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Transportation Study **PROPOSED** **RESIDENTIAL** **DEVELOPMENT**

86 Thomas Street
Mississauga, ON

June 24, 2020
Project No: NT-19-013

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NextEng Consulting Group Inc.

June 24, 2020

Rexton Realty
c/o Rocco Forgione
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Toronto, ON M3N 1V7

Attention: AI Ruggero

**Re: Engineering Service – Transportation Impact Study
Proposed Residential Development
86 Thomas Street, Mississauga ON
Our Project No. NT-19-013**

Nextrans Consulting Engineers (A Division of NextEng Consulting Group Inc.) is pleased to present the enclosed Transportation Impact Study for the above noted site in support of a Rezoning (ZBA) and Site Plan Control (SPCA) Applications.

The proposed 10 back to back townhouse units located at 86 Thomas Street will provide 21 vehicular parking spaces, one (1) of which are designated as an accessible parking space. Access to the site is proposed via one (1) full movement driveway located on the north side of Thomas Street.

The study concludes that the development proposal can adequately be accommodated by the existing transportation network with manageable traffic impact to the adjacent public roadways. We trust the enclosed sufficiently addresses your needs. Should you have any questions, please do not hesitate to contact the undersigned.

Yours truly,

Nextrans Consulting Engineers
A Division of NextEng Consulting Group Inc.

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EXECUTIVE SUMMARY

Nextrans Consulting Engineers (A Division of NextEng Consulting Group Inc.) was retained by Al Ruggero and Rocco Forgione (the 'Client'), to undertake a Transportation Impact Study in support of the Rezoning (ZBA and Site Plan Control Application (SPCA) for the proposed Residential Development located at 86 Thomas Street, in the City of Mississauga.

Development Proposal

The proposed 10 back to back townhouse units located at 86 Thomas Street will provide 21 vehicular parking spaces, one (1) of which are designated as an accessible parking space. Access to the site is proposed via one (1) full movement driveway located on the north side of Thomas Street.

Traffic Analysis

Based on the information contained in the 2016 Transportation Tomorrow Survey (TTS), a non-auto modal split for the subject area is approximately 20%. The proposed development is anticipated to generate four (4) two-way trips (1 inbound and 3 outbound) during the AM peak hours and six (6) two-way trips (4 inbound and 2 outbound) during the PM peak hours.

The intersection capacity analysis results (based on the methodology and procedures outlined in the Highway Capacity Manual, HCM 2000, published by the Transportation Research Board) indicate that the study area intersections and proposed vehicular access are expected to operate within acceptable levels of service, with the exception of the northbound left-right lane at the Hillside Drive and Thomas Street intersection during the AM peak period, and the southbound left lane at the Thomas Street and Joymar Drive intersection during the AM and PM peak periods experiencing a failing level of service.

It is recommended the Region monitor the intersections for potential road improvements at Hillside Drive / Thomas Street and Joymar Drive / Thomas Street as they are experiencing failing levels of service in existing and future background traffic conditions, without the implementation of our site traffic.

Access Study

To ensure safe traffic operation in the area, we recommend appropriate signage consisting of a STOP sign (Ra-1) and STOP bar be provided on the Thomas Street driveway, and a DISABLED PARKING PERMIT Sign (Rb-93) at the accessible parking spaces.

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1.0 INTRODUCTION

Nextrans Consulting Engineers (A Division of NextEng Consulting Group Inc.) was retained by Al Ruggero and Rocco Forgione (the 'Clients'), to undertake a Transportation Impact Study in support of the Rezoning (ZBA and Site Plan Control Application (SPCA) for the proposed Residential Development located at 86 Thomas Street, in the City of Mississauga. Subject lands are currently vacant. The proposal is to construct 10 back to back townhouse units.

The subject site location is illustrated in **Figure 1.1**.

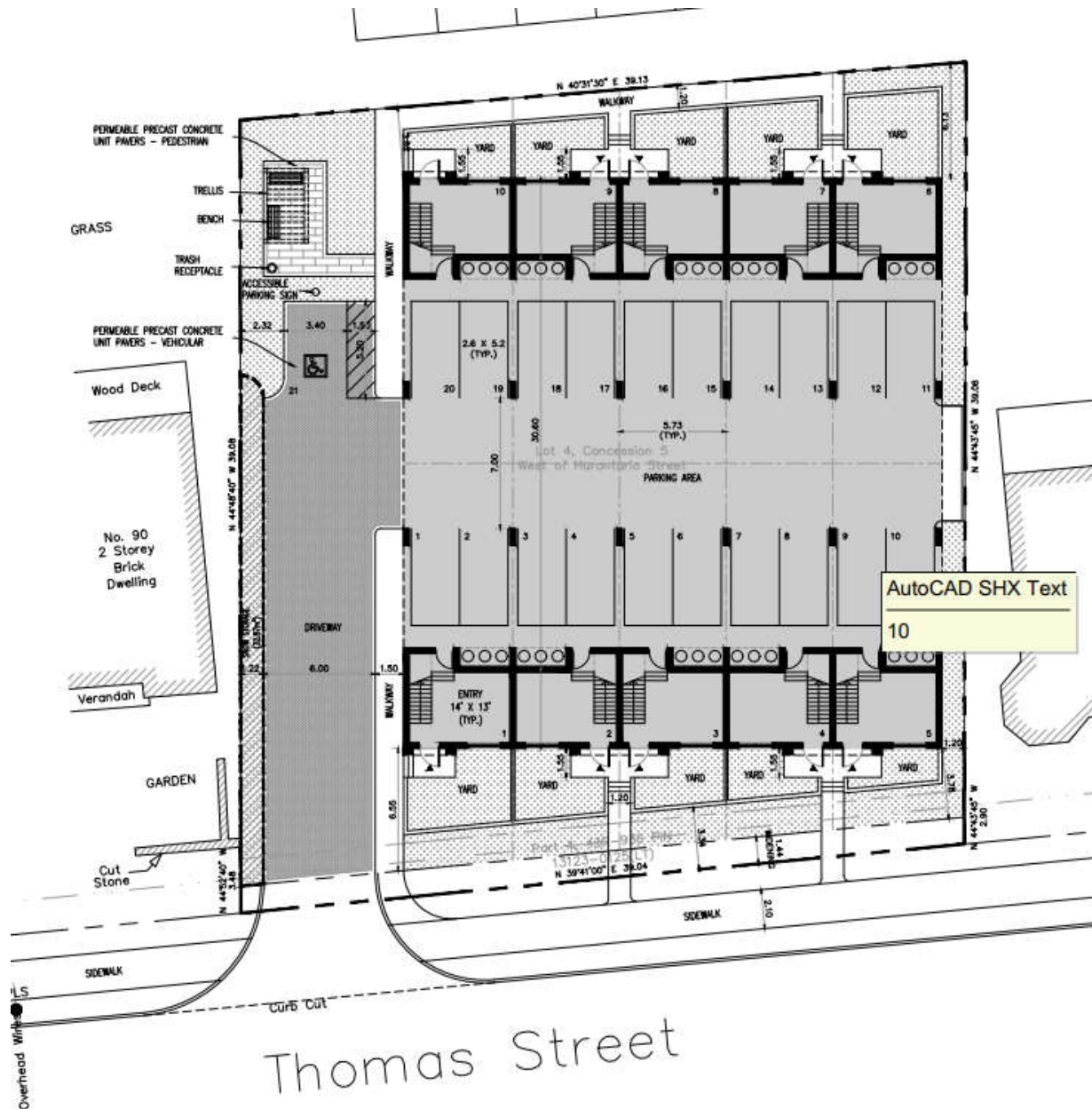
Figure 1.1 – Subject Site Location



The proposed 10 back to back townhouse units located at 86 Thomas Street will provide 21 vehicular parking spaces, one (1) of which are designated as an accessible parking spaces. Access to the site is proposed via one (1) full movement driveway located on the north side of Thomas Street.

Figure 1.2 illustrates the current site plan; **Appendix A** also provides larger scale version of the current site plan.

Figure 1.2 – Proposed Site Plan



2.0 EXISTING TRAFFIC CONDITIONS

2.1. Existing Road Network

The existing subject site is located north of Thomas Street, west of Joyrmar Drive in the City of Mississauga. The existing road network is described as follows:

Thomas Street: is classified as a Major Collector road under the Official Plan of City of Mississauga. It has a four-lane cross with sidewalks on both sides of the road and maintains a posted speed limit of 50 km/h in the vicinity of the subject site.

Hillside Drive: is classified as a Local road. It has a two-lane cross section and maintains a unposted speed limit of 40 km/h in the vicinity of the subject site.

2.2. Existing Active Transportation Network

Sidewalks

The vicinity of the subject site is currently serviced with dedicated sidewalks. Sidewalks are available throughout a majority of the residential areas in the vicinity of the subject site. There are also sidewalks available on Thomas Street, Queen Street South, Joymar Drive and Mississauga Road.

Bicycle Lanes

There are currently dedicated Bicycle Lanes, Signed Bike Routes and a Multi-Use Trail in the vicinity of the subject site, and are detailed as follows:

Bicycle lanes - Mississauga Road south of Erin Centre Boulevard and Main Street East of Wyndham Street

- Signed bike routes - Joymar Drive, Erin Centre Boulevard and Mississauga Road between Erin Centre Boulevard and Reid Drive
- Multi-use trail - Thomas Street West of Erin Mills Parkway

Figure 2-1 depicts the sidewalks and shared roadways near the subject site.

Figure 2-1 – Cycling Map and Sidewalk Availability



2.3. Existing Traffic Volumes

Existing traffic volumes at the study area intersections of Thomas Street and Hillside Drive and Thomas Street and Joymar Drive were undertaken by Spectrum Traffic on behalf of NexTrans Consulting Engineers on Thursday, March 7, 2019 and Wednesday, September 21, 2016 respectively during the morning (7:00 a.m. to 10:00 a.m.) and afternoon (4:00 p.m. to 7:00 p.m.) peak periods. Detailed traffic data sheets are provided in **Appendix B**. It is important to note the surrounding area is fully developed based on images taken from Google Earth, as detailed in **Appendix C**. As such, the turning movement counts from September 21, 2016 are assumed to remain unchanged.

2.4. Existing Traffic Assessment

The existing volumes are illustrated in **Figure 2-2**, and were analyzed using Synchro 10 software. The methodology of the software follows the procedures described and outlined in the Highway Capacity Manual, HCM 2000, published by the Transportation Research Board. The detailed results are provided in **Appendix D** and summarized in **Table 2.1**.

Figure 2-2 – Existing Traffic Volumes

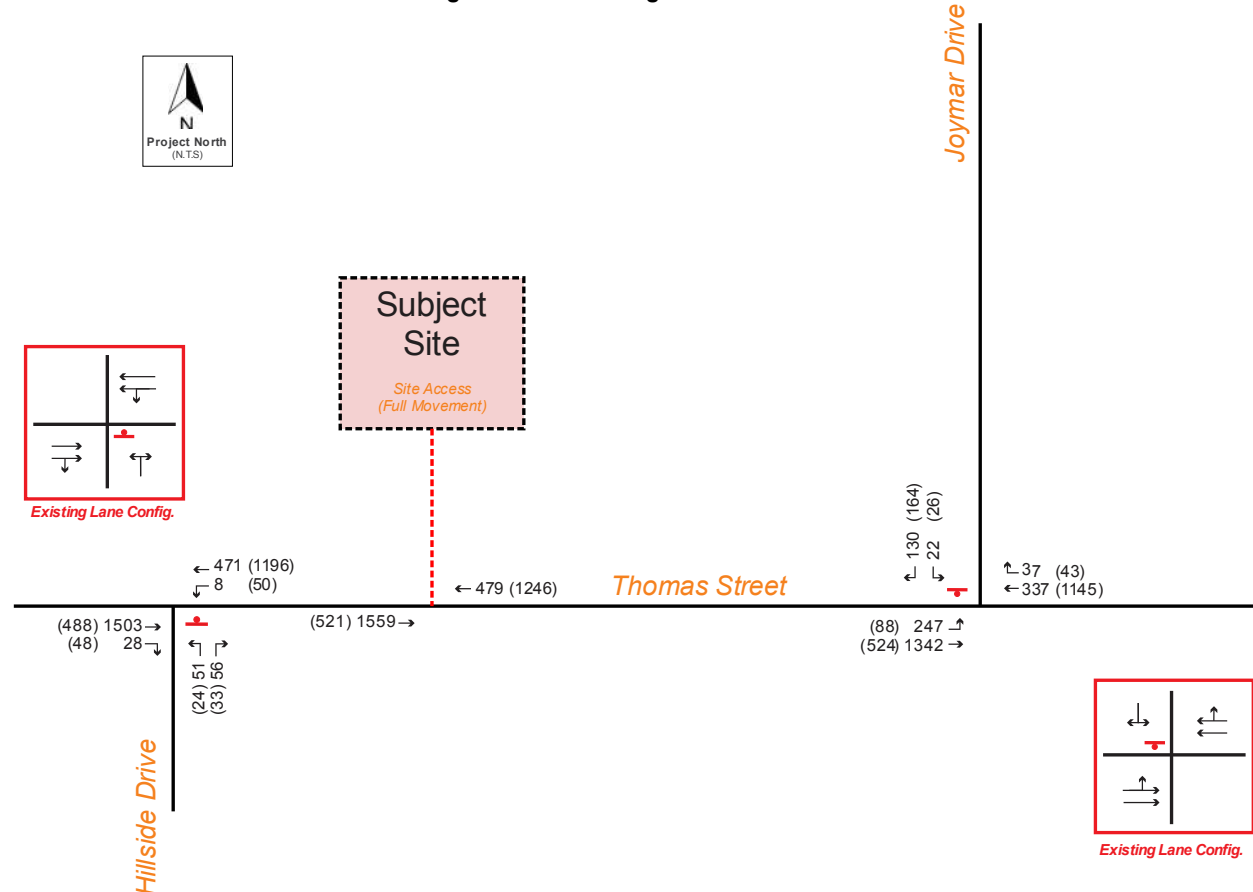


Table 2.1 – Level of Service – Existing Traffic Assessments

| Intersection | Movement | Weekday AM Peak Hour | | | Weekday PM Peak Hour | | |
|---|--------------------|----------------------------------|----------------------|----------------------------|----------------------------------|----------------------|----------------------------|
| | | LOS (v/c) | Delay (s) | Queue (95 th m) | LOS (v/c) | Delay (s) | Queue (95 th m) |
| Hillside Drive and Thomas Street (unsignalized) | WBLT NBLR | A (0.04) F (1.62) | 1.9 408.0 | 1.1 86.0 | A (0.06) C (0.31) | 1.6 24.8 | 1.4 9.6 |
| Thomas Street and Joymar Drive (unsignalized) | EBLT SBL SBR | A (0.33) F (1.00) B (0.31) | 6.8 316.0 12.0 | 11.0 27.9 9.9 | A (0.19) F (0.55) C (0.50) | 6.6 126.3 23.0 | 5.3 16.7 20.2 |

As summarized in **Table 2.1**, under existing traffic conditions, the study area intersection is currently operating at excellent levels of service during both peak periods with no critical movements, with the exceptions of the northbound left-right lane at the Hillside Drive and Thomas Street intersection experiencing a failing level of service during the AM peak hour time period, and the southbound left lane at the Thomas Street and Joymar Drive intersection experiencing a failing level of service during the AM and PM peak hour time periods. This is considered a typical condition for any unsignalized intersection where a Major Collector road, otherwise known as a high capacity urban road, meets with a local residential road.

2.4.1. Evaluation of Existing Capacity Analysis at Unsignalized Intersection

As previously mentioned, the failing level of service at the unsignalized intersections are considered a typical where a Major Collector road, otherwise known as a high capacity urban road, meet with a local residential road. It is important to note, the signalized intersections of Thomas Street and McFarren Boulevard/Gafney Drive and Thomas Street and Streetsville GO Parking Access are 400 meters apart. As such, Joymar Drive and Hillside Drive intersections cannot be signalized based on the signalized spacing requirements of 400 meters. It is recommended, Signal-Coordinating Timing Plan be implemented between the intersections of Thomas Street and McFarren Boulevard/Gafney Drive and Thomas Street and Streetsville GO Parking Access to synchronize signals together that are closely spaced. Benefits of signal coordination include, maintenance of a preferred speed, possibility of sending vehicles through successive intersections in moving platoons and avoiding stoppage of large number of vehicles. On this basis, it is expected the delays and v/c ratios for the northbound left-right movement via Hillside Drive and the southbound left movement via Joymar Drive will improve with the increase in gap availabilities.

Based on **Table 2.1** Synchro outputs, the northbound shared lane configuration via Hillside Drive and Thomas Street intersection experiences an average v/c ratio of 1.62 during the morning peak hour, and the southbound lane via Joymar Drive and Thomas Street intersection experience an average v/c ratio of 3.22 and 4.11 during the morning and afternoon peak hour respectively.

It is our experience that Synchro is overly conservative when assessing level of service at unsignalized one-way stop-controlled intersections. Factors such as platooning, and gap opportunities are not considered in the analysis as those parameters do not appear in the Synchro inputs for one-way stop control analysis. In order to address this shortcoming and provide an accurate assessment of level of service and volume to capacity at the unsignalized location, NexTrans has opted to employ video based turning movement counts. The video allows for queuing, turning delay and gap study analysis. Using the videos provided by Spectrum Traffic Data Inc., we have reviewed the videos to determine the v/c ratio during the AM peak hour period to calculate an average v/c ratio for the shared-lane configuration. The surveyed delay study sheet experienced during the AM peak hour period is detailed in **Appendix E**.

Based on the survey results, the average delay during the morning peak hour period for the shared-lane configuration is 0.30 seconds. As expected, the Synchro analysis for the existing condition is 1360% overly conservative during the morning peak hour. Level of service is determined based on Synchro 'v/c ratio' as detailed in **Table 2.2** in accordance to the Synchro 10 software.

Table 2.2 – Level of Service Criteria for Unsignalized Intersections

| Table 2. Level of Service Criteria for Unsignalized Intersections | |
|--|--|
| Level of Service | Average Control Delay (sec/veh) |
| A | 0 - 10 |
| B | >10 - 15 |
| C | >15 - 25 |
| D | >25 - 35 |
| E | >35 - 50 |
| F | >50 |

Based on the results summarized in **Table 2.2**, the northbound shared-lane configuration is operating at an acceptable LOS 'D' during the AM peak period.

While the delay study of the existing condition clearly demonstrates good level of service and ample capacity for the northbound shared movement, it is not possible to carry forward these observations in any quantitative sense to the future background or future total conditions since observations can only be made in the present, not the future. However, we may make some qualitative assumptions based on the conditions that would change both turning delay and gap opportunities in the future. Primarily, the factor that would impact unsignalized operations the greatest would be changes in the flow of traffic on Thomas Street, and thus gap opportunities, due to future background growth. The Synchro unsignalized analysis will be brought forward in the following sections unchanged, but discussed in the context of the observations made in the existing condition.

3.0 FUTURE BACKGROUND CONDITIONS

3.1. Background Traffic Growth

The AADT data for Thomas Street provided by Peel Region Open Data website indicates an unknown annual growth rate as counts have not been conducted on Thomas Street. It is important to note the surrounding area is fully developed based on images taken from Google, as detailed in **Appendix C**. Therefore, a growth rate of 1% was utilized on a 5-year horizon for the eastbound and westbound directions on Thomas Street.

3.2. Future Background Developments

Future background developments to be considered in the analysis included a residential development located at the northwest corner of Thomas Street and Joymar Drive, municipally known as 80 Thomas Street. Based on the study completed by NexTrans Consulting Engineers dated March 28, 2019, the development proposes 194 residential condominium / townhouse units. The background development considered is summarized in **Table 3.1**.

Table 3.1 – Background Development (80 Thomas Street)

| ITE Land Use | Parameter | Morning Peak Hour | | | Afternoon Peak Hour | | |
|---|------------------|-------------------|-----------|-----------|---------------------|-----------|------------|
| | | In | Out | Total | In | Out | Total |
| Residential Condominium / Townhouse (LUC 230) 194 units | Gross New Trips | 15 | 81 | 96 | 77 | 37 | 114 |
| | Gross Trip Rate | 0.07 | 0.37 | 0.44 | 0.35 | 0.17 | 0.52 |
| | Non-Auto (10%) | 2 | 8 | 10 | 8 | 3 | 11 |
| Total | New Trips | 13 | 73 | 86 | 69 | 34 | 103 |

The future (2024) background traffic volumes are provided in **Figure 3-1**. **Table 3.4** summarizes the level of service at the study area intersections under future background traffic conditions. An applied growth rate of 1%, which given the general build-out conditions of the immediate area, and background development can be considered a reasonable approach to the traffic assessment. Detailed output analysis can be found in **Appendix G**.

Figure 3-1 – Future (2024) Background Traffic Volumes

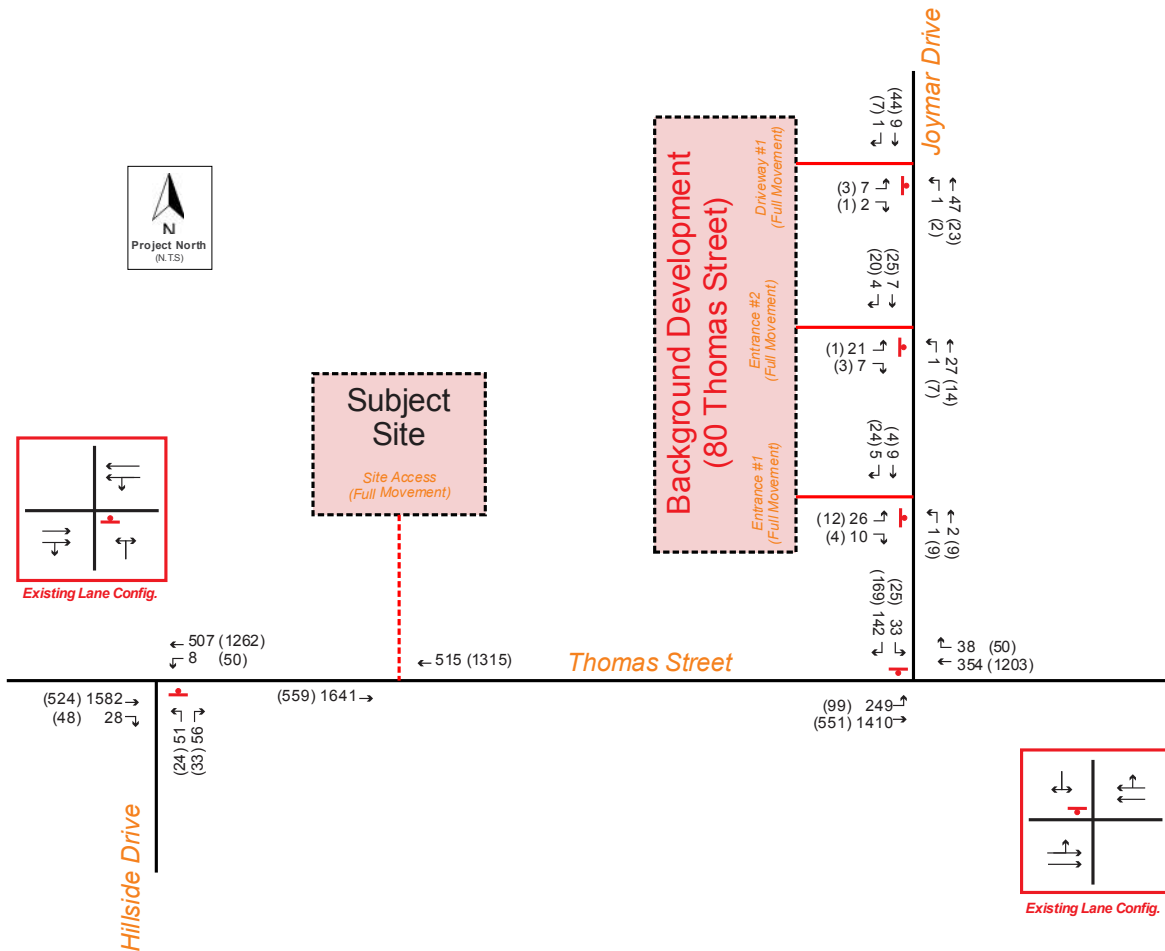


Table 3.2 – Level of Service - Future (2024) Background Traffic Assessments

| Intersection | Movement | Weekday AM Peak Hour | | | Weekday PM Peak Hour | | |
|---|--------------------|----------------------------------|----------------------|----------------------------|----------------------------------|----------------------|----------------------------|
| | | LOS (v/c) | Delay (s) | Queue (95 th m) | LOS (v/c) | Delay (s) | Queue (95 th m) |
| Hillside Drive and Thomas Street (unsignalized) | WBLT NBLR | A (0.02) F (1.34) | 1.1 297.7 | 0.6 65.9 | A (0.06) D (0.26) | 1.6 25.6 | 1.3 7.7 |
| Thomas Street & Joymar Drive (unsignalized) | EBLT SBL SBR | A (0.24) F (0.58) B (0.19) | 5.2 124.7 10.6 | 7.1 18.3 5.5 | A (0.22) F (0.52) C (0.47) | 7.2 134.7 22.0 | 6.2 15.2 18.4 |

As summarized in **Table 3.2**, under future background traffic conditions, the study area intersections will continue to operate at excellent levels of service during both peak periods with the exception of the northbound left-right lane at the Hillside Drive and Thomas Street intersection during the AM peak period, and the southbound left lane at the Thomas Street and Joymar Drive intersection during the PM peak period.

These results are nonsensical, particularly in view of the fact that there is only a 1.00% growth rate per annum increase in through volumes on Thomas Street and no vehicles per hour increase to the northbound left-right turn movements during the critical AM peak hour. It can be safely assumed based on an existing northbound left-right v/c of 0.11 that the future background 2022 traffic conditions at the subject intersection will continue to operate at good levels of service.

4.0 SITE TRAFFIC

The development proposal is to construct 10 back to back townhouse dwelling units. Trip rates and site generated trips were derived from the information contained in the *Trip Generation Manual, 10th Edition* published by the Institute of Transportation Engineers (ITE) for “Multifamily Housing (Low-Rise)” (LUC 220).

According to the 2016 TTS data, approximately 20% of people in the vicinity of the subject site utilize alternative modes of transportation, such as transit, walking, and cycling, as summarized in **Table 4.1**. TTS Data for Ward 11 can be found in **Appendix E**.

The trip generation summary is shown in **Table 4.2**.

Table 4.1 – TTS Data for Ward 11

| Time Period | Modes of Travel | | | | | |
|-----------------|---------------------|------------|-------------------------|-----------|-------------------|-----------|
| | Auto Mode of Travel | | Non-Auto Mode of Travel | | | |
| | Driver | Passenger | Transit | GO Train | Walking & Cycling | Other |
| 6-9AM | 62% | 16% | 6% | 4% | 5% | 8% |
| 24 Hours | 67% | 17% | 6% | 2% | 4% | 5% |
| Average | 64% | 16% | 6% | 3% | 5% | 7% |
| Total | 80% | | 20% | | | |

Table 4.2 – Site Traffic Trip Generation (Based on ITE)

| ITE Land Use | Parameter | Morning Peak Hour | | | Afternoon Peak Hour | | |
|---|------------------|-------------------|----------|----------|---------------------|----------|----------|
| | | In | Out | Total | In | Out | Total |
| Multifamily Housing (Low-Rise) (LUC 220) 10 Units | Gross New Trips | 1 | 4 | 5 | 5 | 3 | 8 |
| | Gross Trip Rate | 0.10 | 0.40 | 0.50 | 0.50 | 0.30 | 0.80 |
| | Non-auto (20%) | 0 | 1 | 1 | 1 | 1 | 2 |
| Total | New Trips | 1 | 3 | 4 | 4 | 2 | 6 |

The proposed development is anticipated to generate four (4) two-way trips (1 inbound and 3 outbound) during the AM peak hours and six (6) two-way trips (4 inbound and 2 outbound) during the PM peak hours.

It must be noted, the proposed development site traffic volumes were not assigned to the critical northbound left and right turn movement via Hillside Drive.

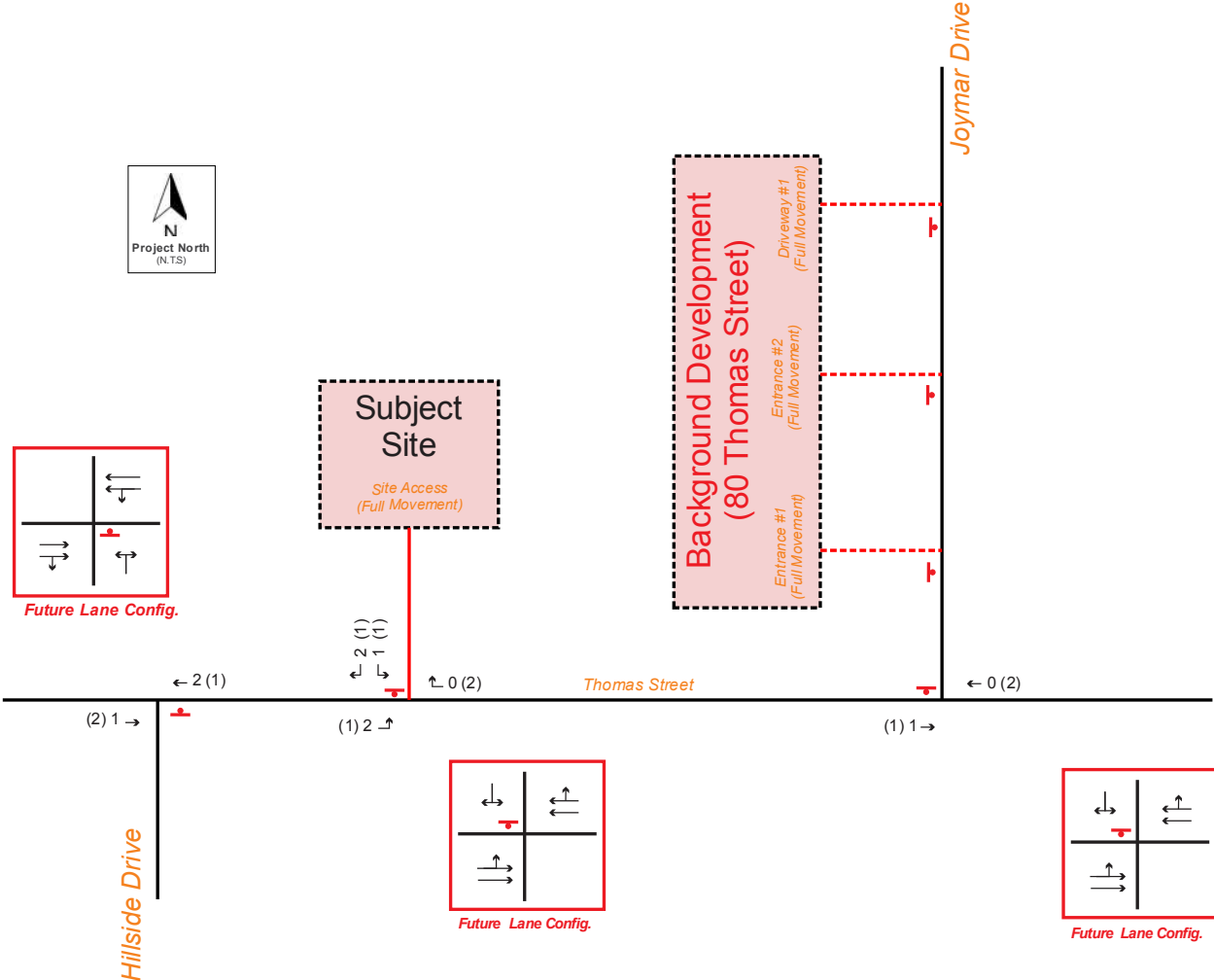
Furthermore, the subject site is generating a minimal amount of traffic onto Thomas Street. As such, it is our opinion the site traffic will not significantly impact the traffic onto Thomas Street, with the site generating a fraction of the existing traffic (i.e. <1%).

The assumptions for the trip distribution rates are detailed in **Table 4.3**.

Table 4.3 – Trip Distribution

| Direction | Via | AM Peak Hour | | PM Peak Hour | |
|--------------|---------------|--------------|-------------|--------------|-------------|
| | | Inbound | Outbound | Inbound | Outbound |
| East | Thomas Street | 31% | 31% | 47% | 47% |
| West | Thomas Street | 69% | 69% | 53% | 53% |
| Total | | 100% | 100% | 100% | 100% |

Figure 4-1 – Site Generated Traffic Volumes



5.0 FUTURE TOTAL TRAFFIC CONDITIONS

The forecasted 2024 future total traffic volumes (future background traffic volumes plus site generated traffic volumes) are illustrated in **Figure 5-1**, and were analyzed using Synchro 10 software. The detailed calculations are provided in **Appendix F** and summarized in **Table 5.1**.

Figure 5-1 – Future (2024) Total Traffic Volumes

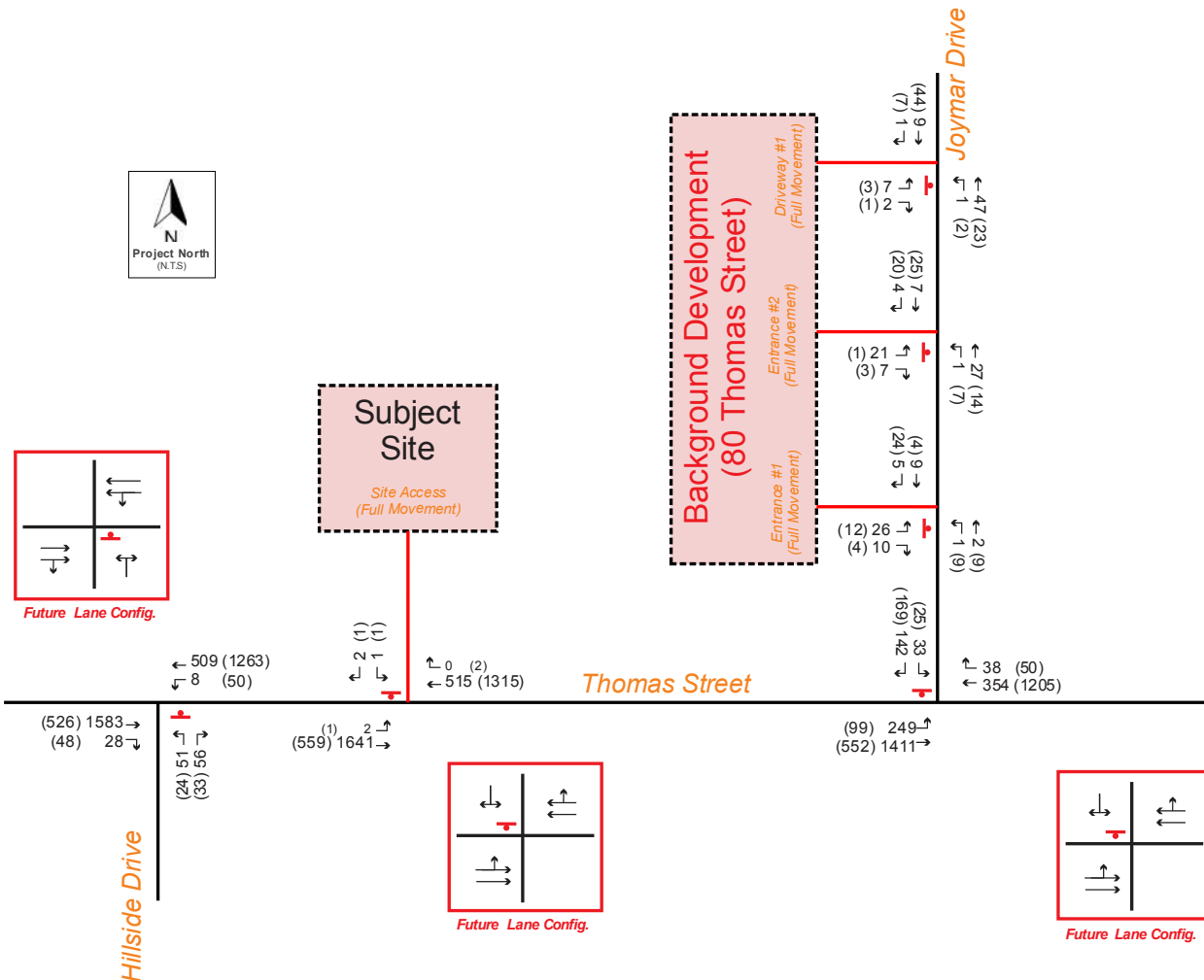


Table 5.1 – Level of Service – Future (2024) Total Traffic Assessments

| Intersection | Movement | Weekday AM Peak Hour | | | Weekday PM Peak Hour | | |
|---|--------------------|----------------------------------|----------------------|----------------------------|----------------------------------|----------------------|----------------------------|
| | | LOS (v/c) | Delay (s) | Queue (95 th m) | LOS (v/c) | Delay (s) | Queue (95 th m) |
| Hillside Drive and Thomas Street (unsignalized) | WBLT NBLR | A (0.02) F (1.34) | 1.1 299.4 | 0.6 66.1 | A (0.06) D (0.26) | 1.6 25.7 | 1.3 7.8 |
| Thomas Street & Joymar Drive (unsignalized) | EBLT SBL SBR | A (0.24) F (0.58) B (0.19) | 5.2 124.9 10.6 | 7.1 18.3 5.5 | A (0.22) F (0.53) C (0.47) | 7.2 135.7 22.0 | 6.2 15.2 18.4 |
| Thomas Street & Site Access (unsignalized) | EBLT SBLR | A (<0.01) C (0.01) | 0.0 18.4 | 0.0 0.3 | A (<0.01) D (0.02) | 0.2 33.4 | 0.1 0.4 |

As summarized in **Table 5.1**, under future total traffic conditions, the study area intersections will continue to operate at acceptable levels of service during both peak periods with the exception of the northbound left-right lane at the Hillside Drive and Thomas Street intersection during the AM peak period, and the southbound left lane at the Thomas Street and Joymar Drive intersection during the AM and PM peak periods.

As detailed in **Table 5.1**, these results are nonsensical as mentioned earlier, particularly in view of the fact that there is only a 1.00% growth rate per annum increase in through volumes on Thomas Street and no vehicles per hour

increase for the northbound left-right turn movements on Hillside Drive during the critical AM peak hour. Due to the limitations in Synchro and inability to accurately reflect delay opportunities, the formulae are extremely sensitive to small increases in traffic. Furthermore, no more than six (6) vehicles were added from the existing traffic conditions to the future total 2024 conditions. It can be safely assumed based on an existing LOD 'D', based on delay study, for the northbound left-right movement via Hillside Drive, that future total 2024 traffic conditions at the subject intersection will continue to operate at good levels of service.

As noted in **Section 4.0**, the subject site is generating a minimal amount of traffic onto Thomas Street. As such, it is our opinion this will not be the cause of any major issues to Thomas Street, as the site is only generating a fraction of the existing traffic (i.e. <1%).

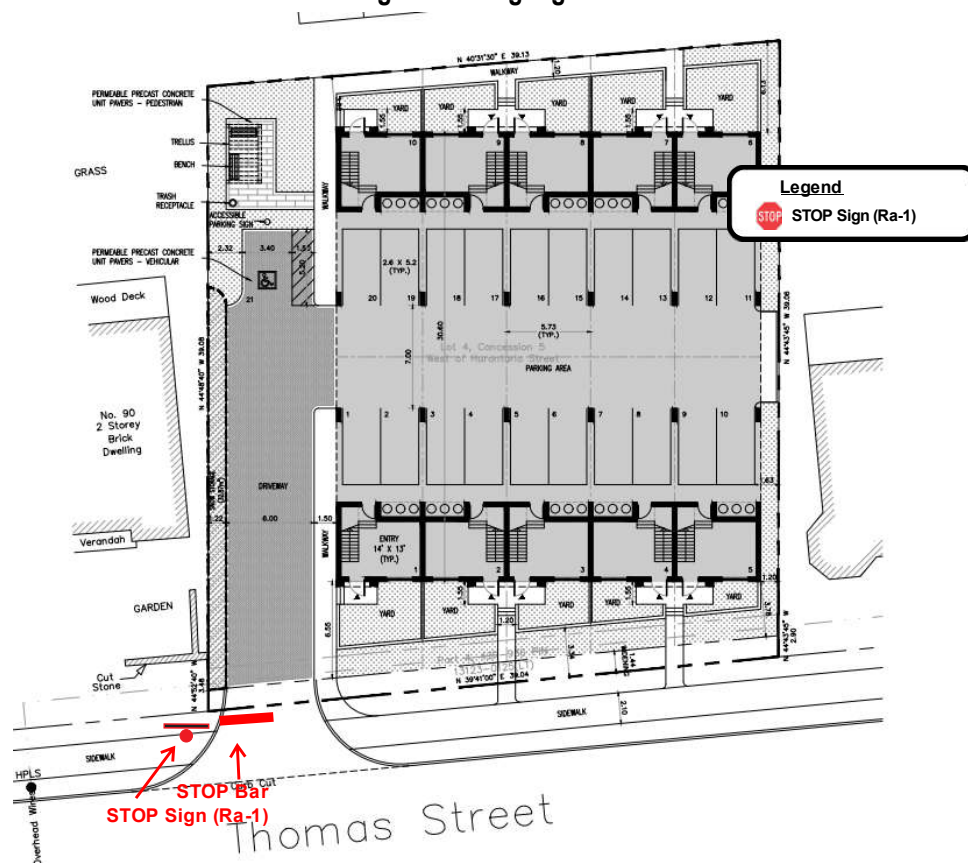
It is recommended the Region monitor the intersections for potential road improvements at Hillside Drive / Thomas Street and Joymar Drive / Thomas Street as they are experiencing failing levels of service in existing and future background traffic conditions, without the implementation of our site traffic.

6.0 SITE PLAN REVIEW

6.1. Site Access

In accordance with the site plan provided, access to the site is provided through one (1) full movement driveway located on the north side of Thomas Street. In accordance with Ontario Traffic Manual (OTM) Book 5, we recommend appropriate signage consisting of a STOP sign (Ra-1) and STOP bar be provided on the Thomas Street driveway, and a DISABLED PARKING PERMIT Sign (Rb-93) at the accessible parking spaces, see **Figure 6-1**. The DISABLED PARKING PERMIT Sign (Rb-93) is provided on the site plan: **Appendix G** also provides a larger scale version of the signage plan.

Figure 6-1: Signage Plan



7.0 TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) refers to variety of strategies to reduce congestion, minimize the number of single-occupant vehicles, encourage non-auto modes of travel, and reduce vehicle dependency to create a sustainable transportation system. Typically, TDM strategies are for residential and office developments where large quantities of people congregate in one origin or destination.

Based on our experience, excessive parking supply imposes environmental costs, contradicts community development objectives for more livable and walkable communities, and tends to increase driving and discourage the use of alternative mode of travel. It is anticipated that the combination of reduced parking supply and an efficient public transit system will encourage the use of alternative modes of travel.

7.1. TDM Implementation

The owner is committed to promoting sustainable transportation systems. It actively encourages its tenants to explore and take advantage of the alternative modes of travelling available within their neighbourhood. The *Mississauga Smart Commute* webpage can provide information on the following categories: Public Transit, Carpooling and Cycling Information and Active Transportation.

8.0 FINDINGS / RECOMMENDATIONS / CONCLUSION

The findings, recommendations and conclusions of our analysis are as follows:

- The proposed 10 back to back townhouse units located at 86 Thomas Street will provide 21 vehicular parking spaces, one (1) of which are designated as an accessible parking space. Access to the site is proposed via one (1) full movement driveway located on the north side of Thomas Street.
- Based on the information contained in the 2016 Transportation Tomorrow Survey (TTS), a non-auto modal split for the subject area is approximately 20%. The proposed development is anticipated to generate four (4) two-way trips (1 inbound and 3 outbound) during the AM peak hours and six (6) two-way trips (4 inbound and 2 outbound) during the PM peak hours.
- The intersection capacity analysis results (based on the methodology and procedures outlined in the Highway Capacity Manual, HCM 2000, published by the Transportation Research Board) indicate that the study area intersections and proposed vehicular access are expected to operate within acceptable levels of service, as no critical movements were identified based on the recommendations made to Thomas Street and Hillside Drive, and Thomas Street and Joymar Drive.
- It is recommended the Region monitor the intersections for potential road improvements at Hillside Drive / Thomas Street and Joymar Drive / Thomas Street as they are experiencing failing levels of service in existing and future background traffic conditions, without the implementation of our site traffic.
- To ensure safe traffic operation in the area, we recommend appropriate signage consisting of a STOP sign (Ra-1) and STOP bar be provided on the Thomas Street driveway, and a DISABLED PARKING PERMIT Sign (Rb-93) at the accessible parking spaces

Appendix A - Proposed Site Plan

| ZONING REGULATIONS - From Table 4.14.1 - RM9 and RM10 Permitted Uses and Zone Regulations | | | | | | |
|---|------------------|--|--------------------------------|--|---|----------------------|
| ZONE RM-10 (BACK TO BACK AND STACKED TOWNHOUSES) | | | | REXTON DEVELOPMENT | DUNPAR DEVELOPMENT | |
| 1. | ZONE REGULATIONS | | REQUIRED | PROPOSED | REQUIRED | APPROVED |
| 2. | | MAXIMUM DWELLING HEIGHT | | | | |
| 3. | 5.1 | Measured to the mean height level of a flat roof on top of a sloped roof. | 15.0 m. 3 Storeys. | 12.66 m. 4 Storeys. | | 9.54 m. 3 Storeys. |
| 4. | 6.0 | MINIMUM FRONT YARD | 7.50 m. | | | 8.22 m (North) |
| 5. | | | | 3.78 m (South) | | 3.27 m (South) |
| 7. | 7.0 | MINIMUM EXTERIOR SIDE YARD | 4.5 m. | N/A | | N/A |
| 8. | | | | N/A | | 3.05 m (East) |
| 9. | 8.0 | MINIMUM INTERIOR SIDE YARD | 4.5 m. | 8.72 m (West) | | 1.67 m (West) |
| 10. | | | | 1.20 m (East) | | N/A |
| 11. | 12.2 | MINIMUM PARKING SPACES | | | | |
| 12. | | 2.0 spaces per 4-4 bedroom unit = 8 parking spaces. 1.5 spaces per 6-2 bedroom unit = 9 spaces. | 17 spaces | 20 spaces | 1.3 spaces / Unit for 2 bedroom units. 1.4 Spaces / Unit for 3 bedroom units | 261 spaces |
| 13. | 12.3 | MINIMUM VISITOR PARKING SPACES | | | | |
| 14. | | 0.25 spaces per 10 units = 2.5 spaces. | 2.5 spaces | 1 space | 0.2 visitor spaces per unit | 40 spaces |
| 15. | | MINIMUM BARRIER FREE PARKING SPACES | | | | |
| 16. | | Accessible parking spaces shall apply only to the total number of visitor parking spaces required. | 1 space | 1 space | 1.6 spaces | 2 spaces |
| 17. | 13.0 | PARKING AREAS SETBACKS | | | | |
| 18. | | Minimum setback between a parking space and an interior side lot line and/or rear lot line. | 3.0 metres | 1.63 metres | | 1.67 metres |
| 19. | 15.0 | MINIMUM AMENITY AREA AND LANDSCAPE AREA | | | | |
| 20. | 15.1 | MINIMUM LANDSCAPE AREA | 40 % of lot area. | 30.64 % (503.52 m²) | | 33.17% (8,203.19 m²) |
| 21. | 15.2 | MINIMUM REQUIRED LANDSCAPED SOFT AREA | 50 % of landscaped area | 69.45 % (349.67 m²) | | 66.57% (5,461.15 m²) |
| 22. | 15.3 | MINIMUM LANDSCAPED BUFFER ABUTTING ANY SIDE AND REAR LOT LINE | 3.0 metres | 1.20 m East yard. 1.22 m West yard. | | 1.67 metres |
| 23. | 15.4 | MINIMUM CONTIGUOUS AMENITY AREA | 82.17 m² (5 % of the lot area) | 72.12 m² outdoor. | | 511 m² |
| 24. | 15.7 | MINIMUM CONTIGUOUS PRIVATE OUTDOOR SPACE PER UNIT | 6.0 m² | 6.60 m² | | 3.8 m² |

PART OF Lot 4
Concession 5, West of Hurontario Street
City of Mississauga
Regional Municipality of Peel

ZONING:
RM10 (Back to back & stacked townhouse)

LOT AREA 1,643.35 m² (17,689 Ft²) (0.406 ac)

PERMITTED: N/A
PROPOSED: 885.48 m² (9,531 Ft²) 53.88 %

DWELLING UNIT WIDTH:
MINIMUM PERMITTED: 4.5 m
PROPOSED: 5.73 m

LOT FRONTAGE:
 REQUIRED (MIN.): 38.0 m
 PROPOSED: 39.04 m

| | |
|-------------------------|--|
| FIRST FLOOR AREA | 311.58 m ² (3,353.82 Ft ²) |
| SECOND FLOOR AREA | 882.42 m ² (9,498.29 Ft ²) |
| THIRD FLOOR AREA | 882.42 m ² (9,498.29 Ft ²) |
| FOURTH FLOOR AREA | 882.42 m ² (9,498.29 Ft ²) |
| TOTAL GROSS AREA | 2,958.84 m² (31,848.69 Ft²) |

| SETBACKS | REQUIRED | PROVIDED |
|---------------------------|----------|----------|
| Front Yard (South) | 4.5 m | 3.78 m |
| Rear Yard (North) | 7.5 m | 3.79 m |
| Interior Side Yard (East) | 2.5 m | 1.20 m |
| Interior Side Yard (West) | 2.5 m | 8.72 m |

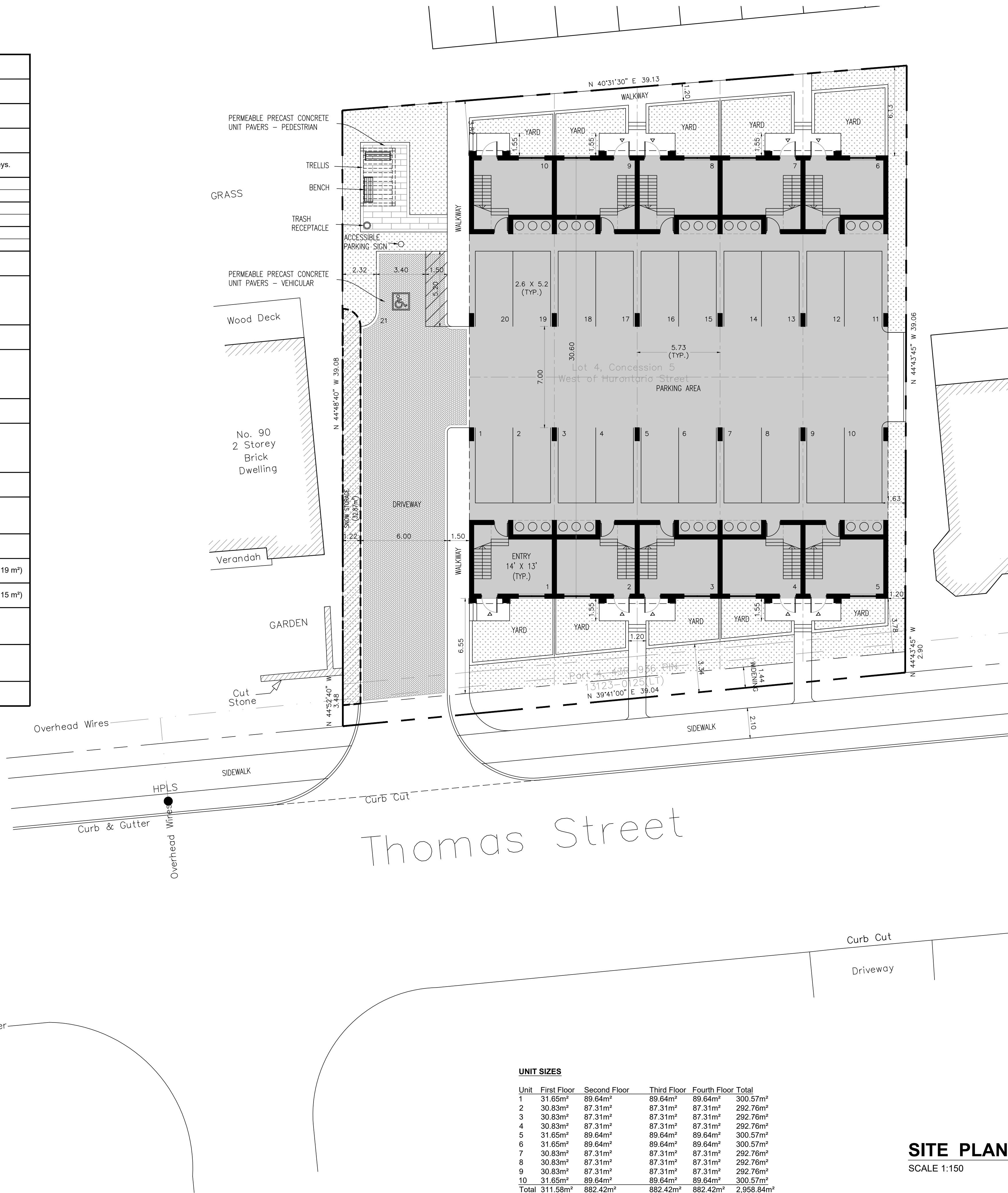
| | | |
|------------------------------|-------|--------|
| PARKING SETBACKS: | | |
| East (to a Residential Zone) | 4.5 m | 1.63 m |

| | |
|-----------------------------------|------------------------------|
| REQUIRED: | |
| 2.0 spaces per 4-4 bedroom unit = | 8 parking spaces |
| 1.5 spaces per 6-2 bedroom unit = | 9 spaces. |
| <u>0.25 spaces per 10 units =</u> | <u>2.5 spaces</u> |
| Total: | 20 spaces |
| PROVIDED: | 21 spaces |
| | Including 1 Accessible space |

| | |
|-----------------------|----------------------------------|
| LANDSCAPE AREA | |
| MINIMUM REQUIRED | 40 % |
| PROPOSED | 30.64 % (503.52 m ²) |

SNOW STORAGE
 REQUIRED MIN.: 32.87 m² (2.00 % of Lot Area)
 PROVIDED: 33.04 m² (2.01% of Lot Area)

- i. I hereby certify that this drawing conforms in all respects to the site development plans Architect or Engineer's Signature (if applicable) and Professional seal
- ii. The City of Mississauga requires that all working drawings submitted to the Building Division as part of an application for the issuance of a building permit shall be certified by the architect or engineer as being in conformity with the site development plan as approved by the City of Mississauga.
- iii. All exterior lighting will be directed onto the site and will not infringe upon the adjacent property.
- iv. All rooftop mechanical shall be screened from view by the applicant.
- v. Parking spaces reserved for people with disabilities must be identified by a sign, indicating the applicant's expense, in accordance with the By-law Requirements and Building Code Requirements.
- vi. The applicant will be responsible for ensuring that all plans conform to Transport Canada's restrictions.
- vii. Grades will be met with a 33% maximum slope at the property lines and within the site.
- viii. All damaged areas are to be reinstated with topsoil and sod prior to the release of securities.
- ix. Signage shown on the site development plans is permitted for information purposes only. All signs will be subject to the provisions of Sign By-law 0054-2002, as amended, and a separate sign application will be required through the Building Division.
- x. Any fencing adjacent to municipal lands is to be located 15 cm (6.0 in.) inside the property line.
 - a. Only "shielded" lighting fixtures are permitted for all development, except for detached and semi-detached dwellings (within 60 m (195 ft.) of a residentially zoned property) and must confirm to the Engineer Certified Lighting Plan.
- xii. The Engineer Certified Lighting Plan must be signed by the consulting Engineer.
- xiii. The Owner owns and agrees to construct and install "Shielded" lighting fixtures on the subject lands, in conformity with the Site Plan and Engineer Certified Lighting Plan to the satisfaction of the City of Mississauga.
- xiv. The applicant will be responsible for ensuring that all plans confirm to Transport Canada's restrictions.
 - a. Where planting is to be located in landscaped areas on top of an underground parking structure, it is the responsibility of the applicant to arrange the coordination of the design of the underground parking structure with the Landscape Architect and the Consulting Engineering. Underground parking structure with landscaping area to be capable of supporting the following loads:
 - 15 cm of drainage gravel plus 40 cm topsoil for sod
 - 15 cm of drainage gravel plus 40 cm topsoil for shrubs
 - 15 cm of drainage gravel plus 90 cm for trees
- Or
 - Prefabricated sheet drain system* with a compressive strength of 1003 kPa plus 40 cm topsoil for sod
 - Prefabricated sheet drain system* with a compressive strength of 1003 kPa plus 60 cm topsoil for shrubs
 - Prefabricated sheet drain system* with a compressive strength of 1003 kPa plus 90 cm topsoil for trees
 - * Terradrain 900 or approved equal
- xvi. The structural design of any retaining wall over 0.6 m in height or any retaining wall located on a property line is to be shown on the Site Grading plan for this project and is to be approved by the Consulting Engineer for the project.
- xvii. Continuous 15 cm high barrier type poured concrete curbing will be provided between all asphalt and landscaped areas throughout the site.
- xviii. All utility companies will be notified for locates prior to the installation of the hoarding that lies within the site and within the limit of the City boulevard area.



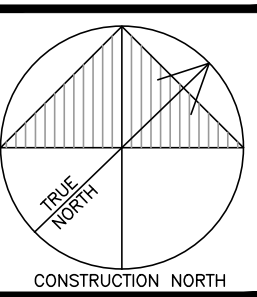
| UNIT SIZES | | | | | |
|--------------|----------------------------|----------------------------|----------------------------|----------------------------|------------------------------|
| Unit | First Floor | Second Floor | Third Floor | Fourth Floor | Total |
| 1 | 31.65m ² | 89.64m ² | 89.64m ² | 89.64m ² | 300.57m ² |
| 2 | 30.83m ² | 87.31m ² | 87.31m ² | 87.31m ² | 292.76m ² |
| 3 | 30.83m ² | 87.31m ² | 87.31m ² | 87.31m ² | 292.76m ² |
| 4 | 30.83m ² | 87.31m ² | 87.31m ² | 87.31m ² | 292.76m ² |
| 5 | 31.65m ² | 89.64m ² | 89.64m ² | 89.64m ² | 300.57m ² |
| 6 | 31.65m ² | 89.64m ² | 89.64m ² | 89.64m ² | 300.57m ² |
| 7 | 30.83m ² | 87.31m ² | 87.31m ² | 87.31m ² | 292.76m ² |
| 8 | 30.83m ² | 87.31m ² | 87.31m ² | 87.31m ² | 292.76m ² |
| 9 | 30.83m ² | 87.31m ² | 87.31m ² | 87.31m ² | 292.76m ² |
| 10 | 31.65m ² | 89.64m ² | 89.64m ² | 89.64m ² | 300.57m ² |
| Total | 311.58m² | 882.42m² | 882.42m² | 882.42m² | 2,958.84m² |

SCALE 1:150

KEY PLAN
N.T.S.

| | | |
|-------------|------------------------------|--|
| | | |
| | | |
| | | |
| | | |
| | | |
| MAY 13 2020 | SITE PLAN APPROVAL | |
| MAR 21 2019 | PRE-APPLICATION CONSULTATION | |
| DATE | REVISION/ISSUED FOR | |

PROPOSED
RESIDENTIAL DEVELOPMENT
86 THOMAS ST.
MISSISSAUGA, ON



WES SURDYKA
a r c h i t e c t i n c

545 KEELE STREET, 2nd FLOOR, STE 10
TORONTO ONTARIO M3J 1M5
TEL (416) 630-2254 FAX (416) 630-5711
e-mail: surdykaarchitect@bellnet.ca

RAWN BY

LOTED MAY 21, 2020

| | |
|-----------|----------|
| CALE | AS SHOWN |
| TART DATE | MAR 2019 |

PROJECT NO. 18-12

540

A1.0

Appendix B – Existing Traffic Data



Turning Movement Count (2 - JOYMAR DR & THOMAS ST)

| Start Time | N Approach JOYMAR DR | | | | | E Approach THOMAS ST | | | | | W Approach THOMAS ST | | | | | Int. Total (15 min) | Int. Total (1 hr) |
|------------|-------------------------|-------------|---------------|------------|----------------|-------------------------|-------------|---------------|------------|----------------|-------------------------|-------------|---------------|------------|----------------|------------------------|----------------------|
| | Right N:W | Left N:E | U-Turn N:N | Peds N: | Approach Total | Right E:N | Thru E:W | U-Turn E:E | Peds E: | Approach Total | Thru W:E | Left W:N | U-Turn W:W | Peds W: | Approach Total | | |
| | | | | | | | | | | | | | | | | | |
| 07:00:00 | 10 | 4 | 0 | 2 | 14 | 0 | 63 | 0 | 0 | 63 | 186 | 19 | 1 | 0 | 206 | 283 | |
| 07:15:00 | 8 | 9 | 0 | 1 | 17 | 2 | 74 | 0 | 0 | 76 | 301 | 23 | 0 | 0 | 324 | 417 | |
| 07:30:00 | 24 | 6 | 0 | 1 | 30 | 6 | 94 | 0 | 1 | 100 | 332 | 55 | 0 | 0 | 387 | 517 | |
| 07:45:00 | 41 | 7 | 0 | 7 | 48 | 17 | 80 | 0 | 0 | 97 | 331 | 90 | 0 | 0 | 421 | 566 | 1783 |
| 08:00:00 | 57 | 4 | 0 | 7 | 61 | 12 | 89 | 0 | 0 | 101 | 378 | 79 | 0 | 0 | 457 | 619 | 2119 |
| 08:15:00 | 22 | 4 | 0 | 1 | 26 | 6 | 88 | 0 | 0 | 94 | 218 | 49 | 0 | 0 | 267 | 387 | 2089 |
| 08:30:00 | 16 | 6 | 0 | 5 | 22 | 5 | 88 | 0 | 0 | 93 | 269 | 51 | 0 | 0 | 320 | 435 | 2007 |
| 08:45:00 | 24 | 4 | 0 | 1 | 28 | 3 | 55 | 0 | 0 | 58 | 151 | 43 | 0 | 2 | 194 | 280 | 1721 |
| 09:00:00 | 22 | 3 | 0 | 1 | 25 | 3 | 59 | 0 | 0 | 62 | 114 | 25 | 0 | 0 | 139 | 226 | 1328 |
| 09:15:00 | 14 | 1 | 0 | 0 | 15 | 3 | 54 | 0 | 1 | 57 | 106 | 24 | 0 | 0 | 130 | 202 | 1143 |
| 09:30:00 | 15 | 5 | 0 | 3 | 20 | 2 | 44 | 0 | 0 | 46 | 81 | 19 | 0 | 0 | 100 | 166 | 874 |
| 09:45:00 | 7 | 1 | 0 | 4 | 8 | 4 | 42 | 0 | 1 | 46 | 80 | 17 | 0 | 0 | 97 | 151 | 745 |

BREAK

| | | | | | | | | | | | | | | | | | |
|----------|----|---|---|---|----|----|-----|---|---|-----|-----|----|---|---|-----|-----|------|
| 16:00:00 | 30 | 8 | 0 | 5 | 38 | 7 | 111 | 0 | 0 | 118 | 77 | 17 | 0 | 0 | 94 | 250 | |
| 16:15:00 | 32 | 3 | 0 | 2 | 35 | 3 | 180 | 0 | 0 | 183 | 91 | 13 | 0 | 0 | 104 | 322 | |
| 16:30:00 | 31 | 6 | 0 | 1 | 37 | 7 | 97 | 0 | 0 | 104 | 59 | 19 | 0 | 0 | 78 | 219 | |
| 16:45:00 | 40 | 4 | 0 | 5 | 44 | 6 | 223 | 0 | 0 | 229 | 93 | 20 | 0 | 0 | 113 | 386 | 1177 |
| 17:00:00 | 50 | 3 | 1 | 3 | 54 | 8 | 153 | 0 | 0 | 161 | 93 | 22 | 0 | 0 | 115 | 330 | 1257 |
| 17:15:00 | 53 | 4 | 0 | 3 | 57 | 17 | 240 | 0 | 0 | 257 | 111 | 18 | 0 | 0 | 129 | 443 | 1378 |
| 17:30:00 | 38 | 7 | 0 | 2 | 45 | 8 | 291 | 0 | 0 | 299 | 139 | 19 | 0 | 0 | 158 | 502 | 1661 |
| 17:45:00 | 48 | 2 | 0 | 4 | 50 | 9 | 271 | 0 | 0 | 280 | 116 | 22 | 0 | 0 | 138 | 468 | 1743 |
| 18:00:00 | 48 | 8 | 0 | 4 | 56 | 11 | 261 | 0 | 1 | 272 | 140 | 23 | 0 | 0 | 163 | 491 | 1904 |
| 18:15:00 | 30 | 5 | 0 | 3 | 35 | 15 | 322 | 0 | 0 | 337 | 129 | 24 | 0 | 0 | 153 | 525 | 1986 |
| 18:30:00 | 41 | 1 | 0 | 6 | 42 | 4 | 206 | 0 | 0 | 210 | 103 | 19 | 0 | 0 | 122 | 374 | 1858 |

Turning Movement Count



| | | | | | | | | | | | | | | | | | |
|--------------------|-------|------|------|----|------|------|-------|----|---|------|-------|-------|----|---|-------|------|------|
| 18:45:00 | 27 | 4 | 0 | 5 | 31 | 4 | 113 | 0 | 1 | 117 | 144 | 17 | 0 | 0 | 161 | 309 | 1699 |
| Grand Total | 728 | 109 | 1 | 76 | 838 | 162 | 3298 | 0 | 5 | 3460 | 3842 | 727 | 1 | 2 | 4570 | 8868 | - |
| Approach% | 86.9% | 13% | 0.1% | | - | 4.7% | 95.3% | 0% | | - | 84.1% | 15.9% | 0% | | - | - | - |
| Totals % | 8.2% | 1.2% | 0% | | 9.4% | 1.8% | 37.2% | 0% | | 39% | 43.3% | 8.2% | 0% | | 51.5% | - | - |
| Heavy | 17 | 5 | 0 | | - | 2 | 97 | 0 | | - | 113 | 12 | 0 | | - | - | - |
| Heavy % | 2.3% | 4.6% | 0% | | - | 1.2% | 2.9% | 0% | | - | 2.9% | 1.7% | 0% | | - | - | - |
| Bicycles | 0 | 0 | 0 | | - | 1 | 3 | 0 | | - | 2 | 0 | 0 | | - | - | - |
| Bicycle % | 0% | 0% | 0% | | - | 0.6% | 0.1% | 0% | | - | 0.1% | 0% | 0% | | - | - | - |



Peak Hour: 07:15 AM - 08:15 AM Weather:

| Start Time | N Approach JOYMAR DR | | | | | E Approach THOMAS ST | | | | | W Approach THOMAS ST | | | | | Int. Total (15 min) |
|-------------|-------------------------|------|--------|------|----------------|-------------------------|------|--------|------|----------------|-------------------------|------|--------|------|----------------|------------------------|
| | Right | Left | U-Turn | Peds | Approach Total | Right | Thru | U-Turn | Peds | Approach Total | Thru | Left | U-Turn | Peds | Approach Total | |
| 07:15:00 | 8 | 9 | 0 | 1 | 17 | 2 | 74 | 0 | 0 | 76 | 301 | 23 | 0 | 0 | 324 | 417 |
| 07:30:00 | 24 | 6 | 0 | 1 | 30 | 6 | 94 | 0 | 1 | 100 | 332 | 55 | 0 | 0 | 387 | 517 |
| 07:45:00 | 41 | 7 | 0 | 7 | 48 | 17 | 80 | 0 | 0 | 97 | 331 | 90 | 0 | 0 | 421 | 566 |
| 08:00:00 | 57 | 4 | 0 | 7 | 61 | 12 | 89 | 0 | 0 | 101 | 378 | 79 | 0 | 0 | 457 | 619 |
| Grand Total | 130 | 26 | 0 | 16 | 156 | 37 | 337 | 0 | 1 | 374 | 1342 | 247 | 0 | 0 | 1589 | 2119 |

| | | | | | | | | | | | | | | | | |
|------------------------|-------|-------|----|-------|-------|-------|----|-------|-------|-------|----|-------|---|---|---|---|
| Approach% | 83.3% | 16.7% | 0% | - | 9.9% | 90.1% | 0% | - | 84.5% | 15.5% | 0% | - | - | - | - | - |
| Totals % | 6.1% | 1.2% | 0% | 7.4% | 1.7% | 15.9% | 0% | 17.6% | 63.3% | 11.7% | 0% | 75% | - | - | - | - |
| PHF | 0.57 | 0.72 | 0 | 0.64 | 0.54 | 0.9 | 0 | 0.93 | 0.89 | 0.69 | 0 | 0.87 | - | - | - | - |
| Heavy | 8 | 3 | 0 | 11 | 2 | 20 | 0 | 22 | 33 | 3 | 0 | 36 | - | - | - | - |
| Heavy % | 6.2% | 11.5% | 0% | 7.1% | 5.4% | 5.9% | 0% | 5.9% | 2.5% | 1.2% | 0% | 2.3% | - | - | - | - |
| Lights | 122 | 23 | 0 | 145 | 35 | 317 | 0 | 352 | 1309 | 244 | 0 | 1553 | - | - | - | - |
| Lights % | 93.8% | 88.5% | 0% | 92.9% | 94.6% | 94.1% | 0% | 94.1% | 97.5% | 98.8% | 0% | 97.7% | - | - | - | - |
| Single-Unit Trucks | 3 | 1 | 0 | 4 | 1 | 0 | 0 | 1 | 4 | 1 | 0 | 5 | - | - | - | - |
| Single-Unit Trucks % | 2.3% | 3.8% | 0% | 2.6% | 2.7% | 0% | 0% | 0.3% | 0.3% | 0.4% | 0% | 0.3% | - | - | - | - |
| Buses | 5 | 2 | 0 | 7 | 1 | 20 | 0 | 21 | 29 | 2 | 0 | 31 | - | - | - | - |
| Buses % | 3.8% | 7.7% | 0% | 4.5% | 2.7% | 5.9% | 0% | 5.6% | 2.2% | 0.8% | 0% | 2% | - | - | - | - |
| Articulated Trucks | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | - | - | - |
| Articulated Trucks % | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | - | - | - | - |
| Pedestrians | - | - | - | 11 | - | - | - | 1 | - | - | - | 0 | - | - | - | - |
| Pedestrians% | - | - | - | 64.7% | - | - | - | 5.9% | - | - | - | 0% | - | - | - | - |
| Bicycles on Crosswalk | - | - | - | 5 | - | - | - | 0 | - | - | - | 0 | - | - | - | - |
| Bicycles on Crosswalk% | - | - | - | 29.4% | - | - | - | 0% | - | - | - | 0% | - | - | - | - |
| Bicycles on Road | 0 | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | - | - |
| Bicycles on Road% | - | - | - | 0% | - | - | - | 0% | - | - | - | - | - | - | - | - |



Peak Hour: 05:30 PM - 06:30 PM Weather:

| Start Time | N Approach JOYMAR DR | | | | | E Approach THOMAS ST | | | | | W Approach THOMAS ST | | | | | Int. Total (15 min) |
|-------------|-------------------------|------|--------|------|----------------|-------------------------|------|--------|------|----------------|-------------------------|------|--------|------|----------------|------------------------|
| | Right | Left | U-Turn | Peds | Approach Total | Right | Thru | U-Turn | Peds | Approach Total | Thru | Left | U-Turn | Peds | Approach Total | |
| | | | | | | | | | | | | | | | | |
| 17:30:00 | 38 | 7 | 0 | 2 | 45 | 8 | 291 | 0 | 0 | 299 | 139 | 19 | 0 | 0 | 158 | 502 |
| 17:45:00 | 48 | 2 | 0 | 4 | 50 | 9 | 271 | 0 | 0 | 280 | 116 | 22 | 0 | 0 | 138 | 468 |
| 18:00:00 | 48 | 8 | 0 | 4 | 56 | 11 | 261 | 0 | 1 | 272 | 140 | 23 | 0 | 0 | 163 | 491 |
| 18:15:00 | 30 | 5 | 0 | 3 | 35 | 15 | 322 | 0 | 0 | 337 | 129 | 24 | 0 | 0 | 153 | 525 |
| Grand Total | 164 | 22 | 0 | 13 | 186 | 43 | 1145 | 0 | 1 | 1188 | 524 | 88 | 0 | 0 | 612 | 1986 |

Approach% 88.2% 11.8% 0% - 3.6% 96.4% 0% 0% - 85.6% 14.4% 0% 0% - -

Totals % 8.3% 1.1% 0% 9.4% 2.2% 57.7% 0% 59.8% 26.4% 4.4% 0% 30.8% -

PHF 0.85 0.69 0 0.83 0.72 0.89 0 0.88 0.94 0.92 0 0.94 -

Heavy 0 0 0 0 0 0 17 0 17 14 0 0 14 -

Heavy % 0% 0% 0% 0% 0% 1.5% 0% 1.4% 2.7% 0% 0% 2.3% -

Lights 164 22 0 186 43 1128 0 1171 510 88 0 598 -

Lights % 100% 100% 0% 100% 100% 98.5% 0% 98.6% 97.3% 100% 0% 97.7% -

Single-Unit Trucks 0 0 0 0 0 0 1 0 1 0 0 0 0 -

Single-Unit Trucks % 0% 0% 0% 0% 0% 0.1% 0% 0.1% 0% 0% 0% 0% -

Buses 0 0 0 0 0 0 16 0 16 14 0 0 14 -

Buses % 0% 0% 0% 0% 0% 1.4% 0% 1.3% 2.7% 0% 0% 2.3% -

Articulated Trucks 0 0 0 0 0 0 0 0 0 0 0 0 0 -

Articulated Trucks % 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% -

Pedestrians - - 11 - - 1 - 0 - - - -

Pedestrians% - - 78.6% - - 7.1% - - 0% - - -

Bicycles on Crosswalk - - 2 - - 0 - - - - -

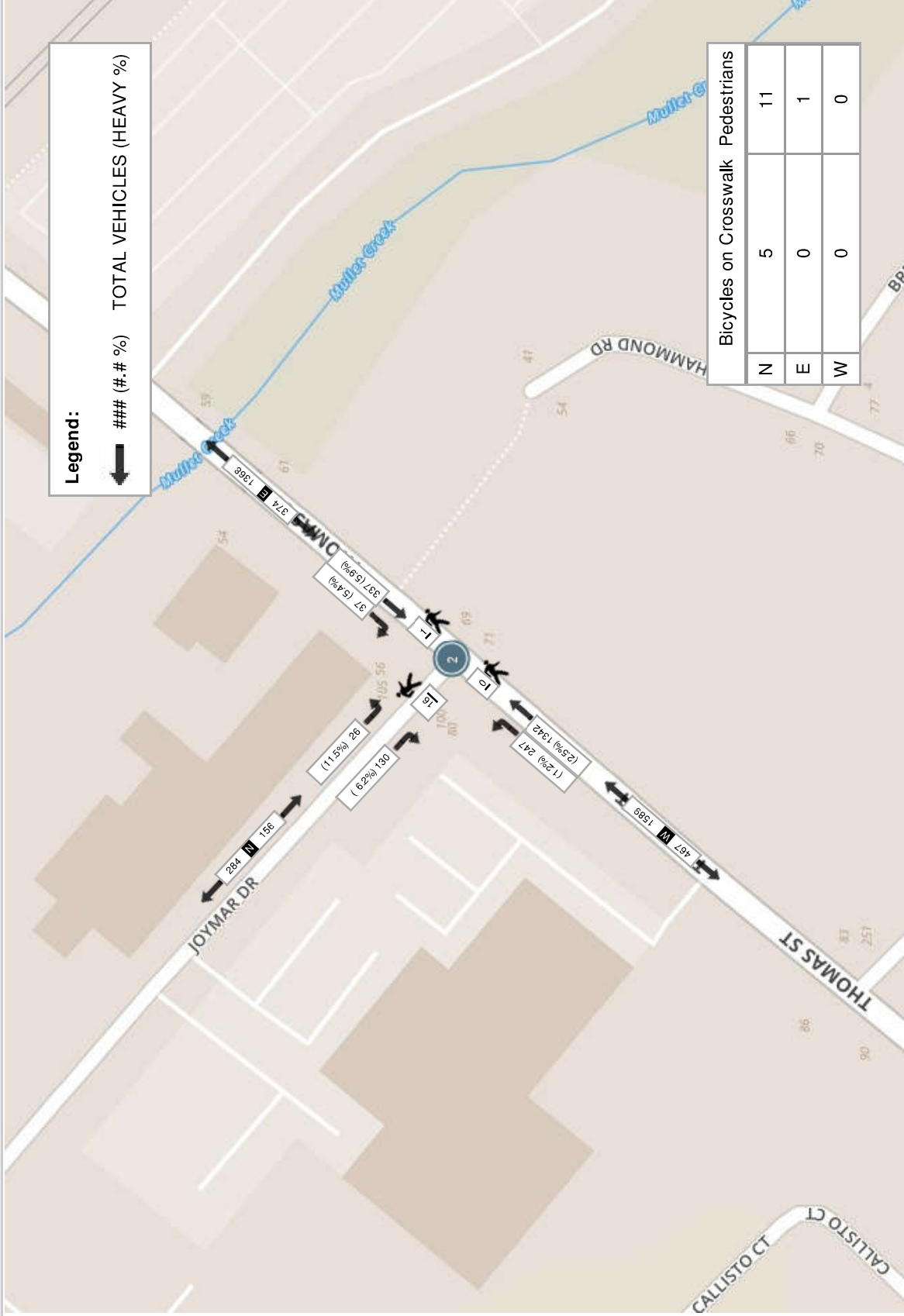
Bicycles on Crosswalk% - - 14.3% - - 0% - - 0% - - -

Bicycles on Road 0 0 0 0 0 0 1 0 0 0 0 0 0 -

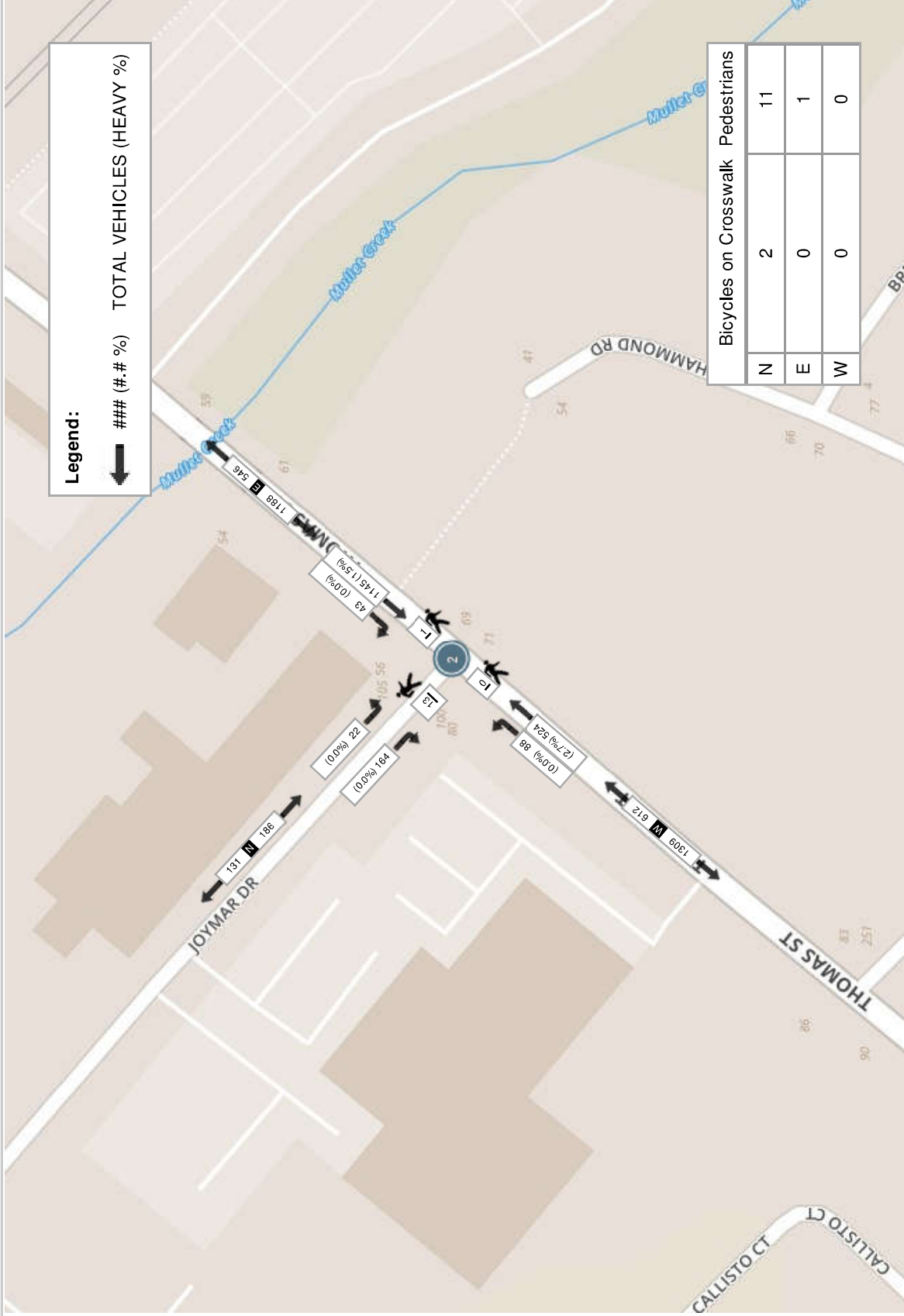
Bicycles on Road% - - 0% - - 0% - - 0% - - -



Peak Hour: 07:15 AM - 08:15 AM Weather:



Peak Hour: 05:30 PM - 06:30 PM Weather:





Turning Movement Count (1 . THOMAS ST & HILLSIDE DR)

| Start Time | E Approach THOMAS ST | | | | | S Approach HILLSIDE DR | | | | | W Approach THOMAS ST | | | | | Int. Total (15 min) | Int. Total (1 hr) |
|------------|-------------------------|-------------|---------------|------------|----------------|---------------------------|-------------|---------------|------------|----------------|-------------------------|-------------|---------------|------------|----------------|------------------------|----------------------|
| | Thru E:W | Left E:S | U-Turn E:E | Peds E: | Approach Total | Right S:E | Left S:W | U-Turn S:S | Peds S: | Approach Total | Right W:S | Thru W:E | U-Turn W:W | Peds W: | Approach Total | | |
| | | | | | | | | | | | | | | | | | |
| 07:00:00 | 63 | 2 | 0 | 0 | 65 | 9 | 8 | 0 | 0 | 17 | 4 | 215 | 0 | 0 | 219 | 301 | |
| 07:15:00 | 89 | 0 | 0 | 0 | 89 | 9 | 12 | 0 | 1 | 21 | 11 | 302 | 0 | 1 | 313 | 423 | |
| 07:30:00 | 121 | 2 | 0 | 0 | 123 | 15 | 15 | 0 | 0 | 30 | 2 | 386 | 0 | 0 | 388 | 541 | |
| 07:45:00 | 118 | 2 | 0 | 0 | 120 | 20 | 15 | 0 | 0 | 35 | 10 | 430 | 0 | 0 | 440 | 595 | 1860 |
| 08:00:00 | 143 | 4 | 0 | 0 | 147 | 12 | 9 | 0 | 1 | 21 | 5 | 385 | 0 | 1 | 390 | 558 | 2117 |
| 08:15:00 | 87 | 7 | 0 | 0 | 94 | 16 | 9 | 0 | 0 | 25 | 7 | 240 | 0 | 0 | 247 | 366 | 2060 |
| 08:30:00 | 93 | 4 | 0 | 0 | 97 | 25 | 9 | 0 | 0 | 34 | 7 | 319 | 0 | 0 | 326 | 457 | 1976 |
| 08:45:00 | 71 | 8 | 0 | 0 | 79 | 11 | 5 | 0 | 1 | 16 | 5 | 184 | 0 | 0 | 189 | 284 | 1665 |
| 09:00:00 | 73 | 9 | 0 | 0 | 82 | 13 | 12 | 0 | 1 | 25 | 1 | 124 | 0 | 0 | 125 | 232 | 1339 |
| 09:15:00 | 62 | 3 | 0 | 0 | 65 | 8 | 11 | 0 | 0 | 19 | 4 | 111 | 0 | 0 | 115 | 199 | 1172 |
| 09:30:00 | 53 | 2 | 0 | 0 | 55 | 9 | 4 | 0 | 1 | 13 | 3 | 81 | 0 | 0 | 84 | 152 | 867 |
| 09:45:00 | 47 | 5 | 0 | 0 | 52 | 9 | 5 | 0 | 0 | 14 | 5 | 107 | 0 | 0 | 112 | 178 | 761 |

BREAK

| | | | | | | | | | | | | | | | | | |
|----------|-----|----|---|---|-----|----|---|---|---|----|----|-----|---|---|-----|-----|------|
| 16:00:00 | 129 | 8 | 0 | 0 | 137 | 8 | 7 | 0 | 0 | 15 | 7 | 110 | 0 | 0 | 117 | 269 | |
| 16:15:00 | 201 | 13 | 0 | 0 | 214 | 5 | 3 | 0 | 2 | 8 | 6 | 87 | 0 | 0 | 93 | 315 | |
| 16:30:00 | 137 | 9 | 0 | 0 | 146 | 8 | 9 | 0 | 0 | 17 | 5 | 91 | 1 | 0 | 97 | 260 | |
| 16:45:00 | 186 | 18 | 0 | 0 | 204 | 4 | 6 | 0 | 1 | 10 | 10 | 106 | 0 | 0 | 116 | 330 | 1174 |
| 17:00:00 | 222 | 13 | 0 | 0 | 235 | 5 | 4 | 0 | 1 | 9 | 6 | 93 | 0 | 0 | 99 | 343 | 1248 |
| 17:15:00 | 194 | 18 | 0 | 0 | 212 | 7 | 6 | 0 | 1 | 13 | 13 | 104 | 0 | 0 | 117 | 342 | 1275 |
| 17:30:00 | 376 | 13 | 0 | 0 | 389 | 6 | 6 | 0 | 0 | 12 | 10 | 129 | 0 | 0 | 139 | 540 | 1555 |
| 17:45:00 | 187 | 15 | 1 | 0 | 203 | 13 | 6 | 0 | 0 | 19 | 14 | 120 | 0 | 0 | 134 | 356 | 1581 |
| 18:00:00 | 335 | 10 | 0 | 0 | 345 | 8 | 7 | 0 | 0 | 15 | 14 | 122 | 0 | 0 | 136 | 496 | 1734 |
| 18:15:00 | 298 | 12 | 0 | 0 | 310 | 6 | 5 | 0 | 1 | 11 | 10 | 117 | 0 | 0 | 127 | 448 | 1840 |
| 18:30:00 | 252 | 11 | 0 | 0 | 263 | 7 | 5 | 0 | 2 | 12 | 7 | 133 | 0 | 0 | 140 | 415 | 1715 |

Turning Movement Count



| | | | | | | | | | | | | | | | | | | |
|--------------------|-------|------|----|---|---|-------|-------|-------|----|----|------|------|-------|----|---|-------|-------------|------|
| 18:45:00 | 152 | 10 | 0 | 0 | 0 | 162 | 6 | 3 | 0 | 1 | 9 | 7 | 121 | 0 | 0 | 128 | 299 | 1658 |
| Grand Total | 3689 | 198 | 1 | 0 | 0 | 3888 | 239 | 181 | 0 | 14 | 420 | 173 | 4217 | 1 | 2 | 4391 | 8699 | - |
| Approach% | 94.9% | 5.1% | 0% | | | - | 56.9% | 43.1% | 0% | | - | 3.9% | 96% | 0% | | - | - | - |
| Totals % | 42.4% | 2.3% | 0% | | | 44.7% | 2.7% | 2.1% | 0% | | 4.8% | 2% | 48.5% | 0% | | 50.5% | - | - |
| Heavy | 97 | 5 | 0 | | | - | 3 | 4 | 0 | | - | 3 | 120 | 0 | | - | - | - |
| Heavy % | 2.6% | 2.5% | 0% | | | - | 1.3% | 2.2% | 0% | | - | 1.7% | 2.8% | 0% | | - | - | - |
| Bicycles | - | - | - | | | - | - | - | - | | - | - | - | - | | - | - | - |
| Bicycle % | - | - | - | | | - | - | - | - | | - | - | - | - | | - | - | - |



Peak Hour: 07:15 AM - 08:15 AM Weather: Few Clouds (-12.28 °C)

| Start Time | E Approach THOMAS ST | | | | | S Approach HILLSIDE DR | | | | | W Approach THOMAS ST | | | | | Int. Total (15 min) |
|----------------------|-------------------------|------|--------|------|----------------|---------------------------|-------|--------|------|----------------|-------------------------|-------|--------|------|----------------|------------------------|
| | Thru | Left | U-Turn | Peds | Approach Total | Right | Left | U-Turn | Peds | Approach Total | Right | Thru | U-Turn | Peds | Approach Total | |
| 07:15:00 | 89 | 0 | 0 | 0 | 89 | 9 | 12 | 0 | 1 | 21 | 11 | 302 | 0 | 1 | 313 | 423 |
| 07:30:00 | 121 | 2 | 0 | 0 | 123 | 15 | 15 | 0 | 0 | 30 | 2 | 386 | 0 | 0 | 388 | 541 |
| 07:45:00 | 118 | 2 | 0 | 0 | 120 | 20 | 15 | 0 | 0 | 35 | 10 | 430 | 0 | 0 | 440 | 595 |
| 08:00:00 | 143 | 4 | 0 | 0 | 147 | 12 | 9 | 0 | 1 | 21 | 5 | 385 | 0 | 1 | 390 | 558 |
| Grand Total | 471 | 8 | 0 | 0 | 479 | 56 | 51 | 0 | 2 | 107 | 28 | 1503 | 0 | 2 | 1531 | 2117 |
| Approach% | 98.3% | 1.7% | 0% | | - | 52.3% | 47.7% | 0% | | - | 1.8% | 98.2% | 0% | | - | - |
| Totals % | 22.2% | 0.4% | 0% | | 22.6% | 2.6% | 2.4% | 0% | | 5.1% | 1.3% | 71% | 0% | | 72.3% | - |
| PHF | 0.82 | 0.5 | 0 | | 0.81 | 0.7 | 0.85 | 0 | | 0.76 | 0.64 | 0.87 | 0 | | 0.87 | - |
| Heavy | 30 | 0 | 0 | | 30 | 0 | 1 | 0 | | 1 | 1 | 32 | 0 | | 33 | - |
| Heavy % | 6.4% | 0% | 0% | | 6.3% | 0% | 2% | 0% | | 0.9% | 3.6% | 2.1% | 0% | | 2.2% | - |
| Lights | 441 | 8 | 0 | | 449 | 56 | 50 | 0 | | 106 | 27 | 1471 | 0 | | 1498 | - |
| Lights % | 93.6% | 100% | 0% | | 93.7% | 100% | 98% | 0% | | 99.1% | 96.4% | 97.9% | 0% | | 97.8% | - |
| Single-Unit Trucks | 5 | 0 | 0 | | 5 | 0 | 0 | 0 | | 0 | 0 | 2 | 0 | | 2 | - |
| Single-Unit Trucks % | 1.1% | 0% | 0% | | 1% | 0% | 0% | 0% | | 0% | 0% | 0.1% | 0% | | 0.1% | - |
| Buses | 25 | 0 | 0 | | 25 | 0 | 1 | 0 | | 1 | 1 | 30 | 0 | | 31 | - |
| Buses % | 5.3% | 0% | 0% | | 5.2% | 0% | 2% | 0% | | 0.9% | 3.6% | 2% | 0% | | 2% | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 2 | - | - | - | - | 2 | - | - |
| Pedestrians% | - | - | - | 0% | - | - | - | - | 50% | - | - | - | - | 50% | - | - |

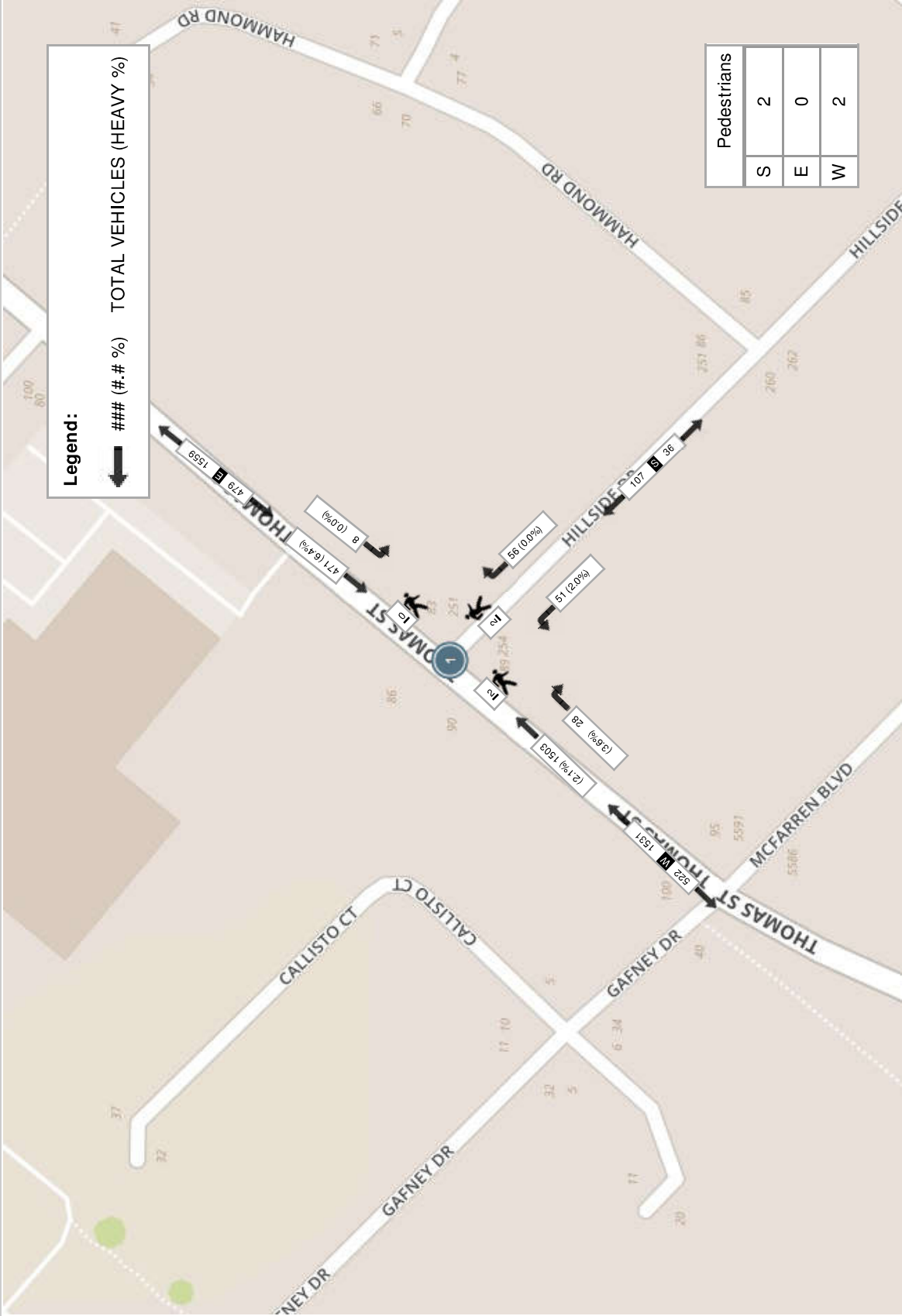


Peak Hour: 05:30 PM - 06:30 PM Weather: Scattered Clouds (-5.46 °C)

| Start Time | E Approach THOMAS ST | | | | | S Approach HILLSIDE DR | | | | | W Approach THOMAS ST | | | | | Int. Total (15 min) | | | | | |
|----------------------|-------------------------|-------|------|------|--------|---------------------------|------|-------|----------------|----|-------------------------|-------|------|-------|--------|------------------------|------|-------|----------------|-----|--|
| | Thru | | Left | | U-Turn | | Peds | | Approach Total | | Right | | Thru | | U-Turn | | Peds | | Approach Total | | |
| | | | | | | | | | | | | | | | | | | | | | |
| 17:30:00 | | 376 | 13 | 0 | 0 | 0 | 389 | | 6 | 6 | 0 | 0 | 12 | | 10 | 129 | 0 | 0 | 139 | 540 | |
| 17:45:00 | | 187 | 15 | 1 | 0 | 203 | | 13 | 6 | 0 | 0 | 19 | | 14 | 120 | 0 | 0 | 134 | 356 | | |
| 18:00:00 | | 335 | 10 | 0 | 0 | 345 | | 8 | 7 | 0 | 0 | 15 | | 14 | 122 | 0 | 0 | 136 | 496 | | |
| 18:15:00 | | 298 | 12 | 0 | 0 | 310 | | 6 | 5 | 0 | 1 | 11 | | 10 | 117 | 0 | 0 | 127 | 448 | | |
| Grand Total | | 1196 | 50 | 1 | 0 | 1247 | | 33 | 24 | 0 | 1 | 57 | | 48 | 488 | 0 | 0 | 536 | 1840 | | |
| Approach% | | 95.9% | 4% | 0.1% | | - | | 57.9% | 42.1% | 0% | | - | | 9% | 91% | 0% | | - | | - | |
| Totals % | | 65% | 2.7% | 0.1% | | 67.8% | | 1.8% | 1.3% | 0% | | 3.1% | | 2.6% | 26.5% | 0% | | 29.1% | | - | |
| PHF | | 0.8 | 0.83 | 0.25 | | 0.8 | | 0.63 | 0.86 | 0 | | 0.75 | | 0.86 | 0.95 | 0 | | 0.96 | | - | |
| Heavy | | 15 | 0 | 0 | | 15 | | 0 | 1 | 0 | | 1 | | 1 | 12 | 0 | | 13 | | - | |
| Heavy % | | 1.3% | 0% | 0% | | 1.2% | | 0% | 4.2% | 0% | | 1.8% | | 2.1% | 2.5% | 0% | | 2.4% | | - | |
| Lights | | 1181 | 50 | 1 | | 1232 | | 33 | 23 | 0 | | 56 | | 47 | 476 | 0 | | 523 | | - | |
| Lights % | | 98.7% | 100% | 100% | | 98.8% | | 100% | 95.8% | 0% | | 98.2% | | 97.9% | 97.5% | 0% | | 97.6% | | - | |
| Single-Unit Trucks | | 1 | 0 | 0 | | 1 | | 0 | 1 | 0 | | 1 | | 1 | 0 | 0 | | 1 | | - | |
| Single-Unit Trucks % | | 0.1% | 0% | 0% | | 0.1% | | 0% | 4.2% | 0% | | 1.8% | | 2.1% | 0% | 0% | | 0.2% | | - | |
| Buses | | 14 | 0 | 0 | | 14 | | 0 | 0 | 0 | | 0 | | 0 | 12 | 0 | | 12 | | - | |
| Buses % | | 1.2% | 0% | 0% | | 1.1% | | 0% | 0% | 0% | | 0% | | 0% | 2.5% | 0% | | 2.2% | | - | |
| Pedestrians | | - | - | - | 0 | - | | - | - | - | 1 | - | | - | - | - | 0 | - | | - | |
| Pedestrians% | | - | - | - | 0% | - | | - | - | - | 100% | - | | - | - | - | 0% | - | | - | |

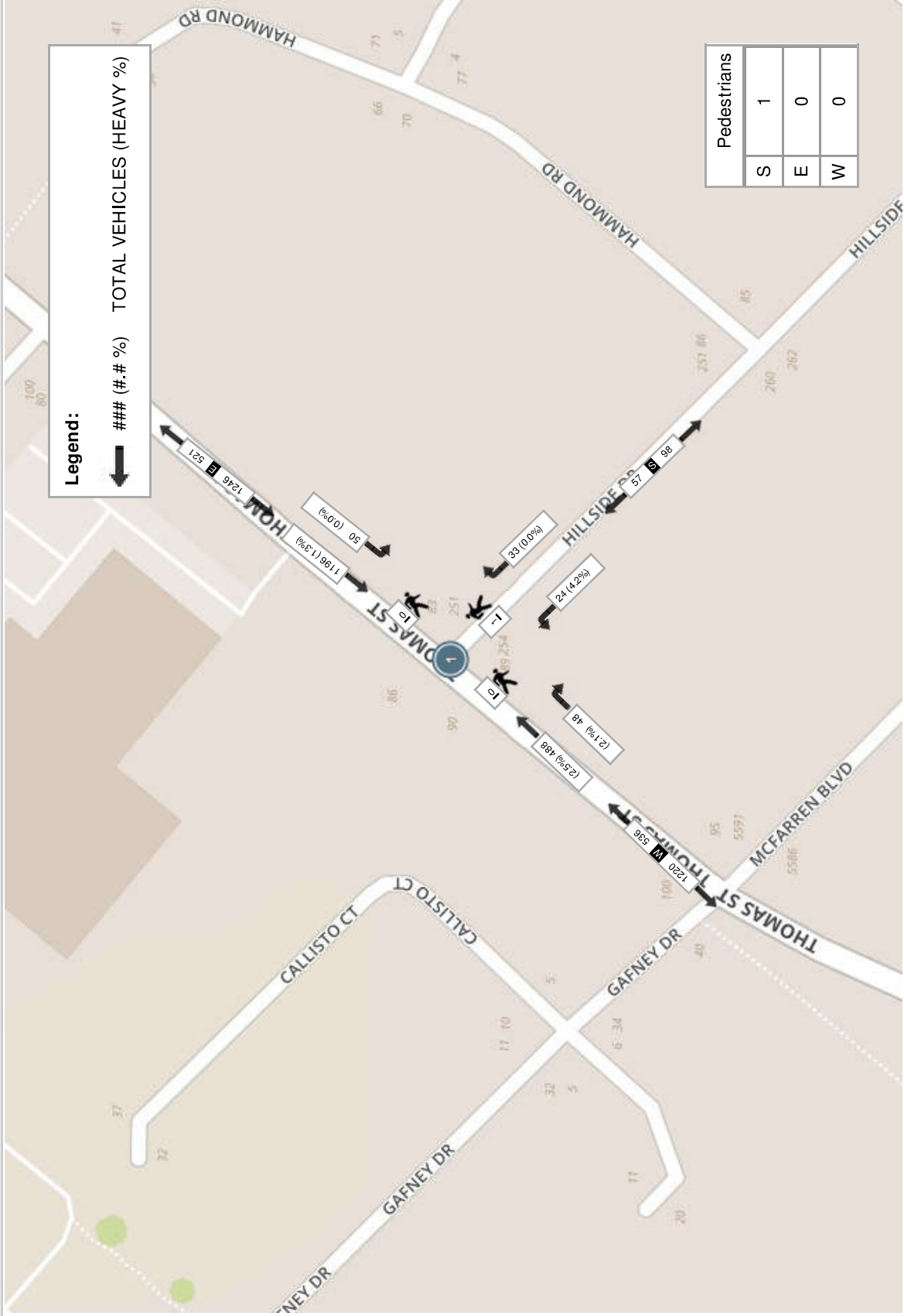


Peak Hour: 07:15 AM - 08:15 AM Weather: Few Clouds (-12.28 °C)





Peak Hour: 05:30 PM - 06:30 PM Weather: Scattered Clouds (-5.46 °C)












Appendix C – Existing Traffic Level of Service Calculations

HCM Unsignalized Intersection Capacity Analysis

3: Hillside Drive & Thomas Street

04/09/2019

| | | | | | | |
|-----------------------------------|---|---|---|---|---|---|
| |  |  |  |  |  |  |
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations |  | | |  |  | |
| Traffic Volume (veh/h) | 1503 | 28 | 8 | 471 | 51 | 56 |
| Future Volume (Veh/h) | 1503 | 28 | 8 | 471 | 51 | 56 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.87 | 0.64 | 0.50 | 0.82 | 0.85 | 0.70 |
| Hourly flow rate (vph) | 1728 | 44 | 16 | 574 | 60 | 80 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | | | | |
| tC, single (s) | | | | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | | | | |
| p0 queue free % | | | | | | |
| cM capacity (veh/h) | | | | | | |
| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | |
| Volume Total | 1152 | 620 | 207 | 383 | 140 | |
| Volume Left | 0 | 0 | 16 | 0 | 60 | |
| Volume Right | 0 | 44 | 0 | 0 | 80 | |
| cSH | 1700 | 1700 | 356 | 1700 | 87 | |
| Volume to Capacity | 0.68 | 0.36 | 0.04 | 0.23 | 1.62 | |
| Queue Length 95th (m) | 0.0 | 0.0 | 1.1 | 0.0 | 86.0 | |
| Control Delay (s) | 0.0 | 0.0 | 1.9 | 0.0 | 408.0 | |
| Lane LOS | | | A | | F | |
| Approach Delay (s) | 0.0 | | 0.7 | | 408.0 | |
| Approach LOS | | | | | F | |
| Intersection Summary | | | | | | |
| Average Delay | | | | | | |
| Intersection Capacity Utilization | | | | | | |
| ICU Level of Service | | | | | | |
| Analysis Period (min) | | | | | | |

HCM Unsignalized Intersection Capacity Analysis

5: Thomas Street & Joymar Drive

04/09/2019












| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|-----------------------------------|------|------|-------|------|----------------------|------|
| Lane Configurations | | ↕↕ | ↕↕ | | ↗ | ↗ |
| Traffic Volume (veh/h) | 247 | 1342 | 337 | 37 | 26 | 130 |
| Future Volume (Veh/h) | 247 | 1342 | 337 | 37 | 26 | 130 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.69 | 0.89 | 0.90 | 0.54 | 0.72 | 0.57 |
| Hourly flow rate (vph) | 358 | 1508 | 374 | 69 | 36 | 228 |
| Pedestrians | | | 1 | | 16 | |
| Lane Width (m) | | | 3.7 | | 3.7 | |
| Walking Speed (m/s) | | | 1.1 | | 1.1 | |
| Percent Blockage | | | 0 | | 2 | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 459 | | | | 1896 | 238 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 459 | | | | 1896 | 238 |
| tC, single (s) | 4.1 | | | | 7.0 | 7.0 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.4 |
| p0 queue free % | 67 | | | | 0 | 69 |
| cM capacity (veh/h) | 1088 | | | | 36 | 740 |
| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 | SB 2 |
| Volume Total | 861 | 1005 | 249 | 194 | 36 | 228 |
| Volume Left | 358 | 0 | 0 | 0 | 36 | 0 |
| Volume Right | 0 | 0 | 0 | 69 | 0 | 228 |
| cSH | 1088 | 1700 | 1700 | 1700 | 36 | 740 |
| Volume to Capacity | 0.33 | 0.59 | 0.15 | 0.11 | 1.00 | 0.31 |
| Queue Length 95th (m) | 11.0 | 0.0 | 0.0 | 0.0 | 27.9 | 9.9 |
| Control Delay (s) | 6.8 | 0.0 | 0.0 | 0.0 | 316.0 | 12.0 |
| Lane LOS | A | | | | F | B |
| Approach Delay (s) | 3.2 | | 0.0 | | 53.5 | |
| Approach LOS | | | | | F | |
| Intersection Summary | | | | | | |
| Average Delay | | | 7.8 | | | |
| Intersection Capacity Utilization | | | 69.4% | | ICU Level of Service | C |
| Analysis Period (min) | | | 15 | | | |

HCM Unsignalized Intersection Capacity Analysis

3: Hillside Drive & Thomas Street

04/09/2019

| | | | | | | |
|-----------------------------------|---|---|---|---|---|---|
| |  |  |  |  |  |  |
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations |  | | |  |  | |
| Traffic Volume (veh/h) | 488 | 48 | 50 | 1196 | 24 | 33 |
| Future Volume (Veh/h) | 488 | 48 | 50 | 1196 | 24 | 33 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.86 | 0.83 | 0.80 | 0.86 | 0.63 |
| Hourly flow rate (vph) | 514 | 56 | 60 | 1495 | 28 | 52 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | | | | |
| tC, single (s) | | | | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | | | | |
| p0 queue free % | | | | | | |
| cM capacity (veh/h) | | | | | | |
| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | |
| Volume Total | 343 | 227 | 558 | 997 | 80 | |
| Volume Left | 0 | 0 | 60 | 0 | 28 | |
| Volume Right | 0 | 56 | 0 | 0 | 52 | |
| cSH | 1700 | 1700 | 1013 | 1700 | 261 | |
| Volume to Capacity | 0.20 | 0.13 | 0.06 | 0.59 | 0.31 | |
| Queue Length 95th (m) | 0.0 | 0.0 | 1.4 | 0.0 | 9.6 | |
| Control Delay (s) | 0.0 | 0.0 | 1.6 | 0.0 | 24.8 | |
| Lane LOS | | | A | | C | |
| Approach Delay (s) | 0.0 | | 0.6 | | 24.8 | |
| Approach LOS | | | | | C | |
| Intersection Summary | | | | | | |
| Average Delay | | | | | | |
| Intersection Capacity Utilization | | | | | | |
| ICU Level of Service | | | | | | |
| Analysis Period (min) | | | | | | |

HCM Unsignalized Intersection Capacity Analysis

5: Thomas Street & Joymar Drive

04/09/2019












| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|-----------------------------------|------|------|-------|------|----------------------|------|
| Lane Configurations | | ↕↕ | ↕↕ | | ↕ | ↕ |
| Traffic Volume (veh/h) | 88 | 524 | 1145 | 43 | 22 | 164 |
| Future Volume (Veh/h) | 88 | 524 | 1145 | 43 | 22 | 164 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.94 | 0.89 | 0.72 | 0.69 | 0.85 |
| Hourly flow rate (vph) | 96 | 557 | 1287 | 60 | 32 | 193 |
| Pedestrians | | | 1 | | 13 | |
| Lane Width (m) | | | 3.7 | | 3.7 | |
| Walking Speed (m/s) | | | 1.1 | | 1.1 | |
| Percent Blockage | | | 0 | | 1 | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 1360 | | | | 1802 | 686 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1360 | | | | 1802 | 686 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 81 | | | | 45 | 50 |
| cM capacity (veh/h) | 505 | | | | 58 | 389 |
| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 | SB 2 |
| Volume Total | 282 | 371 | 858 | 489 | 32 | 193 |
| Volume Left | 96 | 0 | 0 | 0 | 32 | 0 |
| Volume Right | 0 | 0 | 0 | 60 | 0 | 193 |
| cSH | 505 | 1700 | 1700 | 1700 | 58 | 389 |
| Volume to Capacity | 0.19 | 0.22 | 0.50 | 0.29 | 0.55 | 0.50 |
| Queue Length 95th (m) | 5.3 | 0.0 | 0.0 | 0.0 | 16.7 | 20.2 |
| Control Delay (s) | 6.6 | 0.0 | 0.0 | 0.0 | 126.3 | 23.0 |
| Lane LOS | A | | | | F | C |
| Approach Delay (s) | 2.9 | | 0.0 | | 37.7 | |
| Approach LOS | | | | | E | |
| Intersection Summary | | | | | | |
| Average Delay | | | 4.7 | | | |
| Intersection Capacity Utilization | | | 63.4% | | ICU Level of Service | B |
| Analysis Period (min) | | | 15 | | | |

Appendix D - Future (2024) Background Traffic Level of Service Calculations

HCM Unsignalized Intersection Capacity Analysis

3: Hillside Drive & Thomas Street

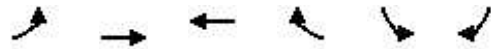
04/05/2019

| | | | | | | |
|-----------------------------------|---|---|---|---|---|---|
| |  |  |  |  |  |  |
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations |  | | |  |  | |
| Traffic Volume (veh/h) | 1582 | 28 | 8 | 507 | 51 | 56 |
| Future Volume (Veh/h) | 1582 | 28 | 8 | 507 | 51 | 56 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 1720 | 30 | 9 | 551 | 55 | 61 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | | | | |
| tC, single (s) | | | | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | | | | |
| p0 queue free % | | | | | | |
| cM capacity (veh/h) | | | | | | |
| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | |
| Volume Total | 1147 | 603 | 193 | 367 | 116 | |
| Volume Left | 0 | 0 | 9 | 0 | 55 | |
| Volume Right | 0 | 30 | 0 | 0 | 61 | |
| cSH | 1700 | 1700 | 363 | 1700 | 87 | |
| Volume to Capacity | 0.67 | 0.35 | 0.02 | 0.22 | 1.34 | |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.6 | 0.0 | 65.9 | |
| Control Delay (s) | 0.0 | 0.0 | 1.1 | 0.0 | 297.7 | |
| Lane LOS | | | | A | F | |
| Approach Delay (s) | 0.0 | | 0.4 | | 297.7 | |
| Approach LOS | | | | | F | |
| Intersection Summary | | | | | | |
| Average Delay | | | | | | |
| Intersection Capacity Utilization | | | | | | |
| ICU Level of Service | | | | | | |
| Analysis Period (min) | | | | | | |

HCM Unsignalized Intersection Capacity Analysis

5: Thomas Street & Joymar Drive

04/05/2019



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|-----------------------------------|------|------|-------|------|----------------------|------|
| Lane Configurations | | ↕↕ | ↕↕ | | ↗ | ↗ |
| Traffic Volume (veh/h) | 249 | 1410 | 354 | 38 | 33 | 142 |
| Future Volume (Veh/h) | 249 | 1410 | 354 | 38 | 33 | 142 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 271 | 1533 | 385 | 41 | 36 | 154 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 426 | | | | 1714 | 213 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 426 | | | | 1714 | 213 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 76 | | | | 42 | 81 |
| cM capacity (veh/h) | 1130 | | | | 62 | 792 |
| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 | SB 2 |
| Volume Total | 782 | 1022 | 257 | 169 | 36 | 154 |
| Volume Left | 271 | 0 | 0 | 0 | 36 | 0 |
| Volume Right | 0 | 0 | 0 | 41 | 0 | 154 |
| cSH | 1130 | 1700 | 1700 | 1700 | 62 | 792 |
| Volume to Capacity | 0.24 | 0.60 | 0.15 | 0.10 | 0.58 | 0.19 |
| Queue Length 95th (m) | 7.1 | 0.0 | 0.0 | 0.0 | 18.3 | 5.5 |
| Control Delay (s) | 5.2 | 0.0 | 0.0 | 0.0 | 124.7 | 10.6 |
| Lane LOS | A | | | | F | B |
| Approach Delay (s) | 2.3 | | 0.0 | | 32.3 | |
| Approach LOS | | | | | D | |
| Intersection Summary | | | | | | |
| Average Delay | | | 4.2 | | | |
| Intersection Capacity Utilization | | | 70.5% | | ICU Level of Service | C |
| Analysis Period (min) | | | 15 | | | |

HCM Unsignalized Intersection Capacity Analysis

7: Joymar Drive & Entrance #1

04/05/2019






| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 26 | 10 | 1 | 2 | 9 | 5 |
| Future Volume (Veh/h) | 26 | 10 | 1 | 2 | 9 | 5 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 28 | 11 | 1 | 2 | 10 | 5 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 16 | 12 | 15 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 16 | 12 | 15 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 97 | 99 | 100 | | | |
| cM capacity (veh/h) | 1001 | 1068 | 1603 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 39 | 3 | 15 | | | |
| Volume Left | 28 | 1 | 0 | | | |
| Volume Right | 11 | 0 | 5 | | | |
| cSH | 1019 | 1603 | 1700 | | | |
| Volume to Capacity | 0.04 | 0.00 | 0.01 | | | |
| Queue Length 95th (m) | 0.9 | 0.0 | 0.0 | | | |
| Control Delay (s) | 8.7 | 2.4 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 8.7 | 2.4 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | 6.1 | | | | |
| Intersection Capacity Utilization | | 13.3% | | ICU Level of Service | | A |
| Analysis Period (min) | | 15 | | | | |

HCM Unsignalized Intersection Capacity Analysis

9: Joymar Drive & Entrance #2

04/05/2019






| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|---|------|------|---|---|------|
| Lane Configurations |  | | |  |  | |
| Traffic Volume (veh/h) | 21 | 7 | 1 | 27 | 7 | 4 |
| Future Volume (Veh/h) | 21 | 7 | 1 | 27 | 7 | 4 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 23 | 8 | 1 | 29 | 8 | 4 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 41 | 10 | 12 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 41 | 10 | 12 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 98 | 99 | 100 | | | |
| cM capacity (veh/h) | 970 | 1071 | 1607 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 31 | 30 | 12 | | | |
| Volume Left | 23 | 1 | 0 | | | |
| Volume Right | 8 | 0 | 4 | | | |
| cSH | 994 | 1607 | 1700 | | | |
| Volume to Capacity | 0.03 | 0.00 | 0.01 | | | |
| Queue Length 95th (m) | 0.7 | 0.0 | 0.0 | | | |
| Control Delay (s) | 8.7 | 0.2 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 8.7 | 0.2 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | 3.8 | | | | | |
| Intersection Capacity Utilization | 13.3% | | | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | | | |

HCM Unsignalized Intersection Capacity Analysis

11: Joymar Drive & Driveway #1

04/05/2019












| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|---|------|-------|---|---|------|
| Lane Configurations |  | | |  |  | |
| Traffic Volume (veh/h) | 7 | 2 | 1 | 47 | 9 | 1 |
| Future Volume (Veh/h) | 7 | 2 | 1 | 47 | 9 | 1 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 8 | 2 | 1 | 51 | 10 | 1 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 64 | 10 | 11 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 64 | 10 | 11 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 99 | 100 | 100 | | | |
| cM capacity (veh/h) | 942 | 1071 | 1608 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 10 | 52 | 11 | | | |
| Volume Left | 8 | 1 | 0 | | | |
| Volume Right | 2 | 0 | 1 | | | |
| cSH | 965 | 1608 | 1700 | | | |
| Volume to Capacity | 0.01 | 0.00 | 0.01 | | | |
| Queue Length 95th (m) | 0.2 | 0.0 | 0.0 | | | |
| Control Delay (s) | 8.8 | 0.1 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 8.8 | 0.1 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.3 | | | |
| Intersection Capacity Utilization | | | 13.3% | ICU Level of Service | | A |
| Analysis Period (min) | | | 15 | | | |

HCM Unsignalized Intersection Capacity Analysis

3: Hillside Drive & Thomas Street

04/05/2019

| | | | | | | |
|-----------------------------------|---|---|---|---|---|---|
| |  |  |  |  |  |  |
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations |  | | |  |  | |
| Traffic Volume (veh/h) | 524 | 48 | 50 | 1262 | 24 | 33 |
| Future Volume (Veh/h) | 524 | 48 | 50 | 1262 | 24 | 33 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 570 | 52 | 54 | 1372 | 26 | 36 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | | 622 | 1390 | 311 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | | 622 | 1390 | 311 |
| tC, single (s) | | | | 4.1 | 6.9 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | | 2.2 | 3.5 | 3.3 |
| p0 queue free % | | | | 94 | 79 | 95 |
| cM capacity (veh/h) | | | | 969 | 124 | 691 |
| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | |
| Volume Total | 380 | 242 | 511 | 915 | 62 | |
| Volume Left | 0 | 0 | 54 | 0 | 26 | |
| Volume Right | 0 | 52 | 0 | 0 | 36 | |
| cSH | 1700 | 1700 | 969 | 1700 | 236 | |
| Volume to Capacity | 0.22 | 0.14 | 0.06 | 0.54 | 0.26 | |
| Queue Length 95th (m) | 0.0 | 0.0 | 1.3 | 0.0 | 7.7 | |
| Control Delay (s) | 0.0 | 0.0 | 1.6 | 0.0 | 25.6 | |
| Lane LOS | | | | A | D | |
| Approach Delay (s) | 0.0 | 0.6 | | 25.6 | | |
| Approach LOS | | | | D | | |
| Intersection Summary | | | | | | |
| Average Delay | | | | 1.1 | | |
| Intersection Capacity Utilization | 65.7% | | | ICU Level of Service | | C |
| Analysis Period (min) | 15 | | | | | |

HCM Unsignalized Intersection Capacity Analysis

5: Thomas Street & Joymar Drive

04/05/2019






| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|-----------------------------------|------|------|-------|------|----------------------|------|
| Lane Configurations | | ↕↕ | ↕↕ | | ↗ | ↗ |
| Traffic Volume (veh/h) | 99 | 551 | 1203 | 50 | 25 | 169 |
| Future Volume (Veh/h) | 99 | 551 | 1203 | 50 | 25 | 169 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 108 | 599 | 1308 | 54 | 27 | 184 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 1362 | | | | 1850 | 681 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1362 | | | | 1850 | 681 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 78 | | | | 48 | 53 |
| cM capacity (veh/h) | 501 | | | | 52 | 393 |
| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 | SB 2 |
| Volume Total | 308 | 399 | 872 | 490 | 27 | 184 |
| Volume Left | 108 | 0 | 0 | 0 | 27 | 0 |
| Volume Right | 0 | 0 | 0 | 54 | 0 | 184 |
| cSH | 501 | 1700 | 1700 | 1700 | 52 | 393 |
| Volume to Capacity | 0.22 | 0.23 | 0.51 | 0.29 | 0.52 | 0.47 |
| Queue Length 95th (m) | 6.2 | 0.0 | 0.0 | 0.0 | 15.2 | 18.4 |
| Control Delay (s) | 7.2 | 0.0 | 0.0 | 0.0 | 134.7 | 22.0 |
| Lane LOS | A | | | | F | C |
| Approach Delay (s) | 3.1 | | 0.0 | | 36.4 | |
| Approach LOS | | | | | E | |
| Intersection Summary | | | | | | |
| Average Delay | | | 4.3 | | | |
| Intersection Capacity Utilization | | | 66.3% | | ICU Level of Service | C |
| Analysis Period (min) | | | 15 | | | |

HCM Unsignalized Intersection Capacity Analysis

7: Joymar Drive & Entrance #1

04/05/2019



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|---|------|-------|---|---|------|
| Lane Configurations |  | | |  |  | |
| Traffic Volume (veh/h) | 12 | 4 | 9 | 9 | 4 | 24 |
| Future Volume (Veh/h) | 12 | 4 | 9 | 9 | 4 | 24 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 13 | 4 | 10 | 10 | 4 | 26 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 47 | 17 | 30 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 47 | 17 | 30 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 99 | 100 | 99 | | | |
| cM capacity (veh/h) | 957 | 1062 | 1583 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 17 | 20 | 30 | | | |
| Volume Left | 13 | 10 | 0 | | | |
| Volume Right | 4 | 0 | 26 | | | |
| cSH | 980 | 1583 | 1700 | | | |
| Volume to Capacity | 0.02 | 0.01 | 0.02 | | | |
| Queue Length 95th (m) | 0.4 | 0.1 | 0.0 | | | |
| Control Delay (s) | 8.7 | 3.7 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 8.7 | 3.7 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 3.3 | | | |
| Intersection Capacity Utilization | | | 17.6% | ICU Level of Service | | A |
| Analysis Period (min) | | | 15 | | | |

HCM Unsignalized Intersection Capacity Analysis

9: Joymar Drive & Entrance #2

04/05/2019






| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 11 | 3 | 7 | 14 | 25 | 20 |
| Future Volume (Veh/h) | 11 | 3 | 7 | 14 | 25 | 20 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 12 | 3 | 8 | 15 | 27 | 22 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 69 | 38 | 49 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 69 | 38 | 49 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 99 | 100 | 99 | | | |
| cM capacity (veh/h) | 931 | 1034 | 1558 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 15 | 23 | 49 | | | |
| Volume Left | 12 | 8 | 0 | | | |
| Volume Right | 3 | 0 | 22 | | | |
| cSH | 950 | 1558 | 1700 | | | |
| Volume to Capacity | 0.02 | 0.01 | 0.03 | | | |
| Queue Length 95th (m) | 0.4 | 0.1 | 0.0 | | | |
| Control Delay (s) | 8.9 | 2.6 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 8.9 | 2.6 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | 2.2 | | | | |
| Intersection Capacity Utilization | | 16.9% | | ICU Level of Service | | A |
| Analysis Period (min) | | 15 | | | | |

HCM Unsignalized Intersection Capacity Analysis

11: Joymar Drive & Driveway #1

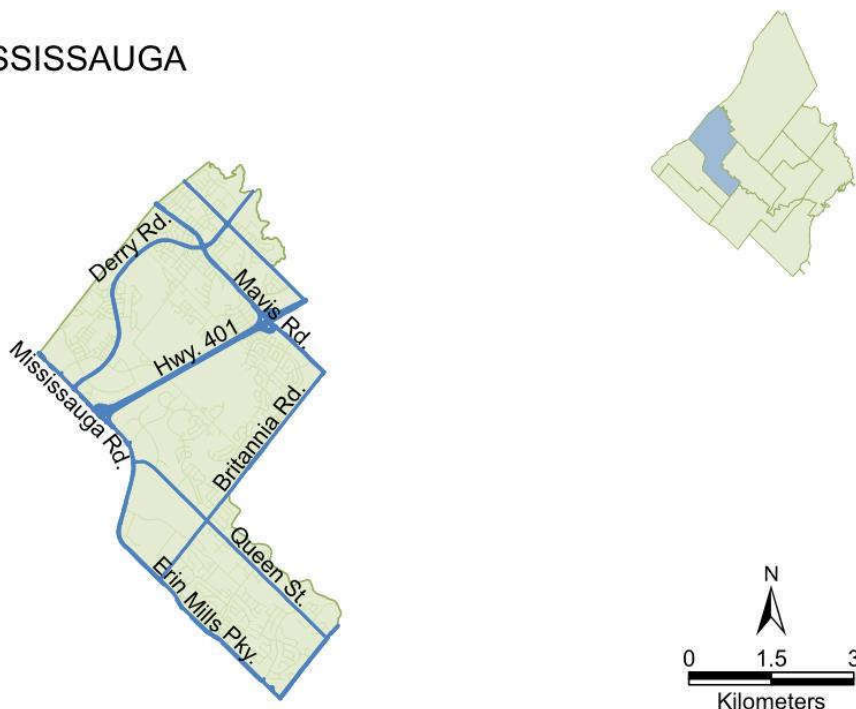
04/05/2019



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|---|------|-------|---|---|------|
| Lane Configurations |  | | |  |  | |
| Traffic Volume (veh/h) | 3 | 1 | 2 | 23 | 44 | 7 |
| Future Volume (Veh/h) | 3 | 1 | 2 | 23 | 44 | 7 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 3 | 1 | 2 | 25 | 48 | 8 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 81 | 52 | 56 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 81 | 52 | 56 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 100 | 100 | 100 | | | |
| cM capacity (veh/h) | 920 | 1016 | 1549 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 4 | 27 | 56 | | | |
| Volume Left | 3 | 2 | 0 | | | |
| Volume Right | 1 | 0 | 8 | | | |
| cSH | 942 | 1549 | 1700 | | | |
| Volume to Capacity | 0.00 | 0.00 | 0.03 | | | |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.0 | | | |
| Control Delay (s) | 8.8 | 0.6 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 8.8 | 0.6 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 0.6 | | | |
| Intersection Capacity Utilization | | | 13.3% | ICU Level of Service | | A |
| Analysis Period (min) | | | 15 | | | |

Appendix E – TTS Data for Ward 11

CITY OF MISSISSAUGA WARD 11



WARD 11

HOUSEHOLD CHARACTERISTICS

| Households | Dwelling Type | | | Household Size | | | | | Number of Available Vehicles | | | | | Household Averages | | | | |
|------------|---------------|-----------|-----------|----------------|-----|-----|-----|-----|------------------------------|-----|-----|-----|----|--------------------|---------|---------|----------|-----------|
| | House | Townhouse | Apartment | 1 | 2 | 3 | 4 | 5+ | 0 | 1 | 2 | 3 | 4+ | Persons | Workers | Drivers | Vehicles | Trips/Day |
| 16,600 | 74% | 19% | 7% | 9% | 21% | 19% | 28% | 23% | 2% | 29% | 50% | 15% | 4% | 3.4 | 1.9 | 2.3 | 1.9 | 6.7 |

POPULATION CHARACTERISTICS

| Population | Age | | | | | | | Daily Trips per Person (age 11+) | Daily Work Trips per Worker | Population | Employment Type | | | Student | Licensed | Transit Pass |
|------------|------|-------|-------|-------|-------|-----|--------|----------------------------------|-----------------------------|------------|-----------------|-----------|---------|---------|----------|--------------|
| | 0-10 | 11-15 | 16-25 | 26-45 | 46-64 | 65+ | Median | | | | Full Time | Part Time | At Home | | | |
| | | | | | | | | | | | | | | | | |
| | Male | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | 28,100 | 47% | 6% | 4% |
| | | | | | | | | | | Female | | | | | | |
| 57,100 | 13% | 9% | 15% | 26% | 28% | 10% | 38.9 | 2.3 | 0.75 | 28,900 | 33% | 10% | 3% | 26% | 64% | 19% |

TRIPS MADE BY RESIDENTS OF CITY OF MISSISSAUGA - WARD 11

| Time Period | Trips | % 24hr | Trip Purpose | | | | Mode of Travel | | | | | | Median Trip Length (km) | | | |
|-------------|---------|--------|--------------|------|------|------|----------------|-------|---------|----------|--------------|-------|-------------------------|-------|---------|----------|
| | | | HB-W | HB-S | HB-D | N-HB | Driver | Pass. | Transit | GO Train | Walk & Cycle | Other | Driver | Pass. | Transit | GO Train |
| 6-9 AM | 29,500 | 26.3% | 45% | 24% | 22% | 10% | 62% | 16% | 6% | 4% | 5% | 8% | 6.7 | 3.3 | 11.0 | 27.7 |
| 24 Hrs | 112,000 | | 34% | 14% | 38% | 14% | 67% | 17% | 6% | 2% | 4% | 5% | 6.0 | 4.2 | 9.9 | 27.7 |

TRIPS MADE TO CITY OF MISSISSAUGA - WARD 11 - BY RESIDENTS OF THE TTS AREA










| Time Period | Trips | % 24 hr | Trip Purpose | | | | Mode of Travel | | | | | | Median Trip Length (km) | | | |
|-------------|---------|---------|--------------|--------|------|-------|----------------|-------|---------|----------|--------------|-------|-------------------------|-------|---------|----------|
| | | | Work | School | Home | Other | Driver | Pass. | Transit | GO Train | Walk & Cycle | Other | Driver | Pass. | Transit | GO Train |
| 6-9 AM | 31,100 | 28.7% | 61% | 19% | 5% | 15% | 73% | 11% | 4% | * | 3% | 8% | 10.7 | 3.3 | 10.5 | * |
| 24 Hrs | 108,200 | | 27% | 6% | 44% | 23% | 70% | 15% | 5% | 1% | 4% | 5% | 6.9 | 4.0 | 9.2 | 27.8 |

Appendix F - Future (2021) Total Traffic Level of Service Calculations

HCM Unsignalized Intersection Capacity Analysis

3: Hillside Drive & Thomas Street

04/05/2019

| | | | | | | |
|-----------------------------------|---|---|---|---|---|---|
| |  |  |  |  |  |  |
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations |  | | |  |  | |
| Traffic Volume (veh/h) | 1583 | 28 | 8 | 509 | 51 | 56 |
| Future Volume (Veh/h) | 1583 | 28 | 8 | 509 | 51 | 56 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 1721 | 30 | 9 | 553 | 55 | 61 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | | | | |
| tC, single (s) | | | | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | | | | |
| p0 queue free % | | | | | | |
| cM capacity (veh/h) | | | | | | |
| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | |
| Volume Total | 1147 | 604 | 193 | 369 | 116 | |
| Volume Left | 0 | 0 | 9 | 0 | 55 | |
| Volume Right | 0 | 30 | 0 | 0 | 61 | |
| cSH | 1700 | 1700 | 363 | 1700 | 87 | |
| Volume to Capacity | 0.67 | 0.36 | 0.02 | 0.22 | 1.34 | |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.6 | 0.0 | 66.1 | |
| Control Delay (s) | 0.0 | 0.0 | 1.1 | 0.0 | 299.4 | |
| Lane LOS | | | A | F | | |
| Approach Delay (s) | 0.0 | | 0.4 | | 299.4 | |
| Approach LOS | | | | | F | |
| Intersection Summary | | | | | | |
| Average Delay | | | | | | |
| Intersection Capacity Utilization | | | | | | |
| ICU Level of Service | | | | | | |
| Analysis Period (min) | | | | | | |

HCM Unsignalized Intersection Capacity Analysis

5: Thomas Street & Joymar Drive

04/05/2019



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|-----------------------------------|------|------|-------|------|----------------------|------|
| Lane Configurations | | ↕↕ | ↕↕ | | ↗ | ↗ |
| Traffic Volume (veh/h) | 249 | 1411 | 354 | 38 | 33 | 142 |
| Future Volume (Veh/h) | 249 | 1411 | 354 | 38 | 33 | 142 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 271 | 1534 | 385 | 41 | 36 | 154 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 426 | | | | 1714 | 213 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 426 | | | | 1714 | 213 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 76 | | | | 42 | 81 |
| cM capacity (veh/h) | 1130 | | | | 62 | 792 |
| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 | SB 2 |
| Volume Total | 782 | 1023 | 257 | 169 | 36 | 154 |
| Volume Left | 271 | 0 | 0 | 0 | 36 | 0 |
| Volume Right | 0 | 0 | 0 | 41 | 0 | 154 |
| cSH | 1130 | 1700 | 1700 | 1700 | 62 | 792 |
| Volume to Capacity | 0.24 | 0.60 | 0.15 | 0.10 | 0.58 | 0.19 |
| Queue Length 95th (m) | 7.1 | 0.0 | 0.0 | 0.0 | 18.3 | 5.5 |
| Control Delay (s) | 5.2 | 0.0 | 0.0 | 0.0 | 124.9 | 10.6 |
| Lane LOS | A | | | | F | B |
| Approach Delay (s) | 2.3 | | 0.0 | | 32.3 | |
| Approach LOS | | | | | D | |
| Intersection Summary | | | | | | |
| Average Delay | | | 4.2 | | | |
| Intersection Capacity Utilization | | | 70.6% | | ICU Level of Service | C |
| Analysis Period (min) | | | 15 | | | |

HCM Unsignalized Intersection Capacity Analysis

7: Joymar Drive & Entrance #1

04/05/2019






| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 26 | 10 | 1 | 2 | 9 | 5 |
| Future Volume (Veh/h) | 26 | 10 | 1 | 2 | 9 | 5 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 28 | 11 | 1 | 2 | 10 | 5 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 16 | 12 | 15 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 16 | 12 | 15 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 97 | 99 | 100 | | | |
| cM capacity (veh/h) | 1001 | 1068 | 1603 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 39 | 3 | 15 | | | |
| Volume Left | 28 | 1 | 0 | | | |
| Volume Right | 11 | 0 | 5 | | | |
| cSH | 1019 | 1603 | 1700 | | | |
| Volume to Capacity | 0.04 | 0.00 | 0.01 | | | |
| Queue Length 95th (m) | 0.9 | 0.0 | 0.0 | | | |
| Control Delay (s) | 8.7 | 2.4 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 8.7 | 2.4 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | 6.1 | | | | |
| Intersection Capacity Utilization | | 13.3% | | ICU Level of Service | | A |
| Analysis Period (min) | | 15 | | | | |

HCM Unsignalized Intersection Capacity Analysis

9: Joymar Drive & Entrance #2

04/05/2019






| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|---|------|------|---|---|------|
| Lane Configurations |  | | |  |  | |
| Traffic Volume (veh/h) | 21 | 7 | 1 | 27 | 7 | 4 |
| Future Volume (Veh/h) | 21 | 7 | 1 | 27 | 7 | 4 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 23 | 8 | 1 | 29 | 8 | 4 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 41 | 10 | 12 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 41 | 10 | 12 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 98 | 99 | 100 | | | |
| cM capacity (veh/h) | 970 | 1071 | 1607 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 31 | 30 | 12 | | | |
| Volume Left | 23 | 1 | 0 | | | |
| Volume Right | 8 | 0 | 4 | | | |
| cSH | 994 | 1607 | 1700 | | | |
| Volume to Capacity | 0.03 | 0.00 | 0.01 | | | |
| Queue Length 95th (m) | 0.7 | 0.0 | 0.0 | | | |
| Control Delay (s) | 8.7 | 0.2 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 8.7 | 0.2 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | 3.8 | | | | | |
| Intersection Capacity Utilization | 13.3% | | | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | | | |

HCM Unsignalized Intersection Capacity Analysis

11: Joymar Drive & Driveway #1

04/05/2019

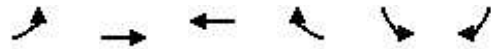


| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|---|------|-------|---|---|------|
| Lane Configurations |  | | |  |  | |
| Traffic Volume (veh/h) | 7 | 2 | 1 | 47 | 9 | 1 |
| Future Volume (Veh/h) | 7 | 2 | 1 | 47 | 9 | 1 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 8 | 2 | 1 | 51 | 10 | 1 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 64 | 10 | 11 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 64 | 10 | 11 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 99 | 100 | 100 | | | |
| cM capacity (veh/h) | 942 | 1071 | 1608 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 10 | 52 | 11 | | | |
| Volume Left | 8 | 1 | 0 | | | |
| Volume Right | 2 | 0 | 1 | | | |
| cSH | 965 | 1608 | 1700 | | | |
| Volume to Capacity | 0.01 | 0.00 | 0.01 | | | |
| Queue Length 95th (m) | 0.2 | 0.0 | 0.0 | | | |
| Control Delay (s) | 8.8 | 0.1 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 8.8 | 0.1 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.3 | | | |
| Intersection Capacity Utilization | | | 13.3% | ICU Level of Service | | A |
| Analysis Period (min) | | | 15 | | | |

HCM Unsignalized Intersection Capacity Analysis

13: Thomas Street & Site Access

04/05/2019












| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|-----------------------------------|------|------|-------|------|----------------------|------|
| Lane Configurations | | ↑↑ | ↑↑ | | ↑↑ | |
| Traffic Volume (veh/h) | 1 | 1641 | 515 | 0 | 1 | 2 |
| Future Volume (Veh/h) | 1 | 1641 | 515 | 0 | 1 | 2 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 1 | 1784 | 560 | 0 | 1 | 2 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 560 | | | | 1454 | 280 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 560 | | | | 1454 | 280 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 100 | | | | 99 | 100 |
| cM capacity (veh/h) | 1007 | | | | 121 | 717 |
| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 | |
| Volume Total | 596 | 1189 | 373 | 187 | 3 | |
| Volume Left | 1 | 0 | 0 | 0 | 1 | |
| Volume Right | 0 | 0 | 0 | 0 | 2 | |
| cSH | 1007 | 1700 | 1700 | 1700 | 271 | |
| Volume to Capacity | 0.00 | 0.70 | 0.22 | 0.11 | 0.01 | |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 18.4 | |
| Lane LOS | A | | | | C | |
| Approach Delay (s) | 0.0 | | 0.0 | | 18.4 | |
| Approach LOS | | | | | C | |
| Intersection Summary | | | | | | |
| Average Delay | | | 0.0 | | | |
| Intersection Capacity Utilization | | | 56.1% | | ICU Level of Service | B |
| Analysis Period (min) | | | 15 | | | |

HCM Unsignalized Intersection Capacity Analysis

3: Hillside Drive & Thomas Street

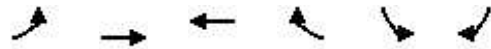
04/05/2019

| |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations |  | | |  |  | |
| Traffic Volume (veh/h) | 526 | 48 | 50 | 1263 | 24 | 33 |
| Future Volume (Veh/h) | 526 | 48 | 50 | 1263 | 24 | 33 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 572 | 52 | 54 | 1373 | 26 | 36 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 624 | | 1392 | 312 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 624 | | 1392 | 312 |
| tC, single (s) | | | 4.1 | | 6.9 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 94 | | 79 | 95 |
| cM capacity (veh/h) | | | 967 | | 123 | 690 |
| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | |
| Volume Total | 381 | 243 | 512 | 915 | 62 | |
| Volume Left | 0 | 0 | 54 | 0 | 26 | |
| Volume Right | 0 | 52 | 0 | 0 | 36 | |
| cSH | 1700 | 1700 | 967 | 1700 | 235 | |
| Volume to Capacity | 0.22 | 0.14 | 0.06 | 0.54 | 0.26 | |
| Queue Length 95th (m) | 0.0 | 0.0 | 1.3 | 0.0 | 7.8 | |
| Control Delay (s) | 0.0 | 0.0 | 1.6 | 0.0 | 25.7 | |
| Lane LOS | | | A | | D | |
| Approach Delay (s) | 0.0 | | 0.6 | | 25.7 | |
| Approach LOS | | | | | D | |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.1 | | | |
| Intersection Capacity Utilization | | | 65.8% | | ICU Level of Service | C |
| Analysis Period (min) | | | 15 | | | |

HCM Unsignalized Intersection Capacity Analysis

5: Thomas Street & Joymar Drive

04/05/2019






| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|-----------------------------------|------|------|-------|------|----------------------|------|
| Lane Configurations | | ↕↕ | ↕↕ | | ↕ | ↕ |
| Traffic Volume (veh/h) | 99 | 552 | 1205 | 50 | 25 | 169 |
| Future Volume (Veh/h) | 99 | 552 | 1205 | 50 | 25 | 169 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 108 | 600 | 1310 | 54 | 27 | 184 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 1364 | | | | 1853 | 682 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1364 | | | | 1853 | 682 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 78 | | | | 47 | 53 |
| cM capacity (veh/h) | 500 | | | | 51 | 392 |
| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 | SB 2 |
| Volume Total | 308 | 400 | 873 | 491 | 27 | 184 |
| Volume Left | 108 | 0 | 0 | 0 | 27 | 0 |
| Volume Right | 0 | 0 | 0 | 54 | 0 | 184 |
| cSH | 500 | 1700 | 1700 | 1700 | 51 | 392 |
| Volume to Capacity | 0.22 | 0.24 | 0.51 | 0.29 | 0.53 | 0.47 |
| Queue Length 95th (m) | 6.2 | 0.0 | 0.0 | 0.0 | 15.2 | 18.4 |
| Control Delay (s) | 7.2 | 0.0 | 0.0 | 0.0 | 135.7 | 22.0 |
| Lane LOS | A | | | | F | C |
| Approach Delay (s) | 3.1 | | 0.0 | | 36.6 | |
| Approach LOS | | | | | E | |
| Intersection Summary | | | | | | |
| Average Delay | | | 4.4 | | | |
| Intersection Capacity Utilization | | | 66.4% | | ICU Level of Service | C |
| Analysis Period (min) | | | 15 | | | |

HCM Unsignalized Intersection Capacity Analysis

7: Joymar Drive & Entrance #1

04/05/2019






| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|---|------|------|---|---|------|
| Lane Configurations |  | | |  |  | |
| Traffic Volume (veh/h) | 12 | 4 | 9 | 9 | 4 | 24 |
| Future Volume (Veh/h) | 12 | 4 | 9 | 9 | 4 | 24 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 13 | 4 | 10 | 10 | 4 | 26 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 47 | 17 | 30 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 47 | 17 | 30 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 99 | 100 | 99 | | | |
| cM capacity (veh/h) | 957 | 1062 | 1583 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 17 | 20 | 30 | | | |
| Volume Left | 13 | 10 | 0 | | | |
| Volume Right | 4 | 0 | 26 | | | |
| cSH | 980 | 1583 | 1700 | | | |
| Volume to Capacity | 0.02 | 0.01 | 0.02 | | | |
| Queue Length 95th (m) | 0.4 | 0.1 | 0.0 | | | |
| Control Delay (s) | 8.7 | 3.7 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 8.7 | 3.7 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | 3.3 | | | | | |
| Intersection Capacity Utilization | 17.6% | | | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | | | |

HCM Unsignalized Intersection Capacity Analysis

9: Joymar Drive & Entrance #2

04/05/2019






| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|---|------|------|---|---|------|
| Lane Configurations |  | | |  |  | |
| Traffic Volume (veh/h) | 11 | 3 | 7 | 14 | 25 | 20 |
| Future Volume (Veh/h) | 11 | 3 | 7 | 14 | 25 | 20 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 12 | 3 | 8 | 15 | 27 | 22 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 69 | 38 | 49 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 69 | 38 | 49 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 99 | 100 | 99 | | | |
| cM capacity (veh/h) | 931 | 1034 | 1558 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 15 | 23 | 49 | | | |
| Volume Left | 12 | 8 | 0 | | | |
| Volume Right | 3 | 0 | 22 | | | |
| cSH | 950 | 1558 | 1700 | | | |
| Volume to Capacity | 0.02 | 0.01 | 0.03 | | | |
| Queue Length 95th (m) | 0.4 | 0.1 | 0.0 | | | |
| Control Delay (s) | 8.9 | 2.6 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 8.9 | 2.6 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | 2.2 | | | | | |
| Intersection Capacity Utilization | 16.9% | | | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | | | |

HCM Unsignalized Intersection Capacity Analysis

11: Joymar Drive & Driveway #1

04/05/2019

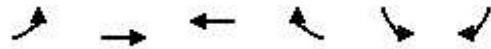


| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|---|------|-------|---|---|------|
| Lane Configurations |  | | |  |  | |
| Traffic Volume (veh/h) | 3 | 1 | 2 | 23 | 44 | 7 |
| Future Volume (Veh/h) | 3 | 1 | 2 | 23 | 44 | 7 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 3 | 1 | 2 | 25 | 48 | 8 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 81 | 52 | 56 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 81 | 52 | 56 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 100 | 100 | 100 | | | |
| cM capacity (veh/h) | 920 | 1016 | 1549 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 4 | 27 | 56 | | | |
| Volume Left | 3 | 2 | 0 | | | |
| Volume Right | 1 | 0 | 8 | | | |
| cSH | 942 | 1549 | 1700 | | | |
| Volume to Capacity | 0.00 | 0.00 | 0.03 | | | |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.0 | | | |
| Control Delay (s) | 8.8 | 0.6 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 8.8 | 0.6 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 0.6 | | | |
| Intersection Capacity Utilization | | | 13.3% | ICU Level of Service | | A |
| Analysis Period (min) | | | 15 | | | |

HCM Unsignalized Intersection Capacity Analysis

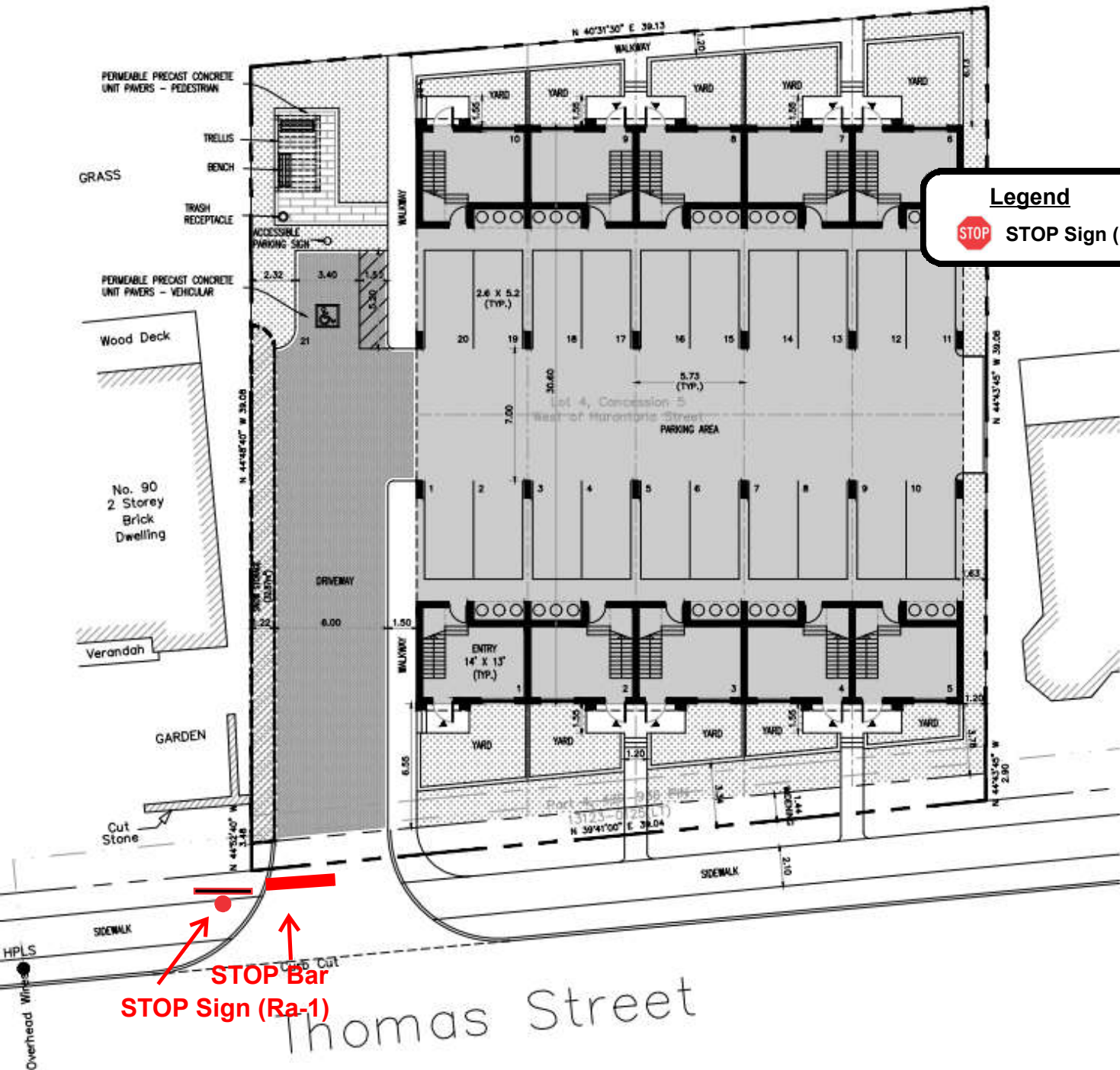
13: Thomas Street & Site Access

04/05/2019



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|-----------------------------------|------|------|-------|------|----------------------|------|
| Lane Configurations | | ↕↕ | ↕↕ | | ↕ | |
| Traffic Volume (veh/h) | 2 | 559 | 1315 | 2 | 1 | 1 |
| Future Volume (Veh/h) | 2 | 559 | 1315 | 2 | 1 | 1 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 2 | 608 | 1429 | 2 | 1 | 1 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 1431 | | | | 1738 | 716 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1431 | | | | 1738 | 716 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 100 | | | | 99 | 100 |
| cM capacity (veh/h) | 471 | | | | 78 | 373 |
| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 | |
| Volume Total | 205 | 405 | 953 | 478 | 2 | |
| Volume Left | 2 | 0 | 0 | 0 | 1 | |
| Volume Right | 0 | 0 | 0 | 2 | 1 | |
| cSH | 471 | 1700 | 1700 | 1700 | 129 | |
| Volume to Capacity | 0.00 | 0.24 | 0.56 | 0.28 | 0.02 | |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.0 | 0.0 | 0.4 | |
| Control Delay (s) | 0.2 | 0.0 | 0.0 | 0.0 | 33.4 | |
| Lane LOS | A | | | | D | |
| Approach Delay (s) | 0.1 | | 0.0 | | 33.4 | |
| Approach LOS | | | | | D | |
| Intersection Summary | | | | | | |
| Average Delay | | | 0.1 | | | |
| Intersection Capacity Utilization | | | 46.4% | | ICU Level of Service | A |
| Analysis Period (min) | | | 15 | | | |

Appendix G – Signage Plan



Legend

 STOP Sign (Ra-1)