# TRAFFIC IMPACT ASSESSMENT

## 1503 HYDE PARK ROAD
## CITY OF LONDON

**PREPARED FOR:**
**BUSINESS NETWORK ASSOCIATES**


**PREPARED BY:**

**C.F. CROZIER & ASSOCIATES INC.**
**2800 HIGH POINT DRIVE, SUITE 100**
**MILTON, ON L9T 6P4**


**JULY 2021**
**UPDATE OCTOBER 2021**

**CFCA FILE NO. 2103-5995**



CROZIER
CONSULTING ENGINEERS

| Revision Number | Date | Comments |
|---|---|---|
| Rev.0 | June 25, 2021 | Issued for Client Review |
| Rev.1 | July 20, 2021 | Issued for First Submission |
| Rev.2 | October 13, 2021 | Update Issued for First Submission |

# 1.0 Executive Summary

Business Network Associates retained C.F. Crozier & Associates Inc. (Crozier) to complete a Transportation Impact Assessment (TIA) supporting a Zoning By-Law Amendment for a proposed development at 1503 Hyde Park Road in the City of London. The analysis undertaken herein was completed using the Site Plan prepared by Aci Wright Architects Inc. dated August 2021. Any minor changes to the Site Plan will not materially affect the conclusions set out within this report.

The proposed development is for the implementation of a mixed-use residential and commercial 8-storey apartment building. The development envisions 130 residential units, with ground floor retail with approximately 260 and 522 $m^2$ of restaurant and retail spaces, respectively. The plan also proposes 164 parking spaces, of which 123 are surface-level and 41 are below-grade spaces. The proposed main access for the site is via the existing right-in right-out access for 1435 Hyde Park (Peavy Mart) located just south of the proposed development. Additionally, the site will be served by a new laneway running north-south along the east side of the site. This new laneway will provide full-moves access to Hyde Park Road via South Carriage Road.

Under 2021 existing conditions, the existing boundary network operates at a Level of Service (LOS) "C" or better during the weekday A.M. and P.M. peak periods. A maximum volume-to-capacity ratio of 0.95 and 0.97 was observed for the westbound left-turn movement at Hyde Park Road and Gainsborough Road during the weekday A.M. and P.M. peak period, respectively.

Under 2026 future background conditions, the surrounding road network would continue to operate with a Level of Service "C" or better during the weekday peak periods, with the westbound movement at Hyde Park and Gainsborough Road continuing to near capacity.

The development is expected to generate 47 two-way (33 inbound and 14 outbound) trips during the weekday A.M. peak hour, and 81 two-way (34 inbound and 47 outbound) trips during the weekday P.M. peak hour.

Under 2026 future total conditions, the surrounding road network is expected to operate similarly to the future background conditions. Notably, the westbound left-turn movement at Gainsborough and Hyde Park Road is expected to just reach capacity with a Level of Service “D” during the weekday P.M. peak hour. Due to the capacity concerns at the intersection of Gainsborough and Hyde Park Road identified in existing traffic conditions and not attributed to the subject development, signal optimization is recommended at the intersection.

The proposed intersection of Hyde Park Road at the proposed site access operates with a maximum Level of Service "C" with minimal delays. The proposed site access from Hyde Park Road is an existing site access and therefore was not assessed for sightline or access spacing requirements.

The proposed parking supply does not meet the City By-Law requirements, however we request to reduce requirements to reflect parking rates approved by the City for nearby developments as well as considering shared parking for the non-residential uses at the proposed development.

Transportation Demand Management (TDM) measures such as targeted infrastructure, education and incentives are recommended at the site to support transit and active transportation infrastructure at the proposed development to reduce vehicle trips and promote alternative modes of transportation.

The planning application can be supported from a transportation perspective as the site-generated traffic will have a minimal effect on the operations of the existing public roadway system.

# TABLE OF CONTENTS

## LIST OF APPENDICES



## LIST OF FIGURES



## LIST OF TABLES

## 2.0 Introduction

Business Network Associates retained C.F. Crozier & Associates Inc. (Crozier) to undertake a Transportation Impact Assessment (TIA) in support of the Zoning By-Law Amendment (ZBA) concerning a proposed mixed-use residential and commercial building situated at 1503 Hyde Park Road, in the City of London. The objective of the Transportation Impact Assessment is to evaluate the impacts of the proposed development on the surrounding road network and recommend transportation-related mitigation measures if warranted.

This study has been completed per the procedures set out in the City of London's Transportation Impact Assessment Guidelines with the associated analysis and findings outlined herein. A terms of reference outlining the following scope of study was sent to City of London Staff on June 2, 2021 and comments were received on June 15, 2021. City correspondence is provided in Appendix A.

The following intersections were reviewed:

- Hyde Park Road at South Carriage Road
- Hyde Park Road at Gainsborough Road
- Hyde Park Road at Site Access

The following horizon timeframes were analyzed in this assessment, consistent with procedures set out in the City of London Transportation Impact Assessment Guidelines:

- Existing conditions (2021)
- Five-year horizon (2026) future conditions
- Weekday morning and afternoon peak hours

## 3.0 Development Proposal

The subject lands encompass a total developable area of approximately 2.3 acres. The proposed development includes 130 residential units and ground-floor retail and restaurant area consisting of a combined total of approximately 780 square metres. 164 parking spaces are included within the development, with 123 surface-level and 41 below-grade parking spaces.

Multiple site accesses are included in the proposed plan, with two connections on the 'New Laneway' running parallel to the Hyde Park Road and one connection to the property located at 1435 Hyde Park via an access agreement.

The existing right-in right-out access off Hyde Park Road via the Peavy Mart driveway was assigned all inbound traffic from the south and all outbound traffic to the north to produce a conservative estimate of traffic impacts. The remaining traffic was assigned to the South Carriageway and Hyde Park Road intersection.

The most recent Site Plan dated August 2021 is included in Appendix G.

# 4.0 Existing Conditions

## 4.1 Study Area

The subject lands are currently occupied by landscaped lands and dirt roads and are zoned by the City of London By-Law Z.-1 as H-91 (pending development zone, according to Section 3.1) and BDC1 BD2 Business District Commercial Zone referenced in Appendix A.

The Site is bounded by the commercial property to the north and south, an existing residential development to the east, and Hyde Park Road to the west. Refer to Figure 1 for the site location.

## 4.2 Boundary Road Network

**Hyde Park Road** is a north-south four-lane two-way roadway with an urban cross-section. Hyde Park Road is under the City's jurisdiction and is classified as a collector road under the City of London Official Plan, Chapter 18, included in Appendix B. The roadway has sidewalks available on both sides and a dedicated bike lane on one side. The roadway has a posted speed limit of 60 km/h throughout the study area.

**Gainsborough Road** is an east-west four-lane roadway with an urban cross-section. Gainsborough Road is under the jurisdiction of the City of London and is classified as a collector road under the City of London Official Plan. The roadway has sidewalks available on both sides and has a posted speed limit of 50 km/h throughout the study area.

**South Carriage Road** is an east-west two-lane two-way roadway with an urban cross-section. South Carriage Road is under the jurisdiction of the City of London and is classified as a local road under the City of London Official Plan. It is noted, the westbound leg is assumed to be wide enough to operate as two lanes for analysis purposes. The roadway has sidewalks available on both sides. There is no posted speed limit along this section of roadway and was thus assumed to be 50 km/h.

The intersection of Hyde Park Road and Gainsborough Road is a four-legged signalized intersection. The eastbound approach (Gainsborough Road) has a dedicated left-turn lane, one through lane, and one dedicated right turn lane. The westbound approach has one shared through/left-turn lane and one shared through/right turn lane. The north and south approach on Hyde Park Road consists of one dedicated left-turn lane, one through lane, and one shared through/right turn lane.

The intersection of Hyde Park Road and South Carriage Road is a four-legged signalized intersection. The north and south approach (Hyde Park Road) has one dedicated left-turn lane, one through lane, and one shared through/right-turn lane. The eastbound approach on South Carriage Road has one lane, but due to its large width, it is assumed to operate as two lanes: one shared through/left-turn lane and one shared through/right-turn lane. The westbound approach on South Carriage Road has one shared through/left/right-turn lane.

Figure 2 illustrates the existing surrounding road network.

## 4.3 Public Transit

The study area is serviced by London Transit Route 19 'Downtown – Stoney Creek', which operates daily with a 30-minute headway in the early morning and afternoons, and a 60-minute headway in the early and late evening. The route provides direct connections to major intersections in the downtown core, including Wellington and Dundas, Queens at Richmond, Hyde Park at Oxford, Seagull at Hyde Park, Fanshawe Park at Richmond, and South Wenige at Sunningdale.

The existing stop north of the proposed development (Fanshawe Road) is approximately 2.5 km away, and the existing stop south of the proposed development (Oxford Road) is approximately 2.9 km away.

Appendix B includes the route serviced by Transit Route 19.

### 4.4 Traffic Data

Turning movement counts at the intersection of Gainsborough Road and Hyde Park Road was provided by the City of London and conducted on Wednesday, May 1, 2019, between the weekday A.M. and mid-day peak hours of 7:00 to 2:00 P.M., as well as the P.M. peak hours of 3:00 P.M. to 6:00 P.M. Additionally, traffic movement counts at the intersection of Hyde Park Road, and South Carriage Road was provided by the City and conducted on Tuesday, October 9, 2018 for periods between the weekday A.M. and mid-day peak hours of 7:00 A.M. to 2:00 P.M., as well as the P.M. peak hours of 3:00 P.M. to 6:00 P.M. The traffic movement counts, are included in Appendix C.

Peak hour factors used for analysis were calculated based on existing traffic volumes and are summarized in Table 1.

**Table 1: Existing Peak Hour Factors**

| Intersection | Weekday A.M. Peak Hour Factor | Weekday P.M. Peak Hour Factor |
|---|---|---|
| Hyde Park Road at Gainsborough Road | 0.9 | 0.98 |
| Hyde Park Road at South Carriage Road | 0.9 | 0.97 |

### 4.5 Traffic Modelling

The assessment of intersections is based on the method outlined in Highway Capacity Manual (2000) using Synchro 10 modelling software. Intersections are assessed using a Level of Service metric, with ranges of delay assigned a letter from "A" to "F". For stop-controlled intersections, a Level of Service "A" or "B" would typically be measured during off-peak hours when lesser traffic volumes are on the roadways. Levels of Service "C" through "F" would typically be measured in the commuter peak hours when more significant vehicle volumes cause longer travel times. The Level of Service (LOS) definitions for signalized and stop control intersections are included in Appendix D.

The peak hour factors, heavy vehicle percentage, and pedestrian movements at the study intersections were obtained from existing traffic movement counts.

### 4.6 Intersection Operations

The traffic operations at the study intersections were analyzed based on recorded traffic volumes during the A.M. and P.M. peak hours as shown in Figure 3. Detailed capacity analyses are included in Appendix E. Table 2 outlines the existing traffic operations in the study area.

It is noted that a lost time adjustment of -3.0 seconds was applied to the westbound left-turn phase at the intersection of Gainsborough at Hyde Park Road, as the unadjusted existing operations at the intersection were observed to exceed capacity.

**Table 2: 2021 Existing Levels of Service**

| Intersection | Peak Hour | Level of Service | Average Delay per Vehicles (s) | V/C Ratio > 0.90 (Approach) | 95th Percentile Queue Length > Storage Length |
|---|---|---|---|---|---|
| Hyde Park Road at Gainsborough Road | Weekday A.M. | C | 28.1 | 0.91 (WBL) | 60 m (WBL) |
| Hyde Park Road at Gainsborough Road | Weekday P.M. | C | 31.7 | 0.97 (WBL) | 65 m (WBL) |
| Hyde Park Road at South Carriage Road | Weekday A.M. | A | 6.6 | 0.46 (NBTR) | None |
| Hyde Park Road at South Carriage Road | Weekday P.M. | A | 8.4 | 0.56 (NBTR) | None |

Note: The Level of Service of a signalized intersection is based on the average control delay per vehicle.

As indicated in Table 2, the intersection of Hyde Park and Gainsborough Road currently operates with a Level of Service "C"during the weekday A.M. and P.M. peak hour. A maximum volume-to-capacity ratio of 0.91 and 0.97 for the westbound left-turn movement was observed during the weekday A.M. and P.M. peak hours, respectively. The 95th percentile queue was observed to exceed the available storage storage length for both peak periods, however on average, (represented by the 50th percentile queue), queues above capacity are not likely to form.

The intersection of Hyde Park and South Carriage Road operates with a Level of Service "A" during the weekday A.M. and P.M. peak periods. A maximum volume-to-capacity ratio of 0.42 was observed for the northbound through movement during the A.M. peak period and a maximum of 0.56 for the southbound through movement during the P.M. peak period. The 95th percentile queue was observed at the intersection, and all movements are expected to have sufficient storage length for queued vehicles.

## 5.0 Future Background Conditions

Future background traffic volumes for horizon years consist of the following components:

- Background traffic growth from outside the study area.
- Traffic generated within the study area from other proposed developments.

### 5.1 Study Horizons

Per the City of London's Transportation Impact Assessment Guidelines and after confirmation with City Staff, a five-year horizon year (2026) was considered for analysis purposes.

### 5.2 Background Development

There is currently one active development application in the vicinity of the proposed site. The application is for a proposed development located at 1600 – 1674 Hyde Park Road. This application is for new construction and redevelopment of mixed-use residential, retail, and office facilities totalling approximately 450 residential units. 3500 sq. m. of retail and 415 sq. m. of office space across both properties. Paradigm Transportation Solutions completed a Transportation Impact Assessment for this development in April 2019. Per the report, it is estimated the development will generate 175 two-way net trips in the A.M. peak hour and 216 two-way net trips in the P.M. peak hour. All relevant excerpts from the Transportation Impact Assessment for the development are provided in Appendix F.

### 5.3 Transportation Improvements

Per comments from City Staff, there are no transportation improvement projects currently planned within the study area.

### 5.4 Traffic Growth Rates

Following consultation with the City of London, a growth rate of 1.5% per annum was applied to key traffic movements in the intersections of the study. Figure 4 illustrate the future background traffic volumes for the 2026 horizon year, in addition to the background development site-generated traffic.

### 5.5 Intersection Operations

Traffic operations at the study intersections were analyzed with associated growth rates and traffic from background developments. Figure 4 demonstrates the future background traffic volumes. Table 3 outlines the 2026 future background Levels of Service. The observed delays under future background conditions are shown in Table 3.

Detailed capacity analyses are included in Appendix E.

**Table 3: 2026 Future Background Level of Service**

| Intersection | Peak Hour | Level of Service | Average Delay per Vehicles (s) | Max V/C Ratio > 0.90 (Approach) | 95th Percentile Queue Length > Storage Length |
|---|---|---|---|---|---|
| Hyde Park Road at Gainsborough Road | Weekday A.M. | C | 29.7 | 0.95 (WBL) | 65 m (WBL) |
| Hyde Park Road at Gainsborough Road | Weekday P.M. | C | 31.7 | 0.97 (WBL) | 65 m (WBL) |
| Hyde Park Road at South Carriage Road | Weekday A.M. | A | 6.5 | 0.50 (NBTR) | None |
| Hyde Park Road at South Carriage Road | Weekday P.M. | B | 10.0 | 0.62 (NBTR) | None |

Note: The Level of Service of a signalized intersection is based on the average control delay per vehicle.

Under future background traffic conditions, the intersection of Hyde Park and Gainsborough Road operates with a Level of Service "C" during the weekday A.M. and P.M. peak periods. A maximum volume-to-capacity ratio of 0.95 and 0.97 was observed for the westbound left-turning movement during the A.M. peak hour and P.M. peak hour, respectively. Similar to existing conditions, 95$^{th}$ percentile queues are forecasted to exceed available storage, however the average queue (50$^{th}$ percentile queue) is expected to be within the available lane storage length.

The intersection of Hyde Park and South Carriage Road operates with a Level of Service "A" during the weekday A.M. and weekday P.M. peak period. A maximum volume-to-capacity ratio of 0.50 and 0.62 was observed for the northbound through movement during the A.M. peak period and P.M. peak period, respectively. The 95$^{th}$ percentile queues were observed at the intersection, and all movements are expected to have sufficient storage length for queued vehicles.

# 6.0 Site Generated Traffic

## 6.1 Trip Generation

The proposed mixed-use residential and commercial development will result in additional vehicles to travel and the surrounding road network that previously was not present. Additionally, the development will also result in additional turning movements at the boundary road intersections.

The trip generation for the proposed development was estimated using rates provided in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. As the proposed mixed-use development has residential and commercial characteristics, the ITE Multi-Use Trip Generation calculation was employed. Land use categories (LUC) 220 "Multifamily Housing (Low-Rise)" and LUC 820 "Shopping Centre" were used to determine the most conservative estimated number of trips generated at the proposed development. The forecasted primary trips are tabulated in Table 4, 5 and 6.

According to London's Official Plan – Chapter 18, a target modal split of 33% is expected by 2024, and an existing modal split of 14% was recorded in 2002. Relevant excerpts from the Official Plan are included in Appendix B. However, for a more conservative estimate, a modal split of 14% was applied to site-generated traffic.

Per the ITE Trip Generation Handbook, 3rd Edition, an average of 34% pass-by trips applies to P.M. peak hour retail trips. Using methodologies outlined in NCHRP Report 684, internal capture calculations and assumptions are included in Appendix H.

It is noted that the trip generation was completed based on an earlier version of the site plan and there have been some minor changes in the latest site plan. However, the traffic assessment has not been updated since these changes are minor and are not expected to materially change the results of the assessment.

**Table 4: Retail/Restaurant (Shopping Centre 820) Trip Generation**

| Parameter | AM In | AM Out | AM 2-Way | PM In | PM Out | PM 2-Way |
|---|---|---|---|---|---|---|
| Gross Trips | 5 | 3 | 8 | 15 | 17 | 32 |
| Rate/Equation Used | 0.94 trips /1000 SF | 0.94 trips /1000 SF | 0.94 trips /1000 SF | 3.81 trips /1000 SF | 3.81 trips /1000 SF | 3.81 trips /1000 SF |
| Less Non-Auto Trips | 1 | 0 | 1 | 2 | 2 | 4 |
| Less Internal Capture Trips | 0 | 0 | 0 | 2 | 4 | 6 |
| Less Pass-by Trips | 0 | 0 | 0 | 3 | 4 | 7 |
| Net New Trips | **4** | **3** | **7** | **8** | **7** | **15** |

**Table 5: Multifamily Housing (Mid-Rise Residential (221) 128 Units) Trip Generation**

| Parameter | AM In | AM Out | AM 2-Way | PM In | PM Out | PM 2-Way |
|---|---|---|---|---|---|---|
| Gross Trips | 12 | 35 | 47 | 35 | 22 | 57 |
| Rate/Equation Used | 0.36 trips / unit | 0.36 trips / unit | 0.36 trips / unit | 0.44 trips / unit | 0.44 trips / unit | 0.44 trips / unit |
| Less Non-Auto Trips | 2 | 5 | 7 | 4 | 3 | 7 |
| Less Internal Capture Trips | 0 | 0 | 0 | 4 | 2 | 6 |
| Less Pass-by Trips | 0 | 0 | 0 | 0 | 0 | 0 |
| Net New Trips | **10** | **30** | **40** | **27** | **17** | **44** |

**Table 6: Total Trip Generation**

| Parameter | AM In | AM Out | AM 2-Way | PM In | PM Out | PM 2-Way |
|---|---|---|---|---|---|---|
| Gross Trips | 17 | 38 | 55 | 50 | 39 | 89 |
| Less Non-Auto Trips | 3 | 5 | 8 | 6 | 5 | 11 |
| Less Internal Capture Trips | 0 | 0 | 0 | 6 | 6 | 12 |
| Less Pass-by Trips | 0 | 0 | 0 | 3 | 4 | 7 |
| Net New Trips | **14** | **33** | **47** | **35** | **24** | **59** |

Overall, the development is expected to generate 47 two-way (14 inbound and 33 outbound) trips during the weekday A.M. peak hour and 59 two-way (35 inbound and 24 outbound) trips during the weekday P.M. peak hour.

### 6.2 Trip Distribution and Assignment

Figure 5 illustrates the site-generated trips at the proposed mixed-use residential I development on the surrounding road network. The trips generated at the development were distributed to the surrounding road networks based on current travel patterns on the existing roadways.

Appendix I includes the trip distribution assumptions at the proposed site and surrounding road network, as well as pass-by trip assumptions made.

## 7.0 Total Traffic Conditions

### 7.1 Intersection Operations

Traffic operations at the study intersections were analyzed with associated growth rates and traffic from background developments. Figure 6 illustrated the future total traffic volumes along the study intersections and proposed intersection. Table 7 outlines the 2026 future background Levels of Service**.** Detailed capacity analyses are included in Appendix E.

**Table 7: 2026 Future Total Levels of Service**

| Intersection | Peak Hour | Level of Service | Average Delay per Vehicles (s) | Max V/C Ratio > 0.90 (Approach) | 95th Percentile Queue Length > Storage Length |
|---|---|---|---|---|---|
| Hyde Park Road at Gainsborough Road | Weekday A.M. | C | 29.7 | 0.95 (WBL) | 65 m (WBL) |
| Hyde Park Road at Gainsborough Road | Weekday P.M. | D | 35.3 | 1.01 (WBL) | 70 m (WBL) |
| Hyde Park Road at South Carriage Road | Weekday A.M. | A | 6.9 | 0.51 (NBTR) | None |
| Hyde Park Road at South Carriage Road | Weekday P.M. | A | 10.8 | 0.63 (NBTR) | None |
| Hyde Park Road at Site Access | Weekday A.M. | B | 11.0 | 0.50 (NB) | None |
| Hyde Park Road at Site Access | Weekday P.M. | C | 11.7 | 0.69 (NB) | None |

Note: The Level of Service of a signalized intersection is based on the average control delay per vehicle.

Under future total traffic conditions, the intersection of Hyde Park and Gainsborough Road operates with a Level of Service "C" and "D" during the weekday A.M. and P.M. peak periods, respectively. It is noted the westbound left-turn movement is expected to just exceed capacity during the weekday afternoon peak hour. In line with future background and existing conditions, the 95th percentile queues are expected to continue exceeding available storage.

The intersection of Hyde Park and South Carriage Road is forecasted to operate with a Level of Service "A" during the weekday A.M. peak period and the weekday P.M. peak period under future total traffic conditions. A maximum volume-to-capacity ratio of 0.51 and 0.63 was observed for the northbound through movement during the A.M. peak period and P.M. peak period, respectively.

The proposed site access intersecting at Hyde Park Road expected to operate with a Level of Service "B" during the weekday A.M. peak period and operate with a Level of Service "C" during the weekday P.M. peak period with relatively low delays. All movements at the proposed intersection are expected to operate well within capacity.

The 95th percentile queue was observed at the intersections of Hyde Park and South Carriage Road as well as the proposed site access to Hyde Park Road, and all movements at the intersections are expected to have sufficient storage length for queued vehicles.

## 8.0 Recommendations

Per the operational analysis previously conducted, capacity concerns were identified at the intersection of Hyde Park and Gainsborough Road. Notably, westbound left-turn movement is nearing capacity under existing conditions, and is anticipated to just exceed capacity under future total traffic conditions.

It is noted that capacity concerns identified at this intersections are expected during existing traffic conditions, and not attributed to site-generated traffic.

It is recommended the City continue to monitor the intersection for signal optimization. Table 8 presents operations results from an optimized timing plan (where only splits were optimized) at the intersection under 2029 future total traffic during the P.M. peak period. The detailed capacity worksheets for the optimized scenario are included in Appendix E.

**Table 8: Signal Optimization Results**

| Intersection | Timing Plan | Level of Service | Average Delay per Vehicles | Max V/C Ratio > 0.90 (Approach) | 95th Percentile Queue Length > Storage Length |
|---|---|---|---|---|---|
| Hyde Park Road at Gainsborough Road | Existing | D | 35.3 | 1.01 (WBL) | 70 m (EBL) |
| Hyde Park Road at Gainsborough Road | Optimized | C | 33.1 | 0.89 (WBL)<br>0.96 (NBTR) | 55 m (WBL) |

Per the results in Table 8, signal optimization at the intersection of Hyde Park and Gainsborough Road would be conducive in improving the overcapacity westbound left-turn movement. Notably, as only the splits were optimized, there are limited improvements that can be achieved. To further improve operations at the intersection, optimization of the cycle length may be an additional option.

## 9.0 Site Access Review

The south site access to Hyde Park Road is connected to existing site access for a facility south of the proposed development. The existing site access is not expected to have any geometric changes resulting from the proposed development other than the connection to the proposed site.

As such, no additional analysis is required for the existing right-in right-out site access, since it is assumed that this site access satisfies intersection spacing and sight distance requirements.

## 10.0 Parking Assessment

### 10.1 Bicycle Parking Assessment

Per the City of London Zoning By-Law, Section 4, the number of bicycle parking spaces required for a residential development necessitates 0.75 long-term bicycle spaces per residential unit. Furthermore, for non-residential developments, short-term bicycle parking spaces should be provided at a rate of 7% of the required (non-residential) automobile parking spaces at the development. As such, the proposed bicycle parking supply of 98 long-term and 24 short-term spces meets the required minimums of 96 long-term and 5 short-term spaces.

Furthermore, it is noted that per the City of London Zoning By Law Section 4, the required number of vehicle parking spaces for non-residential uses may be reduced by up to 10% of the required motor vehicle spaces for each additional bicycle parking space provided above the By-law requirements. As such, the site would be entitled to a reduction of up 22 (10%) parking spaces based on the total auto parking requirement of 228 spaces for the site.

The site provides an additional 21 biycle parking spaces, which reduces the total auto parking supply requirement to 203 parking spaces as per Table 9 below.

### 10.2 Auto Parking Assessment

This section calculates the parking requirements per the City of London Zoning By-Law Section 4 and compares the required rates to the estimated peak parking demand at the proposed site.

***Zoning By-Law Parking Requirements***

The required parking for the subject site was calculated using City of London Zoning By-Law Section 4.19, using the rates set out for Parking Standard Area 3 for sites outside the downtown area.

**Table 9: City of London Parking Requirements**

| Land Use | Units/ GFA | Parking Requirements | Parking Required | Parking Provided |
|---|---|---|---|---|
| Apartment | 130 units | 1.25 spaces per residential unit | 163 | 123 surface level<br>41 underground |
| Restaurant | 260 $m^2$ | 1 space per 10 $m^2$ of restaurant space | 26 | |
| Retail | 522 $m^2$ | 1 space per 15 $m^2$ of retail space (Retail space less than 2000 $m^2$) | 35 | |
| Total Required Auto Parking | | | 224 | 164 spaces<br>(39 space deficit) |
| Bike Space Incentive | 21 | # spaces above Required Bike Parking (Max 10% of required parking spaces) | -21 | |
| Total Required Auto Paking less Incentives | | | 203 | |

Per the assessment in Table 9, the proposed parking for the subject site is deficient of 39 parking spaces in comparison to City's By-Law requirements.

***Surrogate Site Approved Parking Rates***

To justify the proposed parking supply, surrogate site data in the City of London were reviewed in this section. Table 10 summarizes the approved parking rates based on previous applications.

**Table 10: Approved Parking Rates based on Surrogate Sites**

| Location | Land Use | # of Units/ GFA | Approved Parking Rate |
|---|---|---|---|
| 945 Bluegrass Drive | Residential Apartment | 80 units | 0.825 spaces per residential unit |
| 1674 Hyde Park Road | Mixed-Use Residential | 80 units | 1.00 spaces per residential unit |
| 1674 Hyde Park Road | Mixed-Use Commercial | 926 $m^2$ | 1 space per 25 $m^2$ of retail space |
| 1631-1649 Richmond Street | Residential Apartment | 291 units | 0.67 spaces per resident |
| 1076 Gainsborough Road | Mixed-Use Residential | 32 units | 1.00 spaces per residential unit |
| 1076 Gainsborough Road | Mixed-Use Commercial | 311 $m^2$ | 1 space per 15 $m^2$ of retail space |
| 1600/1622 Hyde Park Road | Mixed-Use Residential | 410 units | 1.00 spaces per residential unit |
| 1600/1622 Hyde Park Road | Mixed-Use Commercial | 2975 $m^2$ | 1 space per 20 $m^2$ of retail space |
| 180-186 Commissioners Road West | Residential Apartment | 40 units | 1.00 spaces per residential unit |

Per the surrogate sites presented within Table 10, the proposed parking spaces for residential have historically been reduced to rates as low as 0.67 spaces per resident, and 1 space per 25 $m^2$ of retail space for non-residential parking, especially in mixed-use developments.

***Mixed-Use Non-Residential Parking***

It is noted that the ground-floor retail and restaurant areas are in close proximity, and many trips made to this development will result in use of both of these spaces within a single trip. Furthermore, it is expected that the peaking characteristics of the different land uses at the site will differ and providing for the maximum requirement for each land use at the site would therefore result in an oversupply of parking.

It would be reasonable to allow for a reduction to account for the combination of trips and land uses at the site should the commercial and visitor parking at the site be shared within the ground level non-residential parking supply. It is noted that this is a common reduction in municipal By-laws.

***Conclusion***

Overall, it is proposed that the proposed development would meet the expected parking demand at the site after accounting for the characteristics of the site including the additional bicycle parking supply incentive and a reduced peak parking demand due to the mix of uses, as well as the history of reduction in approved parking rates for both residential and retail uses within the City.

# 11.0 Transportation Demand Management Plan

To reduce single-occupant vehicle (SOV) use, the following Transportation Demand Management (TDM) Plan proposes several low-impact opportunities to promote alternative modes of transportation.

## 11.1 Active Transportation

Several initiatives can be implemented at the site to promote active transportation, including cyclist and pedestrian trips.

### 11.1.1 Pedestrians

Sidewalks are available on both sides of the road along Hyde Park Road. Consequently, sidewalks on both sides of the proposed site access and pedestrian walkways throughout the site connecting to the existing pedestrian network are recommended. Furthermore, pedestrian-friendly site design, such as ensuring proper lighting conditions and avoiding narrow spaces or stairwells, will ensure accessibility to and from the site. Furthermore, safety features such as refuge islands or curb extensions at the site access crossing would be recommended to promote safe pedestrian travel.

Additionally, weather protection should be available at the main entrance and may also be added at key pedestrian traffic zones (intersections, transit stops). Facilities such as benches or shelters are also recommended at high pedestrian traffic zones to enhance pedestrian trips.

### 11.1.2 Cyclists

For cyclists, an existing dedicated bike lane is available along Hyde Park Road. It would be recommended to implement a bicycle paths connecting the site to the existing cyclist network.

To promote cyclist trips for residents, various facilities may be implemented. A bicycle storage facility on-site would allow safe and easy access to bikes for residents and visitors for the long-term bike spaces proposed at the site. Recommended locations for implementing bicycle parking include: near the building entrance for visitor, near elevators or stairs for residents, and near the on ground or first floor, or in below-grade vehicle parking.

Another recommendation to promote cyclist trips would be providing a bike repair room fitted with equipment (pumps, tools) accessible to residents near the cycle parking facility. This facility would allow residents to maintain their bikes and promote overall use.

For short-term bike spaces, it is recommended to place the racks near the entrance and near the available cyclist paths to minimize pedestrian or vehicle conflicts.

Additionally, a bike-share program or station may be implemented at the site to promote cycling for short trips instead of using vehicles. The City of London has been exploring pilot bike-share projects throughout the City to promote cyclist trips, especially for shorter work commutes.

### 11.2 Public Transit

As noted previously, the study area is serviced by London Transit Route 19 'Downtown – Stoney Creek', which operates on a daily schedule with a 30-minute headway in the early morning and afternoons, and 60-minute headway in the early and late evening. The route provides direct connections to major intersections in the downtown core, including Wellington and Dundas, Queens at Richmond, Hyde Park at Oxford, Seagull at Hyde Park, Fanshawe Park at Richmond, and South Wenige at Sunningdale.

The nearest existing stops are at Hyde Park Road and Fanshawe Park to the north at approximately 2.5 km from the site, and Hyde Park Road and Oxford Road to the south of the proposed development, approximately 2.9 km from the site.

Due to the rising number of developments in the vicinity of the study area, it would be recommended for the development to work with London Transit and consider adding a transit stop for Transit Route 19 at the intersection of Gainsborough Road and Hyde Park Road to promote transit accessibility to residents who may not be able to walk the entire distance to the existing transit stops.

To improve awareness of the existing transit routes, pamphlets or brochures containing nearby transit routes and the overall network and schedule info should be made available to residents in the lobby or entrance area or as part of a "welcome package" to new residents. Furthermore, consultation with London Transit may be conducted to include displays or kiosks near the building entrance or lobby to display route information, such as the schedules of the nearby route.

### 11.3 Automobile Ride-share

Automobile ride-sharing services are an excellent way to decrease auto ownership and reduce single-occupant vehicle (SOV) trips. Consultations may be made with carshare providers in the regions to allocate vehicles and parking stalls at the development. Additionally, discounts or other incentives could be offered to residents to promote interest in the carshare as a viable mode of travel.

### 11.4 Education, Promotion, and Incentives

Education and incentives through marketing is a crucial element to promoting alternative modes of transit. In promoting the development to new occupants, transit proximity, access to cycling and pedestrian facilities, car and bike share opportunities, or other incentives such as complimentary transit passes should be included in the branding and marketing of units. The development should consider providing a complimentary London Smart Pass (transit pass), and bike/carshare discounts or memberships to new residents to encourage the use of sustainable travel while also reducing automobile ownership and reducing parking requirements.

## 12.0 Conclusion

The findings and conclusions of our analysis are represented as follows:

- The intersections within the development study area operate with moderate delays in the existing traffic conditions during the weekday A.M. and P.M. peak periods. The westbound left-turn movement at Gainsborough and Hyde Park Road is anticipated to near capacity during the A.M. and P.M. peak periods.

- During all peak hours in the 2026 future background traffic conditions, movements continue to operate similarly to existing conditions.

- The development is expected to generate 47 two-way (14 inbound and 33 outbound) trips during the weekday A.M. peak hour and 59 two-way (35 inbound and 24 outbound) trips during the weekday P.M. peak hour.

- The proposed right-in right-out access from Hyde Park Road is anticipated to function with minimal delays.

- The proposed development is expected to have a negligible impact on the surrounding road network.

- The future total traffic is expected to operate similarly to the future background scenario. It is noted the westbound left-turn movement at Gainsborough and Hyde Park just reaches capacity during the 2026 future total traffic horizon during the P.M. peak hour.

- Signal optimization is recommended at the intersection of Gainsborough and Hyde Park Road to alleviate capacity concerns associated with the westbound left-turn movement.

- The proposed parking supply is deficient per the City's By-Law requirements, however in consideration of approved parking rates at surrounding developments as well as shared parking spaces for non-residential trips, the supplied parking is expected to be sufficient to the meet the peak parking demand for the proposed development.

- Several TDM measures are recommended for the site, including provisions for cyclists, pedestrians, and transit improvements to promote alternate transportation modes.

- The analysis undertaken herein was prepared using the most recent Site Plan dated December 2020. Any minor changes to the plan will not materially affect the conclusions contained within this report.

- The proposed development can be supported from a traffic operations perspective as the site-generated traffic will have a negligible impact on the operations of the surrounding road network system.

We trust that this review satisfies any transportation concerns associated with the Site Plan for this development. Please feel free to contact any of the undersigned for any further information required.

Respectfully submitted,

**C.F. CROZIER & ASSOCIATES INC.**

Brandon Bradt, M.Eng.CEM, P.Eng.
Project Manager, Transportation

**C.F. CROZIER & ASSOCIATES INC.**

R. Aaron Wignall
Associate, Transportation

FC/cj

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# APPENDIX A

## City of London Zoning By-Law Excerpts and Correspondence

## Kavleen Sachdeva

**From:** Chamorro, Juan <jchamorr@london.ca>
**Sent:** Tuesday, June 15, 2021 11:29 AM
**To:** Kavleen Sachdeva
**Cc:** Gardiner, Joshua; Grady, Sarah
**Subject:** RE: 1503 Hyde Park Road Traffic ToR (CFCA 2103-5995)
**Attachments:** TMC AADT Diagram - Gainsborough - Hyde Park.pdf; TMC AADT Diagram - South Carriage - Hyde Park.pdf; TMC Details Report - Gainsborough - Hyde Park.pdf; TMC Details Report - South Carriage - Hyde Park.pdf; TIA 1600-1674 Hyde Park Road.pdf

Good morning Kavleen.

Attached comes the information requested. Note that the study has to include the Pedestrian Crossing PXO across rear laneway in the study, as per comments submitted on the Site plan consultation SPC21-084 1503 Hyde Park Road on Wed 5/19/2021.

Please use 1.5% per annum for the Background Growth Rate.
Background roadway improvements: None

If you have further questions please let me know.

Rgs,

**Juan C. Chamorro, CET**
Senior Transportation Technologist
Transportation Planning & Design
City of London

300 Dufferin Ave ON N6A4L6
P: 519.661.CITY(2489) x 4737 | Fax: 519.661.4137
jchamorr@london.ca | www.london.ca

*As part of our ongoing efforts to stop the spread of COVID-19, the City of London has made changes to many City services. Visit our website for the latest information about City services and COVID-19*

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**From:** Yanchuk, Paul <pyanchuk@london.ca>
**Sent:** Monday, June 14, 2021 3:38 PM
**To:** Grady, Sarah <sgrady@london.ca>
**Subject:** FW: 1503 Hyde Park Road Traffic ToR (CFCA 2103-5995)

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**From:** Kavleen Sachdeva <ksachdeva@cfcrozier.ca>
**Sent:** Friday, June 11, 2021 12:32 PM

**To:** Yanchuk, Paul <pyanchuk@london.ca>; Kostyniuk, Jon <jkostyni@london.ca>
**Subject:** [EXTERNAL] FW: 1503 Hyde Park Road Traffic ToR (CFCA 2103-5995)

Hi Paul, Jon

Just wanted to follow up on the below email. If you are not the correct contact for correspondence, I'd appreciate it if you direct me to the correct contact.

Regards,
Kavleen

**Kavleen Sachdeva**, P.Eng. | Project Engineer
2800 High Point Drive, Suite 100 | Milton, ON L9T 6P4
T: 905.875.0026

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**From:** Kavleen Sachdeva
**Sent:** Wednesday, June 2, 2021 11:48 AM
**To:** pyanchuk@london.ca; jkostyni@london.ca
**Cc:** Aaron Wignall <awignall@cfcrozier.ca>
**Subject:** 1503 Hyde Park Road Traffic ToR (CFCA 2103-5995)

Hi Paul, Jon

I hope you're doing well. We have been retained to prepare a Transportation Impact Assessment to support the Zoning By-Law Amendment Application for a proposed mixed-use residential and commercial building for the site located at 1503 Hyde Park Road in the City of London. The element envisioned for this development is an 8-storey apartment with 128 residential units. In addition, a restaurant and retail space are to occupy the first floor.

We kindly request if you could let us know if the Terms of Reference (ToR) outlined below will be acceptable. *Furthermore, if you are not the correct person for correspondence, I'd appreciate it if you direct me to the correct contact.*

**Study Methodology for the Transportation Impact Assessment**

Study Area and Intersections to Assess

The following intersections will be analyzed:

- Hyde Park Road and Gainsborough Road;
- Hyde Park Road and South Carriage Road; and
- Hyde Park Road and the Site Access

Traffic Data

Given the ongoing Global Covid-19 Pandemic and the travel restrictions, we kindly request any available historical counts for the above intersections, along with the relevant growth rate that should be applied to reflect 2021 volumes. Grown volumes will be circulated before submission for confirmation.

Analysis Periods and Scenarios

Analysis of weekday A.M. and P.M. peak hours will be used to capture the peak hours associated with the proposed use. Analysis of a 5-year horizon post buildout (2026) will be analyzed.

Background Developments

We ask that you please provide us with any background developments you would like us to consider in our analysis.

Growth Rate

We ask that you please provide us with an appropriate growth rate to apply for expected growth in the area.

Trip Generation

ITE Trip Generation 10$^{th}$ Edition will be used to compile the expected trip generation for the development. Assignment of site-generated traffic on the boundary road network based on existing travel patterns and Transportation Tomorrow Survey (TTS).

Operation Assessment

Analysis of future background and future total traffic volumes will identify if capacity issues are forecasted to occur and if mitigation measures are required.

Road Characteristics

Site distance availability at the site access(es) will be reviewed based on TAC GDGCR. In addition, signalization and auxiliary turn lanes warrants will be conducted based on criteria outlined in OTM and the MTO Design Supplement for TAC.

Transportation Demand Management

Analysis of existing and future TDM opportunities for the proposed development will be conducted to reduce the number of auto trips and increase non-auto trips generated by the site. All TDM recommendations will be presented in a TDM Plan.

I hope the above is acceptable. We kindly request you provide us with guidance regarding data collection, background developments, and growth rates to start our analysis. Should you have any questions or concerns, please feel free to contact me.

## SECTION 25

## BUSINESS DISTRICT COMMERCIAL (BDC) ZONE

### 25.1 GENERAL PURPOSE OF THE BDC ZONE

The BDC Zone is typically applied to corridors with a main street character. This Zone provides for and regulates a mix of retail, restaurant, neighbourhood facility, office and residential uses located along pedestrian-oriented business districts in older parts of the City and in hamlets or small business areas in rural areas. Normally buildings are located near the street line with parking to the rear. The uses in this zone, which are intended to provide for the shopping needs of nearby residents, and cater to certain specialty shopping needs, have been differentiated on the basis of their function, intensity and potential impacts. (Z-1-051390) (Z.-1-202871)

The BDC Zone variation provides for a wide range of compatible office, retail, facility and residential uses which are appropriate in all Business District Commercial Zone variations. In addition to the uses provided for under BDC an expanded range of uses may be permitted at appropriate locations through the use of other zone variations in BDC1 (larger scale uses) and BDC2 (institutional/facility type uses). Automotive uses are not permitted in the zone.

### 25.2 PERMITTED USES

No person shall erect or use any building or structure, or use any land or cause or permit any building or structure to be erected or used, or cause or permit any land to be used, in any BDC Zone variation for any use other than the following uses:

1) BDC

The following uses are permitted in the BDC Zone variation:

a) Animal hospitals;
b) Apartment buildings, with any or all of the other permitted uses on the first floor;(Z.-1-94236)
c) Bake shops;
d) Clinics;
e) Commercial recreation establishments;
f) Commercial parking structures and/or lots;
g) Converted dwellings;
h) Day care centres;
i) Dry cleaning and laundry depots;
j) Duplicating shops;
k) Emergency care establishments;
l) Existing dwellings;
m) Financial institutions;
n) Grocery stores;
o) Laboratories;
p) Laundromats;
q) Libraries;
r) Medical/dental offices;
s) Offices;
t) Personal service establishments;
u) Private clubs;
v) Restaurants,((Z.-1-96439); (Z.-1-081795)
w) Retail stores;
x) Service and repair establishments;
y) Studios;
z) (Theatres and cinemas deleted by Z.-1-96458 - O.M.B. File No. R 980047 - Order Issue Date: June 25, 1998)
aa) Video rental establishments;
bb) Lodging house class 2.(Z.-1-93172)
cc) Cinemas ;(Z.-1-96458 - O.M.B. File No. R 980047 - Order Issue

Date: June 25, 1998)

dd) Brewing on Premises Establishment.(Z.-1-021027)
ee) Food Store; (Z-1-051390)
ff) Animal Clinic; (Z-1-051390)
gg) Convenience Store; (Z-1-051390)
hh) Post Office; (Z-1-051390)
ii) Convenience service establishments; (Z-1-051390)
jj) Dwelling units restricted to the rear portion of the ground floor or on the second floor or above with any or all of the other permitted uses in the front portion of the ground floor; (Z-1-051390)
kk) Bed and breakfast establishments; (Z-1-051390)
ll) Antique store; (Z-1-051390)
mm) Police stations; (Z-1-051390)
nn) Artisan Workshop (Z.-1-172561)
oo) Craft Brewery (Z.-1-172561)

2) BDC1

The following are permitted uses in the BDC1 Zone variation:

a) Any use permitted in the BDC Zone variation;
b) Hotels;
c) Restaurants (Z-1-051390); (Z.-1-081795)
d) Taverns.

3) BDC2

The following are permitted uses in the BDC2 Zone variation:

a) Any use permitted in the BDC Zone variation;
b) Assembly halls;
c) Places of Worship;
d) Community centres;
e) Funeral homes;
f) Institutions;
g) Schools.
h) Fire halls. (Z-1-051390)

## 25.3 REGULATIONS

No person shall erect or use any building or structure, or use any land or cause or permit any building or structure to be erected or used, or cause or permit any land to be used, in any BDC Zone variation except in conformity with the regulations as set out below and in Table 25.3.

1) BDC GROSS FLOOR AREA (MAXIMUM) (Z-1-051390)

The maximum gross floor area for specific individual uses in the BDC and BDC2 Zone variations shall be as follows:

| | | | |
|---|---|---|---|
| a) | Dry Cleaning & Laundry Depot | 300 $m^2$ | (3,229.2 sq.ft.) |
| b) | Restaurants eat-in | 500 $m^2$ | (5,382.0 sq.ft.) |
| c) | Offices (Z-1-051390) | 2000$m^2$ | (21,529 sq.ft.) |
| d) | Artisan Workshop (Z.-1-172561) | 500 $m^2$ | (5,382 sq. ft.) |
| e) | Craft Brewery (Z.-1-172561) | 500 $m^2$ | (5,382 sq. ft.) |

2) BDC1 GROSS FLOOR AREA (MAXIMUM) (Z-1-051390)

The maximum gross floor area for specific individual uses in the BDC1 Zone variation shall as follows:

| | | | |
|---|---|---|---|
| a) | Restaurants | 800 $m^2$ | (8,611.4 sq.ft.) |
| b) | Taverns | 800 $m^2$ | (8,611.4 sq.ft.) |

3) APARTMENT BUILDINGS (Z-1-051390)

In the BDC Zone variations, the height and density of each apartment building over the standard zone height and/or containing units outside existing structures, will be established through a zoning by-law amendment application and be indicated on Schedule A of the Zoning By-law.

4) DRIVE-THROUGH FACILITIES

Drive-through facilities, either as a main or accessory use, are not permitted in the Business District Commercial (BDC) Zone. (Z.-1-081795)

5) REQUIRED GROUND FLOOR USES FOR ARTISAN WORKSHOP AND CRAFT BREWERY (Z.-1-172561)

Where located on the ground floor with street front access, Artisan Workshop and Craft Brewery uses shall include a retail store or restaurant that:

a) is located within the main building or unit occupied by the Artisan Workshop or Craft Brewery use;
b) is a minimum of 10% of the gross floor area (GFA) of the main building or unit;
c) is located within the front portion of the ground floor; and,
d) is accessible via the front of the building.

## 25.4 SPECIAL PROVISIONS

The following Zone variations apply to unique or existing situations and are not the standard BDC Zone variations. If a regulation or use is not specified, the list of permitted uses and/or regulations of Section 25.2 and/or Section 25.3 shall apply.
(Z.-1-93173)

**BDC Zone Variation**

BDC(1) Richmond Street, between Kent Street and Oxford Street

a) Permitted Uses:

i) Any use permitted in the BDC2 Zone variation.

b) Regulations:

| | | |
|---|---|---|
| i) | Lot Frontage (Minimum) | 3 metres (9.8 feet) |

BDC(2) Dundas Street East, between Adelaide Street and Quebec Street

a) Permitted Uses:

i) Any uses permitted in the BDC1 and BDC2 zone variations;
ii) (deleted by Z.-1-99698)
iii) Group homes type 2;
iv) Apartment building units and dwelling units may be permitted in the rear portion of the ground floor or on the second floor or above with any or all other permitted uses in the front portion of the ground floor;(Z.-1-98618)
v) Accessory dwelling units restricted to the rear portion of the ground floor or on the second floor or above with any or all of the other permitted uses in the front portion of the ground floor. (Z.-1-98618)

b) Prohibited Uses:

i) Accessory parking lots on Dundas Street between Adelaide Street and Rectory Street. (Z.-1-99698)

## SECTION 3

## ZONES AND ZONE SYMBOLS

### 3.1 ESTABLISHMENT OF ZONES

For the purposes of this By-Law and of the maps contained in Schedule "A" hereto, the following zones are established and they may be referred to by class, symbol or name:

**CLASS: RESIDENTIAL**

| Symbol | Name |
|---|---|
| R1 | Residential R1 Zone |
| R2 | Residential R2 Zone |
| R3 | Residential R3 Zone |
| R4 | Residential R4 Zone |
| R5 | Residential R5 Zone |
| R6 | Residential R6 Zone |
| R7 | Residential R7 Zone |
| R8 | Residential R8 Zone |
| R9 | Residential R9 Zone |
| R10 | Residential R10 Zone |
| R11 | Residential R11 Zone |

**CLASS: OFFICE**

| Symbol | Name |
|---|---|
| OR | Office Residential Zone |
| OC | Office Conversion Zone |
| RO | Restricted Office Zone |
| OF | Office Zone |

**CLASS: COMMERCIAL Name**

| Symbol | | |
|---|---|---|
| | Downtown Area Zone | |
| DA | | |
| | RSA | Regional Shopping Area Zone |
| | CSA | Community Shopping Area Zone |
| | NSA | Neighbourhood Shopping Area Zone |
| | ASA | Associated Shopping Area Commercial Zone |
| | BDC | Business District Commercial Zone |
| AC | Arterial Commercial Zone | |
| HS | Highway Service Commercial Zone | |
| RSC | Restricted Service Commercial Zone | |
| CC | Convenience Commercial Zone | |
| SS | Automobile Service Station Zone | |

**CLASS: INSTITUTIONAL FACILITIES**

| Symbol | Name |
|---|---|
| RF | Regional Facility Zone |
| CF | Community Facility Zone Neighbourhood |
| NF | Facility Zone |
| | HER Heritage Zone |
| DC | Day Care Zone |

**CLASS: OPEN SPACE AND RECREATION Name**

| Symbol | |
|---|---|
| | Open Space Zone |
| OS | Environmental Review Zone (Z.-1-051390) |
| ER | Commercial Recreation Zone |
| CR | |

| CLASS: | INDUSTRIAL |
|---|---|
| **Symbol** | **Name** |
| OB | Office Business Park Zone |
| LI | Light Industrial Zone |
| GI | General Industrial Zone |
| HI | Heavy Industrial Zone |
| EX | Resource Extraction Zone |
| RT | Rail Transportation Zone (Z.1-051390) |

| CLASS: | AGRICULTURAL (Z.1-051390**)** |
|---|---|
| **Symbol** | **Name** |
| AG | Agricultural Zone (Z.1-051390**)** |
| AGC | Agricultural Commercial Zone (Z.1-051390**)** Rural |
| RRC | Settlement Commercial Zone (Z.1-051390**)** |
| TGS | Temporary Garden Suite Zone (Z.1-051390**)** |

(Z-1-051390)

| CLASS: | MISCELLANEOUS |
|---|---|
| **Symbol** | **Name** |
| UR | Urban Reserve Zone |
| T | Temporary Zone |

## 3.2 SCHEDULES AND TABLES

All Schedules and Tables attached to this By-Law form part of the By-Law.

## 3.3 ZONE SYMBOLS AND PROVISIONS

The Zone symbols may be used to refer to buildings or structures and to the uses of lots, buildings and structures permitted by this By-Law in the said Zones.

Wherever in this By-Law the word "zone" is used, preceded by any of the said zone symbols, such reference shall mean any part of the zoned area delineated on Schedule "A" and designated thereon by the said symbol.

For each zone established by this By-Law, a separate section of this By-Law sets out the uses permitted in, and the specific provisions relating to, such zone under the headings "PERMITTED USES" and "REGULATIONS", respectively.

Except as otherwise specifically provided herein, the specific zone requirements set out for each zone shall apply to such zone in addition to the general provisions set out in Section 4.

## 3.4 DENSITY "D"

Where the symbol "D" follows a single zone or a compound zone applying to certain lands on a zoning map, the number following the "D" specifies the maximum net residential density in units per hectare permitted on those lands, and this map designation takes precedence over any maximum density regulation set out in the relevant use zone.

Where, in a compound zone, a separate "D" symbol follows each individual zone, the relevant density shall apply only to the uses permitted in the associated zone.

Where the Lodging House Class 2 use is permitted in a zone and the symbol "D", follows a single zone or a compound zone applying to certain lands on a zoning map, the number following the "D", multiplied by three (3), specifies the maximum net lodging unit density in units per hectare permitted on those lands, and this map designation takes precedence over any maximum lodging unit density regulation set out in the relevant use zone.
(Z.-1-96447)

Where a nursing home, rest home, retirement lodge, continuum-of-care facility, emergency care establishment or hospital is permitted in a zone which is subject

to a density provision in the Zone Regulations or on the Zoning Maps, the number following the "D", multiplied by three (3), specifies the maximum density in number of beds per hectare permitted for accommodations not defined as a dwelling unit(s) herein. For the above-noted uses, three (3) beds are equal to one (1) dwelling unit.
(Z.-1-99688)

| **EXAMPLE APPLICATION OF SECTION 3.4 - DENSITY "D" ZONES** |
|---|
| **Metric**<br>A 0.5 hectare (or 5 000 $m^2$) lot zoned OR-D150 may be developed for apartments at a density of 150 units per net residential hectare (for a total of 0.5 X 150 = 75 units), or for non-residential uses at a floor area ratio of (150 ÷100) 1.5:1 (for a total of 1.5 X 5 000 = 7 500 $m^2$ gross floor area). |
| **Lodging Houses**<br>For the calculation of lodging houses, three lodging house units equal one dwelling unit for the purpose of density calculations. |
| **Nursing Homes, Rest Homes, Retirement Lodges, Continuum-of-Care Facilities, Emergency Care Establishments and Hospitals**<br>For the calculation of density of accommodations for nursing homes, rest homes, retirement lodges, continuum-of-care facilities and emergency care establishments, three beds equal one dwelling unit. For example, a 0.75 ha lot zoned R7•D150 may be developed for a nursing home at a density of 150 units per hectare. With three beds equalling one unit the nursing home could contain 337 beds (0.75 ha. x 150 u.p.h. x 3 beds).<br>If the same site were to be used for a continuum-of-care facility with 20 dwelling units, 276 beds in addition to the units would be permitted. The calculation is as follows:<br>0.75 ha. X 150 u.p.h = 112.5 units<br>112 units (permitted) - 20 units (requested) = 92 units (available for bed equivalent)<br>92 units x 3 (1 unit = 3 beds) =276 beds<br>(Z.-1-99688) |

**1) MIXED USE DEVELOPMENTS**

a) RESIDENTIAL/NON-RESIDENTIAL COMBINATIONS
Where a lot is used for both residential and non-residential purposes, the maximum number of dwelling units permitted by the applicable maximum density regulations or "D" zone shall be reduced at the rate of one dwelling unit for each 100.0 square metres (1,076 sq. ft.) of gross floor area devoted to non-residential uses.

b) BED/UNIT COMBINATIONS FOR CARE FACILITIES
Where a site is used for a nursing home, rest home, retirement lodge, continuum-of-care facility, emergency care establishment, hospital, or a combination thereof in which dwelling units (as defined) and institutional beds, are to be provided, the maximum number of dwellings units permitted by the applicable maximum density regulations or "D" zone shall be reduced at the rate of one (1) dwelling unit for each three (3) beds.
(Z.-1-99688)

| EXAMPLE APPLICATION OF SECTION 3.4 - MIXED USE DEVELOPMENTS |
|---|
| A 0.5 hectare (1.23 acre) lot zoned OR-D150 (OR-D61) is to be developed for an apartment building with 500 square metres (5,382 square feet) of office space on the ground floor:<br><br>0.5 hectare (1.23 acres) X 150 units per hectare (61 units per acre) = 75 units<br><br>500.0 square metres (5,382 square feet) ÷ 100.0 square metres (1,076 square feet) = 5<br><br>Permitted development is (75 - 5 =) 70 dwelling units plus 500.0 square metres (5,382 square feet) of office space. |

### 3.5 PRIVATE ROAD "PR"

Where the symbol "PR" appears on a zoning map as a prefix to a single zone or a compound zone applying to certain lands, it is considered to represent development on individually owned parcels or structures with frontage on a private road, in conformity with the Official Plan policies. The "PR" symbol can be used with both residential and non-residential zones. (Z.-1-96446)

### 3.6 HEIGHT "H"

Where the symbol "H" follows a zone applying to certain lands on a zoning map, the number following the "H" specifies the maximum height in metres permitted on these lands.

### 3.7 BONUSING "B"

Where the symbol "B" follows a zone applying to certain lands on a zoning map, the number following the "B" identifies the specific provisions as outlined in Section 4.3 (Bonus Zones) that will be applicable to these lands.

### 3.8 HOLDING "h" ZONES

**1) USE OF SYMBOL**

Where the symbol "h" appears on a zoning map as a prefix to a single zone or a compound zone applying to certain lands, notwithstanding the provisions of that zone or zones, unless this By-law has been amended to remove the relevant "h" symbol, those lands shall not be developed or used except in compliance with the provisions of the applicable zone for existing uses, or for such other uses set out in the relevant Holding Zone Provisions below. The relevant Holding Zone Provisions are denoted by the number (if any) immediately following the symbol "h" on the zoning map.

**2) HOLDING ZONE PROVISIONS**

h — *Purpose:* To ensure the orderly development of lands and the adequate provision of municipal services, the “h” symbol shall not be deleted until the required security has been provided for the development agreement or subdivision agreement, and Council is satisfied that the conditions of the approval of the plans and drawings for a site plan, or the conditions of the approval of a draft plan of subdivision, will ensure a development agreement or subdivision agreement is executed by the applicant and the City prior to development.

*Permitted Interim Uses:* Model homes are permitted in accordance with Section 4.5(2) of the By-law; (Z.-1-122078) (Z.-1-142245)

h-1 — *Purpose*: To ensure that mitigating measures are undertaken in areas adjacent to transportation and utility corridors, an agreement shall be entered into, following consultation with relevant agencies, covering requirements for incorporating appropriate noise and/or vibration attenuation measures into the design of the development, prior to the removal of the "h-1" symbol. (Z.-1-051390)

*Permitted Interim Uses*: Existing uses; any non-residential use

permitted by the applicable zones.

h-2 Purpose: To determine the extent to which development will be permitted and ensure that development will not have a negative impact on relevant components of the Natural Heritage System of the Official Plan, an agreement shall be entered into specifying appropriate development conditions and boundaries, based on an Environmental Impact Study or Subject Lands Status Report that has been prepared in accordance with the provisions of the Official Plan and to the satisfaction of the City of London, prior to removal of the "h-2" symbol. (Z.-1-051390) (Z.-1-202871)

h-3 *Purpose*: To ensure that development over 30.0 metres (98.4 feet) in the DA1 Zone or over 15.0 metres (49.2 feet) in the DA2 Zone will not have an adverse impact on pedestrian level wind conditions in the Downtown Area of the City of London, a wind impact assessment which may, at the request of the City, include wind tunnel testing, shall be prepared by a qualified professional and submitted to the City, and any recommendation contained therein for building design or site modifications necessary to achieve acceptable wind conditions shall be incorporated in the proposed development to the satisfaction of the City of London prior to removal of the "h-3" symbol.

*Permitted Interim Uses*:

(i) For lands zoned DA1 for any building or use less than 30.0 metres in height: any use permitted by the DA1 zone;

(ii) For lands zoned DA2 for any building or use less than 15.0 metres in height: any use permitted by the DA2 zone.

h-4 *Purpose*: To refine the One Hundred Year Erosion Limit of the Official Plan, assess the potential impacts of development and identify measures to avoid or address potential erosion/slope instability hazards, an agreement shall be entered into specifying appropriate development conditions and boundaries, based on a geotechnical study that has been prepared in accordance with the provisions of the Official Plan and to the satisfaction of the City of London, prior to removal of the "h-4" symbol. (Z.-1-051390)(Z.-1-202871)

*Permitted Interim Uses*: Existing uses.

h-5 *Purpose*: To ensure that development takes a form compatible with adjacent land uses, agreements shall be entered into following public site plan review specifying the issues allowed for under Section 41 of the *Planning Act, R.S.O. 1990, c. P.13,* prior to the removal of the "h-5" symbol.

*Permitted Interim Uses*: Existing uses. (Z.-1-94236)

h-6 *Purpose*: To ensure that development in the vicinity of operating and closed landfill sites will occur in a safe manner and in accordance with the *Environmental Protection Act*, agreements shall be entered into specifying any necessary studies and protective measures to the satisfaction of the City of London, demonstrating that the development in the form and manner proposed, will not be adversely affected prior to the removal of the "h-6" symbol.

*Permitted Interim Uses*: Existing uses.

h-7 *Purpose*: To ensure that aggregate resource extraction does not take place in advance of the municipal review and approval of an aggregate extraction license application submitted to the City of London by the Ministry of Natural Resources prior to the removal of the "h-7" symbol.

(Z-1-051390)

*Permitted Interim Uses*: Existing uses.

h-8 *Purpose*: To ensure that there is no land-use conflict between industrial and proposed residential uses on these lands, the "h-8" symbol shall not be deleted until all industrial uses have been removed from the site and abutting residentially zoned lands.

*Permitted Interim Uses*: Existing uses.
(O.M.B. File #910043, R910387 - Appeal #5013 June 4, 1993)

h-9 *Purpose*: To ensure that buildings and structures that have been identified by the City as historically significant and that are being actively pursued for a designation under the *Ontario Heritage Act* are not negatively impacted by development or redevelopment of the site or buildings, and to ensure that the development or redevelopment is in a form compatible with the heritage buildings, the following conditions must be satisfied prior to the removal of the holding provision:

i) The site and/or building and/or portions thereof must be designated under the *Ontario Heritage Act* by the City of London;
ii) The site, buildings or portions thereof must be subject to an easement or easements to provide for municipal services, heritage preservation and conservation in favour of the City of London and to the satisfaction of the City of London;
iii) The affected lands will be subject to Site Plan Control under Section 41 of the *Planning Act, R.S.O. 1990, c. P.13,* and a development agreement must be entered into by the owner of the subject lands and the City of London; (Z.-1-94236)
iv) A density bonusing agreement must be entered into with the City of London to permit additional development on the site in exchange for retaining and preserving the heritage resources on the subject lands;
v) The "h-9" symbol shall also be treated as a temporary use provision under Section 38 of the *Planning Act, R.S.O. 1990, c. P.13* and shall be applicable for a maximum of two years from the date of enforcement of this By-Law; and (Z.-1-94236)
vi) If the City has not initiated obtaining a designation under the *Ontario Heritage Act* within the time period identified, the holding provision is no longer applicable.

*Permitted Interim Uses*: Existing uses, buildings and structures as they legally existed at the date of adoption of this By-Law.

h-10 *Purpose*: To ensure land use compatibility the construction of single detached dwellings on lands contiguous to the north and fronting on Grenfell Drive shall be substantially completed to the satisfaction of Council prior to the removal of the "h-10" symbol.

*Permitted Interim Uses*: Existing uses.(Z.-1-91003)

h-11 *Purpose*: To ensure the orderly development of lands and the adequate provision of municipal services, the "h-11" symbol shall not be deleted until a development agreement associated with a site plan which provides for appropriate access arrangements to the satisfaction of Council is entered into with the City of London.

*Permitted Interim Uses*: Existing uses.(O.M.B. File #R 910387 - Appeal #3004 May 19, 1994)(Z.-1-92066)

h-12 *Purpose*: To ensure that there is no land-use conflict between industrial and proposed residential uses in these lands, the "h-12" symbol shall

not be deleted until all industrial uses have been removed from the site and abutting residentially zoned lands.

*Permitted Interim Uses*: Existing uses
(Z.-1-92101)

h-13 i) Until this By-law is amended to remove the Holding Provisions, the Holding Provisions and Interim Provisions shall apply;

ii) To ensure the protection and preservation of the City's Heritage Resources, and to ensure that new development and redevelopment does not affect the integrity or result in the destruction of the City's Heritage Resources, the following conditions must be satisfied prior to the removal of the Holding Provisions:

a) The existing building exterior must be designated under the *Ontario Heritage Act* by the City of London;
b) The site and buildings, or portions thereof. Must be subject to an easement, or easements, to provide for municipal services, heritage preservation, and conservation purposes, in favour of the City of London, to the satisfaction of the City of London.
c) The affected lands will be subject to Site Plan Control under Section 41 of the *Planning Act, R.S.O. 1990, c. P.13* and a development agreement must be entered into by the owner of the subject lands and the City of London; and, (Z.-1-94236)
d) An agreement to permit additional uses on this site must be entered into with the City of London to permit additional development on the site in exchange for retaining and preserving the heritage resources on the subject land.

*Interim Permitted Uses/Interim Provisions*: Uses legally existing on the 5th day of October, 1992. (Z.-1-92118)

h-14 *Purpose*: To ensure the orderly development of lands for access to an arterial road, the "h-14" symbol shall not be deleted until vehicle access is provided to an arterially designated road across lands planned for use as a regional facility. (Z.-1-202871)

*Permitted Interim Uses*: Existing uses.(O.M.B. File #R 910387, O 920043, S 910016, Z 890157 -Appeal #1001 June 4, 1993

h-15 *Purpose*: To ensure that development within 300 metres (984 feet) of a resource extraction operation will not be adversely impacted by the presence of such an operation, a noise and dust impact study shall be completed and any mitigation measures contained therein shall be carried out to the satisfaction of the City of London in conjunction with the Ministry of the Environment and Energy and the Ministry of Natural Resources prior to the removal of the "h-15" symbol. (Z.-1-94236)

Notwithstanding the regulations of residential zones in this By-law to the contrary, new buildings intended for human occupancy shall have a minimum separation distance of 135 metres (443 feet) from a Resource Extraction (EX/EX1) Zone or area licensed for gravel extraction. Any deviation from the 135 metres (443 feet) regulation would only be considered on the basis of the noise and dust impact study referred to above.

*Permitted Interim Uses*: Existing uses
(Z.-1-93193)

h-16 *Purpose*: To prohibit the demolition of the existing buildings at 144 and 148 Adelaide Street North, until the expansion of the commercial plaza at 170 Adelaide Street North occurs and the subject sites will be

required for additional parking.
(Z.-1-95351)

h-17 *Purpose*: To ensure the orderly development of lands and the adequate provision of municipal services, the "h-17" symbol shall not be deleted until full municipal sanitary sewer and water services are available to service the site.

*Permitted Interim Uses*: Dry uses on individual sanitary facilities permitted by the applied Zone.
(Z.-1-97484)

h-18 *Purpose:* The proponent shall retain a consultant archaeologist, licensed by the Ministry of Tourism, Culture and Sport (MTCS) under the provisions of the *Ontario Heritage Act* (R.S.O. 1990 as amended) to carry out a Stage 1 (or Stage 1-2) archaeological assessment of the entire property. Development or property alteration shall only be permitted on the subject property containing archaeological resources or areas of archaeological potential if the archaeological resources have been conserved by removal and documentation, or by site preservation (Stages 3 and 4). The archaeological assessment must be completed in accordance with the most current Standards and Guidelines for Consulting Archaeologists. Engagement with the appropriate First Nations shall be completed consistent with the policies of the London Plan.

All archaeological assessment reports, in both hard copy format and digitally in Portable Document Format (PDF), will be submitted to the City of London once MTCS has accepted them into the Public Registry.

Significant archaeological resources will be incorporated into the proposed development through either in situ preservation or interpretation where feasible, or may be commemorated and interpreted on site.

No demolition, new exterior construction, grading, or any other activity where soil disturbance will occur or might be reasonably anticipated shall take place on the subject property prior to the City of London receiving the MTCS compliance letter indicating that all archaeological licensing and reporting requirements have been satisfied.
(Z.-1-192784)

h-19 *Purpose*: To ensure that development occurs in a safe manner, a soil contamination assessment shall be carried out by a qualified professional and submitted to the City and any recommendation contained therein for remedial measures be undertaken to the satisfaction of the City of London, prior to the removal of the "h-19" symbol.

*Permitted Interim Uses*: Uses permitted in the LI2/LI3 Zone Variations.
(Z.-1-98603)

h-20 Purpose: To encourage high quality urban design for commercial development such as improved street scape, massing of buildings, internal traffic patterns, integration with surrounding, existing and proposed commercial buildings, and integration with planned residential development, commercial urban design guidelines will be required for development at this intersection (Z.-1-99671) (Z.-1-01889)

h-21 Purpose: To ensure that the development of a cemetery will not have any negative impacts on the drainage patterns in the area and on the groundwater with specific attention given to any negative impacts on existing wells in the area a Hydrological Study and a Hydrogeological Study shall be prepared by a qualified professional and submitted to the City and any recommendations contained therein shall be incorporated into the development agreement to the satisfaction of the

City of London prior to the removal of the "h-21" symbol
(Z.-1-99672) (Z.-01889)

h-22 *Purpose:* To ensure there is no land use conflict between office uses and proposed residential development on these lands, the "h-22" symbol shall not be deleted until the existing building is removed from this site.

*Permitted Interim Use*: Uses permitted by the OC5 Zone Variation.
(Z.-1-99677)

h-23 *Purpose*: To ensure that development will not negatively impact area industrial uses, the "h-23" symbol shall not be deleted until Bradley Avenue is extended to these lands.

*Permitted Interim Uses*: Uses permitted in the LI2 Zone Variation.
(Z.-1-99725)

h-24 (Z.-1-00805) (deleted by Z.-1-01889)

h-25 *Purpose:* To encourage high quality urban design for new format retail developments containing buildings over 6000 square metres (64,586 square feet) in total area, satisfactory compliance with the City of London Commercial Urban Design Guidelines will be assessed during the site plan review process. A site plan application will have to be submitted to the City and a development agreement drafted acceptable to the City of London prior to the removal of the "h-25" symbol.
(Z.-1-00808)

h-26 *Purpose:* To ensure the protection of a possible future transportation corridor, the "h-26" symbol shall not be deleted until the Long Term Transportation Corridor Study is completed and City Council has determined that either there is no need for a corridor, alternatives have been reviewed and the protected corridor is not required, or Council has approved measures to acquire a corridor, but in any case such holding symbol shall not extend beyond March 31, 2001.
(Z.-1-00835 - O.M.B. Decision No. 0332 - March 7, 2000)

h-27 *Purpose:* To ensure orderly development, the "h-27" symbol shall not be deleted until the collector road adjacent to the lands and its intersection with Fanshawe Park Road have been constructed.

*Permitted Interim Uses:* All permitted uses except a convenience store.
(Z.-1-01850)

h-28 *Purpose:* To ensure the orderly development of lands for future road connection to an arterial road, the "h-28" symbol shall not be deleted until a suitable location for a future road connection is finalized.

| | |
|---|---|
| Lot Width (Minimum): (Z.-1-01853) | 22.5 metres (73.8 feet) |

h-29 *Purpose:* To ensure the adequate provision of municipal services for the development of a car wash, the "h-29" symbol shall not be deleted until municipal sanitary sewers are available to service this site, and a development agreement is entered into with the City of London.

*Permitted Interim Uses:* Dry uses on individual sanitary facilities permitted by the applied Zone.
(Z.-1-01868)

h-30 *Purpose:* To ensure the orderly development of lands within the identified Community Plan Area, conditions relating to phasing arrangements, completion of a tertiary plan, availability of servicing,

and the subdivider entering into a subdivision agreement shall be given clearance to the satisfaction of the City, prior to the removal of the "h-30" symbol. (Z.-1-01875)

h-31 *Purpose:* To ensure the orderly development of lands located at 2185 Highbury Avenue North and part of 2225 Highbury Avenue North (formerly 2135 Highbury Avenue North), notwithstanding the list of permitted uses included within Section 33.2.(2), uses permitted on private temporary water and sewerage systems shall be limited to place of worship, school and day care uses. (Z.-1-01900)

h-32 *Purpose:* To encourage street-oriented development and discourage noise attenuation walls along arterial roads, a development agreement shall be entered into to ensure that new development is designed and approved consistent with the design guidelines in the Hyde Park Community Plan to the satisfaction of the City of London, prior to the removal of the "h-32" symbol. (Z.-1-01911)

h-33 *Purpose*: To implement the Provincial Minimum Distance Separation (MDS) regulations, the "h-33" symbol shall not be deleted until the existing livestock facility at 1577 Wilton Grove Road has been removed or the facility is longer capable of housing livestock through the removal of the building infrastructure.

*Permitted Interim Uses*: Existing agricultural uses. (Z.-1-01926)

h-34 *Purpose*: To encourage street-oriented development and discourage noise attenuation walls along arterial roads, a development agreement shall be entered into to ensure that new development is designed and approved consistent with the design guidelines in the Hyde Park Community Plan, to the satisfaction City of London, prior to removal of the "h-34" symbol. (Z.-1-01929)

h-35 *Purpose*: To ensure that development will not have a negative impact on an environmentally sensitive area, or natural feature, an agreement shall be entered into specifying any necessary preventative measures, based on study(ies) to the satisfaction of the City of London conducted by qualified professional(s) demonstrating that development in the form proposed will not adversely affect the area or feature, prior to the removal of the "h-35" symbol.

*Permitted Interim Uses*: Uses permitted by the applicable zone within existing buildings.(Z.-1-02942)

h-36 Purpose: To implement the Provincial Minimum Distance Separation (MDS) regulations the h-36 holding provision will not be deleted until the existing livestock facility has been removed or, through removal of building infrastructure, is no longer capable of housing livestock.

Permitted Interim Uses: Vehicle parking and equipment storage, in association with permitted uses in the LI2(9) Zone variation, excluding storage of hazardous materials and fuel and refuelling stations. (Z.-1-021039)(deleted and replaced by Z.-1-101929)

h-37 *Purpose*: To implement the Provincial Minimum Distance Separation (MDS) regulations the "h-37" holding provision will not be deleted until the existing livestock facility has been removed or, through removal of building infrastructure, is no longer capable of housing livestock.

*Permitted Interim Use*: Existing uses (Z.-1-021040)

h-38 *Purpose:* To ensure that development occurs in a safe manner, a soil contamination assessment shall be carried out by a qualified professional and submitted to the City and any recommendation

contained therein for remedial measures be undertake to the satisfaction of the City of London, prior to the removal of the "h-38" symbol. (Z.-1-031068)

h-39 *Purpose:* To ensure a suitable lotting pattern is established for future residential development, and for the adequate provision of municipal services, the "h-39" symbol shall not be deleted until an acceptable lotting pattern is established to the satisfaction of the General Manager of Planning and Development, or a development agreement is entered into for the lands in question with the City of London. (Z.-1-031071)

h-40 *Purpose:* To ensure that appropriate protection and enhancement measures will be undertaken for lands that comprise part of the adjacent Environmentally Significant Area (ESA) buffer, a forest conservation management plan shall be prepared and implemented to the satisfaction of the City, prior to removal of the "h-40" symbol. (Z.-1-031072)

h-41 *Purpose:* To ensure that buildings and structures that have been identified by the City as historically significant and that are being actively pursue for a designation under the *Ontario Heritage Act* are not negatively impacted by development or redevelopment of the site or buildings, and to ensure that the development or redevelopment is in a form compatible with the heritage buildings, the following conditions must be satisfied prior to the removal of the holding provision:

a) The site and/or building and/or portions thereof must be designated under the *Ontario Heritage Act* by the City of London; and

b) The affected lands will be subject to Site Plan Control under Section 41 of the *Planning Act*, R.S.O. 1990 c. P.13, and a development agreement must be entered into by the owner of the subject lands and the City of London.

*Permitted Interim Uses*: Only within existing buildings. (Z.-1-031082)

h-42 *Purpose*: To ensure that the on-site septic treatment system is adequate to accommodate a proposed use and that there will not be any adverse impact on groundwater resources or recharge functions, an agreement shall be entered into specifying any necessary preventative measures, based on study(ies) to the satisfaction of the City of London conducted by qualified professional(s) demonstrating that the use or development in the form proposed will not adversely affect the area.

*Permitted Interim Uses*: Existing Uses. (Z.-1-031085)

h-43 *Purpose:* To implement the Provincial Minimum Distance Separation (MDS) regulations, the "h-43" symbol shall not be deleted until the existing livestock facility at 1577 Wilton Grove Road has been removed or the facility is no longer capable of housing livestock through the removal of the building infrastructure.

*Permitted Interim Uses*: Tractor trailer parking. (Z.-1-031086)

h-44 *Purpose:* To ensure, that prior to the issuance of building permits, the benefiting landowners are legally obligated to contribute to the maintenance and repair of the facilities and services located within a new private street, a common elements condominium shall be registered on title, to the satisfaction of the City of London, prior to the prior to the removal of the "h- 44" symbol. (Z.-1-031095).

h-45 *Purpose*: Notwithstanding the regulations of residential zones in this By-law to the contrary, new buildings intended for human occupancy shall have a minimum separation distance of 300 metres (492 feet)

from a Resource Extraction (EX/EX1) Zone or area licensed for gravel extraction. Any deviation from the 300 metres (492 feet) regulation would only be considered on the basis of a noise and dust impact study completed to the satisfaction of the City of London.

*Permitted Interim Uses*: Existing uses (Z.-1-031178)

h-46 Deleted at Council on May 17th, 2004

h-47 Purpose: To ensure the development of the recycling facility will be planned, designed, operated and maintained in such a way as to promote compatibility with adjacent, existing and future land uses, and to minimize any adverse impacts on the natural environment, the h-47 symbol shall not be deleted until a Certificate of Approval has been granted by the Ministry of Environment.
(OMB Order # R 040163) (Z.-1-041255)

h-48 *Purpose:* To ensure that development is not adversely impacted by industrial uses on the east side of Clarke Road, a noise study shall be undertaken and an agreement shall be entered into, covering requirements for incorporating appropriate attenuation measures into the design of the development, prior to the removal of the "h-48" symbol.

*Permitted Interim Uses:* Existing uses. (Z.-1-041257)

h-49 *Purpose:* To ensure there are no land use conflicts between existing industrial/aggregate resource extraction use(s) and the proposed residential uses, the h-49 shall not be deleted until the owner agrees to implement all noise and dust attenuation measures, recommended in noise and dust assessment reports acceptable to the City of London.

*Permitted Interim Uses:* Existing Uses (Z.-1-041267)

h-50 Repealed by Z.-1-041278

h-51 *Purpose:* To ensure orderly development of lands, the "h-51" symbol shall not be deleted until either a subdivision agreement has been entered into or the provision of land to provide a future north-south collector road connection to Shore Road has been finalized.

*Permitted Interim Uses*: Existing Uses (Z.-1-041275)

h-52 *Purpose*: To ensure that there are no land use conflicts between existing industrial/aggregate resource extraction use and the proposed residential uses, the "h-52" shall not be deleted until the owner agrees to implement all noise and dust attenuation measures recommended in a noise and dust assessment report acceptable to the City of London.

*Permitted Interim Uses*: Existing uses (Z.-1-041278)

h-53 *Purpose:* To encourage street-oriented development and discourage noise attenuation walls along arterial roads, a development agreement shall be entered into to ensure that new development is designed and approved, consistent with the Community Plan, to the satisfaction of the City of London, prior to the removal of the "h-53" symbol.
( Z.-1-041281)

h-54 *Purpose:* To ensure there are no land use conflicts between arterial roads and the proposed residential uses, the h-54 shall not be deleted until the owner agrees to implement all noise attenuation measures, recommended in noise assessment reports acceptable to the City of London. (Z.-1-041290)

h-55 *Purpose:* To ensure the appropriate development of the site and limit the impact of the development on the existing roadways, a traffic impact study for the entire site is to be completed prior to site plan approval to

determine the location and number of access points, the traffic impact on surrounding roads and roadway improvements required to accommodate this development. The "h-55 " symbol shall be deleted upon the acceptance of the traffic study by the City of London. (Z.-1-041295)

h-56 *Purpose:* To ensure there are no land use conflicts between arterial roads and the proposed residential uses, the "h-56" shall not be deleted until the owner agrees to implement all noise attenuation measures, recommended in noise assessment reports acceptable to the City of London. (Z.-1-041307)

h-57 *Purpose:* To ensure the adequate provision of sanitary treatment capacity at the Oxford Pollution Control Plant, the "h-57" symbol shall not be deleted until an allocation for treatment capacity at the Oxford Pollution Control Plant has been made by the City Engineer.

*Permitted Interim Uses:* Existing uses (Z.-1-051389)

h-58 *Purpose*: To ensure that development in the vicinity of abandoned oil, gas or water wells will occur in a safe manner, an agreement shall be entered into specifying appropriate protective measures in accordance with the requirements of the *Petroleum Resources Act* and/or the *Ontario Water Resources Act* and to the satisfaction of the City of London, prior to removal of the "h-58" symbol.

*Permitted Interim Uses*: Existing Uses. (Z-1-051390)

h-59 *Purpose:* To ensure that all environmental reviews and approvals have taken place for the location, quality and quantity of discharge from the pollution control plant. The "h-59" symbol shall not be deleted until a Certificate of Approval has been issued by the Ministry of the Environment of the Province of Ontario which will deal with the discharge of effluent from the pollution control plant. (Z-1-051390)

h-60 *Purpose:* To ensure compliance with Official Plan Amendment No. 279, any expansion to the Southside Pollution Control Plant shall not occur until an environmental assessment under the *Environmental Assessment Act, R.S.O. 1990, c E.18*, as amended, or any subsequent legislation has been completed including any reviews and appeals beyond the initial 4 MIGD (million imperial gallons per day). The "h-60" symbol shall not be deleted or amended until and unless any additional capacity has been authorized through an environmental assessment under the aforementioned Act and a Certificate of Approval has been issued by the Ministry of the Environment of the Province of Ontario.

*Permitted Interim Uses*: pollution control plant to a maximum capacity of 4 MIGD (million imperial gallons per day). (Z-1-051390)

h-61 *Purpose:* To ensure there are no land use conflicts between abutting land uses and to ensure consistency with the Provincial Policy Statement, the h-61 shall not be deleted until noise, dust (air emissions) and odour studies are received, and if necessary implemented, to the satisfaction of the City of London.

*Permitted Interim Uses:* Existing Use(s) (Z.-1-051437)

h-62 *Purpose*: To ensure that a multiple services easement is dedicated to the City over the easterly portion of the owner's lands. The width and location of the easement must be consistent with the Environmental Assessment for the Medway Trunk Sanitary Sewer. In lieu of the easement, the owner may dedicate the land to the Corporation of the City of London at no cost to the City. The holding provision will be removed once the owner executes and registers, to the satisfaction of the City Solicitor, a multiple services easement in favour of the City to

provide for an easement over the owner's lands for a multi-use pathway system, stormwater management infrastructure and the Medway Trunk Sanitary Sewer by which the lands of the owner are to be serviced, or the owner provides the easement or land as a condition of site plan approval, severance or plan of subdivision. (Z.-1-061466)

h-63 *Purpose*: To ensure there are no land use conflicts between the commercial and residential land uses, the “h- 63” symbol shall not be deleted until the owner agrees to implement all noise attenuation and design mitigating measures as recommended in noise assessment reports, acceptable to the City of London. (Z.-1-061467)

h-64 *Purpose:* To ensure there are no land use conflicts between commercial uses and adjacent residential land uses, the “h-64” symbol shall not be deleted until the owner agrees to implement all noise attenuation and design mitigating measures as recommended in a noise study, acceptable to the City of London. (Z.-1-061477)

h-65 *Purpose*: To ensure there are no land use conflicts between the adjacent arterial roads and/or rail line and the proposed residential uses, the "h-65" shall not be deleted until the owner agrees to implement all noise and vibration attenuation measures, recommended in noise and vibration assessment reports acceptable to the City of London. (Z.-1-061478)

h-66 *Purpose*: To encourage high quality urban design for new infill residential development, satisfactory compliance with Council approved site specific design guidelines, adopted under the Official Plan, will be assessed during the site plan approval/review process. A site plan application; including the site plan, building elevations and landscaping plan; will be submitted in conformity with these site specific urban design guidelines and a development agreement drafted acceptable to the City of London prior to the removal of the "h-66" symbol. (Z.-1-061479) (Z.-1-202871)

h-67 *Purpose:* To address concerns of site contamination, a Record of Site Condition shall be carried out by a qualified professional and submitted to the Ministry of the Environment. The City of London will remove the "h-67" holding provision once the Ministry is satisfied that the Record of Site Condition is satisfactory.
(Z.-1-061479)

h-68 *Purpose*: To encourage a street-oriented development, to ensure that the residential infill development is designed to mitigate impacts on adjacent residential properties, and provide for a high quality of urban design, a development agreement shall be entered into to ensure that new residential infill development is designed substantially consistent with the design concept tabled by the developer as part of the rezoning application, to the satisfaction of the City of London, prior to the removal of the "h-68" symbol.

*Permitted Interim Uses*: Existing Uses (Z.-1-061480)

h-69 *Purpose:* To ensure proper site drainage, the owner/developer’s professional engineer shall submit an engineered design that adequately addresses drainage impacts on the neighbouring lands to the west and south as a result of any new development on the subject site, to the satisfaction of the City Engineer.
(Z.-1-061496)

h-70 *Purpose:* To ensure there are no land use conflicts between freeways and the proposed residential uses, the h-70 shall not be deleted until the owner agrees to implement all noise attenuation measures,

recommended in noise assessment reports acceptable to the City of London.
(Z.-1-061515)

h-71 *Purpose:* To encourage street orientation development, the Owner shall prepare a building orientation plan which demonstrates how the front façade of the dwelling units can be oriented to all abutting streets (except where a noise barrier has been approved),acceptable to the General Manager of Planning and Development. The recommended building orientation will be incorporated into the approved site plan and executed development agreement prior to the removal of the "h-71" symbol.
(Z.-1-061521)

h-72 *Purpose:* To ensure adequate sanitary and stomwater management services are provided to the site, a maximum of a total of 50 full, model home or no connect building permits will be permitted. The Holding provision will not be removed until the Owner confirms that the Snake Creek sanitary trunk sewer is constructed and operational, and the Municipal Class Environmental Assessment (EA) Study has been completed and all related storm/drainage service works, including the ultimate Heard Drain remediation works required within the limits of this plan, are constructed and operational, all to the satisfaction of the City Engineer.
(Z.-1-061522)

h-73 *Purpose:* In order to ensure there are no conflicts between arterial roads and development on these lands, the h-73 shall not be deleted until an Municipal Class EA has been completed on area arterial roads and its accepted recommendations implemented.

*Internal Permitted Uses:* Existing Uses. (Z.-1-061568)

h-74 *Purpose:* To ensure the construction of a local road to service the subject site, the holding provisions shall not be deleted until the applicant has dedicated a sufficient width to accommodate half the road allowance for a local street, to the satisfaction of the City of London. (Z.-1-061580)

h-75 *Purpose*: To ensure orderly development of lands, the "h-75" symbol shall not be deleted until either a subdivision agreement has been entered into or provisions for the dedication of land and construction of a future secondary collector road connection at the intersection of Southdale Road West, and a local road connection west of this intersection as identified in the community plan, have been finalized and the lands have been conveyed to the City.

*Permitted Interim Uses*: Existing Uses (Z.-1-071593)

h-76 *Purpose:* To ensure the adequate provision of sanitary treatment capacity in the Westmount Pumping Station, the "h-76" symbol shall not be deleted until an allocation for treatment and/or conveyance capacity at the Pumping Station and/or the Treatment Plant has been made by the City Engineer.

*Permitted Interim Uses*: Existing uses. (Z.-1-071601)

h-77 Purpose: In order to ensure there are no conflicts between Veterans Memorial Parkway and development on these lands, the h-77 shall not be deleted until the Veterans Memorial Parkway Interchanges Environmental Assessment Study is completed.

*Interim Permitted Uses:* Existing Uses. (Z.-1-071613 – PL070313- August 19, 2008)

h-78 *Purpose*: To ensure the orderly development of land and the adequate provision of municipal services, the "h-78" symbol shall not be deleted until a sanitary servicing plan has been prepared, confirmation that

stormwater management capacity is available, and that access for future development is to the secondary collector road system as identified in the Official Plan, all to the satisfaction of the City Engineer.

*Permitted Interim Uses*: Existing Uses. (Z.-1-071640)

h-79 *Purpose*: To ensure the owner undertakes a tree retention plan as part of any future subdivision development, the “h” symbol shall not be deleted until a tree preservation report and plan has been prepared by a qualified ecological consultant in accordance with the Tree Preservation Policy and is implemented to the satisfaction of the General Manager of Planning & Development.

*Permitted Interim Uses*: Existing Uses. (Z.-1-071640)

h-80 *Purpose:* To ensure the orderly development of lands and the adequate provision of municipal services, the “h80” shall not be removed until full municipal services are available to the site.

*Interim Permitted Uses:* Existing Uses (Z-1-071642)

h-81 *Purpose*: the “h- 81” symbol shall not be deleted until a methane gas study is completed and mitigation measures are implemented, if required, to the satisfaction of City Engineer. (Z.-1-071652)

h-82 *Purpose:* To ensure that there is a consistent lotting pattern in this area, the “h-82” symbol shall not be deleted until the part block has been consolidated with adjacent lands. (Z.-1-071654)

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h-83 ~~*Purpose*: To ensure the construction of a local road to service the subject site, the holding provision shall not be de~~leted until the applicant has dedicated and constructed a sufficient width to accommodate half the road allowance for a local street, to the satisfaction of the City of London.

*Permitted Interim Uses*: Existing uses.(Z-1-071654)

h-84 *Purpose:* To ensure that there is a consistent lotting pattern in this area, the "h-84" symbol shall not be deleted until the part block has been consolidated with adjacent lands.
(Z.-1-071661) O.M.B. Order # PL070738 July 9, 2008

h-85 *Purpose:* To address concerns of potential methane contamination on adjacent sites, an assessment should be conducted on site by a qualified professional to determine if methane exists and any potential mitigation is necessary and should be implemented on site, prior to the issuance of any building permits, to the satisfaction of the General Manager of Planning and Development.

*Permitted Interim Uses:* Existing uses (Z.-1-071673)

h-86 NUMBER NOT USED

h-87 Purpose: To ensure adequate sanitary servicing capacity, the owner/developer’s professional engineer shall complete a sanitary sewer capacity analysis study, prepare an evaluation of the White Oak Road Sanitary Sewer and Water Service Area Rating By-law, and ensure that all outstanding payments with respect to the Area Rating By-law charges on the subject lands have been made in full, all to the satisfaction of the City Engineer.

*Permitted Interim Uses:* Existing Uses
(Z.-1-071674 approved by OMB, Issue Date: April 15, 2008/ OMB Case No: PL071247)

h-88 *Purpose:* To ensure that the urban design concepts established through the Official Plan and/or Zoning amendment review process are implemented, a development agreement will be entered into which, to

the satisfaction of the General Manager of Planning and Development, incorporates these concepts and addresses identified urban design issues.

*Permitted Interim Uses:* Existing Uses
(OMB Case No. PL071246, Issue Date June 11, 2008, Z.-1-071680)

h-89 *Purpose:* To ensure the orderly development of the lands the “h-89” symbol shall not be deleted until a stormwater servicing report has been prepared and confirmation that stormwater management systems are implemented to the satisfaction of the City Engineer.

*Permitted Interim Uses:* Existing Uses

h-90 *Purpose:* To ensure the orderly development of the lands the “h-90” symbol shall not be deleted until the construction of Coronation Drive is undertaken to the satisfaction of the City Engineer.

*Permitted Interim Uses:* Existing Uses

h-91 *Purpose:* To ensure that the urban design concepts established through the Zoning amendment review process are implemented, a site plan will be approved and a development agreement will be entered into which, to the satisfaction of the General Manager of Planning and Development, incorporates these concepts and Addresses identified urban design issues.

*Permitted Interim Uses:* Existing Uses (Z.-1-081701)

h-92 *Purpose:* To assess the degree of impact that the access driveway will have on the adjacent woodland, identify potential mitigation measures and determine appropriate ecological compensation, an Environmental Impact Study will be completed to the satisfaction of the City of London prior to the removal of the “h-92” symbol.

*Permitted Interim Uses:* Existing uses. (Z.-1-081704 – OMB Case No. PL080351)

h-93 *Purpose:* To ensure that the urban design concepts established through the Zoning amendment review process are implemented, a site plan will be approved and a development agreement will be entered into which, to the satisfaction of the General Manager of Planning and Development, incorporates these concepts and addresses identified urban design issues. (Z.-1-081704 – OMB Case No. PL080351)

h-94 *Purpose:* To ensure that there is a consistent lotting pattern in this area, the “h-94” symbol shall not be deleted until the block has been consolidated with adjacent lands.
(Z.-1-081703)

h-95 Purpose: To ensure that the urban design concepts established through the Official Plan and/or Zoning amendment review process are implemented, a development agreement will be entered into which, to the satisfaction of the General Manager of Planning and Development, incorporates these concepts and addresses identified Urban design issues.

*Permitted Interim Uses:* Existing Uses (Z.-1-081711)

h-96 *Purpose:* To order to ensure the orderly development of the lands and the adequate provision of municipal services the “h” symbol shall not be deleted until a subdivision agreement is entered into and all works required by applicable Municipal Class EA have been implemented.

*Interim Permitted Uses:* Existing Uses
(OMB Decision Date: March 07, 2008 OMB File No. PL061242)

h-97 *Purpose:* To ensure the orderly development of lands and the adequate provision of municipal services, the “h-97” symbol shall not be deleted until appropriate access arrangements have been made and sigh lines along Hamilton Road have been restored to the satisfaction of the City Engineer.

Permitted Interim Uses: Existing Uses (Z.-1-081735)

h-98 *Purpose:* The “h” symbol shall not be deleted until there is an acceptable pathway incorporated into Block 278 as part of the final channel design for this area to the satisfaction of the General Manager of Planning and Development.

*Permitted Interim Uses:* Existing uses. (Z.-1-081736)

h-99 *Purpose:* To ensure that new development is designed and approved consistent with the policies of the Sunningdale North Area Plan and the “Upper Richmond Village-Urban Design Guidelines”, to the satisfaction City of London, prior to removal of the “h-99” symbol. (Z-1-081786)

h-100 Purpose: To ensure there is adequate water service and appropriate access, a looped watermain system must be constructed and a second public access must be available to the satisfaction of the City Engineer, prior to the removal of the h-100 symbol.

Permitted Interim Uses: A maximum of 80 residential units (Z.-1-081786) (Z.-1-122078)

h-101 Purpose: To encourage high quality urban design for new infill residential development, the following urban design concepts must be provided for in the design of any new dwellings at this location:

i) the design of the dwelling unit must maintain the continuity of the Riverside Drive streetscape;
ii) where appropriate the dwelling unit shall front Riverside Drive;
iii) where appropriate the dwelling unit shall provide for a front porch along Riverside Drive street frontage and provide for pedestrian access to Riverside Drive;
iv) noise walls and non-transparent fencing (ie board on board) shall not be permitted adjacent to Riverside Drive.

These urban design concepts must be addressed in the submission of any building permit application to the satisfaction of the General Manager of Planning and Development prior to the removal of the holding provision and the issuance of a building permit. (Z.-1-081803)

h-102 Purpose: To ensure the orderly development of the lands, the "h" symbol shall not be deleted until a Certificate of Approval has been granted from the Ministry of the Environment, to the satisfaction of the General Manager of Planning and Development.

Permitted Interim Uses: Existing Uses (Z.-1-081822)

h-103 Purpose: To ensure that urban design is addressed at site plan, a site plan will be approved and a development agreement will be entered into which, to the satisfaction of the General Manger of Planning and Development, incorporates the design objectives as identified in the Council resolution. A requirement of the site plan submission will include an urban design brief and building elevations which detail how the objectives have been achieved. (Z.-1-091840)

h-104 *Purpose:* To ensure that a comprehensive storm drainage and stormwater management report prepared by a consulting engineer is completed to address the stormwater management strategy for all lands within the subject plan and external lands where a private permanent on-site storm drainage facility is proposed for any block or

blocks not serviced by a constructed regional stormwater management facility. The "h-104" symbol shall not be deleted until the report has been accepted to the satisfaction of the General Manager of Planning and Development and City Engineer. (Z.-1-091860)

h-105 *Purpose:* To ensure that a comprehensive storm drainage and stormwater management report prepared by a consulting engineer is completed to address the stormwater management strategy for all lands within the subject plan and external lands where a private permanent on-site storm drainage facility is proposed for any block or blocks not serviced by a constructed regional stormwater management facility. The "h-105" symbol shall not be deleted until the report has been accepted to the satisfaction of the General Manager of Planning and Development and City Engineer. (Z.-1-091861)

h-106 Purpose: To mitigate potential conflicts between industrial uses and adjacent residential land uses the h-106 symbol shall not be deleted and existing and or future buildings shall not be expanded until public site plan approval is received which will address, among other items, issues of access, on-site parking, outdoor storage, buffering and screening. (Z.-1-091871)

h-107 *Purpose*: In order to ensure there are not conflicts between Old Victoria Road and development on these lands, the h-107 shall not be deleted until the City Engineer has accepted a final alignment for the Old Victoria Road road allowance.

Interim Permitted Uses: Existing Uses; Carpool parking lot (Z.-1-091879)

h-108 *Purpose*: To ensure that this parcel is developed in conjunction with abutting lands, to the satisfaction City of London, prior to removal of the”h-108” symbol. (Z.-1-091882)

h-109 *Purpose*: To ensure that this parcel is developed in conjunction with abutting lands, to the satisfaction City of London, prior to removal of the “h-109” symbol. (Z.-1-091883)

h-110 *Purpose*: To ensure adequate provision of municipal services and access are provided, the “h-110” shall not be lifted until municipal servicing and access are adequately addressed through future planning applications to the satisfaction of the General Manager of Planning and Development.

*Permitted Interim Uses:* Existing Uses.(Z.-1-091886)

h-111 *Purpose:* To ensure that there is a consistent lotting pattern in this area, the h-111 symbol shall not be deleted until the block has been consolidated with adjacent lands. (Z.-1-091891)

h-112 1175 & 1205 Hyde Park Road

To ensure orderly development of these lands, the h-112 shall not be removed until a development agreement associated with a site plan is entered into which addresses transportation, and stormwater management concerns, and the accepted recommendations of the Municipal Class EA on surrounding arterial roads have been incorporated into the site plan, all to the satisfaction of Municipal Council.

*Permitted Interim Uses*: Existing permitted uses and a daycare, all within the existing building.
(Z.-1-091897) (deleted and replaced by Z.-1-101935)

h-113 1175 & 1205 Hyde Park Road

To ensure noise issues are addressed, the h-113 shall not be removed until the owner has implemented all noise attenuation measures recommended in an approved noise assessment report, to the satisfaction of Municipal Council.
(Z.-1-091897)(deleted and replaced by Z.-1-101935)

h-114 A building permit shall not be issued for this parcel of land until such time as it is determined how much of this parcel is required to provide for the exit/access ramp to the future bicycle/pedestrian overpass which is to cross Richmond Street at this location.(Z.-1-101915)

h-115 NUMBER NOT USED

h-116 NUMBER NOT USED

h-117 *Purpose:* To ensure the orderly development of lands and the adequate provision of municipal services, the h-117 symbol shall not be deleted until the current approved and registered site plan for the property is amended.

*Permitted Interim Uses:* Existing uses. *(Z.*-1-101960)

h-118 *Purpose*: To ensure successful completion of the channel project (and with receipt of as-built drawings) a letter from the Upper Thames River Conservation Authority must be submitted to the satisfaction of the City of London prior to the removal of the "h-118" symbol.

*Permitted Interim Uses:* Existing Uses (Z.-1-101970)

h-119 *Purpose*: To ensure that the urban design objectives established through the Official Plan and Zoning amendment review process are implemented, a site plan will be approved and a development agreement will be entered into which, to the satisfaction of the General Manager of Planning and Development, incorporates these objectives and addresses identified urban design issues.

*Permitted Interim Uses*: Existing Uses (Z.-1-101970)

h-120 *Purpose*: To ensure the orderly development of lands, the "h-120" symbol shall not be deleted until a Traffic Impact Study has been completed and the accepted recommendations have been implemented through a development agreement all to the satisfaction of the City Engineer and the General Manager of Planning and Development.

*Permitted Interim Use*s: Existing uses. (Z.-1-111981)

h-121 *Purpose*: To ensure that flood proofing requirements are incorporated and/or that dry, safe access to the Regulatory Flood Elevation is achieved to the satisfaction of the Upper Thames River Conservation Authority. (Z.-1-111989)

h-122 *Purpose*: To ensure the orderly development of lands and the adequate provision of municipal services, the "h" symbol shall not be deleted until of a parking study and a development agreement is entered into for the lands in question with the City of London.

*Permitted Interim Uses*: Existing Uses (Z.-1-111990)

h-123 *Purpose*: To ensure the orderly development of lands and the adequate provision of municipal services, the "h" symbol shall not be deleted until a urban design brief and the Urban Design Peer Review Panel review process are implemented, and a development agreement is entered into for the lands in question with the City of London.

*Permitted Interim Uses*: Existing Uses (Z.-1-111990)

h-124 *Purpose:* To ensure appropriate vehicular access to the property. The "h-124" symbol shall not be deleted until a joint access plan has been submitted and approved, and the joint rights of way are registered on title, all to the satisfaction of the City Engineer.
*Permitted Interim Uses:* Existing Uses (Z.-1-111992)

h-125 *Purpose*: To ensure the orderly development of lands and provisions of municipal services, the holding provision shall not be deleted until the Owner confirms that the watermain system in the subdivision has been looped to the satisfaction of the City Engineer.

*Permitted Interim Uses*: Existing Uses (Z.-1-112007)

h-126 *Purpose*: To ensure the orderly development of lands and provisions of municipal services, the holding provision shall not be deleted until the Owner confirms that the watermain system in the subdivision has been looped to the satisfaction of the City Engineer.

*Permitted Interim Uses*: Existing Uses. (Z.-1-112006)

h-127 *Purpose*: To ensure the orderly development of lands and provisions of municipal services, the holding provision shall not be deleted until the Owner confirms that the watermain system in the subdivision has been looped to the satisfaction of the City Engineer.

*Permitted Interim Uses*: Existing uses. (Z.-1-112000)

h-128 *Purpose*: To ensure that urban design objectives for the town centre and public square are addressed, a site plan will be approved and development agreement entered into which, to the satisfaction of the City Planner, incorporates the community design guidelines for the Old Victoria Area Plan. A requirement of the site plan submission will include an overall design concept plan, a design brief, and building elevations which details how the ultimate development will be designed and built in accordance with the community design guidelines.

*Permitted Interim Uses*: Existing Uses (Z.-1-112020)

h-129 *Purpose*: To ensure that the results of the Hydraulic Floodway Analysis are accepted to the satisfaction of the Upper Thames River Conservation Authority.
(Z-1-112002)

h-130 7 Holiday Avenue

To ensure orderly development of these lands, the h-130 shall not be removed until adequate storm water management and infrastructure addressing overland water flows are in place, and a development agreement associated with a site plan is entered into which addresses drainage and storm water management issues and joint access with #15 Holiday Avenue and prohibitions of vehicular left turns into and out of the lands known as #7 Holiday Avenue, as to the satisfaction of Municipal Council.

*Permitted Interim Uses:* Existing permitted uses within the existing building.
(Z.-1-112005 – OMB Order PL 100465)

h-131 *Purpose*: To determine the extent to which development will be permitted and ensure that development will not have a negative impact on abutting wetlands and wells, an agreement shall be entered into specifying appropriate development conditions and boundaries, based on an Environmental Impact Study, a Water Balance Study and a

Hydrogeological Study that has been prepared to the satisfaction of the City of London, prior to removal of the "h-131" symbol.

Permitted Interim Uses: Existing Uses
(Z.-1-112012)

h-132 *Purpose*: To ensure that a Water Balance Study and a Hydrogeological Study is submitted as part of a complete Site Plan Application, the h-132 symbol shall not be removed until the results of each Study are accepted to the satisfaction of the City of London.
(Z.-1-112012)

h-133 *Purpose*: To ensure the orderly redevelopment of the site, the "h" symbol shall not be deleted and no development can occur beyond 47,120 square metres gross floor area until a comprehensive (re)development concept site plan and urban design brief are completed at the time of site plan review and a public site plan meeting is held.

*Permitted Interim Uses*: Permitted uses in stand-alone buildings, enclosed shopping centre format and/or non-enclosed shopping centre format totalling 47,120 square metres.
(Z.-1-112017)

h-134 *Purpose:* To ensure that development does not exceed a maximum interim threshold of 759 residential units, the h-134 symbol shall not be deleted until the temporary Bostwick sanitary sewage pumping station and forcemain are decommissioned; and a Traffic Impact Study is prepared, which demonstrates that the transportation infrastructure in Bostwick East is adequate to accommodate forecast traffic volumes.

*Permitted Interim Uses:* Permitted uses up to a total of 759 residential units on the multi-family lands in draft plan 39T-07510.
(Z.-1-112024)

h-135 *Purpose:* To ensure that commercial development does not exceed a maximum interim floor area threshold of 15,248 $m^2$ in draft plan 39T-07510, the h-135 symbol shall not be deleted until a Traffic Impact Study is prepared, which demonstrates that the transportation infrastructure in Bostwick East is adequate to accommodate forecast traffic volumes.

*Permitted Interim Uses:* Permitted uses up to a maximum total floor area of 15,248 $m^2$ on the commercial lands in draft plan 39T-07510.
(Z.-1-112024)

h-136 *Purpose:* To ensure that development in draft plan 39T-08508 does not exceed a maximum interim threshold of 263 residential units, the h-136 symbol shall not be deleted until the temporary Bostwick sanitary sewage pumping station and forcemain are decommissioned; and a Traffic Impact Study is prepared, which demonstrates that the transportation infrastructure in Bostwick East is adequate to accommodate forecast traffic volumes.

*Permitted Interim Uses:* Permitted uses up to a total of 263 residential units on the multi-family lands in draft plan 39T-08508.
(Z.-1-112024)

h-137 *Purpose:* To ensure that development in draft plan 39T-05509 does not exceed a maximum interim threshold of 240 residential units, the h-137 symbol shall not be deleted until the temporary Bostwick sanitary sewage pumping station and forcemain are decommissioned; and a Traffic Impact Study is prepared, which demonstrates that the transportation infrastructure in Bostwick East is adequate to accommodate forecast traffic volumes.

*Permitted Interim Uses:* Permitted uses up to a total of 240 residential units on the multi-family lands in draft plan 39T-05509. (Z.-1-112024)

h-138 *Purpose:* To ensure that commercial development in draft plan 39T-05509 does not exceed a maximum interim floor area threshold of 12,868 $m^2$, the h-138 symbol shall not be deleted until a Traffic Impact Study is prepared, which demonstrates that the transportation infrastructure in Bostwick East is adequate to accommodate forecast traffic volumes.

*Permitted Interim Uses:* Permitted uses up to a maximum total floor area of 12,868 $m^2$ on the commercial & office lands in draft plan 39T-05509.
(Z.-1-112024)

h-139 *Purpose*: To ensure that development takes a form compatible with the adjacent lands uses so that the issues identified as a condition of approval can be implemented. The "h-139" symbol shall not be deleted until an agreement is entered into for the subject lands with the City of London, and a lot grading plan, storm water servicing plan, landscape plan, a site plan and security sufficient to cover the works identified in these plans is provided to the satisfaction of The City of London.

*Permitted Interim Uses*: Existing single detached dwelling
(Z.-1-112053)

h-140 *Purpose*: To ensure the orderly development of land and adequate provision of municipal water supply, the holding provision shall not be deleted until such time as the high level water supply is available on Westdel Bourne, and the necessary works to connect this subdivision to high level water servicing has been undertaken, to the satisfaction of the City Engineer.

*Permitted Interim Uses*: Existing Uses (Z.-1-112060)

h-141 *Purpose:* To ensure the orderly development of the lands and the adequate provision of municipal services, the “h-141” symbol shall not be deleted until a development agreement is entered into and permits are issued by the Ministry of Transportation as required by the *Public Transportation and Highway Improvement Act* or any successor legislation.

*Permitted Uses:* Existing Uses.
(Z.-1-081704 – OMB Case No. PL080351)

h-142 Purpose: to ensure the orderly development of the site the following items shall be addressed through site plan review and a development agreement be entered into by the owner/developer and the City of London:

a) Urban design objectives through the submission of an urban design brief and building elevations; and

b) Provision for joint access with the property to the east of the subject site.
(Z.-1-122062)

h-143 *Purpose*: To ensure the orderly development of the lands and that development takes a form compatible with the adjacent land uses. An agreement shall be entered into with the City of London specifying the necessary works required for the development of the subject lands, based on the submission of the following studies: lot grading plan, storm water servicing plan, landscape plan, and a site plan, as well as the requirement for sufficient securities to cover the works identified in these plans to be provided to the satisfaction of The City of London.

*Permitted Interim Uses*: Existing uses (Z.-1-122097)

h-144 Purpose: To ensure that any development proposed for this block takes into account lands needs for a future roundabout at the intersection of Hyde Park Rd and Sunningdale Rd W., to the satisfaction City of London, prior to removal of the "h-144" symbol. (Z.-1-122100)

h-145 *Purpose:* To ensure there will be no conflicts between the existing aggregate resource extraction use and the proposed residential uses, the h-145 shall not be deleted until a geotechnical report is prepared which confirms the Erosion Hazard Limit and addresses potential erosion hazards based on the proposed development, layout and site grading, to the satisfaction of the City of London,

*Permitted Interim Uses:* Existing Uses (Z.-1-122117)

h-146 *Purpose:* To ensure there will be no conflicts between existing aggregate resource extraction use and the proposed residential uses, the h-146 shall not be deleted until a noise impact assessment is prepared which confirms that noise levels at 537 Crestwood Drive are within MOE guidelines, to the satisfaction of the City of London.

*Permitted Interim Uses:* Existing Uses (Z.-1-122117)

h-147 *Purpose*: To ensure that urban design is addressed at site plan, a site plan will be approved and a development agreement will be entered into which incorporates the design objectives as identified in the Council resolution (Z.-1-122122)

h-148 *Purpose*: to ensure that the future property owners of 585 and 613 Sovereign Road undertake tree management plans as part of any future site plan approvals, the holding provision will not be deleted until a tree management plan has been prepared by a Registered Professional Forester (R.P.F.), the management plan includes supervision of the removal of the trees on 585 and 613 Sovereign Road by a R.P.F., and that the removal and movement of topsoil and other materials are in accordance with the City-led Forest Management plan which includes revegetation of the area on the east side of Sovereign Road (604-650 Sovereign Road). (Z.-1-122123)

h-149 *Purpose*: To ensure the orderly development of the lands the symbol shall not be deleted until sanitary and stormwater servicing reports have been prepared and confirmation that sanitary and stormwater management systems are implemented to the satisfaction of the City Engineer.(Z.-1-132185)

h-150 *Purpose*: To ensure that adequate parking is provided, the "h-150" symbol shall not be deleted until an easement for parking and Vehicular ingress/egress is provided over 570 Gainsborough Road to the satisfaction of the City Engineer.
(Z.-1-132206)

h-151 *Purpose*: To ensure the Owner undertakes a hydrogeotechnical evaluation and identify geotechnical conditions as well as all required erosion set back maintenance, erosion, structural, geotechnical setbacks, and ensure that all matters of slope stability are adequately engineered for the subject site in the above noted areas by the Professional Engineer, all to the satisfaction of the City Engineer and the Upper Thames River Conservation Authority prior to removal of the "h-151" symbol. (Z.-1-132208) (Z.-1-132209)

h-152 *Purpose*: To ensure that development will not have an adverse impact on pedestrian level wind conditions, a wind impact assessment which may, at the request of the City, include wind tunnel testing, shall be prepared by a qualified professional and submitted to the City, and any

recommendation contained therein for building design or site modifications necessary to achieve acceptable wind conditions shall be incorporated in the proposed development to the satisfaction of the City of London prior to removal of the "h-152" symbol.
(Z.-1-132208) (Z.-1-132209)

h-153 Deleted by OMB Appeal of Z.-1-132226 (OMB Case No. PL131116)

h-154 *Purpose*: The removal of the h-154 symbol shall not occur until such time as the Owner has entered into an agreement with the City of London, which specifies the conditions associated with the provision of temporary sanitary servicing for the land, in order to ensure that development will not have a negative impact on existing municipal infrastructure or the City of London's sanitary servicing strategy for the area. (Z.-1-132210)

h-155 *Purpose*: The removal of the h-155 symbol shall not occur until such time as the Owner has entered into a development agreement with the City of London, to ensure that the development is consistent with and conforms to the guidelines and vision of OPA 541, Southwest Area Secondary Plan (SWAP). (Z.-1-132210)

h-156 *Purpose*: To ensure landscaping enhancements are implemented within the abutting Oxford Street and Waterloo Street road allowances, the "h-156" symbol shall not be deleted until a development agreement associated with a site plan which provides for the creation of an attractive street edge at this strategic gateway location is entered into with the City of London, to achieve high quality landscaping and the creation of an attractive street edge at this strategic gateway location. (Z.-1-132218)

h-157 Deleted by OMB Appeal of Z.-1-132226 (OMB Case No. PL131116)

h-158 Deleted by OMB Appeal of Z.-1-132226 (OMB Case No. PL131116)

h-159 *Purpose*: To ensure that development will not have negative impacts on abutting natural heritage features, an Environmental Impact Study (EIS) to address the potential impacts of the access laneway will be required to the satisfaction of the City and UTRCA, prior to the removal of the "h-159" symbol.
(Z.-1-132231)

h-160 Under Appeal

h-161 *Purpose*: To ensure the proposed stormwater management system servicing serving this subdivision is constructed and operational, the holding provision shall not be deleted until these works have been completed to the satisfaction of the City. (Z.-1-142250)

h-162 *Purpose*: To ensure private individual sanitary disposal systems on each lot are installed in accordance with applicable recommendations and in compliance with the overall servicing strategy for this subdivision, the holding provision shall not be deleted until these works have been approved to the satisfaction of the City. (Z.-1-142250)

h-163 *Purpose*: To ensure private water wells on each lot are in compliance with the overall servicing strategy for this subdivision, the holding provision shall not be deleted until these works have been approved to the satisfaction of the City. (Z.-1-142250)

h-164 *Purpose*: To ensure that the *Richmond Street-Old Masonville Master Plan and Urban Design Guidelines,* established through the Official Plan and Zoning amendment review process, are implemented, a development agreement shall be entered into which ensures that future

development of these lands incorporates the concepts and urban design principles identified in the Master Plan and Urban Design Guidelines to the satisfaction of the Director, Land Use Planning and City Planner prior to the removal of the h-164 symbol.

*Permitted Interim Uses*: Existing Uses (Z.-1-142261)

h-165 *Purpose*: To ensure the orderly development of the subject lands, the h-165 symbol shall not be removed until a storm/drainage and stormwater management (SWM) servicing design report has been prepared and accepted for the subject lands to ensure that the that future development has the sufficient storm outlet and SWM servicing to the specifications and satisfaction of the City Engineer.

*Permitted Interim Uses:* Existing Uses (Z.-1-142261)

h-166 *Purpose*: To ensure the orderly development of lands and the adequate provision of water services, the "h-166" symbol shall not be deleted until full municipal water services are available to service the site or the site is serviced from a private water system which is regulated by the Ontario Safe Drinking Water Act and Regulation 170/03 is installed and all requirements are met, to the satisfaction of the City Engineer. (Z.-1-142275)

h-167 Purpose: To ensure the orderly development of the lands, the h-167 shall not be deleted until a private on-site sanitary disposal system has been designed and can be implemented to the satisfaction of the Managing Director, Development and Compliance Services and Chief Building Official. (Z.-1-142288)

h-168 *Purpose*: To ensure the orderly development of lands and the adequate provision of municipal services, the "h-168" symbol shall not be deleted:

i) Until a development agreement associated with a site plan which provides for appropriate access arrangements to the satisfaction of Council is entered into with the City of London;
ii) Until the owner agrees to implement all noise attenuation and design mitigating measures as recommended in noise assessment reports, acceptable to the City of London; and
iii) That urban design is addressed at site plan, a site plan will be approved and a development agreement will be entered into which, to the satisfaction of the City Planner, incorporates the design objectives as identified in the June 12, 2012 Council resolution. A requirement of the site plan submission will include an urban design brief and building elevations which detail how the objectives have been achieved.

Permitted Interim Uses: Existing Uses; automobile sales and service establishment permitted by the applicable zone within existing buildings. (Z.-1-142289)

h-169 *Purpose*: A h-169 holding provision shall not be deleted until the conceptual design of the proposed storm/drainage and SWM servicing works is completed and approved prior to the site plan application being considered to satisfaction of the City Engineer. (Z.-1-142294)

h-170 *Purpose*: A h-170 holding provision shall not be deleted until the following development design criteria are met: the design shall include, but not be limited to, the required engineering evaluations and confirmation of the existing outlet capacity to the Medway Creek main channel via Amica's storm sewer and channel, address minor and major flows conveyance, SWM measures (quantity, quality and erosion control), all in accordance with City of London Design Permanent Private Systems (PPS) and MOE's requirements, all to the satisfaction

of the City Engineer and the MOE ECA's requirements. The Owner's consulting engineer must ensure that the proposed PPS for storm/drainage and SWM servicing works for the subject lands will be sized to address the proposed land use on the subject lands and the limitation in the outlet system, no adverse impact on the downstream lands or the existing water resources/storm conveyance and SWM system. (Z.-1-142294)

h-171 *Purpose*: To ensure the orderly development of the lands and the adequate provision of municipal services, the holding provision shall address, the following, prior to the removal of the holding provision:

1. That the commercially zoned parcels shall be developed only as a co-ordinated and integrated development, which act as one site comprised of two separate development agreements. The development agreements shall be fully executed and registered on title.
2. That a subsequent consent application for lot adjustment be obtained if it is identified that the property boundaries between the commercially zoned parcels constrain the site plan function or design. The consent application shall be at no cost to the City, to the City's satisfaction and in full force and effect.
3. That sanitary, storm and water servicing shall be provided to the satisfaction of the City Engineer. (Z.-1-142299)

h-172 DELETED BY OMB DECISION DATED JAN 12, 2018 PL140745

h-173 *Purpose*: To ensure that development is consistent with the City of London Urban Design Principles and Placemaking Guidelines, the h-173 shall not be deleted until urban design guidelines have been prepared and implemented through the subdivision agreement, to the satisfaction of the City of London.

*Permitted Interim Uses*: Existing Uses
(Z.-1-142328)

h-174 Number not used

h-175 Number not used

h-176 Number not used

h-177 Number not used

h-178 Number not used

h-179 *Purpose*: The holding provision shall not be removed until such time as the property owner provides a financial contribution to the City of London for the funding of source control measures in the municipal sanitary sewer system to which this land is tributary. The amount of the contribution shall be agreed upon with the Waste Water and Drainage Engineering Division prior to the removal of the holding provision and the payment will be made directly to the Waste Water and Drainage Engineering Division. Upon receipt of the payment a request for removal of the holding provision can be made.
(Z.-1-142337)

h-180 Under Appeal (Z.-1-142343)

h-181 *Purpose:* To ensure the orderly development of lands and the adequate provision of municipal services, the "h-181" symbol shall not be deleted until appropriate vehicular access arrangements have been made to the satisfaction of the City Engineer.

*Permitted Interim Uses*: Existing uses (Z.-1-142347)

h-182 *Purpose*: The removal of the h-182 shall not occur until such time as the as the owner has entered into a development agreement with the City of London to ensure that development of the site occurs generally in accordance with the Urban Design Guidelines and Illustrations attached as Schedule "1" to the amending by-law and to ensure the long-term maintenance of on-site architectural and landscaping features which are visible from the public realm.
(Z.-1-142351 – Approved by OMB on April 2, 2015)

h-183 *Purpose*: To ensure that development will not have any negative impacts on the groundwater in the area, with specific attention given to any negative impacts on existing wells, a Hydrogeological Study shall be prepared by a qualified professional and submitted to the City to evaluate the potential impact of the proposed development to area private wells and provide recommendations for monitoring post construction impacts and possible mitigation measures to the satisfaction of the City Engineer prior to the removal of the h-183 symbol. Any recommendations contained therein shall be incorporated into the development agreement to the satisfaction of the City of London. (Z.-1-142350)

h-184 *Purpose*: The removal of the h-184 shall not occur until such time as the Owner has entered into a development agreement with the City of London to ensure that the development of the site is consistent with and conforms to the Urban Design Policies of the Southwest Area Secondary Plan, and that the development incorporates the design considerations identified through the Zoning By-law amendment to the satisfaction of the Managing Director, Planning and City Planner.
(Z.-1-142352)

h-185 *Purpose*: The removal of the h-185 shall not occur until such time as the as the alignment of the Hamlyn Street extension has been determined in accordance with the policies of Section 20.5.16.10 of the Southwest Area Secondary Plan and the Owner has entered into an agreement with the City of London, to the satisfaction of the City Engineer, to construct and convey Hamlyn Street. Schedule "C" may be amended to reflect the determined alignment of the proposed future road corridor without the need for an Official Plan amendment.
(Z.-1-142352)

h-186 *Purpose*: To ensure the orderly development of the subject lands, the h-186 symbol shall not be removed until the design of the proposed storm/drainage and SWM servicing works from the proposed development is completed in accordance Pincombe Drain Strom Drainage, Stormwater Management and Drain Restoration Schedule "B" Municipal Class EA Summary Report (Stantec, 2013), City of London design and specifications, MOE requirements and guidelines all to satisfaction of the City Engineer, it being noted that any proposed works must be located outside the footprint of the future Pincombe No.4 SWM facility location as identified in the Municipal Class EA; or the regional Pincombe No.4 SWM facility is functional and operational.
(Z.-1-142352)

h-187 Purpose: To outline the extent to which development will be permitted and ensure that development will not have a negative impact on significant wildlife habitat, an agreement shall be entered into specifying appropriate development conditions and boundaries based on a Species at Risk Assessment prepared in accordance with the Endangered Species Act to the satisfaction of the Managing Director,

Planning and City Planner prior to the removal of the h-187 symbol. (Z.-1-142352)

h-188 Purpose: In order to ensure that building setbacks and design elements on lands along Wonderland Road South are not impacted by the widening of Wonderland Road as identified through the results of the Wonderland Road Environmental Assessment, no development shall be approved within 28.5 metres of the centerline of Wonderland Road South and until such time as the Environmental Assessment (EA) Study of Wonderland Road South is approved and a further Zoning By-law Amendment is in full force and effect to reflect the ultimate right-of-way. (Z.-1-142352)

h-189 *Purpose*: To ensure that development will not affect the adjacent significant natural heritage features, the h-189 shall not be deleted until remediation works required for the adjacent stormwater management pond, as identified in the accepted remediation plan, have been implemented, to the satisfaction of the City of London.

*Permitted Interim Uses*: Existing Uses (Z.-1-142354)

h-190 *Purpose*: To ensure that the *Conceptual Block Development Plan,* established through the Official Plan and Zoning amendment review process and attached as Schedule “1” to the amending by-law, is implemented, a development agreement shall be entered into which ensures that future development of these lands incorporates the concepts and design principles identified in the *Conceptual Block Development Plan* to the satisfaction of the Managing Director, Land Use Planning and City Planner prior to the removal of the h-190symbol. (Z.-1-142355)

h-191 Number not used

h-192 Number not used

h-193 *Purpose:* To ensure that adequate parking is provided for 510 Central Avenue, the "h-193" symbol shall not be deleted until an easement for parking and vehicular ingress/egress is provided over 609 William Street to the satisfaction of the Managing Director, Planning and City Planner.
*Permitted Interim Uses:* Only within existing buildings (Z.-1-142366)

h-194 *Purpose*: The removal of the h-194 shall not occur until such time as the Owner has entered into an agreement with the City of London to ensure that, if determined necessary through the completion of a geotechnical subsurface analysis, appropriate municipal roadway upgrades are completed to accommodate truck traffic from the proposed pit operation to the satisfaction of the City Engineer. (Z.-1-152372)

h-195 *Purpose*: The owner shall submit all studies required by Development Services including a Hydrogeological report, and will address issues of Stormwater Management, Water and Sanitary Servicing and grading. Any recommendation contained therein to achieve acceptable on-site servicing conditions shall be incorporated in the proposed development to the satisfaction of the City of London Chief Building Official prior to removal of the holding provision symbol. (Z.-1-152379)

h-196 *Purpose*: To ensure the orderly development of land and adequate provision of municipal services, the holding provision shall not be deleted until such time as the Wickerson Water Pumping Station upgrades to service this development are completed and operational, to

the satisfaction of the City of London.

*Permitted Interim Uses*: Existing Uses (Z.-1-152386)

h-197 *Purpose*: To ensure the size and configuration of lots and blocks is appropriate for the area and suitably serviced the “h-(197)” symbol shall not be deleted until after the Environmental Assessment for the Bostwick Road realignments has been completed and a subdivision agreement is entered into specifying conditions of development, to the satisfaction of Council.(Z.-1-152390)

h-198 *Purpose*: To encourage street-oriented development and discourage noise attenuation walls along arterial roads, a development agreement shall be entered into to ensure that new development is designed and approved consistent with the Southwest Area Secondary Plan. (Z.-1-152390)

h-199 *Purpose*:To ensure that the works required to implement the Pottersburg Creek Storm Drainage, Flood Control and Remediation Works project are completed prior to any development on the site, the “h-199” symbol shall not be deleted until the “as-built” drawings for the required works are submitted and accepted to the satisfaction of the Upper Thames River Conservation Authority and City Engineer. (Z.-1-152430)

h-200 *Purpose*: To ensure that urban design is addressed at site plan, a development agreement shall be entered into that incorporates high quality urban design features that recognize the prominent gateway location of the site, including enhanced building and landscape design, screened service and loading areas, and building orientation and setbacks. The “h-200” symbol shall not be deleted until building elevations and site plan have been submitted that recognizes the prominent gateway location of the site, to the satisfaction of the City Planner. (Z.-1-152430)

h-201 *Purpose*: The removal of the h-201 shall not occur until such time as the Owner, through the site plan process, enters into a development agreement with the City of London which includes the provision for a future joint access with the property to the west, municipally known as 614 Springbank Drive, and the joint rights-of-way are registered on title to the satisfaction of the City Engineer. (Z.-1-152432)

h-202 *Purpose*: To ensure that as much of the existing vegetation is retained, the holding provision will not be deleted until a tree preservation report and plan has been prepared by a qualified ecological consultant and is implemented to the satisfaction of City of London. (Z.-1-162440)

h-203 *Purpose*: To ensure the orderly development of lands, the “h-203” symbol shall not be deleted until a development agreement associated with plan of subdivision provides for the dedication and construction of Gleeson Street to municipal standards, between Ashland Avenue and McCormick Boulevard, as proposed in the Concept Plan, attached as Schedule “1” of the amending by-law, as part of a future development proposal. (Z.-1-162440)

h-204 *Purpose*: To encourage high quality urban design for the redevelopment of the former McCormick factory site, a development which, with minor variations at the discretion of the Managing Director, Planning and City Planner, is consistent with the conceptual site plan

attached as Schedule “1” to the amending by-law and with the Urban Design Guidelines, attached as Schedule “2” of the amending by-law, will be assessed during the site plan approval/review process and a development agreement is entered into with the City of London prior to the removal of the "h-204” symbol. (Z.-1-162440)

h-205 *Purpose*: To ensure the orderly development of lands, the “h-205” symbol shall not be deleted until a Land Use Compatibility report associated with a site plan is undertaken which provides direction on how the proposed sensitive land uses can be appropriately designed, buffered and/or separated from the existing major facilities to prevent or mitigate potential adverse effects. (Z.-1-162440)

h-206 *Purpose*: To ensure that urban design objectives established through the subdivision review process are being met, a site plan shall be approved and a development agreement shall be entered into which ensures that future development of the lands is in keeping with the design principles and concepts identified in the West Five Urban Design Guidelines, and subject to further refinement through the subdivision Design Studies and/or Site Plan Approval process, to the satisfaction of the City of London prior to the removal of the h-206 symbol. *Permitted Interim Uses*: Existing Uses (Z.-1-162444)

h-207 *Purpose*: To ensure that no development occurs on lands adjacent to a protected heritage property except where the proposed development has been evaluated and it is demonstrated that the heritage attributes of the protected property will be conserved, the removal of the h-207 shall not occur until such time as a Heritage Impact Assessment has been prepared and accepted to the satisfaction of the Managing Director, Planning and City Planner. *Permitted Interim Uses*: existing uses. (Z.-1-162447)

h-208 *Purpose*: to ensure that there are no land use conflicts of the operation of the class III industry (as per the D-6 guidelines) located at 3280 & 3300 White Oaks Road on the subject site, and to implement appropriate urban design policies. The holding provision shall not be removed until a development agreement associated with a site plan is entered into with the City of London which:

i) Provides for an appropriate ventilation system, certified by the owner’s qualified professional engineer, that airborne contaminants and odours are removed, neutralized or diluted to acceptable levels consistent with Health Canada’s Residential Indoor Air Quality Guidelines, to the satisfaction of the City of London; and

ii) Implements the urban design policies in the Southwest Area Secondary Plan, to the satisfaction of the City of London. (Z.-1-162455)

h-209 *Purpose*: To encourage building orientation towards public streets and public spaces, a site plan shall be approved and a development agreement shall be entered into which ensures that future development of the lands complies with the urban design policies identified in the Riverbend South Secondary Plan, to the satisfaction of the City of London prior to the removal of the h-209 symbol.

*Permitted Interim Uses*: Existing Uses (Z.-1-172539)

h-210 *Purpose*: to ensure the orderly development of lands for the livestock facility use, the holding provision shall not be removed until site plan approval has been granted and a record of approval for Nutrient Management Strategy has been obtain.

(Z.-1-172592)

h-211 *Purpose*: To ensure orderly development of lands, the holding provision shall not be deleted until the interim SWM facility adjacent the south and southeast perimeter of SWM Facility ‘A’ is decommissioned to the satisfaction of the City of London, prior to the removal of the h-211 symbol. *Permitted Interim Uses*: Existing Uses (Z.-1-172596)

h-212 *Purpose*: To prevent or minimize possible adverse effects on sensitive land uses created by industrial properties an analysis of compatibility between industrial facilities (D6 Guidelines) shall be carried out by a qualified professional and submitted to the City and any recommendation contained therein for mitigation measures be undertaken to the satisfaction of the Site Plan Approval Authority, prior to the removal of the "h-212" symbol. (Z.-1-172619)

h-213 *Purpose*: To ensure the orderly development of the lands the “h-213” symbol shall not be deleted until a sanitary servicing capacity report has been prepared and confirmation that a municipal sanitary sewer outlet is available to service the site to the satisfaction of the City Engineer. (Z.-182648)

h-214 *Purpose*: To ensure that development occurs in a safe manner, no new structures that would require municipal servicing shall be erected, or the use of the Wellington Pavilion Building be permitted until it is demonstrated to the City Engineer that the on-site water servicing meets current City standards, prior to the removal of the "h-214" symbol. (Z.-1-182662)

h-215 *Purpose*: To ensure that adequate provision of municipal water services, the “h-215” symbol shall not be deleted until it is demonstrated to the City Engineer that the on-site water servicing meets current City standards, prior to the removal of the "h-215" symbol.

*Permitted Interim Uses*: Conservation lands, Conservation works, Cultivation of land for agricultural/horticultural purposes, Greenhouses, Institutional uses, Managed forest, Office of a charitable non-profit organization and associated uses, Offices in association with an institutional use, Outdoor farmers market, Playground, Passive recreational uses which include hiking trails and multi-use pathways, Private Schools, Recreational Buildings, Recreational buildings in association with conservation lands and public parks, Sports fields without structures, Wellness Centre. (Z.-1-182662)

h-217 *Purpose*: To ensure that residential development takes a form compatible with adjacent land uses, agreements shall be entered into following public site plan review specifying the issues allowed for under Section 41 of the Planning Act, R.S.O. 1990, c. P.13, prior to the removal of the "h-_" symbol. (Z.-1-182680)

h-216 *Purpose*: To ensure that there is no land-use conflict between existing industrial and future residential uses on these lands, the "h-_" symbol shall not be deleted and the lands shall not be developed for residential uses until a compatibility study has demonstrated that Ministry of the

Environment and Climate Change D-6 Guidelines: Compatibility between Industrial Facilities and Sensitive Land Uses can be met, or mitigation measures provided, to the satisfaction of the City of London.

*Permitted Interim Uses*: any non-residential use permitted by the applicable zones. (Z.-1-182678)

h-218 *Purpose*: to ensure that development is consistent with the vision and objectives for the development of the Old Victoria Hospital lands, the holding provision will not be lifted until a development agreement is entered into for the subject lands, that substantively implements the site plan and renderings attached as Schedule "1" to the amending by-law, with minor variations to the satisfaction of the City of London; that conforms with the community structure, character area, form and design policies of the Old Victoria Hospital Lands Secondary Plan. (Z.-1-182687)

h-219 *Purpose*: To ensure archaeological matters are addressed, the owner/developer's consultant archaeologist licenced by the Ministry of Tourism, Cultural and Sport under the provisions of the Ontario Heritage Act (R.S.O. 1990 as amended) shall prepare an archeological monitoring mitigation strategy to the satisfaction of the City of London, prior to the removal of the h-* symbol. (Z.-1-182697)

h-220 *Purpose*: To ensure that the built form is guided by a consistent design approach, Urban Design Guidelines shall be prepared for the High Density Residential designated lands within the Bostwick Neighbourhood, and adopted under Section 19.2.2 (Guideline Documents) of the Official Plan; with the input of the Urban Design Peer Review Panel and to the satisfaction of the City of London, to establish an overall design vision based on holistic and comprehensive consideration of all development sites within the master plan lands.

h-221 *Purpose*: To ensure that new development is designed and approved consistent with the Urban Design Guidelines prepared for the High Density Residential designated lands within the Bostwick Neighbourhood, the site plan, building elevations, and landscape plan will be assessed for compliance with the approved Urban Design Guidelines during the site plan approval review process; and a development agreement entered into to the satisfaction of the City of London prior to the removal of the h-221 symbol.

*Permitted Interim Uses*: Existing uses (Z.-1-182711)

h-222 Purpose: To ensure that development will not have a negative impact on the hydrology and hydrogeology or on the natural heritage system including the abutting wetland and woodland features, an Environmental Impact Study, a Water Balance Study and a Hydrogeological Study and a Stormwater Management Study shall be prepared and accepted to the satisfaction of the UTRCA and the City of London, prior to removal of the "h-222" symbol.

*Permitted Interim Uses*: Existing uses (Z.-1-182711)

h-223 *Purpose*: To determine the extent to which development will be permitted and ensure that development will not have a negative impact on the hydrology and hydrogeology or on the natural heritage system including the abutting wetland and woodland features, an Environmental Impact Study, a Water Balance Study and a Hydrogeological Study and a Stormwater Management Study shall be prepared and accepted to the satisfaction of the UTRCA and the City of London, prior to removal of the "h-223" symbol.

*Permitted Interim Uses*: Existing uses (Z.-1-182712)

h-224 *Purpose*: The proponent shall retain an archaeologist, licensed by the Ministry of Tourism, Culture and Sport under the provisions of the Ontario Heritage Act (R.S.O. 1990 as amended) to carry out a Stage 1 (or Stage 1-2) archaeological assessment of the entire property and follow through on recommendations to mitigate, through preservation or resource removal and documentation, adverse impacts to any significant archaeological resources found (Stages 3-4). The archaeological assessment must be completed in accordance with the most current Standards and Guidelines for Consulting Archaeologists, Ministry of Tourism, Culture and Sport.
All archaeological assessment reports, in both hard copy format and as a PDF, will be submitted to the City of London once the Ministry of Tourism, Culture and Sport has accepted them into the Public Registry.
Significant archaeological resources will be incorporated into the proposed development through either in situ preservation or interpretation where feasible, or may be commemorated and interpreted through exhibition development on site including, but not limited to, commemorative plaquing.
No demolition, construction, or grading or other soil disturbance shall take place on the subject property prior to the City's Planning Services receiving the Ministry of Tourism, Culture and Sport compliance letter indicating that all archaeological licensing and technical review requirements have been satisfied.

*Permitted interim uses*: uses within the existing building where no soil disturbance takes place.
(By-law Z.-1-192722 – LPAT Order PL190015)

h-225 *Purpose:* The proponent shall retain an archaeologist, licensed by the Ministry of Tourism, Culture and Sport under the provisions of the Ontario Heritage Act (R.S.O. 1990 as amended) to carry out a Stage 1 (or Stage 1-2) archaeological assessment of the entire property and follow through on recommendations to mitigate, through preservation or resource removal and documentation, adverse impacts to any significant archaeological resources found (Stages 3-4). The archaeological assessment must be completed in accordance with the most current Standards and Guidelines for Consulting Archaeologists, Ministry of Tourism, Culture and Sport.

All archaeological assessment reports, in both hard copy format and as a PDF, will be submitted to the City of London once the Ministry of Tourism, Culture and Sport has accepted them into the Public Registry.

Significant archaeological resources will be incorporated into the proposed development through either in situ preservation or interpretation where feasible, or may be commemorated and interpreted through exhibition development on site including, but not limited to, commemorative plaquing.

No soil disturbance arising from demolition, construction, grading, or any other activity, shall take place on the subject property prior to the City of London receiving the Ministry of Tourism, Culture and Sport compliance letter indicating that all archaeological licensing and technical review requirements have been satisfied. (Z.-1-192743)

h-226 *Purpose*: The removal of the "h-226" shall not occur until such time as the Owner has entered into an agreement with the City of London to ensure that, if determined necessary through the completion of a geotechnical subsurface analysis, appropriate municipal roadway upgrades are completed to accommodate truck traffic from the proposed asphalt and concrete batching plant(s) to the satisfaction of the City Engineer. (Z.-1-192744)

h-227 *Purpose*: To ensure the orderly development of land and the adequate provision of municipal services, the "h-__" symbol shall not be deleted

until the sanitary forcemain has been relocated to the future municipal right-of-ways, all to the satisfaction of the City Engineer.

*Permitted Interim Uses*: Existing uses (Z.-1-192756)

## 3.9 COMPOUND ZONES AND MULTIPLE ZONES

### 1) COMPOUND ZONES

Notwithstanding any other provision of this By-Law, where two or more zoning symbols divided by a "/" are shown on the zoning maps as applying to a lot or as compounded by a Special Provision, that lot may be used exclusively for any use permitted in any one of the zones included in the compound zone symbol, or for any combination of uses permitted in any of the zones included in the compound zone symbol, subject to the following regulations:

i) The regulations for each zone set out in this by-law that forms part of a compound zone shall be considered separately in relation to the erection or use of any building or structure. Where two or more zones in a compound zone permit the same use and the regulations contained in each of the two or more zones for that use are different in one or more categories identified in Column A to the Tables in this by-law, the least restrictive regulation in each category of zone regulation for that use will be applied. (Z.-1-97483)

ii) In a compound zone involving an SS Zone, the provisions of Section 30 for the SS Zone shall apply to the use of lands for the purposes of an automobile service station or gas bar, notwithstanding Paragraph (i) above.

iii) In a compound zone involving an OS4 Zone, in addition to the OS4 uses, lands may be used for purposes accessory to the uses permitted by the other applicable zone(s), such as parking and landscaped open space; and any regrading or construction of buildings or structures shall be subject to the approval of the *Conservation Authorities Act*; but the lands affected by such a compound zone shall continue to be eligible for application of Section 3.9(2)(b) (Multiple Zones), including for the purpose of density calculations.

iv) The parking and loading required by this By-Law for each of the uses included in the development of the lands, whether for a single use or a combination of uses, shall be provided.

| **EXAMPLE APPLICATION OF SECTION 3.9(1) - COMPOUND ZONES** |
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| Lands zoned CF3/R2 may be used for CF3 uses, or for R2 uses, or for a combination of those uses. |

### 2) MULTIPLE ZONES

i) Where a lot is divided into two or more zones, each such portion of the said lot shall be considered a separate lot as defined herein and shall be used in accordance with the provisions of this By-Law which are applicable to the zone wherein such portion of the said lot is located.

ii) Notwithstanding anything to the contrary in Paragraph (i) of this Clause, where a use or uses are permitted by the zones applying to two or more portions of the lot, those portions shall be considered to constitute a single lot as defined herein and the highest or most restrictive zone requirements pertaining to such use or uses in all the pertinent zones shall apply throughout.

## 3.10 DETERMINING ZONE BOUNDARIES

The extent and boundaries of all zones and restricted areas are set out on the maps comprising Schedule "A" hereto and shall be interpreted in accordance with the following:

1) Boundaries of zones and restricted areas shall be construed wherever possible to be concurrent with:

a) the centreline of a street, lane, railway right-of-way, transmission line or watercourse;

b) the lot line of any lot in a registered plan of subdivision, or deed description, or of a lot created by severance for which consent has been given pursuant to Section 53 of the *Planning Act, R.S.O. 1990, c. P.13*, such lot line is the boundary unless it abuts a street, lane, railway right-of-way, transmission line or watercourse; (Z.-1-94236)

c) as running substantially parallel to a street line where the distance from the street line is not indicated and the circumstances described in Paragraphs (a) and (b) do not pertain, the boundary is parallel to the street line and the distance therefrom shall be determined according to the scale shown on the zoning map; and,

d) the maximum extent of the hazard line as determined by the Conservation Authority, typically the Open Space (OS4) Zone line, or where a flood fringe area has been identified and approved by the Conservation Authority and no other hazard feature is present, the boundary of the floodway. (Z.-1-051390)

2) In the event that a street or lane which forms the boundary is closed or partially closed, the boundary between such zones shall be construed as the former centreline of the said closed street or lane.

3) Where uncertainty exists as to the location of a zone boundary on Schedule "A" hereto or a Schedule to any amendment to this By-Law, reference shall be made to the Schedules at the original scales as contained in the Municipal Offices and shall be deemed to be the centrepoint of the line on such Schedule which denotes the said zone boundary.

## 3.11 MAP DETAILS

Any street or other names, property boundaries, municipal numbers or physical features on key map grid patterns shown on the maps are for reference purposes only. The shaded areas contained on the base maps of Schedule "A" Zone Maps are for reference purposes only, to assist property owners in knowing if their lands are affected by the Conservation Authorities Act or are identified as extractive industrial areas or aggregate resource areas. The lands in the Byron Gravel Pits area shaded on Key Maps 126 and 127 have been identified as areas containing aggregate resources that are presently licensed or that may be licensed for future aggregate extraction. Policies pertaining to the extraction of aggregate resources in the City of London are contained in the Natural Resources Chapter of the Official Plan. The lands so shaded on all other key maps lie within the flood fringe of the Thames River and at a minimum may require floodproofing and/or safe access before any development or redevelopment may occur. Approvals pursuant to the Conservation Authorities Act, will be required. (Z.-1-94236) (Z.-1-021019) (Z.-1-202871)

## 3.12 INTERPRETATION OF USE

Where a use is listed in a zone, the interpretation of that use shall not include any other use specifically referred to or otherwise defined in this By-law.
(O.M.B. File # R910387 - Appeal #9006-3, 9009-2, 9009-7 June 4, 1993)

# APPENDIX B

## City of London Official Plan and Transit Excerpts

## TABLE 18.1 - FUNCTIONAL CLASSIFICATION OF ROADS

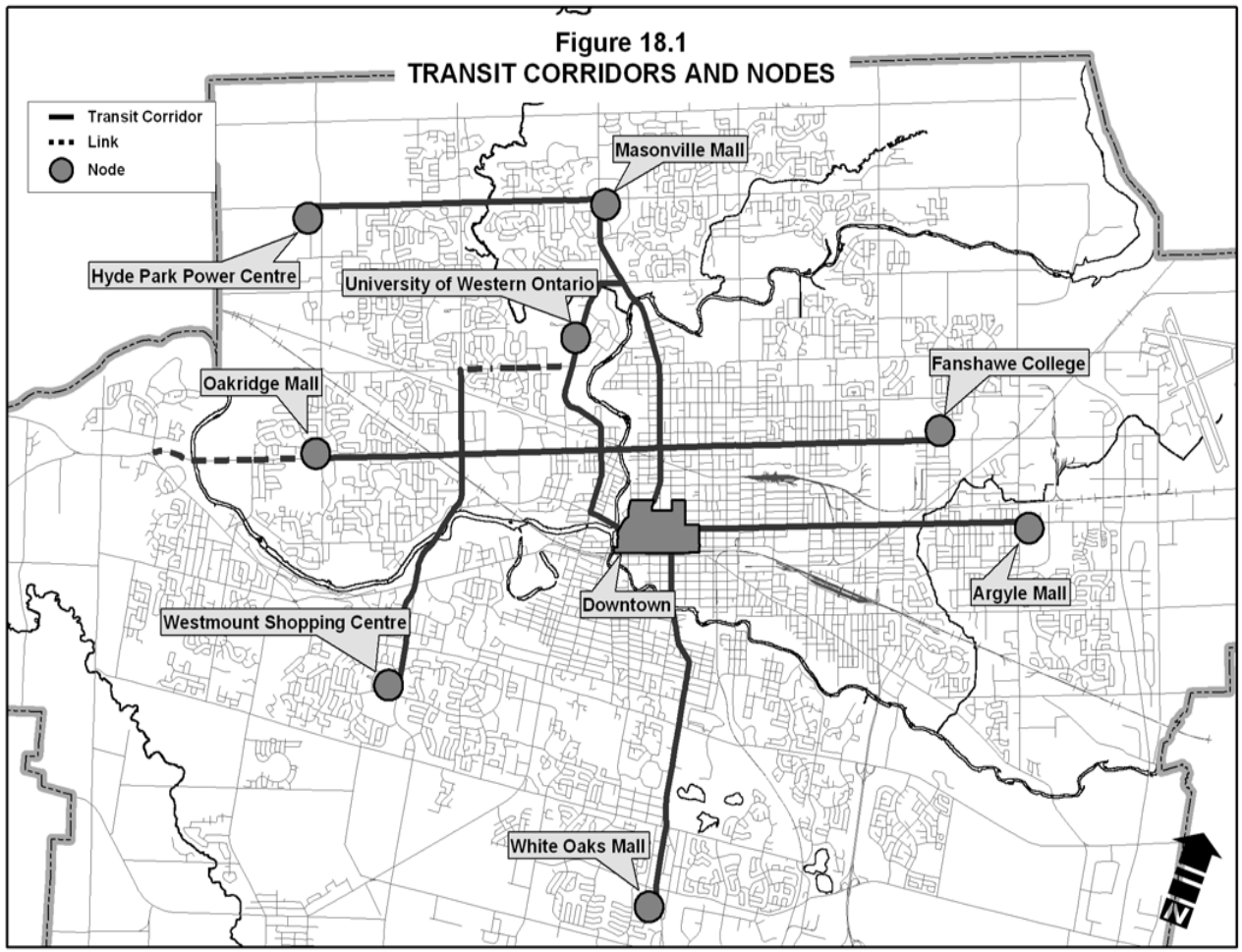
| Classification | Function | Road Allowances (m) | No. of Lanes | Operating Speed (kph) | Access and Parking Policy | Accommodation of Pedestrians | Accommodation of Cyclists | Intersection Policy |
|---|---|---|---|---|---|---|---|---|
| **Freeway** | o High volume inter-urban and long distance movements at high speeds under free flow conditions. | 90 | 4+ | 100 | o No direct access<br>o No stopping/ parking<br>o No licensed and motorized vehicle restriction | o Prohibited | o Prohibited | o Grade-separated interchanges with freeways, expressways or arterial roads. |
| **Expressway** | o High volume inter-urban and long distance movements at medium to high speeds.<br>o Access is limited to intersections with arterials. | 60-90 | 2+ | 60-100 | o Controlled access<br>o No stopping/parking<br>o No licensed and motorized vehicle restrictions | o Prohibited | o Prohibited | o Grade-separated interchanges with freeways, other expressways or arterial roads.<br>o At-grade intersections with arterial roads at widely spaced intervals. |
| **Arterial** | o High volumes of intra-urban traffic at moderate speeds.<br>o Moderate volumes of inter-neighbourhood traffic. | 26-60 | 2+ | 50-80 | o Controlled or limited access<br>o Restricted or no parking<br>o No vehicle restrictions | o Sidewalks on one or both sides | o May have a wider curb lane or a bicycle lane. | o Grade-separated interchanges with freeways, expressways, and arterials.<br>o At-grade intersections with arterials and |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | o Limited property access.<br>o Bus routes.<br>o Bicycle facilities.<br>o Pedestrian facilities. | | | | | | | collectors. |
| **Primary Collector** | o Light to moderate volumes of inter-neighbourhood traffic at moderate speeds.<br>o Limited property access function.<br>o Bus routes.<br>o Bicycle facilities.<br>o Pedestrian facilities.<br>o < 15,000 AADT | 20-26 | 2-4 | 50-60 | o Limited access<br>o Restricted Parking<br>o Limited truck routes | o Sidewalks on one or both sides | o May have a wider curb lane or a bicycle lane. | o At-grade intersections with arterial, collector and local roads. |
| **Secondary Collector** | o Light volumes for short distances between local and arterial streets.<br>o Full property access.<br>o Bus routes.<br>o Bicycle facilities.<br>o Pedestrian facilities. | 18-21.5 | 2 | 50-60 | o Full access.<br>o Parking may be restricted.<br>o No truck routes. | o Sidewalks on one or both sides | O May have a wider curb lane or a bicycle lane. | o At-grade intersections with arterial, collector and local roads. |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | o < 5,000 AADT | | | | | | | |
| **Local** | o To provide access to individual properties.<br>o Connect neighbourhood destinations.<br>o Light volumes of local traffic only.<br>o Limited Bus routes.<br>o Bicycle facilities.<br>o Pedestrian facilities.<br>o < 1,500 AADT | 16.5-20 | 2 | 40-50 | o Full access.<br>• Parking may be restricted to one side for lots under 11 metres in lot frontage.<br>o No truck routes<br>o Driveways – two sides. | o Sidewalks on one or both sides | o May have a wider curb lane or a bicycle lane. | o At-grade intersections with secondary collector roads<br>o Intersections with arterial and primary collector roads to be discouraged. |
| **Window Street** | o To provide single loaded access to individual properties.<br>o Connect neighbourhood destinations.<br>o Light volumes of local traffic | 14.5-16.5 | 2 | 40-50 | o Full access.<br>o Parking limited to outer boulevard.<br>o No truck routes.<br>o Driveways – one side. | o Sidewalks on one side if required | o May have a wider curb lane or a bicycle lane. | o At-grade intersections with secondary collector roads<br>o Intersections with arterial and primary collector roads to be discouraged. |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | only.<br>o Bicycle facilities.<br>o Pedestrian facilities. | | | | | | | |

**Figure 18.1**
**TRANSIT CORRIDORS AND NODES**



## 18. TRANSPORTATION

### INTRODUCTION

*The Transportation policies deal with the various elements of the transportation system in the City of London and the modes of travel that they support. The transportation system provides a major part of the framework for urban growth and development and influences the function and compatibility of land uses and the quality of life in the City. The policies contained in the Plan will guide future public investment in the development of transportation facilities and will inform the public of Council's intentions in this regard. A Progressive Transportation System is identified as a strategic priority in the 2007 – 2010 Council Strategic Plan.*

*Since transportation planning is an ongoing process, it is anticipated that the City's Transportation Plan will be updated and the policies contained in this Chapter of the Plan may be refined or revised at various times during the planning period and that the horizon year for the Transportation Plan will be advanced accordingly.*
(Introduction amended by OPA No. 88 - OMB Order No. 2314 - approved 99/12/23)
(Introduction amended by OPA 438 Dec. 17/09)

### 18.1. TRANSPORTATION OBJECTIVES

The development of the transportation system in the City of London shall be directed toward the following objectives:

i) Meet the immediate and long-term requirements of all sectors of the community related to the safe and efficient movement of people and goods within and through the City.

ii) Provide for appropriate linkages among local, regional and provincial transportation systems.

iii) Provide for a balanced and sustainable transportation system that integrates all modes of travel minimizes the conflicts among these modes and provides opportunities to minimize reliance on the automobile.
(Clause iii) added by OPA No. 88 - OMB Order No. 2314 - approved 99/12/23)
(Clause iii) amended by OPA 438 Dec. 17/09)

iv) Provide a plan for the development of a transportation system that will be responsive to development and economic trends that influence transportation patterns.

v) Provide a public transit system that offers an effective and less costly alternative to travel by automobile and achieves a realistic share of the travel demand in the overall transportation system.
(Clause v) amended by OPA No. 88 - OMB Order No. 2314 - approved 99/12/23)

vi) Minimize the adverse effects of the transportation system on

natural environments and communities, especially in established residential neighbourhoods.
(Clause vi) amended by OPA No. 88 - OMB Order No. 2314 - approved 99/12/23)

vii) Conserve energy and reduce transportation costs by such means as increasing the efficiency of traffic movements and promoting public transit use and alternative modes of transportation.
(Clause vii) amended by OPA No. 88 - OMB Order No. 2314 - approved 99/12/23)

viii) Promote land use planning and development that is conducive to the efficient operation and increased use of the public transit system and alternative modes of transportation.
(Clause viii) amended by OPA No. 88 - OMB Order No. 2314 - approved 99/12/23)

ix) Provide for motor vehicle and bicycle parking facilities that are appropriately located, adequate for the uses that they support, and compatible with adjacent land uses.
(Clause ix) amended by OPA No. 88 - OMB Order No. 2314 - approved 99/12/23)

x) Provide a high level of accessibility to the Downtown, major institutions, industrial areas, major shopping areas and other areas where there is a significant concentration of employment.
(Clause x) amended by OPA No. 88 - OMB Order No. 2314 - approved 99/12/23)

xi) Encourage accessibility to, and the convenience of all modes of, the transportation system for persons with disabilities.
(Clause xi) amended by OPA No. 88 - OMB Order No. 2314 - approved 99/12/23)
(Clause xi) amended by OPA 438 Dec. 17/09)

xii) Support the planning and development of bicycle routes and pedestrian paths that provide linkages among open space areas, major activity centres, employment nodes and the public transit system and that enhance the convenience, safety and enjoyment of these modes of travel.
(Clause xii) amended by OPA No. 88 - OMB Order No. 2314 - approved 99/12/23)

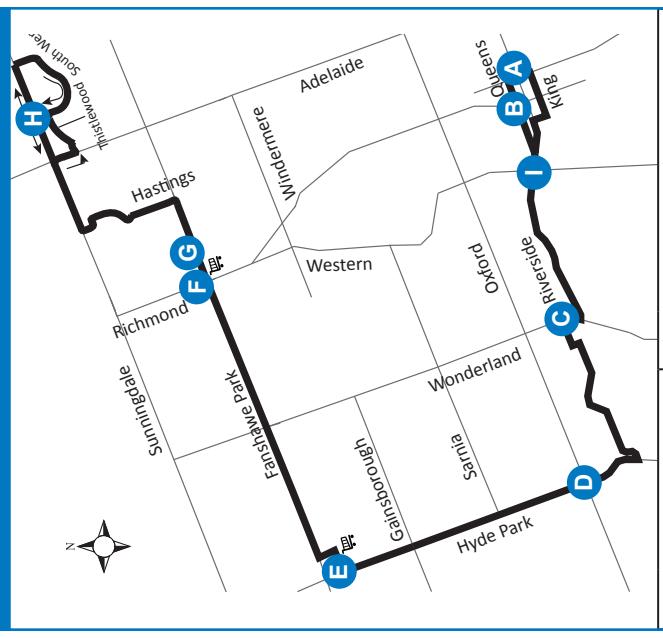
xiii) Develop a transportation network that is conducive to the provision of emergency services to all areas of the City.

xiv) Support the provision of safe and effective pedestrian movement within the City for all populations.
(Clause xiv) amended by OPA 438 Dec. 17/09)

xv) Encourage, as an overall system performance objective, a 15% reduction in peak hour auto use by striving to achieve the following mode split targets:

| | 1987 (Actual) | 2002 (Actual) | Target 2024 |
|---|---|---|---|
| Walking | 10.5% | 6.9% | 9% |
| Bicycling | 1.5% | 0.5% | 2% |
| Public Transit | 9.5% | 6.9% | 10% |

# 19 DOWNTOWN-STONEY CREEK



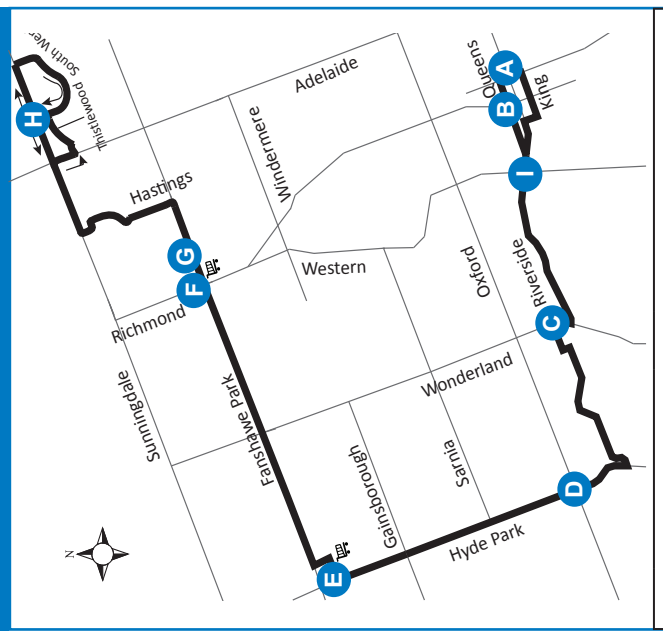

**Map Legend** — **Effective: November 29th, 2020**

| | | | |
|---|---|---|---|
| A | Timepoint | | Shopping Centre |
| → | Route Direction | 19 | Service Notes |

**519-451-1347**
**www.londontransit.ca**

london transit


# 19 DOWNTOWN-STONEY CREEK




**Map Legend** — **Effective: November 29th, 2020**

| | | | |
|---|---|---|---|
| A | Timepoint | | Shopping Centre |
| → | Route Direction | 19 | Service Notes |

**519-451-1347**
**www.londontransit.ca**

london transit


*use realtime.londontransit.ca for up-to-date arrivals*

## ROUTE 19 - MONDAY TO FRIDAY

| NORTHBOUND | | | | | | | | | SOUTHBOUND | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wellington at Dundas | Queens at Richmond | Wonderland at Riverside | Hyde Park at Oxford | Seagull at Hyde Park | Fanshawe Park at Richmond | Fanshawe Park at North Centre | South Wenige at Sunningdale EB | South Wenige at Sunningdale | South Wenige at Sunningdale WB | Fanshawe Park at North Centre | Seagull at Hyde Park | Hyde Park at Oxford | Riverside at Wonderland | Riverside at Wharncliffe | Wellington at Dundas |
| A | B | C | D | E | F | G | H | H | H | G | E | D | C | I | A |
| LVS | LVS | | | LVS | | | ARR | LVS | | | LVS | | | | ARR |
| - | - | - | - | - | - | - | - | - | - | **5:48** | 5:56 | 6:04 | 6:11 | 6:16 | 6:22 |
| - | - | - | - | - | - | - | **6:07** | 6:07 | 6:13 | 6:21 | 6:29 | 6:37 | 6:44 | 6:49 | 6:55 |
| - | - | - | - | - | - | - | **6:22** | 6:22 | 6:24 | 6:33 | 6:52 | 7:02 | 7:11 | 7:18 | 7:25 |
| - | 6:10 | 6:16 | 6:24 | 6:33 | 6:42 | 6:44 | 6:52 | 6:52 | 6:54 | 7:03 | 7:22 | 7:32 | 7:41 | 7:48 | 7:55 |
| 6:25 | 6:30 | 6:36 | 6:44 | 6:53 | 7:02 | 7:05 | 7:13 | 7:15 | 7:17 | 7:26 | 7:52 | 8:02 | 8:11 | 8:18 | 8:25 |
| 6:57 | 7:00 | 7:07 | 7:15 | 7:24 | 7:35 | 7:43 | 7:52 | 7:52 | 7:54 | 8:03 | 8:22 | 8:32 | 8:41 | 8:48 | 8:55 |
| 7:27 | 7:30 | 7:37 | 7:45 | 7:54 | 8:05 | 8:17 | 8:26 | 8:28 | 8:30 | 8:38 | 8:58 | 9:06 | 9:14 | 9:19 | 9:24 |
| 7:57 | 8:00 | 8:07 | 8:15 | 8:24 | 8:35 | 8:43 | 8:52 | 8:55 | 8:57 | 9:05 | 9:25 | 9:33 | 9:41 | 9:46 | 9:51 |
| 8:27 | 8:30 | 8:37 | 8:45 | 8:54 | 9:05 | 9:13 | 9:22 | 9:22 | 9:24 | 9:32 | 9:52 | 10:00 | 10:08 | 10:13 | 10:18 |
| 8:57 | 9:00 | 9:07 | 9:15 | 9:23 | 9:34 | 9:41 | 9:49 | 9:49 | 9:51 | 9:59 | 10:19 | 10:27 | 10:35 | 10:40 | 10:45 |
| 9:24 | 9:27 | 9:34 | 9:42 | 9:50 | 10:01 | 10:08 | 10:16 | 10:16 | 10:18 | 10:26 | 10:46 | 10:54 | 11:02 | 11:07 | 11:12 |
| 9:51 | 9:54 | 10:01 | 10:09 | 10:17 | 10:28 | 10:35 | 10:43 | 10:43 | 10:45 | 10:53 | 11:13 | 11:21 | 11:29 | 11:34 | 11:39 |
| 10:18 | 10:21 | 10:28 | 10:36 | 10:44 | 10:55 | 11:02 | 11:10 | 11:10 | 11:12 | 11:20 | 11:40 | 11:48 | 11:56 | 12:01 | 12:06 |
| 10:45 | 10:48 | 10:55 | 11:03 | 11:11 | 11:22 | 11:29 | 11:37 | 11:37 | 11:39 | 11:47 | 12:14 | 12:21 | 12:29 | 12:34 | 12:40 |
| 11:12 | 11:15 | 11:22 | 11:30 | 11:38 | 11:49 | 11:56 | 12:04 | 12:07 | 12:09 | 12:17 | 12:44 | 12:51 | 12:59 | 13:04 | 13:10 |
| 11:39 | 11:42 | 11:49 | 11:57 | 12:05 | 12:16 | 12:24 | 12:32 | 12:32 | 12:34 | 12:42 | 13:14 | 13:21 | 13:29 | 13:34 | 13:40 |
| 12:06 | 12:11 | 12:18 | 12:26 | 12:34 | 12:46 | 12:55 | 13:03 | 13:03 | 13:05 | 13:13 | 13:40 | 13:47 | 13:55 | 14:00 | 14:06 |
| 12:40 | 12:45 | 12:52 | 13:00 | 13:08 | 13:20 | 13:29 | 13:37 | 13:37 | 13:39 | 13:47 | 14:14 | 14:21 | 14:29 | 14:34 | 14:40 |
| 13:10 | 13:15 | 13:22 | 13:30 | 13:38 | 13:50 | 13:59 | 14:07 | 14:07 | 14:09 | 14:17 | 14:45 | 14:54 | 15:02 | 15:08 | 15:15 |
| 13:40 | 13:45 | 13:52 | 14:00 | 14:08 | 14:20 | 14:29 | 14:37 | 14:37 | 14:39 | 14:47 | 15:16 | 15:25 | 15:33 | 15:39 | 15:46 |
| 14:11 | 14:15 | 14:23 | 14:32 | 14:41 | 14:53 | 15:02 | 15:10 | 15:10 | 15:12 | 15:20 | 15:49 | 15:58 | 16:06 | 16:12 | 16:19 |
| 14:43 | 14:47 | 14:55 | 15:04 | 15:13 | 15:25 | 15:34 | 15:42 | 15:42 | 15:44 | 15:52 | 16:21 | 16:30 | 16:38 | 16:44 | 16:51 |
| 15:15 | 15:19 | 15:27 | 15:36 | 15:45 | 15:57 | 16:06 | 16:14 | 16:14 | 16:16 | 16:25 | 16:52 | 17:01 | 17:09 | 17:15 | 17:25 |
| 15:47 | 15:51 | 15:59 | 16:08 | 16:17 | 16:29 | 16:38 | 16:46 | 16:46 | 16:48 | 16:57 | 17:24 | 17:33 | 17:41 | 17:47 | 17:57 |
| 16:20 | 16:24 | 16:33 | 16:43 | 16:53 | 17:05 | 17:13 | 17:21 | 17:21 | 17:23 | 17:32 | 17:59 | 18:08 | 18:16 | 18:22 | 18:32 |
| 16:53 | 16:57 | 17:06 | 17:16 | 17:26 | 17:38 | 17:46 | 17:54 | 17:54 | 17:56 | 18:05 | 18:35 | 18:44 | 18:52 | 18:58 | 19:08 |
| 17:26 | 17:30 | 17:39 | 17:49 | 17:59 | 18:11 | 18:18 | 18:26 | 18:26 | 18:28 | 18:36 | 18:55 | 19:03 | 19:10 | 19:15* | To Garage |
| 18:02 | 18:05 | 18:12 | 18:19 | 18:27 | 18:37 | 18:44 | 18:52 | 18:52 | 18:54 | 19:02 | 19:22 | 19:30 | 19:37 | 19:42 | 19:47 |
| 18:37 | 18:40 | 18:47 | 18:54 | 19:02 | 19:12 | 19:19 | 19:27 | 19:27 | 19:29 | 19:37 | 19:57 | 20:05 | 20:12 | 20:17 | 20:22 |
| 19:12 | 19:15 | 19:22 | 19:29 | 19:37 | 19:47 | 19:54 | 20:02 | 20:02 | 20:04 | 20:12 | 20:27 | 20:35 | 20:42 | 20:47 | 20:52 |
| 19:47 | 19:50 | 19:57 | 20:04 | 20:12 | 20:22 | 20:29 | 20:37 | 20:37 | 20:39 | 20:47 | 21:17 | 21:25 | 21:32 | 21:37 | 21:42 |
| 20:22 | 20:25 | 20:32 | 20:39 | 20:47 | 20:57 | 21:04 | 21:12 | 21:12 | 21:14 | 21:21 | 21:31 | 21:37 | 21:44 | 21:49* | To Garage |
| 20:52 | 20:55 | 21:02 | 21:09 | 21:17 | 21:27 | 21:34 | 21:42 | 21:44 | 21:46 | 21:53 | 22:15 | 22:21 | 22:28 | 22:33 | 22:38 |
| 21:48 | 21:50 | 21:57 | 22:04 | 22:11 | 22:20 | 22:27 | 22:34 | 22:34 | 22:36 | 22:43 | 23:05 | 23:11 | 23:18 | 23:23 | 23:28 |
| 22:38 | 22:40 | 22:47 | 22:54 | 23:01 | 23:10 | 23:17 | 23:24 | 23:24 | 23:26 | 23:33 | 23:43 | 23:49 | 23:56 | 24:01* | To Garage |
| 23:28 | 23:30 | 23:37 | 23:44 | 23:51 | 24:00 | 24:02* | To Garage | | | | | | | | |

| LEGEND | | | |
|---|---|---|---|
| * | Bus into Garage | + | Route Change |
| **0:00** | Bus goes into service at Blackwater east of Adelaide 2min earlier | | |

## ROUTE 19 - SATURDAY

| NORTHBOUND | | | | | | | | | SOUTHBOUND | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wellington at Dundas | Queens at Richmond | Wonderland at Riverside | Hyde Park at Oxford | Seagull at Hyde Park | Fanshawe Park at Richmond | Fanshawe Park at North Centre | South Wenige at Sunningdale EB | South Wenige at Sunningdale | South Wenige at Sunningdale WB | Fanshawe Park at North Centre | Seagull at Hyde Park | Hyde Park at Oxford | Riverside at Wonderland | Riverside at Wharncliffe | Wellington at Dundas |
| A | B | C | D | E | F | G | H | H | H | G | E | D | C | I | A |
| LVS | LVS | | | LVS | | | ARR | LVS | | | LVS | | | | ARR |
| - | - | - | - | - | - | - | - | - | - | **8:01** | 8:09 | 8:17 | 8:24 | 8:29 | 8:33 |
| - | - | - | - | - | - | - | **8:25** | 8:25 | 8:30 | 8:37 | 8:45 | 8:53 | 9:00 | 9:05 | 9:09 |
| 8:33 | 8:35 | 8:41 | 8:49 | 8:55 | 9:02 | 9:08 | 9:17 | 9:17 | 9:22 | 9:29 | 9:40 | 9:48 | 9:55 | 10:00 | 10:04 |
| 9:11 | 9:13 | 9:19 | 9:27 | 9:33 | 9:40 | 9:46 | 9:55 | 9:55 | 10:00 | 10:08 | 10:21 | 10:29 | 10:36 | 10:42 | 10:46 |
| 9:42 | 9:44 | 9:50 | 9:58 | 10:05 | 10:14 | 10:20 | 10:29 | 10:29 | 10:34 | 10:42 | 10:56 | 11:04 | 11:11 | 11:17 | 11:21 |
| 10:14 | 10:17 | 10:24 | 10:33 | 10:40 | 10:49 | 10:55 | 11:04 | 11:04 | 11:09 | 11:17 | 11:31 | 11:39 | 11:46 | 11:52 | 11:56 |
| 10:49 | 10:52 | 10:59 | 11:08 | 11:15 | 11:24 | 11:30 | 11:39 | 11:39 | 11:44 | 11:52 | 12:06 | 12:13 | 12:20 | 12:25 | 12:29 |
| 11:24 | 11:27 | 11:34 | 11:43 | 11:50 | 11:59 | 12:05 | 12:14 | 12:14 | 12:19 | 12:27 | 12:41 | 12:48 | 12:55 | 13:00 | 13:04 |
| 12:00 | 12:03 | 12:10 | 12:18 | 12:25 | 12:36 | 12:42 | 12:51 | 12:51 | 12:56 | 13:04 | 13:16 | 13:23 | 13:30 | 13:35 | 13:39 |
| 12:35 | 12:38 | 12:45 | 12:53 | 13:00 | 13:11 | 13:17 | 13:26 | 13:26 | 13:31 | 13:39 | 13:51 | 13:58 | 14:05 | 14:10 | 14:14 |
| - | - | - | - | - | - | - | **13:53** | 13:53 | 13:58 | 14:06 | 14:18 | 14:26 | 14:33 | 14:39 | 14:43 |
| 13:10 | 13:13 | 13:20 | 13:28 | 13:35 | 13:46 | 13:55 | 14:04 | 14:04 | 14:09 | 14:17 | 14:41 | 14:49 | 14:56 | 15:02 | 15:06 |
| 13:44 | 13:47 | 13:54 | 14:03 | 14:10 | 14:21 | 14:27 | 14:35 | 14:35 | 14:40 | 14:48 | 15:08 | 15:16 | 15:23 | 15:29 | 15:33 |
| 14:17 | 14:19 | 14:26 | 14:35 | 14:42 | 14:53 | 14:59 | 15:07 | 15:07 | 15:12 | 15:20 | 15:35 | 15:43 | 15:50 | 15:56 | 16:00 |
| 14:44 | 14:46 | 14:53 | 15:02 | 15:09 | 15:20 | 15:26 | 15:34 | 15:34 | 15:39 | 15:47 | 16:02 | 16:10 | 16:17 | 16:23 | 16:27 |
| 15:11 | 15:13 | 15:20 | 15:29 | 15:36 | 15:47 | 15:53 | 16:01 | 16:01 | 16:06 | 16:14 | 16:29 | 16:37 | 16:44 | 16:50 | 16:54 |
| 15:38 | 15:40 | 15:47 | 15:56 | 16:03 | 16:14 | 16:20 | 16:28 | 16:28 | 16:33 | 16:41 | 16:56 | 17:04 | 17:11 | 17:17 | 17:21 |
| 16:05 | 16:07 | 16:14 | 16:23 | 16:30 | 16:41 | 16:47 | 16:55 | 16:55 | 17:00 | 17:08 | 17:23 | 17:31 | 17:38 | 17:44* | To Garage |
| 16:32 | 16:34 | 16:41 | 16:50 | 16:57 | 17:08 | 17:14 | 17:22 | 17:22 | 17:27 | 17:35 | 17:50 | 17:58 | 18:05 | 18:11 | 18:15 |
| 16:59 | 17:01 | 17:08 | 17:17 | 17:24 | 17:35 | 17:41 | 17:49 | 17:49 | 17:54* | To Garage | | | | | |
| 17:26 | 17:28 | 17:35 | 17:44 | 17:51 | 18:02 | 18:08 | 18:17 | 18:17 | 18:22 | 18:29 | 18:42 | 18:50 | 18:57 | 19:02 | 19:06 |
| 18:18 | 18:20 | 18:27 | 18:36 | 18:43 | 18:52 | 18:58 | 19:07 | 19:07 | 19:12 | 19:19 | 19:32 | 19:40 | 19:47 | 19:52 | 19:56 |
| 19:10 | 19:12 | 19:19 | 19:28 | 19:35 | 19:44 | 19:50 | 19:59 | 19:59 | 20:04 | 20:11 | 20:24 | 20:32 | 20:39 | 20:44 | 20:48 |
| 20:02 | 20:04 | 20:11 | 20:20 | 20:27 | 20:36 | 20:42 | 20:51 | 20:51 | 20:56 | 21:02 | 21:16 | 21:24 | 21:30 | 21:35 | 21:38 |
| 20:56 | 20:58 | 21:05 | 21:13 | 21:19 | 21:26 | 21:32 | 21:40 | 21:40 | 21:45 | 21:51 | 22:03 | 22:11 | 22:17 | 22:22 | 22:25 |
| 21:43 | 21:45 | 21:52 | 22:00 | 22:06 | 22:13 | 22:16 | 22:24 | 22:24 | 22:29* | To Garage | | | | | |
| 22:28 | 22:30 | 22:37 | 22:45 | 22:51 | 22:58 | 23:04* | To Garage | | | | | | | | |

## ROUTE 19 - SUNDAY / HOLIDAY

| NORTHBOUND | | | | | | | | | SOUTHBOUND | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wellington at Dundas | Queens at Richmond | Wonderland at Riverside | Hyde Park at Oxford | Seagull at Hyde Park | Fanshawe Park at Richmond | Fanshawe Park at North Centre | South Wenige at Sunningdale EB | South Wenige at Sunningdale | South Wenige at Sunningdale WB | Fanshawe Park at North Centre | Seagull at Hyde Park | Hyde Park at Oxford | Riverside at Wonderland | Riverside at Wharncliffe | Wellington at Dundas |
| A | B | C | D | E | F | G | H | H | H | G | E | D | C | I | A |
| LVS | LVS | | | LVS | | | ARR | LVS | | | LVS | | | | ARR |
| - | - | - | - | - | - | - | **8:49** | 8:49 | 8:54 | 9:01 | 9:13 | 9:20 | 9:27 | 9:32 | 9:38 |
| 8:50 | 8:53 | 9:00 | 9:09 | 9:15 | 9:23 | 9:30 | 9:39 | 9:39 | 9:44 | 9:51 | 10:03 | 10:10 | 10:17 | 10:22 | 10:28 |
| 9:40 | 9:43 | 9:50 | 9:59 | 10:05 | 10:13 | 10:20 | 10:29 | 10:29 | 10:34 | 10:41 | 10:53 | 11:00 | 11:07 | 11:12 | 11:18 |
| 10:30 | 10:33 | 10:40 | 10:49 | 10:55 | 11:03 | 11:10 | 11:19 | 11:19 | 11:24 | 11:31 | 11:43 | 11:50 | 11:57 | 12:02 | 12:09 |
| 11:20 | 11:23 | 11:30 | 11:39 | 11:45 | 11:53 | 12:00 | 12:09 | 12:09 | 12:14 | 12:21 | 12:35 | 12:43 | 12:50 | 12:55 | 13:01 |
| 12:13 | 12:15 | 12:21 | 12:30 | 12:37 | 12:47 | 12:53 | 13:02 | 13:02 | 13:07 | 13:14 | 13:29 | 13:37 | 13:44 | 13:49 | 13:55 |
| 13:05 | 13:07 | 13:13 | 13:22 | 13:29 | 13:39 | 13:45 | 13:54 | 13:54 | 13:59 | 14:06 | 14:21 | 14:29 | 14:36 | 14:41 | 14:47 |
| 13:57 | 13:59 | 14:05 | 14:14 | 14:21 | 14:31 | 14:37 | 14:46 | 14:46 | 14:51 | 14:58 | 15:13 | 15:21 | 15:28 | 15:33 | 15:39 |
| 14:49 | 14:51 | 14:57 | 15:06 | 15:13 | 15:23 | 15:29 | 15:38 | 15:38 | 15:43 | 15:50 | 16:05 | 16:13 | 16:20 | 16:25 | 16:31 |
| 15:41 | 15:43 | 15:49 | 15:58 | 16:05 | 16:15 | 16:21 | 16:30 | 16:30 | 16:35 | 16:42 | 16:57 | 17:05 | 17:12 | 17:16 | 17:21 |
| 16:33 | 16:35 | 16:41 | 16:50 | 16:57 | 17:07 | 17:13 | 17:22 | 17:22 | 17:27 | 17:34 | 17:47 | 17:55 | 18:01 | 18:06 | 18:11 |
| 17:24 | 17:26 | 17:33 | 17:41 | 17:47 | 17:56 | 18:02 | 18:11 | 18:11 | 18:16 | 18:23 | 18:37 | 18:45 | 18:51 | 18:56 | 19:01 |
| 18:14 | 18:16 | 18:23 | 18:31 | 18:37 | 18:46 | 18:52 | 19:01 | 19:01 | 19:06 | 19:13 | 19:27 | 19:35 | 19:41 | 19:46* | To Garage |
| 19:04 | 19:06 | 19:13 | 19:21 | 19:27 | 19:36 | 19:42 | 19:51 | 19:51 | 19:56* | To Garage | | | | | |

| LEGEND | | | |
|---|---|---|---|
| * | Bus into Garage | + | Route Change |
| **0:00** | Bus goes into service at Blackwater east of Adelaide 2min earlier | | |

*use realtime.londontransit.ca for up-to-date arrivals*

# APPENDIX C

## Traffic Data

# Turning Movement Count - Details Report

**Location.....** GAINSBOROUGH RD @ HYDE PARK RD

**Municipality.....** LONDON

**Count Date.....** Wednesday, May 01, 2019

| | | HYDE PARK RD | | | | | | | | | | GAINSBOROUGH RD | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | North Approach | | | | | South Approach | | | | | East Approach | | | | | West Approach | | | | |
| Time Period | | LT | TH | RT | Ped | TOT | LT | TH | RT | Ped | TOT | LT | TH | RT | Ped | TOT | LT | TH | RT | Ped | TOT |
| 07:00 | 07:15 | 10 | 80 | 6 | 0 | 96 | 20 | 99 | 9 | 0 | 129 | 14 | 20 | 13 | 0 | 47 | 12 | 20 | 34 | 1 | 66 |
| 07:15 | 07:30 | 2 | 108 | 8 | 0 | 118 | 32 | 167 | 15 | 0 | 214 | 26 | 17 | 15 | 0 | 58 | 21 | 11 | 43 | 0 | 75 |
| 07:30 | 07:45 | 10 | 112 | 8 | 0 | 130 | 29 | 174 | 16 | 0 | 219 | 30 | 32 | 25 | 0 | 87 | 17 | 21 | 45 | 0 | 83 |
| 07:45 | 08:00 | 13 | 163 | 22 | 1 | 199 | 40 | 213 | 39 | 0 | 292 | 46 | 23 | 31 | 1 | 100 | 28 | 26 | 46 | 0 | 100 |
| Hourly Total | | 35 | 463 | 44 | 1 | 543 | 121 | 653 | 79 | 0 | 854 | 116 | 92 | 84 | 1 | 292 | 78 | 78 | 168 | 1 | 324 |
| 08:00 | 08:15 | 9 | 145 | 14 | 0 | 168 | 30 | 173 | 30 | 2 | 233 | 41 | 21 | 11 | 0 | 73 | 13 | 24 | 47 | 0 | 84 |
| 08:15 | 08:30 | 18 | 155 | 23 | 2 | 196 | 31 | 207 | 28 | 1 | 266 | 26 | 23 | 23 | 1 | 72 | 24 | 28 | 36 | 0 | 88 |
| 08:30 | 08:45 | 13 | 160 | 14 | 1 | 188 | 34 | 185 | 39 | 0 | 258 | 45 | 24 | 24 | 0 | 93 | 23 | 30 | 40 | 0 | 93 |
| 08:45 | 09:00 | 15 | 176 | 17 | 0 | 208 | 31 | 218 | 25 | 0 | 274 | 54 | 28 | 32 | 1 | 114 | 32 | 25 | 44 | 0 | 101 |
| Hourly Total | | 55 | 636 | 68 | 3 | 760 | 126 | 783 | 122 | 3 | 1031 | 166 | 96 | 90 | 2 | 352 | 92 | 107 | 167 | 0 | 366 |
| 11:00 | 11:15 | 27 | 169 | 13 | 0 | 209 | 16 | 153 | 32 | 0 | 201 | 26 | 14 | 32 | 0 | 72 | 23 | 22 | 18 | 0 | 63 |
| 11:15 | 11:30 | 33 | 180 | 12 | 0 | 225 | 28 | 167 | 25 | 1 | 220 | 30 | 23 | 36 | 0 | 89 | 22 | 17 | 16 | 0 | 55 |
| 11:30 | 11:45 | 29 | 160 | 15 | 0 | 204 | 21 | 119 | 33 | 1 | 173 | 31 | 15 | 17 | 0 | 63 | 13 | 25 | 20 | 1 | 58 |
| 11:45 | 12:00 | 19 | 207 | 25 | 1 | 251 | 30 | 180 | 45 | 0 | 255 | 37 | 14 | 38 | 0 | 89 | 16 | 20 | 29 | 0 | 65 |
| Hourly Total | | 108 | 716 | 65 | 1 | 889 | 95 | 619 | 135 | 2 | 849 | 124 | 66 | 123 | 0 | 313 | 74 | 84 | 83 | 1 | 241 |
| 12:00 | 12:15 | 38 | 164 | 18 | 0 | 220 | 23 | 210 | 44 | 3 | 277 | 23 | 21 | 36 | 1 | 80 | 29 | 18 | 29 | 1 | 76 |
| 12:15 | 12:30 | 28 | 188 | 16 | 4 | 232 | 27 | 229 | 31 | 5 | 287 | 31 | 24 | 42 | 3 | 97 | 19 | 23 | 20 | 2 | 62 |
| 12:30 | 12:45 | 22 | 174 | 22 | 1 | 218 | 24 | 218 | 36 | 2 | 278 | 30 | 16 | 32 | 3 | 78 | 16 | 17 | 20 | 0 | 53 |
| 12:45 | 13:00 | 26 | 205 | 26 | 1 | 257 | 25 | 231 | 34 | 0 | 290 | 35 | 23 | 28 | 0 | 86 | 19 | 23 | 30 | 0 | 72 |
| Hourly Total | | 114 | 731 | 82 | 6 | 927 | 99 | 888 | 145 | 10 | 1132 | 119 | 84 | 138 | 7 | 341 | 83 | 81 | 99 | 3 | 263 |
| 13:00 | 13:15 | 28 | 172 | 21 | 2 | 221 | 20 | 228 | 29 | 2 | 277 | 28 | 16 | 55 | 1 | 99 | 21 | 23 | 17 | 1 | 61 |
| 13:15 | 13:30 | 27 | 173 | 28 | 3 | 230 | 26 | 195 | 33 | 2 | 254 | 28 | 15 | 39 | 0 | 82 | 14 | 18 | 27 | 1 | 59 |
| 13:30 | 13:45 | 31 | 183 | 24 | 0 | 238 | 24 | 188 | 16 | 1 | 228 | 31 | 26 | 37 | 2 | 94 | 25 | 17 | 33 | 1 | 75 |
| 13:45 | 14:00 | 29 | 200 | 22 | 2 | 251 | 22 | 231 | 21 | 1 | 274 | 29 | 19 | 42 | 2 | 90 | 28 | 14 | 33 | 2 | 75 |
| Hourly Total | | 115 | 728 | 95 | 7 | 940 | 92 | 842 | 99 | 6 | 1033 | 116 | 76 | 173 | 5 | 365 | 88 | 72 | 110 | 5 | 270 |
| 15:00 | 15:15 | 25 | 257 | 25 | 1 | 307 | 19 | 196 | 33 | 2 | 248 | 41 | 22 | 31 | 1 | 94 | 27 | 14 | 42 | 1 | 83 |
| 15:15 | 15:30 | 31 | 207 | 20 | 0 | 258 | 30 | 221 | 38 | 0 | 289 | 27 | 23 | 29 | 0 | 79 | 9 | 23 | 37 | 0 | 69 |
| 15:30 | 15:45 | 29 | 227 | 16 | 0 | 272 | 25 | 226 | 43 | 0 | 294 | 30 | 29 | 37 | 0 | 96 | 25 | 25 | 22 | 1 | 72 |
| 15:45 | 16:00 | 31 | 208 | 26 | 0 | 265 | 34 | 235 | 39 | 2 | 308 | 36 | 25 | 38 | 0 | 99 | 22 | 25 | 46 | 0 | 93 |
| Hourly Total | | 116 | 899 | 87 | 1 | 1102 | 108 | 878 | 153 | 4 | 1139 | 134 | 99 | 135 | 1 | 368 | 83 | 87 | 147 | 2 | 317 |
| 16:00 | 16:15 | 36 | 299 | 43 | 0 | 378 | 15 | 249 | 48 | 0 | 312 | 32 | 32 | 44 | 0 | 108 | 26 | 34 | 35 | 2 | 95 |

| | | HYDE PARK RD | | | | | | | | | | GAINSBOROUGH RD | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | North Approach | | | | | South Approach | | | | | East Approach | | | | | West Approach | | | | |
| Time Period | | LT | TH | RT | Ped | TOT | LT | TH | RT | Ped | TOT | LT | TH | RT | Ped | TOT | LT | TH | RT | Ped | TOT |
| 16:15 | 16:30 | 35 | 238 | 33 | 1 | 306 | 27 | 273 | 54 | 0 | 355 | 38 | 41 | 46 | 0 | 125 | 27 | 33 | 44 | 0 | 104 |
| 16:30 | 16:45 | 34 | 289 | 38 | 0 | 361 | 21 | 247 | 46 | 1 | 314 | 45 | 24 | 41 | 1 | 110 | 41 | 29 | 46 | 0 | 116 |
| 16:45 | 17:00 | 41 | 258 | 33 | 0 | 332 | 29 | 256 | 42 | 0 | 328 | 36 | 33 | 42 | 3 | 111 | 26 | 39 | 45 | 1 | 110 |
| Hourly Total | | 146 | 1084 | 147 | 1 | 1377 | 92 | 1025 | 190 | 1 | 1309 | 151 | 130 | 173 | 4 | 454 | 120 | 135 | 170 | 3 | 425 |
| 17:00 | 17:15 | 48 | 258 | 42 | 2 | 348 | 24 | 296 | 52 | 2 | 372 | 27 | 36 | 31 | 0 | 94 | 26 | 35 | 39 | 2 | 100 |
| 17:15 | 17:30 | 40 | 257 | 29 | 0 | 326 | 32 | 269 | 50 | 0 | 351 | 30 | 24 | 35 | 1 | 89 | 29 | 27 | 32 | 0 | 88 |
| 17:30 | 17:45 | 35 | 216 | 20 | 0 | 272 | 22 | 245 | 52 | 1 | 319 | 37 | 20 | 27 | 0 | 84 | 30 | 45 | 36 | 0 | 111 |
| 17:45 | 18:00 | 25 | 190 | 35 | 1 | 250 | 22 | 232 | 26 | 0 | 281 | 29 | 24 | 44 | 0 | 97 | 25 | 32 | 40 | 1 | 97 |
| Hourly Total | | 148 | 921 | 126 | 3 | 1196 | 100 | 1042 | 180 | 3 | 1323 | 123 | 104 | 137 | 1 | 364 | 110 | 139 | 147 | 3 | 396 |
| Grand Total | | 837 | 6178 | 714 | 23 | 7734 | 833 | 6730 | 1103 | 29 | 8670 | 1049 | 747 | 1053 | 21 | 2849 | 728 | 783 | 1091 | 0 | 18 |
| Truck % | | 1% | 3% | 8% | 0% | 3% | 5% | 2% | 2% | 0% | 3% | 2% | 4% | 2% | 0% | 3% | 7% | 3% | 4% | 0% | 4% |

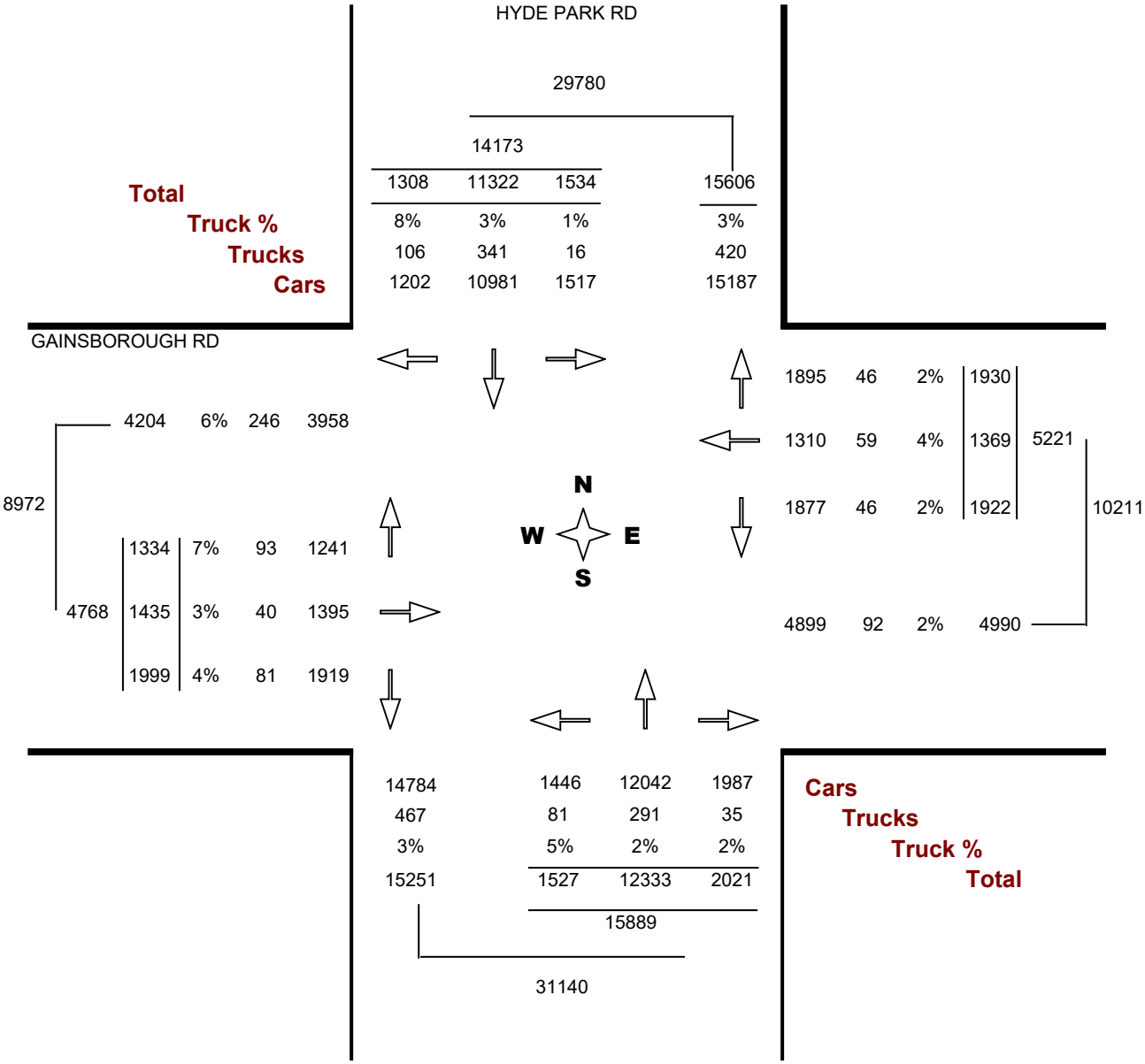
# Turning Movements Count - AADT Report

**Location.....** GAINSBOROUGH RD @ HYDE PARK RD

**Municipality.** LONDON

**Traffic Cont.** Traffic signal

**Count Date..** Wednesday, May 01, 2019 **AADT factor..** 1.8326



# Turning Movement Count - Details Report

**Location.....** HYDE PARK RD @ SOUTH CARRIAGE RD

**Municipality.....** LONDON

**Count Date.....** Tuesday, October 09, 2018

| | | HYDE PARK RD | | | | | | | | | | SOUTH CARRIAGE RD | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | North Approach | | | | | South Approach | | | | | East Approach | | | | | West Approach | | | | |
| Time Period | | LT | TH | RT | Ped | TOT | LT | TH | RT | Ped | TOT | LT | TH | RT | Ped | TOT | LT | TH | RT | Ped | TOT |
| 07:00 | 07:15 | 7 | 136 | 1 | 0 | 144 | 1 | 156 | 14 | 0 | 172 | 10 | 0 | 5 | 0 | 15 | 0 | 0 | 3 | 0 | 3 |
| 07:15 | 07:30 | 8 | 165 | 1 | 0 | 174 | 1 | 191 | 19 | 0 | 211 | 22 | 1 | 7 | 0 | 30 | 0 | 1 | 6 | 0 | 7 |
| 07:30 | 07:45 | 7 | 207 | 1 | 3 | 215 | 6 | 247 | 8 | 0 | 261 | 19 | 1 | 16 | 3 | 36 | 0 | 1 | 6 | 1 | 7 |
| 07:45 | 08:00 | 18 | 287 | 0 | 0 | 305 | 8 | 283 | 19 | 0 | 310 | 12 | 0 | 10 | 0 | 22 | 0 | 1 | 7 | 0 | 8 |
| Hourly Total | | 40 | 795 | 3 | 3 | 838 | 16 | 877 | 60 | 0 | 954 | 63 | 2 | 38 | 3 | 103 | 0 | 3 | 22 | 1 | 25 |
| 08:00 | 08:15 | 8 | 257 | 0 | 3 | 265 | 4 | 261 | 26 | 0 | 291 | 25 | 0 | 10 | 0 | 35 | 0 | 0 | 8 | 0 | 8 |
| 08:15 | 08:30 | 10 | 232 | 1 | 0 | 243 | 6 | 240 | 17 | 0 | 264 | 19 | 0 | 12 | 1 | 31 | 0 | 0 | 9 | 1 | 9 |
| 08:30 | 08:45 | 18 | 200 | 1 | 4 | 219 | 8 | 233 | 29 | 0 | 270 | 20 | 0 | 17 | 4 | 37 | 0 | 0 | 12 | 0 | 12 |
| 08:45 | 09:00 | 13 | 245 | 1 | 0 | 259 | 7 | 259 | 26 | 0 | 292 | 18 | 0 | 25 | 2 | 43 | 0 | 1 | 5 | 0 | 6 |
| Hourly Total | | 49 | 934 | 3 | 7 | 986 | 25 | 993 | 98 | 0 | 1117 | 82 | 0 | 64 | 7 | 146 | 0 | 1 | 34 | 1 | 35 |
| 11:00 | 11:15 | 6 | 237 | 1 | 0 | 244 | 2 | 214 | 13 | 0 | 229 | 5 | 0 | 9 | 2 | 14 | 0 | 0 | 1 | 0 | 1 |
| 11:15 | 11:30 | 5 | 213 | 2 | 0 | 220 | 2 | 211 | 21 | 0 | 234 | 10 | 0 | 6 | 0 | 16 | 0 | 0 | 4 | 1 | 4 |
| 11:30 | 11:45 | 11 | 205 | 1 | 1 | 217 | 8 | 202 | 25 | 1 | 235 | 15 | 0 | 16 | 0 | 31 | 0 | 0 | 3 | 0 | 3 |
| 11:45 | 12:00 | 21 | 244 | 1 | 0 | 266 | 5 | 229 | 11 | 0 | 245 | 9 | 0 | 15 | 0 | 24 | 0 | 0 | 6 | 0 | 6 |
| Hourly Total | | 43 | 899 | 5 | 1 | 947 | 17 | 856 | 70 | 1 | 943 | 39 | 0 | 46 | 2 | 85 | 0 | 0 | 14 | 1 | 14 |
| 12:00 | 12:15 | 8 | 244 | 1 | 0 | 253 | 8 | 212 | 14 | 0 | 234 | 6 | 0 | 12 | 0 | 18 | 0 | 0 | 4 | 0 | 4 |
| 12:15 | 12:30 | 18 | 247 | 0 | 0 | 265 | 6 | 254 | 14 | 0 | 274 | 7 | 0 | 9 | 0 | 16 | 0 | 1 | 5 | 2 | 6 |
| 12:30 | 12:45 | 13 | 244 | 1 | 0 | 259 | 2 | 279 | 18 | 0 | 299 | 12 | 0 | 9 | 0 | 21 | 1 | 0 | 2 | 0 | 3 |
| 12:45 | 13:00 | 13 | 215 | 0 | 0 | 228 | 3 | 279 | 11 | 0 | 294 | 10 | 0 | 4 | 0 | 14 | 0 | 0 | 3 | 0 | 3 |
| Hourly Total | | 52 | 950 | 2 | 0 | 1005 | 19 | 1024 | 57 | 0 | 1101 | 35 | 0 | 34 | 0 | 69 | 1 | 1 | 14 | 2 | 16 |
| 13:00 | 13:15 | 8 | 246 | 0 | 0 | 254 | 2 | 253 | 14 | 0 | 270 | 6 | 0 | 11 | 0 | 17 | 1 | 0 | 5 | 0 | 7 |
| 13:15 | 13:30 | 11 | 215 | 0 | 1 | 227 | 3 | 245 | 14 | 0 | 262 | 15 | 0 | 12 | 2 | 27 | 0 | 0 | 8 | 0 | 8 |
| 13:30 | 13:45 | 11 | 248 | 0 | 0 | 259 | 7 | 231 | 17 | 1 | 256 | 11 | 0 | 6 | 0 | 17 | 1 | 0 | 1 | 0 | 2 |
| 13:45 | 14:00 | 12 | 213 | 1 | 2 | 226 | 5 | 255 | 12 | 0 | 272 | 12 | 1 | 10 | 0 | 23 | 0 | 0 | 4 | 0 | 4 |
| Hourly Total | | 42 | 922 | 1 | 3 | 966 | 17 | 984 | 57 | 1 | 1060 | 44 | 1 | 39 | 2 | 84 | 2 | 0 | 18 | 0 | 21 |
| 15:00 | 15:15 | 15 | 275 | 1 | 3 | 291 | 8 | 242 | 28 | 0 | 278 | 11 | 0 | 8 | 0 | 19 | 0 | 1 | 11 | 1 | 12 |
| 15:15 | 15:30 | 15 | 276 | 0 | 0 | 291 | 10 | 265 | 32 | 0 | 307 | 10 | 1 | 12 | 2 | 23 | 0 | 1 | 3 | 0 | 4 |
| 15:30 | 15:45 | 8 | 320 | 1 | 0 | 329 | 14 | 303 | 23 | 0 | 341 | 15 | 0 | 22 | 1 | 37 | 0 | 0 | 5 | 0 | 5 |
| 15:45 | 16:00 | 17 | 330 | 2 | 0 | 349 | 10 | 288 | 44 | 0 | 342 | 13 | 1 | 19 | 0 | 33 | 0 | 0 | 6 | 0 | 6 |
| Hourly Total | | 55 | 1201 | 4 | 3 | 1260 | 42 | 1098 | 127 | 0 | 1268 | 49 | 2 | 61 | 3 | 112 | 0 | 2 | 25 | 1 | 27 |
| 16:00 | 16:15 | 5 | 331 | 3 | 3 | 339 | 12 | 319 | 35 | 0 | 366 | 12 | 1 | 9 | 1 | 22 | 0 | 0 | 7 | 1 | 7 |

| | | HYDE PARK RD | | | | | | | | | | | SOUTH CARRIAGE RD | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | North Approach | | | | | South Approach | | | | | East Approach | | | | | West Approach | | | | |
| Time Period | | LT | TH | RT | Ped | TOT | LT | TH | RT | Ped | TOT | LT | TH | RT | Ped | TOT | LT | TH | RT | Ped | TOT |
| 16:15 | 16:30 | 17 | 348 | 1 | 1 | 366 | 16 | 350 | 23 | 0 | 389 | 5 | 0 | 13 | 1 | 18 | 0 | 0 | 8 | 0 | 8 |
| 16:30 | 16:45 | 15 | 379 | 0 | 2 | 394 | 16 | 346 | 26 | 0 | 388 | 8 | 0 | 16 | 0 | 24 | 0 | 1 | 7 | 0 | 8 |
| 16:45 | 17:00 | 13 | 328 | 0 | 0 | 342 | 17 | 344 | 33 | 0 | 394 | 16 | 0 | 20 | 0 | 36 | 0 | 0 | 5 | 0 | 5 |
| Hourly Total | | 50 | 1386 | 4 | 6 | 1441 | 61 | 1359 | 117 | 0 | 1537 | 41 | 1 | 58 | 2 | 100 | 0 | 1 | 27 | 1 | 28 |
| 17:00 | 17:15 | 17 | 389 | 1 | 2 | 407 | 14 | 339 | 28 | 0 | 381 | 13 | 0 | 19 | 0 | 32 | 0 | 0 | 1 | 4 | 1 |
| 17:15 | 17:30 | 13 | 338 | 1 | 0 | 352 | 12 | 329 | 43 | 0 | 385 | 6 | 0 | 11 | 0 | 17 | 0 | 0 | 6 | 0 | 6 |
| 17:30 | 17:45 | 13 | 277 | 0 | 1 | 290 | 12 | 315 | 43 | 0 | 370 | 9 | 0 | 11 | 0 | 20 | 0 | 0 | 2 | 0 | 2 |
| 17:45 | 18:00 | 14 | 276 | 2 | 1 | 292 | 11 | 316 | 12 | 0 | 339 | 5 | 0 | 10 | 0 | 15 | 0 | 0 | 3 | 1 | 3 |
| Hourly Total | | 57 | 1280 | 4 | 4 | 1341 | 49 | 1299 | 126 | 0 | 1475 | 33 | 0 | 51 | 0 | 84 | 0 | 0 | 12 | 5 | 12 |
| Grand Total | | 388 | 8367 | 26 | 27 | 8784 | 246 | 8490 | 712 | 2 | 9455 | 386 | 6 | 391 | 19 | 783 | 3 | 8 | 166 | 1 | 12 |
| Truck % | | 5% | 3% | 12% | 0% | 3% | 4% | 3% | 4% | 0% | 3% | 3% | 17% | 6% | 0% | 4% | 0% | 38% | 4% | 0% | 6% |

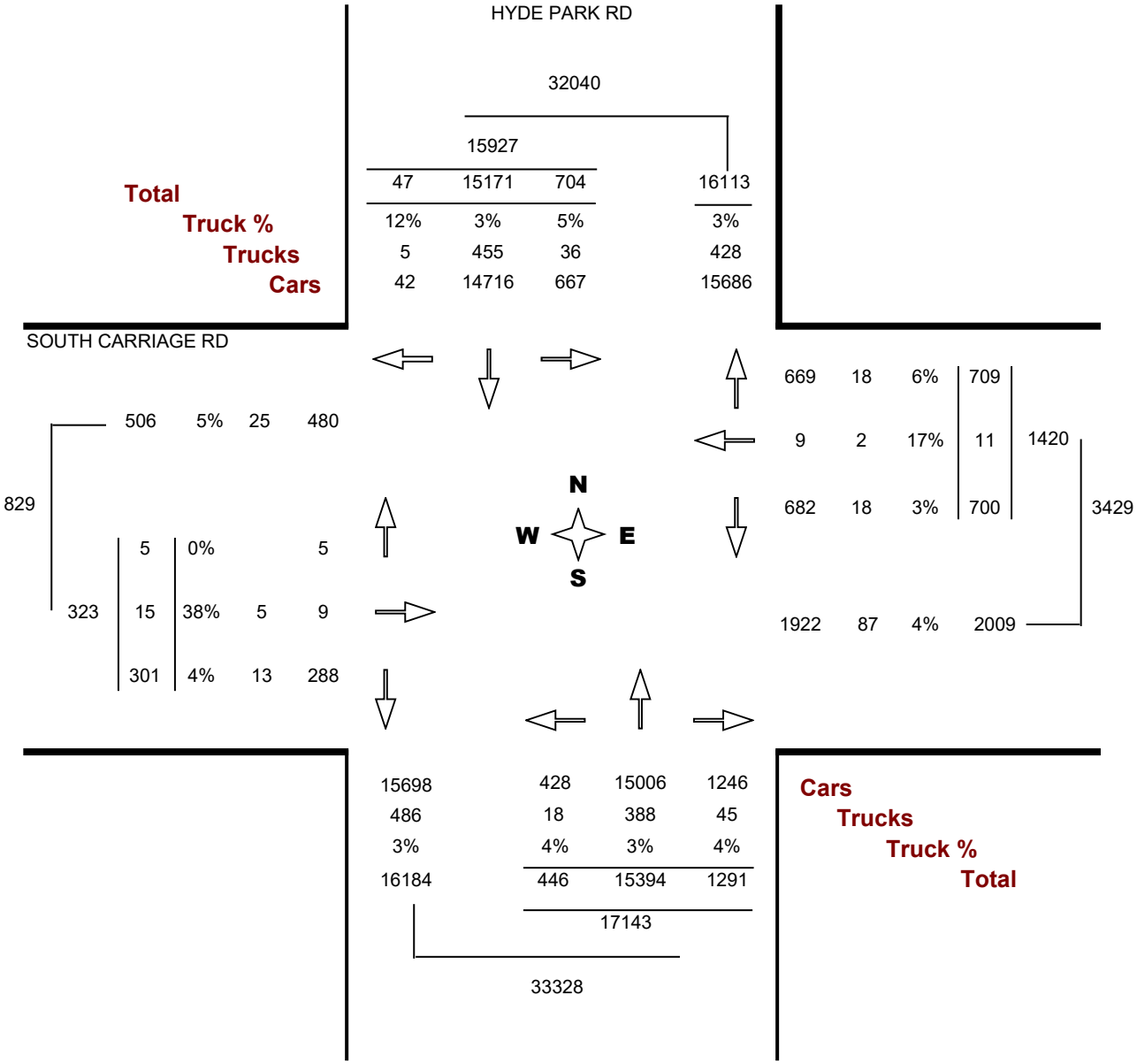
# Turning Movements Count - AADT Report

**Location.....** HYDE PARK RD @ SOUTH CARRIAGE RD

**Municipality.** LONDON

**Traffic Cont.** Stop sign

**Count Date..** Tuesday, October 09, 2018 **AADT factor..** 1.813152



# APPENDIX D

## Level of Service Definitions

Level of Service Definitions

Two-Way Stop Controlled Intersections

| Level of Service | Control Delay per Vehicle (seconds) | Interpretation |
|---|---|---|
| A | ≤ 10 | EXCELLENT. Large and frequent gaps in traffic on the main roadway. Queuing on the minor street is rare. |
| B | > 10 and ≤ 15 | VERY GOOD. Many gaps exist in traffic on the main roadway. Queuing on the minor street is minimal. |
| C | > 15 and ≤ 25 | GOOD. Fewer gaps exist in traffic on the main roadway. Delay on minor approach becomes more noticeable. |
| D | > 25 and ≤ 35 | FAIR. Infrequent and shorter gaps in traffic on the main roadway. Queue lengths develop on the minor street. |
| E | > 35 and ≤ 50 | POOR. Very infrequent gaps in traffic on the main roadway. Queue lengths become noticeable. |
| F | > 50 | UNSATISFACTORY. Very few gaps in traffic on the main roadway. Excessive delay with significant queue lengths on the minor street. |

Adapted from Highway Capacity Manual 2000, Transportation Research Board

Signalized Intersections

| Level of Service | Control Delay per Vehicle (seconds) | Interpretation |
|---|---|---|
| A | ≤ 10 | EXCELLENT. Extremely favourable progression with most vehicles arriving during the green phase. Most vehicles do not stop and short cycle lengths may contribute to low delay. |
| B | > 10 and ≤ 20 | VERY GOOD. Very good progression and/or short cycle lengths with slightly more vehicles stopping than LOS "A" causing slightly higher levels of average delay. |
| C | > 20 and ≤ 35 | GOOD. Fair progression and longer cycle lengths lead to a greater number of vehicles stopping than LOS "B". |
| D | > 35 and ≤ 55 | FAIR. Congestion becomes noticeable with higher average delays resulting from a combination of long cycle lengths, high volume-to-capacity ratios and unfavourable progression. |
| E | > 55 and ≤ 80 | POOR. Lengthy delays values are indicative of poor progression, long cycle lengths and high volume-to-capacity ratios. Individual cycle failures are common with individual movement failures also common. |
| F | > 80 | UNSATISFACTORY. Indicative of oversaturated conditions with vehicular demand greater than the capacity of the intersection. |

Adapted from Highway Capacity Manual 2000, Transportation Research Board

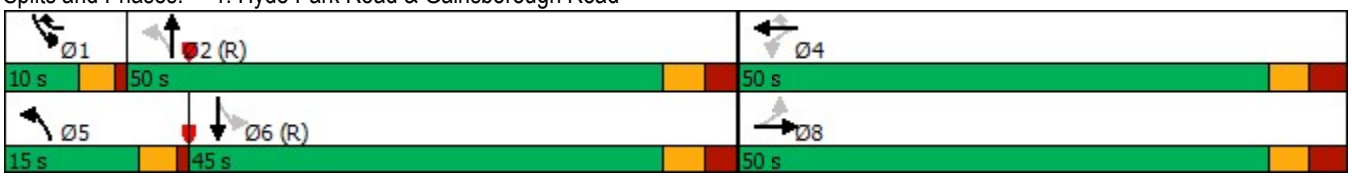
# APPENDIX E

## Detailed Capacity Analysis

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 92 | 107 | 166 | 96 | 90 | 126 | 783 | 55 | 636 |
| Future Volume (vph) | 92 | 107 | 166 | 96 | 90 | 126 | 783 | 55 | 636 |
| Turn Type | Perm | NA | Perm | NA | pm+ov | pm+pt | NA | pm+pt | NA |
| Protected Phases | | 8 | | 4 | 1 | 5 | 2 | 1 | 6 |
| Permitted Phases | 8 | | 4 | | 4 | 2 | | 6 | |
| Detector Phase | 8 | 8 | 4 | 4 | 1 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | 7.0 | 5.0 | 5.0 | 7.0 | 5.0 | 7.0 |
| Minimum Split (s) | 36.6 | 36.6 | 36.6 | 36.6 | 9.0 | 9.0 | 28.1 | 9.0 | 28.1 |
| Total Split (s) | 50.0 | 50.0 | 50.0 | 50.0 | 10.0 | 15.0 | 50.0 | 10.0 | 45.0 |
| Total Split (%) | 45.5% | 45.5% | 45.5% | 45.5% | 9.1% | 13.6% | 45.5% | 9.1% | 40.9% |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.0 | 3.0 | 3.4 | 3.0 | 3.4 |
| All-Red Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 1.0 | 1.0 | 2.7 | 1.0 | 2.7 |
| Lost Time Adjust (s) | 0.0 | 0.0 | -3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.6 | 6.6 | 3.6 | 6.6 | 4.0 | 4.0 | 6.1 | 4.0 | 6.1 |
| Lead/Lag | | | | | Lead | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | Max | None | C-Max | Max | C-Max |
| Act Effct Green (s) | 27.8 | 27.8 | 30.8 | 27.8 | 52.0 | 55.2 | 43.9 | 70.2 | 56.3 |
| Actuated g/C Ratio | 0.25 | 0.25 | 0.28 | 0.25 | 0.47 | 0.50 | 0.40 | 0.64 | 0.51 |
| v/c Ratio | 0.33 | 0.63 | 0.91 | 0.23 | 0.13 | 0.34 | 0.72 | 0.13 | 0.44 |
| Control Delay | 33.8 | 30.6 | 80.3 | 31.2 | 5.8 | 11.3 | 26.8 | 10.1 | 19.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 33.8 | 30.6 | 80.3 | 31.2 | 5.8 | 11.3 | 26.8 | 10.1 | 19.8 |
| LOS | C | C | F | C | A | B | C | B | B |
| Approach Delay | | 31.4 | | 47.8 | | | 25.0 | | 19.1 |
| Approach LOS | | C | | D | | | C | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 110 | |
| Actuated Cycle Length: 110 | |
| Offset: 95 (86%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.91 | |
| Intersection Signal Delay: 27.3 | Intersection LOS: C |
| Intersection Capacity Utilization 73.1% | ICU Level of Service D |
| Analysis Period (min) 15 | |

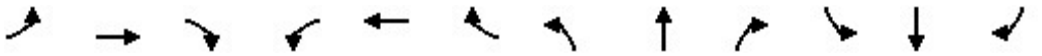
Splits and Phases: 1: Hyde Park Road & Gainsborough Road



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 102 | 305 | 184 | 107 | 100 | 140 | 1006 | 61 | 783 |
| v/c Ratio | 0.33 | 0.63 | 0.91 | 0.23 | 0.13 | 0.34 | 0.72 | 0.13 | 0.44 |
| Control Delay | 33.8 | 30.6 | 80.3 | 31.2 | 5.8 | 11.3 | 26.8 | 10.1 | 19.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 33.8 | 30.6 | 80.3 | 31.2 | 5.8 | 11.3 | 26.8 | 10.1 | 19.8 |
| Queue Length 50th (m) | 17.9 | 42.1 | 38.1 | 18.2 | 3.1 | 10.3 | 93.4 | 4.4 | 52.5 |
| Queue Length 95th (m) | 28.2 | 60.2 | #60.1 | 27.8 | 11.4 | 21.7 | 92.0 | 12.1 | 89.5 |
| Internal Link Dist (m) | | 159.4 | | 199.7 | | | 99.2 | | 171.2 |
| Turn Bay Length (m) | | | 110.0 | | | 80.0 | | 80.0 | |
| Base Capacity (vph) | 486 | 709 | 305 | 728 | 787 | 451 | 1406 | 467 | 1782 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.21 | 0.43 | 0.60 | 0.15 | 0.13 | 0.31 | 0.72 | 0.13 | 0.44 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 92 | 107 | 167 | 166 | 96 | 90 | 126 | 783 | 122 | 55 | 636 | 68 |
| Future Volume (vph) | 92 | 107 | 167 | 166 | 96 | 90 | 126 | 783 | 122 | 55 | 636 | 68 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 6.6 | 6.6 | | 3.6 | 6.6 | 4.0 | 4.0 | 6.1 | | 4.0 | 6.1 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.99 | | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.91 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1701 | 1669 | | 1786 | 1847 | 1587 | 1738 | 3494 | | 1807 | 3476 | |
| Flt Permitted | 0.69 | 1.00 | | 0.38 | 1.00 | 1.00 | 0.36 | 1.00 | | 0.13 | 1.00 | |
| Satd. Flow (perm) | 1232 | 1669 | | 723 | 1847 | 1587 | 650 | 3494 | | 254 | 3476 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 102 | 119 | 186 | 184 | 107 | 100 | 140 | 870 | 136 | 61 | 707 | 76 |
| RTOR Reduction (vph) | 0 | 63 | 0 | 0 | 0 | 39 | 0 | 11 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 102 | 242 | 0 | 184 | 107 | 61 | 140 | 995 | 0 | 61 | 778 | 0 |
| Confl. Peds. (#/hr) | 3 | | 3 | 3 | | 3 | | | 2 | 2 | | |
| Heavy Vehicles (%) | 7% | 3% | 4% | 2% | 4% | 2% | 5% | 2% | 2% | 1% | 3% | 8% |
| Turn Type | Perm | NA | | Perm | NA | pm+ov | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 8 | | | 4 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 8 | | | 4 | | 4 | 2 | | | 6 | | |
| Actuated Green, G (s) | 27.8 | 27.8 | | 27.8 | 27.8 | 49.4 | 53.1 | 43.9 | | 69.5 | 56.3 | |
| Effective Green, g (s) | 27.8 | 27.8 | | 30.8 | 27.8 | 49.4 | 53.1 | 43.9 | | 69.5 | 56.3 | |
| Actuated g/C Ratio | 0.25 | 0.25 | | 0.28 | 0.25 | 0.45 | 0.48 | 0.40 | | 0.63 | 0.51 | |
| Clearance Time (s) | 6.6 | 6.6 | | 6.6 | 6.6 | 4.0 | 4.0 | 6.1 | | 4.0 | 6.1 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 311 | 421 | | 202 | 466 | 712 | 404 | 1394 | | 465 | 1779 | |
| v/s Ratio Prot | | 0.15 | | | 0.06 | 0.02 | c0.03 | c0.28 | | 0.03 | c0.22 | |
| v/s Ratio Perm | 0.08 | | | c0.25 | | 0.02 | 0.14 | | | 0.06 | | |
| v/c Ratio | 0.33 | 0.58 | | 0.91 | 0.23 | 0.09 | 0.35 | 0.71 | | 0.13 | 0.44 | |
| Uniform Delay, d1 | 33.5 | 35.9 | | 38.3 | 32.6 | 17.4 | 16.0 | 27.8 | | 11.0 | 16.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 0.89 | 0.87 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.6 | 1.9 | | 39.4 | 0.3 | 0.1 | 0.5 | 2.9 | | 0.6 | 0.8 | |
| Delay (s) | 34.1 | 37.8 | | 77.6 | 32.9 | 17.4 | 14.8 | 27.0 | | 11.6 | 17.7 | |
| Level of Service | C | D | | E | C | B | B | C | | B | B | |
| Approach Delay (s) | | 36.9 | | | 50.0 | | | 25.5 | | | 17.2 | |
| Approach LOS | | D | | | D | | | C | | | B | |

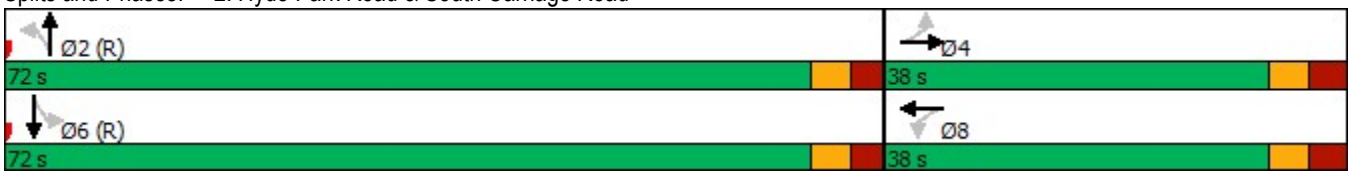
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 28.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.72 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 16.7 |
| Intersection Capacity Utilization | 73.1% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Lane Group | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 1 | 79 | 0 | 27 | 1063 | 56 | 1021 |
| Future Volume (vph) | 1 | 79 | 0 | 27 | 1063 | 56 | 1021 |
| Turn Type | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Minimum Split (s) | 35.5 | 35.5 | 35.5 | 30.0 | 30.0 | 30.0 | 30.0 |
| Total Split (s) | 38.0 | 38.0 | 38.0 | 72.0 | 72.0 | 72.0 | 72.0 |
| Total Split (%) | 34.5% | 34.5% | 34.5% | 65.5% | 65.5% | 65.5% | 65.5% |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 |
| All-Red Time (s) | 3.2 | 3.2 | 3.2 | 2.7 | 2.7 | 2.7 | 2.7 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.5 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Recall Mode | None | None | None | C-Max | C-Max | C-Max | C-Max |
| Act Effct Green (s) | 9.6 | | 9.6 | 87.9 | 87.9 | 87.9 | 87.9 |
| Actuated g/C Ratio | 0.09 | | 0.09 | 0.80 | 0.80 | 0.80 | 0.80 |
| v/c Ratio | 0.24 | | 0.52 | 0.09 | 0.46 | 0.22 | 0.40 |
| Control Delay | 17.6 | | 35.3 | 3.4 | 4.3 | 3.9 | 2.9 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 17.6 | | 35.3 | 3.4 | 4.3 | 3.9 | 2.9 |
| LOS | B | | D | A | A | A | A |
| Approach Delay | 17.6 | | 35.3 | | 4.3 | | 3.0 |
| Approach LOS | B | | D | | A | | A |

| Intersection Summary | |
|---|---|
| Cycle Length: 110 | |
| Actuated Cycle Length: 110 | |
| Offset: 89 (81%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.52 | |
| Intersection Signal Delay: 5.6 | Intersection LOS: A |
| Intersection Capacity Utilization 67.4% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 2: Hyde Park Road & South Carriage Road



| Lane Group | EBT | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 43 | 145 | 30 | 1287 | 62 | 1136 |
| v/c Ratio | 0.24 | 0.52 | 0.09 | 0.46 | 0.22 | 0.40 |
| Control Delay | 17.6 | 35.3 | 3.4 | 4.3 | 3.9 | 2.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 17.6 | 35.3 | 3.4 | 4.3 | 3.9 | 2.9 |
| Queue Length 50th (m) | 0.2 | 9.5 | 1.1 | 35.3 | 1.7 | 23.0 |
| Queue Length 95th (m) | 10.5 | 19.0 | 3.7 | 54.6 | m5.1 | 31.1 |
| Internal Link Dist (m) | 128.5 | 141.5 | | 344.4 | | 316.2 |
| Turn Bay Length (m) | | | 250.0 | | | |
| Base Capacity (vph) | 485 | 778 | 347 | 2792 | 287 | 2830 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.09 | 0.19 | 0.09 | 0.46 | 0.22 | 0.40 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 0 | 1 | 38 | 79 | 0 | 51 | 27 | 1063 | 95 | 56 | 1021 | 2 |
| Future Volume (vph) | 0 | 1 | 38 | 79 | 0 | 51 | 27 | 1063 | 95 | 56 | 1021 | 2 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 6.5 | | | 6.5 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | | 1.00 | | | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 1.00 | | | 0.99 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.87 | | | 0.94 | | 1.00 | 0.99 | | 1.00 | 1.00 | |
| Flt Protected | | 1.00 | | | 0.97 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1592 | | | 3175 | | 1752 | 3491 | | 1738 | 3542 | |
| Flt Permitted | | 1.00 | | | 0.79 | | 0.24 | 1.00 | | 0.20 | 1.00 | |
| Satd. Flow (perm) | | 1592 | | | 2577 | | 435 | 3491 | | 361 | 3542 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 0 | 1 | 42 | 88 | 0 | 57 | 30 | 1181 | 106 | 62 | 1134 | 2 |
| RTOR Reduction (vph) | 0 | 38 | 0 | 0 | 52 | 0 | 0 | 3 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 5 | 0 | 0 | 93 | 0 | 30 | 1284 | 0 | 62 | 1136 | 0 |
| Confl. Peds. (#/hr) | 7 | | | | | 7 | 7 | | 1 | 1 | | 7 |
| Heavy Vehicles (%) | 0% | 38% | 4% | 3% | 17% | 6% | 4% | 3% | 4% | 5% | 3% | 12% |
| Turn Type | | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 9.6 | | | 9.6 | | 87.9 | 87.9 | | 87.9 | 87.9 | |
| Effective Green, g (s) | | 9.6 | | | 9.6 | | 87.9 | 87.9 | | 87.9 | 87.9 | |
| Actuated g/C Ratio | | 0.09 | | | 0.09 | | 0.80 | 0.80 | | 0.80 | 0.80 | |
| Clearance Time (s) | | 6.5 | | | 6.5 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 138 | | | 224 | | 347 | 2789 | | 288 | 2830 | |
| v/s Ratio Prot | | 0.00 | | | | | | c0.37 | | | 0.32 | |
| v/s Ratio Perm | | | | | c0.04 | | 0.07 | | | 0.17 | | |
| v/c Ratio | | 0.03 | | | 0.42 | | 0.09 | 0.46 | | 0.22 | 0.40 | |
| Uniform Delay, d1 | | 46.0 | | | 47.5 | | 2.4 | 3.5 | | 2.7 | 3.3 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 0.66 | 0.72 | |
| Incremental Delay, d2 | | 0.1 | | | 1.2 | | 0.5 | 0.5 | | 1.6 | 0.4 | |
| Delay (s) | | 46.1 | | | 48.8 | | 2.9 | 4.1 | | 3.4 | 2.8 | |
| Level of Service | | D | | | D | | A | A | | A | A | |
| Approach Delay (s) | | 46.1 | | | 48.8 | | | 4.0 | | | 2.8 | |
| Approach LOS | | D | | | D | | | A | | | A | |

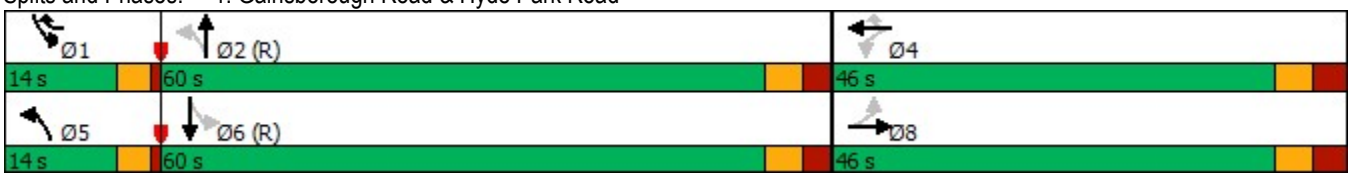
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 6.6 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.46 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 67.4% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 124 | 140 | 150 | 138 | 165 | 104 | 1104 | 163 | 1075 |
| Future Volume (vph) | 124 | 140 | 150 | 138 | 165 | 104 | 1104 | 163 | 1075 |
| Turn Type | Perm | NA | Perm | NA | pm+ov | pm+pt | NA | pm+pt | NA |
| Protected Phases | | 8 | | 4 | 1 | 5 | 2 | 1 | 6 |
| Permitted Phases | 8 | | 4 | | 4 | 2 | | 6 | |
| Detector Phase | 8 | 8 | 4 | 4 | 1 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | 7.0 | 5.0 | 5.0 | 7.0 | 5.0 | 7.0 |
| Minimum Split (s) | 36.6 | 36.6 | 36.6 | 36.6 | 9.0 | 9.0 | 28.1 | 9.0 | 28.1 |
| Total Split (s) | 46.0 | 46.0 | 46.0 | 46.0 | 14.0 | 14.0 | 60.0 | 14.0 | 60.0 |
| Total Split (%) | 38.3% | 38.3% | 38.3% | 38.3% | 11.7% | 11.7% | 50.0% | 11.7% | 50.0% |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.0 | 3.0 | 3.4 | 3.0 | 3.4 |
| All-Red Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 1.0 | 1.0 | 2.7 | 1.0 | 2.7 |
| Lost Time Adjust (s) | 0.0 | 0.0 | -3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.6 | 6.6 | 3.6 | 6.6 | 4.0 | 4.0 | 6.1 | 4.0 | 6.1 |
| Lead/Lag | | | | | Lead | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | Max | None | C-Max | Max | C-Max |
| Act Effct Green (s) | 28.4 | 28.4 | 31.4 | 28.4 | 52.0 | 64.1 | 53.9 | 80.2 | 66.8 |
| Actuated g/C Ratio | 0.24 | 0.24 | 0.26 | 0.24 | 0.43 | 0.53 | 0.45 | 0.67 | 0.56 |
| v/c Ratio | 0.47 | 0.73 | 0.98 | 0.32 | 0.24 | 0.40 | 0.85 | 0.44 | 0.65 |
| Control Delay | 43.0 | 43.3 | 109.4 | 37.6 | 15.8 | 10.5 | 31.8 | 24.7 | 22.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 43.0 | 43.3 | 109.4 | 37.6 | 15.8 | 10.5 | 31.8 | 24.7 | 22.2 |
| LOS | D | D | F | D | B | B | C | C | C |
| Approach Delay | | 43.2 | | 53.5 | | | 30.2 | | 22.5 |
| Approach LOS | | D | | D | | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 95 (79%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.98 | |
| Intersection Signal Delay: 31.7 | Intersection LOS: C |
| Intersection Capacity Utilization 89.9% | ICU Level of Service E |
| Analysis Period (min) 15 | |

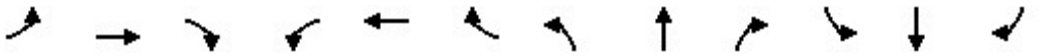
Splits and Phases: 1: Gainsborough Road & Hyde Park Road



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 127 | 326 | 153 | 141 | 168 | 106 | 1331 | 166 | 1250 |
| v/c Ratio | 0.47 | 0.73 | 0.98 | 0.32 | 0.24 | 0.40 | 0.85 | 0.44 | 0.65 |
| Control Delay | 43.0 | 43.3 | 109.4 | 37.6 | 15.8 | 10.5 | 31.8 | 24.7 | 22.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 43.0 | 43.3 | 109.4 | 37.6 | 15.8 | 10.5 | 31.8 | 24.7 | 22.2 |
| Queue Length 50th (m) | 25.6 | 58.8 | 35.6 | 27.4 | 17.6 | 7.0 | 143.1 | 17.9 | 102.5 |
| Queue Length 95th (m) | 39.6 | 80.5 | #64.8 | 40.0 | 31.7 | 17.0 | 173.6 | #57.5 | 157.5 |
| Internal Link Dist (m) | | 159.4 | | 199.7 | | | 99.2 | | 171.2 |
| Turn Bay Length (m) | | | 110.0 | | | 80.0 | | 80.0 | |
| Base Capacity (vph) | 374 | 596 | 211 | 606 | 706 | 294 | 1575 | 380 | 1927 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.34 | 0.55 | 0.73 | 0.23 | 0.24 | 0.36 | 0.85 | 0.44 | 0.65 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 124 | 140 | 179 | 150 | 138 | 165 | 104 | 1104 | 200 | 163 | 1075 | 150 |
| Future Volume (vph) | 124 | 140 | 179 | 150 | 138 | 165 | 104 | 1104 | 200 | 163 | 1075 | 150 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 6.6 | 6.6 | | 3.6 | 6.6 | 4.0 | 4.0 | 6.1 | | 4.0 | 6.1 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.92 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1697 | 1699 | | 1789 | 1847 | 1584 | 1738 | 3480 | | 1807 | 3449 | |
| Flt Permitted | 0.64 | 1.00 | | 0.32 | 1.00 | 1.00 | 0.17 | 1.00 | | 0.07 | 1.00 | |
| Satd. Flow (perm) | 1142 | 1699 | | 600 | 1847 | 1584 | 320 | 3480 | | 131 | 3449 | |
| Peak-hour factor, PHF | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Adj. Flow (vph) | 127 | 143 | 183 | 153 | 141 | 168 | 106 | 1127 | 204 | 166 | 1097 | 153 |
| RTOR Reduction (vph) | 0 | 44 | 0 | 0 | 0 | 21 | 0 | 12 | 0 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 127 | 282 | 0 | 153 | 141 | 147 | 106 | 1319 | 0 | 166 | 1242 | 0 |
| Confl. Peds. (#/hr) | 5 | | | | | 5 | 1 | | 4 | 4 | | 1 |
| Heavy Vehicles (%) | 7% | 3% | 4% | 2% | 4% | 2% | 5% | 2% | 2% | 1% | 3% | 8% |
| Turn Type | Perm | NA | | Perm | NA | pm+ov | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 8 | | | 4 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 8 | | | 4 | | 4 | 2 | | | 6 | | |
| Actuated Green, G (s) | 28.4 | 28.4 | | 28.4 | 28.4 | 49.4 | 62.0 | 53.9 | | 78.9 | 66.8 | |
| Effective Green, g (s) | 28.4 | 28.4 | | 31.4 | 28.4 | 49.4 | 62.0 | 53.9 | | 78.9 | 66.8 | |
| Actuated g/C Ratio | 0.24 | 0.24 | | 0.26 | 0.24 | 0.41 | 0.52 | 0.45 | | 0.66 | 0.56 | |
| Clearance Time (s) | 6.6 | 6.6 | | 6.6 | 6.6 | 4.0 | 4.0 | 6.1 | | 4.0 | 6.1 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 270 | 402 | | 157 | 437 | 652 | 261 | 1563 | | 379 | 1919 | |
| v/s Ratio Prot | | 0.17 | | | 0.08 | 0.04 | 0.03 | c0.38 | | c0.08 | c0.36 | |
| v/s Ratio Perm | 0.11 | | | c0.26 | | 0.05 | 0.18 | | | 0.21 | | |
| v/c Ratio | 0.47 | 0.70 | | 0.97 | 0.32 | 0.23 | 0.41 | 0.84 | | 0.44 | 0.65 | |
| Uniform Delay, d1 | 39.3 | 41.9 | | 43.9 | 37.9 | 22.9 | 15.7 | 29.3 | | 22.9 | 18.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 0.68 | 0.92 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.3 | 5.5 | | 63.7 | 0.4 | 0.2 | 0.9 | 4.9 | | 3.6 | 1.7 | |
| Delay (s) | 40.6 | 47.4 | | 107.6 | 38.3 | 23.1 | 11.6 | 31.8 | | 26.6 | 20.1 | |
| Level of Service | D | D | | F | D | C | B | C | | C | C | |
| Approach Delay (s) | | 45.5 | | | 55.7 | | | 30.3 | | | 20.9 | |
| Approach LOS | | D | | | E | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 31.7 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.84 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 16.7 |
| Intersection Capacity Utilization | 89.9% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Lane Group | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 1 | 44 | 0 | 67 | 1442 | 66 | 1510 |
| Future Volume (vph) | 1 | 44 | 0 | 67 | 1442 | 66 | 1510 |
| Turn Type | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Minimum Split (s) | 35.5 | 35.5 | 35.5 | 30.0 | 30.0 | 30.0 | 30.0 |
| Total Split (s) | 37.0 | 37.0 | 37.0 | 83.0 | 83.0 | 83.0 | 83.0 |
| Total Split (%) | 30.8% | 30.8% | 30.8% | 69.2% | 69.2% | 69.2% | 69.2% |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 |
| All-Red Time (s) | 3.2 | 3.2 | 3.2 | 2.7 | 2.7 | 2.7 | 2.7 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.5 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Recall Mode | None | None | None | C-Max | C-Max | C-Max | C-Max |
| Act Effct Green (s) | 9.1 | | 9.1 | 98.4 | 98.4 | 98.4 | 98.4 |
| Actuated g/C Ratio | 0.08 | | 0.08 | 0.82 | 0.82 | 0.82 | 0.82 |
| v/c Ratio | 0.17 | | 0.49 | 0.32 | 0.56 | 0.34 | 0.54 |
| Control Delay | 22.8 | | 38.6 | 7.4 | 4.6 | 13.3 | 8.8 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 22.8 | | 38.6 | 7.4 | 4.6 | 13.3 | 8.8 |
| LOS | C | | D | A | A | B | A |
| Approach Delay | 22.8 | | 38.6 | | 4.7 | | 9.0 |
| Approach LOS | C | | D | | A | | A |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 49 (41%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.56 | |
| Intersection Signal Delay: 8.0 | Intersection LOS: A |
| Intersection Capacity Utilization 75.3% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 2: Hyde Park Road & South Carriage Road

| Lane Group | EBT | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 23 | 119 | 69 | 1606 | 68 | 1559 |
| v/c Ratio | 0.17 | 0.49 | 0.32 | 0.56 | 0.34 | 0.54 |
| Control Delay | 22.8 | 38.6 | 7.4 | 4.6 | 13.3 | 8.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 22.8 | 38.6 | 7.4 | 4.6 | 13.3 | 8.8 |
| Queue Length 50th (m) | 0.2 | 8.5 | 3.0 | 49.7 | 5.5 | 80.3 |
| Queue Length 95th (m) | 8.2 | 17.5 | 10.2 | 73.8 | m19.1 | 165.1 |
| Internal Link Dist (m) | 128.5 | 141.5 | | 344.4 | | 316.2 |
| Turn Bay Length (m) | | | 250.0 | | | |
| Base Capacity (vph) | 413 | 705 | 216 | 2869 | 202 | 2906 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.06 | 0.17 | 0.32 | 0.56 | 0.34 | 0.54 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 0 | 1 | 21 | 44 | 0 | 72 | 67 | 1442 | 115 | 66 | 1510 | 2 |
| Future Volume (vph) | 0 | 1 | 21 | 44 | 0 | 72 | 67 | 1442 | 115 | 66 | 1510 | 2 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 6.5 | | | 6.5 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | | 1.00 | | | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 0.99 | | | 0.99 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.87 | | | 0.91 | | 1.00 | 0.99 | | 1.00 | 1.00 | |
| Flt Protected | | 1.00 | | | 0.98 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1562 | | | 3063 | | 1754 | 3495 | | 1737 | 3543 | |
| Flt Permitted | | 1.00 | | | 0.84 | | 0.14 | 1.00 | | 0.13 | 1.00 | |
| Satd. Flow (perm) | | 1562 | | | 2633 | | 264 | 3495 | | 247 | 3543 | |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 0 | 1 | 22 | 45 | 0 | 74 | 69 | 1487 | 119 | 68 | 1557 | 2 |
| RTOR Reduction (vph) | 0 | 20 | 0 | 0 | 44 | 0 | 0 | 3 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 3 | 0 | 0 | 75 | 0 | 69 | 1603 | 0 | 68 | 1559 | 0 |
| Confl. Peds. (#/hr) | 3 | | 3 | 3 | | 3 | 4 | | 3 | 3 | | 4 |
| Heavy Vehicles (%) | 0% | 38% | 4% | 3% | 17% | 6% | 4% | 3% | 4% | 5% | 3% | 12% |
| Turn Type | | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 9.1 | | | 9.1 | | 98.4 | 98.4 | | 98.4 | 98.4 | |
| Effective Green, g (s) | | 9.1 | | | 9.1 | | 98.4 | 98.4 | | 98.4 | 98.4 | |
| Actuated g/C Ratio | | 0.08 | | | 0.08 | | 0.82 | 0.82 | | 0.82 | 0.82 | |
| Clearance Time (s) | | 6.5 | | | 6.5 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 118 | | | 199 | | 216 | 2865 | | 202 | 2905 | |
| v/s Ratio Prot | | 0.00 | | | | | | c0.46 | | | 0.44 | |
| v/s Ratio Perm | | | | | c0.03 | | 0.26 | | | 0.28 | | |
| v/c Ratio | | 0.02 | | | 0.38 | | 0.32 | 0.56 | | 0.34 | 0.54 | |
| Uniform Delay, d1 | | 51.3 | | | 52.7 | | 2.6 | 3.6 | | 2.7 | 3.5 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 2.62 | 2.23 | |
| Incremental Delay, d2 | | 0.1 | | | 1.2 | | 3.9 | 0.8 | | 3.7 | 0.6 | |
| Delay (s) | | 51.4 | | | 53.9 | | 6.5 | 4.4 | | 10.7 | 8.3 | |
| Level of Service | | D | | | D | | A | A | | B | A | |
| Approach Delay (s) | | 51.4 | | | 53.9 | | | 4.5 | | | 8.4 | |
| Approach LOS | | D | | | D | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 8.4 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.54 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 75.3% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 93 | 138 | 166 | 111 | 93 | 147 | 849 | 56 | 720 |
| Future Volume (vph) | 93 | 138 | 166 | 111 | 93 | 147 | 849 | 56 | 720 |
| Turn Type | Perm | NA | Perm | NA | pm+ov | pm+pt | NA | pm+pt | NA |
| Protected Phases | | 8 | | 4 | 1 | 5 | 2 | 1 | 6 |
| Permitted Phases | 8 | | 4 | | 4 | 2 | | 6 | |
| Detector Phase | 8 | 8 | 4 | 4 | 1 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | 7.0 | 5.0 | 5.0 | 7.0 | 5.0 | 7.0 |
| Minimum Split (s) | 36.6 | 36.6 | 36.6 | 36.6 | 9.0 | 9.0 | 28.1 | 9.0 | 28.1 |
| Total Split (s) | 50.0 | 50.0 | 50.0 | 50.0 | 10.0 | 15.0 | 50.0 | 10.0 | 45.0 |
| Total Split (%) | 45.5% | 45.5% | 45.5% | 45.5% | 9.1% | 13.6% | 45.5% | 9.1% | 40.9% |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.0 | 3.0 | 3.4 | 3.0 | 3.4 |
| All-Red Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 1.0 | 1.0 | 2.7 | 1.0 | 2.7 |
| Lost Time Adjust (s) | 0.0 | 0.0 | -3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.6 | 6.6 | 3.6 | 6.6 | 4.0 | 4.0 | 6.1 | 4.0 | 6.1 |
| Lead/Lag | | | | | Lead | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | Max | None | C-Max | Max | C-Max |
| Act Effct Green (s) | 30.2 | 30.2 | 33.2 | 30.2 | 52.0 | 55.3 | 43.9 | 67.0 | 53.6 |
| Actuated g/C Ratio | 0.27 | 0.27 | 0.30 | 0.27 | 0.47 | 0.50 | 0.40 | 0.61 | 0.49 |
| v/c Ratio | 0.31 | 0.68 | 0.95 | 0.24 | 0.13 | 0.43 | 0.77 | 0.15 | 0.51 |
| Control Delay | 31.4 | 33.7 | 89.8 | 29.6 | 6.0 | 13.6 | 28.3 | 11.8 | 22.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 31.4 | 33.7 | 89.8 | 29.6 | 6.0 | 13.6 | 28.3 | 11.8 | 22.8 |
| LOS | C | C | F | C | A | B | C | B | C |
| Approach Delay | | 33.2 | | 50.7 | | | 26.4 | | 22.0 |
| Approach LOS | | C | | D | | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 110 | |
| Actuated Cycle Length: 110 | |
| Offset: 95 (86%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.95 | |
| Intersection Signal Delay: 29.3 | Intersection LOS: C |
| Intersection Capacity Utilization 76.9% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Hyde Park Road & Gainsborough Road

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 103 | 350 | 184 | 123 | 103 | 163 | 1079 | 62 | 876 |
| v/c Ratio | 0.31 | 0.68 | 0.95 | 0.24 | 0.13 | 0.43 | 0.77 | 0.15 | 0.51 |
| Control Delay | 31.4 | 33.7 | 89.8 | 29.6 | 6.0 | 13.6 | 28.3 | 11.8 | 22.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 31.4 | 33.7 | 89.8 | 29.6 | 6.0 | 13.6 | 28.3 | 11.8 | 22.8 |
| Queue Length 50th (m) | 17.5 | 53.8 | 38.4 | 20.4 | 3.4 | 13.0 | 103.4 | 4.8 | 65.4 |
| Queue Length 95th (m) | 27.0 | 70.9 | #65.8 | 29.6 | 11.9 | 24.9 | 103.5 | 13.2 | 106.1 |
| Internal Link Dist (m) | | 159.4 | | 199.7 | | | 99.2 | | 171.2 |
| Turn Bay Length (m) | | | 110.0 | | | 80.0 | | 80.0 | |
| Base Capacity (vph) | 478 | 707 | 270 | 728 | 786 | 402 | 1407 | 404 | 1702 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.22 | 0.50 | 0.68 | 0.17 | 0.13 | 0.41 | 0.77 | 0.15 | 0.51 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 93 | 138 | 177 | 166 | 111 | 93 | 147 | 849 | 122 | 56 | 720 | 68 |
| Future Volume (vph) | 93 | 138 | 177 | 166 | 111 | 93 | 147 | 849 | 122 | 56 | 720 | 68 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 6.6 | 6.6 | | 3.6 | 6.6 | 4.0 | 4.0 | 6.1 | | 4.0 | 6.1 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.99 | | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.92 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1701 | 1684 | | 1786 | 1847 | 1586 | 1738 | 3500 | | 1807 | 3483 | |
| Flt Permitted | 0.68 | 1.00 | | 0.34 | 1.00 | 1.00 | 0.30 | 1.00 | | 0.11 | 1.00 | |
| Satd. Flow (perm) | 1214 | 1684 | | 641 | 1847 | 1586 | 544 | 3500 | | 205 | 3483 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 103 | 153 | 197 | 184 | 123 | 103 | 163 | 943 | 136 | 62 | 800 | 76 |
| RTOR Reduction (vph) | 0 | 51 | 0 | 0 | 0 | 39 | 0 | 10 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 103 | 299 | 0 | 184 | 123 | 64 | 163 | 1069 | 0 | 62 | 871 | 0 |
| Confl. Peds. (#/hr) | 3 | | 3 | 3 | | 3 | | | 2 | 2 | | |
| Heavy Vehicles (%) | 7% | 3% | 4% | 2% | 4% | 2% | 5% | 2% | 2% | 1% | 3% | 8% |
| Turn Type | Perm | NA | | Perm | NA | pm+ov | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 8 | | | 4 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 8 | | | 4 | | 4 | 2 | | | 6 | | |
| Actuated Green, G (s) | 30.2 | 30.2 | | 30.2 | 30.2 | 49.4 | 53.4 | 43.9 | | 67.1 | 53.6 | |
| Effective Green, g (s) | 30.2 | 30.2 | | 33.2 | 30.2 | 49.4 | 53.4 | 43.9 | | 67.1 | 53.6 | |
| Actuated g/C Ratio | 0.27 | 0.27 | | 0.30 | 0.27 | 0.45 | 0.49 | 0.40 | | 0.61 | 0.49 | |
| Clearance Time (s) | 6.6 | 6.6 | | 6.6 | 6.6 | 4.0 | 4.0 | 6.1 | | 4.0 | 6.1 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 333 | 462 | | 193 | 507 | 712 | 367 | 1396 | | 404 | 1697 | |
| v/s Ratio Prot | | 0.18 | | | 0.07 | 0.02 | c0.04 | c0.31 | | 0.03 | c0.25 | |
| v/s Ratio Perm | 0.08 | | | c0.29 | | 0.02 | 0.18 | | | 0.07 | | |
| v/c Ratio | 0.31 | 0.65 | | 0.95 | 0.24 | 0.09 | 0.44 | 0.77 | | 0.15 | 0.51 | |
| Uniform Delay, d1 | 31.6 | 35.2 | | 37.6 | 31.0 | 17.4 | 16.2 | 28.6 | | 12.8 | 19.3 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 0.89 | 0.86 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 3.1 | | 51.1 | 0.3 | 0.1 | 0.8 | 3.6 | | 0.8 | 1.1 | |
| Delay (s) | 32.2 | 38.3 | | 88.7 | 31.3 | 17.5 | 15.2 | 28.3 | | 13.6 | 20.4 | |
| Level of Service | C | D | | F | C | B | B | C | | B | C | |
| Approach Delay (s) | | 36.9 | | | 53.6 | | | 26.6 | | | 19.9 | |
| Approach LOS | | D | | | D | | | C | | | B | |

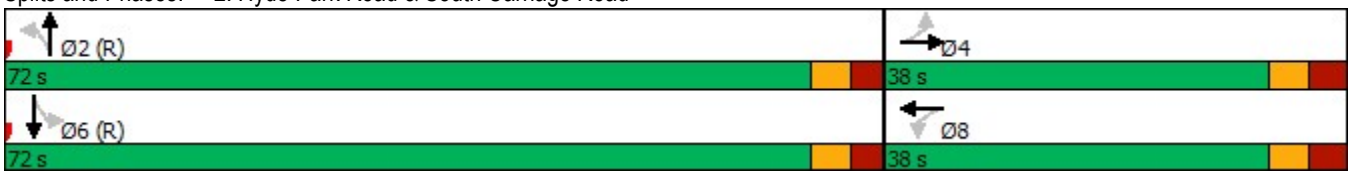
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 29.7 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.78 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 16.7 |
| Intersection Capacity Utilization | 76.9% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Lane Group | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 1 | 79 | 0 | 27 | 1171 | 58 | 1142 |
| Future Volume (vph) | 1 | 79 | 0 | 27 | 1171 | 58 | 1142 |
| Turn Type | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Minimum Split (s) | 35.5 | 35.5 | 35.5 | 30.0 | 30.0 | 30.0 | 30.0 |
| Total Split (s) | 38.0 | 38.0 | 38.0 | 72.0 | 72.0 | 72.0 | 72.0 |
| Total Split (%) | 34.5% | 34.5% | 34.5% | 65.5% | 65.5% | 65.5% | 65.5% |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 |
| All-Red Time (s) | 3.2 | 3.2 | 3.2 | 2.7 | 2.7 | 2.7 | 2.7 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.5 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Recall Mode | None | None | None | C-Max | C-Max | C-Max | C-Max |
| Act Effct Green (s) | 9.6 | | 9.6 | 87.9 | 87.9 | 87.9 | 87.9 |
| Actuated g/C Ratio | 0.09 | | 0.09 | 0.80 | 0.80 | 0.80 | 0.80 |
| v/c Ratio | 0.24 | | 0.53 | 0.10 | 0.50 | 0.26 | 0.45 |
| Control Delay | 17.5 | | 35.2 | 3.7 | 4.6 | 4.5 | 3.0 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 17.5 | | 35.2 | 3.7 | 4.6 | 4.5 | 3.0 |
| LOS | B | | D | A | A | A | A |
| Approach Delay | 17.5 | | 35.2 | | 4.6 | | 3.1 |
| Approach LOS | B | | D | | A | | A |

| Intersection Summary | |
|---|---|
| Cycle Length: 110 | |
| Actuated Cycle Length: 110 | |
| Offset: 89 (81%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.53 | |
| Intersection Signal Delay: 5.6 | Intersection LOS: A |
| Intersection Capacity Utilization 70.4% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 2: Hyde Park Road & South Carriage Road



| Lane Group | EBT | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 43 | 146 | 30 | 1407 | 64 | 1271 |
| v/c Ratio | 0.24 | 0.53 | 0.10 | 0.50 | 0.26 | 0.45 |
| Control Delay | 17.5 | 35.2 | 3.7 | 4.6 | 4.5 | 3.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 17.5 | 35.2 | 3.7 | 4.6 | 4.5 | 3.0 |
| Queue Length 50th (m) | 0.2 | 9.5 | 1.1 | 40.8 | 1.8 | 26.5 |
| Queue Length 95th (m) | 10.5 | 19.1 | 3.9 | 63.0 | m5.1 | 33.3 |
| Internal Link Dist (m) | 128.5 | 141.5 | | 344.4 | | 316.2 |
| Turn Bay Length (m) | | | 250.0 | | | |
| Base Capacity (vph) | 485 | 779 | 296 | 2795 | 248 | 2829 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.09 | 0.19 | 0.10 | 0.50 | 0.26 | 0.45 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 0 | 1 | 38 | 79 | 0 | 52 | 27 | 1171 | 95 | 58 | 1142 | 2 |
| Future Volume (vph) | 0 | 1 | 38 | 79 | 0 | 52 | 27 | 1171 | 95 | 58 | 1142 | 2 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 6.5 | | | 6.5 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | | 1.00 | | | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 1.00 | | | 0.99 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.87 | | | 0.94 | | 1.00 | 0.99 | | 1.00 | 1.00 | |
| Flt Protected | | 1.00 | | | 0.97 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1592 | | | 3173 | | 1752 | 3495 | | 1738 | 3542 | |
| Flt Permitted | | 1.00 | | | 0.79 | | 0.20 | 1.00 | | 0.17 | 1.00 | |
| Satd. Flow (perm) | | 1592 | | | 2578 | | 371 | 3495 | | 311 | 3542 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 0 | 1 | 42 | 88 | 0 | 58 | 30 | 1301 | 106 | 64 | 1269 | 2 |
| RTOR Reduction (vph) | 0 | 38 | 0 | 0 | 53 | 0 | 0 | 3 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 5 | 0 | 0 | 93 | 0 | 30 | 1404 | 0 | 64 | 1271 | 0 |
| Confl. Peds. (#/hr) | 7 | | | | | 7 | 7 | | 1 | 1 | | 7 |
| Heavy Vehicles (%) | 0% | 38% | 4% | 3% | 17% | 6% | 4% | 3% | 4% | 5% | 3% | 12% |
| Turn Type | | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 9.6 | | | 9.6 | | 87.9 | 87.9 | | 87.9 | 87.9 | |
| Effective Green, g (s) | | 9.6 | | | 9.6 | | 87.9 | 87.9 | | 87.9 | 87.9 | |
| Actuated g/C Ratio | | 0.09 | | | 0.09 | | 0.80 | 0.80 | | 0.80 | 0.80 | |
| Clearance Time (s) | | 6.5 | | | 6.5 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 138 | | | 224 | | 296 | 2792 | | 248 | 2830 | |
| v/s Ratio Prot | | 0.00 | | | | | | c0.40 | | | 0.36 | |
| v/s Ratio Perm | | | | | c0.04 | | 0.08 | | | 0.21 | | |
| v/c Ratio | | 0.03 | | | 0.42 | | 0.10 | 0.50 | | 0.26 | 0.45 | |
| Uniform Delay, d1 | | 46.0 | | | 47.5 | | 2.4 | 3.7 | | 2.8 | 3.5 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 0.62 | 0.68 | |
| Incremental Delay, d2 | | 0.1 | | | 1.3 | | 0.7 | 0.7 | | 2.2 | 0.5 | |
| Delay (s) | | 46.1 | | | 48.8 | | 3.1 | 4.4 | | 4.0 | 2.8 | |
| Level of Service | | D | | | D | | A | A | | A | A | |
| Approach Delay (s) | | 46.1 | | | 48.8 | | | 4.3 | | | 2.9 | |
| Approach LOS | | D | | | D | | | A | | | A | |

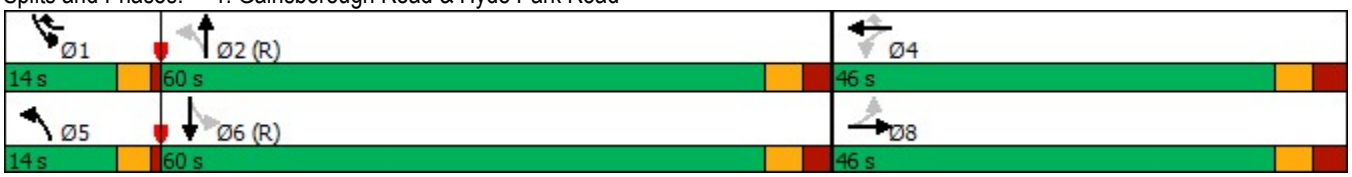
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 6.5 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.49 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 70.4% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 124 | 163 | 150 | 162 | 167 | 150 | 1194 | 165 | 1191 |
| Future Volume (vph) | 124 | 163 | 150 | 162 | 167 | 150 | 1194 | 165 | 1191 |
| Turn Type | Perm | NA | Perm | NA | pm+ov | pm+pt | NA | pm+pt | NA |
| Protected Phases | | 8 | | 4 | 1 | 5 | 2 | 1 | 6 |
| Permitted Phases | 8 | | 4 | | 4 | 2 | | 6 | |
| Detector Phase | 8 | 8 | 4 | 4 | 1 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | 7.0 | 5.0 | 5.0 | 7.0 | 5.0 | 7.0 |
| Minimum Split (s) | 36.6 | 36.6 | 36.6 | 36.6 | 9.0 | 9.0 | 28.1 | 9.0 | 28.1 |
| Total Split (s) | 46.0 | 46.0 | 46.0 | 46.0 | 14.0 | 14.0 | 60.0 | 14.0 | 60.0 |
| Total Split (%) | 38.3% | 38.3% | 38.3% | 38.3% | 11.7% | 11.7% | 50.0% | 11.7% | 50.0% |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.0 | 3.0 | 3.4 | 3.0 | 3.4 |
| All-Red Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 1.0 | 1.0 | 2.7 | 1.0 | 2.7 |
| Lost Time Adjust (s) | 0.0 | 0.0 | -3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.6 | 6.6 | 3.6 | 6.6 | 4.0 | 4.0 | 6.1 | 4.0 | 6.1 |
| Lead/Lag | | | | | Lead | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | Max | None | C-Max | Max | C-Max |
| Act Effct Green (s) | 30.4 | 30.4 | 33.4 | 30.4 | 52.0 | 66.2 | 53.9 | 77.4 | 62.7 |
| Actuated g/C Ratio | 0.25 | 0.25 | 0.28 | 0.25 | 0.43 | 0.55 | 0.45 | 0.64 | 0.52 |
| v/c Ratio | 0.47 | 0.76 | 1.01 | 0.35 | 0.24 | 0.63 | 0.90 | 0.48 | 0.76 |
| Control Delay | 41.9 | 45.3 | 119.3 | 37.1 | 16.9 | 20.2 | 35.2 | 27.4 | 27.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 41.9 | 45.3 | 119.3 | 37.1 | 16.9 | 20.2 | 35.2 | 27.4 | 27.6 |
| LOS | D | D | F | D | B | C | D | C | C |
| Approach Delay | | 44.4 | | 55.8 | | | 33.7 | | 27.6 |
| Approach LOS | | D | | E | | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 95 (79%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.01 | |
| Intersection Signal Delay: 35.3 | Intersection LOS: D |
| Intersection Capacity Utilization 94.3% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Gainsborough Road & Hyde Park Road



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 127 | 359 | 153 | 165 | 170 | 153 | 1422 | 168 | 1369 |
| v/c Ratio | 0.47 | 0.76 | 1.01 | 0.35 | 0.24 | 0.63 | 0.90 | 0.48 | 0.76 |
| Control Delay | 41.9 | 45.3 | 119.3 | 37.1 | 16.9 | 20.2 | 35.2 | 27.4 | 27.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 41.9 | 45.3 | 119.3 | 37.1 | 16.9 | 20.2 | 35.2 | 27.4 | 27.6 |
| Queue Length 50th (m) | 25.1 | 66.8 | 35.7 | 31.5 | 19.1 | 11.2 | 159.6 | 19.3 | 135.2 |
| Queue Length 95th (m) | 40.2 | 92.0 | #69.5 | 46.2 | 33.2 | 29.5 | #195.8 | #59.0 | 182.0 |
| Internal Link Dist (m) | | 159.4 | | 199.7 | | | 99.2 | | 171.2 |
| Turn Bay Length (m) | | | 110.0 | | | 80.0 | | 80.0 | |
| Base Capacity (vph) | 351 | 594 | 192 | 606 | 701 | 252 | 1575 | 350 | 1813 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.36 | 0.60 | 0.80 | 0.27 | 0.24 | 0.61 | 0.90 | 0.48 | 0.76 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 124 | 163 | 189 | 150 | 162 | 167 | 150 | 1194 | 200 | 165 | 1191 | 151 |
| Future Volume (vph) | 124 | 163 | 189 | 150 | 162 | 167 | 150 | 1194 | 200 | 165 | 1191 | 151 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 6.6 | 6.6 | | 3.6 | 6.6 | 4.0 | 4.0 | 6.1 | | 4.0 | 6.1 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.92 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1698 | 1706 | | 1789 | 1847 | 1583 | 1738 | 3486 | | 1807 | 3456 | |
| Flt Permitted | 0.60 | 1.00 | | 0.29 | 1.00 | 1.00 | 0.11 | 1.00 | | 0.07 | 1.00 | |
| Satd. Flow (perm) | 1073 | 1706 | | 545 | 1847 | 1583 | 205 | 3486 | | 131 | 3456 | |
| Peak-hour factor, PHF | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Adj. Flow (vph) | 127 | 166 | 193 | 153 | 165 | 170 | 153 | 1218 | 204 | 168 | 1215 | 154 |
| RTOR Reduction (vph) | 0 | 39 | 0 | 0 | 0 | 16 | 0 | 11 | 0 | 0 | 7 | 0 |
| Lane Group Flow (vph) | 127 | 320 | 0 | 153 | 165 | 154 | 153 | 1411 | 0 | 168 | 1362 | 0 |
| Confl. Peds. (#/hr) | 5 | | | | | 5 | 1 | | 4 | 4 | | 1 |
| Heavy Vehicles (%) | 7% | 3% | 4% | 2% | 4% | 2% | 5% | 2% | 2% | 1% | 3% | 8% |
| Turn Type | Perm | NA | | Perm | NA | pm+ov | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 8 | | | 4 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 8 | | | 4 | | 4 | 2 | | | 6 | | |
| Actuated Green, G (s) | 30.4 | 30.4 | | 30.4 | 30.4 | 49.4 | 64.1 | 53.9 | | 76.9 | 62.7 | |
| Effective Green, g (s) | 30.4 | 30.4 | | 33.4 | 30.4 | 49.4 | 64.1 | 53.9 | | 76.9 | 62.7 | |
| Actuated g/C Ratio | 0.25 | 0.25 | | 0.28 | 0.25 | 0.41 | 0.53 | 0.45 | | 0.64 | 0.52 | |
| Clearance Time (s) | 6.6 | 6.6 | | 6.6 | 6.6 | 4.0 | 4.0 | 6.1 | | 4.0 | 6.1 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 271 | 432 | | 151 | 467 | 651 | 239 | 1565 | | 349 | 1805 | |
| v/s Ratio Prot | | 0.19 | | | 0.09 | 0.04 | c0.05 | c0.40 | | 0.08 | c0.39 | |
| v/s Ratio Perm | 0.12 | | | c0.28 | | 0.06 | 0.29 | | | 0.23 | | |
| v/c Ratio | 0.47 | 0.74 | | 1.01 | 0.35 | 0.24 | 0.64 | 0.90 | | 0.48 | 0.75 | |
| Uniform Delay, d1 | 38.0 | 41.2 | | 43.3 | 36.7 | 23.0 | 18.2 | 30.6 | | 25.1 | 22.6 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 0.76 | 0.91 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.3 | 6.7 | | 76.8 | 0.5 | 0.2 | 4.6 | 7.3 | | 4.7 | 3.0 | |
| Delay (s) | 39.2 | 47.9 | | 120.1 | 37.2 | 23.2 | 18.5 | 35.0 | | 29.8 | 25.6 | |
| Level of Service | D | D | | F | D | C | B | C | | C | C | |
| Approach Delay (s) | | 45.6 | | | 58.3 | | | 33.4 | | | 26.0 | |
| Approach LOS | | D | | | E | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 35.0 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.91 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 16.7 |
| Intersection Capacity Utilization | 94.3% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Lane Group | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 1 | 44 | 0 | 67 | 1600 | 69 | 1667 |
| Future Volume (vph) | 1 | 44 | 0 | 67 | 1600 | 69 | 1667 |
| Turn Type | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Minimum Split (s) | 35.5 | 35.5 | 35.5 | 30.0 | 30.0 | 30.0 | 30.0 |
| Total Split (s) | 37.0 | 37.0 | 37.0 | 83.0 | 83.0 | 83.0 | 83.0 |
| Total Split (%) | 30.8% | 30.8% | 30.8% | 69.2% | 69.2% | 69.2% | 69.2% |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 |
| All-Red Time (s) | 3.2 | 3.2 | 3.2 | 2.7 | 2.7 | 2.7 | 2.7 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.5 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Recall Mode | None | None | None | C-Max | C-Max | C-Max | C-Max |
| Act Effct Green (s) | 9.7 | | 9.7 | 97.8 | 97.8 | 97.8 | 97.8 |
| Actuated g/C Ratio | 0.08 | | 0.08 | 0.82 | 0.82 | 0.82 | 0.82 |
| v/c Ratio | 0.16 | | 0.50 | 0.40 | 0.62 | 0.44 | 0.60 |
| Control Delay | 22.1 | | 45.1 | 11.4 | 5.5 | 21.0 | 12.0 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 22.1 | | 45.1 | 11.4 | 5.5 | 21.0 | 12.0 |
| LOS | C | | D | B | A | C | B |
| Approach Delay | 22.1 | | 45.1 | | 5.7 | | 12.3 |
| Approach LOS | C | | D | | A | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 49 (41%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.62 | |
| Intersection Signal Delay: 10.2 | Intersection LOS: B |
| Intersection Capacity Utilization 78.3% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 2: Hyde Park Road & South Carriage Road

| Lane Group | EBT | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 23 | 122 | 69 | 1768 | 71 | 1721 |
| v/c Ratio | 0.16 | 0.50 | 0.40 | 0.62 | 0.44 | 0.60 |
| Control Delay | 22.1 | 45.1 | 11.4 | 5.5 | 21.0 | 12.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 22.1 | 45.1 | 11.4 | 5.5 | 21.0 | 12.0 |
| Queue Length 50th (m) | 0.2 | 10.6 | 3.5 | 63.0 | 9.4 | 139.5 |
| Queue Length 95th (m) | 8.1 | 20.0 | 13.9 | 93.3 | m19.7 | 196.5 |
| Internal Link Dist (m) | 128.5 | 141.5 | | 344.4 | | 316.2 |
| Turn Bay Length (m) | | | 250.0 | | | |
| Base Capacity (vph) | 413 | 693 | 172 | 2854 | 161 | 2887 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.06 | 0.18 | 0.40 | 0.62 | 0.44 | 0.60 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 0 | 1 | 21 | 44 | 0 | 75 | 67 | 1600 | 115 | 69 | 1667 | 2 |
| Future Volume (vph) | 0 | 1 | 21 | 44 | 0 | 75 | 67 | 1600 | 115 | 69 | 1667 | 2 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 6.5 | | | 6.5 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | | 1.00 | | | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 0.99 | | | 0.99 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.87 | | | 0.91 | | 1.00 | 0.99 | | 1.00 | 1.00 | |
| Flt Protected | | 1.00 | | | 0.98 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1562 | | | 3059 | | 1754 | 3499 | | 1737 | 3543 | |
| Flt Permitted | | 1.00 | | | 0.84 | | 0.12 | 1.00 | | 0.11 | 1.00 | |
| Satd. Flow (perm) | | 1562 | | | 2632 | | 212 | 3499 | | 197 | 3543 | |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 0 | 1 | 22 | 45 | 0 | 77 | 69 | 1649 | 119 | 71 | 1719 | 2 |
| RTOR Reduction (vph) | 0 | 20 | 0 | 0 | 30 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 3 | 0 | 0 | 92 | 0 | 69 | 1766 | 0 | 71 | 1721 | 0 |
| Confl. Peds. (#/hr) | 3 | | 3 | 3 | | 3 | 4 | | 3 | 3 | | 4 |
| Heavy Vehicles (%) | 0% | 38% | 4% | 3% | 17% | 6% | 4% | 3% | 4% | 5% | 3% | 12% |
| Turn Type | | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 9.7 | | | 9.7 | | 97.8 | 97.8 | | 97.8 | 97.8 | |
| Effective Green, g (s) | | 9.7 | | | 9.7 | | 97.8 | 97.8 | | 97.8 | 97.8 | |
| Actuated g/C Ratio | | 0.08 | | | 0.08 | | 0.81 | 0.81 | | 0.81 | 0.81 | |
| Clearance Time (s) | | 6.5 | | | 6.5 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 126 | | | 212 | | 172 | 2851 | | 160 | 2887 | |
| v/s Ratio Prot | | 0.00 | | | | | | c0.50 | | | 0.49 | |
| v/s Ratio Perm | | | | | c0.03 | | 0.32 | | | 0.36 | | |
| v/c Ratio | | 0.02 | | | 0.43 | | 0.40 | 0.62 | | 0.44 | 0.60 | |
| Uniform Delay, d1 | | 50.8 | | | 52.5 | | 3.1 | 4.1 | | 3.2 | 4.0 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 2.85 | 2.61 | |
| Incremental Delay, d2 | | 0.1 | | | 1.4 | | 6.8 | 1.0 | | 6.6 | 0.7 | |
| Delay (s) | | 50.9 | | | 53.9 | | 9.9 | 5.2 | | 15.8 | 11.1 | |
| Level of Service | | D | | | D | | A | A | | B | B | |
| Approach Delay (s) | | 50.9 | | | 53.9 | | | 5.3 | | | 11.3 | |
| Approach LOS | | D | | | D | | | A | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 10.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.60 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 78.3% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 93 | 138 | 167 | 111 | 93 | 149 | 862 | 56 | 724 |
| Future Volume (vph) | 93 | 138 | 167 | 111 | 93 | 149 | 862 | 56 | 724 |
| Turn Type | Perm | NA | Perm | NA | pm+ov | pm+pt | NA | pm+pt | NA |
| Protected Phases | | 8 | | 4 | 1 | 5 | 2 | 1 | 6 |
| Permitted Phases | 8 | | 4 | | 4 | 2 | | 6 | |
| Detector Phase | 8 | 8 | 4 | 4 | 1 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | 7.0 | 5.0 | 5.0 | 7.0 | 5.0 | 7.0 |
| Minimum Split (s) | 36.6 | 36.6 | 36.6 | 36.6 | 9.0 | 9.0 | 28.1 | 9.0 | 28.1 |
| Total Split (s) | 50.0 | 50.0 | 50.0 | 50.0 | 10.0 | 15.0 | 50.0 | 10.0 | 45.0 |
| Total Split (%) | 45.5% | 45.5% | 45.5% | 45.5% | 9.1% | 13.6% | 45.5% | 9.1% | 40.9% |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.0 | 3.0 | 3.4 | 3.0 | 3.4 |
| All-Red Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 1.0 | 1.0 | 2.7 | 1.0 | 2.7 |
| Lost Time Adjust (s) | 0.0 | 0.0 | -3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.6 | 6.6 | 3.6 | 6.6 | 4.0 | 4.0 | 6.1 | 4.0 | 6.1 |
| Lead/Lag | | | | | Lead | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | Max | None | C-Max | Max | C-Max |
| Act Effct Green (s) | 30.5 | 30.5 | 33.5 | 30.5 | 52.0 | 55.3 | 43.9 | 66.6 | 53.3 |
| Actuated g/C Ratio | 0.28 | 0.28 | 0.30 | 0.28 | 0.47 | 0.50 | 0.40 | 0.61 | 0.48 |
| v/c Ratio | 0.31 | 0.68 | 0.95 | 0.24 | 0.13 | 0.45 | 0.78 | 0.16 | 0.52 |
| Control Delay | 31.1 | 33.5 | 88.5 | 29.4 | 6.0 | 13.9 | 28.5 | 12.0 | 23.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 31.1 | 33.5 | 88.5 | 29.4 | 6.0 | 13.9 | 28.5 | 12.0 | 23.0 |
| LOS | C | C | F | C | A | B | C | B | C |
| Approach Delay | | 32.9 | | 50.2 | | | 26.6 | | 22.3 |
| Approach LOS | | C | | D | | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 110 | |
| Actuated Cycle Length: 110 | |
| Offset: 95 (86%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.95 | |
| Intersection Signal Delay: 29.4 | Intersection LOS: C |
| Intersection Capacity Utilization 77.5% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Hyde Park Road & Gainsborough Road

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 103 | 351 | 186 | 123 | 103 | 166 | 1096 | 62 | 880 |
| v/c Ratio | 0.31 | 0.68 | 0.95 | 0.24 | 0.13 | 0.45 | 0.78 | 0.16 | 0.52 |
| Control Delay | 31.1 | 33.5 | 88.5 | 29.4 | 6.0 | 13.9 | 28.5 | 12.0 | 23.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 31.1 | 33.5 | 88.5 | 29.4 | 6.0 | 13.9 | 28.5 | 12.0 | 23.0 |
| Queue Length 50th (m) | 17.4 | 53.8 | 38.7 | 20.4 | 3.4 | 13.3 | 105.8 | 4.8 | 66.3 |
| Queue Length 95th (m) | 26.9 | 70.8 | #65.9 | 29.4 | 11.9 | 25.4 | 99.5 | 13.3 | 106.6 |
| Internal Link Dist (m) | | 159.4 | | 199.7 | | | 99.2 | | 171.2 |
| Turn Bay Length (m) | | | 110.0 | | | 80.0 | | 80.0 | |
| Base Capacity (vph) | 478 | 706 | 272 | 728 | 786 | 398 | 1407 | 394 | 1692 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.22 | 0.50 | 0.68 | 0.17 | 0.13 | 0.42 | 0.78 | 0.16 | 0.52 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 93 | 138 | 178 | 167 | 111 | 93 | 149 | 862 | 124 | 56 | 724 | 68 |
| Future Volume (vph) | 93 | 138 | 178 | 167 | 111 | 93 | 149 | 862 | 124 | 56 | 724 | 68 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 6.6 | 6.6 | | 3.6 | 6.6 | 4.0 | 4.0 | 6.1 | | 4.0 | 6.1 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 0.99 | | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.92 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1701 | 1683 | | 1786 | 1847 | 1586 | 1738 | 3500 | | 1807 | 3483 | |
| Flt Permitted | 0.68 | 1.00 | | 0.34 | 1.00 | 1.00 | 0.29 | 1.00 | | 0.10 | 1.00 | |
| Satd. Flow (perm) | 1214 | 1683 | | 644 | 1847 | 1586 | 535 | 3500 | | 195 | 3483 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 103 | 153 | 198 | 186 | 123 | 103 | 166 | 958 | 138 | 62 | 804 | 76 |
| RTOR Reduction (vph) | 0 | 51 | 0 | 0 | 0 | 39 | 0 | 10 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 103 | 300 | 0 | 186 | 123 | 64 | 166 | 1086 | 0 | 62 | 875 | 0 |
| Confl. Peds. (#/hr) | 3 | | 3 | 3 | | 3 | | | 2 | 2 | | |
| Heavy Vehicles (%) | 7% | 3% | 4% | 2% | 4% | 2% | 5% | 2% | 2% | 1% | 3% | 8% |
| Turn Type | Perm | NA | | Perm | NA | pm+ov | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 8 | | | 4 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 8 | | | 4 | | 4 | 2 | | | 6 | | |
| Actuated Green, G (s) | 30.5 | 30.5 | | 30.5 | 30.5 | 49.4 | 53.4 | 43.9 | | 66.8 | 53.3 | |
| Effective Green, g (s) | 30.5 | 30.5 | | 33.5 | 30.5 | 49.4 | 53.4 | 43.9 | | 66.8 | 53.3 | |
| Actuated g/C Ratio | 0.28 | 0.28 | | 0.30 | 0.28 | 0.45 | 0.49 | 0.40 | | 0.61 | 0.48 | |
| Clearance Time (s) | 6.6 | 6.6 | | 6.6 | 6.6 | 4.0 | 4.0 | 6.1 | | 4.0 | 6.1 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 336 | 466 | | 196 | 512 | 712 | 363 | 1396 | | 395 | 1687 | |
| v/s Ratio Prot | | 0.18 | | | 0.07 | 0.02 | c0.04 | c0.31 | | 0.03 | c0.25 | |
| v/s Ratio Perm | 0.08 | | | c0.29 | | 0.03 | 0.18 | | | 0.07 | | |
| v/c Ratio | 0.31 | 0.64 | | 0.95 | 0.24 | 0.09 | 0.46 | 0.78 | | 0.16 | 0.52 | |
| Uniform Delay, d1 | 31.4 | 35.0 | | 37.4 | 30.8 | 17.4 | 16.2 | 28.8 | | 13.2 | 19.5 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 0.90 | 0.86 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 3.1 | | 49.2 | 0.2 | 0.1 | 0.8 | 3.8 | | 0.8 | 1.1 | |
| Delay (s) | 31.9 | 38.0 | | 86.6 | 31.0 | 17.5 | 15.3 | 28.5 | | 14.0 | 20.7 | |
| Level of Service | C | D | | F | C | B | B | C | | B | C | |
| Approach Delay (s) | | 36.6 | | | 52.7 | | | 26.8 | | | 20.2 | |
| Approach LOS | | D | | | D | | | C | | | C | |

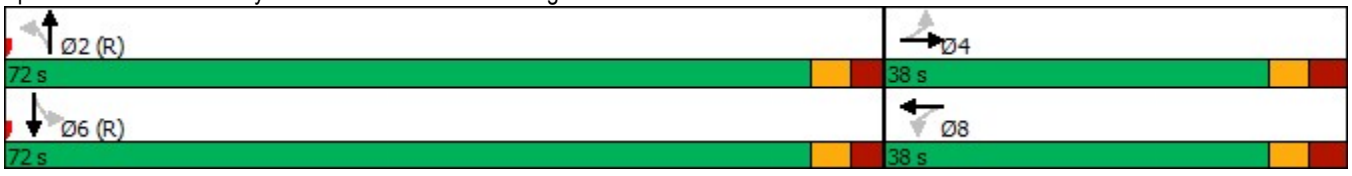
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 29.7 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.79 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 16.7 |
| Intersection Capacity Utilization | 77.5% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Lane Group | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 1 | 95 | 0 | 27 | 1179 | 64 | 1142 |
| Future Volume (vph) | 1 | 95 | 0 | 27 | 1179 | 64 | 1142 |
| Turn Type | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Minimum Split (s) | 35.5 | 35.5 | 35.5 | 30.0 | 30.0 | 30.0 | 30.0 |
| Total Split (s) | 38.0 | 38.0 | 38.0 | 72.0 | 72.0 | 72.0 | 72.0 |
| Total Split (%) | 34.5% | 34.5% | 34.5% | 65.5% | 65.5% | 65.5% | 65.5% |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 |
| All-Red Time (s) | 3.2 | 3.2 | 3.2 | 2.7 | 2.7 | 2.7 | 2.7 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.5 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Recall Mode | None | None | None | C-Max | C-Max | C-Max | C-Max |
| Act Effct Green (s) | 10.3 | | 10.3 | 87.2 | 87.2 | 87.2 | 87.2 |
| Actuated g/C Ratio | 0.09 | | 0.09 | 0.79 | 0.79 | 0.79 | 0.79 |
| v/c Ratio | 0.23 | | 0.56 | 0.10 | 0.51 | 0.29 | 0.45 |
| Control Delay | 16.9 | | 37.5 | 4.0 | 4.9 | 5.4 | 3.2 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 16.9 | | 37.5 | 4.0 | 4.9 | 5.4 | 3.2 |
| LOS | B | | D | A | A | A | A |
| Approach Delay | 16.9 | | 37.5 | | 4.9 | | 3.3 |
| Approach LOS | B | | D | | A | | A |

| Intersection Summary | |
|---|---|
| Cycle Length: 110 | |
| Actuated Cycle Length: 110 | |
| Offset: 89 (81%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.56 | |
| Intersection Signal Delay: 6.2 | Intersection LOS: A |
| Intersection Capacity Utilization 71.3% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 2: Hyde Park Road & South Carriage Road



| Lane Group | EBT | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 43 | 164 | 30 | 1416 | 71 | 1271 |
| v/c Ratio | 0.23 | 0.56 | 0.10 | 0.51 | 0.29 | 0.45 |
| Control Delay | 16.9 | 37.5 | 4.0 | 4.9 | 5.4 | 3.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 16.9 | 37.5 | 4.0 | 4.9 | 5.4 | 3.2 |
| Queue Length 50th (m) | 0.2 | 11.5 | 1.2 | 43.3 | 2.3 | 29.2 |
| Queue Length 95th (m) | 10.4 | 21.6 | 4.1 | 66.9 | m6.4 | 36.3 |
| Internal Link Dist (m) | 128.5 | 141.5 | | 344.4 | | 184.5 |
| Turn Bay Length (m) | | | 250.0 | | | |
| Base Capacity (vph) | 485 | 777 | 292 | 2773 | 242 | 2807 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.09 | 0.21 | 0.10 | 0.51 | 0.29 | 0.45 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 0 | 1 | 38 | 95 | 0 | 52 | 27 | 1179 | 95 | 64 | 1142 | 2 |
| Future Volume (vph) | 0 | 1 | 38 | 95 | 0 | 52 | 27 | 1179 | 95 | 64 | 1142 | 2 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 6.5 | | | 6.5 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | | 1.00 | | | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 1.00 | | | 0.99 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.87 | | | 0.95 | | 1.00 | 0.99 | | 1.00 | 1.00 | |
| Flt Protected | | 1.00 | | | 0.97 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1592 | | | 3195 | | 1752 | 3496 | | 1738 | 3542 | |
| Flt Permitted | | 1.00 | | | 0.78 | | 0.20 | 1.00 | | 0.17 | 1.00 | |
| Satd. Flow (perm) | | 1592 | | | 2571 | | 369 | 3496 | | 305 | 3542 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 0 | 1 | 42 | 106 | 0 | 58 | 30 | 1310 | 106 | 71 | 1269 | 2 |
| RTOR Reduction (vph) | 0 | 38 | 0 | 0 | 53 | 0 | 0 | 3 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 5 | 0 | 0 | 111 | 0 | 30 | 1413 | 0 | 71 | 1271 | 0 |
| Confl. Peds. (#/hr) | 7 | | | | | 7 | 7 | | 1 | 1 | | 7 |
| Heavy Vehicles (%) | 0% | 38% | 4% | 3% | 17% | 6% | 4% | 3% | 4% | 5% | 3% | 12% |
| Turn Type | | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 10.3 | | | 10.3 | | 87.2 | 87.2 | | 87.2 | 87.2 | |
| Effective Green, g (s) | | 10.3 | | | 10.3 | | 87.2 | 87.2 | | 87.2 | 87.2 | |
| Actuated g/C Ratio | | 0.09 | | | 0.09 | | 0.79 | 0.79 | | 0.79 | 0.79 | |
| Clearance Time (s) | | 6.5 | | | 6.5 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 149 | | | 240 | | 292 | 2771 | | 241 | 2807 | |
| v/s Ratio Prot | | 0.00 | | | | | | c0.40 | | | 0.36 | |
| v/s Ratio Perm | | | | | c0.04 | | 0.08 | | | 0.23 | | |
| v/c Ratio | | 0.03 | | | 0.46 | | 0.10 | 0.51 | | 0.29 | 0.45 | |
| Uniform Delay, d1 | | 45.3 | | | 47.2 | | 2.6 | 4.0 | | 3.1 | 3.7 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 0.63 | 0.69 | |
| Incremental Delay, d2 | | 0.1 | | | 1.4 | | 0.7 | 0.7 | | 2.8 | 0.5 | |
| Delay (s) | | 45.4 | | | 48.7 | | 3.3 | 4.6 | | 4.7 | 3.0 | |
| Level of Service | | D | | | D | | A | A | | A | A | |
| Approach Delay (s) | | 45.4 | | | 48.7 | | | 4.6 | | | 3.1 | |
| Approach LOS | | D | | | D | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 6.9 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.50 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 71.3% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 17 | 1170 | 8 | 0 | 1139 |
| Future Volume (Veh/h) | 0 | 17 | 1170 | 8 | 0 | 1139 |
| 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) | 0 | 18 | 1272 | 9 | 0 | 1238 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | 208 | | | 255 |
| pX, platoon unblocked | 0.90 | 0.87 | | | 0.87 | |
| vC, conflicting volume | 1689 | 640 | | | 1281 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1133 | 281 | | | 1019 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 97 | | | 100 | |
| cM capacity (veh/h) | 177 | 622 | | | 587 | |

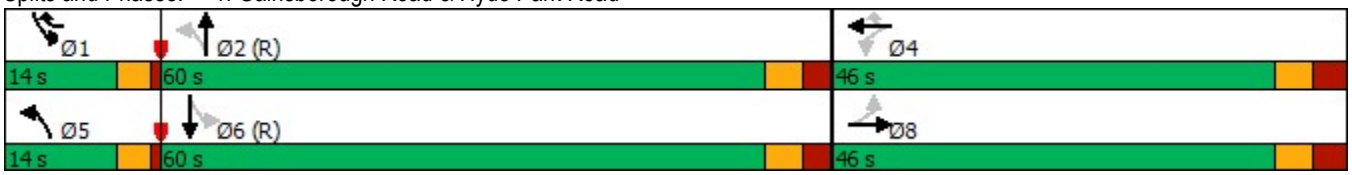
| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 | SB 3 |
|---|---|---|---|---|---|---|
| Volume Total | 18 | 848 | 433 | 248 | 495 | 495 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 18 | 0 | 9 | 0 | 0 | 0 |
| cSH | 622 | 1700 | 1700 | 587 | 1700 | 1700 |
| Volume to Capacity | 0.03 | 0.50 | 0.25 | 0.00 | 0.29 | 0.29 |
| Queue Length 95th (m) | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Control Delay (s) | 11.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | B | | | | | |
| Approach Delay (s) | 11.0 | 0.0 | | 0.0 | | |
| Approach LOS | B | | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 42.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 124 | 163 | 152 | 162 | 167 | 151 | 1202 | 165 | 1204 |
| Future Volume (vph) | 124 | 163 | 152 | 162 | 167 | 151 | 1202 | 165 | 1204 |
| Turn Type | Perm | NA | Perm | NA | pm+ov | pm+pt | NA | pm+pt | NA |
| Protected Phases | | 8 | | 4 | 1 | 5 | 2 | 1 | 6 |
| Permitted Phases | 8 | | 4 | | 4 | 2 | | 6 | |
| Detector Phase | 8 | 8 | 4 | 4 | 1 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | 7.0 | 5.0 | 5.0 | 7.0 | 5.0 | 7.0 |
| Minimum Split (s) | 36.6 | 36.6 | 36.6 | 36.6 | 9.0 | 9.0 | 28.1 | 9.0 | 28.1 |
| Total Split (s) | 46.0 | 46.0 | 46.0 | 46.0 | 14.0 | 14.0 | 60.0 | 14.0 | 60.0 |
| Total Split (%) | 38.3% | 38.3% | 38.3% | 38.3% | 11.7% | 11.7% | 50.0% | 11.7% | 50.0% |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.0 | 3.0 | 3.4 | 3.0 | 3.4 |
| All-Red Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 1.0 | 1.0 | 2.7 | 1.0 | 2.7 |
| Lost Time Adjust (s) | 0.0 | 0.0 | -3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.6 | 6.6 | 3.6 | 6.6 | 4.0 | 4.0 | 6.1 | 4.0 | 6.1 |
| Lead/Lag | | | | | Lead | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | Max | None | C-Max | Max | C-Max |
| Act Effct Green (s) | 30.7 | 30.7 | 33.7 | 30.7 | 52.0 | 66.1 | 53.9 | 77.1 | 62.5 |
| Actuated g/C Ratio | 0.26 | 0.26 | 0.28 | 0.26 | 0.43 | 0.55 | 0.45 | 0.64 | 0.52 |
| v/c Ratio | 0.46 | 0.76 | 1.01 | 0.35 | 0.24 | 0.65 | 0.91 | 0.49 | 0.77 |
| Control Delay | 41.4 | 44.9 | 119.0 | 36.8 | 16.9 | 22.3 | 35.6 | 27.8 | 28.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 41.4 | 44.9 | 119.0 | 36.8 | 16.9 | 22.3 | 35.6 | 27.8 | 28.1 |
| LOS | D | D | F | D | B | C | D | C | C |
| Approach Delay | | 44.0 | | 55.9 | | | 34.3 | | 28.1 |
| Approach LOS | | D | | E | | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 95 (79%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.01 | |
| Intersection Signal Delay: 35.7 | Intersection LOS: D |
| Intersection Capacity Utilization 94.8% | ICU Level of Service F |
| Analysis Period (min) 15 | |

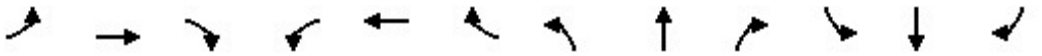
Splits and Phases: 1: Gainsborough Road & Hyde Park Road



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 127 | 361 | 155 | 165 | 170 | 154 | 1433 | 168 | 1383 |
| v/c Ratio | 0.46 | 0.76 | 1.01 | 0.35 | 0.24 | 0.65 | 0.91 | 0.49 | 0.77 |
| Control Delay | 41.4 | 44.9 | 119.0 | 36.8 | 16.9 | 22.3 | 35.6 | 27.8 | 28.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 41.4 | 44.9 | 119.0 | 36.8 | 16.9 | 22.3 | 35.6 | 27.8 | 28.1 |
| Queue Length 50th (m) | 24.9 | 67.0 | 36.1 | 31.3 | 19.1 | 11.0 | 161.8 | 19.5 | 138.8 |
| Queue Length 95th (m) | 40.2 | 92.6 | #70.3 | 46.2 | 33.2 | #32.0 | #200.9 | #59.0 | 184.8 |
| Internal Link Dist (m) | | 159.4 | | 199.7 | | | 99.2 | | 171.2 |
| Turn Bay Length (m) | | | 110.0 | | | 80.0 | | 80.0 | |
| Base Capacity (vph) | 352 | 594 | 192 | 606 | 701 | 246 | 1575 | 345 | 1807 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.36 | 0.61 | 0.81 | 0.27 | 0.24 | 0.63 | 0.91 | 0.49 | 0.77 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 124 | 163 | 191 | 152 | 162 | 167 | 151 | 1202 | 202 | 165 | 1204 | 151 |
| Future Volume (vph) | 124 | 163 | 191 | 152 | 162 | 167 | 151 | 1202 | 202 | 165 | 1204 | 151 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 6.6 | 6.6 | | 3.6 | 6.6 | 4.0 | 4.0 | 6.1 | | 4.0 | 6.1 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.92 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1698 | 1705 | | 1789 | 1847 | 1583 | 1738 | 3486 | | 1807 | 3457 | |
| Flt Permitted | 0.60 | 1.00 | | 0.29 | 1.00 | 1.00 | 0.11 | 1.00 | | 0.07 | 1.00 | |
| Satd. Flow (perm) | 1075 | 1705 | | 546 | 1847 | 1583 | 196 | 3486 | | 131 | 3457 | |
| Peak-hour factor, PHF | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Adj. Flow (vph) | 127 | 166 | 195 | 155 | 165 | 170 | 154 | 1227 | 206 | 168 | 1229 | 154 |
| RTOR Reduction (vph) | 0 | 39 | 0 | 0 | 0 | 16 | 0 | 11 | 0 | 0 | 7 | 0 |
| Lane Group Flow (vph) | 127 | 322 | 0 | 155 | 165 | 154 | 154 | 1422 | 0 | 168 | 1376 | 0 |
| Confl. Peds. (#/hr) | 5 | | | | | 5 | 1 | | 4 | 4 | | 1 |
| Heavy Vehicles (%) | 7% | 3% | 4% | 2% | 4% | 2% | 5% | 2% | 2% | 1% | 3% | 8% |
| Turn Type | Perm | NA | | Perm | NA | pm+ov | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 8 | | | 4 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 8 | | | 4 | | 4 | 2 | | | 6 | | |
| Actuated Green, G (s) | 30.7 | 30.7 | | 30.7 | 30.7 | 49.4 | 64.0 | 53.9 | | 76.6 | 62.5 | |
| Effective Green, g (s) | 30.7 | 30.7 | | 33.7 | 30.7 | 49.4 | 64.0 | 53.9 | | 76.6 | 62.5 | |
| Actuated g/C Ratio | 0.26 | 0.26 | | 0.28 | 0.26 | 0.41 | 0.53 | 0.45 | | 0.64 | 0.52 | |
| Clearance Time (s) | 6.6 | 6.6 | | 6.6 | 6.6 | 4.0 | 4.0 | 6.1 | | 4.0 | 6.1 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 275 | 436 | | 153 | 472 | 651 | 234 | 1565 | | 344 | 1800 | |
| v/s Ratio Prot | | 0.19 | | | 0.09 | 0.04 | c0.06 | c0.41 | | 0.08 | c0.40 | |
| v/s Ratio Perm | 0.12 | | | c0.28 | | 0.06 | 0.30 | | | 0.23 | | |
| v/c Ratio | 0.46 | 0.74 | | 1.01 | 0.35 | 0.24 | 0.66 | 0.91 | | 0.49 | 0.76 | |
| Uniform Delay, d1 | 37.7 | 41.0 | | 43.1 | 36.5 | 23.0 | 18.7 | 30.8 | | 25.4 | 22.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 0.78 | 0.90 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.2 | 6.5 | | 76.2 | 0.5 | 0.2 | 5.3 | 7.7 | | 4.9 | 3.1 | |
| Delay (s) | 38.9 | 47.4 | | 119.4 | 36.9 | 23.2 | 19.9 | 35.4 | | 30.3 | 26.0 | |
| Level of Service | D | D | | F | D | C | B | D | | C | C | |
| Approach Delay (s) | | 45.2 | | | 58.2 | | | 33.9 | | | 26.5 | |
| Approach LOS | | D | | | E | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 35.3 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.91 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 16.7 |
| Intersection Capacity Utilization | 94.8% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Lane Group | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 1 | 58 | 0 | 67 | 1618 | 87 | 1665 |
| Future Volume (vph) | 1 | 58 | 0 | 67 | 1618 | 87 | 1665 |
| Turn Type | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Minimum Split (s) | 35.5 | 35.5 | 35.5 | 30.0 | 30.0 | 30.0 | 30.0 |
| Total Split (s) | 37.0 | 37.0 | 37.0 | 83.0 | 83.0 | 83.0 | 83.0 |
| Total Split (%) | 30.8% | 30.8% | 30.8% | 69.2% | 69.2% | 69.2% | 69.2% |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 |
| All-Red Time (s) | 3.2 | 3.2 | 3.2 | 2.7 | 2.7 | 2.7 | 2.7 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.5 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Recall Mode | None | None | None | C-Max | C-Max | C-Max | C-Max |
| Act Effct Green (s) | 10.4 | | 10.4 | 97.1 | 97.1 | 97.1 | 97.1 |
| Actuated g/C Ratio | 0.09 | | 0.09 | 0.81 | 0.81 | 0.81 | 0.81 |
| v/c Ratio | 0.15 | | 0.54 | 0.41 | 0.63 | 0.59 | 0.60 |
| Control Delay | 21.5 | | 47.4 | 12.0 | 5.9 | 31.9 | 12.6 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 21.5 | | 47.4 | 12.0 | 5.9 | 31.9 | 12.6 |
| LOS | C | | D | B | A | C | B |
| Approach Delay | 21.5 | | 47.4 | | 6.1 | | 13.5 |
| Approach LOS | C | | D | | A | | B |

| Intersection Summary | | |
|---|---|---|
| Cycle Length: 120 | | |
| Actuated Cycle Length: 120 | | |
| Offset: 49 (41%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | |
| Natural Cycle: 130 | | |
| Control Type: Actuated-Coordinated | | |
| Maximum v/c Ratio: 0.63 | | |
| Intersection Signal Delay: 11.2 | Intersection LOS: B | |
| Intersection Capacity Utilization 80.9% | ICU Level of Service D | |
| Analysis Period (min) 15 | | |

Splits and Phases: 2: Hyde Park Road & South Carriage Road

| Lane Group | EBT | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 23 | 137 | 69 | 1787 | 90 | 1718 |
| v/c Ratio | 0.15 | 0.54 | 0.41 | 0.63 | 0.59 | 0.60 |
| Control Delay | 21.5 | 47.4 | 12.0 | 5.9 | 31.9 | 12.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 21.5 | 47.4 | 12.0 | 5.9 | 31.9 | 12.6 |
| Queue Length 50th (m) | 0.2 | 12.6 | 3.6 | 67.6 | 14.0 | 141.7 |
| Queue Length 95th (m) | 8.0 | 22.3 | 14.8 | 100.1 | m19.8 | 198.1 |
| Internal Link Dist (m) | 128.5 | 141.5 | | 344.4 | | 207.5 |
| Turn Bay Length (m) | | | 250.0 | | | |
| Base Capacity (vph) | 413 | 689 | 170 | 2834 | 153 | 2866 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.06 | 0.20 | 0.41 | 0.63 | 0.59 | 0.60 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 0 | 1 | 21 | 58 | 0 | 75 | 67 | 1618 | 115 | 87 | 1665 | 2 |
| Future Volume (vph) | 0 | 1 | 21 | 58 | 0 | 75 | 67 | 1618 | 115 | 87 | 1665 | 2 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 6.5 | | | 6.5 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | | 1.00 | | | 0.95 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | | 0.99 | | | 0.99 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.87 | | | 0.92 | | 1.00 | 0.99 | | 1.00 | 1.00 | |
| Flt Protected | | 1.00 | | | 0.98 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1562 | | | 3092 | | 1754 | 3500 | | 1737 | 3543 | |
| Flt Permitted | | 1.00 | | | 0.83 | | 0.11 | 1.00 | | 0.10 | 1.00 | |
| Satd. Flow (perm) | | 1562 | | | 2617 | | 211 | 3500 | | 190 | 3543 | |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 0 | 1 | 22 | 60 | 0 | 77 | 69 | 1668 | 119 | 90 | 1716 | 2 |
| RTOR Reduction (vph) | 0 | 20 | 0 | 0 | 29 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 3 | 0 | 0 | 108 | 0 | 69 | 1785 | 0 | 90 | 1718 | 0 |
| Confl. Peds. (#/hr) | 3 | | 3 | 3 | | 3 | 4 | | 3 | 3 | | 4 |
| Heavy Vehicles (%) | 0% | 38% | 4% | 3% | 17% | 6% | 4% | 3% | 4% | 5% | 3% | 12% |
| Turn Type | | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 10.4 | | | 10.4 | | 97.1 | 97.1 | | 97.1 | 97.1 | |
| Effective Green, g (s) | | 10.4 | | | 10.4 | | 97.1 | 97.1 | | 97.1 | 97.1 | |
| Actuated g/C Ratio | | 0.09 | | | 0.09 | | 0.81 | 0.81 | | 0.81 | 0.81 | |
| Clearance Time (s) | | 6.5 | | | 6.5 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 135 | | | 226 | | 170 | 2832 | | 153 | 2866 | |
| v/s Ratio Prot | | 0.00 | | | | | | c0.51 | | | 0.48 | |
| v/s Ratio Perm | | | | | c0.04 | | 0.33 | | | 0.47 | | |
| v/c Ratio | | 0.02 | | | 0.48 | | 0.41 | 0.63 | | 0.59 | 0.60 | |
| Uniform Delay, d1 | | 50.1 | | | 52.2 | | 3.3 | 4.5 | | 4.2 | 4.2 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 2.60 | 2.57 | |
| Incremental Delay, d2 | | 0.1 | | | 1.6 | | 7.0 | 1.1 | | 11.9 | 0.7 | |
| Delay (s) | | 50.2 | | | 53.8 | | 10.3 | 5.5 | | 22.7 | 11.6 | |
| Level of Service | | D | | | D | | B | A | | C | B | |
| Approach Delay (s) | | 50.2 | | | 53.8 | | | 5.7 | | | 12.2 | |
| Approach LOS | | D | | | D | | | A | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 10.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.62 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 80.9% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 13 | 1608 | 20 | 0 | 1651 |
| Future Volume (Veh/h) | 0 | 13 | 1608 | 20 | 0 | 1651 |
| 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) | 0 | 14 | 1748 | 22 | 0 | 1795 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | 232 | | | 232 |
| pX, platoon unblocked | 0.88 | 0.78 | | | 0.78 | |
| vC, conflicting volume | 2357 | 885 | | | 1770 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 946 | 288 | | | 1423 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 97 | | | 100 | |
| cM capacity (veh/h) | 228 | 553 | | | 370 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 | SB 3 |
|---|---|---|---|---|---|---|
| Volume Total | 14 | 1165 | 605 | 359 | 718 | 718 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 14 | 0 | 22 | 0 | 0 | 0 |
| cSH | 553 | 1700 | 1700 | 370 | 1700 | 1700 |
| Volume to Capacity | 0.03 | 0.69 | 0.36 | 0.00 | 0.42 | 0.42 |
| Queue Length 95th (m) | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Control Delay (s) | 11.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | B | | | | | |
| Approach Delay (s) | 11.7 | 0.0 | | 0.0 | | |
| Approach LOS | B | | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 55.1% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 124 | 163 | 152 | 162 | 167 | 151 | 1202 | 165 | 1204 |
| Future Volume (vph) | 124 | 163 | 152 | 162 | 167 | 151 | 1202 | 165 | 1204 |
| Turn Type | Perm | NA | Perm | NA | pm+ov | pm+pt | NA | pm+pt | NA |
| Protected Phases | | 8 | | 4 | 1 | 5 | 2 | 1 | 6 |
| Permitted Phases | 8 | | 4 | | 4 | 2 | | 6 | |
| Detector Phase | 8 | 8 | 4 | 4 | 1 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | 7.0 | 5.0 | 5.0 | 7.0 | 5.0 | 7.0 |
| Minimum Split (s) | 36.6 | 36.6 | 36.6 | 36.6 | 9.0 | 9.0 | 28.1 | 9.0 | 28.1 |
| Total Split (s) | 36.7 | 36.7 | 36.7 | 36.7 | 9.0 | 9.0 | 44.3 | 9.0 | 44.3 |
| Total Split (%) | 40.8% | 40.8% | 40.8% | 40.8% | 10.0% | 10.0% | 49.2% | 10.0% | 49.2% |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.0 | 3.0 | 3.4 | 3.0 | 3.4 |
| All-Red Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 1.0 | 1.0 | 2.7 | 1.0 | 2.7 |
| Lost Time Adjust (s) | 0.0 | 0.0 | -3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.6 | 6.6 | 3.6 | 6.6 | 4.0 | 4.0 | 6.1 | 4.0 | 6.1 |
| Lead/Lag | | | | | Lead | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | Max | None | C-Max | Max | C-Max |
| Act Effct Green (s) | 22.6 | 22.6 | 25.6 | 22.6 | 37.7 | 48.2 | 38.2 | 54.6 | 42.8 |
| Actuated g/C Ratio | 0.25 | 0.25 | 0.28 | 0.25 | 0.42 | 0.54 | 0.42 | 0.61 | 0.48 |
| v/c Ratio | 0.44 | 0.75 | 0.89 | 0.36 | 0.25 | 0.65 | 0.96 | 0.50 | 0.84 |
| Control Delay | 31.4 | 33.9 | 74.9 | 28.2 | 12.3 | 28.0 | 41.1 | 21.8 | 27.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 31.4 | 33.9 | 74.9 | 28.2 | 12.3 | 28.0 | 41.1 | 21.8 | 27.6 |
| LOS | C | C | E | C | B | C | D | C | C |
| Approach Delay | | 33.3 | | 37.5 | | | 39.9 | | 27.0 |
| Approach LOS | | C | | D | | | D | | C |

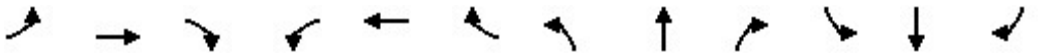
| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.96 | |
| Intersection Signal Delay: 33.9 | Intersection LOS: C |
| Intersection Capacity Utilization 94.8% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Gainsborough Road & Hyde Park Road

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 127 | 361 | 155 | 165 | 170 | 154 | 1433 | 168 | 1383 |
| v/c Ratio | 0.44 | 0.75 | 0.89 | 0.36 | 0.25 | 0.65 | 0.96 | 0.50 | 0.84 |
| Control Delay | 31.4 | 33.9 | 74.9 | 28.2 | 12.3 | 28.0 | 41.1 | 21.8 | 27.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 31.4 | 33.9 | 74.9 | 28.2 | 12.3 | 28.0 | 41.1 | 21.8 | 27.6 |
| Queue Length 50th (m) | 18.2 | 45.9 | 25.2 | 23.1 | 12.9 | 10.0 | 121.5 | 11.0 | 112.5 |
| Queue Length 95th (m) | 30.9 | 68.5 | #52.4 | 35.9 | 25.0 | #43.8 | #170.6 | #51.6 | #162.7 |
| Internal Link Dist (m) | | 159.4 | | 199.7 | | | 99.2 | | 171.2 |
| Turn Bay Length (m) | | | 110.0 | | | 80.0 | | 80.0 | |
| Base Capacity (vph) | 386 | 617 | 225 | 617 | 685 | 237 | 1494 | 334 | 1653 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.33 | 0.59 | 0.69 | 0.27 | 0.25 | 0.65 | 0.96 | 0.50 | 0.84 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 124 | 163 | 191 | 152 | 162 | 167 | 151 | 1202 | 202 | 165 | 1204 | 151 |
| Future Volume (vph) | 124 | 163 | 191 | 152 | 162 | 167 | 151 | 1202 | 202 | 165 | 1204 | 151 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 6.6 | 6.6 | | 3.6 | 6.6 | 4.0 | 4.0 | 6.1 | | 4.0 | 6.1 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.92 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1700 | 1705 | | 1789 | 1847 | 1584 | 1738 | 3487 | | 1807 | 3457 | |
| Flt Permitted | 0.65 | 1.00 | | 0.33 | 1.00 | 1.00 | 0.10 | 1.00 | | 0.09 | 1.00 | |
| Satd. Flow (perm) | 1157 | 1705 | | 614 | 1847 | 1584 | 192 | 3487 | | 180 | 3457 | |
| Peak-hour factor, PHF | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Adj. Flow (vph) | 127 | 166 | 195 | 155 | 165 | 170 | 154 | 1227 | 206 | 168 | 1229 | 154 |
| RTOR Reduction (vph) | 0 | 53 | 0 | 0 | 0 | 23 | 0 | 15 | 0 | 0 | 10 | 0 |
| Lane Group Flow (vph) | 127 | 308 | 0 | 155 | 165 | 147 | 154 | 1418 | 0 | 168 | 1373 | 0 |
| Confl. Peds. (#/hr) | 5 | | | | | 5 | 1 | | 4 | 4 | | 1 |
| Heavy Vehicles (%) | 7% | 3% | 4% | 2% | 4% | 2% | 5% | 2% | 2% | 1% | 3% | 8% |
| Turn Type | Perm | NA | | Perm | NA | pm+ov | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 8 | | | 4 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 8 | | | 4 | | 4 | 2 | | | 6 | | |
| Actuated Green, G (s) | 22.6 | 22.6 | | 22.6 | 22.6 | 35.1 | 46.1 | 38.2 | | 54.7 | 42.8 | |
| Effective Green, g (s) | 22.6 | 22.6 | | 25.6 | 22.6 | 35.1 | 46.1 | 38.2 | | 54.7 | 42.8 | |
| Actuated g/C Ratio | 0.25 | 0.25 | | 0.28 | 0.25 | 0.39 | 0.51 | 0.42 | | 0.61 | 0.48 | |
| Clearance Time (s) | 6.6 | 6.6 | | 6.6 | 6.6 | 4.0 | 4.0 | 6.1 | | 4.0 | 6.1 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 290 | 428 | | 174 | 463 | 617 | 234 | 1480 | | 335 | 1643 | |
| v/s Ratio Prot | | 0.18 | | | 0.09 | 0.03 | c0.06 | c0.41 | | 0.07 | c0.40 | |
| v/s Ratio Perm | 0.11 | | | c0.25 | | 0.06 | 0.28 | | | 0.23 | | |
| v/c Ratio | 0.44 | 0.72 | | 0.89 | 0.36 | 0.24 | 0.66 | 0.96 | | 0.50 | 0.84 | |
| Uniform Delay, d1 | 28.4 | 30.8 | | 30.9 | 27.7 | 18.5 | 15.7 | 25.1 | | 15.8 | 20.5 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.1 | 5.7 | | 38.8 | 0.5 | 0.2 | 6.5 | 15.3 | | 5.3 | 5.2 | |
| Delay (s) | 29.4 | 36.5 | | 69.7 | 28.2 | 18.7 | 22.2 | 40.5 | | 21.1 | 25.7 | |
| Level of Service | C | D | | E | C | B | C | D | | C | C | |
| Approach Delay (s) | | 34.7 | | | 38.0 | | | 38.7 | | | 25.2 | |
| Approach LOS | | C | | | D | | | D | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 33.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.90 | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 16.7 |
| Intersection Capacity Utilization | 94.8% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

# APPENDIX F

## Relevant Excerpts from 1600 – 1674 Hyde Park Road TIA

# 1600-1674 Hyde Park Road
# Transportation Impact Assessment

Paradigm Transportation Solutions Limited

April 2019

Project: 190106

ptsl.com

## 3.2 Site Trip Generation

The Institute of Transportation Engineers (ITE) Trip Generation[4] trip rates for Land Use Codes 221 (Multifamily Housing (Mid-Rise)), 222 (Multifamily Housing (High-Rise)), 710 (General Office Building), 820 (Shopping Center) and 890 (Furniture Store) were used to estimate the subject site's trip generation. Trip reductions have been estimated due to pass-by trips and internal trips, but non-auto modal share reductions have not been applied.

### 3.2.1 1600 Hyde Park Road Trip Generation

**Table 3.1** summarizes the base trip generation estimates for 1600 Hyde Park Road. It is forecast to generate approximately 159 vehicle trips during the AM peak hour and approximately 260 vehicle trips during the PM peak hour on a weekday.

**TABLE 3.1: 1600 HYDE PARK ROAD BASE TRIP GENERATION**

| Land Use | Units | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Rate | In | Out | Total | Rate | In | Out | Total |
| Multifamily Housing (High-Rise) - LUC 222 | 410 | Eq[1] | 31 | 97 | **128** | Eq[2] | 90 | 58 | **148** |
| Shopping Center - LUC 820 (GLA per 1000 ft$^2$) | 28.0 x1000 ft$^2$ | 0.94 | 16 | 10 | **26** | 3.81 | 51 | 56 | **107** |
| General Office Building - LUC 710 (GFA per 1000 ft$^2$) | 4.0 x1000 ft$^2$ | 1.16 | 4 | 1 | **5** | 1.15 | 1 | 4 | **5** |
| **Total Trip Generation** | | | **51** | **108** | **159** | | **142** | **118** | **260** |

[1] T = 0.28(X) + 12.86 [2] T = 0.34(X) + 8.56

The base trip generation was reduced to account for internal and pass-by trips. The estimated internal trip reduction is shown in **Table 3.2** below, and the estimated pass-by trip reduction is shown in **Table 3.3.** The total trip reduction applied to 1600 Hyde Park Road trip generation are 4 vehicle trips during the AM peak hour and 68 vehicle trips during the PM peak hour.

**TABLE 3.2: INTERNAL TRIP REDUCTION**

| Land Use | Units | AM Peak Hour | | | | | PM Peak Hour | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rate | | In | Out | Total | Rate | | In | Out | Total |
| | | In | Out | | | | In | Out | | | |
| Multifamily Housing (High-Rise) - LUC 222 | 410 | 3% | 1% | -1 | -1 | **-2** | 14% | 7% | -13 | -4 | **-17** |
| Shopping Center - LUC 820 (GLA per 1000 ft$^2$) | 28.0 x1000 ft$^2$ | 6% | 10% | -1 | -1 | **-2** | 12% | 27% | -6 | -15 | **-21** |
| General Office Building - LUC 710 (GFA per 1000 ft$^2$) | 4.0 x1000 ft$^2$ | 0% | 0% | 0 | 0 | **0** | 0% | 25% | 0 | -1 | **-1** |
| **Total Trip Generation** | | | | **-2** | **-2** | **-4** | | | **-19** | **-20** | **-39** |

[4] Trip Generation Manual 10th Edition Institute of Transportation Engineers Washington DC

### TABLE 3.3: PASS-BY TRIP REDUCTION

| Land Use | Units | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Rate | In | Out | Total | Rate | In | Out | Total |
| Multifamily Housing (High-Rise) - LUC 222 | 410 | 0% | 0 | 0 | **0** | 0% | 0 | 0 | **0** |
| Shopping Center - LUC 820 (GLA per 1000 $ft^2$) | 28.0 x1000 $ft^2$ | 0% | 0 | 0 | **0** | 34% | -15 | -14 | **-29** |
| General Office Building - LUC 710 (GFA per 1000 $ft^2$) | 4.0 x1000 $ft^2$ | 0% | 0 | 0 | **0** | 0% | 0 | 0 | **0** |
| **Total Trip Generation** | | | **0** | **0** | **0** | | **-15** | **-14** | **-29** |

**Table 3.4** summarizes the net trip generation for 1600 Hyde Park Road after reductions: 155 AM peak hour trips and 192 PM peak hour trips on a weekday.

### TABLE 3.4: 1600 HYDE PARK ROAD NET TRIP GENERATION

| Land Use | Units | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Rate | In | Out | Total | Rate | In | Out | Total |
| Multifamily Housing (High-Rise) - LUC 222 | 410 | Eq[1] | 30 | 96 | **126** | Eq[2] | 77 | 54 | **131** |
| Shopping Center - LUC 820 (GLA per 1000 $ft^2$) | 28.0 x1000 $ft^2$ | 0.94 | 15 | 9 | **24** | 3.81 | 30 | 27 | **57** |
| General Office Building - LUC 710 (GFA per 1000 $ft^2$) | 4.0 x1000 $ft^2$ | 1.16 | 4 | 1 | **5** | 1.15 | 1 | 3 | **4** |
| **Total Trip Generation** | | | **49** | **106** | **155** | | **108** | **84** | **192** |

### 3.2.2 1674 Hyde Park Road Trip Generation

**Table 3.5** summarizes the base trip generation estimates for 1674 Hyde Park Road: approximately 20 vehicle trips during AM peak hour and approximately 39 vehicle trips during the PM peak hour on a weekday.

### TABLE 3.5: 1674 HYDE PARK ROAD TRIP GENERATION

| Land Use | Units | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Rate | In | Out | Total | Rate | In | Out | Total |
| Multifamily Housing (Mid-Rise) - LUC 221 | 40 | Eq[1] | 10 | 4 | **14** | Eq[2] | 8 | 10 | **18** |
| Shopping Center - LUC 820 (GLA per 1000 $ft^2$) | 4.7 x1000 $ft^2$ | 0.94 | 2 | 2 | **4** | 3.81 | 9 | 9 | **18** |
| Furniture Store - LUC 890 (GLA per 1000 $ft^2$) | 5.0 x1000 $ft^2$ | Eq[3] | 1 | 1 | **2** | Eq[4] | 1 | 2 | **3** |
| **Total Trip Generation** | | | **13** | **7** | **20** | | **18** | **21** | **39** |

[1] $Ln(T) = 0.98\ Ln(X) - 0.98$ [2] $Ln(T) = 0.96\ Ln(X) - 0.63$

[3] $T = 0.24(X) + 0.94$ [4] $Ln(T) = 0.85\ Ln(X) - 0.18$

Similar to 1600 Hyde Park Road, the base trip generation for 1674 Hyde Park Road was reduced to account for internal and pass-by trips, shown in **Table 3.6** and **Table 3.7**, respectively. The total trip reduction applied to 1674 Hyde Park Road trip generation are 0 vehicle trips during the AM peak hour and 15 vehicle trips during the PM peak hour.

## TABLE 3.6: INTERNAL TRIP REDUCTION

| Land Use | Units | AM Peak Hour | | | | | PM Peak Hour | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rate | | In | Out | Total | Rate | | In | Out | Total |
| | | In | Out | | | | In | Out | | | |
| Multifamily Housing (Mid-Rise) - LUC 221 | 40 | 0% | 0% | 0 | 0 | **0** | 38% | 10% | -3 | -1 | **-4** |
| Shopping Center - LUC 820 (GLA per 1000 $ft^2$) | 4.7 x1000 $ft^2$ | 0% | 0% | 0 | 0 | **0** | 10% | 28% | -1 | -3 | **-4** |
| Furniture Store - LUC 890 (GLA per 1000 $ft^2$) | 5.0 x1000 $ft^2$ | 0% | 0% | 0 | 0 | **0** | 0% | 0% | 0 | 0 | **0** |
| **Total Trip Generation** | | | | **0** | **0** | **0** | | | **-4** | **-4** | **-8** |

## TABLE 3.7: PASS-BY TRIP REDUCTION

| Land Use | Units | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Rate | In | Out | Total | Rate | In | Out | Total |
| Multifamily Housing (Mid-Rise) - LUC 221 | 40 | 0% | 0 | 0 | **0** | 0% | 0 | 0 | **0** |
| Shopping Center - LUC 820 (GLA per 1000 $ft^2$) | 4.7 x1000 $ft^2$ | 0% | 0 | 0 | **0** | 34% | -3 | -2 | **-5** |
| Furniture Store - LUC 890 (GLA per 1000 $ft^2$) | 5.0 x1000 $ft^2$ | 0% | 0 | 0 | **0** | 53% | -1 | -1 | **-2** |
| **Total Trip Generation** | | | **0** | **0** | **0** | | **-4** | **-3** | **-7** |

**Table 3.8** summarizes the net trip generation for 1674 Hyde Park Road after reductions: 20 AM peak hour trips and 24 PM peak hour trips on a weekday.

## TABLE 3.8: 1674 HYDE PARK ROAD NET TRIP GENERATION

| Land Use | Units | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Rate | In | Out | Total | Rate | In | Out | Total |
| Multifamily Housing (Mid-Rise) - LUC 221 | 40 | Eq[1] | 10 | 4 | **14** | Eq[2] | 5 | 9 | **14** |
| Shopping Center - LUC 820 (GLA per 1000 $ft^2$) | 4.7 x1000 $ft^2$ | 0.94 | 2 | 2 | **4** | 3.81 | 5 | 4 | **9** |
| Furniture Store - LUC 890 (GLA per 1000 $ft^2$) | 5.0 x1000 $ft^2$ | Eq[3] | 1 | 1 | **2** | Eq[4] | 0 | 1 | **1** |
| **Total Trip Generation** | | | **13** | **7** | **20** | | **10** | **14** | **24** |

**Table 3.9** summarizes the total net trip generation for 1600-1674 Hyde Park Road: 175 AM peak hour trips and 216 PM peak hour trips on a weekday.

## TABLE 3.9: 1600-1674 HDYE PARK ROAD NET TRIP GENERATION

| Land Use | Units | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Rate | In | Out | Total | Rate | In | Out | Total |
| Multifamily Housing (Mid-Rise) - LUC 221 | 40 | Eq[1] | 10 | 4 | **14** | Eq[2] | 5 | 9 | **14** |
| Multifamily Housing (High-Rise) - LUC 222 | 410 | Eq[3] | 30 | 96 | **126** | Eq[4] | 77 | 54 | **131** |
| Shopping Center - LUC 820 (GLA per 1000 $ft^2$) | 32.7 x1000 $ft^2$ | 0.94 | 17 | 11 | **28** | 3.81 | 35 | 31 | **66** |
| Furniture Store - LUC 890 (GLA per 1000 $ft^2$) | 5.0 x1000 $ft^2$ | Eq[5] | 1 | 1 | **2** | Eq[6] | 0 | 1 | **1** |
| General Office Building - LUC 710 (GFA per 1000 $ft^2$) | 4.0 x1000 $ft^2$ | 1.16 | 4 | 1 | **5** | 1.15 | 1 | 3 | **4** |
| **Total Trip Generation** | | | **62** | **113** | **175** | | **118** | **98** | **216** |

[1] $Ln(T) = 0.98\ Ln(X) - 0.98$
[2] $Ln(T) = 0.96\ Ln(X) - 0.63$
[3] $T = 0.28(X) + 12.86$
[4] $T = 0.34(X) + 8.56$
[5] $T = 0.24(X) + 0.94$
[6] $Ln(T) = 0.85\ Ln(X) - 0.18$

## 3.3 Site Trip Distribution

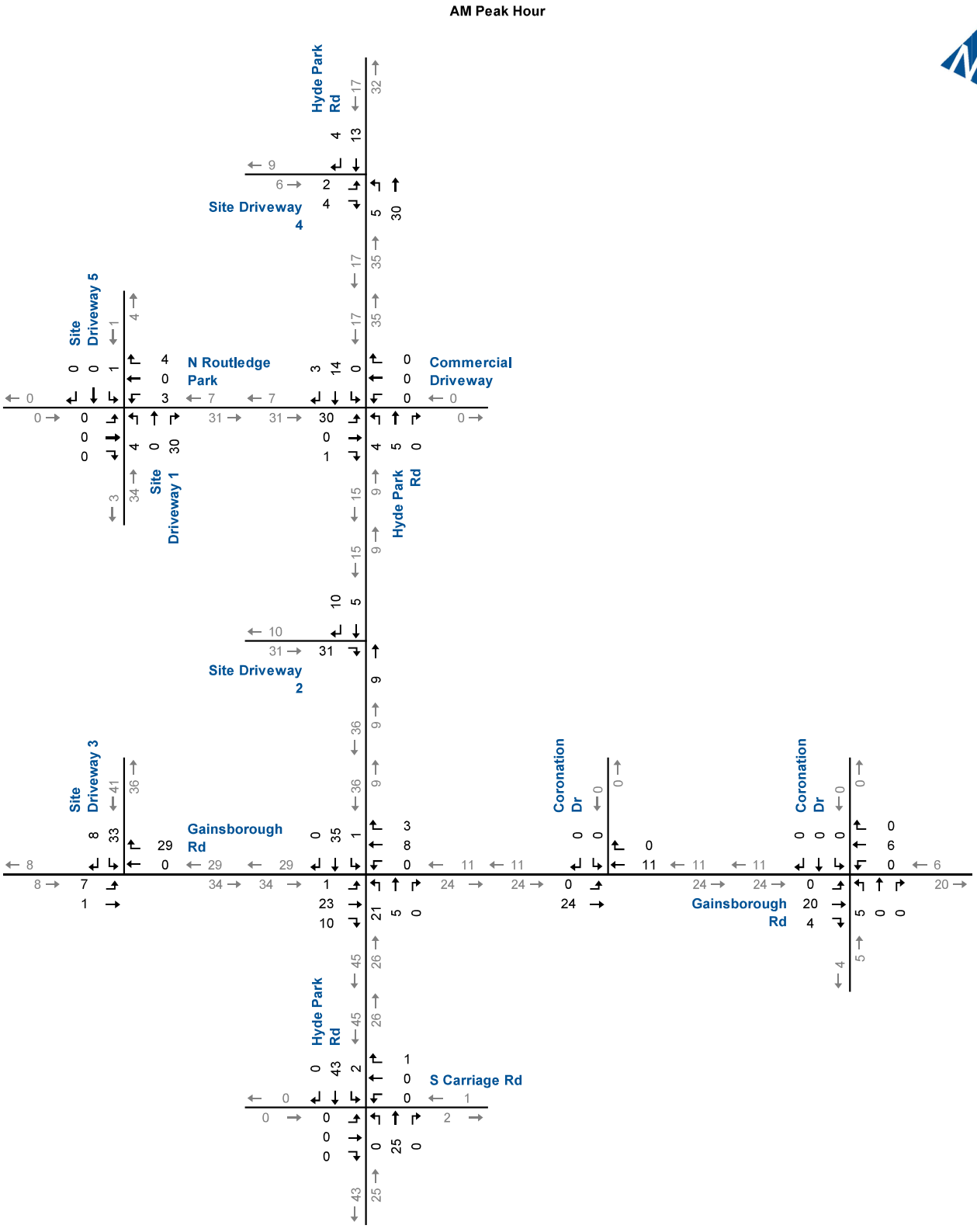
The existing turning movement count data was used to determine the distribution of site traffic on the study area road system. **Table 3.9** summarizes the trip distribution that was applied to site-generated traffic.

**TABLE 3.9: ESTIMATED TRIP DISTRIBUTION**

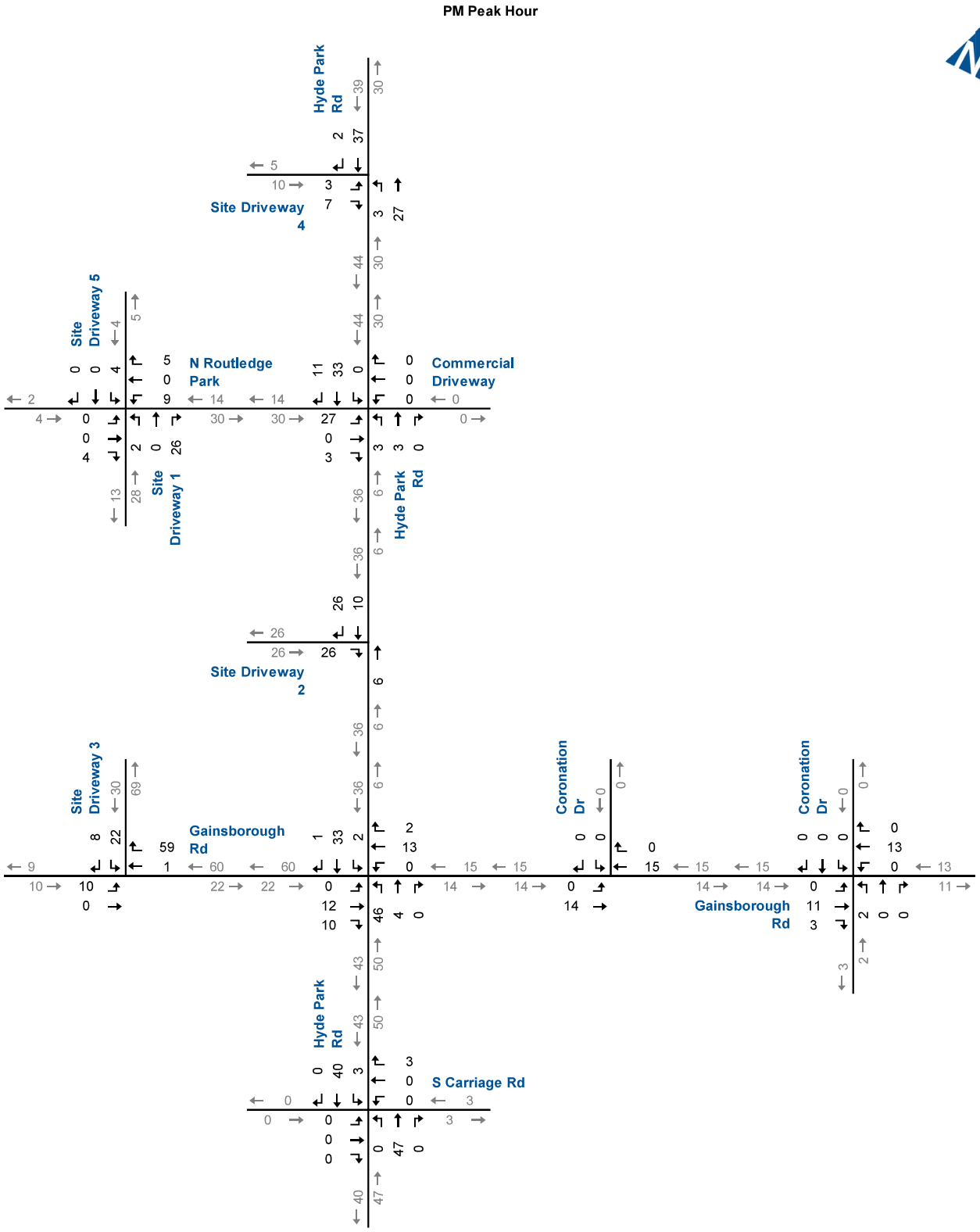
| Origin/Destination | AM | | PM | |
|---|---|---|---|---|
| | In | Out | In | Out |
| West via Gainsborough | 12% | 7% | 8% | 9% |
| West via N Routledge | 0% | 4% | 3% | 2% |
| East via Gainsborough | 11% | 14% | 11% | 11% |
| East via S Carriage | 2% | 6% | 3% | 3% |
| South via Hyde Park | 41% | 38% | 40% | 41% |
| South via Coronation (East) | 8% | 3% | 2% | 4% |
| North via Hyde Park | 27% | 28% | 33% | 30% |
| **Total** | **100%** | **100%** | **100%** | **100%** |

**Figure 3.3.1** and **Figure 3.3.2** respectively detail the net AM and PM peak hour site-generated traffic volumes for 1600-1674 Hyde Park Road on the study area road network.





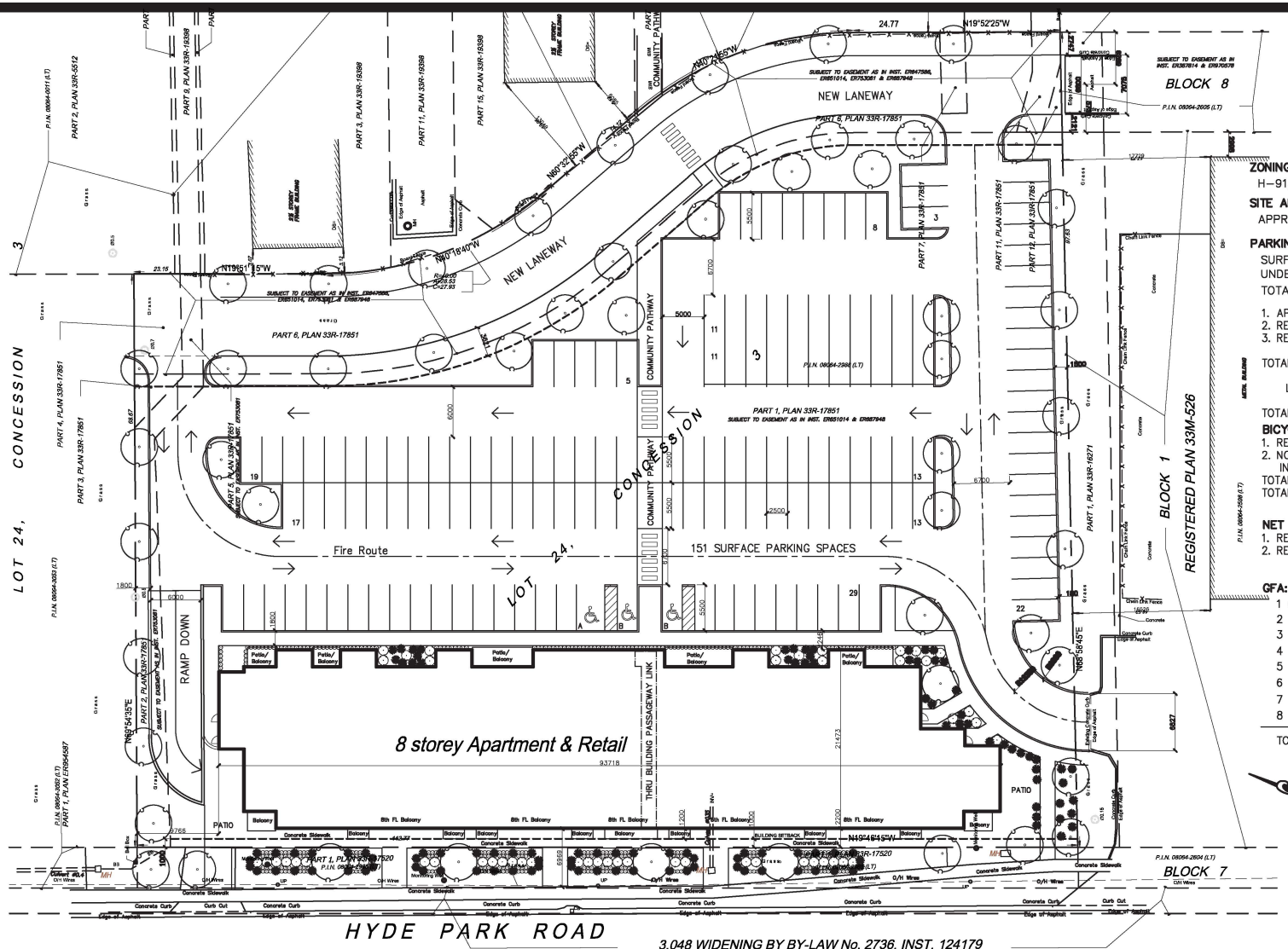

# Site-Generated Traffic Volumes
# AM Peak Hour




# Site-Generated Traffic Volumes
# PM Peak Hour

# APPENDIX G

Site Plan




**ZONING**
H–91, BDC1, BD2

**SITE AREA**
APPROX. 2.3 ACRES (approx 9,335.6 SM)

**PARKING:**

| | |
|---|---|
| SURFACE | 151 |
| UNDERGROUND | 50 |
| TOTAL PROVIDED | 201 |

1. APARTMENTS 128 @ 1.25 = 160 PARKING SPACES
2. RESTAURANTS 2,805.8 SF GFA @ 108 = 25.98 PARKING SPACES
3. RETAIL 6,403.6 SF GFA @ 161 = 39.77 PARKING SPACES

TOTAL REQUIRED =225.8
ROUNDED =226
LESS INCENTIVE BELOW –23 +226 =203 PARKING REQUIRED

TOTAL PROVIDED =201

**BICYCLE AREA:**
1. RESIDENTIAL – 128 UNITS X 0.75 = 96 BIKE RACKS INDOOR
2. NON–RESIDENTIAL 7% OF 46 PARKING SPACES = 3.22 BIKE RACKS
INCENTIVE @10% 226 = 22.6 OR 23
TOTAL REQUIRED: 96 + 23 = 119 BIKE RACKS
TOTAL PROVIDED: 96 INDOOR & 23 OUTDOOR = 119 BIKE RACKS

**NET FLOOR AREA:**
1. RESTAURANTS 2,582 SF GFA
2. RETAIL 5,859.8 SF GFA

**GFA:**

| | |
|---|---|
| 1 st fl: | 1,741.83 sm ( 18,748.90 sf) |
| 2 nd fl: | 1,702.63 sm ( 18,326.96 sf) |
| 3 rd fl: | 1,702.63 sm ( 18,326.96 sf) |
| 4 th fl: | 1,702.63 sm ( 18,326.96 sf) |
| 5 th fl: | 1,702.63 sm ( 18,326.96 sf) |
| 6 th fl: | 1,702.63 sm ( 18,326.96 sf) |
| 7 th fl: | 1,702.63 sm ( 18,326.96 sf) |
| 8 th fl: | 1,776.77 sm ( 19,124.96 sf) |

TOTAL: 14,105.08 sm (151,825.81 sf)

| No. | Issued for | Date |
|---|---|---|
| 4 | | |
| 3 | | |
| 2 | PRE-CONSULT | 31-12-2020 |
| 1 | preliminary | 29-12-2020 |

| No. | Revision | Date |
|---|---|---|
| 4 | | |
| 3 | | |
| 2 | | |
| 1 | - | - |



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Drawing Title –
SITE PLAN (Scheme 4)

Project –
LONDON APTS/RETAIL
1503 Hyde Park Road,
London, ON. N6H 5L4

| | |
|---|---|
| Date – | DEC 2020 |
| Drawn by – | PW |
| Checked by – | PMW |
| Scale – | 1:500 |
| File Number – | 2020-04 |
| Dwg. Number – | 127 |

# APPENDIX H

## Internal Capture Calculations

| NCHRP 684 Internal Trip Capture Estimation Tool | | | |
|---|---|---|---|
| **Project Name:** | 1503 Hyde Park | **Organization:** | C.F. Crozier and Associates |
| **Project Location:** | 1503 Hyde Park | **Performed By:** | Kavleen Sachdeva |
| **Scenario Description:** | AM Peak Period | **Date:** | 2021/23/06 |
| **Analysis Year:** | 2021 | **Checked By:** | Aaron Wignal |
| **Analysis Period:** | **AM Street Peak Hour** | **Date:** | 2021/23/06 |

**Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)**

| Land Use | Development Data (*For Information Only*) | | | Estimated Vehicle-Trips[3] | | |
|---|---|---|---|---|---|---|
| | ITE LUCs[1] | Quantity | Units | Total | Entering | Exiting |
| Office | | | | 0 | | |
| Retail | | | | 9 | 3 | 6 |
| Restaurant | | | | 0 | | |
| Cinema/Entertainment | | | | 0 | | |
| Residential | | | | 46 | 34 | 12 |
| Hotel | | | | 0 | | |
| All Other Land Uses[2] | | | | 0 | | |
| | | | | 55 | 37 | 18 |

**Table 2-A: Mode Split and Vehicle Occupancy Estimates**

| Land Use | Entering Trips | | | Exiting Trips | | |
|---|---|---|---|---|---|---|
| | Veh. Occ.[4] | % Transit | % Non-Motorized | Veh. Occ.[4] | % Transit | % Non-Motorized |
| Office | | | | | | |
| Retail | 1.00 | 14% | 86% | 1.00 | 14% | 86% |
| Restaurant | | | | | | |
| Cinema/Entertainment | | | | | | |
| Residential | 1.00 | 14% | 86% | 1.00 | 14% | 86% |
| Hotel | | | | | | |
| All Other Land Uses[2] | | | | | | |

**Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)**

| Origin (From) | Destination (To) | | | | | |
|---|---|---|---|---|---|---|
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | | | | | |
| Retail | | | | | | |
| Restaurant | | | | | | |
| Cinema/Entertainment | | | | | | |
| Residential | | | | | | |
| Hotel | | | | | | |

**Table 4-A: Internal Person-Trip Origin-Destination Matrix***

| Origin (From) | Destination (To) | | | | | |
|---|---|---|---|---|---|---|
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | 0 | 0 | 0 | 0 | 0 |
| Retail | 0 | | 0 | 0 | 1 | 0 |
| Restaurant | 0 | 0 | | 0 | 0 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | | 0 | 0 |
| Residential | 0 | 0 | 0 | 0 | | 0 |
| Hotel | 0 | 0 | 0 | 0 | 0 | |

**Table 5-A: Computations Summary**

| | Total | Entering | Exiting |
|---|---|---|---|
| All Person-Trips | 55 | 37 | 18 |
| Internal Capture Percentage | 4% | 3% | 6% |
| | | | |
| External Vehicle-Trips[5] | 0 | 0 | 0 |
| External Transit-Trips[6] | 8 | 5 | 3 |
| External Non-Motorized Trips[6] | 45 | 31 | 14 |

**Table 6-A: Internal Trip Capture Percentages by Land Use**

| Land Use | Entering Trips | Exiting Trips |
|---|---|---|
| Office | N/A | N/A |
| Retail | 0% | 17% |
| Restaurant | N/A | N/A |
| Cinema/Entertainment | N/A | N/A |
| Residential | 3% | 0% |
| Hotel | N/A | N/A |

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

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| | |
|---|---|
| **Project Name:** | 1503 Hyde Park |
| **Analysis Period:** | **AM Street Peak Hour** |

| **Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends** | | | | | | |
|---|---|---|---|---|---|---|
| Land Use | Table 7-A (D): Entering Trips | | | Table 7-A (O): Exiting Trips | | |
| | Veh. Occ. | Vehicle-Trips | Person-Trips* | Veh. Occ. | Vehicle-Trips | Person-Trips* |
| Office | 1.00 | 0 | 0 | 1.00 | 0 | 0 |
| Retail | 1.00 | 3 | 3 | 1.00 | 6 | 6 |
| Restaurant | 1.00 | 0 | 0 | 1.00 | 0 | 0 |
| Cinema/Entertainment | 1.00 | 0 | 0 | 1.00 | 0 | 0 |
| Residential | 1.00 | 34 | 34 | 1.00 | 12 | 12 |
| Hotel | 1.00 | 0 | 0 | 1.00 | 0 | 0 |

| **Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)** | | | | | | |
|---|---|---|---|---|---|---|
| Origin (From) | Destination (To) | | | | | |
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | 0 | 0 | 0 | 0 | 0 |
| Retail | 2 | | 1 | 0 | 1 | 0 |
| Restaurant | 0 | 0 | | 0 | 0 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | | 0 | 0 |
| Residential | 0 | 0 | 2 | 0 | | 0 |
| Hotel | 0 | 0 | 0 | 0 | 0 | |

| **Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)** | | | | | | |
|---|---|---|---|---|---|---|
| Origin (From) | Destination (To) | | | | | |
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | 1 | 0 | 0 | 0 | 0 |
| Retail | 0 | | 0 | 0 | 1 | 0 |
| Restaurant | 0 | 0 | | 0 | 2 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | | 0 | 0 |
| Residential | 0 | 1 | 0 | 0 | | 0 |
| Hotel | 0 | 0 | 0 | 0 | 0 | |

| **Table 9-A (D): Internal and External Trips Summary (Entering Trips)** | | | | | | |
|---|---|---|---|---|---|---|
| Destination Land Use | Person-Trip Estimates | | | External Trips by Mode* | | |
| | Internal | External | Total | Vehicles[1] | Transit[2] | Non-Motorized[2] |
| Office | 0 | 0 | 0 | 0 | 0 | 0 |
| Retail | 0 | 3 | 3 | 0 | 0 | 3 |
| Restaurant | 0 | 0 | 0 | 0 | 0 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | 0 | 0 | 0 |
| Residential | 1 | 33 | 34 | 0 | 5 | 28 |
| Hotel | 0 | 0 | 0 | 0 | 0 | 0 |
| All Other Land Uses[3] | 0 | 0 | 0 | 0 | 0 | 0 |

| **Table 9-A (O): Internal and External Trips Summary (Exiting Trips)** | | | | | | |
|---|---|---|---|---|---|---|
| Origin Land Use | Person-Trip Estimates | | | External Trips by Mode* | | |
| | Internal | External | Total | Vehicles[1] | Transit[2] | Non-Motorized[2] |
| Office | 0 | 0 | 0 | 0 | 0 | 0 |
| Retail | 1 | 5 | 6 | 0 | 1 | 4 |
| Restaurant | 0 | 0 | 0 | 0 | 0 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | 0 | 0 | 0 |
| Residential | 0 | 12 | 12 | 0 | 2 | 10 |
| Hotel | 0 | 0 | 0 | 0 | 0 | 0 |
| All Other Land Uses[3] | 0 | 0 | 0 | 0 | 0 | 0 |

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

| NCHRP 684 Internal Trip Capture Estimation Tool | | | |
|---|---|---|---|
| **Project Name:** | 1503 Hyde Park | **Organization:** | C.F. Crozier and Associates |
| **Project Location:** | 1503 Hyde Park | **Performed By:** | Kavleen Sachdeva |
| **Scenario Description:** | AM Peak Period | **Date:** | 2021/23/06 |
| **Analysis Year:** | 2021 | **Checked By:** | Aaron Wignal |
| **Analysis Period:** | **PM Street Peak Hour** | **Date:** | 2021/23/06 |

**Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)**

| Land Use | Development Data (*For Information Only*) | | | Estimated Vehicle-Trips[3] | | |
|---|---|---|---|---|---|---|
| | ITE LUCs[1] | Quantity | Units | Total | Entering | Exiting |
| Office | | | | 0 | | |
| Retail | | | | 93 | 48 | 45 |
| Restaurant | | | | 0 | | |
| Cinema/Entertainment | | | | 0 | | |
| Residential | | | | 56 | 22 | 34 |
| Hotel | | | | 0 | | |
| All Other Land Uses[2] | | | | 0 | | |
| | | | | 149 | 70 | 79 |

**Table 2-P: Mode Split and Vehicle Occupancy Estimates**

| Land Use | Entering Trips | | | Exiting Trips | | |
|---|---|---|---|---|---|---|
| | Veh. Occ.[4] | % Transit | % Non-Motorized | Veh. Occ.[4] | % Transit | % Non-Motorized |
| Office | | | | | | |
| Retail | 1.00 | 14% | 86% | 1.00 | 14% | 86% |
| Restaurant | | | | | | |
| Cinema/Entertainment | | | | | | |
| Residential | 1.00 | 14% | 86% | 1.00 | 14% | 86% |
| Hotel | | | | | | |
| All Other Land Uses[2] | | | | | | |

**Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)**

| Origin (From) | Destination (To) | | | | | |
|---|---|---|---|---|---|---|
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | | | | | |
| Retail | | | | | | |
| Restaurant | | | | | | |
| Cinema/Entertainment | | | | | | |
| Residential | | | | | | |
| Hotel | | | | | | |

**Table 4-P: Internal Person-Trip Origin-Destination Matrix***

| Origin (From) | Destination (To) | | | | | |
|---|---|---|---|---|---|---|
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | 0 | 0 | 0 | 0 | 0 |
| Retail | 0 | | 0 | 0 | 10 | 0 |
| Restaurant | 0 | 0 | | 0 | 0 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | | 0 | 0 |
| Residential | 0 | 5 | 0 | 0 | | 0 |
| Hotel | 0 | 0 | 0 | 0 | 0 | |

**Table 5-P: Computations Summary**

| | Total | Entering | Exiting |
|---|---|---|---|
| All Person-Trips | 149 | 70 | 79 |
| Internal Capture Percentage | 20% | 21% | 19% |
| | | | |
| External Vehicle-Trips[5] | 0 | 0 | 0 |
| External Transit-Trips[6] | 17 | 8 | 9 |
| External Non-Motorized Trips[6] | 102 | 47 | 55 |

**Table 6-P: Internal Trip Capture Percentages by Land Use**

| Land Use | Entering Trips | Exiting Trips |
|---|---|---|
| Office | N/A | N/A |
| Retail | 10% | 22% |
| Restaurant | N/A | N/A |
| Cinema/Entertainment | N/A | N/A |
| Residential | 45% | 15% |
| Hotel | N/A | N/A |

[1]Land Use Codes (LUCs) from *Trip Generation Manual* , published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual* ).

[4]Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

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| | |
|---|---|
| **Project Name:** | 1503 Hyde Park |
| **Analysis Period:** | **PM Street Peak Hour** |

**Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends**

| Land Use | Table 7-P (D): Entering Trips | | | Table 7-P (O): Exiting Trips | | |
|---|---|---|---|---|---|---|
| | Veh. Occ. | Vehicle-Trips | Person-Trips* | Veh. Occ. | Vehicle-Trips | Person-Trips* |
| Office | 1.00 | 0 | 0 | 1.00 | 0 | 0 |
| Retail | 1.00 | 48 | 48 | 1.00 | 45 | 45 |
| Restaurant | 1.00 | 0 | 0 | 1.00 | 0 | 0 |
| Cinema/Entertainment | 1.00 | 0 | 0 | 1.00 | 0 | 0 |
| Residential | 1.00 | 22 | 22 | 1.00 | 34 | 34 |
| Hotel | 1.00 | 0 | 0 | 1.00 | 0 | 0 |

**Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)**

| Origin (From) | Destination (To) | | | | | |
|---|---|---|---|---|---|---|
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | 0 | 0 | 0 | 0 | 0 |
| Retail | 1 | | 13 | 2 | 12 | 2 |
| Restaurant | 0 | 0 | | 0 | 0 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | | 0 | 0 |
| Residential | 1 | 14 | 7 | 0 | | 1 |
| Hotel | 0 | 0 | 0 | 0 | 0 | |

**Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)**

| Origin (From) | Destination (To) | | | | | |
|---|---|---|---|---|---|---|
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | 4 | 0 | 0 | 1 | 0 |
| Retail | 0 | | 0 | 0 | 10 | 0 |
| Restaurant | 0 | 24 | | 0 | 4 | 0 |
| Cinema/Entertainment | 0 | 2 | 0 | | 1 | 0 |
| Residential | 0 | 5 | 0 | 0 | | 0 |
| Hotel | 0 | 1 | 0 | 0 | 0 | |

**Table 9-P (D): Internal and External Trips Summary (Entering Trips)**

| Destination Land Use | Person-Trip Estimates | | | External Trips by Mode* | | |
|---|---|---|---|---|---|---|
| | Internal | External | Total | Vehicles[1] | Transit[2] | Non-Motorized[2] |
| Office | 0 | 0 | 0 | 0 | 0 | 0 |
| Retail | 5 | 43 | 48 | 0 | 6 | 37 |
| Restaurant | 0 | 0 | 0 | 0 | 0 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | 0 | 0 | 0 |
| Residential | 10 | 12 | 22 | 0 | 2 | 10 |
| Hotel | 0 | 0 | 0 | 0 | 0 | 0 |
| All Other Land Uses[3] | 0 | 0 | 0 | 0 | 0 | 0 |

**Table 9-P (O): Internal and External Trips Summary (Exiting Trips)**

| Origin Land Use | Person-Trip Estimates | | | External Trips by Mode* | | |
|---|---|---|---|---|---|---|
| | Internal | External | Total | Vehicles[1] | Transit[2] | Non-Motorized[2] |
| Office | 0 | 0 | 0 | 0 | 0 | 0 |
| Retail | 10 | 35 | 45 | 0 | 5 | 30 |
| Restaurant | 0 | 0 | 0 | 0 | 0 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | 0 | 0 | 0 |
| Residential | 5 | 29 | 34 | 0 | 4 | 25 |
| Hotel | 0 | 0 | 0 | 0 | 0 | 0 |
| All Other Land Uses[3] | 0 | 0 | 0 | 0 | 0 | 0 |

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

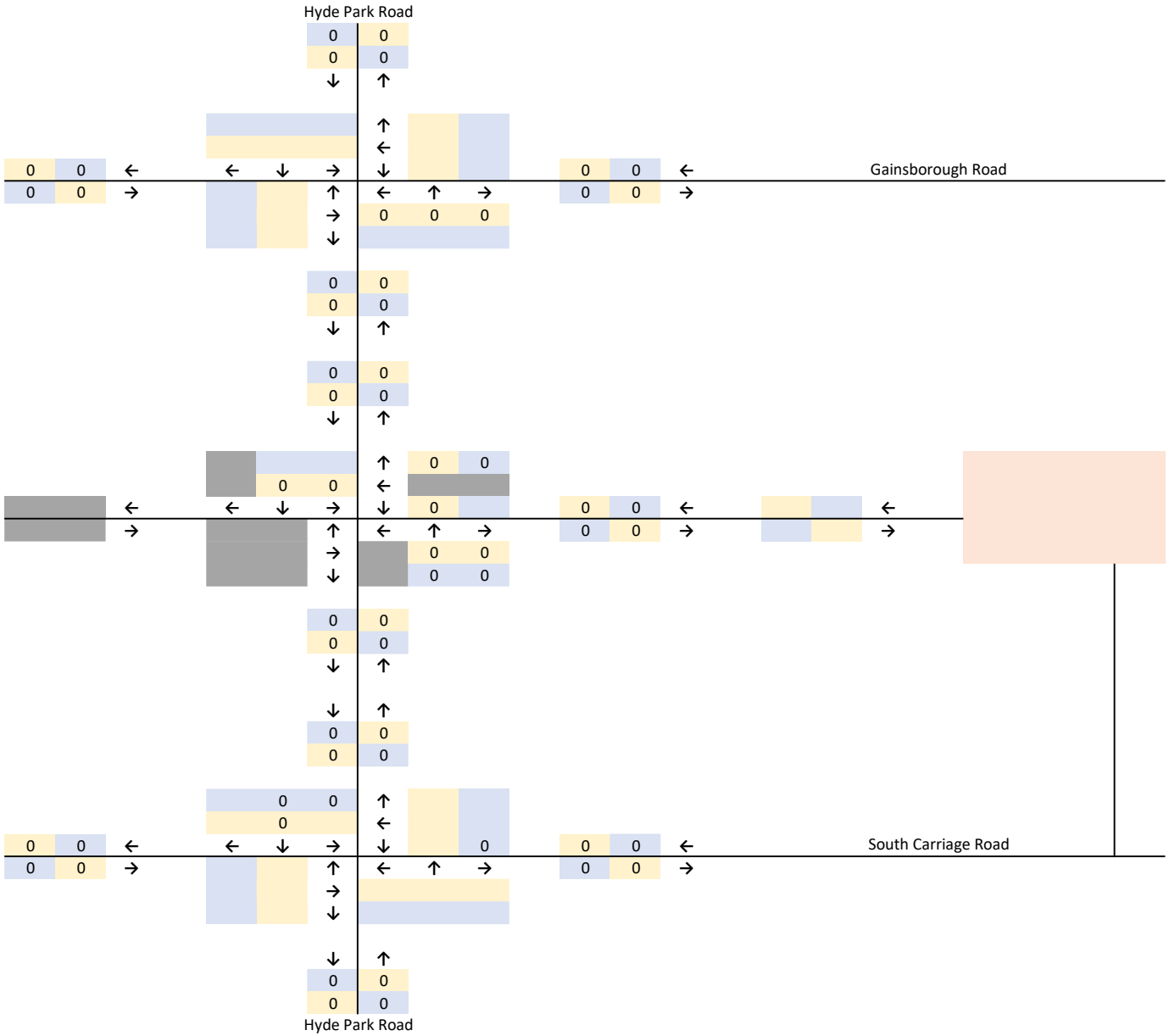
*Indicates computation that has been rounded to the nearest whole number.

| Table 7.1a Adjusted Internal Trip Capture Rates for Trip Origins within a Multi-Use Development | | | |
|---|---|---|---|
| Land Use Pairs | | Weekday | |
| | | AM Peak Hour | PM Peak Hour |
| From OFFICE | To Office | 0.0% | 0.0% |
| | To Retail | 28.0% | 20.0% |
| | To Restaurant | 63.0% | 4.0% |
| | To Cinema/Entertainment | 0.0% | 0.0% |
| | To Residential | 1.0% | 2.0% |
| | To Hotel | 0.0% | 0.0% |
| From RETAIL | To Office | 29.0% | 2.0% |
| | To Retail | 0.0% | 0.0% |
| | To Restaurant | 13.0% | 29.0% |
| | To Cinema/Entertainment | 0.0% | 4.0% |
| | To Residential | 14.0% | 26.0% |
| | To Hotel | 0.0% | 5.0% |
| From RESTAURANT | To Office | 31.0% | 3.0% |
| | To Retail | 14.0% | 41.0% |
| | To Restaurant | 0.0% | 0.0% |
| | To Cinema/Entertainment | 0.0% | 8.0% |
| | To Residential | 4.0% | 18.0% |
| | To Hotel | 3.0% | 7.0% |
| From CINEMA/ENTERTAINMENT | To Office | 0.0% | 2.0% |
| | To Retail | 0.0% | 21.0% |
| | To Restaurant | 0.0% | 31.0% |
| | To Cinema/Entertainment | 0.0% | 0.0% |
| | To Residential | 0.0% | 8.0% |
| | To Hotel | 0.0% | 2.0% |
| From RESIDENTIAL | To Office | 2.0% | 4.0% |
| | To Retail | 1.0% | 42.0% |
| | To Restaurant | 20.0% | 21.0% |
| | To Cinema/Entertainment | 0.0% | 0.0% |
| | To Residential | 0.0% | 0.0% |
| | To Hotel | 0.0% | 3.0% |
| From HOTEL | To Office | 75.0% | 0.0% |
| | To Retail | 14.0% | 16.0% |
| | To Restaurant | 9.0% | 68.0% |
| | To Cinema/Entertainment | 0.0% | 0.0% |
| | To Residential | 0.0% | 2.0% |
| | To Hotel | 0.0% | 0.0% |

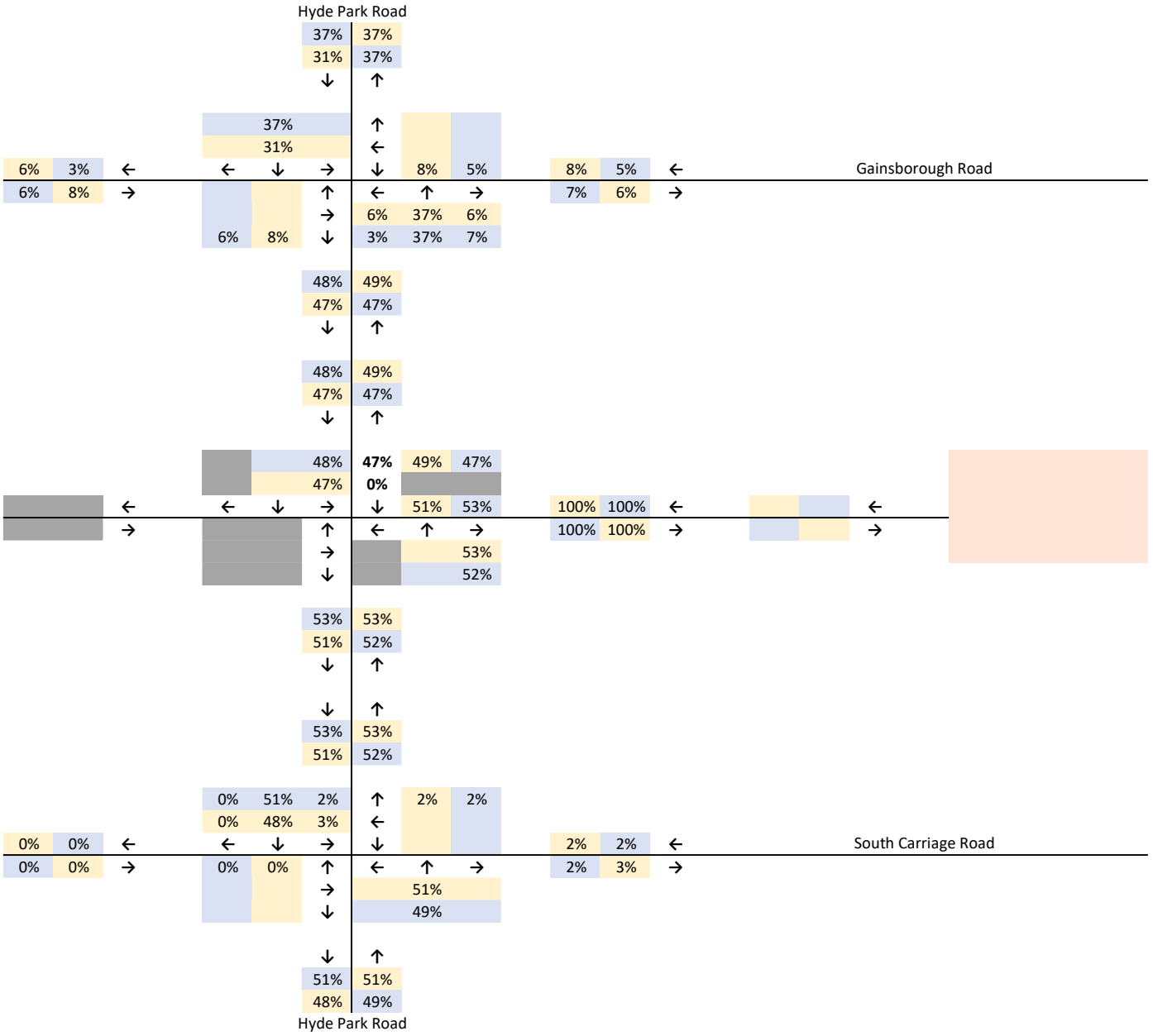
| Table 7.2a Adjusted Internal Trip Capture Rates for Trip Destinations within a Multi-Use Development | | | |
|---|---|---|---|
| Land Use Pairs | | Weekday | |
| | | AM Peak Hour | PM Peak Hour |
| To OFFICE | From Office | 0.0% | 0.0% |
| | From Retail | 4.0% | 31.0% |
| | From Restaurant | 14.0% | 30.0% |
| | From Cinema/Entertainment | 0.0% | 6.0% |
| | From Residential | 3.0% | 57.0% |
| | From Hotel | 3.0% | 0.0% |
| To RETAIL | From Office | 32.0% | 8.0% |
| | From Retail | 0.0% | 0.0% |
| | From Restaurant | 8.0% | 50.0% |
| | From Cinema/Entertainment | 0.0% | 4.0% |
| | From Residential | 17.0% | 10.0% |
| | From Hotel | 4.0% | 2.0% |
| To RESTAURANT | From Office | 23.0% | 2.0% |
| | From Retail | 50.0% | 29.0% |
| | From Restaurant | 0.0% | 0.0% |
| | From Cinema/Entertainment | 0.0% | 3.0% |
| | From Residential | 20.0% | 14.0% |
| | From Hotel | 6.0% | 5.0% |
| To CINEMA/ENTERTAINMENT | From Office | 0.0% | 1.0% |
| | From Retail | 0.0% | 26.0% |
| | From Restaurant | 0.0% | 32.0% |
| | From Cinema/Entertainment | 0.0% | 0.0% |
| | From Residential | 0.0% | 0.0% |
| | From Hotel | 0.0% | 0.0% |
| To RESIDENTIAL | From Office | 0.0% | 4.0% |
| | From Retail | 2.0% | 46.0% |
| | From Restaurant | 5.0% | 16.0% |
| | From Cinema/Entertainment | 0.0% | 4.0% |
| | From Residential | 0.0% | 0.0% |
| | From Hotel | 0.0% | 0.0% |
| To HOTEL | From Office | 0.0% | 0.0% |
| | From Retail | 0.0% | 17.0% |
| | From Restaurant | 4.0% | 71.0% |
| | From Cinema/Entertainment | 0.0% | 1.0% |
| | From Residential | 0.0% | 12.0% |
| | From Hotel | 0.0% | 0.0% |

# APPENDIX I

## Trip Distribution and Pass-by Assumptions

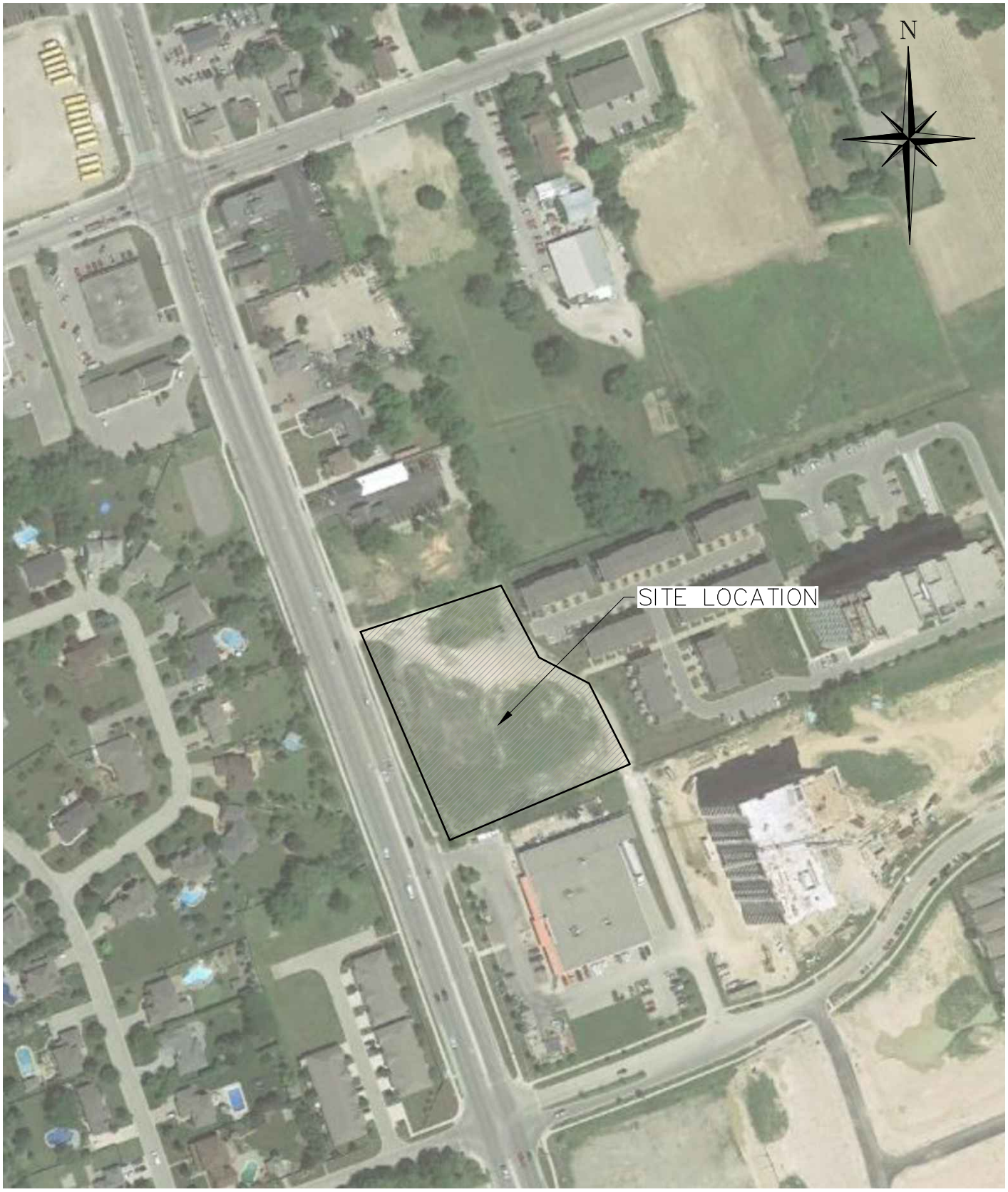



Pass-by Assumptions




Trip Distribution

# FIGURES




# 1503 HYDE PARK ROAD
# LONDON

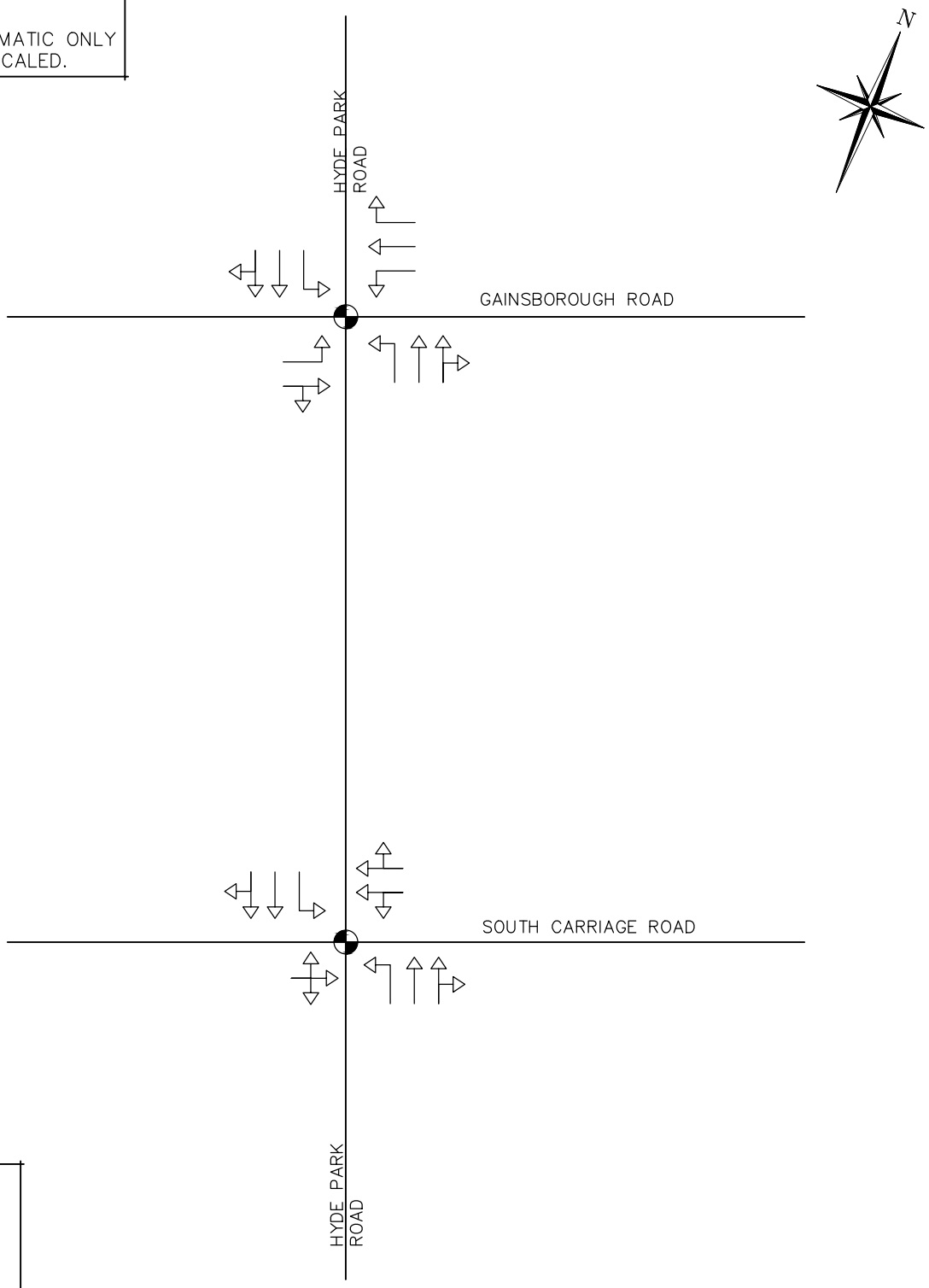
## SITE LOCATION

CROZIER
CONSULTING ENGINEERS

8 Market Street
Suite 600
Toronto, ON M5E 1M6
416-477-3392 T
www.cfcrozier.ca

| Drawn | Design | Project No. | |
|---|---|---|---|
| I.L. | I.L. | | 2103-5995 |
| Date | Check | Scale | Dwg. |
| 10/07/2021 | K.S. | N.T.S | FIG. 01 |

NOTE:
THIS FIGURE IS SCHEMATIC ONLY AND IS NOT TO BE SCALED.




LEGEND:

- SIGNAL CONTROL
- STOP CONTROL
- YIELD CONTROL
- ROUND ABOUT
- AM(PM) WEEKDAY AM(PM) TRIP DISTRIBUTION

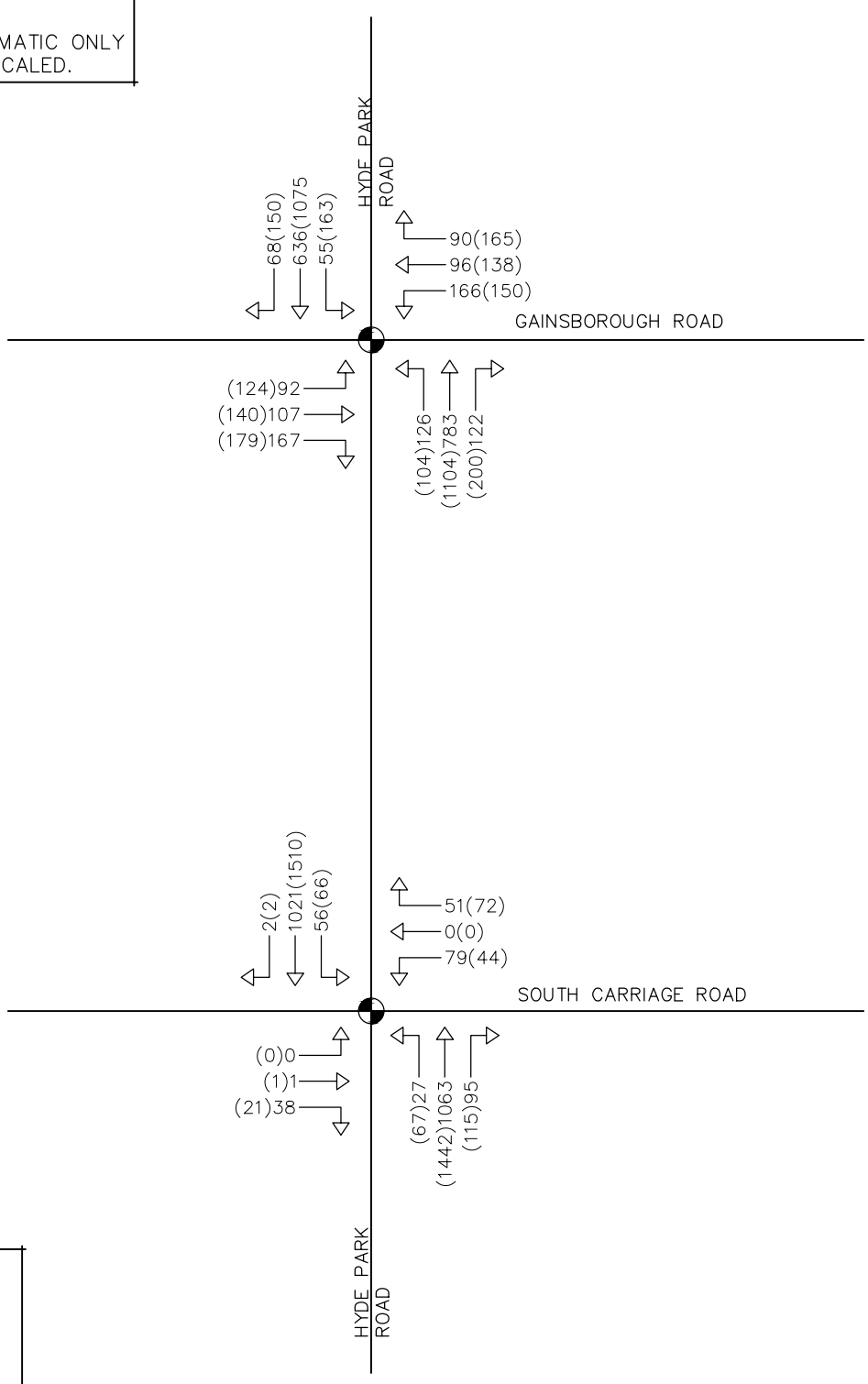
# 1503 HYDE PARK ROAD
# LONDON

## LANE CONFIGURATION

CROZIER CONSULTING ENGINEERS
2800 High Point Drive
Suite 100
Milton, ON L9T 6P4
905-875-0026 T
905-875-4915 F
www.cfcrozier.ca

| Drawn | Design | Project No. | |
|---|---|---|---|
| I.L. | I.L. | | 2103-5995 |
| Date | Check | Scale | Dwg. |
| 10/07/2021 | K.S. | N.T.S | FIG. 02 |

NOTE:
THIS FIGURE IS SCHEMATIC ONLY AND IS NOT TO BE SCALED.




LEGEND:

- SIGNAL CONTROL
- STOP CONTROL
- YIELD CONTROL
- ROUND ABOUT
- AM(PM) WEEKDAY AM(PM) TRIP DISTRIBUTION

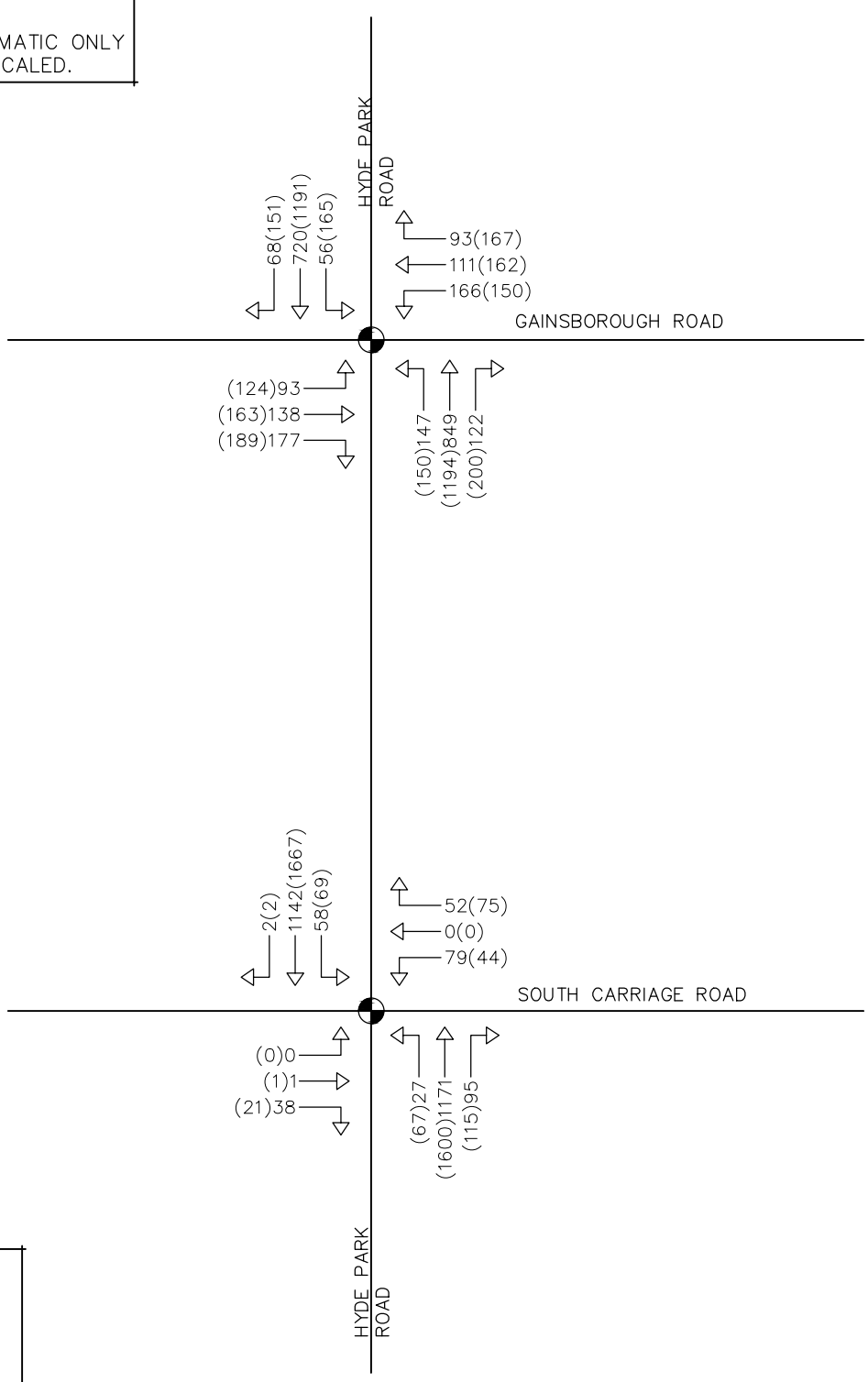
# 1503 HYDE PARK ROAD
# LONDON

## 2021 EXISTING CONDITIONS


CROZIER CONSULTING ENGINEERS
2800 High Point Drive
Suite 100
Milton, ON L9T 6P4
905-875-0026 T
905-875-4915 F
www.cfcrozier.ca


| Drawn | Design | Project No. | |
|---|---|---|---|
| I.L. | I.L. | | 2103-5995 |
| Date | Check | Scale | Dwg. |
| 10/07/2021 | K.S. | N.T.S | FIG. 03 |

NOTE:
THIS FIGURE IS SCHEMATIC ONLY AND IS NOT TO BE SCALED.




LEGEND:

- SIGNAL CONTROL
- STOP CONTROL
- YIELD CONTROL
- ROUND ABOUT
- AM(PM) WEEKDAY AM(PM) TRIP DISTRIBUTION

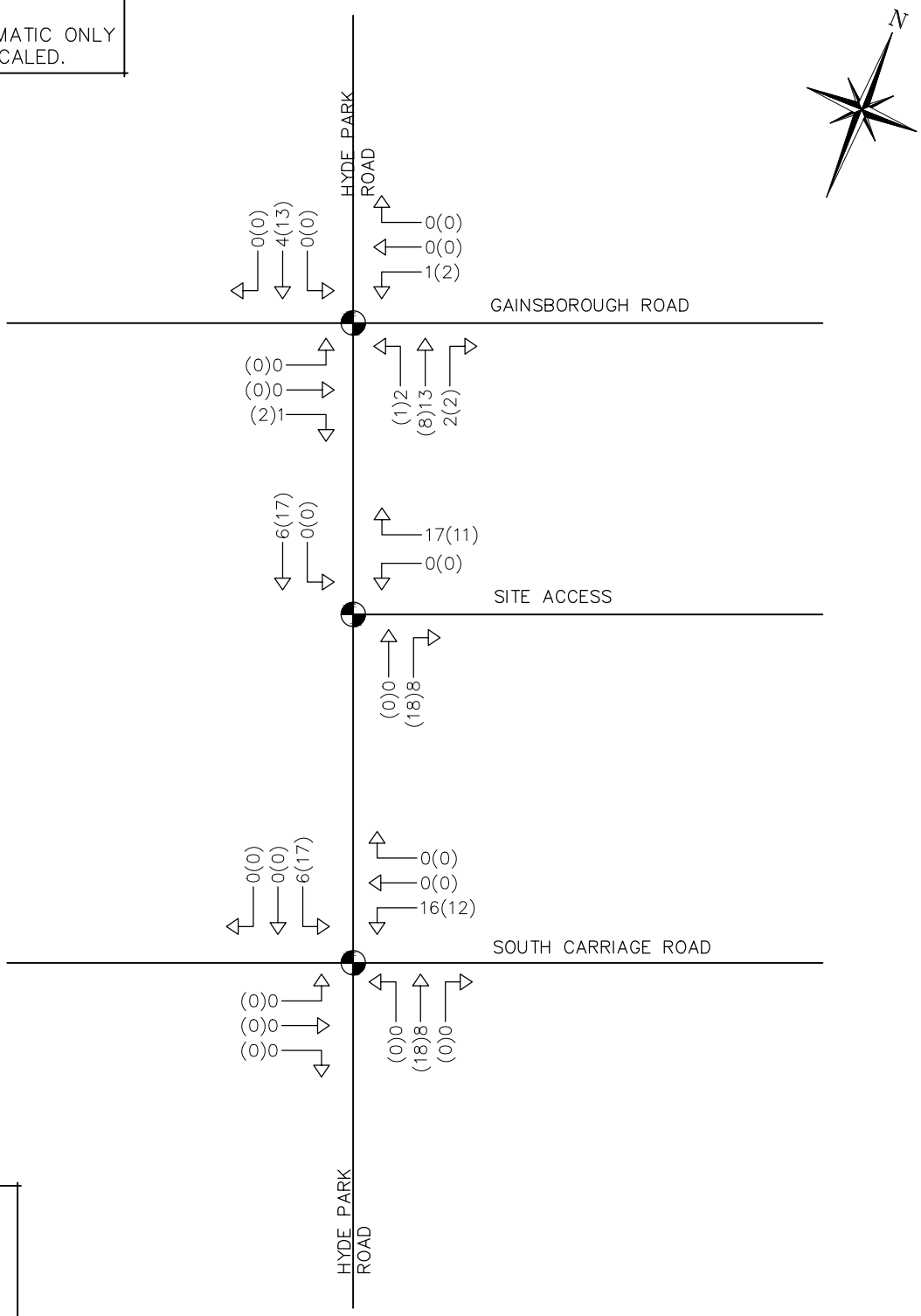
# 1503 HYDE PARK ROAD
# LONDON

## 2026 FUTURE BACKGROUND


CROZIER CONSULTING ENGINEERS
2800 High Point Drive
Suite 100
Milton, ON L9T 6P4
905-875-0026 T
905-875-4915 F
www.cfcrozier.ca


| Drawn | Design | Project No. | |
|---|---|---|---|
| I.L. | I.L. | | 2103-5995 |
| Date | Check | Scale | Dwg. |
| 10/07/2021 | K.S. | N.T.S | FIG. 04 |

NOTE:
THIS FIGURE IS SCHEMATIC ONLY AND IS NOT TO BE SCALED.




LEGEND:

- SIGNAL CONTROL
- STOP CONTROL
- YIELD CONTROL
- ROUND ABOUT
- AM(PM) WEEKDAY AM(PM) TRIP DISTRIBUTION

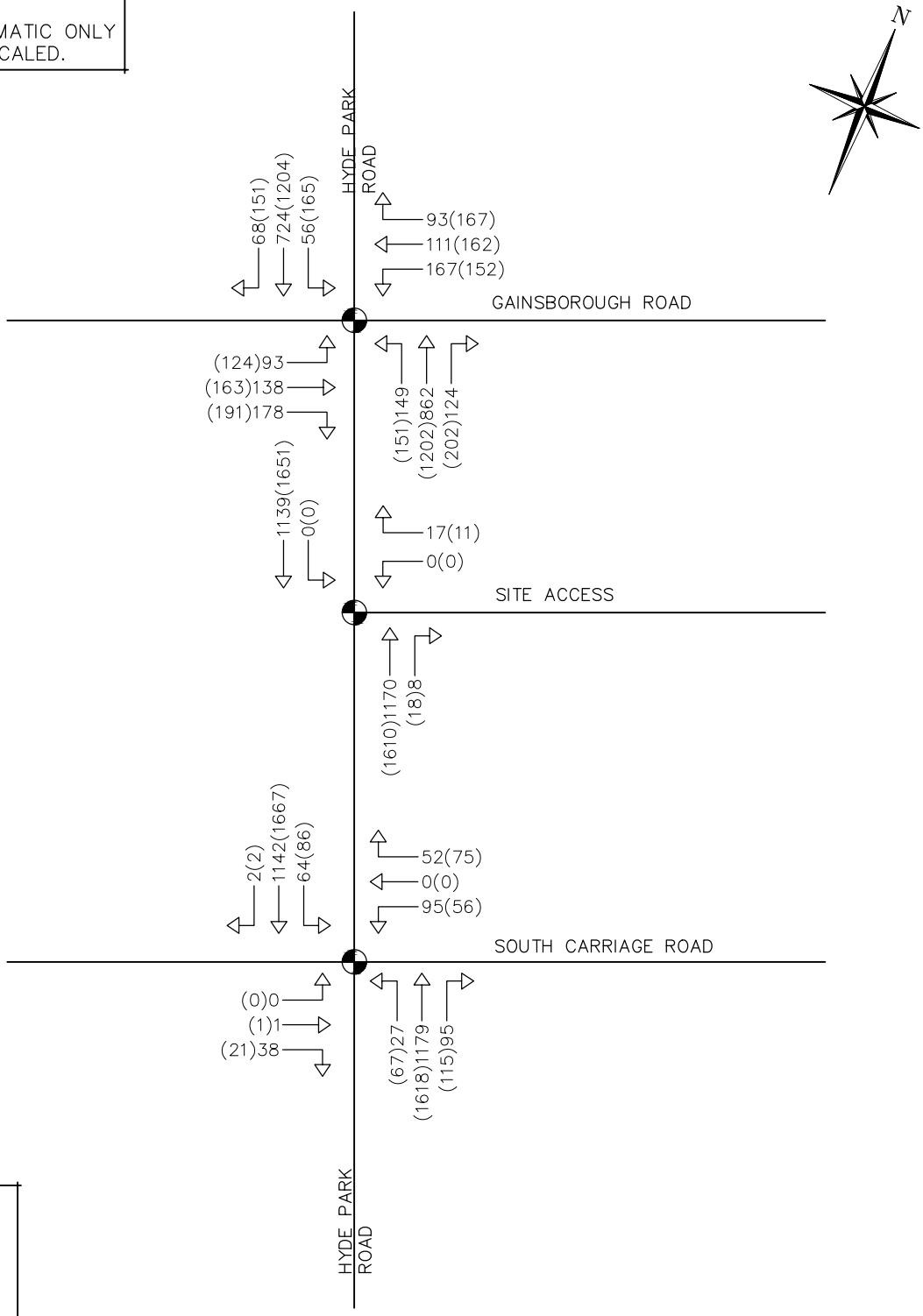
# 1503 HYDE PARK ROAD
# LONDON

## SITE TRAFFIC


CROZIER CONSULTING ENGINEERS
2800 High Point Drive
Suite 100
Milton, ON L9T 6P4
905-875-0026 T
905-875-4915 F
www.cfcrozier.ca


| Drawn | Design | Project No. | |
|---|---|---|---|
| I.L. | I.L. | | 2103-5995 |
| Date | Check | Scale | Dwg. |
| 10/07/2021 | K.S. | N.T.S | FIG. 05 |

NOTE:
THIS FIGURE IS SCHEMATIC ONLY AND IS NOT TO BE SCALED.




LEGEND:

- SIGNAL CONTROL
- STOP CONTROL
- YIELD CONTROL
- ROUND ABOUT
- AM(PM) WEEKDAY AM(PM) TRIP DISTRIBUTION

# 1503 HYDE PARK ROAD
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## 2026 FUTURE TOTAL


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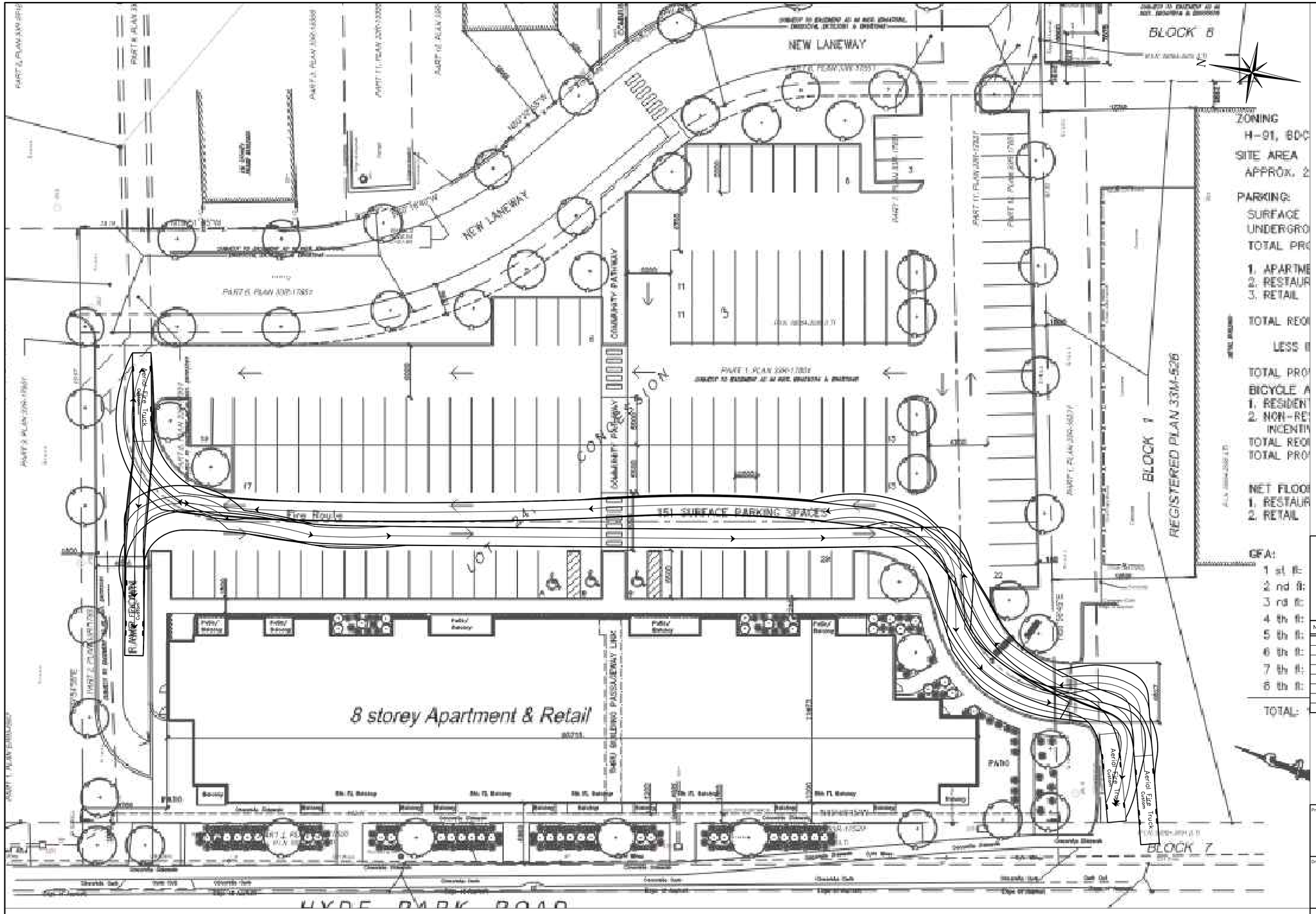
| Date | Check | Scale | Dwg. |
| 10/07/2021 | K.S. | N.T.S | FIG. 06 |







| No. | ISSUE | DATE: MM/DD/YYYY |
|---|---|---|
| 0 | ISSUED FOR 1st SUBMISSION | 06/24/2021 |

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

Project
1503 HYDE PARK ROAD
LONDON

Drawing
TRUCK TURNING DIAGRAM

CROZIER
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| Drawn By | Design By | Project | |
|---|---|---|---|
| I.L. | I.L. | | 2103-5995 |
| Check By | Check By | Scale | Drawing |
| K.S. | K.S. | N.T.S. | FIG07 |