ID | Intersection | Stop Control | Intersection Conditions | Eastbound | | | Westbound | | | Northbound | | | Southbound | | | PHF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Lt | Th | Rt | Lt | Th | Rt | Lt | Th | Rt | Lt | Th | Rt | |
| 6 | Middlebrook Pike @ Old Weisgarber Rd | Signal | Existing Counts | 7 | 997 | 59 | 19 | 1007 | 29 | 83 | 14 | 8 | 169 | 60 | 48 | 0.92 |
| | | | Percent Heavy Vehicles | 0.0 | 2.6 | 0.0 | 0.0 | 1.3 | 0.0 | 1.2 | 14.3 | 12.5 | 1.2 | 0.0 | 2.1 | |
| | | | Phase 1 No Build Volume | 7 | 1017 | 60 | 19 | 1027 | 30 | 85 | 14 | 8 | 172 | 61 | 49 | |
| | | | Inbound Trip Distribution | | | | | 52% | | 13% | | | | | 1% | |
| | | | Outbound Trip Distribution | 1% | 52% | 13% | | | | | | | | | | |
| | | | Phase 1 Project Traffic | 3 | 161 | 40 | 0 | 64 | 0 | 16 | 0 | 0 | 0 | 0 | 1 | |
| | | | Phase 1 Build-Out Volume | 10 | 1178 | 100 | 19 | 1091 | 30 | 101 | 14 | 8 | 172 | 61 | 50 | |
| | | | Phase 2 No Build Volume | 11 | 1240 | 104 | 21 | 1154 | 31 | 106 | 15 | 9 | 183 | 65 | 53 | |
| | | | Inbound Trip Distribution | | | | | 52% | | 13% | | | | | 1% | |
| | | | Outbound Trip Distribution | 1% | 52% | 13% | | | | | | | | | | |
| | | | Phase 2 Project Traffic | 3 | 142 | 36 | | 56 | | 14 | | | | | 1 | |
| | | | Phase 2 Build-Out Volume | 14 | 1382 | 140 | 21 | 1210 | 31 | 120 | 15 | 9 | 183 | 65 | 54 | |
| | | | Phase 3 No Build Volume | 14 | 1471 | 145 | 22 | 1300 | 34 | 127 | 16 | 9 | 198 | 70 | 58 | |
| | | | Inbound Trip Distribution | | | | 13.0% | 39.0% | | | | | | 1.0% | | |
| | | | Outbound Trip Distribution | 0.0% | 39.0% | | | | | | 1.0% | 13.0% | | | | |
| | | | Phase 3 Project Traffic | 0 | 117 | | 15 | 45 | | | 3 | 39 | | 1 | | |
| | | | P1-P2 Diverted Trips | 0 | 0 | -76 | 0 | 0 | 0 | -30 | 0 | 0 | 0 | 0 | 0 | |
| | | | Phase 3 Build-Out Volume | 14 | 1588 | 69 | 37 | 1345 | 34 | 97 | 19 | 48 | 198 | 71 | 58 | |
| 7 | Middlebrook Pike @ East Weisgarber Rd | Signal | Existing Counts | 9 | 807 | 381 | 511 | 734 | 27 | 313 | 9 | 517 | 108 | 112 | 25 | 0.91 |
| | | | Percent Heavy Vehicles | 22.2 | 3.6 | 2.6 | 5.7 | 1.2 | 22.2 | 1.6 | 11.1 | 7.0 | 0.9 | 1.8 | 0.0 | |
| | | | Phase 1 No Build Volume | 9 | 823 | 389 | 521 | 749 | 28 | 319 | 9 | 527 | 110 | 114 | 26 | |
| | | | Inbound Trip Distribution | | | | | 31% | | 20% | | | | | 1% | |
| | | | Outbound Trip Distribution | 1% | 31.0% | 20% | | | | | | | | | | |
| | | | Phase 1 Project Traffic | 3 | 96 | 62 | 0 | 38 | 0 | 25 | 0 | 0 | 0 | 0 | 1 | |
| | | | Phase 1 Build-Out Volume | 12 | 919 | 451 | 521 | 787 | 28 | 344 | 9 | 527 | 110 | 114 | 27 | |
| | | | Phase 2 No Build Volume | 13 | 970 | 474 | 553 | 833 | 29 | 364 | 10 | 560 | 117 | 121 | 28 | |
| | | | Inbound Trip Distribution | | | | | 31% | | 20% | | | | | 1% | |
| | | | Outbound Trip Distribution | 1% | 31% | 20% | | | | | | | | | | |
| | | | Phase 2 Project Traffic | 3 | 85 | 55 | | 33 | | 21 | | | | | 1 | |
| | | | Phase 2 Build-Out Volume | 16 | 1055 | 529 | 553 | 866 | 29 | 385 | 10 | 560 | 117 | 121 | 29 | |
| | | | Phase 3 No Build Volume | 17 | 1127 | 563 | 599 | 931 | 32 | 413 | 11 | 606 | 127 | 131 | 31 | |
| | | | Inbound Trip Distribution | | | | | 31.0% | | 20.0% | | | | | 1.0% | |
| | | | Outbound Trip Distribution | 1.0% | 31.0% | 20.0% | | | | | | | | | | |
| | | | Phase 3 Project Traffic | 3 | 93 | 60 | | 36 | | 23 | | | | | 1 | |
| | | | P1-P2 Diverted Trips | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | Phase 3 Build-Out Volume | 20 | 1220 | 623 | 599 | 967 | 32 | 436 | 11 | 606 | 127 | 131 | 32 | |

PM Peak Period -
Turning Movement Counts

| ID | Intersection | Stop Control | Intersection Conditions | Eastbound | | | Westbound | | | Northbound | | | Southbound | | | PHF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Lt | Th | Rt | Lt | Th | Rt | Lt | Th | Rt | Lt | Th | Rt | |
| 8 | E Weisgarber Rd / N Weisgarber Rd @ Lonas Dr | Signal | Existing Counts | 39 | 61 | 309 | 174 | 64 | 104 | 233 | 579 | 64 | 109 | 1031 | 41 | 0.86 |
| | | | Percent Heavy Vehicles | 0.0 | 1.6 | 1.0 | 0.0 | 1.6 | 2.9 | 0.9 | 9.8 | 1.6 | 0.9 | 3.1 | 2.4 | |
| | | | Phase 1 No Build Volume | 40 | 62 | 315 | 177 | 65 | 106 | 238 | 591 | 65 | 111 | 1052 | 42 | |
| | | | Inbound Trip Distribution | | | | | 2.0% | 0.0% | 11.0% | 20.0% | | | | | |
| | | | Outbound Trip Distribution | | 2.0% | 11.0% | | | | | | | 0.0% | 20.0% | | |
| | | | Phase 1 Project Traffic | 0 | 6 | 34 | 0 | 2 | 0 | 14 | 25 | 0 | 0 | 62 | 0 | |
| | | | Phase 1 Build-Out Volume | 40 | 68 | 349 | 177 | 67 | 106 | 252 | 616 | 65 | 111 | 1114 | 42 | |
| | | | Phase 2 No Build Volume | 42 | 72 | 368 | 188 | 71 | 113 | 266 | 652 | 69 | 118 | 1178 | 44 | |
| | | | Inbound Trip Distribution | | | | | 2.0% | 0.0% | 11.0% | 20.0% | | | | | |
| | | | Outbound Trip Distribution | | 2.0% | 11.0% | | | | | | | 0.0% | 20.0% | | |
| | | | Phase 2 Project Traffic | | 5 | 30 | | 2 | 0 | 12 | 21 | | 0 | 55 | | |
| | | | Phase 2 Build-Out Volume | 42 | 77 | 398 | 188 | 73 | 113 | 278 | 673 | 69 | 118 | 1233 | 44 | |
| | | | Phase 3 No Build Volume | 46 | 82 | 426 | 204 | 79 | 122 | 299 | 724 | 75 | 128 | 1325 | 48 | |
| | | | Inbound Trip Distribution | | | | | 2.0% | 0.0% | 11.0% | 20.0% | | | | | |
| | | | Outbound Trip Distribution | | 2.0% | 11.0% | | | | | | | 0.0% | 20.0% | | |
| | | | Phase 3 Project Traffic | | 6 | 33 | | 2 | 0 | 13 | 23 | | 0 | 60 | | |
| | | | P1-P2 Diverted Trips | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | Phase 3 Build-Out Volume | 46 | 88 | 459 | 204 | 81 | 122 | 312 | 747 | 75 | 128 | 1385 | 48 | |
| 9 | Lonas Dr @ Old Weisgarber Rd | TWSC | Existing Counts | 24 | 285 | | | 229 | 107 | | | | 126 | | 23 | 0.87 |
| | | | Percent Heavy Vehicles | 12.5 | 0.7 | | | 1.7 | 0.0 | | | | 0.0 | | 0.0 | |
| | | | Phase 1 No Build Volume | 24 | 291 | | | 234 | 109 | | | | 129 | | 23 | |
| | | | Inbound Trip Distribution | | | | | | 13% | | | | | | | |
| | | | Outbound Trip Distribution | | | | | | | | | | 13% | | | |
| | | | Phase 1 Project Traffic | 0 | 0 | | | 0 | 16 | | | | 40 | | 0 | |
| | | | Phase 1 Build-Out Volume | 24 | 291 | | | 234 | 125 | | | | 169 | | 23 | |
| | | | Phase 2 No Build Volume | 26 | 308 | | | 248 | 132 | | | | 176 | | 25 | |
| | | | Inbound Trip Distribution | | | | | | 13% | | | | | | | |
| | | | Outbound Trip Distribution | | | | | | | | | | 13% | | | |
| | | | Phase 2 Project Traffic | | | | | | 14 | | | | 36 | | | |
| | | | Phase 2 Build-Out Volume | 26 | 308 | | | 248 | 146 | | | | 212 | | 25 | |
| | | | Phase 3 No Build Volume | 30 | 361 | | | 291 | 171 | | | | 248 | | 29 | |
| | | | Inbound Trip Distribution | | | | | | 13.0% | | | | | | | |
| | | | Outbound Trip Distribution | | | | | | | | | | 13.0% | | | |
| | | | Phase 3 Project Traffic | | | | | | 15 | | | | 39 | | | |
| | | | P1-P2 Diverted Trips | 0 | 0 | | | 0 | 0 | | | | 0 | | 0 | |
| | | | Phase 3 Build-Out Volume | 30 | 361 | | | 291 | 186 | | | | 287 | | 29 | |
| 10 | Old Weisgarber Rd @ East Entrance | TWSC | Phase 3 No Build Volume | | | | | | | | 201 | | | 237 | | 0.90 |
| | | | Inbound Trip Distribution | | | | | | | 13.0% | | | | | 14.0% | |
| | | | Outbound Trip Distribution | 14.0% | | 13.0% | | | | | | | | | | |
| | | | Phase 1 & 2 Project Traffic | | | | | | | | 30 | | | 76 | | |
| | | | Phase 3 Project Traffic | 42 | | 39 | | | | 15 | | | | | 16 | |
| | | | P1-P2 Diverted Trips | | | 76 | | | | 30 | -30 | | | -76 | | |
| | | | Phase 3 Build-Out Volume | 42 | 0 | 115 | 0 | 0 | 0 | 45 | 201 | 0 | 0 | 237 | 16 | |

# Appendix VII – Phase 1 No Build Synchro Reports

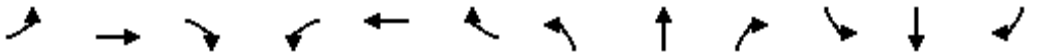
## Table VII-1 Phase 1 No-Build Level of Service

| | Intersection | Stop Control | Intersection Conditions | Approach | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Overall | EB | WB | NB | SB |
| AM Peak Period | Middlebrook @ Vanosdale | Signal | LOS | D | C | D | D | C |
| | | | Delay (sec/veh) | 35.3 | 34.6 | 37.0 | 41.8 | 29.0 |
| | Middlebrook @ Whitehall | TWSC | LOS | | A* | A* | C | B |
| | | | Delay (sec/veh) | | 8.4* | 9.8* | 18.4 | 12.9 |
| | Middlebrook @ Lake Brook | Signal | LOS | A | A | A | | D |
| | | | Delay (sec/veh) | 4.6 | 1.0 | 2.0 | | 52.9 |
| | Middlebrook @ Dick Lonas | TWSC | LOS | | A* | - | | C |
| | | | Delay (sec/veh) | | 8.8 | - | | 15.5 |
| | Middlebrook @ Dowell Springs | Signal | LOS | A | A | A | | D |
| | | | Delay (sec/veh) | 3.7 | 1.2 | 3.9 | | 54.3 |
| | Middlebrook @ Old Weisgarber | Signal | LOS | B | C | B | D | D |
| | | | Delay (sec/veh) | 18.4 | 20.6 | 11.0 | 52.7 | 41.6 |
| | Middlebrook @ E Weisgarber | Signal | LOS | E | B | F | D | D |
| | | | Delay (sec/veh) | 68.6 | 19.7 | 94.2 | 47.9 | 53.9 |
| | E Weisgarber @ Lonas | Signal | LOS | B | D | D | B | B |
| | | | Delay (sec/veh) | 14.2 | 42.0 | 43.5 | 11.7 | 10.9 |
| | Old Weisgarber @ Lonas | TWSC | LOS | | A* | - | | C |
| | | | Delay (sec/veh) | | 8.3* | - | | 17.5 |
| PM Peak Period | Middlebrook @ Vanosdale | Signal | LOS | D | C | D | C | D |
| | | | Delay (sec/veh) | 37.1 | 25.5 | 47.2 | 33.6 | 44.2 |
| | Middlebrook @ Whitehall | TWSC | LOS | | A* | A* | B | B |
| | | | Delay (sec/veh) | | 9.6* | 8.5* | 14.8 | 14.0 |
| | Middlebrook @ Lake Brook | Signal | LOS | A | A | A | | E |
| | | | Delay (sec/veh) | 6.6 | 0.6 | 1.7 | | 56.9 |
| | Middlebrook @ Dick Lonas | TWSC | LOS | | B* | - | | C |
| | | | Delay (sec/veh) | | 10.1* | - | | 17.9 |
| | Middlebrook @ Dowell Springs | Signal | LOS | C | A | C | | D |
| | | | Delay (sec/veh) | 21.1 | 0.9 | 30.7 | | 47.4 |
| | Middlebrook @ Old Weisgarber | Signal | LOS | B | B | B | D | D |
| | | | Delay (sec/veh) | 17.8 | 10.8 | 14.9 | 50.1 | 44.4 |
| | Middlebrook @ E Weisgarber | Signal | LOS | D | D | C | D | E |
| | | | Delay (sec/veh) | 41.0 | 53.2 | 23.8 | 48.7 | 79.7 |
| | E Weisgarber @ Lonas | Signal | LOS | C | C | D | B | B |
| | | | Delay (sec/veh) | 20.5 | 34.3 | 41.8 | 14.8 | 19.3 |
| | Old Weisgarber @ Lonas | TWSC | LOS | | A* | - | | C |
| | | | Delay (sec/veh) | | 8.3* | - | | 19.9 |

*Left turn movement only

# HCM 6th Signalized Intersection Summary
## 1: Vanosdale Rd/Francis Rd & Middlebrook Pike

05/24/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 39 | 1078 | 221 | 189 | 613 | 65 | 92 | 113 | 338 | 261 | 209 | 153 |
| Future Volume (veh/h) | 39 | 1078 | 221 | 189 | 613 | 65 | 92 | 113 | 338 | 261 | 209 | 153 |
| 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 | 1737 | 1870 | 1870 | 1856 | 1826 | 1826 | 1885 | 1796 | 1870 | 1841 | 1826 | 1856 |
| Adj Flow Rate, veh/h | 41 | 1123 | 230 | 197 | 639 | 68 | 96 | 118 | 352 | 272 | 218 | 159 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 11 | 2 | 2 | 3 | 5 | 5 | 1 | 7 | 2 | 4 | 5 | 3 |
| Cap, veh/h | 341 | 1344 | 692 | 243 | 1208 | 128 | 336 | 327 | 447 | 423 | 481 | 414 |
| Arrive On Green | 0.09 | 0.38 | 0.38 | 0.07 | 0.26 | 0.26 | 0.06 | 0.18 | 0.18 | 0.14 | 0.26 | 0.26 |
| Sat Flow, veh/h | 1654 | 3554 | 1585 | 1767 | 3164 | 336 | 1795 | 1796 | 1585 | 1753 | 1826 | 1572 |
| Grp Volume(v), veh/h | 41 | 1123 | 230 | 197 | 350 | 357 | 96 | 118 | 352 | 272 | 218 | 159 |
| Grp Sat Flow(s),veh/h/ln | 1654 | 1777 | 1585 | 1767 | 1735 | 1765 | 1795 | 1796 | 1585 | 1753 | 1826 | 1572 |
| Q Serve(g_s), s | 0.0 | 31.6 | 10.5 | 8.9 | 19.1 | 19.2 | 4.7 | 6.3 | 20.0 | 13.3 | 11.0 | 6.7 |
| Cycle Q Clear(g_c), s | 0.0 | 31.6 | 10.5 | 8.9 | 19.1 | 19.2 | 4.7 | 6.3 | 20.0 | 13.3 | 11.0 | 6.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.19 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 341 | 1344 | 692 | 243 | 662 | 674 | 336 | 327 | 447 | 423 | 481 | 414 |
| V/C Ratio(X) | 0.12 | 0.84 | 0.33 | 0.81 | 0.53 | 0.53 | 0.29 | 0.36 | 0.79 | 0.64 | 0.45 | 0.38 |
| Avail Cap(c_a), veh/h | 346 | 1344 | 692 | 306 | 662 | 674 | 427 | 327 | 447 | 433 | 481 | 414 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 0.67 | 0.67 | 0.67 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 30.6 | 31.1 | 20.4 | 30.4 | 32.4 | 32.4 | 33.6 | 39.4 | 36.4 | 28.8 | 33.9 | 17.8 |
| Incr Delay (d2), s/veh | 0.2 | 6.3 | 1.3 | 12.3 | 3.0 | 3.0 | 0.2 | 0.2 | 8.3 | 2.4 | 0.2 | 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 | 0.8 | 13.7 | 4.1 | 4.5 | 8.7 | 8.9 | 2.1 | 2.8 | 9.6 | 5.8 | 4.9 | 2.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 30.7 | 37.4 | 21.7 | 42.7 | 35.4 | 35.4 | 33.8 | 39.7 | 44.8 | 31.2 | 34.1 | 18.1 |
| LnGrp LOS | C | D | C | D | D | D | C | D | D | C | C | B |
| Approach Vol, veh/h | | 1394 | | | 904 | | | 566 | | | 649 | |
| Approach Delay, s/veh | | 34.6 | | | 37.0 | | | 41.8 | | | 29.0 | |
| Approach LOS | | C | | | D | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.6 | 48.0 | 20.4 | 26.0 | 16.0 | 47.6 | 11.4 | 35.0 |
| Change Period (Y+Rc), s | 6.0 | * 6 | 5.0 | 6.0 | 5.0 | 6.0 | 5.0 | * 6 |
| Max Green Setting (Gmax), s | 10.0 | * 42 | 16.0 | 20.0 | 15.0 | 37.0 | 12.0 | * 25 |
| Max Q Clear Time (g_c+I1), s | 2.0 | 21.2 | 15.3 | 22.0 | 10.9 | 33.6 | 6.7 | 13.0 |
| Green Ext Time (p_c), s | 0.0 | 2.3 | 0.0 | 0.0 | 0.2 | 1.8 | 0.0 | 0.9 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 35.3 |
| HCM 6th LOS | D |

**Notes**

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

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.2 |

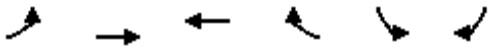
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 22 | 1341 | 36 | 32 | 881 | 6 | 45 | 1 | 58 | 12 | 3 | 31 |
| Future Vol, veh/h | 22 | 1341 | 36 | 32 | 881 | 6 | 45 | 1 | 58 | 12 | 3 | 31 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 25 | - | - | 128 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 1 | - | - | 1 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, % | 0 | 2 | 6 | 0 | 5 | 0 | 4 | 0 | 0 | 0 | 0 | 0 |
| Mvmt Flow | 24 | 1474 | 40 | 35 | 968 | 7 | 49 | 1 | 64 | 13 | 3 | 34 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 975 | 0 | 0 | 1514 | 0 | 0 | 2098 | 2587 | 757 | 1828 | 2604 | 488 |
| Stage 1 | - | - | - | - | - | - | 1542 | 1542 | - | 1042 | 1042 | - |
| Stage 2 | - | - | - | - | - | - | 556 | 1045 | - | 786 | 1562 | - |
| Critical Hdwy | 4.1 | - | - | 4.1 | - | - | 7.58 | 6.5 | 6.9 | 7.5 | 6.5 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.58 | 5.5 | - | 6.5 | 5.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.58 | 5.5 | - | 6.5 | 5.5 | - |
| Follow-up Hdwy | 2.2 | - | - | 2.2 | - | - | 3.54 | 4 | 3.3 | 3.5 | 4 | 3.3 |
| Pot Cap-1 Maneuver | 1081 | - | - | 790 | - | - | *120 | 26 | *549 | *369 | 24 | *746 |
| Stage 1 | - | - | - | - | - | - | *445 | 409 | - | *584 | 537 | - |
| Stage 2 | - | - | - | - | - | - | *696 | 534 | - | *517 | 393 | - |
| Platoon blocked, % | 1 | - | - | 1 | - | - | 1 | 1 | 1 | 1 | 1 | 1 |
| Mov Cap-1 Maneuver | 1081 | - | - | 790 | - | - | *107 | 24 | *549 | *309 | 22 | *746 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | *278 | 211 | - | *349 | 199 | - |
| Stage 1 | - | - | - | - | - | - | *435 | 400 | - | *571 | 513 | - |
| Stage 2 | - | - | - | - | - | - | *631 | 511 | - | *446 | 384 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.1 | 0.3 | 18.4 | 12.9 |
| HCM LOS | | | C | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 382 | 1081 | - | - | 790 | - | - | 505 |
| HCM Lane V/C Ratio | 0.299 | 0.022 | - | - | 0.045 | - | - | 0.1 |
| HCM Control Delay (s) | 18.4 | 8.4 | - | - | 9.8 | - | - | 12.9 |
| HCM Lane LOS | C | A | - | - | A | - | - | B |
| HCM 95th %tile Q(veh) | 1.2 | 0.1 | - | - | 0.1 | - | - | 0.3 |

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



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 157 | 1258 | 858 | 111 | 86 | 73 |
| Future Volume (veh/h) | 157 | 1258 | 858 | 111 | 86 | 73 |
| 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 | 1885 | 1870 | 1841 | 1841 | 1870 | 1900 |
| Adj Flow Rate, veh/h | 173 | 1382 | 943 | 122 | 95 | 80 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 1 | 2 | 4 | 4 | 2 | 0 |
| Cap, veh/h | 706 | 2910 | 1784 | 231 | 128 | 116 |
| Arrive On Green | 0.26 | 1.00 | 1.00 | 1.00 | 0.07 | 0.07 |
| Sat Flow, veh/h | 1795 | 3647 | 3206 | 403 | 1781 | 1610 |
| Grp Volume(v), veh/h | 173 | 1382 | 529 | 536 | 95 | 80 |
| Grp Sat Flow(s),veh/h/ln | 1795 | 1777 | 1749 | 1768 | 1781 | 1610 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 0.0 | 5.8 | 5.3 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 0.0 | 5.8 | 5.3 |
| Prop In Lane | 1.00 | | | 0.23 | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 706 | 2910 | 1002 | 1013 | 128 | 116 |
| V/C Ratio(X) | 0.25 | 0.47 | 0.53 | 0.53 | 0.74 | 0.69 |
| Avail Cap(c_a), veh/h | 706 | 2910 | 1002 | 1013 | 324 | 293 |
| HCM Platoon Ratio | 1.33 | 1.33 | 2.00 | 2.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 4.7 | 0.0 | 0.0 | 0.0 | 50.0 | 49.9 |
| Incr Delay (d2), s/veh | 0.1 | 0.6 | 2.0 | 2.0 | 3.2 | 2.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.9 | 0.2 | 0.6 | 0.6 | 2.7 | 2.2 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d),s/veh | 4.7 | 0.6 | 2.0 | 2.0 | 53.2 | 52.6 |
| LnGrp LOS | A | A | A | A | D | D |
| Approach Vol, veh/h | | 1555 | 1065 | | 175 | |
| Approach Delay, s/veh | | 1.0 | 2.0 | | 52.9 | |
| Approach LOS | | A | A | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 27.1 | 69.0 | | 13.9 | | 96.1 |
| Change Period (Y+Rc), s | 6.0 | * 6 | | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | 10.0 | * 63 | | 20.0 | | 78.0 |
| Max Q Clear Time (g_c+I1), s | 2.0 | 2.0 | | 7.8 | | 2.0 |
| Green Ext Time (p_c), s | 0.1 | 7.5 | | 0.2 | | 13.4 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 4.6 |
| HCM 6th LOS | A |

Notes

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

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.9 |

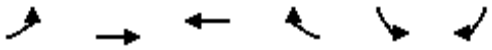
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 40 | 1294 | 913 | 88 | 66 | 55 |
| Future Vol, veh/h | 40 | 1294 | 913 | 88 | 66 | 55 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 124 | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 0 | 2 | 4 | 1 | 3 | 0 |
| Mvmt Flow | 43 | 1407 | 992 | 96 | 72 | 60 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1088 | 0 | - | 0 | 1830 | 544 |
| Stage 1 | - | - | - | - | 1040 | - |
| Stage 2 | - | - | - | - | 790 | - |
| Critical Hdwy | 4.1 | - | - | - | 6.86 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.86 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.86 | - |
| Follow-up Hdwy | 2.2 | - | - | - | 3.53 | 3.3 |
| Pot Cap-1 Maneuver | 993 | - | - | - | *262 | *718 |
| Stage 1 | - | - | - | - | *652 | - |
| Stage 2 | - | - | - | - | *513 | - |
| Platoon blocked, % | 1 | - | - | - | 1 | 1 |
| Mov Cap-1 Maneuver | 993 | - | - | - | *251 | *718 |
| Mov Cap-2 Maneuver | - | - | - | - | *370 | - |
| Stage 1 | - | - | - | - | *624 | - |
| Stage 2 | - | - | - | - | *513 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.3 | 0 | 15.5 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 993 | - | - | - | 475 |
| HCM Lane V/C Ratio | 0.044 | - | - | - | 0.277 |
| HCM Control Delay (s) | 8.8 | - | - | - | 15.5 |
| HCM Lane LOS | A | - | - | - | C |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 1.1 |

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



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 208 | 1159 | 970 | 211 | 35 | 31 |
| Future Volume (veh/h) | 208 | 1159 | 970 | 211 | 35 | 31 |
| 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 | 1900 | 1870 | 1841 | 1856 | 1856 | 1796 |
| Adj Flow Rate, veh/h | 226 | 1260 | 1054 | 0 | 38 | 34 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 0 | 2 | 4 | 3 | 3 | 7 |
| Cap, veh/h | 657 | 3055 | 2257 | | 71 | 62 |
| Arrive On Green | 0.32 | 1.00 | 0.86 | 0.00 | 0.04 | 0.04 |
| Sat Flow, veh/h | 1810 | 3647 | 3589 | 1572 | 1767 | 1522 |
| Grp Volume(v), veh/h | 226 | 1260 | 1054 | 0 | 38 | 34 |
| Grp Sat Flow(s),veh/h/ln | 1810 | 1777 | 1749 | 1572 | 1767 | 1522 |
| Q Serve(g_s), s | 0.0 | 0.0 | 7.8 | 0.0 | 2.3 | 2.4 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 7.8 | 0.0 | 2.3 | 2.4 |
| Prop In Lane | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 657 | 3055 | 2257 | | 71 | 62 |
| V/C Ratio(X) | 0.34 | 0.41 | 0.47 | | 0.53 | 0.55 |
| Avail Cap(c_a), veh/h | 657 | 3055 | 2257 | | 161 | 138 |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.33 | 1.33 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.80 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 5.4 | 0.0 | 3.3 | 0.0 | 51.8 | 51.8 |
| Incr Delay (d2), s/veh | 0.1 | 0.4 | 0.6 | 0.0 | 2.3 | 2.9 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.4 | 0.2 | 1.9 | 0.0 | 1.1 | 1.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d),s/veh | 5.5 | 0.4 | 3.9 | 0.0 | 54.0 | 54.7 |
| LnGrp LOS | A | A | A | | D | D |
| Approach Vol, veh/h | | 1486 | 1054 | A | 72 | |
| Approach Delay, s/veh | | 1.2 | 3.9 | | 54.3 | |
| Approach LOS | | A | A | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 23.6 | 77.0 | | 9.4 | | 100.6 |
| Change Period (Y+Rc), s | 6.0 | * 6 | | 5.0 | | 6.0 |
| Max Green Setting (Gmax), s | 13.0 | * 71 | | 10.0 | | 89.0 |
| Max Q Clear Time (g_c+I1), s | 2.0 | 9.8 | | 4.4 | | 2.0 |
| Green Ext Time (p_c), s | 0.2 | 8.5 | | 0.0 | | 11.4 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 3.7 |
| HCM 6th LOS | A |

Notes

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 45 | 1039 | 99 | 24 | 1046 | 173 | 110 | 56 | 7 | 22 | 5 | 7 |
| Future Volume (veh/h) | 45 | 1039 | 99 | 24 | 1046 | 173 | 110 | 56 | 7 | 22 | 5 | 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 | 1870 | 1870 | 1870 | 1900 | 1841 | 1841 | 1900 | 1900 | 1900 | 1767 | 1900 | 1900 |
| Adj Flow Rate, veh/h | 48 | 1105 | 105 | 26 | 1113 | 184 | 117 | 60 | 7 | 23 | 5 | 7 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 0 | 4 | 4 | 0 | 0 | 0 | 9 | 0 | 0 |
| Cap, veh/h | 282 | 2087 | 198 | 351 | 2021 | 333 | 184 | 71 | 8 | 226 | 99 | 138 |
| Arrive On Green | 0.02 | 0.43 | 0.43 | 0.06 | 0.67 | 0.67 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 |
| Sat Flow, veh/h | 1781 | 3280 | 311 | 1810 | 3005 | 495 | 947 | 514 | 58 | 1260 | 716 | 1003 |
| Grp Volume(v), veh/h | 48 | 598 | 612 | 26 | 646 | 651 | 184 | 0 | 0 | 23 | 0 | 12 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1777 | 1814 | 1810 | 1749 | 1752 | 1519 | 0 | 0 | 1260 | 0 | 1719 |
| Q Serve(g_s), s | 1.2 | 27.4 | 27.5 | 0.0 | 21.1 | 21.3 | 12.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 |
| Cycle Q Clear(g_c), s | 1.2 | 27.4 | 27.5 | 0.0 | 21.1 | 21.3 | 13.1 | 0.0 | 0.0 | 1.9 | 0.0 | 0.7 |
| Prop In Lane | 1.00 | | 0.17 | 1.00 | | 0.28 | 0.64 | | 0.04 | 1.00 | | 0.58 |
| Lane Grp Cap(c), veh/h | 282 | 1131 | 1155 | 351 | 1176 | 1178 | 263 | 0 | 0 | 226 | 0 | 237 |
| V/C Ratio(X) | 0.17 | 0.53 | 0.53 | 0.07 | 0.55 | 0.55 | 0.70 | 0.00 | 0.00 | 0.10 | 0.00 | 0.05 |
| Avail Cap(c_a), veh/h | 365 | 1131 | 1155 | 353 | 1176 | 1178 | 275 | 0 | 0 | 236 | 0 | 250 |
| HCM Platoon Ratio | 0.67 | 0.67 | 0.67 | 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 | 0.79 | 0.79 | 0.79 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 11.6 | 19.3 | 19.4 | 18.9 | 9.4 | 9.4 | 46.7 | 0.0 | 0.0 | 41.7 | 0.0 | 41.2 |
| Incr Delay (d2), s/veh | 0.3 | 1.6 | 1.6 | 0.1 | 1.5 | 1.5 | 6.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.4 | 12.1 | 12.3 | 0.4 | 6.9 | 7.0 | 5.4 | 0.0 | 0.0 | 0.6 | 0.0 | 0.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 11.8 | 21.0 | 21.0 | 19.0 | 10.8 | 10.9 | 52.7 | 0.0 | 0.0 | 41.8 | 0.0 | 41.2 |
| LnGrp LOS | B | C | C | B | B | B | D | A | A | D | A | D |
| Approach Vol, veh/h | | 1258 | | | 1323 | | | 184 | | | 35 | |
| Approach Delay, s/veh | | 20.6 | | | 11.0 | | | 52.7 | | | 41.6 | |
| Approach LOS | | C | | | B | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.8 | 80.0 | | 21.2 | 12.8 | 76.0 | | 21.2 |
| Change Period (Y+Rc), s | 5.0 | 6.0 | | 6.0 | 6.0 | * 6 | | 6.0 |
| Max Green Setting (Gmax), s | 3.8 | 68.0 | | 16.0 | 7.0 | * 70 | | 16.0 |
| Max Q Clear Time (g_c+I1), s | 3.2 | 23.3 | | 3.9 | 2.0 | 29.5 | | 15.1 |
| Green Ext Time (p_c), s | 0.0 | 10.2 | | 0.0 | 0.0 | 8.9 | | 0.1 |

| Intersection Summary | | |
|---|---|---|
| HCM 6th Ctrl Delay | 18.4 | |
| HCM 6th LOS | B | |

Notes

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 21 | 594 | 434 | 665 | 873 | 81 | 417 | 101 | 440 | 16 | 17 | 7 |
| Future Volume (veh/h) | 21 | 594 | 434 | 665 | 873 | 81 | 417 | 101 | 440 | 16 | 17 | 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 | 1826 | 1841 | 1856 | 1678 | 1841 | 1841 | 1870 | 1870 | 1870 | 1530 | 1470 | 1470 |
| Adj Flow Rate, veh/h | 23 | 646 | 0 | 723 | 949 | 88 | 453 | 110 | 0 | 17 | 18 | 8 |
| 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, % | 5 | 4 | 3 | 15 | 4 | 4 | 2 | 2 | 2 | 25 | 29 | 29 |
| Cap, veh/h | 274 | 1410 | | 564 | 1382 | 128 | 525 | 344 | | 32 | 52 | 23 |
| Arrive On Green | 0.21 | 0.54 | 0.00 | 0.18 | 0.43 | 0.43 | 0.15 | 0.18 | 0.00 | 0.02 | 0.05 | 0.05 |
| Sat Flow, veh/h | 1739 | 3497 | 1572 | 3100 | 3235 | 300 | 3456 | 1870 | 0 | 1457 | 964 | 429 |
| Grp Volume(v), veh/h | 23 | 646 | 0 | 723 | 513 | 524 | 453 | 110 | 0 | 17 | 0 | 26 |
| Grp Sat Flow(s),veh/h/ln | 1739 | 1749 | 1572 | 1550 | 1749 | 1787 | 1728 | 1870 | 0 | 1457 | 0 | 1393 |
| Q Serve(g_s), s | 1.2 | 12.5 | 0.0 | 20.0 | 26.1 | 26.2 | 14.1 | 5.6 | 0.0 | 1.3 | 0.0 | 2.0 |
| Cycle Q Clear(g_c), s | 1.2 | 12.5 | 0.0 | 20.0 | 26.1 | 26.2 | 14.1 | 5.6 | 0.0 | 1.3 | 0.0 | 2.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.17 | 1.00 | | 0.00 | 1.00 | | 0.31 |
| Lane Grp Cap(c), veh/h | 274 | 1410 | | 564 | 747 | 763 | 525 | 344 | | 32 | 0 | 75 |
| V/C Ratio(X) | 0.08 | 0.46 | | 1.28 | 0.69 | 0.69 | 0.86 | 0.32 | | 0.53 | 0.00 | 0.35 |
| Avail Cap(c_a), veh/h | 274 | 1410 | | 564 | 747 | 763 | 785 | 344 | | 331 | 0 | 89 |
| HCM Platoon Ratio | 1.33 | 1.33 | 1.33 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.86 | 0.86 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 37.1 | 18.1 | 0.0 | 45.0 | 25.5 | 25.5 | 45.5 | 38.9 | 0.0 | 53.2 | 0.0 | 50.2 |
| Incr Delay (d2), s/veh | 0.0 | 0.9 | 0.0 | 140.4 | 5.1 | 5.0 | 4.5 | 0.2 | 0.0 | 4.9 | 0.0 | 1.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 4.4 | 0.0 | 18.3 | 11.0 | 11.2 | 6.2 | 2.5 | 0.0 | 0.5 | 0.0 | 0.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 37.1 | 19.0 | 0.0 | 185.4 | 30.6 | 30.5 | 50.0 | 39.1 | 0.0 | 58.1 | 0.0 | 51.2 |
| LnGrp LOS | D | B | | F | C | C | D | D | | E | A | D |
| Approach Vol, veh/h | | 669 | A | | 1760 | | | 563 | A | | 43 | |
| Approach Delay, s/veh | | 19.7 | | | 94.2 | | | 47.9 | | | 53.9 | |
| Approach LOS | | B | | | F | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 26.0 | 50.3 | 21.7 | 11.9 | 23.3 | 53.0 | 7.4 | 26.2 |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 | 6.0 | 5.0 | * 6 |
| Max Green Setting (Gmax), s | 20.0 | 35.0 | 25.0 | 7.0 | 8.0 | 47.0 | 25.0 | * 8 |
| Max Q Clear Time (g_c+I1), s | 22.0 | 14.5 | 16.1 | 4.0 | 3.2 | 28.2 | 3.3 | 7.6 |
| Green Ext Time (p_c), s | 0.0 | 3.8 | 0.6 | 0.0 | 0.0 | 5.8 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 68.6 |
| HCM 6th LOS | E |

Notes

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 44 | 77 | 283 | 70 | 60 | 112 | 266 | 1069 | 148 | 167 | 806 | 44 |
| Future Volume (veh/h) | 44 | 77 | 283 | 70 | 60 | 112 | 266 | 1069 | 148 | 167 | 806 | 44 |
| 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 | 1796 | 1856 | 1870 | 1900 | 1856 | 1856 | 1885 | 1811 | 1811 | 1870 | 1722 | 1722 |
| Adj Flow Rate, veh/h | 48 | 85 | 0 | 77 | 66 | 0 | 292 | 1175 | 163 | 184 | 886 | 48 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 7 | 3 | 2 | 0 | 3 | 3 | 1 | 6 | 6 | 2 | 12 | 12 |
| Cap, veh/h | 188 | 227 | | 179 | 227 | | 507 | 1967 | 272 | 352 | 1979 | 107 |
| Arrive On Green | 0.12 | 0.12 | 0.00 | 0.12 | 0.12 | 0.00 | 0.08 | 0.65 | 0.65 | 0.06 | 0.63 | 0.63 |
| Sat Flow, veh/h | 1283 | 1856 | 1585 | 1333 | 1856 | 1572 | 1795 | 3036 | 420 | 1781 | 3156 | 171 |
| Grp Volume(v), veh/h | 48 | 85 | 0 | 77 | 66 | 0 | 292 | 664 | 674 | 184 | 459 | 475 |
| Grp Sat Flow(s),veh/h/ln | 1283 | 1856 | 1585 | 1333 | 1856 | 1572 | 1795 | 1721 | 1736 | 1781 | 1636 | 1691 |
| Q Serve(g_s), s | 3.5 | 4.2 | 0.0 | 5.6 | 3.2 | 0.0 | 5.7 | 22.1 | 22.3 | 3.6 | 14.6 | 14.6 |
| Cycle Q Clear(g_c), s | 6.8 | 4.2 | 0.0 | 9.8 | 3.2 | 0.0 | 5.7 | 22.1 | 22.3 | 3.6 | 14.6 | 14.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.24 | 1.00 | | 0.10 |
| Lane Grp Cap(c), veh/h | 188 | 227 | | 179 | 227 | | 507 | 1115 | 1124 | 352 | 1026 | 1061 |
| V/C Ratio(X) | 0.26 | 0.37 | | 0.43 | 0.29 | | 0.58 | 0.60 | 0.60 | 0.52 | 0.45 | 0.45 |
| Avail Cap(c_a), veh/h | 473 | 640 | | 476 | 640 | | 632 | 1115 | 1124 | 513 | 1026 | 1061 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 43.0 | 40.4 | 0.0 | 44.9 | 39.9 | 0.0 | 7.2 | 10.1 | 10.1 | 9.2 | 9.7 | 9.7 |
| Incr Delay (d2), s/veh | 0.5 | 0.8 | 0.0 | 1.2 | 0.5 | 0.0 | 0.8 | 2.3 | 2.4 | 0.9 | 1.4 | 1.4 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.1 | 2.0 | 0.0 | 1.9 | 1.5 | 0.0 | 1.8 | 7.7 | 7.9 | 1.3 | 5.2 | 5.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 43.5 | 41.1 | 0.0 | 46.1 | 40.4 | 0.0 | 7.9 | 12.4 | 12.5 | 10.1 | 11.1 | 11.0 |
| LnGrp LOS | D | D | | D | D | | A | B | B | B | B | B |
| Approach Vol, veh/h | | 133 | A | | 143 | A | | 1630 | | | 1118 | |
| Approach Delay, s/veh | | 42.0 | | | 43.5 | | | 11.7 | | | 10.9 | |
| Approach LOS | | D | | | D | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.0 | 71.3 | | 17.7 | 13.1 | 69.2 | | 17.7 |
| Change Period (Y+Rc), s | 5.0 | 6.5 | | 5.5 | 5.0 | 6.5 | | 5.5 |
| Max Green Setting (Gmax), s | 15.0 | 33.5 | | 34.5 | 15.0 | 33.5 | | 34.5 |
| Max Q Clear Time (g_c+I1), s | 15.6 | 24.3 | | 11.8 | 7.7 | 16.6 | | 8.8 |
| Green Ext Time (p_c), s | 0.2 | 7.1 | | 0.4 | 0.4 | 8.6 | | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 14.2 |
| HCM 6th LOS | B |

**Notes**

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

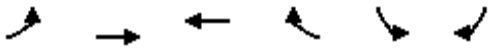
| Intersection | |
|---|---|
| Int Delay, s/veh | 3.1 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 29 | 307 | 210 | 161 | 93 | 45 |
| Future Vol, veh/h | 29 | 307 | 210 | 161 | 93 | 45 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 89 | 89 | 89 | 89 | 89 | 89 |
| Heavy Vehicles, % | 4 | 3 | 1 | 5 | 1 | 0 |
| Mvmt Flow | 33 | 345 | 236 | 181 | 104 | 51 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 417 | 0 | - | 0 | 738 | 327 |
| Stage 1 | - | - | - | - | 327 | - |
| Stage 2 | - | - | - | - | 411 | - |
| Critical Hdwy | 4.14 | - | - | - | 6.41 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.41 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.41 | - |
| Follow-up Hdwy | 2.236 | - | - | - | 3.509 | 3.3 |
| Pot Cap-1 Maneuver | 1131 | - | - | - | 387 | 719 |
| Stage 1 | - | - | - | - | 733 | - |
| Stage 2 | - | - | - | - | 671 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1131 | - | - | - | 373 | 719 |
| Mov Cap-2 Maneuver | - | - | - | - | 373 | - |
| Stage 1 | - | - | - | - | 707 | - |
| Stage 2 | - | - | - | - | 671 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.7 | 0 | 17.5 |
| HCM LOS | | | C |

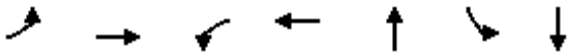
| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1131 | - | - | - | 442 |
| HCM Lane V/C Ratio | 0.029 | - | - | - | 0.351 |
| HCM Control Delay (s) | 8.3 | 0 | - | - | 17.5 |
| HCM Lane LOS | A | A | - | - | C |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 1.6 |



| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 226 | 1260 | 1054 | 229 | 38 | 34 |
| v/c Ratio | 0.41 | 0.41 | 0.44 | 0.20 | 0.34 | 0.27 |
| Control Delay | 5.9 | 1.8 | 10.4 | 5.2 | 57.0 | 21.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 5.9 | 1.8 | 10.4 | 5.2 | 57.0 | 21.2 |
| Queue Length 50th (ft) | 15 | 51 | 223 | 48 | 26 | 0 |
| Queue Length 95th (ft) | 41 | 72 | 248 | m65 | 59 | 31 |
| Internal Link Dist (ft) | | 638 | 1347 | | 539 | |
| Turn Bay Length (ft) | 235 | | | 65 | 465 | |
| Base Capacity (vph) | 551 | 3062 | 2398 | 1125 | 159 | 168 |
| 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 | 0.41 | 0.41 | 0.44 | 0.20 | 0.24 | 0.20 |

Intersection Summary

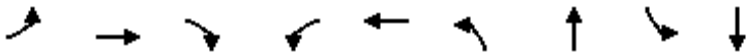
m Volume for 95th percentile queue is metered by upstream signal.



| Lane Group | EBL | EBT | WBL | WBT | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 48 | 1210 | 26 | 1297 | 184 | 23 | 12 |
| v/c Ratio | 0.17 | 0.50 | 0.07 | 0.57 | 0.89 | 0.15 | 0.05 |
| Control Delay | 7.2 | 7.3 | 4.4 | 7.2 | 85.8 | 43.8 | 28.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 7.2 | 7.3 | 4.4 | 7.2 | 85.8 | 43.8 | 28.3 |
| Queue Length 50th (ft) | 11 | 141 | 5 | 237 | 127 | 14 | 3 |
| Queue Length 95th (ft) | 21 | 161 | m5 | 220 | #254 | 39 | 21 |
| Internal Link Dist (ft) | | 1347 | | 1583 | 334 | | 424 |
| Turn Bay Length (ft) | 75 | | 120 | | | 125 | |
| Base Capacity (vph) | 309 | 2408 | 370 | 2287 | 217 | 162 | 258 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.16 | 0.50 | 0.07 | 0.57 | 0.85 | 0.14 | 0.05 |

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.



| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 23 | 646 | 472 | 723 | 1037 | 453 | 588 | 17 | 26 |
| v/c Ratio | 0.22 | 0.59 | 0.58 | 1.31 | 0.60 | 0.52 | 1.03 | 0.20 | 0.21 |
| Control Delay | 39.3 | 22.0 | 12.0 | 188.1 | 22.3 | 39.6 | 74.3 | 54.5 | 40.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 39.3 | 22.0 | 12.0 | 188.1 | 22.3 | 39.6 | 74.3 | 54.5 | 40.3 |
| Queue Length 50th (ft) | 16 | 226 | 218 | ~338 | 231 | 159 | 311 | 12 | 12 |
| Queue Length 95th (ft) | m34 | 262 | 342 | #456 | 384 | 204 | #652 | 35 | 41 |
| Internal Link Dist (ft) | | 1583 | | | 865 | | 1309 | | 808 |
| Turn Bay Length (ft) | 120 | | 200 | 210 | | 145 | | 110 | |
| Base Capacity (vph) | 125 | 1104 | 820 | 553 | 1730 | 942 | 573 | 328 | 126 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.18 | 0.59 | 0.58 | 1.31 | 0.60 | 0.48 | 1.03 | 0.05 | 0.21 |

Intersection Summary

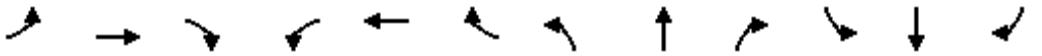
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 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.

# HCM 6th Signalized Intersection Summary
## 1: Vanosdale Rd/Francis Rd & Middlebrook Pike

05/23/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 124 | 870 | 267 | 221 | 1116 | 98 | 242 | 205 | 142 | 73 | 152 | 80 |
| Future Volume (veh/h) | 124 | 870 | 267 | 221 | 1116 | 98 | 242 | 205 | 142 | 73 | 152 | 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 | 1885 | 1870 | 1885 | 1900 | 1900 | 1900 | 1885 | 1885 | 1885 | 1900 | 1900 | 1856 |
| Adj Flow Rate, veh/h | 133 | 935 | 287 | 238 | 1200 | 105 | 260 | 220 | 153 | 78 | 163 | 86 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 3 |
| Cap, veh/h | 214 | 1449 | 866 | 327 | 1483 | 130 | 404 | 469 | 548 | 308 | 311 | 257 |
| Arrive On Green | 0.06 | 0.41 | 0.41 | 0.03 | 0.15 | 0.15 | 0.13 | 0.25 | 0.25 | 0.05 | 0.16 | 0.16 |
| Sat Flow, veh/h | 1795 | 3554 | 1598 | 1810 | 3359 | 293 | 1795 | 1885 | 1598 | 1810 | 1900 | 1572 |
| Grp Volume(v), veh/h | 133 | 935 | 287 | 238 | 644 | 661 | 260 | 220 | 153 | 78 | 163 | 86 |
| Grp Sat Flow(s),veh/h/ln | 1795 | 1777 | 1598 | 1810 | 1805 | 1847 | 1795 | 1885 | 1598 | 1810 | 1900 | 1572 |
| Q Serve(g_s), s | 4.7 | 23.3 | 11.0 | 8.0 | 38.0 | 38.1 | 12.7 | 10.9 | 7.7 | 3.9 | 8.6 | 5.3 |
| Cycle Q Clear(g_c), s | 4.7 | 23.3 | 11.0 | 8.0 | 38.0 | 38.1 | 12.7 | 10.9 | 7.7 | 3.9 | 8.6 | 5.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.16 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 214 | 1449 | 866 | 327 | 797 | 815 | 404 | 469 | 548 | 308 | 311 | 257 |
| V/C Ratio(X) | 0.62 | 0.65 | 0.33 | 0.73 | 0.81 | 0.81 | 0.64 | 0.47 | 0.28 | 0.25 | 0.52 | 0.33 |
| Avail Cap(c_a), veh/h | 269 | 1449 | 866 | 469 | 797 | 815 | 424 | 469 | 548 | 383 | 311 | 257 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 24.4 | 26.2 | 14.1 | 22.3 | 42.5 | 42.5 | 30.7 | 35.2 | 26.3 | 35.6 | 42.1 | 40.7 |
| Incr Delay (d2), s/veh | 2.9 | 2.2 | 1.0 | 3.3 | 8.6 | 8.6 | 2.3 | 3.4 | 1.3 | 0.2 | 6.2 | 3.5 |
| 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 | 2.0 | 9.5 | 4.1 | 3.6 | 20.1 | 20.6 | 5.7 | 5.4 | 3.1 | 1.7 | 4.6 | 2.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 27.3 | 28.4 | 15.1 | 25.5 | 51.1 | 51.1 | 33.0 | 38.5 | 27.5 | 35.8 | 48.3 | 44.2 |
| LnGrp LOS | C | C | B | C | D | D | C | D | C | D | D | D |
| Approach Vol, veh/h | | 1355 | | | 1543 | | | 633 | | | 327 | |
| Approach Delay, s/veh | | 25.5 | | | 47.2 | | | 33.6 | | | 44.2 | |
| Approach LOS | | C | | | D | | | C | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.7 | 54.6 | 10.4 | 33.3 | 15.4 | 50.8 | 19.8 | 24.0 |
| Change Period (Y+Rc), s | 5.0 | 6.0 | 5.0 | 6.0 | 5.0 | 6.0 | 5.0 | * 6 |
| Max Green Setting (Gmax), s | 10.0 | 45.0 | 10.0 | 23.0 | 19.0 | 36.0 | 16.0 | * 18 |
| Max Q Clear Time (g_c+I1), s | 6.7 | 40.1 | 5.9 | 12.9 | 10.0 | 25.3 | 14.7 | 10.6 |
| Green Ext Time (p_c), s | 0.1 | 2.3 | 0.0 | 0.8 | 0.4 | 3.4 | 0.1 | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 37.1 |
| HCM 6th LOS | D |

**Notes**

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

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.9 |

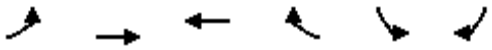
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 30 | 863 | 24 | 57 | 1346 | 11 | 31 | 3 | 28 | 4 | 2 | 27 |
| Future Vol, veh/h | 30 | 863 | 24 | 57 | 1346 | 11 | 31 | 3 | 28 | 4 | 2 | 27 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 25 | - | - | 128 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 1 | - | - | 1 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, % | 0 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 0 | 0 |
| Mvmt Flow | 33 | 948 | 26 | 63 | 1479 | 12 | 34 | 3 | 31 | 4 | 2 | 30 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1491 | 0 | 0 | 974 | 0 | 0 | 1894 | 2644 | 487 | 2153 | 2651 | 746 |
| Stage 1 | - | - | - | - | - | - | 1027 | 1027 | - | 1611 | 1611 | - |
| Stage 2 | - | - | - | - | - | - | 867 | 1617 | - | 542 | 1040 | - |
| Critical Hdwy | 4.1 | - | - | 4.1 | - | - | 7.5 | 6.5 | 6.98 | 7.5 | 6.5 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.5 | 5.5 | - | 6.5 | 5.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.5 | 5.5 | - | 6.5 | 5.5 | - |
| Follow-up Hdwy | 2.2 | - | - | 2.2 | - | - | 3.5 | 4 | 3.34 | 3.5 | 4 | 3.3 |
| Pot Cap-1 Maneuver | 821 | - | - | 1082 | - | - | *346 | 22 | *737 | *158 | 22 | *549 |
| Stage 1 | - | - | - | - | - | - | *601 | 549 | - | *375 | 357 | - |
| Stage 2 | - | - | - | - | - | - | *517 | 353 | - | *703 | 538 | - |
| Platoon blocked, % | 1 | - | - | 1 | - | - | 1 | 1 | 1 | 1 | 1 | 1 |
| Mov Cap-1 Maneuver | 821 | - | - | 1082 | - | - | *300 | 20 | *737 | *139 | 19 | *549 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | *352 | 183 | - | *261 | 185 | - |
| Stage 1 | - | - | - | - | - | - | *577 | 527 | - | *360 | 336 | - |
| Stage 2 | - | - | - | - | - | - | *458 | 332 | - | *643 | 517 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.3 | 0.3 | 14.8 | 14 |
| HCM LOS | | | B | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 435 | 821 | - | - | 1082 | - | - | 438 |
| HCM Lane V/C Ratio | 0.157 | 0.04 | - | - | 0.058 | - | - | 0.083 |
| HCM Control Delay (s) | 14.8 | 9.6 | - | - | 8.5 | - | - | 14 |
| HCM Lane LOS | B | A | - | - | A | - | - | B |
| HCM 95th %tile Q(veh) | 0.6 | 0.1 | - | - | 0.2 | - | - | 0.3 |

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



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 109 | 793 | 1252 | 71 | 132 | 100 |
| Future Volume (veh/h) | 109 | 793 | 1252 | 71 | 132 | 100 |
| 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 | 1900 | 1856 | 1885 | 1885 | 1870 | 1900 |
| Adj Flow Rate, veh/h | 117 | 853 | 1346 | 76 | 142 | 108 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 0 | 3 | 1 | 1 | 2 | 0 |
| Cap, veh/h | 415 | 2797 | 2426 | 137 | 174 | 157 |
| Arrive On Green | 0.09 | 1.00 | 1.00 | 1.00 | 0.10 | 0.10 |
| Sat Flow, veh/h | 1810 | 3618 | 3541 | 194 | 1781 | 1610 |
| Grp Volume(v), veh/h | 117 | 853 | 698 | 724 | 142 | 108 |
| Grp Sat Flow(s),veh/h/ln | 1810 | 1763 | 1791 | 1850 | 1781 | 1610 |
| Q Serve(g_s), s | 1.8 | 0.0 | 0.0 | 0.0 | 8.6 | 7.1 |
| Cycle Q Clear(g_c), s | 1.8 | 0.0 | 0.0 | 0.0 | 8.6 | 7.1 |
| Prop In Lane | 1.00 | | | 0.10 | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 415 | 2797 | 1260 | 1302 | 174 | 157 |
| V/C Ratio(X) | 0.28 | 0.30 | 0.55 | 0.56 | 0.82 | 0.69 |
| Avail Cap(c_a), veh/h | 500 | 2797 | 1260 | 1302 | 227 | 205 |
| HCM Platoon Ratio | 2.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 3.1 | 0.0 | 0.0 | 0.0 | 48.7 | 48.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.3 | 1.8 | 1.7 | 12.6 | 3.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.4 | 0.1 | 0.6 | 0.6 | 4.4 | 3.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d),s/veh | 3.2 | 0.3 | 1.8 | 1.7 | 61.2 | 51.2 |
| LnGrp LOS | A | A | A | A | E | D |
| Approach Vol, veh/h | | 970 | 1422 | | 250 | |
| Approach Delay, s/veh | | 0.6 | 1.7 | | 56.9 | |
| Approach LOS | | A | A | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.9 | 83.4 | | 16.7 | | 93.3 |
| Change Period (Y+Rc), s | 5.0 | 6.0 | | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | 10.0 | 69.0 | | 14.0 | | 84.0 |
| Max Q Clear Time (g_c+I1), s | 3.8 | 2.0 | | 10.6 | | 2.0 |
| Green Ext Time (p_c), s | 0.1 | 12.4 | | 0.1 | | 6.2 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 6.6 |
| HCM 6th LOS | A |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.1 |

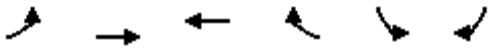
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 24 | 888 | 1253 | 69 | 71 | 58 |
| Future Vol, veh/h | 24 | 888 | 1253 | 69 | 71 | 58 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 124 | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, % | 4 | 2 | 1 | 1 | 0 | 0 |
| Mvmt Flow | 27 | 1009 | 1424 | 78 | 81 | 66 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1502 | 0 | - | 0 | 2022 | 751 |
| Stage 1 | - | - | - | - | 1463 | - |
| Stage 2 | - | - | - | - | 559 | - |
| Critical Hdwy | 4.18 | - | - | - | 6.8 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.8 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.8 | - |
| Follow-up Hdwy | 2.24 | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 735 | - | - | - | *220 | *577 |
| Stage 1 | - | - | - | - | *488 | - |
| Stage 2 | - | - | - | - | *703 | - |
| Platoon blocked, % | 1 | - | - | - | 1 | 1 |
| Mov Cap-1 Maneuver | 735 | - | - | - | *212 | *577 |
| Mov Cap-2 Maneuver | - | - | - | - | *348 | - |
| Stage 1 | - | - | - | - | *470 | - |
| Stage 2 | - | - | - | - | *703 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.3 | 0 | 17.9 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 735 | - | - | - | 424 |
| HCM Lane V/C Ratio | 0.037 | - | - | - | 0.346 |
| HCM Control Delay (s) | 10.1 | - | - | - | 17.9 |
| HCM Lane LOS | B | - | - | - | C |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 1.5 |

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



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 26 | 944 | 1144 | 24 | 149 | 183 |
| Future Volume (veh/h) | 26 | 944 | 1144 | 24 | 149 | 183 |
| 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 | 1841 | 1856 | 1885 | 1781 | 1900 | 1856 |
| Adj Flow Rate, veh/h | 29 | 1037 | 1257 | 0 | 164 | 201 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 4 | 3 | 1 | 8 | 0 | 3 |
| Cap, veh/h | 478 | 2652 | 1823 | | 268 | 233 |
| Arrive On Green | 0.38 | 1.00 | 0.34 | 0.00 | 0.15 | 0.15 |
| Sat Flow, veh/h | 1753 | 3618 | 3676 | 1510 | 1810 | 1572 |
| Grp Volume(v), veh/h | 29 | 1037 | 1257 | 0 | 164 | 201 |
| Grp Sat Flow(s),veh/h/ln | 1753 | 1763 | 1791 | 1510 | 1810 | 1572 |
| Q Serve(g_s), s | 0.0 | 0.0 | 33.3 | 0.0 | 9.3 | 13.7 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 33.3 | 0.0 | 9.3 | 13.7 |
| Prop In Lane | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 478 | 2652 | 1823 | | 268 | 233 |
| V/C Ratio(X) | 0.06 | 0.39 | 0.69 | | 0.61 | 0.86 |
| Avail Cap(c_a), veh/h | 478 | 2652 | 1823 | | 510 | 443 |
| HCM Platoon Ratio | 2.00 | 2.00 | 0.67 | 0.67 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.89 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 17.3 | 0.0 | 28.7 | 0.0 | 43.9 | 45.8 |
| Incr Delay (d2), s/veh | 0.0 | 0.4 | 1.9 | 0.0 | 0.9 | 3.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.4 | 0.2 | 14.9 | 0.0 | 4.2 | 5.6 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d),s/veh | 17.3 | 0.4 | 30.7 | 0.0 | 44.8 | 49.5 |
| LnGrp LOS | B | A | C | | D | D |
| Approach Vol, veh/h | | 1066 | 1257 | A | 365 | |
| Approach Delay, s/veh | | 0.9 | 30.7 | | 47.4 | |
| Approach LOS | | A | C | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 26.7 | 62.0 | | 21.3 | | 88.7 |
| Change Period (Y+Rc), s | 6.0 | * 6 | | 5.0 | | 6.0 |
| Max Green Setting (Gmax), s | 7.0 | * 56 | | 31.0 | | 68.0 |
| Max Q Clear Time (g_c+I1), s | 2.0 | 35.3 | | 15.7 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 8.5 | | 0.5 | | 8.3 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 21.1 |
| HCM 6th LOS | C |

Notes

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 7 | 1017 | 60 | 19 | 1027 | 30 | 85 | 14 | 8 | 172 | 61 | 49 |
| Future Volume (veh/h) | 7 | 1017 | 60 | 19 | 1027 | 30 | 85 | 14 | 8 | 172 | 61 | 49 |
| 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 | 1900 | 1856 | 1856 | 1900 | 1885 | 1885 | 1693 | 1693 | 1693 | 1885 | 1900 | 1900 |
| Adj Flow Rate, veh/h | 8 | 1105 | 65 | 21 | 1116 | 33 | 92 | 15 | 9 | 187 | 61 | 53 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 1.00 | 0.92 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 0 | 1 | 1 | 14 | 14 | 14 | 1 | 0 | 0 |
| Cap, veh/h | 406 | 2236 | 131 | 279 | 2099 | 62 | 161 | 24 | 11 | 308 | 153 | 133 |
| Arrive On Green | 0.08 | 0.66 | 0.66 | 0.02 | 0.59 | 0.59 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |
| Sat Flow, veh/h | 1810 | 3384 | 199 | 1810 | 3552 | 105 | 625 | 147 | 65 | 1398 | 938 | 815 |
| Grp Volume(v), veh/h | 8 | 575 | 595 | 21 | 563 | 586 | 116 | 0 | 0 | 187 | 0 | 114 |
| Grp Sat Flow(s),veh/h/ln | 1810 | 1763 | 1820 | 1810 | 1791 | 1866 | 837 | 0 | 0 | 1398 | 0 | 1753 |
| Q Serve(g_s), s | 0.0 | 18.1 | 18.1 | 0.6 | 20.6 | 20.6 | 9.5 | 0.0 | 0.0 | 0.0 | 0.0 | 6.4 |
| Cycle Q Clear(g_c), s | 0.0 | 18.1 | 18.1 | 0.6 | 20.6 | 20.6 | 15.9 | 0.0 | 0.0 | 13.1 | 0.0 | 6.4 |
| Prop In Lane | 1.00 | | 0.11 | 1.00 | | 0.06 | 0.79 | | 0.08 | 1.00 | | 0.46 |
| Lane Grp Cap(c), veh/h | 406 | 1165 | 1202 | 279 | 1058 | 1103 | 195 | 0 | 0 | 308 | 0 | 286 |
| V/C Ratio(X) | 0.02 | 0.49 | 0.49 | 0.08 | 0.53 | 0.53 | 0.59 | 0.00 | 0.00 | 0.61 | 0.00 | 0.40 |
| Avail Cap(c_a), veh/h | 406 | 1165 | 1202 | 389 | 1058 | 1103 | 207 | 0 | 0 | 321 | 0 | 303 |
| 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) | 0.91 | 0.91 | 0.91 | 0.83 | 0.83 | 0.83 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 15.8 | 9.4 | 9.4 | 12.5 | 13.4 | 13.4 | 47.6 | 0.0 | 0.0 | 44.0 | 0.0 | 41.2 |
| Incr Delay (d2), s/veh | 0.0 | 1.4 | 1.3 | 0.1 | 1.6 | 1.5 | 2.5 | 0.0 | 0.0 | 2.1 | 0.0 | 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 | 0.1 | 6.1 | 6.3 | 0.2 | 7.6 | 7.9 | 3.2 | 0.0 | 0.0 | 5.0 | 0.0 | 2.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 15.9 | 10.8 | 10.7 | 12.6 | 15.0 | 14.9 | 50.1 | 0.0 | 0.0 | 46.1 | 0.0 | 41.5 |
| LnGrp LOS | B | B | B | B | B | B | D | A | A | D | A | D |
| Approach Vol, veh/h | | 1178 | | | 1170 | | | 116 | | | 301 | |
| Approach Delay, s/veh | | 10.8 | | | 14.9 | | | 50.1 | | | 44.4 | |
| Approach LOS | | B | | | B | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.1 | 71.0 | | 23.9 | 7.4 | 78.7 | | 23.9 |
| Change Period (Y+Rc), s | 6.0 | * 6 | | 6.0 | 5.0 | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | 9.0 | * 65 | | 19.0 | 9.0 | 65.0 | | 19.0 |
| Max Q Clear Time (g_c+I1), s | 12.0 | 22.6 | | 15.1 | 2.6 | 20.1 | | 17.9 |
| Green Ext Time (p_c), s | 0.0 | 8.1 | | 0.3 | 0.0 | 8.5 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 17.8 |
| HCM 6th LOS | B |

Notes

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 9 | 823 | 389 | 521 | 749 | 28 | 319 | 9 | 527 | 110 | 114 | 26 |
| Future Volume (veh/h) | 9 | 823 | 389 | 521 | 749 | 28 | 319 | 9 | 527 | 110 | 114 | 26 |
| 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 | 1574 | 1841 | 1856 | 1811 | 1885 | 1885 | 1870 | 1737 | 1737 | 1885 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 10 | 904 | 0 | 573 | 823 | 31 | 351 | 10 | 0 | 121 | 125 | 29 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 22 | 4 | 3 | 6 | 1 | 1 | 2 | 11 | 11 | 1 | 2 | 2 |
| Cap, veh/h | 22 | 1081 | | 900 | 1984 | 75 | 421 | 222 | | 153 | 133 | 31 |
| Arrive On Green | 0.00 | 0.10 | 0.00 | 0.27 | 0.56 | 0.56 | 0.12 | 0.13 | 0.00 | 0.09 | 0.09 | 0.09 |
| Sat Flow, veh/h | 1499 | 3497 | 1572 | 3346 | 3520 | 133 | 3456 | 1737 | 0 | 1795 | 1468 | 341 |
| Grp Volume(v), veh/h | 10 | 904 | 0 | 573 | 419 | 435 | 351 | 10 | 0 | 121 | 0 | 154 |
| Grp Sat Flow(s),veh/h/ln | 1499 | 1749 | 1572 | 1673 | 1791 | 1861 | 1728 | 1737 | 0 | 1795 | 0 | 1809 |
| Q Serve(g_s), s | 0.7 | 27.9 | 0.0 | 16.6 | 14.6 | 14.6 | 10.9 | 0.6 | 0.0 | 7.3 | 0.0 | 9.3 |
| Cycle Q Clear(g_c), s | 0.7 | 27.9 | 0.0 | 16.6 | 14.6 | 14.6 | 10.9 | 0.6 | 0.0 | 7.3 | 0.0 | 9.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.07 | 1.00 | | 0.00 | 1.00 | | 0.19 |
| Lane Grp Cap(c), veh/h | 22 | 1081 | | 900 | 1010 | 1049 | 421 | 222 | | 153 | 0 | 164 |
| V/C Ratio(X) | 0.46 | 0.84 | | 0.64 | 0.41 | 0.41 | 0.83 | 0.05 | | 0.79 | 0.00 | 0.94 |
| Avail Cap(c_a), veh/h | 109 | 1081 | | 900 | 1010 | 1049 | 723 | 222 | | 375 | 0 | 164 |
| HCM Platoon Ratio | 0.33 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.83 | 0.83 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.3 | 46.7 | 0.0 | 35.5 | 13.7 | 13.7 | 47.2 | 42.1 | 0.0 | 49.3 | 0.0 | 49.7 |
| Incr Delay (d2), s/veh | 4.7 | 6.5 | 0.0 | 1.5 | 1.3 | 1.2 | 1.7 | 0.0 | 0.0 | 3.4 | 0.0 | 51.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 13.9 | 0.0 | 6.6 | 5.6 | 5.8 | 4.7 | 0.2 | 0.0 | 3.3 | 0.0 | 6.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 59.1 | 53.1 | 0.0 | 37.0 | 14.9 | 14.9 | 48.9 | 42.1 | 0.0 | 52.8 | 0.0 | 100.8 |
| LnGrp LOS | E | D | | D | B | B | D | D | | D | A | F |
| Approach Vol, veh/h | | 914 | A | | 1427 | | | 361 | A | | 275 | |
| Approach Delay, s/veh | | 53.2 | | | 23.8 | | | 48.7 | | | 79.7 | |
| Approach LOS | | D | | | C | | | D | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 35.6 | 40.0 | 18.4 | 16.0 | 7.6 | 68.0 | 14.4 | 20.0 |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 | 6.0 | 5.0 | * 6 |
| Max Green Setting (Gmax), s | 20.0 | 34.0 | 23.0 | 10.0 | 8.0 | 46.0 | 23.0 | * 11 |
| Max Q Clear Time (g_c+I1), s | 18.6 | 29.9 | 12.9 | 11.3 | 2.7 | 16.6 | 9.3 | 2.6 |
| Green Ext Time (p_c), s | 0.4 | 2.0 | 0.5 | 0.0 | 0.0 | 5.1 | 0.1 | 0.0 |

| 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] is excluded from calculations of the approach delay and intersection delay.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 40 | 62 | 315 | 177 | 65 | 106 | 238 | 591 | 65 | 111 | 1052 | 42 |
| Future Volume (veh/h) | 40 | 62 | 315 | 177 | 65 | 106 | 238 | 591 | 65 | 111 | 1052 | 42 |
| 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 | 1900 | 1870 | 1885 | 1900 | 1870 | 1856 | 1885 | 1752 | 1752 | 1885 | 1856 | 1856 |
| Adj Flow Rate, veh/h | 47 | 72 | 0 | 206 | 76 | 0 | 277 | 687 | 76 | 129 | 1223 | 49 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Percent Heavy Veh, % | 0 | 2 | 1 | 0 | 2 | 3 | 1 | 10 | 10 | 1 | 3 | 3 |
| Cap, veh/h | 300 | 380 | | 303 | 380 | | 360 | 1718 | 190 | 490 | 1848 | 74 |
| Arrive On Green | 0.20 | 0.20 | 0.00 | 0.20 | 0.20 | 0.00 | 0.09 | 0.57 | 0.57 | 0.06 | 0.54 | 0.54 |
| Sat Flow, veh/h | 1344 | 1870 | 1598 | 1349 | 1870 | 1572 | 1795 | 3022 | 334 | 1795 | 3455 | 138 |
| Grp Volume(v), veh/h | 47 | 72 | 0 | 206 | 76 | 0 | 277 | 378 | 385 | 129 | 624 | 648 |
| Grp Sat Flow(s),veh/h/ln | 1344 | 1870 | 1598 | 1349 | 1870 | 1572 | 1795 | 1664 | 1692 | 1795 | 1763 | 1831 |
| Q Serve(g_s), s | 3.0 | 3.2 | 0.0 | 14.9 | 3.4 | 0.0 | 6.7 | 12.7 | 12.7 | 3.1 | 25.5 | 25.5 |
| Cycle Q Clear(g_c), s | 6.4 | 3.2 | 0.0 | 18.1 | 3.4 | 0.0 | 6.7 | 12.7 | 12.7 | 3.1 | 25.5 | 25.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.20 | 1.00 | | 0.08 |
| Lane Grp Cap(c), veh/h | 300 | 380 | | 303 | 380 | | 360 | 946 | 962 | 490 | 943 | 979 |
| V/C Ratio(X) | 0.16 | 0.19 | | 0.68 | 0.20 | | 0.77 | 0.40 | 0.40 | 0.26 | 0.66 | 0.66 |
| Avail Cap(c_a), veh/h | 329 | 421 | | 333 | 421 | | 554 | 946 | 962 | 690 | 943 | 979 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 35.7 | 33.0 | 0.0 | 40.5 | 33.1 | 0.0 | 16.4 | 12.0 | 12.1 | 9.4 | 16.7 | 16.7 |
| Incr Delay (d2), s/veh | 0.2 | 0.2 | 0.0 | 4.4 | 0.2 | 0.0 | 2.6 | 1.3 | 1.2 | 0.2 | 3.6 | 3.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 1.5 | 0.0 | 5.3 | 1.5 | 0.0 | 3.2 | 4.6 | 4.6 | 1.2 | 10.6 | 11.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 35.9 | 33.2 | 0.0 | 44.9 | 33.3 | 0.0 | 19.0 | 13.3 | 13.3 | 9.7 | 20.4 | 20.3 |
| LnGrp LOS | D | C | | D | C | | B | B | B | A | C | C |
| Approach Vol, veh/h | | 119 | A | | 282 | A | | 1040 | | | 1401 | |
| Approach Delay, s/veh | | 34.3 | | | 41.8 | | | 14.8 | | | 19.3 | |
| Approach LOS | | C | | | D | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.8 | 63.3 | | 25.8 | 14.2 | 60.0 | | 25.8 |
| Change Period (Y+Rc), s | 5.0 | 6.5 | | 5.5 | 5.0 | 6.5 | | 5.5 |
| Max Green Setting (Gmax), s | 17.8 | 43.5 | | 22.5 | 20.0 | 38.5 | | 22.5 |
| Max Q Clear Time (g_c+I1), s | 15.1 | 14.7 | | 20.1 | 8.7 | 27.5 | | 8.4 |
| Green Ext Time (p_c), s | 0.2 | 8.4 | | 0.2 | 0.4 | 8.2 | | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 20.5 |
| HCM 6th LOS | C |

Notes

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

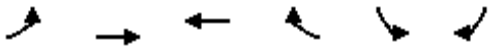
| Intersection | |
|---|---|
| Int Delay, s/veh | 4 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 24 | 291 | 234 | 109 | 129 | 23 |
| Future Vol, veh/h | 24 | 291 | 234 | 109 | 129 | 23 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 87 | 87 | 87 | 87 | 87 | 87 |
| Heavy Vehicles, % | 12 | 1 | 2 | 0 | 0 | 0 |
| Mvmt Flow | 28 | 334 | 269 | 125 | 148 | 26 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 394 | 0 | - | 0 | 722 | 332 |
| Stage 1 | - | - | - | - | 332 | - |
| Stage 2 | - | - | - | - | 390 | - |
| Critical Hdwy | 4.22 | - | - | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | 2.308 | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 1112 | - | - | - | 397 | 714 |
| Stage 1 | - | - | - | - | 731 | - |
| Stage 2 | - | - | - | - | 689 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1112 | - | - | - | 385 | 714 |
| Mov Cap-2 Maneuver | - | - | - | - | 385 | - |
| Stage 1 | - | - | - | - | 708 | - |
| Stage 2 | - | - | - | - | 689 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.6 | 0 | 19.9 |
| HCM LOS | | | C |

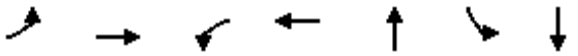
| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1112 | - | - | - | 414 |
| HCM Lane V/C Ratio | 0.025 | - | - | - | 0.422 |
| HCM Control Delay (s) | 8.3 | 0 | - | - | 19.9 |
| HCM Lane LOS | A | A | - | - | C |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 2 |



| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 29 | 1037 | 1257 | 26 | 164 | 201 |
| v/c Ratio | 0.09 | 0.38 | 0.50 | 0.02 | 0.69 | 0.61 |
| Control Delay | 2.2 | 2.0 | 9.3 | 3.3 | 60.4 | 22.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 2.2 | 2.0 | 9.3 | 3.3 | 60.4 | 22.8 |
| Queue Length 50th (ft) | 2 | 34 | 276 | 1 | 112 | 39 |
| Queue Length 95th (ft) | m5 | 47 | 508 | m8 | 174 | 108 |
| Internal Link Dist (ft) | | 638 | 1347 | | 539 | |
| Turn Bay Length (ft) | 235 | | | 65 | 465 | |
| Base Capacity (vph) | 349 | 2694 | 2513 | 1053 | 508 | 543 |
| 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 | 0.08 | 0.38 | 0.50 | 0.02 | 0.32 | 0.37 |

Intersection Summary

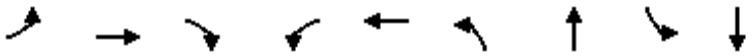
m Volume for 95th percentile queue is metered by upstream signal.



| Lane Group | EBL | EBT | WBL | WBT | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 8 | 1170 | 21 | 1149 | 116 | 187 | 114 |
| v/c Ratio | 0.02 | 0.49 | 0.07 | 0.46 | 0.58 | 0.87 | 0.37 |
| Control Delay | 7.7 | 12.7 | 4.8 | 5.0 | 53.5 | 80.8 | 31.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 7.7 | 12.7 | 4.8 | 5.0 | 53.5 | 80.8 | 31.9 |
| Queue Length 50th (ft) | 2 | 267 | 0 | 10 | 74 | 128 | 50 |
| Queue Length 95th (ft) | m6 | 352 | m8 | 134 | 134 | #246 | 104 |
| Internal Link Dist (ft) | | 1347 | | 1583 | 334 | | 424 |
| Turn Bay Length (ft) | 75 | | 120 | | | 125 | |
| Base Capacity (vph) | 418 | 2405 | 364 | 2516 | 217 | 233 | 330 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.02 | 0.49 | 0.06 | 0.46 | 0.53 | 0.80 | 0.35 |

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.



| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 10 | 904 | 427 | 573 | 854 | 351 | 589 | 121 | 154 |
| v/c Ratio | 0.12 | 0.81 | 0.56 | 0.95 | 0.45 | 0.72 | 0.87 | 0.63 | 0.56 |
| Control Delay | 44.1 | 47.5 | 18.2 | 72.4 | 17.7 | 53.7 | 23.6 | 61.0 | 50.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 44.1 | 47.5 | 18.2 | 72.4 | 17.7 | 53.7 | 23.6 | 61.0 | 50.8 |
| Queue Length 50th (ft) | 7 | 330 | 107 | 208 | 180 | 123 | 66 | 83 | 96 |
| Queue Length 95th (ft) | m14 | 402 | m234 | #317 | 295 | 165 | #299 | 139 | #190 |
| Internal Link Dist (ft) | | 1583 | | | 430 | | 1309 | | 808 |
| Turn Bay Length (ft) | 120 | | 200 | 210 | | 145 | | 110 | |
| Base Capacity (vph) | 107 | 1111 | 761 | 600 | 1883 | 717 | 679 | 373 | 274 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.09 | 0.81 | 0.56 | 0.95 | 0.45 | 0.49 | 0.87 | 0.32 | 0.56 |

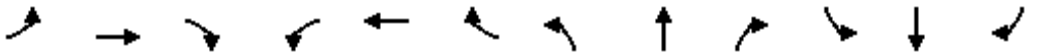
Intersection Summary

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

# Appendix VIII – Phase 1 Build-Out Synchro Reports

# HCM 6th Signalized Intersection Summary
## 1: Vanosdale Rd/Francis Rd & Middlebrook Pike

06/10/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 124 | 896 | 267 | 240 | 1181 | 104 | 242 | 205 | 149 | 75 | 152 | 80 |
| Future Volume (veh/h) | 124 | 896 | 267 | 240 | 1181 | 104 | 242 | 205 | 149 | 75 | 152 | 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 | 1885 | 1870 | 1885 | 1900 | 1900 | 1900 | 1885 | 1885 | 1885 | 1900 | 1900 | 1856 |
| Adj Flow Rate, veh/h | 138 | 963 | 287 | 258 | 1270 | 112 | 260 | 220 | 160 | 81 | 163 | 86 |
| Peak Hour Factor | 0.90 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 3 |
| Cap, veh/h | 217 | 1576 | 933 | 344 | 1608 | 141 | 361 | 394 | 486 | 267 | 230 | 190 |
| Arrive On Green | 0.06 | 0.44 | 0.44 | 0.03 | 0.16 | 0.16 | 0.14 | 0.21 | 0.21 | 0.05 | 0.12 | 0.12 |
| Sat Flow, veh/h | 1795 | 3554 | 1598 | 1810 | 3357 | 295 | 1795 | 1885 | 1598 | 1810 | 1900 | 1572 |
| Grp Volume(v), veh/h | 138 | 963 | 287 | 258 | 681 | 701 | 260 | 220 | 160 | 81 | 163 | 86 |
| Grp Sat Flow(s),veh/h/ln | 1795 | 1777 | 1598 | 1810 | 1805 | 1847 | 1795 | 1885 | 1598 | 1810 | 1900 | 1572 |
| Q Serve(g_s), s | 4.6 | 22.8 | 10.0 | 8.0 | 39.9 | 40.2 | 13.4 | 11.5 | 8.5 | 4.3 | 9.1 | 5.6 |
| Cycle Q Clear(g_c), s | 4.6 | 22.8 | 10.0 | 8.0 | 39.9 | 40.2 | 13.4 | 11.5 | 8.5 | 4.3 | 9.1 | 5.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.16 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 217 | 1576 | 933 | 344 | 865 | 885 | 361 | 394 | 486 | 267 | 230 | 190 |
| V/C Ratio(X) | 0.64 | 0.61 | 0.31 | 0.75 | 0.79 | 0.79 | 0.72 | 0.56 | 0.33 | 0.30 | 0.71 | 0.45 |
| Avail Cap(c_a), veh/h | 274 | 1576 | 933 | 485 | 865 | 885 | 371 | 394 | 486 | 337 | 311 | 257 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 23.5 | 23.4 | 11.6 | 20.6 | 40.9 | 41.0 | 34.1 | 38.9 | 29.6 | 39.4 | 46.5 | 44.9 |
| Incr Delay (d2), s/veh | 3.1 | 1.8 | 0.9 | 4.0 | 7.2 | 7.2 | 5.5 | 5.6 | 1.8 | 0.2 | 2.3 | 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 | 1.9 | 9.1 | 3.7 | 3.7 | 20.8 | 21.4 | 6.4 | 5.9 | 3.5 | 1.9 | 4.4 | 2.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 26.6 | 25.1 | 12.5 | 24.7 | 48.1 | 48.2 | 39.6 | 44.6 | 31.4 | 39.6 | 48.8 | 45.6 |
| LnGrp LOS | C | C | B | C | D | D | D | D | C | D | D | D |
| Approach Vol, veh/h | | 1388 | | | 1640 | | | 640 | | | 330 | |
| Approach Delay, s/veh | | 22.7 | | | 44.5 | | | 39.3 | | | 45.7 | |
| Approach LOS | | C | | | D | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.5 | 58.7 | 10.8 | 29.0 | 15.4 | 54.8 | 20.4 | 19.3 |
| Change Period (Y+Rc), s | 5.0 | 6.0 | 5.0 | 6.0 | 5.0 | 6.0 | 5.0 | * 6 |
| Max Green Setting (Gmax), s | 10.0 | 45.0 | 10.0 | 23.0 | 19.0 | 36.0 | 16.0 | * 18 |
| Max Q Clear Time (g_c+I1), s | 6.6 | 42.2 | 6.3 | 13.5 | 10.0 | 24.8 | 15.4 | 11.1 |
| Green Ext Time (p_c), s | 0.1 | 1.6 | 0.0 | 0.8 | 0.5 | 3.6 | 0.0 | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 36.2 |
| HCM 6th LOS | D |

**Notes**

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

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.9 |

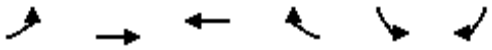
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 30 | 899 | 24 | 60 | 1436 | 14 | 31 | 3 | 29 | 5 | 2 | 27 |
| Future Vol, veh/h | 30 | 899 | 24 | 60 | 1436 | 14 | 31 | 3 | 29 | 5 | 2 | 27 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 25 | - | - | 128 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 1 | - | - | 1 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, % | 0 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 0 | 0 |
| Mvmt Flow | 33 | 988 | 26 | 66 | 1578 | 15 | 34 | 3 | 32 | 5 | 2 | 30 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1593 | 0 | 0 | 1014 | 0 | 0 | 1989 | 2792 | 507 | 2280 | 2798 | 797 |
| Stage 1 | - | - | - | - | - | - | 1067 | 1067 | - | 1718 | 1718 | - |
| Stage 2 | - | - | - | - | - | - | 922 | 1725 | - | 562 | 1080 | - |
| Critical Hdwy | 4.1 | - | - | 4.1 | - | - | 7.5 | 6.5 | 6.98 | 7.5 | 6.5 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.5 | 5.5 | - | 6.5 | 5.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.5 | 5.5 | - | 6.5 | 5.5 | - |
| Follow-up Hdwy | 2.2 | - | - | 2.2 | - | - | 3.5 | 4 | 3.34 | 3.5 | 4 | 3.3 |
| Pot Cap-1 Maneuver | *739 | - | - | *1078 | - | - | *293 | 12 | *709 | *136 | 11 | *492 |
| Stage 1 | - | - | - | - | - | - | *621 | 556 | - | *374 | 347 | - |
| Stage 2 | - | - | - | - | - | - | *464 | 341 | - | *677 | 545 | - |
| Platoon blocked, % | 1 | - | - | 1 | - | - | 1 | 1 | 1 | 1 | 1 | 1 |
| Mov Cap-1 Maneuver | *739 | - | - | *1078 | - | - | *251 | 10 | *709 | *118 | 10 | *492 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | *312 | 174 | - | *248 | 178 | - |
| Stage 1 | - | - | - | - | - | - | *593 | 531 | - | *357 | 326 | - |
| Stage 2 | - | - | - | - | - | - | *407 | 320 | - | *614 | 520 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.3 | 0.3 | 15.9 | 15.1 |
| HCM LOS | | | C | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 400 | * 739 | - | - | * 1078 | - | - | 394 |
| HCM Lane V/C Ratio | 0.173 | 0.045 | - | - | 0.061 | - | - | 0.095 |
| HCM Control Delay (s) | 15.9 | 10.1 | - | - | 8.6 | - | - | 15.1 |
| HCM Lane LOS | C | B | - | - | A | - | - | C |
| HCM 95th %tile Q(veh) | 0.6 | 0.1 | - | - | 0.2 | - | - | 0.3 |

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



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 109 | 831 | 1348 | 74 | 133 | 100 |
| Future Volume (veh/h) | 109 | 831 | 1348 | 74 | 133 | 100 |
| 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 | 1900 | 1856 | 1885 | 1885 | 1870 | 1900 |
| Adj Flow Rate, veh/h | 117 | 894 | 1449 | 80 | 143 | 108 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 0 | 3 | 1 | 1 | 2 | 0 |
| Cap, veh/h | 388 | 2795 | 2427 | 134 | 175 | 158 |
| Arrive On Green | 0.09 | 1.00 | 1.00 | 1.00 | 0.10 | 0.10 |
| Sat Flow, veh/h | 1810 | 3618 | 3546 | 190 | 1781 | 1610 |
| Grp Volume(v), veh/h | 117 | 894 | 750 | 779 | 143 | 108 |
| Grp Sat Flow(s),veh/h/ln | 1810 | 1763 | 1791 | 1851 | 1781 | 1610 |
| Q Serve(g_s), s | 1.8 | 0.0 | 0.0 | 0.0 | 8.7 | 7.1 |
| Cycle Q Clear(g_c), s | 1.8 | 0.0 | 0.0 | 0.0 | 8.7 | 7.1 |
| Prop In Lane | 1.00 | | | 0.10 | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 388 | 2795 | 1259 | 1302 | 175 | 158 |
| V/C Ratio(X) | 0.30 | 0.32 | 0.60 | 0.60 | 0.82 | 0.68 |
| Avail Cap(c_a), veh/h | 473 | 2795 | 1259 | 1302 | 227 | 205 |
| HCM Platoon Ratio | 2.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 3.1 | 0.0 | 0.0 | 0.0 | 48.6 | 48.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.3 | 2.1 | 2.0 | 12.9 | 3.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.4 | 0.1 | 0.7 | 0.7 | 4.5 | 3.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d),s/veh | 3.3 | 0.3 | 2.1 | 2.0 | 61.5 | 51.1 |
| LnGrp LOS | A | A | A | A | E | D |
| Approach Vol, veh/h | | 1011 | 1529 | | 251 | |
| Approach Delay, s/veh | | 0.6 | 2.1 | | 57.0 | |
| Approach LOS | | A | A | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.9 | 83.3 | | 16.8 | | 93.2 |
| Change Period (Y+Rc), s | 5.0 | 6.0 | | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | 10.0 | 69.0 | | 14.0 | | 84.0 |
| Max Q Clear Time (g_c+I1), s | 3.8 | 2.0 | | 10.7 | | 2.0 |
| Green Ext Time (p_c), s | 0.1 | 14.4 | | 0.1 | | 6.7 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 6.5 |
| HCM 6th LOS | A |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.2 |

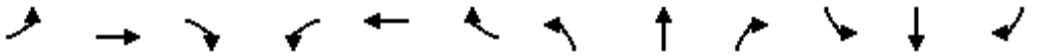
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 24 | 975 | 1352 | 72 | 72 | 58 |
| Future Vol, veh/h | 24 | 975 | 1352 | 72 | 72 | 58 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 124 | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, % | 4 | 2 | 1 | 1 | 0 | 0 |
| Mvmt Flow | 27 | 1108 | 1536 | 82 | 82 | 66 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1618 | 0 | - | 0 | 2185 | 809 |
| Stage 1 | - | - | - | - | 1577 | - |
| Stage 2 | - | - | - | - | 608 | - |
| Critical Hdwy | 4.18 | - | - | - | 6.8 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.8 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.8 | - |
| Follow-up Hdwy | 2.24 | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 650 | - | - | - | *141 | *549 |
| Stage 1 | - | - | - | - | *425 | - |
| Stage 2 | - | - | - | - | *650 | - |
| Platoon blocked, % | 1 | - | - | - | 1 | 1 |
| Mov Cap-1 Maneuver | 650 | - | - | - | *135 | *549 |
| Mov Cap-2 Maneuver | - | - | - | - | *286 | - |
| Stage 1 | - | - | - | - | *407 | - |
| Stage 2 | - | - | - | - | *650 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.3 | 0 | 21.5 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 650 | - | - | - | 364 |
| HCM Lane V/C Ratio | 0.042 | - | - | - | 0.406 |
| HCM Control Delay (s) | 10.8 | - | - | - | 21.5 |
| HCM Lane LOS | B | - | - | - | C |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 1.9 |

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 26 | 1021 | 11 | 82 | 1144 | 24 | 102 | 3 | 127 | 149 | 1 | 183 |
| Future Volume (veh/h) | 26 | 1021 | 11 | 82 | 1144 | 24 | 102 | 3 | 127 | 149 | 1 | 183 |
| 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 | 1841 | 1856 | 1856 | 1870 | 1885 | 1781 | 1870 | 1870 | 1870 | 1870 | 1870 | 1856 |
| Adj Flow Rate, veh/h | 29 | 1122 | 12 | 89 | 1257 | 0 | 111 | 3 | 138 | 164 | 1 | 201 |
| Peak Hour Factor | 0.91 | 0.91 | 0.92 | 0.92 | 0.91 | 0.91 | 0.92 | 0.92 | 0.92 | 0.91 | 0.92 | 0.91 |
| Percent Heavy Veh, % | 4 | 3 | 3 | 2 | 1 | 8 | 2 | 2 | 2 | 2 | 2 | 3 |
| Cap, veh/h | 344 | 1838 | 20 | 147 | 1726 | | 190 | 4 | 166 | 258 | 2 | 229 |
| Arrive On Green | 0.13 | 1.00 | 1.00 | 0.08 | 0.96 | 0.00 | 0.11 | 0.11 | 0.11 | 0.15 | 0.15 | 0.15 |
| Sat Flow, veh/h | 1753 | 3573 | 38 | 3456 | 3582 | 1510 | 1781 | 34 | 1556 | 1771 | 11 | 1572 |
| Grp Volume(v), veh/h | 29 | 553 | 581 | 89 | 1257 | 0 | 111 | 0 | 141 | 165 | 0 | 201 |
| Grp Sat Flow(s),veh/h/ln | 1753 | 1763 | 1849 | 1728 | 1791 | 1510 | 1781 | 0 | 1590 | 1782 | 0 | 1572 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 2.7 | 4.7 | 0.0 | 6.5 | 0.0 | 9.6 | 9.6 | 0.0 | 13.8 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 2.7 | 4.7 | 0.0 | 6.5 | 0.0 | 9.6 | 9.6 | 0.0 | 13.8 |
| Prop In Lane | 1.00 | | 0.02 | 1.00 | | 1.00 | 1.00 | | 0.98 | 0.99 | | 1.00 |
| Lane Grp Cap(c), veh/h | 344 | 907 | 951 | 147 | 1726 | | 190 | 0 | 169 | 260 | 0 | 229 |
| V/C Ratio(X) | 0.08 | 0.61 | 0.61 | 0.61 | 0.73 | | 0.58 | 0.00 | 0.83 | 0.64 | 0.00 | 0.88 |
| Avail Cap(c_a), veh/h | 344 | 907 | 951 | 188 | 1726 | | 211 | 0 | 188 | 292 | 0 | 257 |
| HCM Platoon Ratio | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 0.87 | 0.87 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 17.0 | 0.0 | 0.0 | 49.4 | 1.1 | 0.0 | 46.8 | 0.0 | 48.2 | 44.2 | 0.0 | 46.0 |
| Incr Delay (d2), s/veh | 0.0 | 3.1 | 2.9 | 3.5 | 2.4 | 0.0 | 3.4 | 0.0 | 24.3 | 2.4 | 0.0 | 23.5 |
| 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 | 0.4 | 0.8 | 0.8 | 1.2 | 1.1 | 0.0 | 3.1 | 0.0 | 4.9 | 4.4 | 0.0 | 6.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 17.0 | 3.1 | 2.9 | 52.9 | 3.5 | 0.0 | 50.2 | 0.0 | 72.4 | 46.6 | 0.0 | 69.6 |
| LnGrp LOS | B | A | A | D | A | | D | A | E | D | A | E |
| Approach Vol, veh/h | | 1163 | | | 1346 | A | | 252 | | | 366 | |
| Approach Delay, s/veh | | 3.3 | | | 6.8 | | | 62.6 | | | 59.2 | |
| Approach LOS | | A | | | A | | | E | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.3 | 59.0 | | 21.0 | 9.7 | 62.6 | | 16.7 | | | | |
| Change Period (Y+Rc), s | 6.0 | * 6 | | 5.0 | 5.0 | 6.0 | | 5.0 | | | | |
| Max Green Setting (Gmax), s | 5.0 | * 53 | | 18.0 | 6.0 | 52.0 | | 13.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.0 | 6.7 | | 15.8 | 4.7 | 2.0 | | 11.6 | | | | |
| Green Ext Time (p_c), s | 0.0 | 10.8 | | 0.3 | 0.0 | 8.1 | | 0.2 | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 6th Ctrl Delay | | 16.1 | |
| HCM 6th LOS | | B | |

**Notes**

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 10 | 1178 | 100 | 19 | 1091 | 30 | 101 | 14 | 8 | 172 | 61 | 50 |
| Future Volume (veh/h) | 10 | 1178 | 100 | 19 | 1091 | 30 | 101 | 14 | 8 | 172 | 61 | 50 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1900 | 1856 | 1856 | 1900 | 1885 | 1885 | 1693 | 1693 | 1693 | 1885 | 1900 | 1900 |
| Adj Flow Rate, veh/h | 11 | 1280 | 109 | 21 | 1186 | 33 | 110 | 15 | 9 | 187 | 61 | 54 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 1.00 | 0.92 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 0 | 1 | 1 | 14 | 14 | 14 | 1 | 0 | 0 |
| Cap, veh/h | 368 | 2142 | 182 | 312 | 2103 | 59 | 174 | 22 | 10 | 331 | 161 | 142 |
| Arrive On Green | 0.15 | 1.00 | 1.00 | 0.02 | 0.59 | 0.59 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 |
| Sat Flow, veh/h | 1810 | 3289 | 279 | 1810 | 3559 | 99 | 662 | 126 | 57 | 1398 | 929 | 823 |
| Grp Volume(v), veh/h | 11 | 685 | 704 | 21 | 597 | 622 | 134 | 0 | 0 | 187 | 0 | 115 |
| Grp Sat Flow(s),veh/h/ln | 1810 | 1763 | 1805 | 1810 | 1791 | 1867 | 845 | 0 | 0 | 1398 | 0 | 1752 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 0.6 | 22.5 | 22.5 | 11.4 | 0.0 | 0.0 | 0.0 | 0.0 | 6.4 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 0.6 | 22.5 | 22.5 | 17.8 | 0.0 | 0.0 | 12.5 | 0.0 | 6.4 |
| Prop In Lane | 1.00 | | 0.15 | 1.00 | | 0.05 | 0.82 | | 0.07 | 1.00 | | 0.47 |
| Lane Grp Cap(c), veh/h | 368 | 1148 | 1176 | 312 | 1058 | 1103 | 205 | 0 | 0 | 331 | 0 | 303 |
| V/C Ratio(X) | 0.03 | 0.60 | 0.60 | 0.07 | 0.56 | 0.56 | 0.65 | 0.00 | 0.00 | 0.56 | 0.00 | 0.38 |
| Avail Cap(c_a), veh/h | 385 | 1148 | 1176 | 421 | 1058 | 1103 | 205 | 0 | 0 | 331 | 0 | 303 |
| 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) | 0.77 | 0.77 | 0.77 | 0.79 | 0.79 | 0.79 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 16.2 | 0.0 | 0.0 | 10.6 | 13.8 | 13.8 | 47.6 | 0.0 | 0.0 | 42.8 | 0.0 | 40.3 |
| Incr Delay (d2), s/veh | 0.0 | 1.8 | 1.7 | 0.1 | 1.7 | 1.7 | 5.7 | 0.0 | 0.0 | 1.4 | 0.0 | 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 | 0.1 | 0.6 | 0.6 | 0.2 | 8.3 | 8.6 | 3.9 | 0.0 | 0.0 | 4.9 | 0.0 | 2.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 16.2 | 1.8 | 1.7 | 10.7 | 15.5 | 15.5 | 53.3 | 0.0 | 0.0 | 44.2 | 0.0 | 40.6 |
| LnGrp LOS | B | A | A | B | B | B | D | A | A | D | A | D |
| Approach Vol, veh/h | | 1400 | | | 1240 | | | 134 | | | 302 | |
| Approach Delay, s/veh | | 1.9 | | | 15.4 | | | 53.3 | | | 42.8 | |
| Approach LOS | | A | | | B | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.0 | 71.0 | | 25.0 | 7.4 | 77.6 | | 25.0 |
| Change Period (Y+Rc), s | 6.0 | * 6 | | 6.0 | 5.0 | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | 8.0 | * 65 | | 19.0 | 9.0 | 65.0 | | 19.0 |
| Max Q Clear Time (g_c+I1), s | 2.6 | 24.5 | | 14.5 | 2.6 | 2.0 | | 19.8 |
| Green Ext Time (p_c), s | 0.0 | 8.9 | | 0.3 | 0.0 | 11.9 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 13.6 |
| HCM 6th LOS | B |

Notes

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 12 | 919 | 451 | 521 | 787 | 28 | 344 | 9 | 527 | 110 | 114 | 27 |
| Future Volume (veh/h) | 12 | 919 | 451 | 521 | 787 | 28 | 344 | 9 | 527 | 110 | 114 | 27 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1574 | 1841 | 1856 | 1811 | 1885 | 1885 | 1870 | 1737 | 1737 | 1885 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 13 | 1010 | 0 | 573 | 865 | 31 | 378 | 10 | 0 | 121 | 125 | 30 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 22 | 4 | 3 | 6 | 1 | 1 | 2 | 11 | 11 | 1 | 2 | 2 |
| Cap, veh/h | 27 | 1081 | | 843 | 1916 | 69 | 448 | 251 | | 153 | 146 | 35 |
| Arrive On Green | 0.01 | 0.10 | 0.00 | 0.25 | 0.54 | 0.54 | 0.13 | 0.14 | 0.00 | 0.09 | 0.10 | 0.10 |
| Sat Flow, veh/h | 1499 | 3497 | 1572 | 3346 | 3527 | 126 | 3456 | 1737 | 0 | 1795 | 1458 | 350 |
| Grp Volume(v), veh/h | 13 | 1010 | 0 | 573 | 439 | 457 | 378 | 10 | 0 | 121 | 0 | 155 |
| Grp Sat Flow(s),veh/h/ln | 1499 | 1749 | 1572 | 1673 | 1791 | 1862 | 1728 | 1737 | 0 | 1795 | 0 | 1807 |
| Q Serve(g_s), s | 1.0 | 31.5 | 0.0 | 17.0 | 16.3 | 16.3 | 11.8 | 0.5 | 0.0 | 7.3 | 0.0 | 9.3 |
| Cycle Q Clear(g_c), s | 1.0 | 31.5 | 0.0 | 17.0 | 16.3 | 16.3 | 11.8 | 0.5 | 0.0 | 7.3 | 0.0 | 9.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.07 | 1.00 | | 0.00 | 1.00 | | 0.19 |
| Lane Grp Cap(c), veh/h | 27 | 1081 | | 843 | 973 | 1012 | 448 | 251 | | 153 | 0 | 181 |
| V/C Ratio(X) | 0.49 | 0.93 | | 0.68 | 0.45 | 0.45 | 0.84 | 0.04 | | 0.79 | 0.00 | 0.86 |
| Avail Cap(c_a), veh/h | 109 | 1081 | | 843 | 973 | 1012 | 723 | 251 | | 375 | 0 | 181 |
| HCM Platoon Ratio | 0.33 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.76 | 0.76 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.2 | 48.3 | 0.0 | 37.1 | 15.2 | 15.2 | 46.8 | 40.5 | 0.0 | 49.3 | 0.0 | 48.7 |
| Incr Delay (d2), s/veh | 3.8 | 12.6 | 0.0 | 2.2 | 1.5 | 1.5 | 2.6 | 0.0 | 0.0 | 3.4 | 0.0 | 30.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.4 | 16.5 | 0.0 | 6.8 | 6.3 | 6.6 | 5.1 | 0.2 | 0.0 | 3.3 | 0.0 | 5.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 58.0 | 60.9 | 0.0 | 39.3 | 16.7 | 16.7 | 49.3 | 40.5 | 0.0 | 52.8 | 0.0 | 78.8 |
| LnGrp LOS | E | E | | D | B | B | D | D | | D | A | E |
| Approach Vol, veh/h | | 1023 | A | | 1469 | | | 388 | A | | 276 | |
| Approach Delay, s/veh | | 60.9 | | | 25.5 | | | 49.1 | | | 67.4 | |
| Approach LOS | | E | | | C | | | D | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 33.7 | 40.0 | 14.4 | 21.9 | 8.0 | 65.8 | 19.3 | 17.0 |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 | 6.0 | 5.0 | * 6 |
| Max Green Setting (Gmax), s | 20.0 | 34.0 | 23.0 | 10.0 | 8.0 | 46.0 | 23.0 | * 11 |
| Max Q Clear Time (g_c+I1), s | 19.3 | 33.5 | 9.3 | 2.5 | 3.0 | 18.3 | 13.8 | 11.3 |
| Green Ext Time (p_c), s | 0.3 | 0.3 | 0.1 | 0.0 | 0.0 | 5.3 | 0.5 | 0.0 |

| 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] is excluded from calculations of the approach delay and intersection delay.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 40 | 68 | 349 | 177 | 67 | 106 | 252 | 616 | 65 | 111 | 1114 | 42 |
| Future Volume (veh/h) | 40 | 68 | 349 | 177 | 67 | 106 | 252 | 616 | 65 | 111 | 1114 | 42 |
| 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 | 1900 | 1870 | 1885 | 1900 | 1870 | 1856 | 1885 | 1752 | 1752 | 1885 | 1856 | 1856 |
| Adj Flow Rate, veh/h | 47 | 79 | 0 | 206 | 78 | 0 | 293 | 716 | 76 | 129 | 1295 | 49 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Percent Heavy Veh, % | 0 | 2 | 1 | 0 | 2 | 3 | 1 | 10 | 10 | 1 | 3 | 3 |
| Cap, veh/h | 303 | 387 | | 303 | 387 | | 344 | 1714 | 182 | 474 | 1826 | 69 |
| Arrive On Green | 0.21 | 0.21 | 0.00 | 0.21 | 0.21 | 0.00 | 0.10 | 0.56 | 0.56 | 0.06 | 0.53 | 0.53 |
| Sat Flow, veh/h | 1342 | 1870 | 1598 | 1341 | 1870 | 1572 | 1795 | 3036 | 322 | 1795 | 3464 | 131 |
| Grp Volume(v), veh/h | 47 | 79 | 0 | 206 | 78 | 0 | 293 | 392 | 400 | 129 | 658 | 686 |
| Grp Sat Flow(s),veh/h/ln | 1342 | 1870 | 1598 | 1341 | 1870 | 1572 | 1795 | 1664 | 1694 | 1795 | 1763 | 1832 |
| Q Serve(g_s), s | 3.0 | 3.5 | 0.0 | 15.0 | 3.5 | 0.0 | 7.2 | 13.4 | 13.4 | 3.2 | 28.2 | 28.3 |
| Cycle Q Clear(g_c), s | 6.5 | 3.5 | 0.0 | 18.5 | 3.5 | 0.0 | 7.2 | 13.4 | 13.4 | 3.2 | 28.2 | 28.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.19 | 1.00 | | 0.07 |
| Lane Grp Cap(c), veh/h | 303 | 387 | | 303 | 387 | | 344 | 940 | 956 | 474 | 929 | 966 |
| V/C Ratio(X) | 0.15 | 0.20 | | 0.68 | 0.20 | | 0.85 | 0.42 | 0.42 | 0.27 | 0.71 | 0.71 |
| Avail Cap(c_a), veh/h | 328 | 421 | | 327 | 421 | | 477 | 940 | 956 | 674 | 929 | 966 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 35.5 | 32.8 | 0.0 | 40.5 | 32.8 | 0.0 | 18.3 | 12.4 | 12.4 | 9.8 | 17.8 | 17.9 |
| Incr Delay (d2), s/veh | 0.2 | 0.2 | 0.0 | 4.7 | 0.2 | 0.0 | 9.2 | 1.4 | 1.3 | 0.2 | 4.6 | 4.4 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 1.6 | 0.0 | 5.3 | 1.6 | 0.0 | 4.3 | 4.9 | 4.9 | 1.2 | 11.9 | 12.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 35.7 | 33.0 | 0.0 | 45.2 | 33.0 | 0.0 | 27.5 | 13.8 | 13.7 | 10.1 | 22.4 | 22.3 |
| LnGrp LOS | D | C | | D | C | | C | B | B | B | C | C |
| Approach Vol, veh/h | | 126 | A | | 284 | A | | 1085 | | | 1473 | |
| Approach Delay, s/veh | | 34.0 | | | 41.8 | | | 17.5 | | | 21.3 | |
| Approach LOS | | C | | | D | | | B | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.8 | 63.0 | | 26.2 | 14.6 | 59.2 | | 26.2 |
| Change Period (Y+Rc), s | 5.0 | 6.5 | | 5.5 | 5.0 | 6.5 | | 5.5 |
| Max Green Setting (Gmax), s | 17.3 | 43.5 | | 22.5 | 17.0 | 43.5 | | 22.5 |
| Max Q Clear Time (g_c+I1), s | 5.2 | 15.4 | | 20.5 | 9.2 | 30.3 | | 8.5 |
| Green Ext Time (p_c), s | 0.2 | 8.7 | | 0.2 | 0.4 | 9.9 | | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 22.4 |
| HCM 6th LOS | C |

Notes

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

| Intersection | |
|---|---|
| Int Delay, s/veh | 5.6 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 24 | 291 | 234 | 125 | 169 | 23 |
| Future Vol, veh/h | 24 | 291 | 234 | 125 | 169 | 23 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 87 | 87 | 87 | 87 | 87 | 87 |
| Heavy Vehicles, % | 12 | 1 | 2 | 0 | 0 | 0 |
| Mvmt Flow | 28 | 334 | 269 | 144 | 194 | 26 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 413 | 0 | - | 0 | 731 | 341 |
| Stage 1 | - | - | - | - | 341 | - |
| Stage 2 | - | - | - | - | 390 | - |
| Critical Hdwy | 4.22 | - | - | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | 2.308 | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 1094 | - | - | - | 392 | 706 |
| Stage 1 | - | - | - | - | 725 | - |
| Stage 2 | - | - | - | - | 689 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1094 | - | - | - | 380 | 706 |
| Mov Cap-2 Maneuver | - | - | - | - | 380 | - |
| Stage 1 | - | - | - | - | 703 | - |
| Stage 2 | - | - | - | - | 689 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.6 | 0 | 24.3 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1094 | - | - | - | 402 |
| HCM Lane V/C Ratio | 0.025 | - | - | - | 0.549 |
| HCM Control Delay (s) | 8.4 | 0 | - | - | 24.3 |
| HCM Lane LOS | A | A | - | - | C |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 3.2 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.3 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 923 | 30 | 0 | 1410 | 0 | 77 |
| Future Vol, veh/h | 923 | 30 | 0 | 1410 | 0 | 77 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | - | 0 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 1003 | 33 | 0 | 1533 | 0 | 84 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | - | - | - | 518 |
| 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 | - | 0 | *714 |
| Stage 1 | - | - | 0 | - | 0 | - |
| Stage 2 | - | - | 0 | - | 0 | - |
| Platoon blocked, % | - | - | | - | | 1 |
| Mov Cap-1 Maneuver | - | - | - | - | - | *714 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0 | 10.7 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBT |
|---|---|---|---|---|
| Capacity (veh/h) | 714 | - | - | - |
| HCM Lane V/C Ratio | 0.117 | - | - | - |
| HCM Control Delay (s) | 10.7 | - | - | - |
| HCM Lane LOS | B | - | - | - |
| HCM 95th %tile Q(veh) | 0.4 | - | - | - |

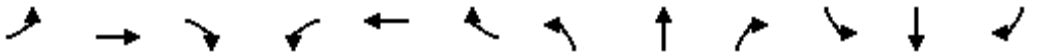
| Notes | | | |
|---|---|---|---|
| ~: Volume exceeds capacity | $: Delay exceeds 300s | +: Computation Not Defined | *: All major volume in platoon |

–

# Appendix IX – Phase 2 No Build Synchro Reports

# HCM 6th Signalized Intersection Summary
## 1: Vanosdale Rd/Francis Rd & Middlebrook Pike

06/10/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 132 | 949 | 284 | 254 | 1249 | 110 | 257 | 218 | 157 | 80 | 161 | 84 |
| Future Volume (veh/h) | 132 | 949 | 284 | 254 | 1249 | 110 | 257 | 218 | 157 | 80 | 161 | 84 |
| 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 | 1885 | 1870 | 1885 | 1900 | 1900 | 1900 | 1885 | 1885 | 1885 | 1900 | 1900 | 1856 |
| Adj Flow Rate, veh/h | 142 | 1020 | 305 | 273 | 1343 | 118 | 276 | 234 | 169 | 86 | 173 | 90 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 3 |
| Cap, veh/h | 194 | 1381 | 847 | 318 | 1444 | 126 | 409 | 474 | 572 | 307 | 311 | 257 |
| Arrive On Green | 0.07 | 0.39 | 0.39 | 0.04 | 0.14 | 0.14 | 0.14 | 0.25 | 0.25 | 0.05 | 0.16 | 0.16 |
| Sat Flow, veh/h | 1795 | 3554 | 1598 | 1810 | 3358 | 294 | 1795 | 1885 | 1598 | 1810 | 1900 | 1572 |
| Grp Volume(v), veh/h | 142 | 1020 | 305 | 273 | 720 | 741 | 276 | 234 | 169 | 86 | 173 | 90 |
| Grp Sat Flow(s),veh/h/ln | 1795 | 1777 | 1598 | 1810 | 1805 | 1847 | 1795 | 1885 | 1598 | 1810 | 1900 | 1572 |
| Q Serve(g_s), s | 5.2 | 27.1 | 12.2 | 9.3 | 43.3 | 43.7 | 13.5 | 11.7 | 8.4 | 4.3 | 9.2 | 5.6 |
| Cycle Q Clear(g_c), s | 5.2 | 27.1 | 12.2 | 9.3 | 43.3 | 43.7 | 13.5 | 11.7 | 8.4 | 4.3 | 9.2 | 5.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.16 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 194 | 1381 | 847 | 318 | 776 | 794 | 409 | 474 | 572 | 307 | 311 | 257 |
| V/C Ratio(X) | 0.73 | 0.74 | 0.36 | 0.86 | 0.93 | 0.93 | 0.67 | 0.49 | 0.30 | 0.28 | 0.56 | 0.35 |
| Avail Cap(c_a), veh/h | 241 | 1381 | 847 | 438 | 776 | 794 | 416 | 474 | 572 | 375 | 311 | 257 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 26.0 | 28.8 | 15.0 | 24.7 | 45.5 | 45.6 | 30.5 | 35.2 | 25.3 | 35.4 | 42.3 | 40.8 |
| Incr Delay (d2), s/veh | 8.4 | 3.6 | 1.2 | 11.9 | 18.7 | 19.3 | 3.4 | 3.6 | 1.3 | 0.2 | 7.0 | 3.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.4 | 11.4 | 4.6 | 5.0 | 24.7 | 25.6 | 6.2 | 5.8 | 3.4 | 1.9 | 4.9 | 2.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 34.4 | 32.4 | 16.2 | 36.5 | 64.2 | 65.0 | 33.9 | 38.8 | 26.7 | 35.6 | 49.3 | 44.5 |
| LnGrp LOS | C | C | B | D | E | E | C | D | C | D | D | D |
| Approach Vol, veh/h | | 1467 | | | 1734 | | | 679 | | | 349 | |
| Approach Delay, s/veh | | 29.2 | | | 60.2 | | | 33.8 | | | 44.7 | |
| Approach LOS | | C | | | E | | | C | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.2 | 53.3 | 10.9 | 33.7 | 16.7 | 48.7 | 20.5 | 24.0 |
| Change Period (Y+Rc), s | 5.0 | 6.0 | 5.0 | 6.0 | 5.0 | 6.0 | 5.0 | * 6 |
| Max Green Setting (Gmax), s | 10.0 | 45.0 | 10.0 | 23.0 | 19.0 | 36.0 | 16.0 | * 18 |
| Max Q Clear Time (g_c+I1), s | 7.2 | 45.7 | 6.3 | 13.7 | 11.3 | 29.1 | 15.5 | 11.2 |
| Green Ext Time (p_c), s | 0.1 | 0.0 | 0.0 | 0.8 | 0.5 | 2.9 | 0.0 | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 43.9 |
| HCM 6th LOS | D |

**Notes**

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

| Intersection | |
|---|---|
| Int Delay, s/veh | 1 |

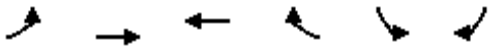
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 31 | 952 | 26 | 64 | 1519 | 15 | 32 | 3 | 30 | 5 | 2 | 28 |
| Future Vol, veh/h | 31 | 952 | 26 | 64 | 1519 | 15 | 32 | 3 | 30 | 5 | 2 | 28 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 25 | - | - | 128 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 1 | - | - | 1 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, % | 0 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 0 | 0 |
| Mvmt Flow | 34 | 1046 | 29 | 70 | 1669 | 16 | 35 | 3 | 33 | 5 | 2 | 31 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1685 | 0 | 0 | 1075 | 0 | 0 | 2105 | 2954 | 538 | 2410 | 2960 | 843 |
| Stage 1 | - | - | - | - | - | - | 1129 | 1129 | - | 1817 | 1817 | - |
| Stage 2 | - | - | - | - | - | - | 976 | 1825 | - | 593 | 1143 | - |
| Critical Hdwy | 4.1 | - | - | 4.1 | - | - | 7.5 | 6.5 | 6.98 | 7.5 | 6.5 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.5 | 5.5 | - | 6.5 | 5.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.5 | 5.5 | - | 6.5 | 5.5 | - |
| Follow-up Hdwy | 2.2 | - | - | 2.2 | - | - | 3.5 | 4 | 3.34 | 3.5 | 4 | 3.3 |
| Pot Cap-1 Maneuver | *697 | - | - | 1010 | - | - | *266 | 5 | *709 | *82 | 4 | *464 |
| Stage 1 | - | - | - | - | - | - | *548 | 507 | - | *326 | 308 | - |
| Stage 2 | - | - | - | - | - | - | *438 | 302 | - | *677 | 496 | - |
| Platoon blocked, % | 1 | - | - | 1 | - | - | 1 | 1 | 1 | 1 | 1 | 1 |
| Mov Cap-1 Maneuver | *697 | - | - | 1010 | - | - | *224 | 4 | *709 | *71 | 4 | *464 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | *282 | 151 | - | *209 | 154 | - |
| Stage 1 | - | - | - | - | - | - | *521 | 482 | - | *310 | 286 | - |
| Stage 2 | - | - | - | - | - | - | *377 | 281 | - | *610 | 472 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.3 | 0.4 | 17 | 16.2 |
| HCM LOS | | | C | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 370 | * 697 | - | - | 1010 | - | - | 360 |
| HCM Lane V/C Ratio | 0.193 | 0.049 | - | - | 0.07 | - | - | 0.107 |
| HCM Control Delay (s) | 17 | 10.4 | - | - | 8.8 | - | - | 16.2 |
| HCM Lane LOS | C | B | - | - | A | - | - | C |
| HCM 95th %tile Q(veh) | 0.7 | 0.2 | - | - | 0.2 | - | - | 0.4 |

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



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 116 | 879 | 1424 | 79 | 141 | 106 |
| Future Volume (veh/h) | 116 | 879 | 1424 | 79 | 141 | 106 |
| 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 | 1900 | 1856 | 1885 | 1885 | 1870 | 1900 |
| Adj Flow Rate, veh/h | 125 | 945 | 1531 | 85 | 152 | 114 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 0 | 3 | 1 | 1 | 2 | 0 |
| Cap, veh/h | 368 | 2778 | 2409 | 133 | 183 | 166 |
| Arrive On Green | 0.09 | 1.00 | 1.00 | 1.00 | 0.10 | 0.10 |
| Sat Flow, veh/h | 1810 | 3618 | 3545 | 191 | 1781 | 1610 |
| Grp Volume(v), veh/h | 125 | 945 | 791 | 825 | 152 | 114 |
| Grp Sat Flow(s),veh/h/ln | 1810 | 1763 | 1791 | 1851 | 1781 | 1610 |
| Q Serve(g_s), s | 2.0 | 0.0 | 0.0 | 0.0 | 9.2 | 7.5 |
| Cycle Q Clear(g_c), s | 2.0 | 0.0 | 0.0 | 0.0 | 9.2 | 7.5 |
| Prop In Lane | 1.00 | | | 0.10 | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 368 | 2778 | 1250 | 1292 | 183 | 166 |
| V/C Ratio(X) | 0.34 | 0.34 | 0.63 | 0.64 | 0.83 | 0.69 |
| Avail Cap(c_a), veh/h | 452 | 2778 | 1250 | 1292 | 227 | 205 |
| HCM Platoon Ratio | 2.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 3.3 | 0.0 | 0.0 | 0.0 | 48.4 | 47.6 |
| Incr Delay (d2), s/veh | 0.2 | 0.3 | 2.4 | 2.4 | 15.5 | 4.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 0.1 | 0.9 | 0.9 | 4.9 | 3.2 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d),s/veh | 3.5 | 0.3 | 2.4 | 2.4 | 63.9 | 51.9 |
| LnGrp LOS | A | A | A | A | E | D |
| Approach Vol, veh/h | | 1070 | 1616 | | 266 | |
| Approach Delay, s/veh | | 0.7 | 2.4 | | 58.8 | |
| Approach LOS | | A | A | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.9 | 82.8 | | 17.3 | | 92.7 |
| Change Period (Y+Rc), s | 5.0 | 6.0 | | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | 10.0 | 69.0 | | 14.0 | | 84.0 |
| Max Q Clear Time (g_c+I1), s | 4.0 | 2.0 | | 11.2 | | 2.0 |
| Green Ext Time (p_c), s | 0.1 | 16.2 | | 0.1 | | 7.2 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 6.9 |
| HCM 6th LOS | A |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.5 |

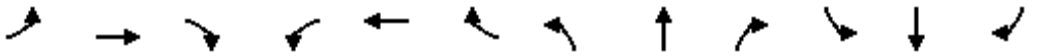
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 26 | 1030 | 1428 | 77 | 77 | 62 |
| Future Vol, veh/h | 26 | 1030 | 1428 | 77 | 77 | 62 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 124 | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, % | 4 | 2 | 1 | 1 | 0 | 0 |
| Mvmt Flow | 30 | 1170 | 1623 | 88 | 88 | 70 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1711 | 0 | - | 0 | 2312 | 856 |
| Stage 1 | - | - | - | - | 1667 | - |
| Stage 2 | - | - | - | - | 645 | - |
| Critical Hdwy | 4.18 | - | - | - | 6.8 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.8 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.8 | - |
| Follow-up Hdwy | 2.24 | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 640 | - | - | - | *~ 61 | *492 |
| Stage 1 | - | - | - | - | *439 | - |
| Stage 2 | - | - | - | - | *624 | - |
| Platoon blocked, % | 1 | - | - | - | 1 | 1 |
| Mov Cap-1 Maneuver | 640 | - | - | - | *~ 58 | *492 |
| Mov Cap-2 Maneuver | - | - | - | - | *254 | - |
| Stage 1 | - | - | - | - | *418 | - |
| Stage 2 | - | - | - | - | *624 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.3 | 0 | 26.2 |
| HCM LOS | | | D |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 640 | - | - | - | 324 |
| HCM Lane V/C Ratio | 0.046 | - | - | - | 0.488 |
| HCM Control Delay (s) | 10.9 | - | - | - | 26.2 |
| HCM Lane LOS | B | - | - | - | D |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 2.5 |

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 27 | 1078 | 11 | 82 | 1214 | 26 | 102 | 3 | 127 | 158 | 9 | 194 |
| Future Volume (veh/h) | 27 | 1078 | 11 | 82 | 1214 | 26 | 102 | 3 | 127 | 158 | 9 | 194 |
| 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 | 1841 | 1856 | 1856 | 1870 | 1885 | 1781 | 1870 | 1870 | 1870 | 1870 | 1870 | 1856 |
| Adj Flow Rate, veh/h | 30 | 1185 | 12 | 89 | 1334 | 0 | 111 | 3 | 138 | 174 | 10 | 213 |
| Peak Hour Factor | 0.91 | 0.91 | 0.92 | 0.92 | 0.91 | 0.91 | 0.92 | 0.92 | 0.92 | 0.91 | 0.92 | 0.91 |
| Percent Heavy Veh, % | 4 | 3 | 3 | 2 | 1 | 8 | 2 | 2 | 2 | 2 | 2 | 3 |
| Cap, veh/h | 331 | 1811 | 18 | 147 | 1693 | | 190 | 4 | 166 | 259 | 15 | 241 |
| Arrive On Green | 0.13 | 1.00 | 1.00 | 0.08 | 0.95 | 0.00 | 0.11 | 0.11 | 0.11 | 0.15 | 0.15 | 0.15 |
| Sat Flow, veh/h | 1753 | 3576 | 36 | 3456 | 3582 | 1510 | 1781 | 34 | 1556 | 1689 | 97 | 1572 |
| Grp Volume(v), veh/h | 30 | 584 | 613 | 89 | 1334 | 0 | 111 | 0 | 141 | 184 | 0 | 213 |
| Grp Sat Flow(s),veh/h/ln | 1753 | 1763 | 1849 | 1728 | 1791 | 1510 | 1781 | 0 | 1590 | 1786 | 0 | 1572 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 2.7 | 8.8 | 0.0 | 6.5 | 0.0 | 9.6 | 10.7 | 0.0 | 14.6 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 2.7 | 8.8 | 0.0 | 6.5 | 0.0 | 9.6 | 10.7 | 0.0 | 14.6 |
| Prop In Lane | 1.00 | | 0.02 | 1.00 | | 1.00 | 1.00 | | 0.98 | 0.95 | | 1.00 |
| Lane Grp Cap(c), veh/h | 331 | 893 | 937 | 147 | 1693 | | 190 | 0 | 169 | 274 | 0 | 241 |
| V/C Ratio(X) | 0.09 | 0.65 | 0.65 | 0.61 | 0.79 | | 0.58 | 0.00 | 0.83 | 0.67 | 0.00 | 0.88 |
| Avail Cap(c_a), veh/h | 331 | 893 | 937 | 188 | 1693 | | 211 | 0 | 188 | 308 | 0 | 272 |
| HCM Platoon Ratio | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 0.85 | 0.85 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 17.6 | 0.0 | 0.0 | 49.4 | 1.8 | 0.0 | 46.8 | 0.0 | 48.2 | 43.9 | 0.0 | 45.6 |
| Incr Delay (d2), s/veh | 0.0 | 3.7 | 3.6 | 3.4 | 3.2 | 0.0 | 3.4 | 0.0 | 24.3 | 3.4 | 0.0 | 23.3 |
| 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 | 0.4 | 0.9 | 0.9 | 1.2 | 1.6 | 0.0 | 3.1 | 0.0 | 4.9 | 5.0 | 0.0 | 7.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 17.6 | 3.7 | 3.6 | 52.9 | 5.1 | 0.0 | 50.2 | 0.0 | 72.4 | 47.3 | 0.0 | 68.9 |
| LnGrp LOS | B | A | A | D | A | | D | A | E | D | A | E |
| Approach Vol, veh/h | | 1227 | | | 1423 | A | | 252 | | | 397 | |
| Approach Delay, s/veh | | 4.0 | | | 8.1 | | | 62.6 | | | 58.9 | |
| Approach LOS | | A | | | A | | | E | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.4 | 58.0 | | 21.9 | 9.7 | 61.7 | | 16.7 | | | | |
| Change Period (Y+Rc), s | 6.0 | * 6 | | 5.0 | 5.0 | 6.0 | | 5.0 | | | | |
| Max Green Setting (Gmax), s | 5.0 | * 52 | | 19.0 | 6.0 | 51.0 | | 13.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.0 | 10.8 | | 16.6 | 4.7 | 2.0 | | 11.6 | | | | |
| Green Ext Time (p_c), s | 0.0 | 11.7 | | 0.3 | 0.0 | 8.8 | | 0.2 | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 6th Ctrl Delay | | 16.8 | |
| HCM 6th LOS | | B | |

Notes

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 11 | 1240 | 104 | 21 | 1154 | 31 | 106 | 15 | 9 | 183 | 65 | 53 |
| Future Volume (veh/h) | 11 | 1240 | 104 | 21 | 1154 | 31 | 106 | 15 | 9 | 183 | 65 | 53 |
| 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 | 1900 | 1856 | 1856 | 1900 | 1885 | 1885 | 1693 | 1693 | 1693 | 1885 | 1900 | 1900 |
| Adj Flow Rate, veh/h | 12 | 1348 | 113 | 23 | 1254 | 34 | 115 | 16 | 10 | 199 | 65 | 58 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 1.00 | 0.92 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 0 | 1 | 1 | 14 | 14 | 14 | 1 | 0 | 0 |
| Cap, veh/h | 241 | 1946 | 163 | 386 | 2347 | 64 | 168 | 22 | 10 | 331 | 160 | 143 |
| Arrive On Green | 0.03 | 1.00 | 1.00 | 0.07 | 0.66 | 0.66 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 |
| Sat Flow, veh/h | 1810 | 3294 | 275 | 1810 | 3562 | 97 | 629 | 125 | 58 | 1396 | 926 | 826 |
| Grp Volume(v), veh/h | 12 | 719 | 742 | 23 | 630 | 658 | 141 | 0 | 0 | 199 | 0 | 123 |
| Grp Sat Flow(s),veh/h/ln | 1810 | 1763 | 1806 | 1810 | 1791 | 1868 | 811 | 0 | 0 | 1396 | 0 | 1751 |
| Q Serve(g_s), s | 0.3 | 0.0 | 0.0 | 0.0 | 20.4 | 20.4 | 12.1 | 0.0 | 0.0 | 0.0 | 0.0 | 6.9 |
| Cycle Q Clear(g_c), s | 0.3 | 0.0 | 0.0 | 0.0 | 20.4 | 20.4 | 19.0 | 0.0 | 0.0 | 13.5 | 0.0 | 6.9 |
| Prop In Lane | 1.00 | | 0.15 | 1.00 | | 0.05 | 0.82 | | 0.07 | 1.00 | | 0.47 |
| Lane Grp Cap(c), veh/h | 241 | 1042 | 1067 | 386 | 1180 | 1230 | 200 | 0 | 0 | 331 | 0 | 303 |
| V/C Ratio(X) | 0.05 | 0.69 | 0.70 | 0.06 | 0.53 | 0.53 | 0.71 | 0.00 | 0.00 | 0.60 | 0.00 | 0.41 |
| Avail Cap(c_a), veh/h | 364 | 1042 | 1067 | 403 | 1180 | 1230 | 200 | 0 | 0 | 331 | 0 | 303 |
| 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) | 0.72 | 0.72 | 0.72 | 0.77 | 0.77 | 0.77 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 12.7 | 0.0 | 0.0 | 10.1 | 9.9 | 9.9 | 48.4 | 0.0 | 0.0 | 43.2 | 0.0 | 40.5 |
| Incr Delay (d2), s/veh | 0.1 | 2.7 | 2.7 | 0.0 | 1.3 | 1.3 | 9.3 | 0.0 | 0.0 | 2.2 | 0.0 | 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 | 0.1 | 0.8 | 0.8 | 0.2 | 6.9 | 7.2 | 4.4 | 0.0 | 0.0 | 5.3 | 0.0 | 3.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 12.8 | 2.7 | 2.7 | 10.1 | 11.2 | 11.2 | 57.7 | 0.0 | 0.0 | 45.4 | 0.0 | 40.8 |
| LnGrp LOS | B | A | A | B | B | B | E | A | A | D | A | D |
| Approach Vol, veh/h | | 1473 | | | 1311 | | | 141 | | | 322 | |
| Approach Delay, s/veh | | 2.8 | | | 11.2 | | | 57.7 | | | 43.6 | |
| Approach LOS | | A | | | B | | | E | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.0 | 71.0 | | 25.0 | 6.5 | 78.5 | | 25.0 | | | | |
| Change Period (Y+Rc), s | 6.0 | * 6 | | 6.0 | 5.0 | 6.0 | | 6.0 | | | | |
| Max Green Setting (Gmax), s | 8.0 | * 65 | | 19.0 | 9.0 | 65.0 | | 19.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.3 | 2.0 | | 15.5 | 2.3 | 22.4 | | 21.0 | | | | |
| Green Ext Time (p_c), s | 0.0 | 13.1 | | 0.3 | 0.0 | 9.8 | | 0.0 | | | | |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 12.6 |
| HCM 6th LOS | B |

Notes

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 13 | 970 | 474 | 553 | 833 | 29 | 364 | 10 | 560 | 117 | 121 | 28 |
| Future Volume (veh/h) | 13 | 970 | 474 | 553 | 833 | 29 | 364 | 10 | 560 | 117 | 121 | 28 |
| 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 | 1574 | 1841 | 1856 | 1811 | 1885 | 1885 | 1870 | 1737 | 1737 | 1885 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 14 | 1066 | 0 | 608 | 915 | 32 | 400 | 11 | 0 | 129 | 133 | 31 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 22 | 4 | 3 | 6 | 1 | 1 | 2 | 11 | 11 | 1 | 2 | 2 |
| Cap, veh/h | 28 | 1081 | | 822 | 1892 | 66 | 470 | 254 | | 161 | 147 | 34 |
| Arrive On Green | 0.01 | 0.10 | 0.00 | 0.25 | 0.54 | 0.54 | 0.14 | 0.15 | 0.00 | 0.09 | 0.10 | 0.10 |
| Sat Flow, veh/h | 1499 | 3497 | 1572 | 3346 | 3530 | 123 | 3456 | 1737 | 0 | 1795 | 1467 | 342 |
| Grp Volume(v), veh/h | 14 | 1066 | 0 | 608 | 464 | 483 | 400 | 11 | 0 | 129 | 0 | 164 |
| Grp Sat Flow(s),veh/h/ln | 1499 | 1749 | 1572 | 1673 | 1791 | 1863 | 1728 | 1737 | 0 | 1795 | 0 | 1809 |
| Q Serve(g_s), s | 1.0 | 33.5 | 0.0 | 18.4 | 17.9 | 17.9 | 12.4 | 0.6 | 0.0 | 7.8 | 0.0 | 9.9 |
| Cycle Q Clear(g_c), s | 1.0 | 33.5 | 0.0 | 18.4 | 17.9 | 17.9 | 12.4 | 0.6 | 0.0 | 7.8 | 0.0 | 9.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.07 | 1.00 | | 0.00 | 1.00 | | 0.19 |
| Lane Grp Cap(c), veh/h | 28 | 1081 | | 822 | 960 | 998 | 470 | 254 | | 161 | 0 | 181 |
| V/C Ratio(X) | 0.49 | 0.99 | | 0.74 | 0.48 | 0.48 | 0.85 | 0.04 | | 0.80 | 0.00 | 0.91 |
| Avail Cap(c_a), veh/h | 109 | 1081 | | 822 | 960 | 998 | 723 | 254 | | 375 | 0 | 181 |
| HCM Platoon Ratio | 0.33 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.71 | 0.71 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.1 | 49.2 | 0.0 | 38.2 | 16.0 | 16.0 | 46.4 | 40.3 | 0.0 | 49.1 | 0.0 | 49.0 |
| Incr Delay (d2), s/veh | 3.4 | 20.0 | 0.0 | 3.6 | 1.7 | 1.7 | 3.7 | 0.0 | 0.0 | 3.5 | 0.0 | 40.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.4 | 18.5 | 0.0 | 7.6 | 7.0 | 7.3 | 5.5 | 0.3 | 0.0 | 3.6 | 0.0 | 6.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 57.6 | 69.1 | 0.0 | 41.8 | 17.7 | 17.7 | 50.1 | 40.4 | 0.0 | 52.6 | 0.0 | 89.7 |
| LnGrp LOS | E | E | | D | B | B | D | D | | D | A | F |
| Approach Vol, veh/h | | 1080 | A | | 1555 | | | 411 | A | | 293 | |
| Approach Delay, s/veh | | 69.0 | | | 27.1 | | | 49.8 | | | 73.3 | |
| Approach LOS | | E | | | C | | | D | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.0 | 40.0 | 14.9 | 22.1 | 8.1 | 64.9 | 20.0 | 17.0 |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 | 6.0 | 5.0 | * 6 |
| Max Green Setting (Gmax), s | 20.0 | 34.0 | 23.0 | 10.0 | 8.0 | 46.0 | 23.0 | * 11 |
| Max Q Clear Time (g_c+I1), s | 11.4 | 35.5 | 9.8 | 2.6 | 3.0 | 19.9 | 14.4 | 11.9 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 5.7 | 0.5 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 47.5 |
| HCM 6th LOS | D |

Notes

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 42 | 72 | 368 | 188 | 71 | 113 | 266 | 652 | 69 | 118 | 1178 | 44 |
| Future Volume (veh/h) | 42 | 72 | 368 | 188 | 71 | 113 | 266 | 652 | 69 | 118 | 1178 | 44 |
| 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 | 1900 | 1870 | 1885 | 1900 | 1870 | 1856 | 1885 | 1752 | 1752 | 1885 | 1856 | 1856 |
| Adj Flow Rate, veh/h | 49 | 84 | 0 | 219 | 83 | 0 | 309 | 758 | 80 | 137 | 1370 | 51 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Percent Heavy Veh, % | 0 | 2 | 1 | 0 | 2 | 3 | 1 | 10 | 10 | 1 | 3 | 3 |
| Cap, veh/h | 315 | 408 | | 314 | 408 | | 344 | 1680 | 177 | 445 | 1717 | 64 |
| Arrive On Green | 0.22 | 0.22 | 0.00 | 0.22 | 0.22 | 0.00 | 0.12 | 0.55 | 0.55 | 0.06 | 0.50 | 0.50 |
| Sat Flow, veh/h | 1336 | 1870 | 1598 | 1335 | 1870 | 1572 | 1795 | 3038 | 321 | 1795 | 3466 | 129 |
| Grp Volume(v), veh/h | 49 | 84 | 0 | 219 | 83 | 0 | 309 | 415 | 423 | 137 | 696 | 725 |
| Grp Sat Flow(s),veh/h/ln | 1336 | 1870 | 1598 | 1335 | 1870 | 1572 | 1795 | 1664 | 1694 | 1795 | 1763 | 1832 |
| Q Serve(g_s), s | 3.1 | 3.7 | 0.0 | 16.1 | 3.6 | 0.0 | 9.3 | 14.9 | 14.9 | 3.7 | 32.9 | 33.1 |
| Cycle Q Clear(g_c), s | 6.7 | 3.7 | 0.0 | 19.7 | 3.6 | 0.0 | 9.3 | 14.9 | 14.9 | 3.7 | 32.9 | 33.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.19 | 1.00 | | 0.07 |
| Lane Grp Cap(c), veh/h | 315 | 408 | | 314 | 408 | | 344 | 921 | 937 | 445 | 873 | 908 |
| V/C Ratio(X) | 0.16 | 0.21 | | 0.70 | 0.20 | | 0.90 | 0.45 | 0.45 | 0.31 | 0.80 | 0.80 |
| Avail Cap(c_a), veh/h | 324 | 421 | | 323 | 421 | | 440 | 921 | 937 | 645 | 873 | 908 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 34.7 | 32.0 | 0.0 | 40.1 | 32.0 | 0.0 | 23.4 | 13.3 | 13.3 | 11.3 | 21.0 | 21.1 |
| Incr Delay (d2), s/veh | 0.2 | 0.2 | 0.0 | 5.8 | 0.2 | 0.0 | 16.9 | 1.6 | 1.6 | 0.3 | 7.5 | 7.3 |
| 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 | 1.0 | 1.7 | 0.0 | 5.7 | 1.7 | 0.0 | 5.0 | 5.4 | 5.5 | 1.4 | 14.6 | 15.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 34.9 | 32.2 | 0.0 | 45.9 | 32.2 | 0.0 | 40.3 | 14.9 | 14.9 | 11.6 | 28.5 | 28.4 |
| LnGrp LOS | C | C | | D | C | | D | B | B | B | C | C |
| Approach Vol, veh/h | | 133 | A | | 302 | A | | 1147 | | | 1558 | |
| Approach Delay, s/veh | | 33.2 | | | 42.1 | | | 21.7 | | | 27.0 | |
| Approach LOS | | C | | | D | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.9 | 61.8 | | 27.3 | 16.6 | 56.0 | | 27.3 |
| Change Period (Y+Rc), s | 5.0 | 6.5 | | 5.5 | 5.0 | 6.5 | | 5.5 |
| Max Green Setting (Gmax), s | 17.6 | 43.5 | | 22.5 | 17.0 | 43.5 | | 22.5 |
| Max Q Clear Time (g_c+I1), s | 15.7 | 16.9 | | 21.7 | 11.3 | 35.1 | | 8.7 |
| Green Ext Time (p_c), s | 0.2 | 9.1 | | 0.1 | 0.3 | 7.0 | | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 26.8 |
| HCM 6th LOS | C |

Notes

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

| Intersection | |
|---|---|
| Int Delay, s/veh | 6.5 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 26 | 308 | 248 | 132 | 176 | 25 |
| Future Vol, veh/h | 26 | 308 | 248 | 132 | 176 | 25 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 87 | 87 | 87 | 87 | 87 | 87 |
| Heavy Vehicles, % | 12 | 1 | 2 | 0 | 0 | 0 |
| Mvmt Flow | 30 | 354 | 285 | 152 | 202 | 29 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 437 | 0 | - | 0 | 775 | 361 |
| Stage 1 | - | - | - | - | 361 | - |
| Stage 2 | - | - | - | - | 414 | - |
| Critical Hdwy | 4.22 | - | - | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | 2.308 | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 1072 | - | - | - | 369 | 688 |
| Stage 1 | - | - | - | - | 710 | - |
| Stage 2 | - | - | - | - | 671 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1072 | - | - | - | 356 | 688 |
| Mov Cap-2 Maneuver | - | - | - | - | 356 | - |
| Stage 1 | - | - | - | - | 685 | - |
| Stage 2 | - | - | - | - | 671 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.7 | 0 | 28.3 |
| HCM LOS | | | D |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1072 | - | - | - | 379 |
| HCM Lane V/C Ratio | 0.028 | - | - | - | 0.61 |
| HCM Control Delay (s) | 8.5 | 0 | - | - | 28.3 |
| HCM Lane LOS | A | A | - | - | D |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 3.9 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.3 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 979 | 30 | 0 | 1490 | 0 | 77 |
| Future Vol, veh/h | 979 | 30 | 0 | 1490 | 0 | 77 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | - | 0 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 1064 | 33 | 0 | 1620 | 0 | 84 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | - | - | - | 549 |
| 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 | - | 0 | *686 |
| Stage 1 | - | - | 0 | - | 0 | - |
| Stage 2 | - | - | 0 | - | 0 | - |
| Platoon blocked, % | - | - | | - | | 1 |
| Mov Cap-1 Maneuver | - | - | - | - | - | *686 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0 | 11 |
| HCM LOS | | | B |

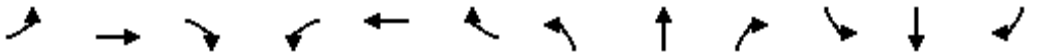
| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBT |
|---|---|---|---|---|
| Capacity (veh/h) | 686 | - | - | - |
| HCM Lane V/C Ratio | 0.122 | - | - | - |
| HCM Control Delay (s) | 11 | - | - | - |
| HCM Lane LOS | B | - | - | - |
| HCM 95th %tile Q(veh) | 0.4 | - | - | - |

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

# Appendix X – Phase 2 Build-Out Synchro Reports

# HCM 6th Signalized Intersection Summary
## 1: Vanosdale Rd/Francis Rd & Middlebrook Pike

06/10/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 132 | 971 | 284 | 270 | 1307 | 115 | 257 | 218 | 163 | 82 | 161 | 84 |
| Future Volume (veh/h) | 132 | 971 | 284 | 270 | 1307 | 115 | 257 | 218 | 163 | 82 | 161 | 84 |
| 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 | 1885 | 1870 | 1885 | 1900 | 1900 | 1900 | 1885 | 1885 | 1885 | 1900 | 1900 | 1856 |
| Adj Flow Rate, veh/h | 142 | 1044 | 305 | 290 | 1405 | 124 | 276 | 234 | 175 | 88 | 173 | 90 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 3 |
| Cap, veh/h | 187 | 1338 | 827 | 328 | 1441 | 127 | 409 | 472 | 590 | 307 | 311 | 257 |
| Arrive On Green | 0.07 | 0.38 | 0.38 | 0.04 | 0.14 | 0.14 | 0.14 | 0.25 | 0.25 | 0.05 | 0.16 | 0.16 |
| Sat Flow, veh/h | 1795 | 3554 | 1598 | 1810 | 3357 | 295 | 1795 | 1885 | 1598 | 1810 | 1900 | 1572 |
| Grp Volume(v), veh/h | 142 | 1044 | 305 | 290 | 752 | 777 | 276 | 234 | 175 | 88 | 173 | 90 |
| Grp Sat Flow(s),veh/h/ln | 1795 | 1777 | 1598 | 1810 | 1805 | 1847 | 1795 | 1885 | 1598 | 1810 | 1900 | 1572 |
| Q Serve(g_s), s | 5.3 | 28.5 | 12.5 | 10.6 | 45.6 | 46.1 | 13.5 | 11.7 | 8.5 | 4.4 | 9.2 | 5.6 |
| Cycle Q Clear(g_c), s | 5.3 | 28.5 | 12.5 | 10.6 | 45.6 | 46.1 | 13.5 | 11.7 | 8.5 | 4.4 | 9.2 | 5.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.16 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 187 | 1338 | 827 | 328 | 775 | 793 | 409 | 472 | 590 | 307 | 311 | 257 |
| V/C Ratio(X) | 0.76 | 0.78 | 0.37 | 0.88 | 0.97 | 0.98 | 0.67 | 0.50 | 0.30 | 0.29 | 0.56 | 0.35 |
| Avail Cap(c_a), veh/h | 232 | 1338 | 827 | 426 | 775 | 793 | 416 | 472 | 590 | 373 | 311 | 257 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 26.4 | 30.3 | 15.8 | 27.6 | 46.5 | 46.7 | 30.5 | 35.3 | 24.6 | 35.4 | 42.3 | 40.8 |
| Incr Delay (d2), s/veh | 10.8 | 4.6 | 1.3 | 16.0 | 26.0 | 27.5 | 3.4 | 3.7 | 1.3 | 0.2 | 7.0 | 3.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.6 | 12.1 | 4.8 | 6.1 | 27.4 | 28.6 | 6.2 | 5.8 | 3.4 | 2.0 | 4.9 | 2.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 37.1 | 34.8 | 17.1 | 43.5 | 72.6 | 74.2 | 33.9 | 39.0 | 25.9 | 35.6 | 49.3 | 44.5 |
| LnGrp LOS | D | C | B | D | E | E | C | D | C | D | D | D |
| Approach Vol, veh/h | | 1491 | | | 1819 | | | 685 | | | 351 | |
| Approach Delay, s/veh | | 31.4 | | | 68.7 | | | 33.6 | | | 44.7 | |
| Approach LOS | | C | | | E | | | C | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.3 | 53.2 | 11.0 | 33.6 | 18.0 | 47.4 | 20.5 | 24.0 |
| Change Period (Y+Rc), s | 5.0 | 6.0 | 5.0 | 6.0 | 5.0 | 6.0 | 5.0 | * 6 |
| Max Green Setting (Gmax), s | 10.0 | 45.0 | 10.0 | 23.0 | 19.0 | 36.0 | 16.0 | * 18 |
| Max Q Clear Time (g_c+I1), s | 7.3 | 48.1 | 6.4 | 13.7 | 12.6 | 30.5 | 15.5 | 11.2 |
| Green Ext Time (p_c), s | 0.1 | 0.0 | 0.0 | 0.9 | 0.4 | 2.5 | 0.0 | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 48.4 |
| HCM 6th LOS | D |

**Notes**

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

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.9 |

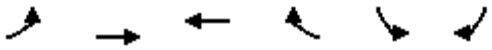
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 31 | 983 | 26 | 67 | 1598 | 18 | 32 | 3 | 31 | 6 | 2 | 28 |
| Future Vol, veh/h | 31 | 983 | 26 | 67 | 1598 | 18 | 32 | 3 | 31 | 6 | 2 | 28 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 25 | - | - | 128 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 1 | - | - | 1 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, % | 0 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 0 | 0 |
| Mvmt Flow | 34 | 1080 | 29 | 74 | 1756 | 20 | 35 | 3 | 34 | 7 | 2 | 31 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1776 | 0 | 0 | 1109 | 0 | 0 | 2190 | 3087 | 555 | 2524 | 3091 | 888 |
| Stage 1 | - | - | - | - | - | - | 1163 | 1163 | - | 1914 | 1914 | - |
| Stage 2 | - | - | - | - | - | - | 1027 | 1924 | - | 610 | 1177 | - |
| Critical Hdwy | 4.1 | - | - | 4.1 | - | - | 7.5 | 6.5 | 6.98 | 7.5 | 6.5 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.5 | 5.5 | - | 6.5 | 5.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.5 | 5.5 | - | 6.5 | 5.5 | - |
| Follow-up Hdwy | 2.2 | - | - | 2.2 | - | - | 3.5 | 4 | 3.34 | 3.5 | 4 | 3.3 |
| Pot Cap-1 Maneuver | *654 | - | - | 1024 | - | - | *239 | ~ 2 | *681 | *50 | ~ 2 | *436 |
| Stage 1 | - | - | - | - | - | - | *572 | 517 | - | *281 | 271 | - |
| Stage 2 | - | - | - | - | - | - | *411 | 265 | - | *650 | 507 | - |
| Platoon blocked, % | 1 | - | - | 1 | - | - | 1 | 1 | 1 | 1 | 1 | 1 |
| Mov Cap-1 Maneuver | *654 | - | - | 1024 | - | - | *200 | ~ 2 | *681 | *42 | ~ 2 | *436 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | *262 | 136 | - | *176 | 143 | - |
| Stage 1 | - | - | - | - | - | - | *542 | 490 | - | *266 | 252 | - |
| Stage 2 | - | - | - | - | - | - | *351 | 246 | - | *582 | 480 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.3 | 0.3 | 18 | 17.8 |
| HCM LOS | | | C | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 348 | * 654 | - | - | 1024 | - | - | 321 |
| HCM Lane V/C Ratio | 0.208 | 0.052 | - | - | 0.072 | - | - | 0.123 |
| HCM Control Delay (s) | 18 | 10.8 | - | - | 8.8 | - | - | 17.8 |
| HCM Lane LOS | C | B | - | - | A | - | - | C |
| HCM 95th %tile Q(veh) | 0.8 | 0.2 | - | - | 0.2 | - | - | 0.4 |

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



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 116 | 912 | 1509 | 82 | 142 | 106 |
| Future Volume (veh/h) | 116 | 912 | 1509 | 82 | 142 | 106 |
| 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 | 1900 | 1856 | 1885 | 1885 | 1870 | 1900 |
| Adj Flow Rate, veh/h | 125 | 981 | 1623 | 88 | 153 | 114 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 0 | 3 | 1 | 1 | 2 | 0 |
| Cap, veh/h | 348 | 2776 | 2411 | 130 | 184 | 167 |
| Arrive On Green | 0.09 | 1.00 | 1.00 | 1.00 | 0.10 | 0.10 |
| Sat Flow, veh/h | 1810 | 3618 | 3550 | 186 | 1781 | 1610 |
| Grp Volume(v), veh/h | 125 | 981 | 837 | 874 | 153 | 114 |
| Grp Sat Flow(s),veh/h/ln | 1810 | 1763 | 1791 | 1852 | 1781 | 1610 |
| Q Serve(g_s), s | 2.0 | 0.0 | 0.0 | 0.0 | 9.3 | 7.5 |
| Cycle Q Clear(g_c), s | 2.0 | 0.0 | 0.0 | 0.0 | 9.3 | 7.5 |
| Prop In Lane | 1.00 | | | 0.10 | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 348 | 2776 | 1249 | 1291 | 184 | 167 |
| V/C Ratio(X) | 0.36 | 0.35 | 0.67 | 0.68 | 0.83 | 0.68 |
| Avail Cap(c_a), veh/h | 432 | 2776 | 1249 | 1291 | 227 | 205 |
| HCM Platoon Ratio | 2.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 3.3 | 0.0 | 0.0 | 0.0 | 48.4 | 47.6 |
| Incr Delay (d2), s/veh | 0.2 | 0.4 | 2.9 | 2.9 | 15.8 | 4.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 0.1 | 1.0 | 1.0 | 4.9 | 3.2 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d),s/veh | 3.5 | 0.4 | 2.9 | 2.9 | 64.2 | 51.7 |
| LnGrp LOS | A | A | A | A | E | D |
| Approach Vol, veh/h | | 1106 | 1711 | | 267 | |
| Approach Delay, s/veh | | 0.7 | 2.9 | | 58.9 | |
| Approach LOS | | A | A | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.9 | 82.7 | | 17.4 | | 92.6 |
| Change Period (Y+Rc), s | 5.0 | 6.0 | | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | 10.0 | 69.0 | | 14.0 | | 84.0 |
| Max Q Clear Time (g_c+I1), s | 4.0 | 2.0 | | 11.3 | | 2.0 |
| Green Ext Time (p_c), s | 0.1 | 18.5 | | 0.1 | | 7.6 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 6.9 |
| HCM 6th LOS | A |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.8 |

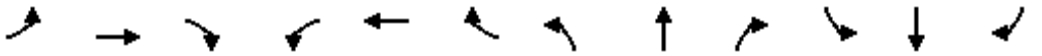
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 26 | 1108 | 1516 | 80 | 78 | 62 |
| Future Vol, veh/h | 26 | 1108 | 1516 | 80 | 78 | 62 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 124 | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, % | 4 | 2 | 1 | 1 | 0 | 0 |
| Mvmt Flow | 30 | 1259 | 1723 | 91 | 89 | 70 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1814 | 0 | - | 0 | 2459 | 907 |
| Stage 1 | - | - | - | - | 1769 | - |
| Stage 2 | - | - | - | - | 690 | - |
| Critical Hdwy | 4.18 | - | - | - | 6.8 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.8 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.8 | - |
| Follow-up Hdwy | 2.24 | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 569 | - | - | - | *~ 8 | *464 |
| Stage 1 | - | - | - | - | *386 | - |
| Stage 2 | - | - | - | - | *597 | - |
| Platoon blocked, % | 1 | - | - | - | 1 | 1 |
| Mov Cap-1 Maneuver | 569 | - | - | - | *~ 7 | *464 |
| Mov Cap-2 Maneuver | - | - | - | - | *210 | - |
| Stage 1 | - | - | - | - | *366 | - |
| Stage 2 | - | - | - | - | *597 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.3 | 0 | 34.2 |
| HCM LOS | | | D |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 569 | - | - | - | 277 |
| HCM Lane V/C Ratio | 0.052 | - | - | - | 0.574 |
| HCM Control Delay (s) | 11.7 | - | - | - | 34.2 |
| HCM Lane LOS | B | - | - | - | D |
| HCM 95th %tile Q(veh) | 0.2 | - | - | - | 3.3 |

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 27 | 1147 | 21 | 153 | 1214 | 26 | 192 | 6 | 239 | 158 | 2 | 194 |
| Future Volume (veh/h) | 27 | 1147 | 21 | 153 | 1214 | 26 | 192 | 6 | 239 | 158 | 2 | 194 |
| 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 | 1841 | 1856 | 1856 | 1870 | 1885 | 1781 | 1870 | 1870 | 1870 | 1870 | 1870 | 1856 |
| Adj Flow Rate, veh/h | 30 | 1260 | 23 | 166 | 1334 | 0 | 209 | 7 | 260 | 174 | 2 | 213 |
| Peak Hour Factor | 0.91 | 0.91 | 0.92 | 0.92 | 0.91 | 0.91 | 0.92 | 0.92 | 0.92 | 0.91 | 0.92 | 0.91 |
| Percent Heavy Veh, % | 4 | 3 | 3 | 2 | 1 | 8 | 2 | 2 | 2 | 2 | 2 | 3 |
| Cap, veh/h | 214 | 1459 | 27 | 220 | 1530 | | 324 | 8 | 282 | 267 | 3 | 238 |
| Arrive On Green | 0.08 | 0.82 | 0.82 | 0.13 | 0.85 | 0.00 | 0.18 | 0.18 | 0.18 | 0.15 | 0.15 | 0.15 |
| Sat Flow, veh/h | 1753 | 3542 | 65 | 3456 | 3582 | 1510 | 1781 | 42 | 1550 | 1762 | 20 | 1572 |
| Grp Volume(v), veh/h | 30 | 627 | 656 | 166 | 1334 | 0 | 209 | 0 | 267 | 176 | 0 | 213 |
| Grp Sat Flow(s),veh/h/ln | 1753 | 1763 | 1844 | 1728 | 1791 | 1510 | 1781 | 0 | 1591 | 1782 | 0 | 1572 |
| Q Serve(g_s), s | 0.0 | 23.8 | 23.9 | 5.1 | 23.4 | 0.0 | 12.0 | 0.0 | 18.1 | 10.2 | 0.0 | 14.6 |
| Cycle Q Clear(g_c), s | 0.0 | 23.8 | 23.9 | 5.1 | 23.4 | 0.0 | 12.0 | 0.0 | 18.1 | 10.2 | 0.0 | 14.6 |
| Prop In Lane | 1.00 | | 0.04 | 1.00 | | 1.00 | 1.00 | | 0.97 | 0.99 | | 1.00 |
| Lane Grp Cap(c), veh/h | 214 | 726 | 760 | 220 | 1530 | | 324 | 0 | 289 | 270 | 0 | 238 |
| V/C Ratio(X) | 0.14 | 0.86 | 0.86 | 0.75 | 0.87 | | 0.65 | 0.00 | 0.92 | 0.65 | 0.00 | 0.89 |
| Avail Cap(c_a), veh/h | 225 | 726 | 760 | 220 | 1530 | | 324 | 0 | 289 | 275 | 0 | 243 |
| HCM Platoon Ratio | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 0.80 | 0.80 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 33.1 | 7.8 | 7.8 | 47.2 | 6.3 | 0.0 | 41.7 | 0.0 | 44.2 | 43.9 | 0.0 | 45.8 |
| Incr Delay (d2), s/veh | 0.1 | 12.9 | 12.5 | 11.3 | 5.8 | 0.0 | 4.4 | 0.0 | 33.3 | 4.1 | 0.0 | 30.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.6 | 5.6 | 5.7 | 2.4 | 3.8 | 0.0 | 5.6 | 0.0 | 9.8 | 4.8 | 0.0 | 7.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 33.3 | 20.7 | 20.3 | 58.4 | 12.1 | 0.0 | 46.1 | 0.0 | 77.6 | 48.0 | 0.0 | 75.9 |
| LnGrp LOS | C | C | C | E | B | | D | A | E | D | A | E |
| Approach Vol, veh/h | | 1313 | | | 1500 | A | | 476 | | | 389 | |
| Approach Delay, s/veh | | 20.8 | | | 17.2 | | | 63.8 | | | 63.3 | |
| Approach LOS | | C | | | B | | | E | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.3 | 53.0 | | 21.7 | 12.0 | 51.3 | | 25.0 | | | | |
| Change Period (Y+Rc), s | 6.0 | * 6 | | 5.0 | 5.0 | 6.0 | | 5.0 | | | | |
| Max Green Setting (Gmax), s | 5.0 | * 47 | | 17.0 | 7.0 | 45.0 | | 20.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.0 | 25.4 | | 16.6 | 7.1 | 25.9 | | 20.1 | | | | |
| Green Ext Time (p_c), s | 0.0 | 9.3 | | 0.1 | 0.0 | 7.6 | | 0.0 | | | | |

| Intersection Summary | | |
|---|---|---|
| HCM 6th Ctrl Delay | | 29.4 |
| HCM 6th LOS | | C |

**Notes**

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 14 | 1382 | 140 | 21 | 1210 | 31 | 120 | 15 | 9 | 183 | 65 | 54 |
| Future Volume (veh/h) | 14 | 1382 | 140 | 21 | 1210 | 31 | 120 | 15 | 9 | 183 | 65 | 54 |
| 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 | 1900 | 1856 | 1856 | 1900 | 1885 | 1885 | 1693 | 1693 | 1693 | 1885 | 1900 | 1900 |
| Adj Flow Rate, veh/h | 15 | 1502 | 152 | 23 | 1315 | 34 | 130 | 16 | 10 | 199 | 65 | 59 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 1.00 | 0.92 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 0 | 1 | 1 | 14 | 14 | 14 | 1 | 0 | 0 |
| Cap, veh/h | 321 | 2004 | 201 | 256 | 1978 | 51 | 203 | 23 | 11 | 381 | 186 | 169 |
| Arrive On Green | 0.16 | 1.00 | 1.00 | 0.02 | 0.55 | 0.55 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| Sat Flow, veh/h | 1810 | 3235 | 325 | 1810 | 3567 | 92 | 702 | 114 | 56 | 1396 | 917 | 833 |
| Grp Volume(v), veh/h | 15 | 813 | 841 | 23 | 660 | 689 | 156 | 0 | 0 | 199 | 0 | 124 |
| Grp Sat Flow(s),veh/h/ln | 1810 | 1763 | 1797 | 1810 | 1791 | 1869 | 872 | 0 | 0 | 1396 | 0 | 1750 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 0.7 | 28.6 | 28.6 | 13.4 | 0.0 | 0.0 | 0.0 | 0.0 | 6.7 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 0.7 | 28.6 | 28.6 | 20.1 | 0.0 | 0.0 | 12.7 | 0.0 | 6.7 |
| Prop In Lane | 1.00 | | 0.18 | 1.00 | | 0.05 | 0.83 | | 0.06 | 1.00 | | 0.48 |
| Lane Grp Cap(c), veh/h | 321 | 1092 | 1113 | 256 | 993 | 1036 | 237 | 0 | 0 | 381 | 0 | 356 |
| V/C Ratio(X) | 0.05 | 0.74 | 0.76 | 0.09 | 0.66 | 0.67 | 0.66 | 0.00 | 0.00 | 0.52 | 0.00 | 0.35 |
| Avail Cap(c_a), veh/h | 321 | 1092 | 1113 | 362 | 993 | 1036 | 288 | 0 | 0 | 440 | 0 | 430 |
| 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) | 0.47 | 0.47 | 0.47 | 0.75 | 0.75 | 0.75 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 21.7 | 0.0 | 0.0 | 12.5 | 17.3 | 17.3 | 45.7 | 0.0 | 0.0 | 40.0 | 0.0 | 37.6 |
| Incr Delay (d2), s/veh | 0.0 | 2.2 | 2.3 | 0.1 | 2.6 | 2.5 | 2.3 | 0.0 | 0.0 | 0.4 | 0.0 | 0.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.7 | 0.7 | 0.3 | 11.0 | 11.4 | 4.3 | 0.0 | 0.0 | 4.9 | 0.0 | 2.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 21.7 | 2.2 | 2.3 | 12.6 | 19.9 | 19.8 | 48.0 | 0.0 | 0.0 | 40.4 | 0.0 | 37.8 |
| LnGrp LOS | C | A | A | B | B | B | D | A | A | D | A | D |
| Approach Vol, veh/h | | 1669 | | | 1372 | | | 156 | | | 323 | |
| Approach Delay, s/veh | | 2.4 | | | 19.8 | | | 48.0 | | | 39.4 | |
| Approach LOS | | A | | | B | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 67.0 | | 28.3 | 7.5 | 74.1 | | 28.3 |
| Change Period (Y+Rc), s | 6.0 | * 6 | | 6.0 | 5.0 | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | 5.0 | * 61 | | 27.0 | 9.0 | 57.0 | | 27.0 |
| Max Q Clear Time (g_c+I1), s | 2.0 | 30.6 | | 14.7 | 2.7 | 2.0 | | 22.1 |
| Green Ext Time (p_c), s | 0.0 | 9.8 | | 0.6 | 0.0 | 16.7 | | 0.2 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 14.6 |
| HCM 6th LOS | B |

Notes

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 16 | 1055 | 529 | 553 | 866 | 29 | 385 | 10 | 560 | 117 | 121 | 29 |
| Future Volume (veh/h) | 16 | 1055 | 529 | 553 | 866 | 29 | 385 | 10 | 560 | 117 | 121 | 29 |
| 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 | 1574 | 1841 | 1856 | 1811 | 1885 | 1885 | 1870 | 1737 | 1737 | 1885 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 18 | 1159 | 0 | 608 | 952 | 32 | 423 | 11 | 0 | 129 | 133 | 32 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 22 | 4 | 3 | 6 | 1 | 1 | 2 | 11 | 11 | 1 | 2 | 2 |
| Cap, veh/h | 35 | 1208 | | 678 | 1857 | 62 | 493 | 266 | | 161 | 146 | 35 |
| Arrive On Green | 0.01 | 0.11 | 0.00 | 0.20 | 0.53 | 0.53 | 0.14 | 0.15 | 0.00 | 0.09 | 0.10 | 0.10 |
| Sat Flow, veh/h | 1499 | 3497 | 1572 | 3346 | 3536 | 119 | 3456 | 1737 | 0 | 1795 | 1457 | 351 |
| Grp Volume(v), veh/h | 18 | 1159 | 0 | 608 | 482 | 502 | 423 | 11 | 0 | 129 | 0 | 165 |
| Grp Sat Flow(s),veh/h/ln | 1499 | 1749 | 1572 | 1673 | 1791 | 1864 | 1728 | 1737 | 0 | 1795 | 0 | 1807 |
| Q Serve(g_s), s | 1.3 | 36.3 | 0.0 | 19.5 | 19.2 | 19.2 | 13.2 | 0.6 | 0.0 | 7.8 | 0.0 | 9.9 |
| Cycle Q Clear(g_c), s | 1.3 | 36.3 | 0.0 | 19.5 | 19.2 | 19.2 | 13.2 | 0.6 | 0.0 | 7.8 | 0.0 | 9.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.06 | 1.00 | | 0.00 | 1.00 | | 0.19 |
| Lane Grp Cap(c), veh/h | 35 | 1208 | | 678 | 940 | 979 | 493 | 266 | | 161 | 0 | 181 |
| V/C Ratio(X) | 0.52 | 0.96 | | 0.90 | 0.51 | 0.51 | 0.86 | 0.04 | | 0.80 | 0.00 | 0.91 |
| Avail Cap(c_a), veh/h | 109 | 1208 | | 678 | 940 | 979 | 723 | 266 | | 375 | 0 | 181 |
| HCM Platoon Ratio | 0.33 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.61 | 0.61 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.0 | 48.0 | 0.0 | 42.7 | 17.0 | 17.0 | 46.1 | 39.7 | 0.0 | 49.1 | 0.0 | 49.0 |
| Incr Delay (d2), s/veh | 2.7 | 12.7 | 0.0 | 14.6 | 2.0 | 1.9 | 4.8 | 0.0 | 0.0 | 3.5 | 0.0 | 42.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 18.9 | 0.0 | 9.0 | 7.6 | 7.9 | 5.8 | 0.3 | 0.0 | 3.6 | 0.0 | 6.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 56.7 | 60.6 | 0.0 | 57.4 | 19.0 | 18.9 | 50.9 | 39.7 | 0.0 | 52.6 | 0.0 | 91.3 |
| LnGrp LOS | E | E | | E | B | B | D | D | | D | A | F |
| Approach Vol, veh/h | | 1177 | A | | 1592 | | | 434 | A | | 294 | |
| Approach Delay, s/veh | | 60.6 | | | 33.6 | | | 50.6 | | | 74.3 | |
| Approach LOS | | E | | | C | | | D | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 28.3 | 44.0 | 14.9 | 22.8 | 8.5 | 63.8 | 20.7 | 17.0 |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 | 6.0 | 5.0 | * 6 |
| Max Green Setting (Gmax), s | 16.3 | 38.0 | 23.0 | 10.0 | 8.0 | 46.0 | 23.0 | * 11 |
| Max Q Clear Time (g_c+I1), s | 21.5 | 38.3 | 9.8 | 2.6 | 3.3 | 21.2 | 15.2 | 11.9 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 5.9 | 0.5 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 48.2 |
| HCM 6th LOS | D |

**Notes**

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 42 | 77 | 398 | 188 | 73 | 113 | 278 | 673 | 69 | 118 | 1233 | 44 |
| Future Volume (veh/h) | 42 | 77 | 398 | 188 | 73 | 113 | 278 | 673 | 69 | 118 | 1233 | 44 |
| 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 | 1900 | 1870 | 1885 | 1900 | 1870 | 1856 | 1885 | 1752 | 1752 | 1885 | 1856 | 1856 |
| Adj Flow Rate, veh/h | 49 | 90 | 0 | 219 | 85 | 0 | 323 | 783 | 80 | 137 | 1434 | 51 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Percent Heavy Veh, % | 0 | 2 | 1 | 0 | 2 | 3 | 1 | 10 | 10 | 1 | 3 | 3 |
| Cap, veh/h | 320 | 417 | | 316 | 417 | | 358 | 1670 | 171 | 431 | 1616 | 57 |
| Arrive On Green | 0.22 | 0.22 | 0.00 | 0.22 | 0.22 | 0.00 | 0.14 | 0.55 | 0.55 | 0.06 | 0.47 | 0.47 |
| Sat Flow, veh/h | 1333 | 1870 | 1598 | 1327 | 1870 | 1572 | 1795 | 3049 | 311 | 1795 | 3473 | 123 |
| Grp Volume(v), veh/h | 49 | 90 | 0 | 219 | 85 | 0 | 323 | 427 | 436 | 137 | 727 | 758 |
| Grp Sat Flow(s),veh/h/ln | 1333 | 1870 | 1598 | 1327 | 1870 | 1572 | 1795 | 1664 | 1696 | 1795 | 1763 | 1833 |
| Q Serve(g_s), s | 3.1 | 3.9 | 0.0 | 16.1 | 3.7 | 0.0 | 11.8 | 15.6 | 15.6 | 3.9 | 37.5 | 37.7 |
| Cycle Q Clear(g_c), s | 6.8 | 3.9 | 0.0 | 20.1 | 3.7 | 0.0 | 11.8 | 15.6 | 15.6 | 3.9 | 37.5 | 37.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.18 | 1.00 | | 0.07 |
| Lane Grp Cap(c), veh/h | 320 | 417 | | 316 | 417 | | 358 | 912 | 929 | 431 | 820 | 853 |
| V/C Ratio(X) | 0.15 | 0.22 | | 0.69 | 0.20 | | 0.90 | 0.47 | 0.47 | 0.32 | 0.89 | 0.89 |
| Avail Cap(c_a), veh/h | 349 | 458 | | 345 | 458 | | 463 | 912 | 929 | 558 | 820 | 853 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 34.4 | 31.7 | 0.0 | 39.9 | 31.6 | 0.0 | 27.6 | 13.8 | 13.8 | 12.6 | 24.3 | 24.4 |
| Incr Delay (d2), s/veh | 0.2 | 0.2 | 0.0 | 4.8 | 0.2 | 0.0 | 16.6 | 1.7 | 1.7 | 0.3 | 13.5 | 13.3 |
| 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 | 1.0 | 1.8 | 0.0 | 5.6 | 1.7 | 0.0 | 9.1 | 5.8 | 5.9 | 1.6 | 17.9 | 18.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 34.6 | 31.9 | 0.0 | 44.7 | 31.8 | 0.0 | 44.2 | 15.5 | 15.5 | 12.9 | 37.8 | 37.7 |
| LnGrp LOS | C | C | | D | C | | D | B | B | B | D | D |
| Approach Vol, veh/h | | 139 | A | | 304 | A | | 1186 | | | 1622 | |
| Approach Delay, s/veh | | 32.8 | | | 41.1 | | | 23.3 | | | 35.7 | |
| Approach LOS | | C | | | D | | | C | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.9 | 61.3 | | 27.8 | 19.2 | 53.0 | | 27.8 |
| Change Period (Y+Rc), s | 5.0 | 6.5 | | 5.5 | 5.0 | 6.5 | | 5.5 |
| Max Green Setting (Gmax), s | 13.6 | 45.5 | | 24.5 | 20.0 | 38.5 | | 24.5 |
| Max Q Clear Time (g_c+I1), s | 15.9 | 17.6 | | 22.1 | 13.8 | 39.7 | | 8.8 |
| Green Ext Time (p_c), s | 0.1 | 9.7 | | 0.2 | 0.4 | 0.0 | | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 31.5 |
| HCM 6th LOS | C |

Notes

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

| Intersection | |
|---|---|
| Int Delay, s/veh | 9.4 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 26 | 308 | 248 | 146 | 212 | 25 |
| Future Vol, veh/h | 26 | 308 | 248 | 146 | 212 | 25 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 87 | 87 | 87 | 87 | 87 | 87 |
| Heavy Vehicles, % | 12 | 1 | 2 | 0 | 0 | 0 |
| Mvmt Flow | 30 | 354 | 285 | 168 | 244 | 29 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 453 | 0 | - | 0 | 783 | 369 |
| Stage 1 | - | - | - | - | 369 | - |
| Stage 2 | - | - | - | - | 414 | - |
| Critical Hdwy | 4.22 | - | - | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | 2.308 | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 1057 | - | - | - | 365 | 681 |
| Stage 1 | - | - | - | - | 704 | - |
| Stage 2 | - | - | - | - | 671 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1057 | - | - | - | 352 | 681 |
| Mov Cap-2 Maneuver | - | - | - | - | 352 | - |
| Stage 1 | - | - | - | - | 679 | - |
| Stage 2 | - | - | - | - | 671 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.7 | 0 | 37.3 |
| HCM LOS | | | E |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1057 | - | - | - | 371 |
| HCM Lane V/C Ratio | 0.028 | - | - | - | 0.734 |
| HCM Control Delay (s) | 8.5 | 0 | - | - | 37.3 |
| HCM Lane LOS | A | A | - | - | E |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 5.7 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.6 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 988 | 56 | 0 | 1578 | 0 | 146 |
| Future Vol, veh/h | 988 | 56 | 0 | 1578 | 0 | 146 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | - | 0 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 1074 | 61 | 0 | 1715 | 0 | 159 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | - | - | - | 568 |
| 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 | - | 0 | *686 |
| Stage 1 | - | - | 0 | - | 0 | - |
| Stage 2 | - | - | 0 | - | 0 | - |
| Platoon blocked, % | - | - | | - | | 1 |
| Mov Cap-1 Maneuver | - | - | - | - | - | *686 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0 | 11.8 |
| HCM LOS | | | B |

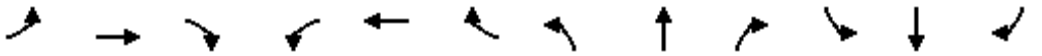
| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBT |
|---|---|---|---|---|
| Capacity (veh/h) | 686 | - | - | - |
| HCM Lane V/C Ratio | 0.231 | - | - | - |
| HCM Control Delay (s) | 11.8 | - | - | - |
| HCM Lane LOS | B | - | - | - |
| HCM 95th %tile Q(veh) | 0.9 | - | - | - |

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

# Appendix XI – Phase 3 No Build Synchro Reports

# HCM 6th Signalized Intersection Summary
## 1: Vanosdale Rd/Francis Rd & Middlebrook Pike

06/10/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 143 | 1047 | 307 | 289 | 1405 | 123 | 278 | 236 | 176 | 88 | 175 | 91 |
| Future Volume (veh/h) | 143 | 1047 | 307 | 289 | 1405 | 123 | 278 | 236 | 176 | 88 | 175 | 91 |
| 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 | 1885 | 1870 | 1885 | 1900 | 1900 | 1900 | 1885 | 1885 | 1885 | 1900 | 1900 | 1856 |
| Adj Flow Rate, veh/h | 154 | 1126 | 330 | 311 | 1511 | 132 | 299 | 254 | 189 | 95 | 188 | 98 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 3 |
| Cap, veh/h | 196 | 1221 | 782 | 346 | 1405 | 122 | 406 | 473 | 636 | 300 | 311 | 257 |
| Arrive On Green | 0.07 | 0.34 | 0.34 | 0.05 | 0.14 | 0.14 | 0.15 | 0.25 | 0.25 | 0.06 | 0.16 | 0.16 |
| Sat Flow, veh/h | 1795 | 3554 | 1598 | 1810 | 3361 | 292 | 1795 | 1885 | 1598 | 1810 | 1900 | 1572 |
| Grp Volume(v), veh/h | 154 | 1126 | 330 | 311 | 807 | 836 | 299 | 254 | 189 | 95 | 188 | 98 |
| Grp Sat Flow(s),veh/h/ln | 1795 | 1777 | 1598 | 1810 | 1805 | 1848 | 1795 | 1885 | 1598 | 1810 | 1900 | 1572 |
| Q Serve(g_s), s | 6.0 | 33.5 | 14.6 | 13.9 | 46.0 | 46.0 | 14.8 | 12.8 | 8.9 | 4.7 | 10.1 | 6.1 |
| Cycle Q Clear(g_c), s | 6.0 | 33.5 | 14.6 | 13.9 | 46.0 | 46.0 | 14.8 | 12.8 | 8.9 | 4.7 | 10.1 | 6.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.16 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 196 | 1221 | 782 | 346 | 755 | 772 | 406 | 473 | 636 | 300 | 311 | 257 |
| V/C Ratio(X) | 0.78 | 0.92 | 0.42 | 0.90 | 1.07 | 1.08 | 0.74 | 0.54 | 0.30 | 0.32 | 0.60 | 0.38 |
| Avail Cap(c_a), veh/h | 229 | 1221 | 782 | 393 | 755 | 772 | 406 | 473 | 636 | 359 | 311 | 257 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 27.0 | 34.7 | 18.1 | 35.5 | 47.4 | 47.4 | 30.8 | 35.7 | 22.6 | 35.2 | 42.7 | 41.0 |
| Incr Delay (d2), s/veh | 14.2 | 12.8 | 1.7 | 21.1 | 52.7 | 57.2 | 6.1 | 4.3 | 1.2 | 0.2 | 8.5 | 4.2 |
| 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 | 3.1 | 15.6 | 5.7 | 11.0 | 33.0 | 34.8 | 7.0 | 6.4 | 3.5 | 2.1 | 5.5 | 2.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 41.2 | 47.4 | 19.8 | 56.6 | 100.2 | 104.6 | 36.9 | 40.0 | 23.8 | 35.4 | 51.2 | 45.3 |
| LnGrp LOS | D | D | B | E | F | F | D | D | C | D | D | D |
| Approach Vol, veh/h | | 1610 | | | 1954 | | | 742 | | | 381 | |
| Approach Delay, s/veh | | 41.2 | | | 95.1 | | | 34.6 | | | 45.7 | |
| Approach LOS | | D | | | F | | | C | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.0 | 52.0 | 11.4 | 33.6 | 21.2 | 43.8 | 21.0 | 24.0 |
| Change Period (Y+Rc), s | 5.0 | 6.0 | 5.0 | 6.0 | 5.0 | 6.0 | 5.0 | * 6 |
| Max Green Setting (Gmax), s | 10.0 | 45.0 | 10.0 | 23.0 | 19.0 | 36.0 | 16.0 | * 18 |
| Max Q Clear Time (g_c+I1), s | 8.0 | 48.0 | 6.7 | 14.8 | 15.9 | 35.5 | 16.8 | 12.1 |
| Green Ext Time (p_c), s | 0.1 | 0.0 | 0.0 | 0.9 | 0.3 | 0.3 | 0.0 | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 63.0 |
| HCM 6th LOS | E |

**Notes**

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

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.3 |

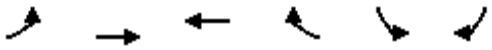
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 34 | 1058 | 28 | 72 | 1716 | 19 | 35 | 4 | 34 | 7 | 2 | 30 |
| Future Vol, veh/h | 34 | 1058 | 28 | 72 | 1716 | 19 | 35 | 4 | 34 | 7 | 2 | 30 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 25 | - | - | 128 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 1 | - | - | 1 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, % | 0 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 0 | 0 |
| Mvmt Flow | 37 | 1163 | 31 | 79 | 1886 | 21 | 38 | 4 | 37 | 8 | 2 | 33 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1907 | 0 | 0 | 1194 | 0 | 0 | 2355 | 3318 | 597 | 2713 | 3323 | 954 |
| Stage 1 | - | - | - | - | - | - | 1253 | 1253 | - | 2055 | 2055 | - |
| Stage 2 | - | - | - | - | - | - | 1102 | 2065 | - | 658 | 1268 | - |
| Critical Hdwy | 4.1 | - | - | 4.1 | - | - | 7.5 | 6.5 | 6.98 | 7.5 | 6.5 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.5 | 5.5 | - | 6.5 | 5.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.5 | 5.5 | - | 6.5 | 5.5 | - |
| Follow-up Hdwy | 2.2 | - | - | 2.2 | - | - | 3.5 | 4 | 3.34 | 3.5 | 4 | 3.3 |
| Pot Cap-1 Maneuver | *570 | - | - | 972 | - | - | *186 | ~ 0 | *653 | *18 | ~ 0 | *379 |
| Stage 1 | - | - | - | - | - | - | *531 | 485 | - | *244 | 236 | - |
| Stage 2 | - | - | - | - | - | - | *358 | 229 | - | *624 | 473 | - |
| Platoon blocked, % | 1 | - | - | 1 | - | - | 1 | 1 | 1 | 1 | 1 | 1 |
| Mov Cap-1 Maneuver | *570 | - | - | 972 | - | - | *152 | 0 | *653 | *15 | 0 | *379 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | *214 | 115 | - | *146 | 124 | - |
| Stage 1 | - | - | - | - | - | - | *496 | 453 | - | *228 | 217 | - |
| Stage 2 | - | - | - | - | - | - | *297 | 211 | - | *544 | 442 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.7 | 0.4 | 21.9 | 20.7 |
| HCM LOS | | | C | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 292 | * 570 | - | - | 972 | - | - | 272 |
| HCM Lane V/C Ratio | 0.275 | 0.066 | - | - | 0.081 | - | - | 0.158 |
| HCM Control Delay (s) | 21.9 | 11.8 | 0.4 | - | 9 | - | - | 20.7 |
| HCM Lane LOS | C | B | A | - | A | - | - | C |
| HCM 95th %tile Q(veh) | 1.1 | 0.2 | - | - | 0.3 | - | - | 0.6 |

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



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 125 | 981 | 1619 | 88 | 153 | 115 |
| Future Volume (veh/h) | 125 | 981 | 1619 | 88 | 153 | 115 |
| 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 | 1900 | 1856 | 1885 | 1885 | 1870 | 1900 |
| Adj Flow Rate, veh/h | 134 | 1055 | 1741 | 95 | 165 | 124 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 0 | 3 | 1 | 1 | 2 | 0 |
| Cap, veh/h | 291 | 2753 | 2387 | 129 | 196 | 177 |
| Arrive On Green | 0.09 | 1.00 | 0.92 | 0.92 | 0.11 | 0.11 |
| Sat Flow, veh/h | 1810 | 3618 | 3550 | 187 | 1781 | 1610 |
| Grp Volume(v), veh/h | 134 | 1055 | 896 | 940 | 165 | 124 |
| Grp Sat Flow(s),veh/h/ln | 1810 | 1763 | 1791 | 1851 | 1781 | 1610 |
| Q Serve(g_s), s | 2.2 | 0.0 | 13.4 | 14.0 | 10.0 | 8.2 |
| Cycle Q Clear(g_c), s | 2.2 | 0.0 | 13.4 | 14.0 | 10.0 | 8.2 |
| Prop In Lane | 1.00 | | | 0.10 | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 291 | 2753 | 1237 | 1279 | 196 | 177 |
| V/C Ratio(X) | 0.46 | 0.38 | 0.72 | 0.73 | 0.84 | 0.70 |
| Avail Cap(c_a), veh/h | 375 | 2753 | 1237 | 1279 | 227 | 205 |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.33 | 1.33 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 5.6 | 0.0 | 1.9 | 2.0 | 48.0 | 47.2 |
| Incr Delay (d2), s/veh | 0.4 | 0.4 | 3.7 | 3.8 | 19.2 | 6.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 0.2 | 2.8 | 3.0 | 5.5 | 3.6 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d),s/veh | 6.1 | 0.4 | 5.6 | 5.7 | 67.2 | 53.4 |
| LnGrp LOS | A | A | A | A | E | D |
| Approach Vol, veh/h | | 1189 | 1836 | | 289 | |
| Approach Delay, s/veh | | 1.0 | 5.7 | | 61.3 | |
| Approach LOS | | A | A | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.9 | 82.0 | | 18.1 | | 91.9 |
| Change Period (Y+Rc), s | 5.0 | 6.0 | | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | 10.0 | 69.0 | | 14.0 | | 84.0 |
| Max Q Clear Time (g_c+I1), s | 4.2 | 16.0 | | 12.0 | | 2.0 |
| Green Ext Time (p_c), s | 0.1 | 20.6 | | 0.1 | | 8.5 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 8.9 |
| HCM 6th LOS | A |

| Intersection | |
|---|---|
| Int Delay, s/veh | 18.2 |

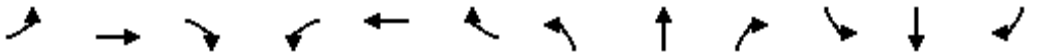
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 28 | 1186 | 1626 | 86 | 84 | 67 |
| Future Vol, veh/h | 28 | 1186 | 1626 | 86 | 84 | 67 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 124 | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, % | 4 | 2 | 1 | 1 | 0 | 0 |
| Mvmt Flow | 32 | 1348 | 1848 | 98 | 95 | 76 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1946 | 0 | - | 0 | 2635 | 973 |
| Stage 1 | - | - | - | - | 1897 | - |
| Stage 2 | - | - | - | - | 738 | - |
| Critical Hdwy | 4.18 | - | - | - | 6.8 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.8 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.8 | - |
| Follow-up Hdwy | 2.24 | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 289 | - | - | - | ~ 20 | 255 |
| Stage 1 | - | - | - | - | 106 | - |
| Stage 2 | - | - | - | - | 439 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 289 | - | - | - | ~ 18 | 255 |
| Mov Cap-2 Maneuver | - | - | - | - | ~ 75 | - |
| Stage 1 | - | - | - | - | ~ 94 | - |
| Stage 2 | - | - | - | - | 439 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.4 | 0 | $ 367.5 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 289 | - | - | - | 109 |
| HCM Lane V/C Ratio | 0.11 | - | - | - | 1.574 |
| HCM Control Delay (s) | 19 | - | - | - | $ 367.5 |
| HCM Lane LOS | C | - | - | - | F |
| HCM 95th %tile Q(veh) | 0.4 | - | - | - | 12.8 |

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 29 | 1153 | 21 | 153 | 1315 | 28 | 192 | 6 | 239 | 171 | 2 | 210 |
| Future Volume (veh/h) | 29 | 1153 | 21 | 153 | 1315 | 28 | 192 | 6 | 239 | 171 | 2 | 210 |
| 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 | 1841 | 1856 | 1856 | 1870 | 1885 | 1781 | 1870 | 1870 | 1870 | 1870 | 1870 | 1856 |
| Adj Flow Rate, veh/h | 32 | 1267 | 23 | 166 | 1445 | 0 | 209 | 7 | 260 | 188 | 2 | 231 |
| Peak Hour Factor | 0.91 | 0.91 | 0.92 | 0.92 | 0.91 | 0.91 | 0.92 | 0.92 | 0.92 | 0.91 | 0.92 | 0.91 |
| Percent Heavy Veh, % | 4 | 3 | 3 | 2 | 1 | 8 | 2 | 2 | 2 | 2 | 2 | 3 |
| Cap, veh/h | 152 | 1421 | 26 | 220 | 1498 | | 324 | 8 | 282 | 287 | 3 | 256 |
| Arrive On Green | 0.07 | 0.80 | 0.80 | 0.13 | 0.84 | 0.00 | 0.18 | 0.18 | 0.18 | 0.16 | 0.16 | 0.16 |
| Sat Flow, veh/h | 1753 | 3542 | 64 | 3456 | 3582 | 1510 | 1781 | 42 | 1550 | 1763 | 19 | 1572 |
| Grp Volume(v), veh/h | 32 | 630 | 660 | 166 | 1445 | 0 | 209 | 0 | 267 | 190 | 0 | 231 |
| Grp Sat Flow(s),veh/h/ln | 1753 | 1763 | 1844 | 1728 | 1791 | 1510 | 1781 | 0 | 1591 | 1782 | 0 | 1572 |
| Q Serve(g_s), s | 0.0 | 27.3 | 27.4 | 5.1 | 37.6 | 0.0 | 12.0 | 0.0 | 18.1 | 11.0 | 0.0 | 15.9 |
| Cycle Q Clear(g_c), s | 0.0 | 27.3 | 27.4 | 5.1 | 37.6 | 0.0 | 12.0 | 0.0 | 18.1 | 11.0 | 0.0 | 15.9 |
| Prop In Lane | 1.00 | | 0.03 | 1.00 | | 1.00 | 1.00 | | 0.97 | 0.99 | | 1.00 |
| Lane Grp Cap(c), veh/h | 152 | 707 | 740 | 220 | 1498 | | 324 | 0 | 289 | 290 | 0 | 256 |
| V/C Ratio(X) | 0.21 | 0.89 | 0.89 | 0.75 | 0.96 | | 0.65 | 0.00 | 0.92 | 0.66 | 0.00 | 0.90 |
| Avail Cap(c_a), veh/h | 166 | 707 | 740 | 220 | 1498 | | 324 | 0 | 289 | 292 | 0 | 257 |
| HCM Platoon Ratio | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 0.75 | 0.75 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 46.9 | 9.2 | 9.2 | 47.2 | 8.3 | 0.0 | 41.7 | 0.0 | 44.2 | 43.2 | 0.0 | 45.2 |
| Incr Delay (d2), s/veh | 0.3 | 15.8 | 15.3 | 10.6 | 13.4 | 0.0 | 4.4 | 0.0 | 33.3 | 4.1 | 0.0 | 31.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 6.5 | 6.7 | 2.3 | 6.0 | 0.0 | 5.6 | 0.0 | 9.8 | 5.2 | 0.0 | 8.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 47.1 | 25.0 | 24.5 | 57.8 | 21.7 | 0.0 | 46.1 | 0.0 | 77.6 | 47.3 | 0.0 | 76.4 |
| LnGrp LOS | D | C | C | E | C | | D | A | E | D | A | E |
| Approach Vol, veh/h | | 1322 | | | 1611 | A | | 476 | | | 421 | |
| Approach Delay, s/veh | | 25.3 | | | 25.4 | | | 63.8 | | | 63.3 | |
| Approach LOS | | C | | | C | | | E | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.1 | 52.0 | | 22.9 | 12.0 | 50.1 | | 25.0 | | | | |
| Change Period (Y+Rc), s | 6.0 | * 6 | | 5.0 | 5.0 | 6.0 | | 5.0 | | | | |
| Max Green Setting (Gmax), s | 5.0 | * 46 | | 18.0 | 7.0 | 44.0 | | 20.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.0 | 39.6 | | 17.9 | 7.1 | 29.4 | | 20.1 | | | | |
| Green Ext Time (p_c), s | 0.0 | 4.4 | | 0.0 | 0.0 | 6.7 | | 0.0 | | | | |

| Intersection Summary | | |
|---|---|---|
| HCM 6th Ctrl Delay | | 34.3 |
| HCM 6th LOS | | C |

Notes

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 14 | 1471 | 145 | 22 | 1300 | 34 | 127 | 16 | 9 | 198 | 70 | 58 |
| Future Volume (veh/h) | 14 | 1471 | 145 | 22 | 1300 | 34 | 127 | 16 | 9 | 198 | 70 | 58 |
| 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 | 1900 | 1856 | 1856 | 1900 | 1885 | 1885 | 1693 | 1693 | 1693 | 1885 | 1900 | 1900 |
| Adj Flow Rate, veh/h | 15 | 1599 | 158 | 24 | 1413 | 37 | 138 | 17 | 10 | 215 | 70 | 63 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 1.00 | 0.92 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 0 | 1 | 1 | 14 | 14 | 14 | 1 | 0 | 0 |
| Cap, veh/h | 277 | 1968 | 192 | 243 | 1978 | 52 | 210 | 24 | 11 | 401 | 198 | 178 |
| Arrive On Green | 0.13 | 1.00 | 1.00 | 0.02 | 0.55 | 0.55 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 |
| Sat Flow, veh/h | 1810 | 3244 | 317 | 1810 | 3566 | 93 | 698 | 112 | 52 | 1394 | 921 | 829 |
| Grp Volume(v), veh/h | 15 | 861 | 896 | 24 | 709 | 741 | 165 | 0 | 0 | 215 | 0 | 133 |
| Grp Sat Flow(s),veh/h/ln | 1810 | 1763 | 1798 | 1810 | 1791 | 1868 | 862 | 0 | 0 | 1394 | 0 | 1751 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 0.7 | 32.1 | 32.2 | 14.4 | 0.0 | 0.0 | 0.0 | 0.0 | 7.1 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 0.7 | 32.1 | 32.2 | 21.5 | 0.0 | 0.0 | 13.6 | 0.0 | 7.1 |
| Prop In Lane | 1.00 | | 0.18 | 1.00 | | 0.05 | 0.84 | | 0.06 | 1.00 | | 0.47 |
| Lane Grp Cap(c), veh/h | 277 | 1070 | 1091 | 243 | 993 | 1036 | 246 | 0 | 0 | 401 | 0 | 377 |
| V/C Ratio(X) | 0.05 | 0.80 | 0.82 | 0.10 | 0.71 | 0.72 | 0.67 | 0.00 | 0.00 | 0.54 | 0.00 | 0.35 |
| Avail Cap(c_a), veh/h | 277 | 1070 | 1091 | 348 | 993 | 1036 | 282 | 0 | 0 | 443 | 0 | 430 |
| 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) | 0.43 | 0.43 | 0.43 | 0.69 | 0.69 | 0.69 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 25.2 | 0.0 | 0.0 | 12.5 | 18.1 | 18.1 | 45.3 | 0.0 | 0.0 | 39.2 | 0.0 | 36.7 |
| Incr Delay (d2), s/veh | 0.0 | 2.9 | 3.1 | 0.1 | 3.0 | 2.9 | 3.5 | 0.0 | 0.0 | 0.4 | 0.0 | 0.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 0.9 | 1.0 | 0.3 | 12.3 | 12.9 | 4.6 | 0.0 | 0.0 | 5.3 | 0.0 | 3.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 25.3 | 2.9 | 3.1 | 12.6 | 21.1 | 21.0 | 48.8 | 0.0 | 0.0 | 39.7 | 0.0 | 36.9 |
| LnGrp LOS | C | A | A | B | C | C | D | A | A | D | A | D |
| Approach Vol, veh/h | | 1772 | | | 1474 | | | 165 | | | 348 | |
| Approach Delay, s/veh | | 3.2 | | | 20.9 | | | 48.8 | | | 38.6 | |
| Approach LOS | | A | | | C | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.3 | 67.0 | | 29.7 | 7.6 | 72.7 | | 29.7 |
| Change Period (Y+Rc), s | 6.0 | * 6 | | 6.0 | 5.0 | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | 5.3 | * 61 | | 27.0 | 9.0 | 57.0 | | 27.0 |
| Max Q Clear Time (g_c+I1), s | 2.0 | 34.2 | | 15.6 | 2.7 | 2.0 | | 23.5 |
| Green Ext Time (p_c), s | 0.0 | 10.5 | | 0.6 | 0.0 | 19.0 | | 0.2 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 15.4 |
| HCM 6th LOS | B |

Notes

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 17 | 1127 | 563 | 599 | 931 | 32 | 413 | 11 | 606 | 127 | 131 | 31 |
| Future Volume (veh/h) | 17 | 1127 | 563 | 599 | 931 | 32 | 413 | 11 | 606 | 127 | 131 | 31 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1574 | 1841 | 1856 | 1811 | 1885 | 1885 | 1870 | 1737 | 1737 | 1885 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 19 | 1238 | 0 | 658 | 1023 | 35 | 454 | 12 | 0 | 140 | 144 | 34 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 22 | 4 | 3 | 6 | 1 | 1 | 2 | 11 | 11 | 1 | 2 | 2 |
| Cap, veh/h | 36 | 1208 | | 602 | 1771 | 61 | 519 | 295 | | 172 | 169 | 40 |
| Arrive On Green | 0.01 | 0.11 | 0.00 | 0.18 | 0.50 | 0.50 | 0.15 | 0.17 | 0.00 | 0.10 | 0.12 | 0.12 |
| Sat Flow, veh/h | 1499 | 3497 | 1572 | 3346 | 3533 | 121 | 3456 | 1737 | 0 | 1795 | 1463 | 345 |
| Grp Volume(v), veh/h | 19 | 1238 | 0 | 658 | 518 | 540 | 454 | 12 | 0 | 140 | 0 | 178 |
| Grp Sat Flow(s),veh/h/ln | 1499 | 1749 | 1572 | 1673 | 1791 | 1863 | 1728 | 1737 | 0 | 1795 | 0 | 1808 |
| Q Serve(g_s), s | 1.4 | 38.0 | 0.0 | 19.8 | 22.4 | 22.4 | 14.1 | 0.6 | 0.0 | 8.4 | 0.0 | 10.6 |
| Cycle Q Clear(g_c), s | 1.4 | 38.0 | 0.0 | 19.8 | 22.4 | 22.4 | 14.1 | 0.6 | 0.0 | 8.4 | 0.0 | 10.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.06 | 1.00 | | 0.00 | 1.00 | | 0.19 |
| Lane Grp Cap(c), veh/h | 36 | 1208 | | 602 | 898 | 934 | 519 | 295 | | 172 | 0 | 209 |
| V/C Ratio(X) | 0.53 | 1.02 | | 1.09 | 0.58 | 0.58 | 0.87 | 0.04 | | 0.81 | 0.00 | 0.85 |
| Avail Cap(c_a), veh/h | 109 | 1208 | | 602 | 898 | 934 | 628 | 295 | | 375 | 0 | 230 |
| HCM Platoon Ratio | 0.33 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.50 | 0.50 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 53.9 | 48.7 | 0.0 | 45.1 | 19.3 | 19.3 | 45.7 | 38.2 | 0.0 | 48.8 | 0.0 | 47.7 |
| Incr Delay (d2), s/veh | 2.2 | 24.9 | 0.0 | 64.9 | 2.7 | 2.6 | 10.0 | 0.0 | 0.0 | 3.5 | 0.0 | 21.9 |
| 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 | 21.8 | 0.0 | 13.2 | 9.0 | 9.4 | 6.6 | 0.3 | 0.0 | 3.9 | 0.0 | 6.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 56.2 | 73.6 | 0.0 | 110.0 | 22.0 | 21.9 | 55.8 | 38.2 | 0.0 | 52.3 | 0.0 | 69.6 |
| LnGrp LOS | E | F | | F | C | C | E | D | | D | A | E |
| Approach Vol, veh/h | | 1257 | A | | 1716 | | | 466 | A | | 318 | |
| Approach Delay, s/veh | | 73.4 | | | 55.7 | | | 55.3 | | | 62.0 | |
| Approach LOS | | E | | | E | | | E | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 25.8 | 44.0 | 15.5 | 24.7 | 8.6 | 61.1 | 21.5 | 18.7 |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 | 6.0 | 5.0 | * 6 |
| Max Green Setting (Gmax), s | 16.8 | 38.0 | 23.0 | 10.0 | 8.0 | 46.0 | 20.0 | * 14 |
| Max Q Clear Time (g_c+I1), s | 21.8 | 40.0 | 10.4 | 2.6 | 3.4 | 24.4 | 16.1 | 12.6 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 6.2 | 0.4 | 0.1 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 62.1 |
| HCM 6th LOS | E |

**Notes**

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 46 | 82 | 426 | 204 | 79 | 122 | 299 | 724 | 75 | 128 | 1325 | 48 |
| Future Volume (veh/h) | 46 | 82 | 426 | 204 | 79 | 122 | 299 | 724 | 75 | 128 | 1325 | 48 |
| 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 | 1900 | 1870 | 1885 | 1900 | 1870 | 1856 | 1885 | 1752 | 1752 | 1885 | 1856 | 1856 |
| Adj Flow Rate, veh/h | 53 | 95 | 0 | 237 | 92 | 0 | 348 | 842 | 87 | 149 | 1541 | 56 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Percent Heavy Veh, % | 0 | 2 | 1 | 0 | 2 | 3 | 1 | 10 | 10 | 1 | 3 | 3 |
| Cap, veh/h | 317 | 421 | | 315 | 421 | | 377 | 1641 | 170 | 411 | 1510 | 55 |
| Arrive On Green | 0.22 | 0.22 | 0.00 | 0.22 | 0.22 | 0.00 | 0.17 | 0.54 | 0.54 | 0.07 | 0.44 | 0.44 |
| Sat Flow, veh/h | 1325 | 1870 | 1598 | 1321 | 1870 | 1572 | 1795 | 3045 | 315 | 1795 | 3470 | 126 |
| Grp Volume(v), veh/h | 53 | 95 | 0 | 237 | 92 | 0 | 348 | 460 | 469 | 149 | 781 | 816 |
| Grp Sat Flow(s),veh/h/ln | 1325 | 1870 | 1598 | 1321 | 1870 | 1572 | 1795 | 1664 | 1695 | 1795 | 1763 | 1833 |
| Q Serve(g_s), s | 3.4 | 4.1 | 0.0 | 17.8 | 4.0 | 0.0 | 15.0 | 17.6 | 17.6 | 4.5 | 43.5 | 43.5 |
| Cycle Q Clear(g_c), s | 7.4 | 4.1 | 0.0 | 22.0 | 4.0 | 0.0 | 15.0 | 17.6 | 17.6 | 4.5 | 43.5 | 43.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.19 | 1.00 | | 0.07 |
| Lane Grp Cap(c), veh/h | 317 | 421 | | 315 | 421 | | 377 | 897 | 914 | 411 | 767 | 798 |
| V/C Ratio(X) | 0.17 | 0.23 | | 0.75 | 0.22 | | 0.92 | 0.51 | 0.51 | 0.36 | 1.02 | 1.02 |
| Avail Cap(c_a), veh/h | 317 | 421 | | 315 | 421 | | 377 | 897 | 914 | 597 | 767 | 798 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 34.6 | 31.6 | 0.0 | 40.6 | 31.6 | 0.0 | 31.4 | 14.7 | 14.7 | 13.9 | 28.2 | 28.2 |
| Incr Delay (d2), s/veh | 0.2 | 0.2 | 0.0 | 9.4 | 0.2 | 0.0 | 27.7 | 2.1 | 2.1 | 0.4 | 37.1 | 37.9 |
| 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 | 1.9 | 0.0 | 6.5 | 1.8 | 0.0 | 10.9 | 6.5 | 6.7 | 1.8 | 25.3 | 26.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 34.8 | 31.8 | 0.0 | 50.1 | 31.8 | 0.0 | 59.1 | 16.8 | 16.7 | 14.3 | 65.3 | 66.1 |
| LnGrp LOS | C | C | | D | C | | E | B | B | B | F | F |
| Approach Vol, veh/h | | 148 | A | | 329 | A | | 1277 | | | 1746 | |
| Approach Delay, s/veh | | 32.9 | | | 45.0 | | | 28.3 | | | 61.4 | |
| Approach LOS | | C | | | D | | | C | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.6 | 60.4 | | 28.0 | 22.0 | 50.0 | | 28.0 |
| Change Period (Y+Rc), s | 5.0 | 6.5 | | 5.5 | 5.0 | 6.5 | | 5.5 |
| Max Green Setting (Gmax), s | 17.6 | 43.5 | | 22.5 | 17.0 | 43.5 | | 22.5 |
| Max Q Clear Time (g_c+I1), s | 6.5 | 19.6 | | 24.0 | 17.0 | 45.5 | | 9.4 |
| Green Ext Time (p_c), s | 0.2 | 9.9 | | 0.0 | 0.0 | 0.0 | | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 46.5 |
| HCM 6th LOS | D |

**Notes**

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

| Intersection | |
|---|---|
| Int Delay, s/veh | 24.4 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 30 | 361 | 291 | 171 | 248 | 29 |
| Future Vol, veh/h | 30 | 361 | 291 | 171 | 248 | 29 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 87 | 87 | 87 | 87 | 87 | 87 |
| Heavy Vehicles, % | 12 | 1 | 2 | 0 | 0 | 0 |
| Mvmt Flow | 34 | 415 | 334 | 197 | 285 | 33 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 531 | 0 | - | 0 | 916 | 433 |
| Stage 1 | - | - | - | - | 433 | - |
| Stage 2 | - | - | - | - | 483 | - |
| Critical Hdwy | 4.22 | - | - | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | 2.308 | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 988 | - | - | - | 305 | 627 |
| Stage 1 | - | - | - | - | 658 | - |
| Stage 2 | - | - | - | - | 625 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 988 | - | - | - | 291 | 627 |
| Mov Cap-2 Maneuver | - | - | - | - | 291 | - |
| Stage 1 | - | - | - | - | 628 | - |
| Stage 2 | - | - | - | - | 625 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.7 | 0 | 98.4 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 988 | - | - | - | 308 |
| HCM Lane V/C Ratio | 0.035 | - | - | - | 1.034 |
| HCM Control Delay (s) | 8.8 | 0 | - | - | 98.4 |
| HCM Lane LOS | A | A | - | - | F |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 11.6 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.6 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 1068 | 56 | 0 | 1693 | 0 | 146 |
| Future Vol, veh/h | 1068 | 56 | 0 | 1693 | 0 | 146 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | - | 0 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 1161 | 61 | 0 | 1840 | 0 | 159 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | - | - | - | 611 |
| 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 | - | 0 | *658 |
| Stage 1 | - | - | 0 | - | 0 | - |
| Stage 2 | - | - | 0 | - | 0 | - |
| Platoon blocked, % | - | - | | - | | 1 |
| Mov Cap-1 Maneuver | - | - | - | - | - | *658 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0 | 12.2 |
| HCM LOS | | | B |

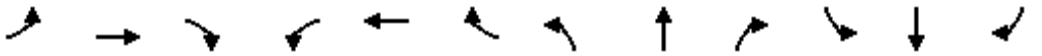
| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBT |
|---|---|---|---|---|
| Capacity (veh/h) | 658 | - | - | - |
| HCM Lane V/C Ratio | 0.241 | - | - | - |
| HCM Control Delay (s) | 12.2 | - | - | - |
| HCM Lane LOS | B | - | - | - |
| HCM 95th %tile Q(veh) | 0.9 | - | - | - |

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

# Appendix XII – Phase 3 Build-Out Synchro Reports

# HCM 6th Signalized Intersection Summary
## 1: Vanosdale Rd/Francis Rd & Middlebrook Pike

06/10/2019



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 143 | 1071 | 307 | 307 | 1468 | 129 | 278 | 236 | 183 | 90 | 175 | 91 |
| Future Volume (veh/h) | 143 | 1071 | 307 | 307 | 1468 | 129 | 278 | 236 | 183 | 90 | 175 | 91 |
| 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 | 1885 | 1870 | 1885 | 1900 | 1900 | 1900 | 1885 | 1885 | 1885 | 1900 | 1900 | 1856 |
| Adj Flow Rate, veh/h | 154 | 1152 | 330 | 330 | 1578 | 139 | 299 | 254 | 197 | 97 | 188 | 98 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 3 |
| Cap, veh/h | 199 | 1164 | 756 | 363 | 1400 | 122 | 406 | 471 | 660 | 300 | 311 | 257 |
| Arrive On Green | 0.07 | 0.33 | 0.33 | 0.05 | 0.14 | 0.14 | 0.15 | 0.25 | 0.25 | 0.06 | 0.16 | 0.16 |
| Sat Flow, veh/h | 1795 | 3554 | 1598 | 1810 | 3359 | 293 | 1795 | 1885 | 1598 | 1810 | 1900 | 1572 |
| Grp Volume(v), veh/h | 154 | 1152 | 330 | 330 | 842 | 875 | 299 | 254 | 197 | 97 | 188 | 98 |
| Grp Sat Flow(s),veh/h/ln | 1795 | 1777 | 1598 | 1810 | 1805 | 1847 | 1795 | 1885 | 1598 | 1810 | 1900 | 1572 |
| Q Serve(g_s), s | 6.2 | 35.5 | 15.1 | 15.8 | 45.8 | 45.8 | 14.8 | 12.8 | 9.1 | 4.8 | 10.1 | 6.1 |
| Cycle Q Clear(g_c), s | 6.2 | 35.5 | 15.1 | 15.8 | 45.8 | 45.8 | 14.8 | 12.8 | 9.1 | 4.8 | 10.1 | 6.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.16 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 199 | 1164 | 756 | 363 | 752 | 770 | 406 | 471 | 660 | 300 | 311 | 257 |
| V/C Ratio(X) | 0.78 | 0.99 | 0.44 | 0.91 | 1.12 | 1.14 | 0.74 | 0.54 | 0.30 | 0.32 | 0.60 | 0.38 |
| Avail Cap(c_a), veh/h | 229 | 1164 | 756 | 380 | 752 | 770 | 406 | 471 | 660 | 357 | 311 | 257 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 27.4 | 36.8 | 19.3 | 38.4 | 47.4 | 47.4 | 30.8 | 35.8 | 21.6 | 35.2 | 42.7 | 41.0 |
| Incr Delay (d2), s/veh | 13.4 | 24.0 | 1.8 | 24.6 | 70.6 | 77.3 | 6.1 | 4.4 | 1.2 | 0.2 | 8.5 | 4.2 |
| 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 | 18.2 | 5.9 | 12.1 | 36.6 | 38.9 | 7.0 | 6.5 | 3.6 | 2.2 | 5.5 | 2.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 40.9 | 60.8 | 21.1 | 63.1 | 118.0 | 124.7 | 36.9 | 40.1 | 22.8 | 35.4 | 51.2 | 45.3 |
| LnGrp LOS | D | E | C | E | F | F | D | D | C | D | D | D |
| Approach Vol, veh/h | | 1636 | | | 2047 | | | 750 | | | 383 | |
| Approach Delay, s/veh | | 50.9 | | | 112.0 | | | 34.3 | | | 45.7 | |
| Approach LOS | | D | | | F | | | C | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.2 | 51.8 | 11.5 | 33.5 | 23.0 | 42.0 | 21.0 | 24.0 |
| Change Period (Y+Rc), s | 5.0 | 6.0 | 5.0 | 6.0 | 5.0 | 6.0 | 5.0 | * 6 |
| Max Green Setting (Gmax), s | 10.0 | 45.0 | 10.0 | 23.0 | 19.0 | 36.0 | 16.0 | * 18 |
| Max Q Clear Time (g_c+I1), s | 8.2 | 47.8 | 6.8 | 14.8 | 17.8 | 37.5 | 16.8 | 12.1 |
| Green Ext Time (p_c), s | 0.1 | 0.0 | 0.0 | 0.9 | 0.1 | 0.0 | 0.0 | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 73.9 |
| HCM 6th LOS | E |

**Notes**

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

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.3 |

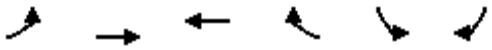
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 34 | 1092 | 28 | 75 | 1803 | 22 | 35 | 4 | 35 | 8 | 2 | 30 |
| Future Vol, veh/h | 34 | 1092 | 28 | 75 | 1803 | 22 | 35 | 4 | 35 | 8 | 2 | 30 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 25 | - | - | 128 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 1 | - | - | 1 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, % | 0 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 0 | 0 |
| Mvmt Flow | 37 | 1200 | 31 | 82 | 1981 | 24 | 38 | 4 | 38 | 9 | 2 | 33 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 2005 | 0 | 0 | 1231 | 0 | 0 | 2446 | 3459 | 616 | 2833 | 3462 | 1003 |
| Stage 1 | - | - | - | - | - | - | 1290 | 1290 | - | 2157 | 2157 | - |
| Stage 2 | - | - | - | - | - | - | 1156 | 2169 | - | 676 | 1305 | - |
| Critical Hdwy | 4.1 | - | - | 4.1 | - | - | 7.5 | 6.5 | 6.98 | 7.5 | 6.5 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.5 | 5.5 | - | 6.5 | 5.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.5 | 5.5 | - | 6.5 | 5.5 | - |
| Follow-up Hdwy | 2.2 | - | - | 2.2 | - | - | 3.5 | 4 | 3.34 | 3.5 | 4 | 3.3 |
| Pot Cap-1 Maneuver | *527 | - | - | *951 | - | - | *160 | 0 | *626 | *~ 6 | 0 | *351 |
| Stage 1 | - | - | - | - | - | - | *553 | 494 | - | *198 | 198 | - |
| Stage 2 | - | - | - | - | - | - | *331 | 190 | - | *597 | 482 | - |
| Platoon blocked, % | 1 | - | - | 1 | - | - | 1 | 1 | 1 | 1 | 1 | 1 |
| Mov Cap-1 Maneuver | *527 | - | - | *951 | - | - | *128 | 0 | *626 | *~ 5 | 0 | *351 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | *193 | 96 | - | *120 | 111 | - |
| Stage 1 | - | - | - | - | - | - | *515 | 460 | - | *184 | 181 | - |
| Stage 2 | - | - | - | - | - | - | *271 | 174 | - | *516 | 448 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.4 | 0.4 | 24.5 | 23.8 |
| HCM LOS | | | C | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 265 | * 527 | - | - | * 951 | - | - | 235 |
| HCM Lane V/C Ratio | 0.307 | 0.071 | - | - | 0.087 | - | - | 0.187 |
| HCM Control Delay (s) | 24.5 | 12.4 | - | - | 9.1 | - | - | 23.8 |
| HCM Lane LOS | C | B | - | - | A | - | - | C |
| HCM 95th %tile Q(veh) | 1.3 | 0.2 | - | - | 0.3 | - | - | 0.7 |

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



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 125 | 1017 | 1712 | 91 | 154 | 115 |
| Future Volume (veh/h) | 125 | 1017 | 1712 | 91 | 154 | 115 |
| 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 | 1900 | 1856 | 1885 | 1885 | 1870 | 1900 |
| Adj Flow Rate, veh/h | 134 | 1094 | 1841 | 98 | 166 | 124 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 0 | 3 | 1 | 1 | 2 | 0 |
| Cap, veh/h | 271 | 2751 | 2389 | 126 | 197 | 178 |
| Arrive On Green | 0.09 | 1.00 | 0.92 | 0.92 | 0.11 | 0.11 |
| Sat Flow, veh/h | 1810 | 3618 | 3555 | 183 | 1781 | 1610 |
| Grp Volume(v), veh/h | 134 | 1094 | 945 | 994 | 166 | 124 |
| Grp Sat Flow(s),veh/h/ln | 1810 | 1763 | 1791 | 1852 | 1781 | 1610 |
| Q Serve(g_s), s | 2.3 | 0.0 | 16.0 | 16.9 | 10.1 | 8.2 |
| Cycle Q Clear(g_c), s | 2.3 | 0.0 | 16.0 | 16.9 | 10.1 | 8.2 |
| Prop In Lane | 1.00 | | | 0.10 | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 271 | 2751 | 1236 | 1278 | 197 | 178 |
| V/C Ratio(X) | 0.49 | 0.40 | 0.76 | 0.78 | 0.84 | 0.70 |
| Avail Cap(c_a), veh/h | 354 | 2751 | 1236 | 1278 | 227 | 205 |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.33 | 1.33 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 6.9 | 0.0 | 2.1 | 2.1 | 48.0 | 47.1 |
| Incr Delay (d2), s/veh | 0.5 | 0.4 | 4.5 | 4.7 | 19.5 | 6.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.6 | 0.2 | 3.2 | 3.4 | 5.5 | 3.6 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d),s/veh | 7.4 | 0.4 | 6.6 | 6.8 | 67.5 | 53.2 |
| LnGrp LOS | A | A | A | A | E | D |
| Approach Vol, veh/h | | 1228 | 1939 | | 290 | |
| Approach Delay, s/veh | | 1.2 | 6.7 | | 61.4 | |
| Approach LOS | | A | A | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.9 | 81.9 | | 18.2 | | 91.8 |
| Change Period (Y+Rc), s | 5.0 | 6.0 | | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | 10.0 | 69.0 | | 14.0 | | 84.0 |
| Max Q Clear Time (g_c+I1), s | 4.3 | 18.9 | | 12.1 | | 2.0 |
| Green Ext Time (p_c), s | 0.1 | 22.7 | | 0.1 | | 9.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 9.3 |
| HCM 6th LOS | A |

| Intersection | |
|---|---|
| Int Delay, s/veh | 23 |

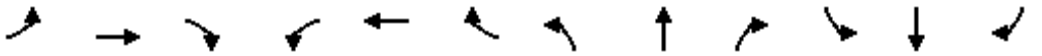
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 28 | 1223 | 1722 | 89 | 85 | 67 |
| Future Vol, veh/h | 28 | 1223 | 1722 | 89 | 85 | 67 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 124 | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, % | 4 | 2 | 1 | 1 | 0 | 0 |
| Mvmt Flow | 32 | 1390 | 1957 | 101 | 97 | 76 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 2058 | 0 | - | 0 | 2767 | 1029 |
| Stage 1 | - | - | - | - | 2008 | - |
| Stage 2 | - | - | - | - | 759 | - |
| Critical Hdwy | 4.18 | - | - | - | 6.8 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.8 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.8 | - |
| Follow-up Hdwy | 2.24 | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 261 | - | - | - | ~ 16 | 234 |
| Stage 1 | - | - | - | - | ~ 92 | - |
| Stage 2 | - | - | - | - | 428 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 261 | - | - | - | ~ 14 | 234 |
| Mov Cap-2 Maneuver | - | - | - | - | ~ 65 | - |
| Stage 1 | - | - | - | - | ~ 81 | - |
| Stage 2 | - | - | - | - | 428 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.5 | 0 | $ 481.7 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 261 | - | - | - | 95 |
| HCM Lane V/C Ratio | 0.122 | - | - | - | 1.818 |
| HCM Control Delay (s) | 20.7 | - | - | - | $ 481.7 |
| HCM Lane LOS | C | - | - | - | F |
| HCM 95th %tile Q(veh) | 0.4 | - | - | - | 14.3 |

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 29 | 1153 | 59 | 168 | 1315 | 28 | 291 | 9 | 280 | 171 | 3 | 210 |
| Future Volume (veh/h) | 29 | 1153 | 59 | 168 | 1315 | 28 | 291 | 9 | 280 | 171 | 3 | 210 |
| 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 | 1841 | 1856 | 1856 | 1870 | 1885 | 1781 | 1870 | 1870 | 1870 | 1870 | 1870 | 1856 |
| Adj Flow Rate, veh/h | 32 | 1267 | 64 | 183 | 1445 | 0 | 316 | 10 | 214 | 188 | 3 | 185 |
| Peak Hour Factor | 0.91 | 0.91 | 0.92 | 0.92 | 0.91 | 0.91 | 0.92 | 0.92 | 0.92 | 0.91 | 0.92 | 0.91 |
| Percent Heavy Veh, % | 4 | 3 | 3 | 2 | 1 | 8 | 2 | 2 | 2 | 2 | 2 | 3 |
| Cap, veh/h | 179 | 1421 | 72 | 220 | 1498 | | 346 | 14 | 296 | 237 | 4 | 212 |
| Arrive On Green | 0.10 | 0.83 | 0.83 | 0.13 | 0.84 | 0.00 | 0.19 | 0.19 | 0.19 | 0.14 | 0.14 | 0.14 |
| Sat Flow, veh/h | 1753 | 3415 | 172 | 3456 | 3582 | 1510 | 1781 | 71 | 1525 | 1755 | 28 | 1572 |
| Grp Volume(v), veh/h | 32 | 653 | 678 | 183 | 1445 | 0 | 316 | 0 | 224 | 191 | 0 | 185 |
| Grp Sat Flow(s),veh/h/ln | 1753 | 1763 | 1825 | 1728 | 1791 | 1510 | 1781 | 0 | 1596 | 1783 | 0 | 1572 |
| Q Serve(g_s), s | 0.0 | 26.4 | 26.7 | 5.7 | 37.6 | 0.0 | 19.1 | 0.0 | 14.5 | 11.4 | 0.0 | 12.7 |
| Cycle Q Clear(g_c), s | 0.0 | 26.4 | 26.7 | 5.7 | 37.6 | 0.0 | 19.1 | 0.0 | 14.5 | 11.4 | 0.0 | 12.7 |
| Prop In Lane | 1.00 | | 0.09 | 1.00 | | 1.00 | 1.00 | | 0.96 | 0.98 | | 1.00 |
| Lane Grp Cap(c), veh/h | 179 | 734 | 759 | 220 | 1498 | | 346 | 0 | 310 | 241 | 0 | 212 |
| V/C Ratio(X) | 0.18 | 0.89 | 0.89 | 0.83 | 0.96 | | 0.91 | 0.00 | 0.72 | 0.79 | 0.00 | 0.87 |
| Avail Cap(c_a), veh/h | 179 | 734 | 759 | 220 | 1498 | | 356 | 0 | 319 | 259 | 0 | 229 |
| HCM Platoon Ratio | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 0.71 | 0.71 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 44.5 | 7.6 | 7.6 | 47.4 | 8.3 | 0.0 | 43.4 | 0.0 | 41.5 | 46.1 | 0.0 | 46.6 |
| Incr Delay (d2), s/veh | 0.2 | 15.2 | 15.0 | 17.3 | 12.9 | 0.0 | 26.7 | 0.0 | 7.6 | 13.0 | 0.0 | 25.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 6.1 | 6.2 | 2.8 | 5.9 | 0.0 | 10.9 | 0.0 | 6.3 | 5.9 | 0.0 | 6.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 44.7 | 22.9 | 22.7 | 64.7 | 21.2 | 0.0 | 70.1 | 0.0 | 49.1 | 59.1 | 0.0 | 72.4 |
| LnGrp LOS | D | C | C | E | C | | E | A | D | E | A | E |
| Approach Vol, veh/h | | 1363 | | | 1628 | A | | 540 | | | 376 | |
| Approach Delay, s/veh | | 23.3 | | | 26.1 | | | 61.4 | | | 65.6 | |
| Approach LOS | | C | | | C | | | E | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.8 | 52.0 | | 19.9 | 12.0 | 51.8 | | 26.4 | | | | |
| Change Period (Y+Rc), s | 6.0 | * 6 | | 5.0 | 5.0 | 6.0 | | 5.0 | | | | |
| Max Green Setting (Gmax), s | 5.0 | * 46 | | 16.0 | 7.0 | 44.0 | | 22.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.0 | 39.6 | | 14.7 | 7.7 | 28.7 | | 21.1 | | | | |
| Green Ext Time (p_c), s | 0.0 | 4.4 | | 0.2 | 0.0 | 7.2 | | 0.3 | | | | |

| Intersection Summary | | |
|---|---|---|
| HCM 6th Ctrl Delay | 33.8 | |
| HCM 6th LOS | C | |

**Notes**

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 14 | 1588 | 69 | 37 | 1345 | 34 | 97 | 19 | 48 | 198 | 71 | 58 |
| Future Volume (veh/h) | 14 | 1588 | 69 | 37 | 1345 | 34 | 97 | 19 | 48 | 198 | 71 | 58 |
| 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 | 1900 | 1856 | 1856 | 1900 | 1885 | 1885 | 1693 | 1693 | 1693 | 1885 | 1900 | 1900 |
| Adj Flow Rate, veh/h | 15 | 1726 | 75 | 40 | 1462 | 37 | 105 | 21 | 52 | 215 | 71 | 63 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 1.00 | 0.92 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 0 | 1 | 1 | 14 | 14 | 14 | 1 | 0 | 0 |
| Cap, veh/h | 277 | 2079 | 90 | 250 | 1980 | 50 | 159 | 36 | 59 | 305 | 194 | 173 |
| Arrive On Green | 0.14 | 1.00 | 1.00 | 0.03 | 0.55 | 0.55 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 |
| Sat Flow, veh/h | 1810 | 3443 | 149 | 1810 | 3570 | 90 | 512 | 171 | 282 | 1338 | 928 | 824 |
| Grp Volume(v), veh/h | 15 | 879 | 922 | 40 | 733 | 766 | 178 | 0 | 0 | 215 | 0 | 134 |
| Grp Sat Flow(s),veh/h/ln | 1810 | 1763 | 1829 | 1810 | 1791 | 1869 | 964 | 0 | 0 | 1338 | 0 | 1752 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 1.2 | 33.9 | 34.1 | 13.4 | 0.0 | 0.0 | 0.1 | 0.0 | 7.2 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 1.2 | 33.9 | 34.1 | 20.6 | 0.0 | 0.0 | 20.7 | 0.0 | 7.2 |
| Prop In Lane | 1.00 | | 0.08 | 1.00 | | 0.05 | 0.59 | | 0.29 | 1.00 | | 0.47 |
| Lane Grp Cap(c), veh/h | 277 | 1065 | 1104 | 250 | 993 | 1036 | 254 | 0 | 0 | 305 | 0 | 367 |
| V/C Ratio(X) | 0.05 | 0.83 | 0.83 | 0.16 | 0.74 | 0.74 | 0.70 | 0.00 | 0.00 | 0.71 | 0.00 | 0.37 |
| Avail Cap(c_a), veh/h | 277 | 1065 | 1104 | 340 | 993 | 1036 | 299 | 0 | 0 | 353 | 0 | 430 |
| 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) | 0.26 | 0.26 | 0.26 | 0.67 | 0.67 | 0.67 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 25.9 | 0.0 | 0.0 | 12.6 | 18.5 | 18.5 | 44.5 | 0.0 | 0.0 | 42.5 | 0.0 | 37.2 |
| Incr Delay (d2), s/veh | 0.0 | 2.0 | 2.1 | 0.2 | 3.3 | 3.2 | 4.1 | 0.0 | 0.0 | 3.9 | 0.0 | 0.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 0.6 | 0.6 | 0.4 | 13.1 | 13.7 | 5.0 | 0.0 | 0.0 | 6.0 | 0.0 | 3.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 25.9 | 2.0 | 2.1 | 12.8 | 21.8 | 21.7 | 48.6 | 0.0 | 0.0 | 46.4 | 0.0 | 37.4 |
| LnGrp LOS | C | A | A | B | C | C | D | A | A | D | A | D |
| Approach Vol, veh/h | | 1816 | | | 1539 | | | 178 | | | 349 | |
| Approach Delay, s/veh | | 2.3 | | | 21.5 | | | 48.6 | | | 43.0 | |
| Approach LOS | | A | | | C | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.0 | 67.0 | | 29.0 | 8.5 | 72.4 | | 29.0 |
| Change Period (Y+Rc), s | 6.0 | * 6 | | 6.0 | 5.0 | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | 5.0 | * 61 | | 27.0 | 9.0 | 57.0 | | 27.0 |
| Max Q Clear Time (g_c+I1), s | 2.0 | 36.1 | | 22.7 | 3.2 | 2.0 | | 22.6 |
| Green Ext Time (p_c), s | 0.0 | 10.7 | | 0.4 | 0.0 | 19.9 | | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 15.7 |
| HCM 6th LOS | B |

Notes

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 20 | 1220 | 623 | 599 | 967 | 32 | 436 | 11 | 606 | 127 | 131 | 32 |
| Future Volume (veh/h) | 20 | 1220 | 623 | 599 | 967 | 32 | 436 | 11 | 606 | 127 | 131 | 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 | 1574 | 1841 | 1856 | 1811 | 1885 | 1885 | 1870 | 1737 | 1737 | 1885 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 22 | 1341 | 0 | 658 | 1063 | 35 | 479 | 12 | 0 | 140 | 144 | 35 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 22 | 4 | 3 | 6 | 1 | 1 | 2 | 11 | 11 | 1 | 2 | 2 |
| Cap, veh/h | 40 | 1176 | | 607 | 1737 | 57 | 545 | 308 | | 172 | 168 | 41 |
| Arrive On Green | 0.01 | 0.11 | 0.00 | 0.18 | 0.49 | 0.49 | 0.16 | 0.18 | 0.00 | 0.10 | 0.12 | 0.12 |
| Sat Flow, veh/h | 1499 | 3497 | 1572 | 3346 | 3539 | 117 | 3456 | 1737 | 0 | 1795 | 1453 | 353 |
| Grp Volume(v), veh/h | 22 | 1341 | 0 | 658 | 538 | 560 | 479 | 12 | 0 | 140 | 0 | 179 |
| Grp Sat Flow(s),veh/h/ln | 1499 | 1749 | 1572 | 1673 | 1791 | 1864 | 1728 | 1737 | 0 | 1795 | 0 | 1807 |
| Q Serve(g_s), s | 1.6 | 37.0 | 0.0 | 19.9 | 24.0 | 24.0 | 14.9 | 0.6 | 0.0 | 8.4 | 0.0 | 10.7 |
| Cycle Q Clear(g_c), s | 1.6 | 37.0 | 0.0 | 19.9 | 24.0 | 24.0 | 14.9 | 0.6 | 0.0 | 8.4 | 0.0 | 10.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.06 | 1.00 | | 0.00 | 1.00 | | 0.20 |
| Lane Grp Cap(c), veh/h | 40 | 1176 | | 607 | 879 | 915 | 545 | 308 | | 172 | 0 | 209 |
| V/C Ratio(X) | 0.55 | 1.14 | | 1.08 | 0.61 | 0.61 | 0.88 | 0.04 | | 0.81 | 0.00 | 0.86 |
| Avail Cap(c_a), veh/h | 109 | 1176 | | 607 | 879 | 915 | 660 | 308 | | 375 | 0 | 214 |
| HCM Platoon Ratio | 0.33 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.43 | 0.43 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 53.9 | 48.9 | 0.0 | 45.0 | 20.4 | 20.4 | 45.3 | 37.5 | 0.0 | 48.8 | 0.0 | 47.8 |
| Incr Delay (d2), s/veh | 1.9 | 67.9 | 0.0 | 61.6 | 3.2 | 3.0 | 10.1 | 0.0 | 0.0 | 3.5 | 0.0 | 25.9 |
| 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 | 28.2 | 0.0 | 13.1 | 9.8 | 10.2 | 7.0 | 0.3 | 0.0 | 3.9 | 0.0 | 6.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 55.7 | 116.8 | 0.0 | 106.6 | 23.5 | 23.4 | 55.4 | 37.5 | 0.0 | 52.3 | 0.0 | 73.6 |
| LnGrp LOS | E | F | | F | C | C | E | D | | D | A | E |
| Approach Vol, veh/h | | 1363 | A | | 1756 | | | 491 | A | | 319 | |
| Approach Delay, s/veh | | 115.8 | | | 54.6 | | | 54.9 | | | 64.3 | |
| Approach LOS | | F | | | D | | | D | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 25.9 | 43.0 | 15.5 | 25.5 | 8.9 | 60.0 | 22.3 | 18.7 |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 | 6.0 | 5.0 | * 6 |
| Max Green Setting (Gmax), s | 17.3 | 37.0 | 23.0 | 10.0 | 8.0 | 46.0 | 21.0 | * 13 |
| Max Q Clear Time (g_c+I1), s | 21.9 | 39.0 | 10.4 | 2.6 | 3.6 | 26.0 | 16.9 | 12.7 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 6.3 | 0.4 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 76.7 |
| HCM 6th LOS | E |

**Notes**

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 46 | 88 | 459 | 204 | 81 | 122 | 312 | 747 | 75 | 128 | 1385 | 48 |
| Future Volume (veh/h) | 46 | 88 | 459 | 204 | 81 | 122 | 312 | 747 | 75 | 128 | 1385 | 48 |
| 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 | 1900 | 1870 | 1885 | 1900 | 1870 | 1856 | 1885 | 1752 | 1752 | 1885 | 1856 | 1856 |
| Adj Flow Rate, veh/h | 53 | 102 | 0 | 237 | 94 | 0 | 363 | 869 | 87 | 149 | 1610 | 56 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Percent Heavy Veh, % | 0 | 2 | 1 | 0 | 2 | 3 | 1 | 10 | 10 | 1 | 3 | 3 |
| Cap, veh/h | 315 | 421 | | 309 | 421 | | 377 | 1647 | 165 | 401 | 1512 | 52 |
| Arrive On Green | 0.22 | 0.22 | 0.00 | 0.22 | 0.22 | 0.00 | 0.17 | 0.54 | 0.54 | 0.07 | 0.44 | 0.44 |
| Sat Flow, veh/h | 1323 | 1870 | 1598 | 1313 | 1870 | 1572 | 1795 | 3055 | 306 | 1795 | 3476 | 121 |
| Grp Volume(v), veh/h | 53 | 102 | 0 | 237 | 94 | 0 | 363 | 473 | 483 | 149 | 814 | 852 |
| Grp Sat Flow(s),veh/h/ln | 1323 | 1870 | 1598 | 1313 | 1870 | 1572 | 1795 | 1664 | 1697 | 1795 | 1763 | 1834 |
| Q Serve(g_s), s | 3.4 | 4.5 | 0.0 | 18.0 | 4.1 | 0.0 | 16.0 | 18.3 | 18.3 | 4.5 | 43.5 | 43.5 |
| Cycle Q Clear(g_c), s | 7.5 | 4.5 | 0.0 | 22.5 | 4.1 | 0.0 | 16.0 | 18.3 | 18.3 | 4.5 | 43.5 | 43.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.18 | 1.00 | | 0.07 |
| Lane Grp Cap(c), veh/h | 315 | 421 | | 309 | 421 | | 377 | 897 | 914 | 401 | 767 | 798 |
| V/C Ratio(X) | 0.17 | 0.24 | | 0.77 | 0.22 | | 0.96 | 0.53 | 0.53 | 0.37 | 1.06 | 1.07 |
| Avail Cap(c_a), veh/h | 315 | 421 | | 309 | 421 | | 377 | 897 | 914 | 588 | 767 | 798 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 34.7 | 31.8 | 0.0 | 41.0 | 31.6 | 0.0 | 32.1 | 14.9 | 14.9 | 14.0 | 28.3 | 28.3 |
| Incr Delay (d2), s/veh | 0.2 | 0.2 | 0.0 | 10.7 | 0.2 | 0.0 | 36.3 | 2.2 | 2.2 | 0.4 | 50.1 | 51.6 |
| 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 | 1.1 | 2.0 | 0.0 | 6.7 | 1.9 | 0.0 | 7.8 | 6.8 | 6.9 | 1.8 | 28.0 | 29.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 34.9 | 32.0 | 0.0 | 51.7 | 31.8 | 0.0 | 68.4 | 17.1 | 17.0 | 14.4 | 78.4 | 79.9 |
| LnGrp LOS | C | C | | D | C | | E | B | B | B | F | F |
| Approach Vol, veh/h | | 155 | A | | 331 | A | | 1319 | | | 1815 | |
| Approach Delay, s/veh | | 33.0 | | | 46.0 | | | 31.2 | | | 73.8 | |
| Approach LOS | | C | | | D | | | C | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.6 | 60.4 | | 28.0 | 22.0 | 50.0 | | 28.0 |
| Change Period (Y+Rc), s | 5.0 | 6.5 | | 5.5 | 5.0 | 6.5 | | 5.5 |
| Max Green Setting (Gmax), s | 17.0 | 43.5 | | 22.5 | 17.0 | 43.5 | | 22.5 |
| Max Q Clear Time (g_c+I1), s | 6.5 | 20.3 | | 24.5 | 18.0 | 45.5 | | 9.5 |
| Green Ext Time (p_c), s | 0.2 | 10.0 | | 0.0 | 0.0 | 0.0 | | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 6th Ctrl Delay | 54.0 |
| HCM 6th LOS | D |

**Notes**

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

| Intersection | |
|---|---|
| Int Delay, s/veh | 41.1 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 30 | 361 | 291 | 186 | 287 | 29 |
| Future Vol, veh/h | 30 | 361 | 291 | 186 | 287 | 29 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 87 | 87 | 87 | 87 | 87 | 87 |
| Heavy Vehicles, % | 12 | 1 | 2 | 0 | 0 | 0 |
| Mvmt Flow | 34 | 415 | 334 | 214 | 330 | 33 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 548 | 0 | - | 0 | 924 | 441 |
| Stage 1 | - | - | - | - | 441 | - |
| Stage 2 | - | - | - | - | 483 | - |
| Critical Hdwy | 4.22 | - | - | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | 2.308 | - | - | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | 973 | - | - | - | ~ 302 | 621 |
| Stage 1 | - | - | - | - | 653 | - |
| Stage 2 | - | - | - | - | 625 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 973 | - | - | - | ~ 288 | 621 |
| Mov Cap-2 Maneuver | - | - | - | - | ~ 288 | - |
| Stage 1 | - | - | - | - | 624 | - |
| Stage 2 | - | - | - | - | 625 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.7 | 0 | 153.3 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 973 | - | - | - | 303 |
| HCM Lane V/C Ratio | 0.035 | - | - | - | 1.199 |
| HCM Control Delay (s) | 8.8 | 0 | - | - | 153.3 |
| HCM Lane LOS | A | A | - | - | F |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 16 |

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

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.5 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 42 | 115 | 45 | 201 | 237 | 16 |
| Future Vol, veh/h | 42 | 115 | 45 | 201 | 237 | 16 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 46 | 125 | 49 | 218 | 258 | 17 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 583 | 267 | 275 | 0 | - | 0 |
| Stage 1 | 267 | - | - | - | - | - |
| Stage 2 | 316 | - | - | - | - | - |
| 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 | 475 | 772 | 1288 | - | - | - |
| Stage 1 | 778 | - | - | - | - | - |
| Stage 2 | 739 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 455 | 772 | 1288 | - | - | - |
| Mov Cap-2 Maneuver | 455 | - | - | - | - | - |
| Stage 1 | 745 | - | - | - | - | - |
| Stage 2 | 739 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 12.5 | 1.4 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1288 | - | 651 | - | - |
| HCM Lane V/C Ratio | 0.038 | - | 0.262 | - | - |
| HCM Control Delay (s) | 7.9 | 0 | 12.5 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0.1 | - | 1 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.6 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 1105 | 56 | 0 | 1789 | 0 | 146 |
| Future Vol, veh/h | 1105 | 56 | 0 | 1789 | 0 | 146 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | - | 0 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 1201 | 61 | 0 | 1945 | 0 | 159 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | - | - | - | 631 |
| 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 | - | 0 | *630 |
| Stage 1 | - | - | 0 | - | 0 | - |
| Stage 2 | - | - | 0 | - | 0 | - |
| Platoon blocked, % | - | - | | - | | 1 |
| Mov Cap-1 Maneuver | - | - | - | - | - | *630 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0 | 12.6 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBT |
|---|---|---|---|---|
| Capacity (veh/h) | 630 | - | - | - |
| HCM Lane V/C Ratio | 0.252 | - | - | - |
| HCM Control Delay (s) | 12.6 | - | - | - |
| HCM Lane LOS | B | - | - | - |
| HCM 95th %tile Q(veh) | 1 | - | - | - |

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

# Appendix XIII – Turn Lane Warrants

# West Access - Phase 1 - AM Peak Period

**Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.**

INPUT

| Roadway geometry: | 4-lane roadway |
|---|---|

| Variable | Value |
|---|---|
| Major-road speed, mph: | 55 |
| Major-road volume (one direction), veh/h: | 1446 |
| Right-turn volume, veh/h: | 84 |

OUTPUT

| Variable | Value |
|---|---|
| Limiting right-turn volume, veh/h: | 11 |
| **Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:** | |
| **Add right-turn bay.** | |

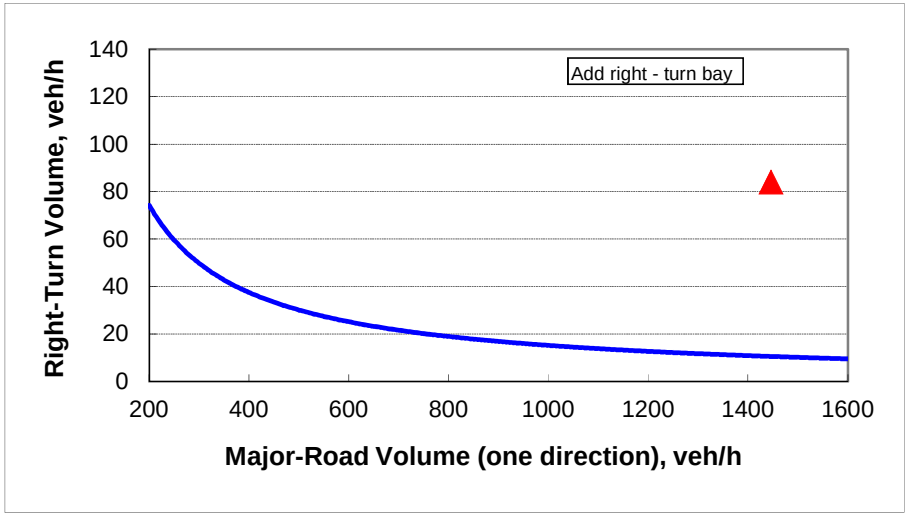


**Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.**

INPUT

| Roadway geometry: | 4-lane roadway |
|---|---|

| Variable | Value |
|---|---|
| Major-road speed, mph: | 55 |
| Major-road volume (one direction), veh/h: | 953 |
| Right-turn volume, veh/h: | 30 |

OUTPUT

| Variable | Value |
|---|---|
| Limiting right-turn volume, veh/h: | 16 |
| **Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:** | |
| **Add right-turn bay.** | |

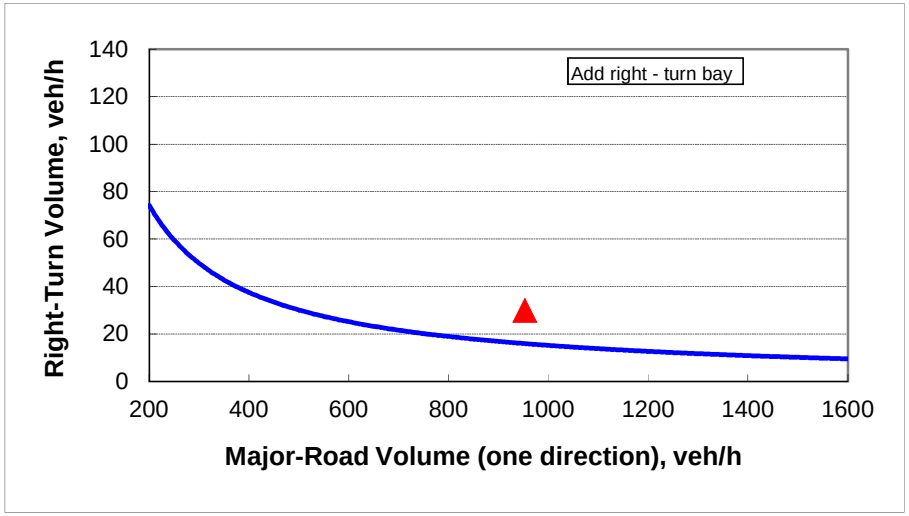


**Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.**

INPUT

| Roadway geometry: | 4-lane roadway |
|---|---|

| Variable | Value |
|---|---|
| Major-road speed, mph: | 55 |
| Major-road volume (one direction), veh/h: | 1589 |
| Right-turn volume, veh/h: | 130 |

OUTPUT

| Variable | Value |
|---|---|
| Limiting right-turn volume, veh/h: | 10 |
| **Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:** | |
| **Add right-turn bay.** | |

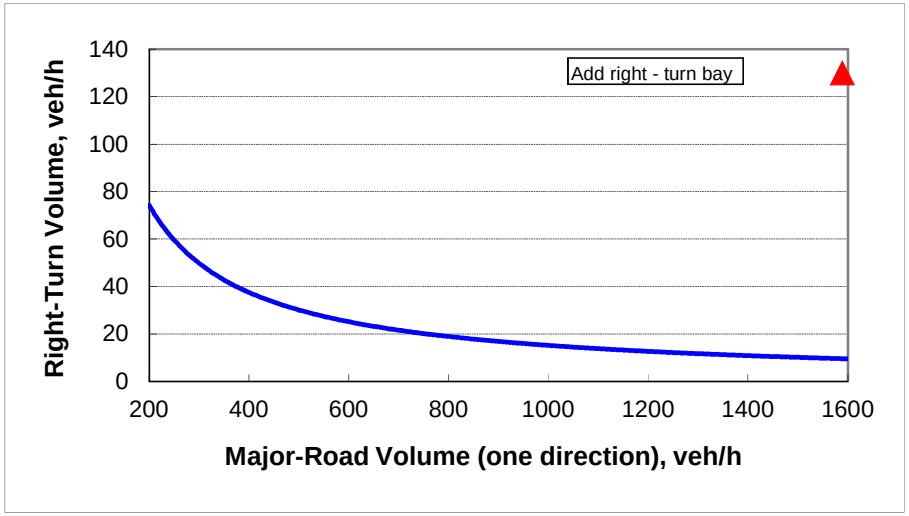


**Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.**

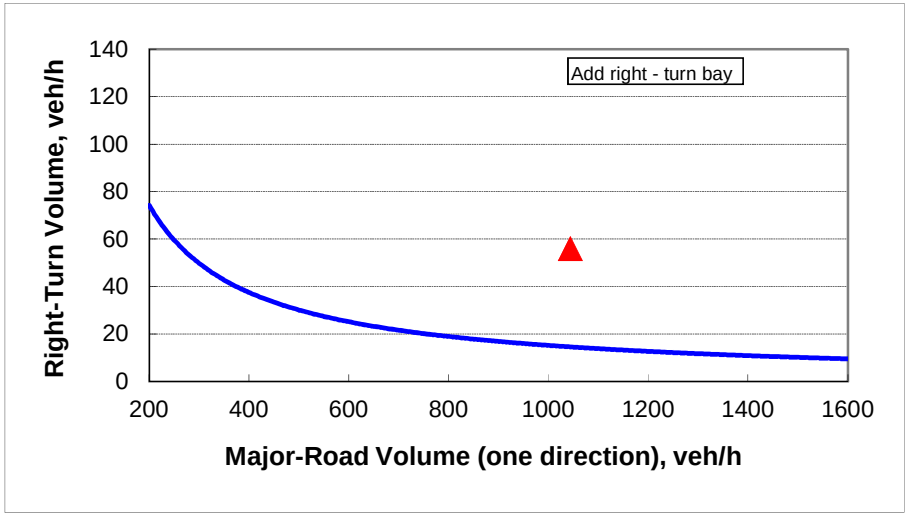
INPUT

| Roadway geometry: | 4-lane roadway |
|---|---|

| Variable | Value |
|---|---|
| Major-road speed, mph: | 55 |
| Major-road volume (one direction), veh/h: | 1044 |
| Right-turn volume, veh/h: | 56 |

OUTPUT

| Variable | Value |
|---|---|
| Limiting right-turn volume, veh/h: | 15 |
| **Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:** | |
| **Add right-turn bay.** | |



# West Access - Phase 3 - AM Peak Period

**Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.**

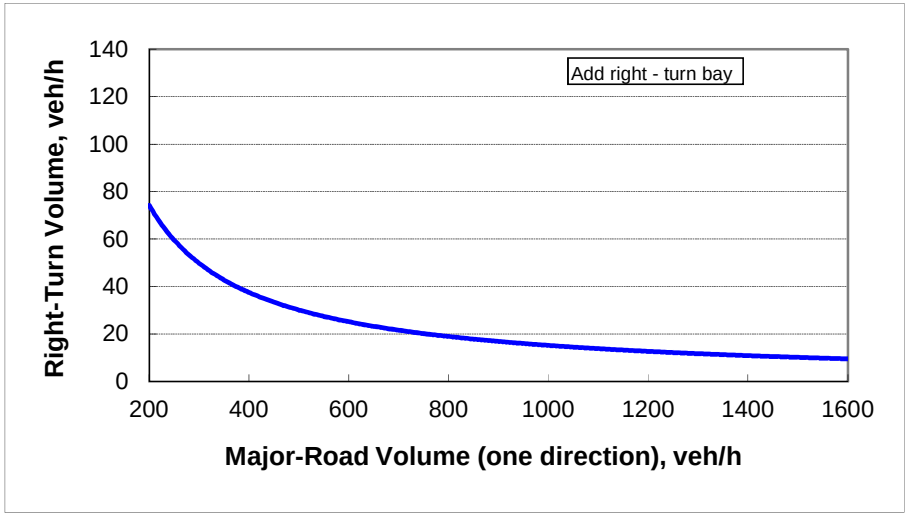
INPUT

| Roadway geometry: | 4-lane roadway |
|---|---|

| Variable | Value |
|---|---|
| Major-road speed, mph: | 55 |
| Major-road volume (one direction), veh/h: | 1772 |
| Right-turn volume, veh/h: | 130 |

OUTPUT

| Variable | Value |
|---|---|
| Limiting right-turn volume, veh/h: | 9 |
| **Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:** | |
| **Add right-turn bay.** | |



# West Access - Phase 3 - PM Peak Period

**Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.**

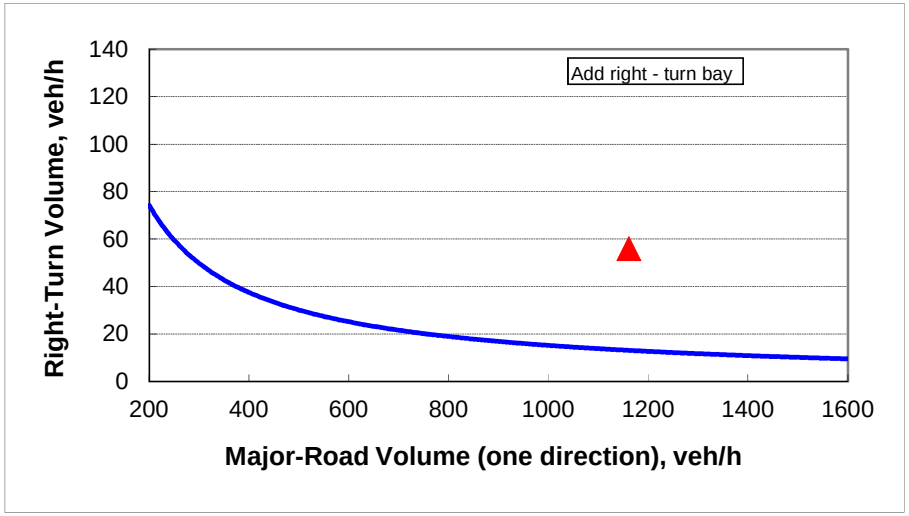
INPUT

| Roadway geometry: | 4-lane roadway |
|---|---|

| Variable | Value |
|---|---|
| Major-road speed, mph: | 55 |
| Major-road volume (one direction), veh/h: | 1161 |
| Right-turn volume, veh/h: | 56 |

OUTPUT

| Variable | Value |
|---|---|
| Limiting right-turn volume, veh/h: | 13 |
| **Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:** | |
| **Add right-turn bay.** | |



# Old Weisgarber Access - Phase 3 - AM Peak Period

**Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.**

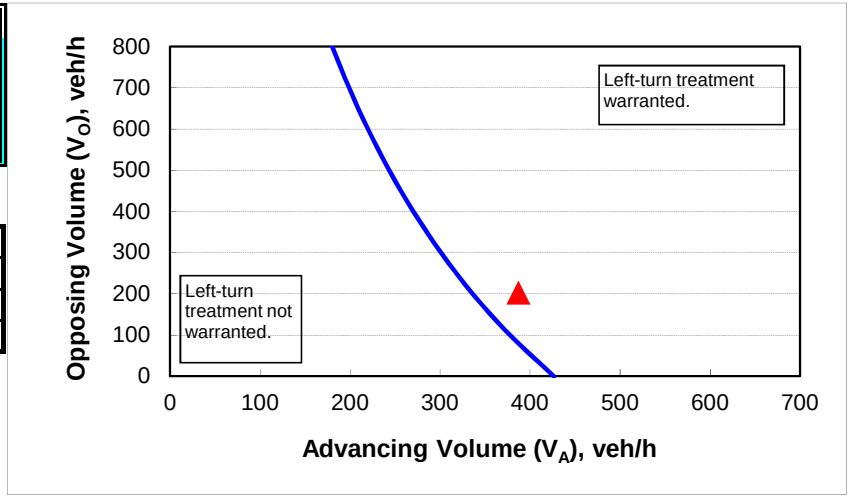
**2-lane roadway (English)**

INPUT

| Variable | Value |
|---|---|
| 85th percentile speed, mph: | 35 |
| Percent of left-turns in advancing volume ($V_A$), %: | 25% |
| Advancing volume ($V_A$), veh/h: | 387 |
| Opposing volume ($V_O$), veh/h: | 202 |

OUTPUT

| Variable | Value |
|---|---|
| Limiting advancing volume ($V_A$), veh/h: | 336 |
| **Guidance for determining the need for a major-road left-turn bay:** | |
| **Left-turn treatment warranted.** | |




CALIBRATION CONSTANTS

| Variable | Value |
|---|---|
| Average time for making left-turn, s: | 3.0 |
| Critical headway, s: | 5.0 |
| Average time for left-turn vehicle to clear the advancing lane, s: | 1.9 |

# Old Weisgarber Access - Phase 3 - PM Peak Period

**Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.**

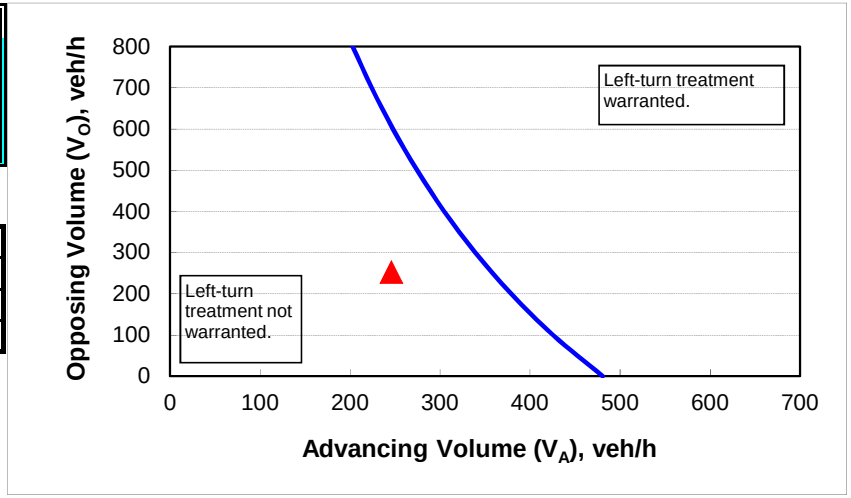
**2-lane roadway (English)**

INPUT

| Variable | Value |
|---|---|
| 85th percentile speed, mph: | 35 |
| Percent of left-turns in advancing volume ($V_A$), %: | 18% |
| Advancing volume ($V_A$), veh/h: | 246 |
| Opposing volume ($V_O$), veh/h: | 253 |

OUTPUT

| Variable | Value |
|---|---|
| Limiting advancing volume ($V_A$), veh/h: | 357 |
| **Guidance for determining the need for a major-road left-turn bay:** | |
| **Left-turn treatment NOT warranted.** | |




CALIBRATION CONSTANTS

| Variable | Value |
|---|---|
| Average time for making left-turn, s: | 3.0 |
| Critical headway, s: | 5.0 |
| Average time for left-turn vehicle to clear the advancing lane, s: | 1.9 |

# Old Weisgarber Access - Phase 3 - AM Peak Period

**Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.**

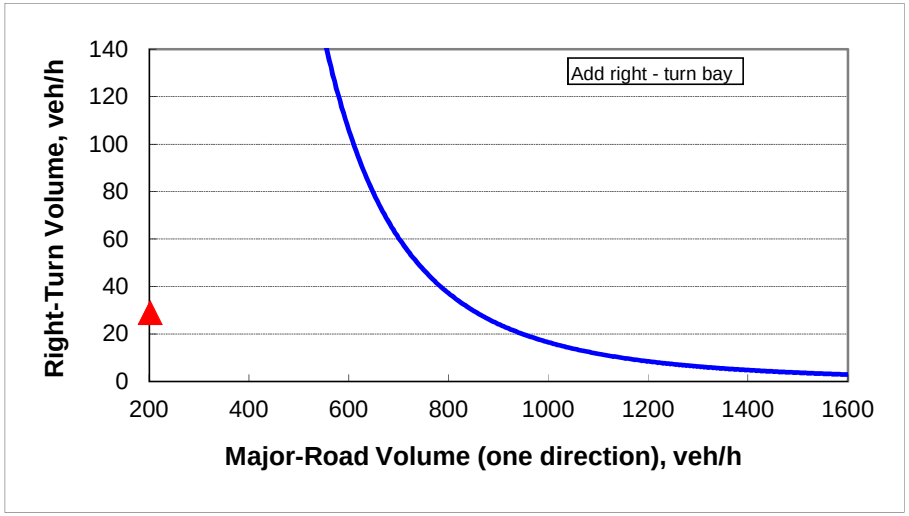
INPUT

| Roadway geometry: | 2-lane roadway |
|---|---|

| Variable | Value |
|---|---|
| Major-road speed, mph: | 35 |
| Major-road volume (one direction), veh/h: | 202 |
| Right-turn volume, veh/h: | 29 |

OUTPUT

| Variable | Value |
|---|---|
| Limiting right-turn volume, veh/h: | 5548 |
| **Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:** | |
| **Do NOT add right-turn bay.** | |



# Old Weisgarber Access - Phase 3 - PM Peak Period

**Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.**

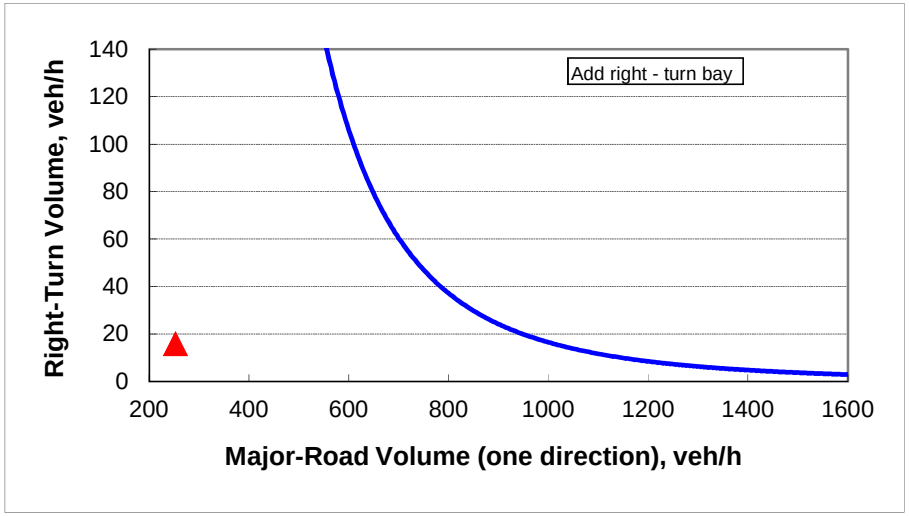
INPUT

| Roadway geometry: | 2-lane roadway |
|---|---|

| Variable | Value |
|---|---|
| Major-road speed, mph: | 35 |
| Major-road volume (one direction), veh/h: | 253 |
| Right-turn volume, veh/h: | 16 |

OUTPUT

| Variable | Value |
|---|---|
| Limiting right-turn volume, veh/h: | 2447 |
| **Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:** | |
| **Do NOT add right-turn bay.** | |



# Appendix XIV – Bus Routes

# 19 LAKESHORE/LONAS CONNECTOR

*(Weekdays and Saturdays)*

**SERVES:**

- Earth Fare
- Lakeshore Park
- Lonas Road
- South College, Main Campus
- Hammond Apartments
- Weisgarber Post Office

kat KNOXVILLE AREA TRANSIT

**Information Updated: February 2017**

| | Going from Earth Fare to Middlebrook Heights | | | Going from Middlebrook Heights to Earth Fare | | | |
|---|---|---|---|---|---|---|---|
| | Transfer to: | | | | | | Rts. 11 & 17 |
| | Earth Fare (at Forest Park) 1 | Veterans Cemetary 2 | Lonas at Coleman 3 | Hammond Apts. 4 | Dowell Springs 5 | Lyons View at Lakeshore 6 | Earth Fare (at Forest Park) 7 |
| **WEEKDAY SCHEDULE** | | | | | | | |
| A.M. | 6:30 | 6:33 | 6:40 | 6:50 | 7:04 | 7:17 | 7:26 |
| | 7:30 | 7:33 | 7:40 | 7:50 | 8:04 | 8:17 | 8:26 |
| | 8:30 | 8:33 | 8:40 | 8:50 | 9:04 | 9:17 | 9:26 |
| | 9:30 | 9:33 | 9:40 | 9:50 | 10:04 | 10:17 | 10:26 |
| | 10:30 | 10:33 | 10:40 | 10:50 | 11:04 | 11:17 | 11:26 |
| | 11:30 | 11:33 | 11:40 | 11:50 | **12:04** | **12:17** | 12:26 |
| **P.M.** | **12:30** | **12:33** | **12:40** | **12:50** | **1:04** | **1:17** | **1:26** |
| | **1:30** | **1:33** | **1:40** | **1:50** | **2:04** | **2:17** | **2:26** |
| | **2:30** | **2:33** | **2:40** | **2:50** | **3:04** | **3:17** | **3:26** |
| | **3:30** | **3:33** | **3:40** | **3:50** | **4:04** | **4:17** | **4:26** |
| | **4:30** | **4:33** | **4:40** | **4:50** | **5:04** | **5:17** | **5:26** |
| | **5:30** | **5:33** | **5:40** | **5:50** | **6:04** | **6:17** | **6:26** |
| **SATURDAY SCHEDULE** | | | | | | | |
| A.M. | 8:30 | 8:33 | 8:40 | 8:50 | 9:04 | 9:17 | 9:26 |
| | 9:30 | 9:33 | 9:40 | 9:50 | 10:04 | 10:17 | 10:26 |
| | 10:30 | 10:33 | 10:40 | 10:50 | 11:04 | 11:17 | 11:26 |
| | 11:30 | 11:33 | 11:40 | 11:50 | **12:04** | **12:17** | **12:26** |
| **P.M.** | **12:30** | **12:33** | 12:40 | 12:50 | **1:04** | **1:17** | **1:26** |
| | **1:30** | **1:33** | 1:40 | **1:50** | **2:04** | **2:17** | **2:26** |
| | **2:30** | **2:33** | **2:40** | **2:50** | **3:04** | **3:17** | **3:26** |
| | **3:30** | **3:33** | **3:40** | **3:50** | **4:04** | **4:17** | **4:26** |
| | **4:30** | **4:33** | **4:40** | **4:50** | **5:04** | **5:17** | **5:26** |
| | **5:30** | **5:33** | **5:40** | **5:50** | **6:04** | **6:17** | **6:26** |

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# 90 CROSSTOWN CONNECTOR

*(Weekdays and Saturdays)*

kat KNOXVILLE AREA TRANSIT

**SERVES:**

- 640 Plaza
- Fountain City Branch Library
- Knoxville Center Mall
- Knox Road/Kroger
- Northgate Shopping Center
- Northgate Terrace
- Norwood Branch Library
- West Town Mall

**Information Updated: August 20, 2018**

| | Going toward West Town Mall | | | | | | | Going toward Knoxville Center Mall | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T Transfer to: | | Rts. 22 & 24 | | Rt. 12 | | | Rt. 11 | | | Rt. 12 | | Rts. 22 & 24 | | Rt. 33 |
| | Knoxville Center Mall | Northgate Terrace | Fountain City Superstop | Merchants at Marguerite | Industrial Parkway | I-640 Plaza | Middlebrook at Vanosdale | West Town Mall | Vanosdale at Middlebrook | I-640 Plaza | Industrial Parkway | Merchants at Marguerite | Fountain City Superstop | Northgate Terrace | Knoxville Center Mall |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **WEEKDAY SCHEDULE** | | | | | | | | | | | | | | | |
| A.M. | | | | | | | | 6:01 | 6:06 | 6:22 | 6:28 | 6:37 | 7:05 | 7:11 | 7:25 |
| | | | 6:05 | 6:15 | 6:25 | 6:36 | 6:43 | 7:01 | 7:06 | 7:22 | 7:28 | 7:37 | 8:05 | 8:11 | 8:25 |
| | 6:30 | 6:45 | 7:05 | 7:15 | 7:25 | 7:36 | 7:43 | 8:01 | 8:06 | 8:22 | 8:28 | 8:37 | 9:05 | 9:11 | 9:25 |
| | 7:30 | 7:45 | 8:05 | 8:15 | 8:25 | 8:36 | 8:43 | 9:01 | 9:06 | 9:22 | 9:28 | 9:37 | 10:05 | 10:11 | 10:25 |
| | 8:30 | 8:45 | 9:05 | 9:15 | 9:25 | 9:36 | 9:43 | 10:01 | 10:06 | 10:22 | 10:28 | 10:37 | 11:05 | 11:11 | 11:25 |
| | 9:30 | 9:45 | 10:05 | 10:15 | 10:25 | 10:36 | 10:43 | 11:01 | 11:06 | 11:22 | 11:28 | 11:37 | **12:05** | **12:11** | **12:25** |
| | 10:30 | 10:45 | 11:05 | 11:15 | 11:25 | 11:36 | 11:43 | **12:01** | **12:06** | **12:22** | **12:28** | **12:37** | **1:05** | **1:11** | **1:25** |
| | 11:30 | 11:45 | **12:05** | **12:15** | **12:25** | **12:36** | **12:43** | **1:01** | **1:06** | **1:22** | **1:28** | **1:37** | **2:05** | **2:11** | **2:25** |
| P.M. | **12:30** | **12:45** | **1:05** | **1:15** | **1:25** | **1:36** | **1:43** | **2:01** | **2:06** | **2:22** | **2:28** | **2:37** | **3:05** | **3:11** | **3:25** |
| | **1:30** | **1:45** | **2:05** | **2:15** | **2:25** | **2:36** | **2:43** | **3:01** | **3:06** | **3:22** | **3:28** | **3:37** | **4:05** | **4:11** | **4:25** |
| | **2:30** | **2:45** | **3:05** | **3:15** | **3:25** | **3:36** | **3:43** | **4:01** | **4:06** | **4:22** | **4:28** | **4:37** | **5:05** | **5:11** | **5:25** |
| | **3:30** | **3:45** | **4:05** | **4:15** | **4:25** | **4:36** | **4:43** | **5:01** | **5:06** | **5:22** | **5:28** | **5:37** | **6:05** | **6:11** | **6:25** |
| | **4:30** | **4:45** | **5:05** | **5:15** | **5:25** | **5:36** | **5:43** | **6:01** | **6:06** | **6:22** | **6:28** | **6:37** | **7:05** | **7:11** | **7:25** |
| | **5:30** | **5:45** | **6:05** | **6:15** | **6:25** | **6:36** | **6:43** | **7:01** | **7:06** | **7:22** | **7:28** | **7:37** | **8:15** | **8:21** | **8:35** |
| | **6:30** | **6:45** | **7:05** | **7:15** | **7:25** | **7:36** | **7:43** | **7:59** | *To Garage* | | | | | | |
| | **7:30** | **7:45** | **8:05** | **8:15** | **8:25** | **8:36** | **8:43** | **8:59** | *To Garage* | | | | | | |
| **SATURDAY SCHEDULE** | | | | | | | | | | | | | | | |
| A.M. | | | | | | | | 7:31 | 7:36 | 7:52 | 7:58 | 8:07 | 8:35 | 8:41 | 8:55 |
| | 7:00 | 7:15 | 7:35 | 7:45 | 7:55 | 8:06 | 8:13 | 8:31 | 8:36 | 8:52 | 8:58 | 9:07 | 9:35 | 9:41 | 9:55 |
| | 8:00 | 8:15 | 8:35 | 8:45 | 8:55 | 9:06 | 9:13 | 9:31 | 9:36 | 9:52 | 9:58 | 10:07 | 10:35 | 10:41 | 10:55 |
| | 9:00 | 9:15 | 9:35 | 9:45 | 9:55 | 10:06 | 10:13 | 10:31 | 10:36 | 10:52 | 10:58 | 11:07 | 11:35 | 11:41 | 11:55 |
| | 10:00 | 10:15 | 10:35 | 10:45 | 10:55 | 11:06 | 11:13 | 11:31 | 11:36 | 11:52 | 11:58 | **12:07** | **12:35** | **12:41** | **12:55** |
| | 11:00 | 11:15 | 11:35 | 11:45 | 11:55 | **12:06** | **12:13** | **12:31** | **12:36** | **12:52** | **12:58** | **1:07** | **1:35** | **1:41** | **1:55** |
| P.M. | **12:00** | **12:15** | **12:35** | **12:45** | **12:55** | **1:06** | **1:13** | **1:31** | **1:36** | **1:52** | **1:58** | **2:07** | **2:35** | **2:41** | **2:55** |
| | **1:00** | **1:15** | **1:35** | **1:45** | **1:55** | **2:06** | **2:13** | **2:31** | **2:36** | **2:52** | **2:58** | **3:07** | **3:35** | **3:41** | **3:55** |
| | **2:00** | **2:15** | **2:35** | **2:45** | **2:55** | **3:06** | **3:13** | **3:31** | **3:36** | **3:52** | **3:58** | **4:07** | **4:35** | **4:41** | **4:55** |
| | **3:00** | **3:15** | **3:35** | **3:45** | **3:55** | **4:06** | **4:13** | **4:31** | **4:36** | **4:52** | **4:58** | **5:07** | **5:35** | **5:41** | **5:55** |
| | **4:00** | **4:15** | **4:35** | **4:45** | **4:55** | **5:06** | **5:13** | **5:31** | **5:36** | **5:52** | **5:58** | **6:07** | **6:35** | **6:41** | **6:55** |
| | **5:00** | **5:15** | **5:35** | **5:45** | **5:55** | **6:06** | **6:13** | **6:31** | **6:36** | **6:52** | **6:58** | **7:07** | **7:35** | **7:41** | **7:55** |
| | **6:00** | **6:15** | **6:35** | **6:45** | **6:55** | **7:06** | **7:13** | **7:31** | **7:36** | **7:52** | **7:58** | **8:07** | **8:35** | **8:41** | **8:55** |
| | **7:00** | **7:15** | **7:35** | **7:45** | **7:55** | **8:06** | **8:13** | **8:31** | *To Garage* | | | | | | |

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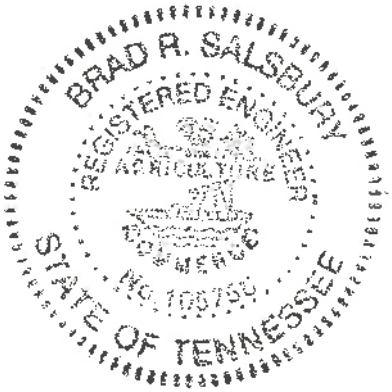
# Appendix XV – Sight Distance Diagram

# Sight Distance Study
# Tennova Middlebrook Pike Medical Park
# Knoxville, Tennessee
# S&ME Project No. 5143-18-012




PREPARED FOR:

**Community Health Systems Professional Services Corporation**
**4000 Meridian Blvd**
**Franklin, TN 37067**

PREPARED BY:

**S&ME, Inc.**
**6515 Nightingale Lane**
**Knoxville, TN 37909**

**Revised June 10, 2019**

June 10, 2019

Community Health Systems Professional Services Corporation
4000 Meridian Blvd
Franklin, TN 37067

Attention: Mr. Dean Tiratto

Reference: **Sight Distance Study**
**Tennova Middlebrook Pike Medical Park**
Knoxville, Tennessee
S&ME Project No. 5143-18-012

Dear Mr. Tiratto:

This report outlines the means and methods used to measure and assess sight distance for the proposed intersections included in Phase 1 of the development of Middlebrook Pike Medical Park. The site distance evaluation techniques were used in accordance with City of Knoxville, Tennessee Department of Transportation (TDOT) and the American Society of State Highway and Traffic Officials (AASTHO) standards. Please contact the undersigned with any questions or concerns.

Sincerely,

**S&ME, Inc.**

Brad Salsbury
Senior Project Manager

Darren Roan
Engineer in Training

# Table of Contents



## Appendices

# 1.0 Introduction

This sight distance report has been prepared to evaluate sight distance requirements for the proposed development of the Middlebrook Pike Medical Park site as well as to identify any obstructions that will need to be addressed during the formal design of the proposed intersections. The project site is located in Knoxville, Tennessee, on the south side of Middlebrook Pike (SR 169), west of Old Weisgarber Road. The proposed intersections include a signal controlled intersection at Middlebrook Pike and Dowell Springs Boulevard as well as right-in-right-out access located southeast of Dick Lonas Road intersection. The proposed intersections can be seen on Figure 1A located in Appendix I.

# 2.0 Design Values

The posted speed limit on Middlebrook Pike is 50 mph. Based on the Knoxville-Knox County Subdivision Regulations the sight distance is to be 10x the posted speed limit or 500 ft. in this case. The ASSHTO Policy on Geometric Design of Highways and Streets (The Green Book) was also consulted to make sure that the design sight distances were sufficient to meet TDOT standards. The longitudinal slope along this section of Middlebrook Pike is less than +/- 3% therefore no sight distances were adjusted for vertical grades, as recommended within the AASHTO guidelines.

## 2.1 Dowell Springs Boulevard

The Dowell Springs Road intersection sight distance falls into Class D for Intersections with Traffic Signal Controls. Right turn on red is planned for the proposed intersection; therefore, based on Class D, the sight distance for the right turning vehicle should be checked for sight distance equivalent to Case B2-Right Turn from Minor Road. It is not anticipated that the signal will be used in a flashing yellow configuration during low volume times; therefore, the sight distance to the right was not include in this analysis. Based on Case B2 in a posted 50 mph section, the intersection sight distance is 480 ft. The Knoxville subdivision regulations require 500 ft. and are more conservative and 500 ft. was used in this analysis. The sight triangle created at this location can be seen on Figure 1A located in Appendix I.

## 2.2 Dick Lonas Road

The right-in-right-out intersection near Dick Lonas Road falls under Case B2- Right Turn from Stop, which also has intersection sight distance of 480 ft. The Knoxville Subdivision regulations are still more conservative and a design sight distance of 500 ft. was used. Due to the nature of the intersection, only the sight distance to the left was verified. The sight triangle created at this location can be seen on Figure 1A located in Appendix I.

## 2.3 Middlebrook Pike - Left turns

The existing left turn from east bound Middlebrook Pike onto Dowell Springs Blvd. has a protected and a permissive phase. The left turn into the development will initially have one left turn lane that will have a protective and permissive component as well. After conversations with TDOT, the intention is that the intersection will be built with two left turn lanes into the proposed site, one of which will be striped off until it is required by one of

the later phases of development. Based on this situation the southernmost left turn lane was analyzed for sight distance.

The sight distance for these left turns yield falls into ASSHTO Class D, which refers to Case B1, Left Turn from Stop. Since in both cases the vehicles will be crossing 2 lanes of traffic, the sight distance was adjusted to account for the extra time it takes to cross the traffic. The adjusted sight distance was calculated based on equation 9-1 below.

$$ISD = 1.47 * V_{major} t_g$$

ISD - Intersection Sight Distance, ft.
$V_{major}$ - Design speed of major road, mph
$T_g$ - Time gap for vehicle to enter road, seconds

The time gap was increased from 7.5 seconds to 8.0 seconds for a passenger vehicle, to account for the extra lane of traffic crossed. Based on these inputs the ASSHTO design sight distance is 588 ft. This distance was rounded to 590 ft. for design, which is greater than the Knoxville Subdivision regulations. 590 ft. was used as the design sight distance for both left turn conditions.

## 3.0 Verification

Sight distance triangles for the proposed access locations were observed in the field. The sight distance was observed based on a standard passenger car with an observation height of 3.5 ft. and an object height of 3.5 ft. based on the field observations, the following sight distances were observed. It is assumed that the site will be cleared of trees and shrubs 20 ft. back from the right-of-way.

**Table 3-1 – Design and Observed Sight Distances**

| Location | Design Sight Distance (ft.) | Observed Sight Distance (ft.) |
|---|---|---|
| Dowell Springs Blvd. – Right on Red | 500 | >500 |
| Dick Lonas Rd. – Right-out | 500 | >500 |
| Left turn into Development at Dowell Springs Blvd. | 590 | >590 |
| Left turn onto Dowell Springs Blvd. | 590 | >590 |

## 4.0 Obstructions

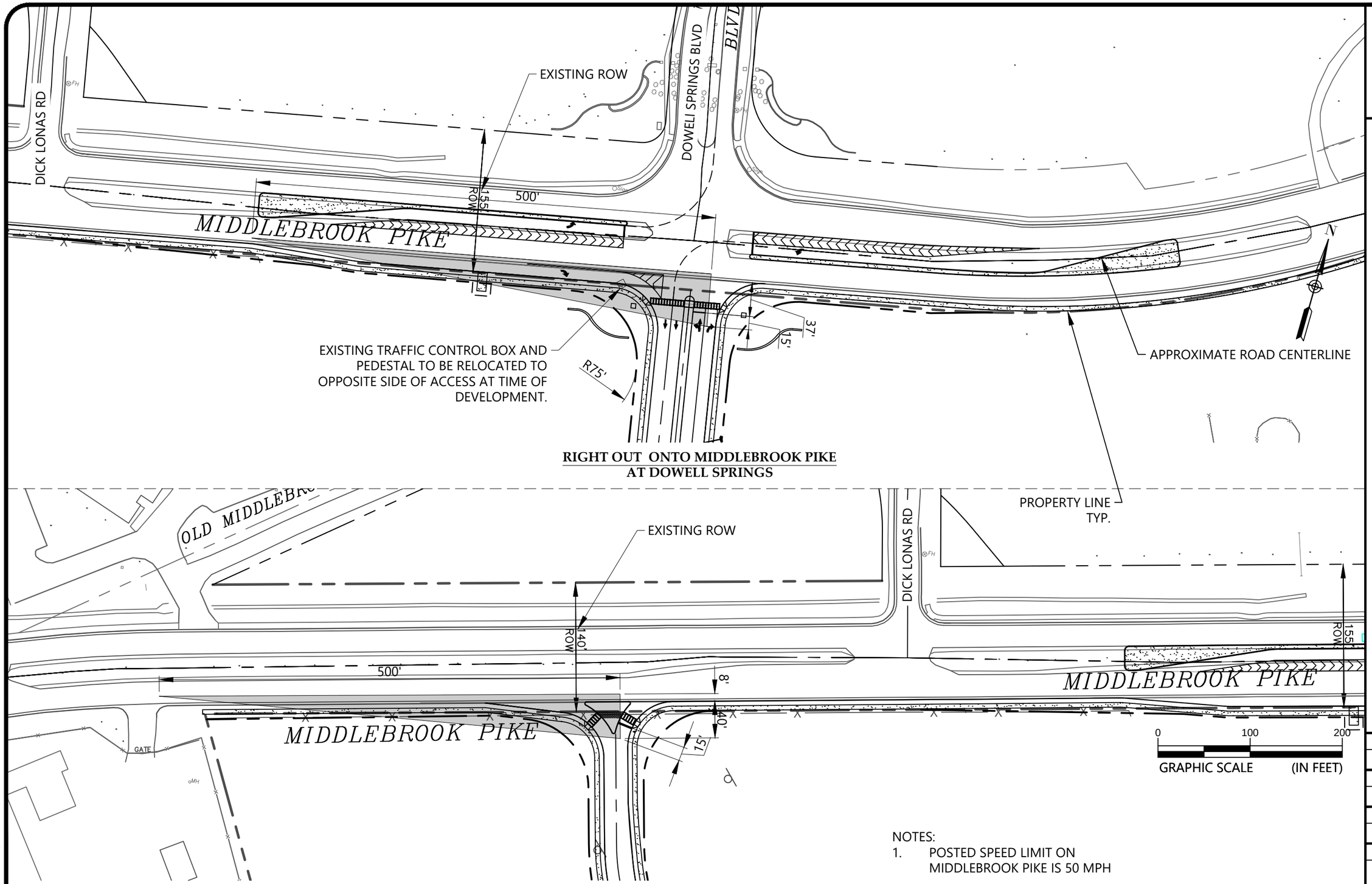
The following lists the observed obstructions located within the observed sight triangles.
Right-out onto Middlebrook Pike near Dick Lonas:

- The existing traffic control box is located in the line of sight.
  - This traffic control box will be relocated outside of the line of sight at the time of development.

The observed obstructions and their approximate locations are depicted on the figures located in Appendix I.

# Appendices

# Appendix I –Figures



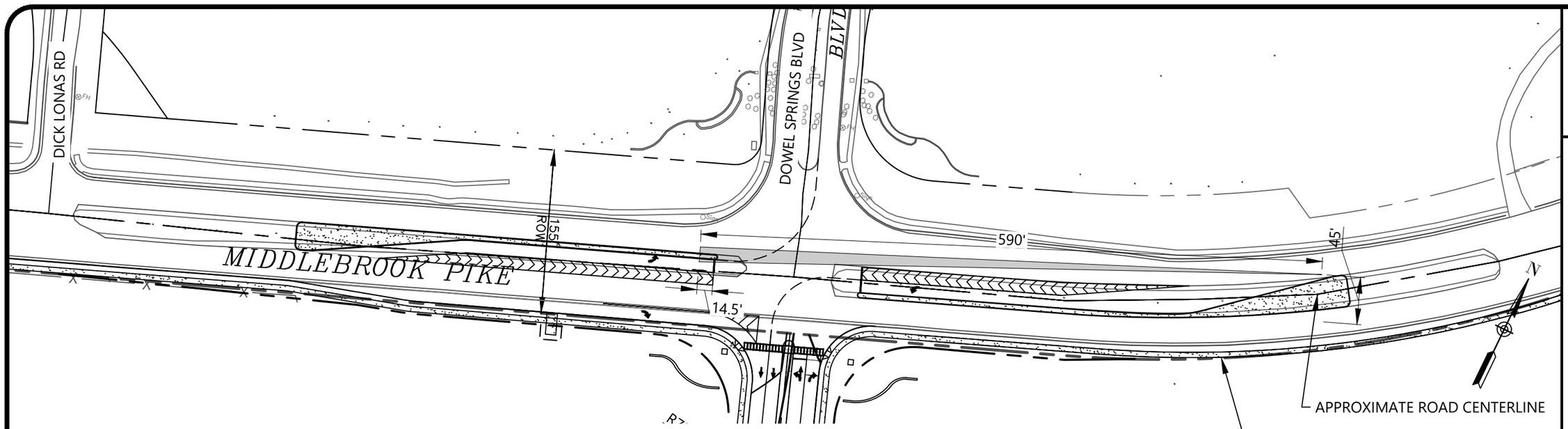

NOTES:
1. POSTED SPEED LIMIT ON MIDDLEBROOK PIKE IS 50 MPH

**SIGHT DISTANCE EXHIBIT**

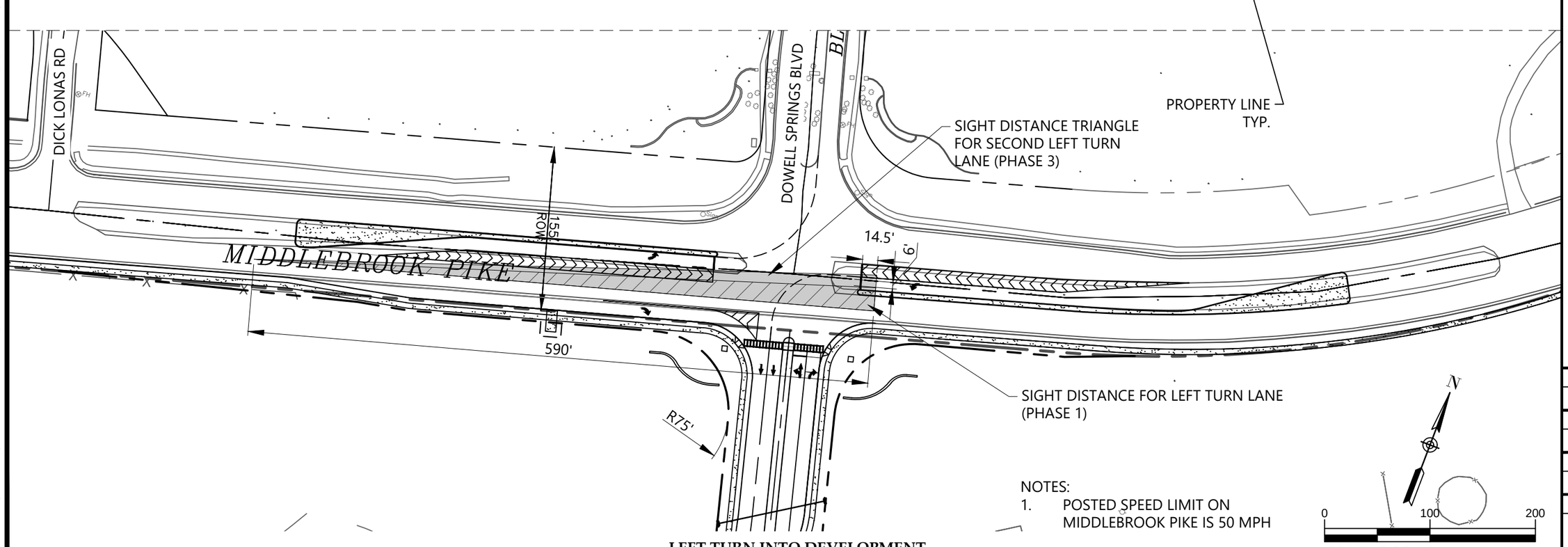
TENNOVA MEDICAL PARK
0 MIDDLEBROOK PIKE
KNOXVILLE, TENNESSEE 37909

| | |
|---|---|
| SCALE: | 1" = 100' |
| DATE: | 5/23/2019 |
| PROJECT NUMBER | 5143-18-012 |
| FIGURE NO. | 1A |

Drawing path: t:\Projects\2018\P&D\5143-18-012_middlebrook_pike_medical_park\CAD\construction\5143-18-012_sd_EXHIBIT.dwg




**LEFT TURN ONTO DOWELL SPRINGS BLVD**




**LEFT TURN INTO DEVELOPMENT**

NOTES:
1. POSTED SPEED LIMIT ON MIDDLEBROOK PIKE IS 50 MPH

# LEFT TURN SIGHT DISTANCE EXHIBIT

TENNOVA MEDICAL PARK
0 MIDDLEBROOK PIKE
KNOXVILLE, TENNESSEE 37909

| | |
|---|---|
| SCALE: | 1" = 100' |
| DATE: | 6/10/19 |
| PROJECT NUMBER | 5143-18-012 |
| FIGURE NO. | 1B |

Drawing path: t:\Projects\2018\P&D\5143-18-012_middlebrook_pike_medical_park\CAD\construction\5143-18-012_sd_EXHIBIT.dwg

# Appendix XVI – Roundabout Analysis

# MOVEMENT SUMMARY

## Site: 101 [AM Peak Period]

New Site
Site Category: (None)
Roundabout

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance ft | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed mph |
| South: South Leg | | | | | | | | | | | | |
| 3 | L2 | 17 | 3.0 | 0.092 | 4.5 | LOS A | 0.4 | 9.8 | 0.43 | 0.31 | 0.43 | 26.4 |
| 8 | T1 | 62 | 3.0 | 0.092 | 4.5 | LOS A | 0.4 | 9.8 | 0.43 | 0.31 | 0.43 | 23.6 |
| 18 | R2 | 11 | 3.0 | 0.092 | 4.5 | LOS A | 0.4 | 9.8 | 0.43 | 0.31 | 0.43 | 26.0 |
| Approach | | 90 | 3.0 | 0.092 | 4.5 | LOS A | 0.4 | 9.8 | 0.43 | 0.31 | 0.43 | 24.6 |
| East: East Leg | | | | | | | | | | | | |
| 1 | L2 | 35 | 3.0 | 0.197 | 4.9 | LOS A | 0.9 | 24.0 | 0.32 | 0.19 | 0.32 | 24.5 |
| 6 | T1 | 104 | 3.0 | 0.197 | 4.9 | LOS A | 0.9 | 24.0 | 0.32 | 0.19 | 0.32 | 29.7 |
| 16 | R2 | 88 | 3.0 | 0.197 | 4.9 | LOS A | 0.9 | 24.0 | 0.32 | 0.19 | 0.32 | 27.3 |
| Approach | | 227 | 3.0 | 0.197 | 4.9 | LOS A | 0.9 | 24.0 | 0.32 | 0.19 | 0.32 | 28.2 |
| North: Dowell Springs | | | | | | | | | | | | |
| 7 | L2 | 171 | 3.0 | 0.479 | 8.4 | LOS A | 3.1 | 80.6 | 0.47 | 0.31 | 0.47 | 25.1 |
| 4 | T1 | 187 | 3.0 | 0.479 | 8.4 | LOS A | 3.1 | 80.6 | 0.47 | 0.31 | 0.47 | 18.7 |
| 14 | R2 | 187 | 3.0 | 0.479 | 8.4 | LOS A | 3.1 | 80.6 | 0.47 | 0.31 | 0.47 | 24.8 |
| Approach | | 545 | 3.0 | 0.479 | 8.4 | LOS A | 3.1 | 80.6 | 0.47 | 0.31 | 0.47 | 23.3 |
| West: West Approach | | | | | | | | | | | | |
| 5 | L2 | 62 | 3.0 | 0.255 | 6.7 | LOS A | 1.2 | 29.9 | 0.54 | 0.47 | 0.54 | 26.3 |
| 2 | T1 | 70 | 3.0 | 0.255 | 6.7 | LOS A | 1.2 | 29.9 | 0.54 | 0.47 | 0.54 | 28.3 |
| 12 | R2 | 95 | 3.0 | 0.255 | 6.7 | LOS A | 1.2 | 29.9 | 0.54 | 0.47 | 0.54 | 23.3 |
| Approach | | 226 | 3.0 | 0.255 | 6.7 | LOS A | 1.2 | 29.9 | 0.54 | 0.47 | 0.54 | 25.9 |
| All Vehicles | | 1088 | 3.0 | 0.479 | 7.0 | LOS A | 3.1 | 80.6 | 0.45 | 0.32 | 0.45 | 25.0 |

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

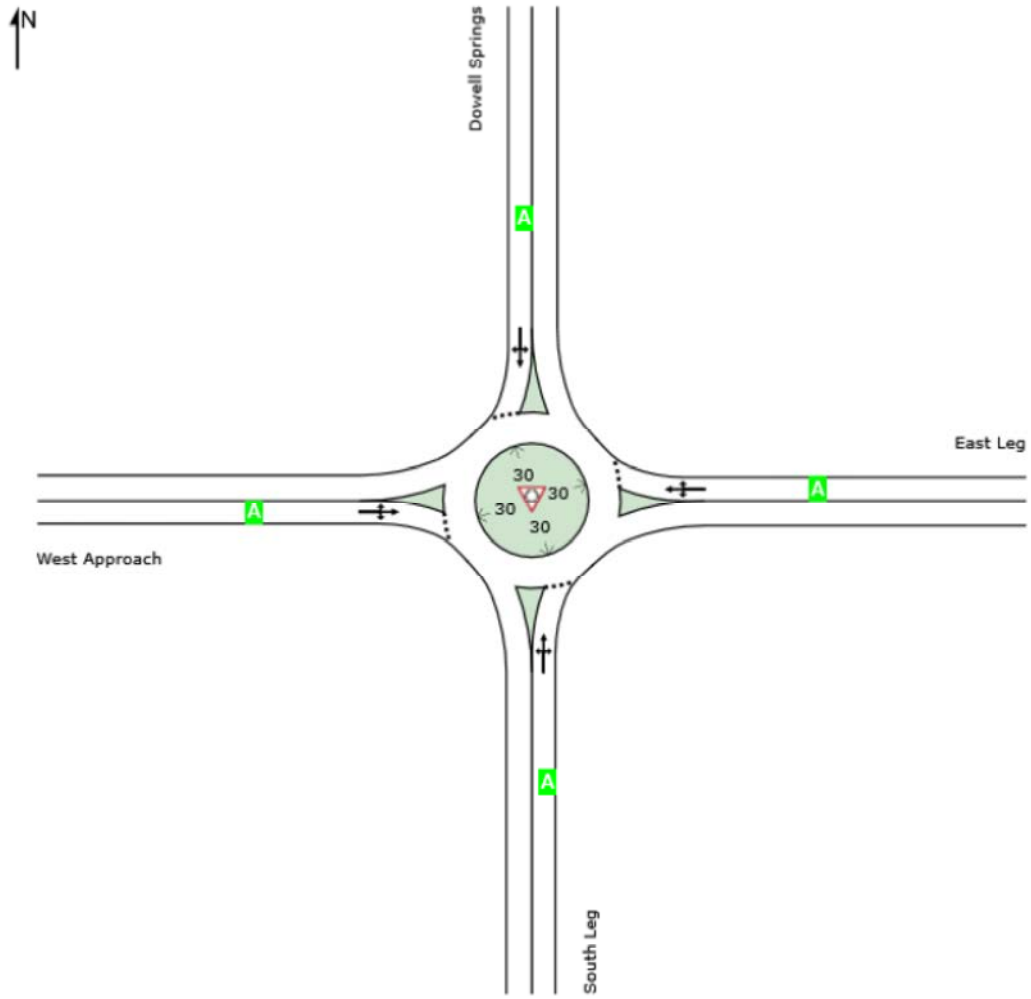
# LANE LEVEL OF SERVICE

## Lane Level of Service

### Site: 101 [AM Peak Period]

New Site
Site Category: (None)
Roundabout

| | Approaches | | | | Intersection |
|---|---|---|---|---|---|
| | South | East | North | West | |
| LOS | A | A | A | A | A |




Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

# MOVEMENT SUMMARY

## Site: 101 [PM Peak Period]

New Site
Site Category: (None)
Roundabout

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance ft | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed mph |
| South: South Leg | | | | | | | | | | | | |
| 3 | L2 | 53 | 3.0 | 0.377 | 8.7 | LOS A | 1.9 | 47.5 | 0.62 | 0.59 | 0.62 | 23.4 |
| 8 | T1 | 221 | 3.0 | 0.377 | 8.7 | LOS A | 1.9 | 47.5 | 0.62 | 0.59 | 0.62 | 20.2 |
| 18 | R2 | 42 | 3.0 | 0.377 | 8.7 | LOS A | 1.9 | 47.5 | 0.62 | 0.59 | 0.62 | 23.1 |
| Approach | | 316 | 3.0 | 0.377 | 8.7 | LOS A | 1.9 | 47.5 | 0.62 | 0.59 | 0.62 | 21.3 |
| East: East Leg | | | | | | | | | | | | |
| 1 | L2 | 16 | 3.0 | 0.453 | 10.5 | LOS B | 2.8 | 71.7 | 0.68 | 0.75 | 0.86 | 21.2 |
| 6 | T1 | 139 | 3.0 | 0.453 | 10.5 | LOS B | 2.8 | 71.7 | 0.68 | 0.75 | 0.86 | 26.7 |
| 16 | R2 | 205 | 3.0 | 0.453 | 10.5 | LOS B | 2.8 | 71.7 | 0.68 | 0.75 | 0.86 | 24.2 |
| Approach | | 361 | 3.0 | 0.453 | 10.5 | LOS B | 2.8 | 71.7 | 0.68 | 0.75 | 0.86 | 25.1 |
| North: Dowell Springs | | | | | | | | | | | | |
| 7 | L2 | 117 | 3.0 | 0.273 | 6.0 | LOS A | 1.4 | 35.0 | 0.42 | 0.29 | 0.42 | 26.4 |
| 4 | T1 | 88 | 3.0 | 0.273 | 6.0 | LOS A | 1.4 | 35.0 | 0.42 | 0.29 | 0.42 | 20.2 |
| 14 | R2 | 88 | 3.0 | 0.273 | 6.0 | LOS A | 1.4 | 35.0 | 0.42 | 0.29 | 0.42 | 26.1 |
| Approach | | 293 | 3.0 | 0.273 | 6.0 | LOS A | 1.4 | 35.0 | 0.42 | 0.29 | 0.42 | 24.9 |
| West: West Approach | | | | | | | | | | | | |
| 5 | L2 | 221 | 3.0 | 0.346 | 6.9 | LOS A | 1.9 | 47.5 | 0.47 | 0.34 | 0.47 | 25.6 |
| 2 | T1 | 107 | 3.0 | 0.346 | 6.9 | LOS A | 1.9 | 47.5 | 0.47 | 0.34 | 0.47 | 27.7 |
| 12 | R2 | 40 | 3.0 | 0.346 | 6.9 | LOS A | 1.9 | 47.5 | 0.47 | 0.34 | 0.47 | 22.7 |
| Approach | | 367 | 3.0 | 0.346 | 6.9 | LOS A | 1.9 | 47.5 | 0.47 | 0.34 | 0.47 | 26.0 |
| All Vehicles | | 1338 | 3.0 | 0.453 | 8.1 | LOS A | 2.8 | 71.7 | 0.55 | 0.50 | 0.60 | 24.7 |

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

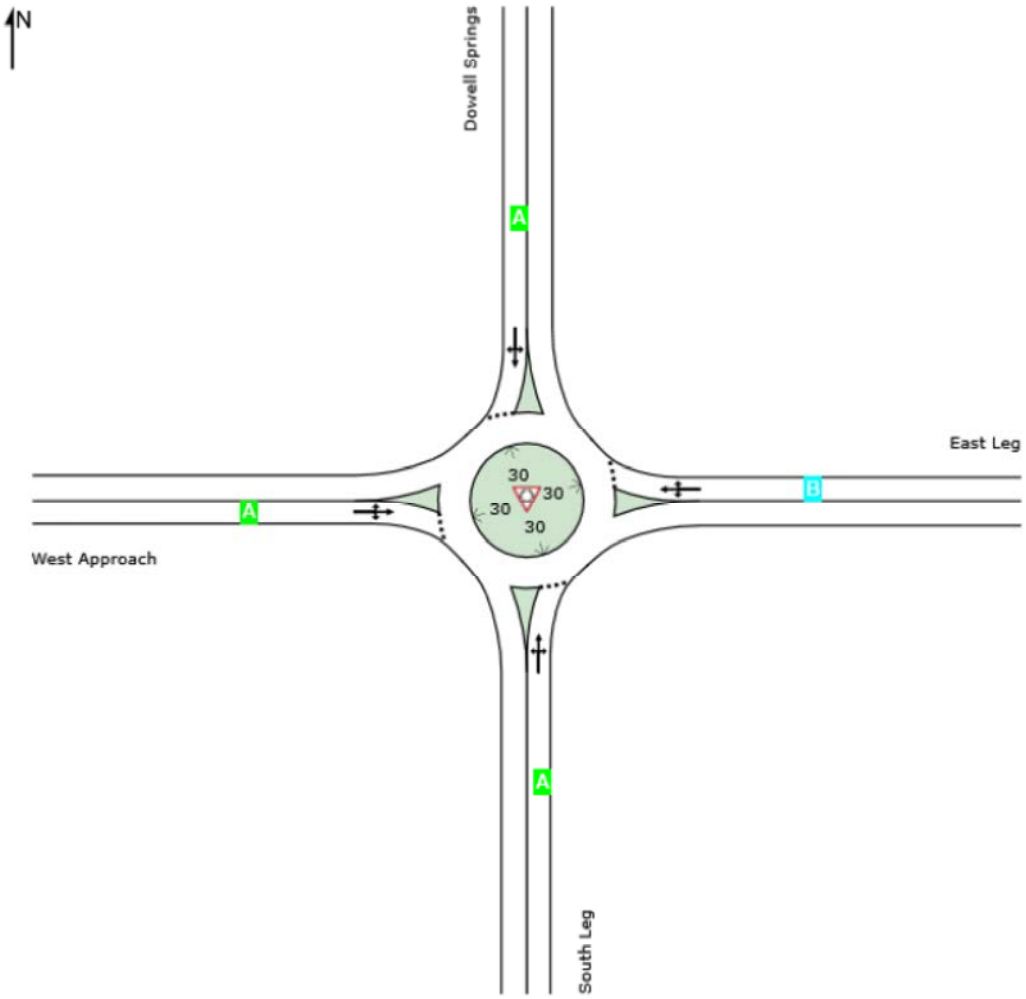
# LANE LEVEL OF SERVICE

## Lane Level of Service

### Site: 101 [PM Peak Period]

New Site
Site Category: (None)
Roundabout

| | Approaches | | | | Intersection |
|---|---|---|---|---|---|
| | South | East | North | West | |
| LOS | A | B | A | A | A |




Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

# Appendix XVII – Comment Response Letter

# Memorandum

**To:** Tarren Barrett, EIT

**From:** S&ME, Inc.

**Cc:** Mike Reynolds, AICP, Knoxville-Knox County Planning
Mike Conger, PE, Knoxville-Knox County Planning
Curtis Williams, PE, City of Knoxville
Evan Hoffman, City of Knoxville
Duane Rainbolt, TDOT
Bryan Bartnik, PE, TDOT
Nathan Vatter, PE, TDOT

**Date:** September 23, 2019

**Subject:** Response to comments received on September 18, 2019 from City of Knoxville concerning the Revised Traffic Impact Study for Middlebrook Pike Medical Park.

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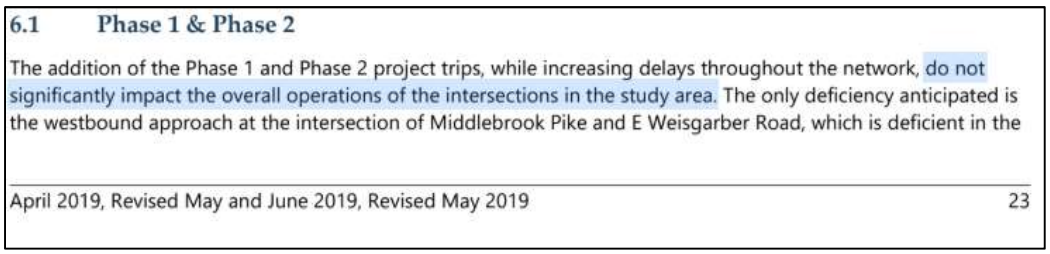
This memo serves a comment response letter for the comments received on

1 **On page 25, please correct the following:**

a. **Section 6.0 – The report stating that "the project trips do not contribute significantly to the delays at the surrounding intersections" should not be stated. Please remove this statement since there is plenty of data within the report that states otherwise.**

- *S&ME: This statement has been removed and the conclusions clarified.* **Planning: The statement that was clarified (in 6.1 pg 23) needs to be modified or removed since the development does have an "impact on the overall operations of the intersections in the study area," due to the increase of delay and LOS.** *S&ME: The statement has been modified to acknowledge the impact of the development to the surrounding conditions.* **Planning: Please see our previous comment & image below.**



6.1 Phase 1 & Phase 2

The addition of the Phase 1 and Phase 2 project trips, while increasing delays throughout the network, do not significantly impact the overall operations of the intersections in the study area. The only deficiency anticipated is the westbound approach at the intersection of Middlebrook Pike and E Weisgarber Road, which is deficient in the

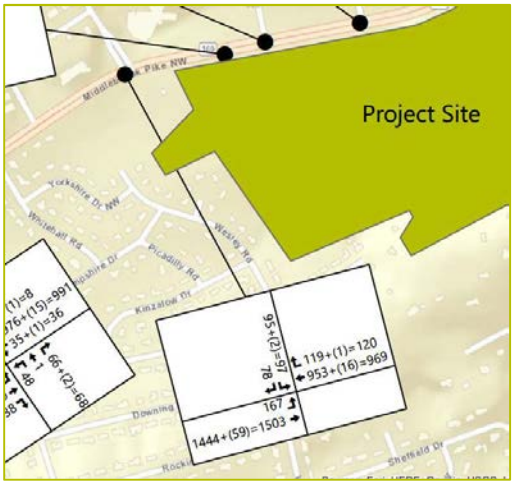
April 2019, Revised May and June 2019, Revised May 2019 23

Response: We have corrected the sentence to represent the correct conclusion, see screen shot below:

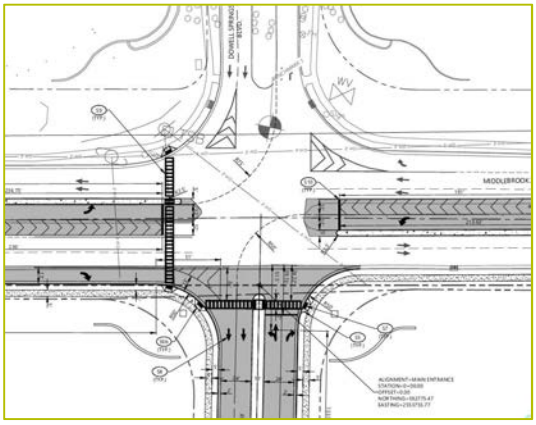
### 6.1 Phase 1 & Phase 2

The addition of the Phase 1 and Phase 2 project trips, increases delays throughout the network and does significantly impact the overall operations of the intersections in the study area. The only deficiency anticipated is the westbound approach at the intersection of Middlebrook Pike and E Weisgarber Road, which is deficient in the

2 **Figure 4-6: Middlebrook & Lake Brook: The diagram for the intersection was not updated and is identical to the diagram for this intersection on Figure 4-4. Please update to correct values. All values were correct in Appendix & analyses.** *S&ME: The figure was updated in the report.* **Planning: This was not corrected, please revise from the attached Figure 4-6 comments.**
Response: We have corrected the Figure, see screen shot below:



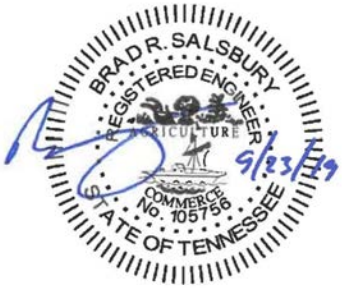

3 **Will there be pedestrian improvements across Middlebrook Pike between Dowell Springs and the new development? There are walking trails in the Dowell Springs development north of Middlebrook, and a greenway south of Middlebrook.** *S&ME: Yes, a pedestrian crossing will be installed on Middlebrook Pike.* **Planning: Please add a figure identifying how the pedestrian crossing will work across Middlebrook Pike. Planning, City & TDOT staff need to review this to understand if there will be pedestrian refuges, etc. considered with the long crosswalk across Middlebrook Pike.**
Response: We have added the permit drawing that shows the cross walk to Appendix II. See screen Shot below:



A PDF of the Signed and Sealed letter and a PDF of the full revised TIS is included with this submittal. If you have any questions or comments please contact the undersigned at (865) 970-0003 or BSalsbury@smeinc.com,

Sincerely,

Brad Salsbury, PE
Senior Engineer and Project Manager



# Memorandum

**To:** Knoxville-Knox County Planning, TDOT and COK staff

**From:** S&ME, Inc.

**Date:** June 10, 2019

**Subject:** June 6, 2019 TIS comment responses

Below are the comments generated by the review of the Revised Traffic Impact Study for the Middlebrook Park Medical Park. Comments from the previous review that have been responded to and have been accepted have been italicized and the size reduced.

From Comment response letter, dated June 6, 2019:

1 ***On page iii, please correct the Figure numbers. There are two listings for Figure 4-3.***
   - *The Table of Appendices has been updated to reflect the correct Figure numbering.* ***Acceptable***

2 ***On page iv, please correct the Table number for Existing Level of Service to "2.1".***
   - *The Table of Tables has been updated to reflect the correct Table numbering.* ***Acceptable***

3 ***Throughout the report please correct the name of the development in the header to "Tennova", and the name of our agency to "Knoxville-Knox County Planning".***
   - *The name of the development has been updated to "Tennova Middlebrook Pike Medical Park", which is the official name of the project.* ***Acceptable***
   - *The report has been updated to reference Knoxville-Knox County Planning.* ***Acceptable***

4 ***On page 1 in reference to Appendix II – Conceptual Site Plan, the right-in/right-out access west of Dick Lonas Rd will need to be moved to ensure 250 ft of clearance between the nose of the median and the eastern-most driveway point of curvature (PC), per TDOT. Currently the spacing is around 135 ft. This will be discussed more during the Developer meeting for the site plan.***
   - *Per our initial discussions with TDOT, they recommended 100' from the nose of the intersection. We have discussed the placement with TDOT and relocated the access to the end of the taper for the left turn from Middlebrook Pike onto Dick Lonas Road. This placement will allow for access to the Dick Lonas turn as well as effectively eliminate the potential of left turn movements into the development from west bound Middlebrook Pike.* ***TDOT accepts this change.***

5 ***On page 2, the report says counts were taken on April 2nd, but the TMC sheet says March 13th. Please correct or explain. Also, there were noticeably different counts between the TMC and Synchro report sheets in the Appendix. Please explain.***
   - *Counts at the Middlebrook Pike/Vanosdale intersection were originally taken during spring break, but recounted on April 2nd due to the presence of schools on both the north and south approaches. The TMCs from April 2nd were used in the study, and have been added to the appendix, and all figures have been checked to reference the correct volumes.* ***Acceptable***

   a. ***Please indicate whether the existing signal timing plans were used. If they were not used, please add the existing signal timing plans for the associated signals in the analysis. Was there any analysis that included optimized signal timing?***
   - *The existing signal timing plans were used for the existing conditions. For future scenarios, the splits have been optimized at the intersection of Middlebrook Pike/Dowell Springs and Middlebrook Pike/Old Weisgarber due to the changes in project volumes; however, the overall signal cycle lengths have not been changed. Signal timing information has been added to Appendix III.* ***Acceptable***

**b. There were a few Synchro reports in the Appendix that were labeled "Improved". What are these reports referring to as "Improved"? Please discuss in the report.**

- *The appendices have been updated to include the correct documentation. There are no 'improved' Synchro reports. We apologize for confusion this may have caused.* **Correct the numbers in Figure 2-1 (Middlebrook Pk @ Francis Rd – AM RT, PM RT, & PM LT) The SB volumes have been corrected for the intersection of Middlebrook Pk @ Francis Rd on Figure 2-1.**

***6 Table 2-1 (pg 4) does not match all the Synchro reports in the Appendix. Please correct. The hard-copies provided did not have all the same Appendix items. Many were missing, duplicated, or misplaced between all the hard-copies.***

- *- The values in Table 2-1 have been verified with the attached Synchro reports, and the hard-copied appendices corrected.* ***Acceptable***

***7 In Table 4-1 (pg 6), please correct "North Weisgarber Rd (south)" to "East Weisgarber Rd (south)".***

- *The label was updated to reflect East Weisgarber Road in Table 4-1.* ***Acceptable***

***8 In Figure 4-2 & 4-3, please verify the distribution at Middlebrook Pike & Old Weisgarber Rd and Middlebrook Pike & Dowell Springs Blvd. The inbound distribution did not add up and some percentages looked like they were placed in the wrong direction.***

- *Figures 4-2 & 4-3 have been updated to ensure the percentages are shown for the correct movements, as shown in the calculations sheet in Appendix VI.* ***Acceptable***

*a.* ***Please ensure there is analysis (Figure, Table, etc.) with all phases (1, 2, & 3), which means there needs to be an overall analysis and trip distribution once Phase 3 is complete.***

- *The project traffic was assigned to the roadway network following the distributions shown in Figure 4-2 (for Phase 1 & 2 project traffic) and Figure 4-3 (for Phase 3 project traffic). The traffic for each phase was added as background traffic for the previous phase, as shown in the calculations in Appendix VI and on Figures 4-4 through 4-9. Thus, the Phase 3 analysis does include all project traffic from Phases 1 & 2.* ***Acceptable***

***9 On page 11, there was very little that was discussed concerning how the 2% annual growth rate was determined. Please add discussion and analysis with historical traffic counts (in Appendix) that pertain to the 2% annual growth rate decision.***

- *From previous experience, 2% provides a conservative estimate of background traffic growth for transportation impact studies, especially when projecting more than 5 years into the future. However, this was compared to the 10-year growth on both Middlebrook Pike and Weisgarber Road. Based on the counts from 2008-2017, Middlebrook Pike had approximately 1.3% annual growth while Weisgarber Road had approximately 3.34% annual growth. An assumption of 2% is thus in line with the historic growth rates in the area. The historical traffic count data used for this assumption is included within the appendices.* ***Acceptable***

***10 On page 18, Appendix XII only has 2 intersections from AM that are included.***

- *Appendix XII has been updated to include all AM intersections.* ***Acceptable***

***a. What about queue spillback at any of the intersections? Please discuss.***

- *Information on queue lengths for the Middlebrook Pike intersections at Dowell Springs, Old Weisgarber, and East Weisgarber Road have been added to the analysis as Section 5.2, per discussions with City/County staff.* ***Acceptable***

***11 Is the "No-Build" scenario for Phase 2 before or after Phase 1 (Table 5-2 & 5-3)? How do certain directions/approaches and overall intersection Level of Service (LOS) change between Phase 1 "Build" & Phase 2 "No-Build"?***

- *The difference between Phase 1 Build-Out and Phase 2 No-Build is the addition of additional background growth for 3 years. In general, delays increase, and some level of services decrease. Additional narrative has been provided within the report as Table 5-1.* ***Acceptable***

***12 Please put all delay & LOS tables together (Existing, Background, & Projected) into one table for comparison.***

- *Figures 5-1 through 5-6 have been moved to Appendix VII-XII and replaced with a new Table 5-2, which compares the existing, Phase 2 Build-Out, Phase 3 No-Build, and Phase 3 Build-Out scenarios, per discussions with planning and city staff.* ***Acceptable***

***13 On page 25, please correct "Appendix XII" to "Appendix XIII" in section 5.2.***

- *The reference to Appendix XII in Section 5.2 has been revised to Appendix XIII.* **Acceptable**

**a. Section 5.3 – Please discuss sight distance at the entrance along Old Weisgarber Rd and the intersection with Middlebrook Pike. Sight distance must not be measured aerially since the vertical component is not accounted for. Please correct. The sight distance requirement that needs to be followed is for the City of Knoxville and TDOT, which pertain to AASHTO standards per the Knoxville-Knox County Subdivision Regulations and TDOT Design Guidelines. Are there any obstructions within the median or along the edge of right-of-way (ROW) that could hinder sight distance?**

- *The narrative for sight distance has been expanded as a separate report, which is included as Appendix XIV. The sight distance was measured in the field to confirm that sight distance for the proposed movements met or exceed the design minimum guidelines. AASHTO sight distance measurements were reviewed and followed per applicable agency guidelines. Currently, there is a signal control box that could hinder sight distance at the Dowell Springs intersection. It is planned to be relocated as part of the permit drawings. Proposed landscaping and signage will be located outside the intersection sight triangles.* **Correction to the response above, Appendix XV is the where the sight distance report is not Appendix XIV. At the intersection of Middlebrook Pk at Dowell Springs Rd, Appendix XV shows the EB LT sight distance triangle being blocked by the outside WB LT vehicles. This left-turn lane may need to be modified (or realigned with outside WB left-turn lane). Also, the same thing happens to the outside WB LT vehicles. With the intersection being signalized as protected-permissive, the sight distance for both left-turns are concerning once the permissive phase is available. As you can tell, this can have a direct effect on the signal operations, queue spillback, etc. at this intersection. –The LB turn lanes for EB & WB have been reviewed and geometry modified to accommodate simultaneous protected-permissive phases. The outside WB LT line has been striped for the Phase 1/Phase 2 condition and the EB LT lane has been shifted north to avoid sight distance issues associated with the dual left condition.**

  **Please show the turning templates for all left-turning vehicle directions at this intersection, so that staff can review if there needs to be further modifications to the medians, to ensure all LT's are not overlapping, etc. –Turning templates have been run for movements in the intersection to avoid LT conflicts**

  **For clarification, the Sight Distance study should reference the object height as 3.50 ft and not the 4.35 ft mentioned since this is for Intersection Sight Distance. Reevaluate as needed.—The reference height has been re-evaluated at 3.5 feet and the letter revised accordingly**

**b. Section 6.0 – The report stating that "the project trips do not contribute significantly to the delays at the surrounding intersections" should not be stated. Please remove this statement since there is plenty of data within the report that states otherwise.**

- *This statement has been removed and the conclusions clarified.* **The statement that was clarified (in 6.1 pg 23) needs to be modified or removed since the development does have an "impact on the overall operations of the intersections in the study area," due to the increase of delay and LOS. –The statement has been modified to acknowledge the impact of the development to the surrounding conditions.**

***14 Please add turn-lane warrant analysis for all development intersections, and a signal warrant analysis for Middlebrook Pk at Dick Lonas Rd.***

- *A turn-lane warrant analysis was added as Section 5.3, with documentation included in Appendix XIII.* ***Acceptable***
- *Discussion with planning and staff indicates that the signal warrant analysis will not be required.* ***Acceptable***

**15 With the installation of dual westbound left-turn lanes on Middlebrook Pk at Dowell Springs Blvd (pg 26), please evaluate the placement of the eastbound left turn lane at the intersection to ensure adequate sight distance. Does the eastbound left-turn need to be shifted north for sight distance purposes due to the placement of the dual left-turn lanes?**

- *We have discussed the double left turn lanes with TDOT staff. Based on proposed volumes, the double left would not be required until Phase II buildout of the project. We will construct both lanes with the initial construction, but will stripe the outside turn lane until such time that both lanes are required for functionality. We have reviewed the placement of the lanes in relation to the existing left turn at Dowell Springs Boulevard and adjustment of this lane will not provide any additional sight distance for the turning movement.* **Please see response to 13.a. Response given under 13a.**

***a. Would a single westbound left-turn lane work? Show analysis & queue for determining this.***

- *The single westbound left-turn lane works in all phases. However, TDOT has indicated that they ask for a second left-turn lane once the turning volume exceeds 300 vehicles/hour, which it does during Phase 2 Build-Out. The intersection has been analyzed with both the single and double left-turn lane within the report.* ***Acceptable***

**b. Is there enough room for two additional westbound left-turn lanes? Discuss and verify storage and taper requirements, and if any through lane shifts need to occur.**

- *There is sufficient room for a dual left-turn lane within the existing median and no lane shifts would be required for the through movements.* **What about the EB LT lane sight distance triangle? The sight distance is blocked by the outside WB LT lane. See response to 13.a. –The EB LT has been shifted to accommodate the outside WB LT in future phases.**

**c. After "Two inbound lanes, two outbound lanes" of Dowell Springs Boulevard (pg 26), please add in parenthesis what the configuration of the outbound lanes are.**

- *The configuration of the outbound lanes has been added on page 26.* **This was not fixed. There needs to be clarification like a parenthesis after this statement describing the movement (e.g. one left/through lane & one right lane).—Revised as requested**

**d. Please add evaluation of road width, etc. of Old Weisgarber Road. The south side of Old Weisgarber Rd should be widened at the signalized intersection with an extra lane to match the north-side across Middlebrook Pk. This should be improved to the culvert south of the intersection.**

- *Old Weisgarber will require widening with any access improvements from Old Weisgarber. The road width is currently measure at less than 26 feet in several places. The Right of Way is approximately 40 feet in width. We anticipate this work will be designed as part of Phase III. The improvements will extend to the culvert where the proposed future drive access will be located.* **Any improvements to Old Weisgarber Rd will be a condition in this staff recommendation for Phase 3. For clarification, any ROW for Phase 3 needing to be dedicated from this property will need to be dedicated at this time for the improvements to Old Weisgarber Rd. Please measure actual road width in a couple of places from Middlebrook Pk to the Phase 3 access. – ROW for future improvements to Old Weisgarber has been included.**

***16 It is very hard to believe that with the development increasing the daily trips along this corridor to over 55% that there are not any additional recommendations for intersection improvements, other than the Dowell Springs Blvd dual left-turn lanes. There are several intersections that are increasing significantly in delay according to the model and outputs, yet there are no mitigation recommendations. Please re-evaluate.***

- *Additional discussion has been added to the recommendations section. At the intersections of Middlebrook Pike/Dick Lonas Road (where TDOT has indicated they will not put a traffic signal) and Old Weisgarber Road/Lonas Road, the minor street are deficient. However, as these deficiencies are due to the volume of traffic on the through movements, it is more likely that drivers will find alternate routes as traffic increases and it becomes increasingly difficult to make the left-turn maneuver from the minor street.* ***Acceptable***

***17 There needs to be more discussion on the $1.7 Million intersection improvement project recently completed by TDOT at the intersection of Middlebrook Pike and East Weisgarber Rd to prepare for the traffic of this development. Any further recommendations for improvement of this intersection should be coordinated with TDOT prior to adding it to the report.***

- *The results of the intersection improvements completed by TDOT at this intersection were incorporated into the existing conditions of the study. However, the results still showed a deficiency at this intersection. TDOT/Knoxville-Knox County can choose to accept the delays for the turns at this intersection without making improvements, but the proposed improvements would result in acceptable conditions in all scenarios. Discussion of the TDOT improvements has been added to the report.* ***Acceptable***

**18 There is no discussion of internal circulation including the design of a roundabout and access to the parcels. For the roundabout design, please look at S Northshore Dr at Concord Rd for an example of how to continue a dedicated lane through the roundabout since this is preferred rather than tapering it into another lane.**

- *Discussion of internal circulation has been added as Section 5.7. The roundabout within the site does not need to handle the volume of traffic that the S Northshore Dr/Concord Rd roundabout handles, and thus can function as a simple single-lane roundabout. Analysis of the roundabout has been completed using all project traffic in the Phase 3 scenario, although this significantly overestimates the traffic that will most likely be present at the roundabout, to demonstrate the operations of a simple single-lane roundabout for this site. We have discussed operational traffic with proposed hospital tenants and with the exception of construction traffic, deliveries are anticipated to be by box or panel trucks. The single lane roundabout will be designed with*

*mountable curbs for use by oversized vehicles. Additionally, at the City of Knoxville Engineering request, we have evaluated the geometry for large tractor-trailer movements through the intersection.* **In Section 5.7 Internal Circulation (pg 23), discuss the storage and taper of the NB RT lane of Middlebrook Pk at Proposed access. This should extend south close to roundabout. –The NB RT taper has been extend to 150 feet for increased storage and described in the narrative.**

19 **Please add a recommendation on how the signal should be phased at Dowell Springs Blvd to account for the dual left-turn lanes.**

- *The westbound left-turn movement will need to be a protected-only movement, and can be a leading interval, with a permitted/protected phase for the eastbound left-turn movement. This recommendation will be added to the report.* **Acceptable, but this will be an issue if the turning templates for any opposing left turns are overlapping. –Turning templates have been run and geometry adjusted to avoid overlapping LT movements.**

20 **Please see Evan Hoffman's comments attached to this. Responses to Evans comments are attached to the end of this document.**

Please provide **five (5) hard-copies** and **a PDF** of the following: **a signed and sealed letter** addressing these concerns in a **comment response sheet** (with the indication of where/how the comments were addressed) attached to the back of a **full revised TIS**. Since there are several crucial items left to correct, staff is recommending postponement of the Concept Plan until the July Planning Commission meeting and therefore, revisions to this are due *no later than noon Friday, June 21, 2019*. If you have any questions, please do not hesitate to contact me at 865-215-3826.

**I have attached Figures 4-5 to Figures 4-9 that I believe need minor corrections. I have explained the issue with each figure below plus any additional concerns that required technical explanation or that we did not discuss yesterday. Please let me know if there was anything you noted yesterday that requires more explanation.**

**For all of the trip assignment figures, they used the trip generation peak hour values without the 2% transit reduction. I do not see an issue with this since it is more conservative, and they would have to change all of their figures and HCM analyses with the new values that would change just slightly.**

- Agreed. The current analysis is more conservative, and the transit reduction would have little impact on the study results.

**• Figure 4-5: Weisgarber & Lonas: The westbound right turn shows 14 trips added (11% in x 124 = 14). Figure 4-2 for Phase 1 trip genera on does not show an 11% trip distribution on this movement and the 11% should be on the eastbound right turn heading outbound instead (11% out x 309 = 34). This occurs in every PM peak period trip assignment figure (4-5, 4-7, 4-9). The values were incorrect in the appendix as well.**

- The figures, analysis, and calculation appendix have been updated to reflect the correct distribution. The revised analysis indicates that there is no change to the level of service and/or delays with the corrected volumes.

**• Figure 4-6: Middlebrook & Lake Brook: The diagram for the intersection was not updated and is identical to the diagram for this intersection on Figure 4-4. Please update to correct values. All values were correct in Appendix and analyses.**

- The figure was updated in the report.

**• Figure 4-7: Weisgarber & Lonas: Same issue as Figure 4-5. 11% out x 274 = 30. The values were incorrect in the appendix as well. Please revise.**

- The figures, analysis, and calculation appendix have been updated to reflect the correct distribution. The revised analysis indicates that there is no change to the level of service and/or delays with the corrected volumes.

**• Figure 4-8: Middlebrook & Vanosdale/Francis: The trip distribution percentages between Figure 4-3 (Phase 3 Trip Distribution) and Appendix VI – Future Turning Movement Calculations are inconsistent. Figure 4-3 shows percentages of 2%, 4%, and 23%. Appendix VI shows percentages of 2%, 6%, and 21%. Analyses follow Appendix VI. Please revise.**

- Figure 4-3 has been updated with the correct percentages, which matches the calculations and analysis provided in the report, and produces the volumes shown on Figure 4-8.

**• Figure 4-9: Middlebrook & Vanosdale/Francis: Same issue with Figure 4-8 where the trip distribution percentages between Figure 4-3 (Phase 3 Trip Distribution) and Appendix VI – Future Turning Movement Calculations are inconsistent. Please revise.**

- Figure 4-3 has been updated with the correct percentages, which matches the calculations and analysis provided in the report, and produces the volumes shown on Figure 4-8.

• **Figure 4-9: Weisgarber & Lonas: Same issue as Figures 4-5 and 4-7. 11% out x 299 = 33. The values were incorrect in the appendix as well. Please revise.**

- The figures, analysis, and calculation appendix have been updated to reflect the correct distribution. The revised analysis indicates that there is no change to the level of service and/or delays with the corrected volumes.

**Table 5-2: There are levels of service/delays that decrease significantly between different phases, specifically between Phase 3 No-Build and Phase 3 Build. The main difference I noticed between the analyses was the HCM platoon ratio that will change in some instances from the minimum of 0.33 to the maximum of 2.00. The platoon ratio will have a significant influence on the resulting delay and queue lengths.**
**https://www.trafficware.com/blog/coordinatedintersections-in-hcm-2010.**
**Please provide an explanation as to why this ratio changes and why the LOS/delay of multiple movements and intersections decreases between no-build and build phases.**

- The platoon ratio was not changed manually between scenarios. It is a value calculated by the software package, based on the surrounding intersections. In some cases, the delay will decrease on an approach because more traffic was added to the least-congested movement on the approach, so the weighted average shifts. The most significant decrease in delays are at the intersections of Middlebrook Pike/Dowell Springs Road and Middlebrook Pike/Old Weisgarber Road. At the Middlebrook Pike/Dowell Springs Road intersection, signal phasing has to be changed to accommodate a protected westbound left-turn, and at Middlebrook Pike/Old Weisgarber Road, volumes are increasing on the northbound approach which will require some signal phasing optimization. Additionally, between the Phase 3 no-build and build-out scenarios, a new access point opens on Old Weisgarber Road, which diverts traffic from the northbound Old Weisgarber approach to Middlebrook Pike and the westbound left-turn lane on Middlebrook Pike at Dowell Springs Road.

**Middlebrook Pike & Dowell Springs Boulevard Signal: Tarren, Bryan, and I discussed various issues that could present themselves during traffic signal design.**
• **The east and west bound le turns would surely overlap without further intersection geometry changes. Without those changes, one of the left turn phases would need to be lagging. If the eastbound left turn remained protective/permissive and a leading movement, it would create a "yellow trap" situation. Therefore, the eastbound left turn phase may need to be protected only due to sight distance as well and would further decrease the efficiency of the signal.**

- Turning templates have been run for movements in the intersection and geometry adjusted to avoid LT conflicts, which allow for the signal phasing shown in the report.

• **Left turn overlaps for the north and south bound le turns were also discussed. This could mean the signal needs to be split phased and would further decrease the efficiency of the signal. I believe the study should include turning templates for all left turns and discuss the specific phasing needed. The analyses should follow that phasing for realistic levels of service and delays.**

- The turning templates are provided for review, which would allow the signals to operate with the standard phasing templates used in the study.

• **Will there be pedestrian improvements across Middlebrook Pike between Dowell Springs and the new**

**development? There are walking trails in the Dowell Springs development north of Middlebrook, and a greenway south of Middlebrook.**

- Yes, a pedestrian crossing will be installed on Middlebrook Pike.

**Old Weisgarber Road & Lonas Drive: On page 24, in regards to the southbound le turn off of Old Weisgarber Road the study states, "As delays increase for this movement, it is anticipated that some vehicles which use Old Weisgarber Road as a cut-through from Middlebrook Pike to I-75 would find an alterna ve route." I do not find this as satisfactory mitigation for a LOS F movement in PM peak Phase 3 build-out because the only alternative route for vehicles presumably travelling to I-40/I-75 would be to travel east bound on Middlebrook Pike and south on Weisgarber Road.**
**This east bound movement at the Middlebrook & Weisgarber intersection operates at a LOS F during the PM peak as well. This is related to phase 3, so we might be able to proceed since only phases 1 and 2 are currently planned.**

- We are recommending that additional counts be completed between Phase 2 and Phase 3 to determine actual background and project trips from the first two phases, and to determine if any diversions have occurred due to additional delays at unsignalized intersections as anticipated.

**Sec on 6.4: The first sentence of the section states, "Although there are some deficiencies seen in the network, the deficiencies are primarily due to background conditions and are not a result of the addition of project trips to the network." The project trips contribute approximately between 45% to 55% of the new trips (between existing and phase 3 build) travelling through on Middlebrook Pike. Stating the deficiencies are primarily due to background conditions is not entirely correct.**

- The paragraph has been revised to reflect acknowledgment of the impacts the proposed development will have on the study area.