

To: Mike Giampa (City of Ottawa)

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Project #: 60648711

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# Memorandum

Subject: **Traffic Impact Assessment Step 4 Update: Analysis for a Warehouse / Distribution Centre Located at 2625 Sheffield Road, Ottawa, Ontario**

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## 1. Introduction

AECOM was retained to undertake a traffic impact assessment (TIA) update for a warehouse / distribution centre located at 2625 Sheffield Road in Ottawa, Ontario. The purpose of this memorandum was to assess the alignment between the transportation elements of the proposed development and the City of Ottawa's city-building objectives and identifies any opportunities to improve alignment. This memorandum also evaluates the post-development performance of the planned transportation network based on the City's established performance measures and targets and identifies potential mitigation measures to off-set development impact. The analysis of the TIA in this memorandum has been prepared as per the City of Ottawa TIA Guidelines, 2017, and addresses Step 4 of the TIA review process. This memorandum was intended to cover nine modules:

1. Development Design;
2. Parking;
3. Boundary Streets;
4. Access Intersections;
5. Traffic Demand Management;
6. Neighborhood Traffic Management;
7. Transit;
8. Network Concept; and
9. Network Intersection.

## 1.1 Development Design

### 1.1.1 Design for Sustainable Modes

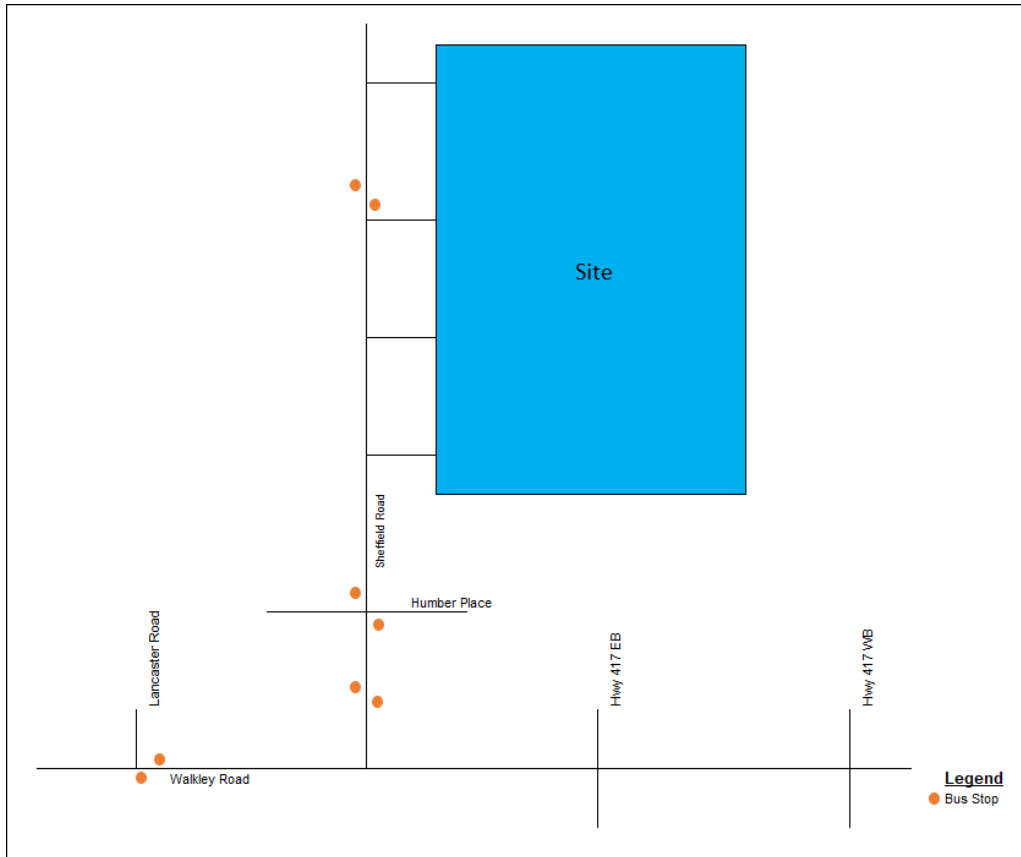
The site plan provides a total of 776 parking spaces including 225 auto spaces, of which 7 are accessible parking spaces, and 551 van spaces. The site also provides ten (10) loading docks for trucks. The locations of the proposed parking spaces are summarized in **Table 1**. The site plan is available in **Appendix A**.

**Table 1: Parking Space Summary**

Type	Number of Spaces	Location
Auto Spaces	225 (including 7 accessible parking space)	North-West Quadrant of the Site
Van Spaces	551	North, and East of the Site
Truck Docks	10	South of the Site

The site will provide a bike rack for 10 bicycles, which are located close to the entrance of the main building in a protected area. There are currently no designated cycling facilities in the vicinity of the study area.

OC Transpo bus route # 47 provides transit services in the vicinity of the site during the AM and PM peak periods Monday to Friday. Bus Route # 47 has multiple stops including at the intersection of Sheffield Road and the north-west access driveway, Sheffield Road and Humber Place, Sheffield Road and Bantree Street, Lancaster Road and Walkley Road. The locations of the bus stops are shown in **Figure 1**.



**Figure 1. Bus Stops in the Vicinity of the Site**

As per the City of Ottawa 2017 TIA guidelines, TDM - Supportive Development Design and Infrastructure Checklist for a Non-Residential Development is provided below.

## TDM-Supportive Development Design and Infrastructure Checklist:

*Non-Residential Developments (office, institutional, retail or industrial)*

<b>Legend</b>	
<b>REQUIRED</b>	The Official Plan or Zoning By-law provides related guidance that must be followed
<b>BASIC</b>	The measure is generally feasible and effective, and in most cases would benefit the development and its users
<b>BETTER</b>	The measure could maximize support for users of sustainable modes, and optimize development performance

TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
<b>1. WALKING &amp; CYCLING: ROUTES</b>		
<b>1.1 Building location &amp; access points</b>		
BASIC	1.1.1 Locate building close to the street, and do not locate parking areas between the street and building entrances	<input type="checkbox"/> Some on-Site parking is located between the building and street
BASIC	1.1.2 Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	<input checked="" type="checkbox"/> The building entrances are locate so they minimize walking distance to transit stops
BASIC	1.1.3 Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	<input checked="" type="checkbox"/> Will conform
<b>1.2 Facilities for walking &amp; cycling</b>		
REQUIRED	1.2.1 Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations ( <i>see Official Plan policy 4.3.3</i> )	<input type="checkbox"/> N/A as the site is not within 60m of a major stop along a rapid transit route
REQUIRED	1.2.2 Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible ( <i>see Official Plan policy 4.3.12</i> )	<input checked="" type="checkbox"/> Designated walkways are provided from the building entrances to the adjacent street. A safe, attractive, and direct pedestrian route between the main building entrance and the Sheffield Road sidewalk will be provided. Public sidewalk on the east side of Sheffield Road along the site frontage to connect the northbound Sheffield Road bus stops will be provided.

TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3 Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks ( <i>see Official Plan policy 4.3.10</i> )	<input type="checkbox"/>

<b>REQUIRED</b>	1.2.4 Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps (see <i>Official Plan policy 4.3.10</i> )	<input checked="" type="checkbox"/> N/A. The site does not encompass sidewalks. There is a public sidewalk in the vicinity of the site along Sheffield Road. <input checked="" type="checkbox"/> All open space areas easily accessible. Curb ramps complete with TWSIs will be provided at accessible parking aisles and at internal crossings of drive aisles.
<b>REQUIRED</b>	1.2.5 Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians (see <i>Official Plan policy 4.3.11</i> )	<input checked="" type="checkbox"/> Pedestrian connections between the building and the adjacent street are provided. <input type="checkbox"/> There are currently no designated cycling facilities in the vicinity of the site.
<b>BASIC</b>	1.2.6 Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	<input checked="" type="checkbox"/> Transit stops are available on Sheffield Road. Safe and attractive pedestrian connections between the building and Sheffield Road are provided.
<b>BASIC</b>	1.2.7 Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	<input type="checkbox"/> Existing sidewalk is secure and visible, but is not well lit.
<b>BASIC</b>	1.2.8 Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	<input type="checkbox"/> N/A. The site does not encompass public roads
<b>1.3 Amenities for walking &amp; cycling</b>		
<b>BASIC</b>	1.3.1 Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	<input checked="" type="checkbox"/> Landscaping will be provided between the building entrances
<b>BASIC</b>	1.3.2 Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	<input checked="" type="checkbox"/> Wayfinding signage for site access will be provided

TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
<b>2. WALKING &amp; CYCLING: END-OF-TRIP FACILITIES</b>		
<b>2.1 Bicycle parking</b>		
<b>REQUIRED</b>	2.1.1 Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible (see <i>Official Plan policy 4.3.6</i> )	<input checked="" type="checkbox"/> There will be a bicycle parking close to the building entrance

REQUIRED	2.1.2 Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas (see <i>Zoning By-law Section 111</i> )	■ The number of bicycle spaces will conform to City of Ottawa By-laws
REQUIRED	2.1.3 Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored (see <i>Zoning By-law Section 111</i> )	■ The minimum dimensions of bicycle spaces will conform to City of Ottawa By-laws
BASIC	2.1.4 Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	■ The number of bicycle spaces will meet the expected demand
BETTER	2.1.5 Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	■ A bike rack for 10 bicycles will be provided at the site. The number of cycling commuters is anticipated to be low due to the nature of the site.
<b>2.2 Secure bicycle parking</b>		
REQUIRED	2.2.1 Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers (see <i>Zoning By-law Section 111</i> )	<input type="checkbox"/> N/A
BETTER	2.2.2 Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	■ Bicycle spaces are located in a secure protected area within close proximity of the building entrance
<b>2.3 Shower &amp; change facilities</b>		
BASIC	2.3.1 Provide shower and change facilities for the use of active commuters	<input type="checkbox"/>
BETTER	2.3.2 In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	<input type="checkbox"/>
<b>2.4 Bicycle repair station</b>		
BETTER	2.4.1 Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	<input type="checkbox"/>

<b>TDM-supportive design &amp; infrastructure measures: Non-residential developments</b>		<b>Check if completed &amp; add descriptions, explanations or plan/drawing references</b>
<b>3. TRANSIT</b>		
<b>3.1 Customer amenities</b>		
BASIC	3.1.1 Provide shelters, lighting and benches at any on-site transit stops	■ Bus stop infrastructure will be improved to an accessible standard, including the addition of

		shelter pads where space is available in the public ROW
<b>BASIC</b>	3.1.2 Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	<input type="checkbox"/>
<b>BETTER</b>	3.1.3 Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	<input type="checkbox"/> There are no on-site transit stops
<b>4. RIDESHARING</b>		
<b>4.1 Pick-up &amp; drop-off facilities</b>		
<b>BASIC</b>	4.1.1 Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	<input checked="" type="checkbox"/> An area at the proximity of the major entrance is designated for ridesharing and passenger pick up or drop off.
<b>4.2 Carpool parking</b>		
<b>BASIC</b>	4.2.1 Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools	<input type="checkbox"/>
<b>BETTER</b>	4.2.2 At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	<input type="checkbox"/>
<b>5. CARSHARING &amp; BIKESHARING</b>		
<b>5.1 Carshare parking spaces</b>		
<b>BETTER</b>	5.1.1 Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces (see <i>Zoning By-law Section 94</i> )	<input type="checkbox"/>
<b>5.2 Bikeshare station location</b>		
<b>BETTER</b>	5.2.1 Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	<input type="checkbox"/>

<b>TDM-supportive design &amp; infrastructure measures: Non-residential developments</b>	<b>Check if completed &amp; add descriptions, explanations or plan/drawing references</b>
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<b>6. PARKING</b>		
<b>6.1 Number of parking spaces</b>		
<b>REQUIRED</b>	6.1.1 Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	<input checked="" type="checkbox"/> Parking supply meets the parking needs of the site given the site operational characteristics.
<b>BASIC</b>	6.1.2 Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	<input checked="" type="checkbox"/> There are parking spaces for the employees and customers in the north-west quadrant of the site

BASIC	6.1.3 Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly (see Zoning By-law Section 104)	<input type="checkbox"/> N/A
BETTER	6.1.4 Reduce the minimum number of parking spaces required by zoning by one space for each 13 square meters of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking (see Zoning By-law Section 111)	<input type="checkbox"/>
<b>6.2 Separate long-term &amp; short-term parking areas</b>		
BETTER	6.2.1 Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	<input type="checkbox"/>
<b>7. OTHER</b>		
<b>7.1 On-site amenities to minimize off-site trips</b>		
BETTER	7.1.1 Provide on-site amenities to minimize mid-day or mid-commute errands	<input type="checkbox"/>

### 1.1.2 Circulation and Access

The proposed site will have six accesses. These will be four accesses on Sheffield Road and two accesses from Humber Place. The most northerly access driveway will provide access to vans/personal vehicles and the two middle access driveways will provide access to site staff (i.e., managers and associates from / to the site to Sheffield Road. The most southern access driveway also provides access to trucks. The two access driveways on Humber Place will provide access to delivery vans from / to the site. The site consists of one delivery station building.

### 1.1.3 New Street Networks

As per the City of Ottawa 2017 TIA guidelines, this section is not required for applications involving site plans. In addition, as document in the Scoping memo, this section is exempted as no new street network is considered.

## 1.2 Parking

### 1.2.1 Parking Supply

The approximate building size is 263,500 sf and the lot size is 18.2 acres. Based on the parking requirement for this particular zoning (0.8/100 m<sup>2</sup> for first 5000 m<sup>2</sup> of GFA and 0.4/100 m<sup>2</sup> above 5000 m<sup>2</sup> GFA) the site requires 118 parking spots. However, given the site operational characteristic and client's parking requirements, the parking supply was increased to 776 spaces in total, which is a surplus and exceeds the city of Ottawa parking by-law requirement in order to accommodate site operational requirements. **Table 2** provides a parking supply summary.



**Table 2: Parking Review Summary**

Parking	Proposed On-Site	Proposed Off-Site
Associates	147	-
Manager Spaces	15	-
Van Personal Vehicles	60	-
Guest Pickup	3	-
<b>Total Auto Spaces</b>	225	-
Van Personal Vehicle	120	-
Van Parking	371	-
Van Loading	60	-
<b>Total Van Spaces</b>	551	-
<b>Total Parking</b>	776	

The zoning requires spaces for 10 bicycles. The site plan will be providing 10 bicycles rack, which will be located in a secure protected area close to the main entrance to the building.

### 1.2.2 Spillover Parking

As document in the Scoping memo, this section is exempted as the parking supply is above the unconstrained demand.

## 1.3 Boundary Street Design

### 1.3.1 Midblock Multi Modal Level of Service

The multi-modal level of service (MMLOS) was evaluated for Sheffield Road, Lancaster Road and Walkley Road to assist with developing a design concept that maximizes the achievement of the MMLOS objectives. The MMLOS then was compared to the MMLOS targets for pedestrians, bicycles, transit and trucks. The LOS targets were obtained from Exhibit 22 of the Multi-Modal Level of Service (MMLOS) Guidelines.

#### 1.3.1.1 Pedestrian Level of Service (PLOS)

**Table 3.** examines the pedestrian level of services for the street segments adjacent to the site and compares it against the target level of service.

**Table 3: Pedestrian Level of Service**

Street	Segment	Level of Service (LOS)	Target Level of Service (LOS)
Sheffield Road	Between Bantree Street and Walkley Road	C	C

**1.3.1.2 Bicycle Level of Service (BLOS)**

**Table 4.** examines the Bicycle level of services for the street segments adjacent to the site and compares it against the target level of service.

**Table 4: Bicycle Level of Service**

Street	Segment	Level of Service (LOS)	Target Level of Service (LOS)
Sheffield Road	Between Bantree Street and Walkley Road	B	C

**1.3.1.3 Transit Level of Service (TLOS)**

**Table 5.** examines the Transit level of services for the street segments adjacent to the site and compares it against the target level of service. 2030 future horizon year was used to calculate the transit delay for the purpose of transit LOS evaluation.

**Table 5: Transit Level of Service**

Street	Segment	Level of Service (LOS)	Target Level of Service (LOS)
Sheffield Road	Between Bantree Street and Walkley Road	D	D

**1.3.1.4 Truck Level of Service (TrLOS)**

**Table 6.** examines the Truck level of services for the street segments adjacent to the site and compares it against the target level of service.

**Table 6: Truck Level of Service**

Street	Segment	Level of Service (LOS)	Target Level of Service (LOS)
Sheffield Road	Between Bantree Street and Walkley Road	C	D

**1.4 Access Intersection Design**

**1.4.1 Location and Design of Access**

The proposed site will have six accesses. These will be four accesses on Sheffield Road and two accesses from Humber Place. The most northerly access driveway will provide access to vans/personal vehicles, and the two middle access driveways will provide access to site staff (i.e., managers and associates from / to the site to Sheffield Road. The most southern access driveway also provides access to trucks. The two access driveways on Humber Place will provide access to delivery vans from / to the site. The site consists of one delivery station building.

### 1.4.2 Intersection Control

Intersection control for all adjacent intersections and site access driveway are summarized in **Table 7**.

**Table 7. Intersection and Site Access Traffic Control Device Type**

Intersection / Access	Type of Traffic Control
Sheffield Road and Walkley Road	Traffic Signal
Lancaster Road and Walkley Road	Traffic Signal
Sheffield Road and Humber Place	Stop control on the minor street
Sheffield Road and Bantree Street	Stop control on the minor street
North-west access and Sheffield Road	Stop control from the site and free flow on the major road
West access and Sheffield Road	Stop control from the site and free flow on the major road
West access and Sheffield Road	Stop control from the site and free flow on the major road
South-west Access and Sheffield Road	No egress from the site and free flow on the major road

### 1.4.3 Intersection Design

#### 1.4.3.1 Intersection Multi-Modal Level of Service (MMLOS)

A multimodal level of service analysis was completed for all of the intersection within the study area. This includes a level of service assessment for pedestrians, cyclists, transit, and trucks. The level of service of trucks, transit services and active transportation users was assessed based on the methodologies outlined in the City of Ottawa's Multi-Modal Level of Service Guidelines (2015) and is based on existing infrastructure available to accommodate these modes of transportation. **Table 8**. examines the MMLOS for the site access driveway and adjacent intersections to the site.

**Table 8. Intersection and Site Access Multi-Modal Level of Service**

Intersection / Access	Pedestrian	Bicycle	Transit	Truck
Sheffield Road and Walkley Road	D	F	D	E
Lancaster Road and Walkley Road	D	F	D	E

#### 1.4.3.2 Intersection Capacity Analysis in Existing Conditions (2022)

In line with the City's TIA Guidelines, traffic operations at the study area intersections were assessed using Synchro software and the methodology outlined in the Highway Capacity Manual (HCM). The performance metrics used to illustrate the assessment findings are average delay per vehicle, level of service (LOS), and volume-to-capacity (V/C) ratio for each of the study area intersections both at the intersection level and the turning movement level.

LOS is intended to describe the quality of service of a transportation facility, i.e., an intersection in this case. As shown in **Table 9**, City of Ottawa defines six levels of service, ranging from LOS 'A' to LOS 'F', for signalized and unsignalized intersections. Levels of service are defined based on vehicle volume to lane/road capacity ratio. LOS 'A' represents the best operating conditions from the traveller's perspective and LOS 'F' represents the worst. The V/C ratio represents the capability of a transportation facility, an intersection in this case, to accommodate demand for travel on the facility. As V/C ratio approaches 1.00, there is an increased possibility of delays and queuing.

The different LOS as per city of Ottawa MMLOS guideline is shown in **Table 9**. Once V/C ratio exceeds 1.00, excessive delays and queues are expected.

**Table 9: Description of Levels of Service as per city of Ottawa MMLOS Guidelines**

Level of Service	Volume to capacity ratio
<b>A</b>	0 – 0.60
<b>B</b>	0.61 – 0.70
<b>C</b>	0.71 – 0.80
<b>D</b>	0.81 – 0.90
<b>E</b>	0.91 – 1.00
<b>F</b>	>1.00

**Table 10** summarizes the traffic analysis findings for the Existing Conditions during both the AM and PM peak hours. The related Synchro outputs are presented in **Appendix B**. In undertaking the Existing Conditions assessment, the following steps were taken:

- The Synchro models were developed to replicate the Existing Conditions (e.g., the lane configurations, traffic control devices, etc.) at the study area intersections during the weekday AM and PM peak hours;
- The weekday AM and PM peak hour turning movement volumes;
- The signal timing plans were provided by the City and input into the Synchro models;
- Peak Hour Factor and Heavy Vehicle Percentages were calculated based on data from the most recent traffic counts provided by the City for the following intersections:
  - Walkley Road and Lancaster Road;
  - Walkley Road and Sheffield Road;
  - Sheffield Road and Humber Place; and
  - Highway 417 at Walkley Road.
- For the intersections where peak hour factor and heavy vehicle percentage data was not available, the following were assumed:
  - Peak Hour Factor of 0.90 was considered for all turning movement volumes; and
  - The Synchro default Heavy Vehicle Percentage of 2% were considered all turning movement volumes, except for the northeast access driveway, which will mainly be used by trucks, where 100% Heavy Vehicle Percentage was considered.
- The Bus Blockages were also inputted into the model as the calculated number of blockages caused by stops made by Routes #47 buses. The Bus Blockages were input into the model only for the specific turning movement volumes that are directly impacted due to stops made by OC Transpo buses;
- The saturation flow rate of 1,800 vehicles per hour per lane was considered for all approaches.
- For all other parameters, the Synchro default values were used, i.e., lane utilization factors, etc.

The individual turning movements that were found to operate at “critical” levels, i.e., at LOS ‘E’ and / or with V/C ratio of greater than 0.85 are bolded in **Table 10**. The key findings of the Existing Conditions analysis are summarized as follows:

- The intersection of Walkley Road & Lancaster Road operates at LOS ‘B’ overall and LOS ‘C’ or better for individual movements in the AM peak hour. In the PM peak hour, the intersection of Walkley Road & Lancaster Road operates at LOS ‘C’ overall with individual movements operating at LOS ‘D’ or better
- The intersection of Walkley Road & Sheffield Road operates well overall at LOS ‘D’ and at LOS ‘E’ or better at the intersection movement level in the AM hour, except for in the WB movements which operate at LOS ‘E’. In the PM peak hour, the intersection of Walkley Road & Sheffield Road operates overall in acceptable

conditions; i.e., at LOS 'C' and at the movement level in acceptable conditions; i.e., at LOS 'C' or better with reserve capacity available.

- The intersection of Walkley Road & SB Highway 417 operates at LOS 'A' overall and at LOS 'B' or better for individual movements for both AM and PM peak hours.
- The intersection of Walkley Road & NB Highway 417 operates at LOS 'A' overall for AM and at LOS 'D' or better for individual movements for AM peak hours and LOS 'B' overall for PM and LOS 'D' or better for individual movements in PM peak hours.
- The intersection of Humber Place & Sheffield Road operates at LOS 'A' overall for AM and at LOS 'A' or better for individual movements for AM peak hours and LOS 'B' overall for PM and LOS 'A' or better for individual movements in PM peak hours.

**Table 10: Summary of the Traffic Analysis Findings for the Existing Conditions**

Intersection	Movements	AM Peak Hour				PM Peak Hour			
		V/C	Delay (s)	LOS	95th Queue (m)	V/C	Delay (s)	LOS	95th Queue (m)
Walkley Road & Lancaster Road (Signalized)	EBL	0.57	24.6	A	73.7	0.29	8.4	A	35.9
	EBT	0.31	5.2	A	52.6	0.76	12.0	C	79.4
	WBT	0.71	10.6	C	79.7	0.55	17.4	A	72.6
	WBR	0.44	11.8	A	83.9	0.12	25.9	A	9.9
	SBL	0.19	56.3	A	37.4	0.89	64.6	D	108.2
	SBR	0.12	55.9	A	22.6	0.39	51.7	A	53.8
Walkley Road & Sheffield Road (Signalized)	EBL	0.85	64.6	D	116.0	0.43	6.2	A	45.0
	EBT	0.18	3.5	A	40.3	0.75	7.3	C	126.9
	WBT	<b>0.92</b>	<b>34.1</b>	<b>E</b>	<b>220.6</b>	0.38	14.5	A	66.0
	WBR	0.27	16.5	A	50.9	0.08	11.6	A	30.6
	SBL	0.16	57.7	A	31.1	0.60	55.9	A	70.7
	SBR	0.20	59.7	A	81.6	0.28	51.0	A	50.8
Walkley Road & Highway 417 SB (Unsignalized)	EBT	0.13	0.0	A	0.0	0.48	0.0	A	2.0
	WBT	0.29	0.0	A	7.2	0.08	0.0	A	0.7
	SBL	0.13	28.2	A	14.0	0.69	45.3	B	147.6
Walkley Road & Highway 417 NB (Unsignalized)	EBTR	0.27	0.0	A	0.0	0.82	0.0	D	2.7
	WBT	0.18	0.0	A	1.4	0.02	0.0	A	0.0
	NBLR	0.88	58.5	D	71.5	0.89	51.7	D	28.3

<b>Humber Place &amp; Sheffield Road (Unsignalized)</b>	EBLTR	0.23	15.7	A	23.3	0.36	17.4	A	25.3
	WBLTR	0.04	23.8	A	11.8	0.03	39.2	A	6.8
	NBLTR	0.13	3.3	A	160.5	0.07	2.2	A	56.2
	SBLTR	0.00	0.1	A	73.7	0.00	0.0	A	7.8

**1.4.3.3 Intersection Capacity Analysis in Future Background Conditions (2025 and 2030)**

**Table 11** and **Table 12** summarize the traffic analysis findings under the Future Background Conditions in 2025 and 2030, respectively, during both the AM and PM adjacent street peak hours. The adjacent street peak hours are from 7:00 AM to 8:00 AM in the morning, and from 4:00 PM to 5:00 PM in the afternoon. **Table 13** and **Table 14** summarize the traffic analysis findings under the Future Background Conditions in 2025 and 2030, respectively, during both the AM and PM site peak hours. The site peak hours are from 10:00 AM to 11:00 AM in the morning and from 8:00 PM to 9:00 PM in the evening. The related Synchro outputs are presented in **Appendix B**. In undertaking the Future Background Conditions scenario assessment, the existing signal timing plans were used at the intersections of Walkley Road & Sheffield Road, Walkley Road & Lancaster Road.

**Opening Year of 2025 – Adjacent Streets Peak Hour:**

The individual turning movements that are found to operate at “critical” levels; i.e., at LOS ‘E’ and / or with V/C ratio of greater than 0.85 in the interim horizon year of 2025 are bolded in **Table 11**. The key findings of the traffic analysis for the Future Background Conditions in the interim horizon year of 2022 are summarized as follows:

- The intersection of Walkley Road & Lancaster Road operates at LOS ‘C’ overall and LOS ‘D’ or better for individual movements in the AM peak hour. In the PM peak hour, the intersection of Walkley Road & Lancaster Road operates at LOS ‘C’ overall with individual movements operating at LOS ‘D’ or better, except for the SBL turn movement, which was found to operate at LOS ‘E’
- The intersection of Walkley Road & Sheffield Road operates well overall at LOS ‘D’ and at LOS ‘D’ or better at the intersection movement level in the AM hour, except for in the WBT movement which operates at LOS ‘E’. In the PM peak hour, the intersection of Walkley Road & Sheffield Road operates overall in acceptable conditions; i.e., at LOS ‘C’ and at the movement level in acceptable conditions; i.e., at LOS ‘C’ or better with reserve capacity available.
- The intersection of Walkley Road & SB Highway 417 operates at LOS ‘A’ overall for AM and LOS ‘B’ for PM with LOS ‘C’ or better for individual movements for PM peak hours.
- The intersection of Walkley Road & NB Highway 417 operates at LOS ‘A’ in the AM and LOS ‘C’ in PM overall and at the movement level with the exception of the northbound approach NBLR, which was found to operate at LOS ‘F’ in both AM and PM peak hours.
- The intersection of Humber Place & Sheffield Road operates at LOS ‘B’ in the AM and LOS ‘C’ in the PM overall, and at the LOS ‘A’ or better for individual movements during both AM and PM peak hours.

**Table 11: Summary of the Traffic Analysis Findings under the Future Background Conditions in the Opening Year of 2025 – Adjacent Streets Peak Hour**

Intersection	Movements	AM Peak Hour				PM Peak Hour			
		V/C	Delay (s)	LOS	95th Queue (m)	V/C	Delay (s)	LOS	95th Queue (m)
Walkley Road & Lancaster Road (Signalized)	EBL	0.62	33.7	B	50.8	0.31	9.2	A	13.2
	EBT	0.33	5.2	A	38.1	0.80	13.1	C	175.3
	WBT	0.74	11.3	C	67.3	0.58	17.9	A	122.0
	WBR	0.47	12.5	A	20.7	0.13	25.7	A	19.6
	SBL	0.20	56.4	A	21.9	<b>0.93</b>	<b>75.6</b>	<b>E</b>	<b>102.6</b>
	SBR	0.13	56.0	A	22.0	0.43	52.8	A	48.1
Walkley Road & Sheffield Road (Signalized)	EBL	0.89	70.5	D	118.7	0.46	6.7	A	17.9
	EBT	0.19	3.6	A	18.0	0.77	8.1	C	120.1
	WBT	<b>0.96</b>	<b>42.7</b>	<b>E</b>	<b>331.2</b>	0.39	14.7	A	62.8
	WBR	0.29	16.8	A	45.7	0.08	11.6	A	7.1
	SBL	0.16	57.8	A	14.2	0.63	56.5	B	55.5
	SBR	0.21	59.9	A	27.9	0.36	53.1	A	39.4
Walkley Road & Highway 417 SB (Unsignalized)	EBT	0.14	0.0	A	0.0	0.48	0.0	A	0.0
	WBTR	0.30	0.0	A	0.0	0.06	0.0	A	0.0
	SBL	0.15	30.7	A	3.8	0.77	56.9	C	42.1
Walkley Road & Highway 417 NB (Unsignalized)	EBTR	0.02	0.0	A	0.0	0.26	0.0	A	0.0
	WBT	0.19	0.0	A	0.0	0.02	0.0	A	0.0
	NBLR	<b>1.06</b>	<b>92.1</b>	<b>F</b>	<b>112.4</b>	<b>1.12</b>	<b>162.7</b>	<b>F</b>	<b>72.9</b>
Humber Place & Sheffield Road (Unsignalized)	EBLTR	0.25	16.9	A	7.6	0.43	20.4	A	15.9
	WBLTR	0.05	26.3	A	1.1	0.04	50.6	A	0.9
	NBLTR	0.14	3.4	A	3.6	0.08	2.3	A	1.9
	SBLTR	0.00	0.1	A	0.1	0.00	0.0	A	0.0

**Ultimate Horizon Year of 2030 - Adjacent Streets Peak Hour:**

The individual turning movements that are found to operate at “critical” levels; i.e., at LOS ‘E’ and / or with V/C ratio of greater than 0.85 in the ultimate horizon year of 2030 are bolded in **Table 12**. The key findings of the traffic analysis for the Future Background Conditions in the ultimate horizon year of 2027 are summarized as follows:

- The intersection of Walkley Road & Lancaster Road operates at LOS 'C' overall and LOS 'C' or better for individual movements in the AM peak hour, In the PM peak hour, the intersection of Walkley Road & Lancaster Road operates at LOS 'C' overall with individual movements operating at LOS 'D' or better, except for the SBL turn movement, which was found to operate at LOS 'E'
- The intersection of Walkley Road & Sheffield Road operates well overall at LOS 'E' and at LOS 'E' or better at the intersection movement level in the AM hour, except for in the WBT movement which operates at LOS 'F'. In the PM peak hour, the intersection of Walkley Road & Sheffield Road operates overall in acceptable conditions; i.e., at LOS 'C' and at the movement level in acceptable conditions; i.e., at LOS 'D' or better with reserve capacity available.
- The intersection of Walkley Road & SB Highway 417 operates at LOS 'B' overall and at LOS 'D' or better for individual movements for both AM and PM peak hours. Except for SBL which operates at LOS 'E' at PM peak hour.
- The intersection of Walkley Road & NB Highway 417 operates at LOS 'A' in the AM and LOS 'C' in the PM overall and at the movement level with the exception of the northbound approach NBLR, which was found to operate at LOS 'F' in both AM and PM peak hours.
- The intersection of Humber Place & Sheffield Road operates at LOS 'B' in the AM and LOS 'C' in the PM overall, and at the LOS 'A' or better for individual movements during both AM and PM peak hours.

**Table 12: Summary of the Traffic Analysis Findings under the Future Background Conditions in the Horizon Year of 2030 - Adjacent Streets Peak Hour**

Intersection	Movements	AM Peak Hour				PM Peak Hour			
		V/C	Delay (s)	LOS	95th Queue (m)	V/C	Delay (s)	LOS	95th Queue (m)
Walkley Road & Lancaster Road (Signalized)	EBL	0.72	48.9	C	65.9	0.35	10.6	A	14.1
	EBT	0.35	5.4	A	41.7	0.85	15.6	D	211.5
	WBT	0.79	12.3	C	68.0	0.62	18.6	B	134.2
	WBR	0.52	12.6	A	21.2	0.14	25.4	A	17.5
	SBL	0.22	56.6	A	23.2	<b>0.99</b>	<b>89.1</b>	<b>E</b>	<b>114.1</b>
	SBR	0.14	56.2	A	22.7	0.49	54.7	A	53.8
Walkley Road & Sheffield Road (Signalized)	EBL	<b>0.95</b>	<b>83.9</b>	<b>E</b>	<b>133.1</b>	0.51	7.7	A	17.8
	EBT	0.21	3.6	A	19.2	0.83	9.9	D	199.2
	WBT	<b>1.03</b>	<b>59.5</b>	<b>F</b>	<b>374.3</b>	0.42	15.1	A	68.3
	WBR	0.31	17.1	A	50.0	0.09	11.7	A	7.3
	SBL	0.17	58.0	A	15.0	0.67	58.1	B	59.2
	SBR	0.22	60.3	A	29.4	0.57	60.4	A	69.0
Walkley Road & Highway 417	EBT	0.15	0.0	A	0.0	0.51	0.0	A	0.0
	WBTR	0.32	0.0	A	0.0	0.06	0.0	A	0.0



<b>SB (Unsignalized)</b>	SBL	0.18	35.7	A	4.9	<b>0.92</b>	<b>87.9</b>	E	<b>57.3</b>
<b>Walkley Road &amp; Highway 417 NB (Unsignalized)</b>	EBTR	0.02	0.0	A	0.0	0.28	0.0	A	0.0
	WBT	0.21	0.0	A	0.0	0.02	0.0	A	0.0
	NBLR	<b>1.21</b>	<b>146.8</b>	<b>F</b>	<b>151.1</b>	<b>1.37</b>	<b>265.4</b>	<b>F</b>	<b>95.3</b>
<b>Humber Place &amp; Sheffield Road (Unsignalized)</b>	EBLTR	0.29	18.6	A	9.2	0.49	23.4	A	19.8
	WBLTR	0.05	29.7	A	1.2	0.05	62.2	A	1.1
	NBLTR	0.15	3.6	A	3.9	0.08	2.4	A	2.1
	SBLTR	0.00	0.1	A	0.1	0.00	0.0	A	0.0

**Opening Year of 2025 – Site Peak Hour:**

The individual turning movements that are found to operate at “critical” levels; i.e., at LOS ‘E’ and / or with V/C ratio of greater than 0.85 in the interim horizon year of 2025 are bolded in **Table 13**. The key findings of the traffic analysis for the Future Background Conditions in the interim horizon year of 2025 are summarized as follows:

- The intersection of Walkley Road & Lancaster Road operates at LOS ‘B’ overall and LOS ‘C’ or better for individual movements in the AM peak hour. In the PM peak hour, the intersection of Walkley Road & Lancaster Road operates at LOS ‘A’ overall with individual movements operating at LOS ‘B’ or better.
- The intersection of Walkley Road & Sheffield Road operates well overall at LOS ‘D’ and at LOS ‘D’ or better at the intersection movement level in the AM hour. Except for WBT which operates at LOS ‘E’ at AM peak hour. In the PM peak hour, the intersection of Walkley Road & Sheffield Road operates overall in acceptable conditions; i.e., at LOS ‘A’ and at the movement level in acceptable conditions; i.e., at LOS ‘A’ or better with reserve capacity available.
- The intersection of Walkley Road & SB Highway 417 operates at LOS ‘A’ overall and at LOS ‘A’ or better for individual movements for both AM and PM peak hours.
- The intersection of Walkley Road & NB Highway 417 operates at LOS ‘A’ overall and at LOS ‘A’ or better for individual movements for both AM and PM peak hours. Except for NBLR which operates at LOS ‘F’ at AM peak hour.
- The intersection of Humber Place & Sheffield Road operates at LOS ‘A’ overall, and at the LOS ‘A’ or better for individual movements during both AM and PM peak hours.

**Table 13: Summary of the Traffic Analysis Findings under the Future Background Conditions in the Opening Year of 2025 – Site Peak Hour**

Intersection	Movements	AM Peak Hour				PM Peak Hour			
		V/C	Delay (s)	LOS	95th Queue (m)	V/C	Delay (s)	LOS	95th Queue (m)
<b>Walkley Road &amp; Lancaster Road (Signalized)</b>	EBL	0.59	27.5	A	44.3	0.19	6.1	A	10.1
	EBT	0.32	5.2	A	36.7	0.59	8.5	A	93.3

	WBT	0.72	10.9	C	67.2	0.43	14.9	A	78.8
	WBR	0.45	12.2	A	20.5	0.10	24.8	A	16.5
	SBL	0.20	56.3	A	21.4	0.69	56.6	B	67.1
	SBR	0.12	55.9	A	21.3	0.21	47.5	A	27.7
Walkley Road & Sheffield Road (Signalized)	EBL	0.86	66.0	D	112.3	0.29	4.5	A	10.9
	EBT	0.19	3.5	A	17.6	0.57	5.1	A	57.0
	WBT	<b>0.93</b>	<b>38.3</b>	<b>E</b>	<b>291.1</b>	0.29	13.4	A	44.4
	WBR	0.28	16.6	A	43.6	0.06	11.4	A	6.2
	SBL	0.16	57.7	A	13.8	0.46	52.4	A	41.7
	SBR	0.20	59.8	A	27.4	0.22	49.6	A	26.9
Walkley Road & Highway 417 SB (Unsignalized)	EBT	0.13	0.0	A	0.0	0.35	0.0	A	0.0
	WBTR	0.29	0.0	A	0.0	0.04	0.0	A	0.0
	SBL	0.13	28.9	A	3.4	0.39	21.6	A	13.6
Walkley Road & Highway 417 NB (Unsignalized)	EBTR	0.02	0.0	A	0.0	0.19	0.0	A	0.0
	WBT	0.19	0.0	A	0.0	0.02	0.0	A	0.0
	NBLR	<b>1.00</b>	<b>74.6</b>	<b>F</b>	<b>98.3</b>	0.51	31.4	A	20.2
Humber Place & Sheffield Road (Unsignalized)	EBLTR	0.24	16.2	A	6.9	0.24	13.9	A	7.1
	WBLTR	0.04	25.0	A	1.0	0.01	26.4	A	0.3
	NBLTR	0.13	3.3	A	3.4	0.05	1.9	A	1.2
	SBLTR	0.00	0.1	A	0.1	0.00	0.0	A	0.0

**Ultimate Horizon Year of 2030 - Site Peak Hour:**

The individual turning movements that are found to operate at “critical” levels; i.e., at LOS ‘E’ and / or with V/C ratio of greater than 0.85 in the ultimate horizon year of 2030 are bolded in **Table 14**. The key findings of the traffic analysis for the Future Background Conditions in the ultimate horizon year of 2030 are summarized as follows:

- The intersection of Walkley Road & Lancaster Road operates at LOS ‘C’ overall and LOS ‘C’ or better for individual movements in the AM peak hour. In the PM peak hour, the intersection of Walkley Road & Lancaster Road operates at LOS ‘B’ overall with individual movements operating at LOS ‘C’ or better.
- The intersection of Walkley Road & Sheffield Road operates well overall at LOS ‘D’ and at LOS ‘E’ or better at the intersection movement level in the AM hour. Except WBT which operates at LOS ‘F’. In the PM peak hour, the intersection of Walkley Road & Sheffield Road operates overall in acceptable conditions; i.e., at LOS ‘B’ and at the movement level in acceptable conditions; i.e., at LOS ‘B’ or better with reserve capacity available.
- The intersection of Walkley Road & SB Highway 417 operates at LOS ‘A’ overall and at LOS ‘A’ or better for individual movements for both AM and PM peak hours.

- The intersection of Walkley Road & NB Highway 417 operates at LOS 'A' overall and at LOS 'B' or better for individual movements for both AM and PM peak hours. Except NBLR which operates at LOS 'F' in the AM peak hour.
- The intersection of Humber Place & Sheffield Road operates at LOS 'B' in the AM and LOS 'A' in the PM peak hours overall, and at the LOS 'A' or better for individual movements during both AM and PM peak hours.

**Table 14: Summary of the Traffic Analysis Findings under the Future Background Conditions in the Horizon Year of 2030 - Site Peak Hour**

Intersection	Movements	AM Peak Hour				PM Peak Hour			
		V/C	Delay (s)	LOS	95th Queue (m)	V/C	Delay (s)	LOS	95th Queue (m)
Walkley Road & Lancaster Road (Signalized)	EBL	0.67	42.0	B	59.2	0.21	6.6	A	10.8
	EBT	0.34	5.3	A	40.1	0.63	9.2	B	105.9
	WBT	0.77	12.0	C	67.6	0.46	15.4	A	86.3
	WBR	0.50	12.8	A	21.0	0.10	25.3	A	17.2
	SBL	0.21	56.6	A	22.7	0.73	58.7	C	71.8
	SBR	0.13	56.1	A	22.3	0.25	48.3	A	31.0
Walkley Road & Sheffield Road (Signalized)	EBL	<b>0.92</b>	<b>77.6</b>	<b>E</b>	<b>127.2</b>	0.32	4.7	A	11.5
	EBT	0.20	3.6	A	18.7	0.61	5.4	B	63.3
	WBT	<b>1.00</b>	<b>51.2</b>	<b>F</b>	<b>354.8</b>	0.31	13.7	A	48.0
	WBR	0.30	16.9	A	48.1	0.07	11.4	A	6.4
	SBL	0.17	57.9	A	14.5	0.50	53.1	A	44.5
	SBR	0.22	60.1	A	28.9	0.23	49.9	A	28.2
Walkley Road & Highway 417 SB (Unsignalized)	EBT	0.14	0.0	A	0.0	0.38	0.0	A	0.0
	WBTR	0.31	0.0	A	0.0	0.04	0.0	A	0.0
	SBL	0.16	33.3	A	4.3	0.45	24.7	A	16.7
Walkley Road & Highway 417 NB (Unsignalized)	EBTR	0.02	0.0	A	0.0	0.21	0.0	A	0.0
	WBT	0.20	0.0	A	0.0	0.02	0.0	A	0.0
	NBLR	<b>1.15</b>	<b>121.4</b>	<b>F</b>	<b>134.1</b>	0.61	40.2	B	27.0
Humber Place & Sheffield Road (Unsignalized)	EBLTR	0.27	17.6	A	8.3	0.27	14.8	A	8.2
	WBLTR	0.05	28.1	A	1.2	0.01	29.5	A	0.3
	NBLTR	0.14	3.5	A	3.8	0.05	1.9	A	1.3
	SBLTR	0.00	0.1	A	0.1	0.00	0.0	A	0.0

**1.4.3.4 Intersection Capacity Analysis in Future Total Conditions (2025 and 2030)**

**Table 15** and **Table 16** summarize the traffic analysis findings under the Future Total Conditions in 2025 and 2030 horizon years, respectively, during both the AM and PM peak hours of the adjacent street. **Table 17** and **Table 18** summarize the traffic analysis findings under the Future Total Conditions in 2025 and 2030 horizon years, respectively, during both the AM and PM peak hours of the site. The related Synchro outputs are presented in **Appendix B**.

**Opening Year of 2025 – Adjacent Streets Peak Hour:**

The Future Total Conditions when compared with the Future Background Conditions in 2025, the proposed Future Site is found to improve operations of some of the individual movements at the study area intersections.

- The intersection of Walkley Road & Lancaster Road operates at LOS ‘B’ overall and LOS ‘C’ or better for individual movements in the AM peak hour. In the PM peak hour, the intersection of Walkley Road & Lancaster Road operates at LOS ‘C’ overall with individual movements operating at LOS ‘C’ or better, except for the SBL turn movement, which was found to operate at LOS ‘E’.
- The intersection of Walkley Road & Sheffield Road operates well overall at LOS ‘E’ and at LOS ‘D’ or better at the intersection movement level in the AM hour, except for in the WBT movement which operates at LOS ‘E’. In the PM peak hour, the intersection of Walkley Road & Sheffield Road operates overall in acceptable conditions; i.e., at LOS ‘D’ and at the movement level in acceptable conditions; i.e., at LOS ‘C’ or better with reserve capacity available.
- The intersection of Walkley Road & SB Highway 417 operates at LOS ‘B’ overall and at LOS ‘A’ or better for individual movements for AM peak hours. And at LOS ‘C’ or better for individual movements for PM peak hours.
- The intersection of Walkley Road & NB Highway 417 operates at LOS ‘A’ for AM and LOS ‘C’ for PM overall and LOS ‘A’ at the movement level with the exception of the northbound approach NB LR, which was found to operate at LOS ‘F’ in both AM and PM peak hours.
- The intersection of Humber Place & Sheffield Road operates at LOS ‘A’ in the AM and LOS ‘C’ in the PM overall, and at the LOS ‘A’ or better for individual movements during both AM and PM peak hours.

**Table 15: Summary of the Traffic Analysis Findings under the Future Total Scenario in the Opening Year of 2025 – Adjacent Streets Peak Hour**

Intersection	Movements	AM Peak Hour				PM Peak Hour			
		V/C	Delay (s)	LOS	95th Queue (m)	V/C	Delay (s)	LOS	95th Queue (m)
Walkley Road & Lancaster Road (Signalized)	EBL	0.62	33.2	B	50.3	0.31	9.2	A	13.2
	EBT	0.32	5.2	A	37.4	0.80	13.2	C	177.4
	WBT	0.74	11.3	C	66.9	0.58	17.9	A	121.7
	WBR	0.47	12.6	A	20.7	0.13	25.8	A	19.9
	SBL	0.20	56.4	A	21.9	<b>0.93</b>	<b>75.6</b>	<b>E</b>	<b>102.6</b>

	SBR	0.13	56.0	A	22.0	0.43	52.8	A	48.1
<b>Walkley Road &amp; Sheffield Road (Signalized)</b>	EBL	0.86	65.9	D	111.9	0.47	6.9	A	18.7
	EBT	0.19	3.6	A	18.2	0.77	8.1	C	122.8
	WBT	<b>0.96</b>	<b>42.7</b>	<b>E</b>	<b>331.2</b>	0.39	14.7	A	62.8
	WBR	0.26	16.3	A	40.5	0.10	11.8	A	7.8
	SBL	0.13	57.3	A	11.9	0.60	55.7	A	52.9
	SBR	0.20	59.8	A	27.3	0.34	52.6	A	37.4
	<b>Walkley Road &amp; Highway 417 SB (Unsignalized)</b>	EBT	0.13	0.0	A	0.0	0.47	0.0	A
WBTR		0.30	0.0	A	0.0	0.06	0.0	A	0.0
SBL		0.14	29.8	A	3.7	0.76	55.6	C	41.5
<b>Walkley Road &amp; Highway 417 NB (Unsignalized)</b>	EBTR	0.02	0.0	A	0.0	0.26	0.0	A	0.0
	WBT	0.19	0.0	A	0.0	0.02	0.0	A	0.0
	NBLR	<b>1.01</b>	<b>78.5</b>	<b>F</b>	<b>100.5</b>	<b>1.16</b>	<b>174.4</b>	<b>F</b>	<b>78.4</b>
<b>Humber Place &amp; Sheffield Road (Unsignalized)</b>	EBLTR	0.24	15.9	A	6.9	0.42	20.0	A	15.5
	WBLTR	0.05	0.0	A	0.0	0.00	0.0	A	0.0
	NBLTR	0.13	3.4	A	3.5	0.07	2.2	A	1.8
	SBLTR	0.00	0.0	A	0.0	0.00	0.0	A	0.0

**Ultimate Horizon Year of 2030 – Adjacent Streets Peak Hour:**

Traffic operations at the study area intersections in the Future Site scenario were found to slightly improve when compared with the Future BAU scenario in 2030. The following provides a quick summary of traffic operations:

- The intersection of Walkley Road & Lancaster Road operates at LOS 'C' overall and LOS 'C' or better for individual movements in the AM peak hour. In the PM peak hour, the intersection of Walkley Road & Lancaster Road operates at LOS 'C' overall with individual movements operating at LOS 'D' or better, except for the SBL turn movement, which was found to operate at LOS 'E'
- The intersection of Walkley Road & Sheffield Road operates well overall at LOS 'D' and at LOS 'E' or better at the intersection movement level in the AM hour, except for in the WBT movement which operates at LOS 'F'. In the PM peak hour, the intersection of Walkley Road & Sheffield Road operates overall in acceptable conditions; i.e., at LOS 'C' and at the movement level in acceptable conditions; i.e., at LOS 'D' or better with reserve capacity available.
- The intersection of Walkley Road & SB Highway 417 operates at LOS 'B' overall and at LOS 'A' or better for individual movements for both AM and PM peak hours. Except for SBL which operates at LOS 'E' in the PM peak hour.
- The intersection of Walkley Road & NB Highway 417 operates at LOS 'A' in the AM and LOS 'C' in the PM overall and LOS 'A' at the movement level with the exception of the northbound approach NBLR, which was found to operate at LOS 'F' in both AM and PM peak hours.

- The intersection of Humber Place & Sheffield Road operates at LOS 'B' in the AM and LOS 'C' in the PM overall, and at the LOS 'A' or better for individual movements during both AM and PM peak hours

**Table 16: Summary of the Traffic Analysis Findings under the Future Site Scenario in the Ultimate Horizon Year of 2030 – Adjacent Street Peak Hour**

Intersection	Movements	AM Peak Hour				PM Peak Hour			
		V/C	Delay (s)	LOS	95th Queue (m)	V/C	Delay (s)	LOS	95th Queue (m)
Walkley Road & Lancaster Road (Signalized)	EBL	0.72	48.5	C	65.7	0.35	10.5	A	14.1
	EBT	0.35	5.4	A	40.8	0.86	15.7	D	213.9
	WBT	0.79	12.3	C	67.6	0.62	18.5	B	133.6
	WBR	0.52	12.6	A	21.1	0.14	25.5	A	17.8
	SBL	0.22	56.6	A	23.2	<b>0.99</b>	<b>89.1</b>	<b>E</b>	<b>114.1</b>
	SBR	0.14	56.2	A	22.7	0.49	54.7	A	53.8
Walkley Road & Sheffield Road (Signalized)	EBL	<b>0.92</b>	<b>77.0</b>	<b>E</b>	<b>125.8</b>	0.53	7.8	A	18.4
	EBT	0.21	3.6	A	19.3	0.83	10.0	D	200.0
	WBT	<b>1.03</b>	<b>59.5</b>	<b>F</b>	<b>374.3</b>	0.42	15.1	A	68.3
	WBR	0.28	16.6	A	44.2	0.11	11.9	A	8.0
	SBL	0.14	57.5	A	12.8	0.64	56.9	B	56.3
	SBR	0.22	60.2	A	28.8	0.55	59.4	A	66.3
Walkley Road & Highway 417 SB (Unsignalized)	EBT	0.14	0.0	A	0.0	0.50	0.0	A	0.0
	WBTR	0.32	0.0	A	0.0	0.06	0.0	A	0.0
	SBL	0.18	34.4	A	4.7	<b>0.91</b>	<b>85.3</b>	<b>E</b>	<b>56.3</b>
Walkley Road & Highway 417 NB (Unsignalized)	EBTR	0.02	0.0	A	0.0	0.28	0.0	A	0.0
	WBT	0.21	0.0	A	0.0	0.02	0.0	A	0.0
	NBLR	<b>1.16</b>	<b>127.0</b>	<b>F</b>	<b>136.3</b>	<b>1.41</b>	<b>276.9</b>	<b>F</b>	<b>100.6</b>
Humber Place & Sheffield Road (Unsignalized)	EBLTR	0.27	17.2	A	8.3	0.48	22.8	A	19.3
	WBLTR	0.00	0.0	A	0.0	0.00	0.0	A	0.0
	NBLTR	0.15	3.6	A	3.9	0.08	2.3	A	2.0
	SBLTR	0.00	0.0	A	0.0	0.00	0.0	A	0.0

**Opening Year of 2025 – Site Peak Hour:**

The Future Total Conditions when compared with the Future Background Conditions in 2025, the proposed Future Site is found to improve operations of some of the individual movements at the study area intersections.

- The intersection of Walkley Road & Lancaster Road operates at LOS 'B' overall and LOS 'C' or better for individual movements in the AM peak hour. In the PM peak hour, the intersection of Walkley Road & Lancaster Road operates at LOS 'A' overall with individual movements operating at LOS 'B' or better.
- The intersection of Walkley Road & Sheffield Road operates well overall at LOS 'D' and at LOS 'A' or better at the intersection movement level in the AM hour. Except for the EBL and WBT which operate at LOS 'E'. In the PM peak hour, the intersection of Walkley Road & Sheffield Road operates overall in acceptable conditions; i.e., at LOS 'A' and at the movement level in acceptable conditions; i.e., at LOS 'B' or better with reserve capacity available.
- The intersection of Walkley Road & SB Highway 417 operates at LOS 'A' overall and at LOS 'A' or better for individual movements for both AM and PM peak hours.
- The intersection of Walkley Road & NB Highway 417 operates at LOS 'A' overall and at LOS 'B' or better for individual movements for both AM and PM peak hours. Except for NBLR which operates at LOS 'F' in the AM peak hour.
- The intersection of Humber Place & Sheffield Road operates at LOS 'C' in the AM and LOS 'B' in the PM overall, and at the LOS 'A' or better for individual movements during both AM and PM peak hours.

**Table 17: Summary of the Traffic Analysis Findings under the Future Total Scenario in the Opening Year of 2025 – Site Peak Hour**

Intersection	Movements	AM Peak Hour				PM Peak Hour			
		V/C	Delay (s)	LOS	95th Queue (m)	V/C	Delay (s)	LOS	95th Queue (m)
Walkley Road & Lancaster Road (Signalized)	EBL	0.59	27.1	A	43.8	0.19	6.3	A	10.1
	EBT	0.33	5.3	A	38.3	0.60	8.7	A	97.3
	WBT	0.72	10.8	C	67.3	0.45	15.3	A	82.4
	WBR	0.45	12.3	A	20.4	0.10	24.0	A	15.7
	SBL	0.20	56.3	A	21.4	0.69	56.6	B	67.1
	SBR	0.12	55.9	A	21.3	0.21	47.5	A	27.7
Walkley Road & Sheffield Road (Signalized)	EBL	<b>0.94</b>	<b>79.7</b>	<b>E</b>	<b>130.1</b>	0.34	4.8	A	13.0
	EBT	0.19	3.5	A	17.3	0.57	5.1	A	57.4
	WBT	<b>0.93</b>	<b>38.3</b>	<b>E</b>	<b>291.1</b>	0.29	13.4	A	44.4
	WBR	0.36	17.9	A	58.6	0.14	12.3	A	8.9
	SBL	0.47	64.2	A	34.8	0.62	56.5	B	55.3
	SBR	0.23	60.6	A	29.6	0.24	50.0	A	28.3

<b>Walkley Road &amp; Highway 417 SB (Unsignalized)</b>	EBT	0.14	0.0	A	0.0	0.35	0.0	A	0.0
	WBTR	0.30	0.0	A	0.0	0.05	0.0	A	0.0
	SBL	0.14	30.7	A	3.6	0.41	23.3	A	14.9
<b>Walkley Road &amp; Highway 417 NB (Unsignalized)</b>	EBTR	0.02	0.0	A	0.0	0.19	0.0	A	0.0
	WBT	0.19	0.0	A	0.0	0.02	0.0	A	0.0
	NBLR	<b>1.09</b>	<b>101.6</b>	<b>F</b>	<b>121.8</b>	0.67	42.3	B	32.7
<b>Humber Place &amp; Sheffield Road (Unsignalized)</b>	EBLTR	0.34	23.2	A	10.9	0.30	16.9	A	9.3
	WBLTR	0.00	0.0	A	0.0	0.00	0.0	A	0.0
	NBLTR	0.15	3.5	A	4.0	0.05	1.6	A	1.3
	SBLTR	0.00	0.0	A	0.0	0.00	0.0	A	0.0

**Ultimate Horizon Year of 2030 – Site Peak Hour:**

Traffic operations at the study area intersections in the Future Total scenario were found to slightly improve when compared with the Future Background scenario in 2030. The following provides a quick summary of traffic operations:

- The intersection of Walkley Road & Lancaster Road operates at LOS 'C' overall and LOS 'C' or better for individual movements in the AM peak hour. In the PM peak hour, the intersection of Walkley Road & Lancaster Road operates at LOS 'B' overall and LOS 'C' or better for individual movements.
- The intersection of Walkley Road & Sheffield Road operates well overall at LOS 'D' and at LOS 'A' or better at the intersection movement level in the AM hour. Except for the EBL and WBT which operate at LOS 'F'. In the PM peak hour, the intersection of Walkley Road & Sheffield Road operates overall in acceptable conditions; i.e., at LOS 'B' and at the movement level in acceptable conditions; i.e., at LOS 'B' or better with reserve capacity available.
- The intersection of Walkley Road & SB Highway 417 operates at LOS 'A' overall and at LOS 'A' or better for individual movements for both AM and PM peak hours.
- The intersection of Walkley Road & NB Highway 417 operates at LOS 'A' overall and at LOS 'A' or better for individual movements for both AM and PM peak hours. Except for NBLR which operates at LOS 'F' in the AM and LOS 'C' in the PM.
- The intersection of Humber Place & Sheffield Road operates at LOS 'C' overall, and at the LOS 'A' or better for individual movements during both AM and PM peak hours.



**Table 18: Summary of the Traffic Analysis Findings under the Future Site Scenario in the Ultimate Horizon Year of 2030 – Site Peak Hour**

Intersection	Movements	AM Peak Hour				PM Peak Hour			
		V/C	Delay (s)	LOS	95th Queue (m)	V/C	Delay (s)	LOS	95th Queue (m)
Walkley Road & Lancaster Road (Signalized)	EBL	0.67	41.6	B	58.7	0.21	6.8	A	10.8
	EBT	0.35	5.4	A	41.7	0.65	9.4	B	110.5
	WBT	0.77	12.0	C	68.4	0.48	15.9	A	91.3
	WBR	0.50	13.0	A	20.6	0.10	24.4	A	16.1
	SBL	0.21	56.6	A	22.7	0.73	58.7	C	71.8
	SBR	0.13	56.1	A	22.3	0.25	48.3	A	31.0
Walkley Road & Sheffield Road (Signalized)	EBL	<b>1.00</b>	<b>96.2</b>	<b>F</b>	<b>144.6</b>	0.38	5.1	A	13.6
	EBT	0.20	3.5	A	18.5	0.61	5.4	B	63.8
	WBT	<b>1.00</b>	<b>51.2</b>	<b>F</b>	<b>354.8</b>	0.31	13.7	A	48.0
	WBR	0.38	18.3	A	62.9	0.15	12.3	A	9.1
	SBL	0.48	64.4	A	35.5	0.65	57.5	B	57.7
	SBR	0.30	62.6	A	35.5	0.30	51.5	A	34.2
Walkley Road & Highway 417 SB (Unsignalized)	EBT	0.15	0.0	A	0.0	0.38	0.0	A	0.0
	WBTR	0.32	0.0	A	0.0	0.06	0.0	A	0.0
	SBL	0.17	35.4	A	4.6	0.47	26.8	A	18.3
Walkley Road & Highway 417 NB (Unsignalized)	EBTR	0.02	0.0	A	0.0	0.21	0.0	A	0.0
	WBT	0.20	0.0	A	0.0	0.02	0.0	A	0.0
	NBLR	<b>1.24</b>	<b>156.5</b>	<b>F</b>	<b>160.4</b>	0.78	59.0	C	43.4
Humber Place & Sheffield Road (Unsignalized)	EBLTR	0.39	26.2	A	13.3	0.33	18.2	A	11.0
	WBLTR	0.00	0.0	A	0.0	0.00	0.0	A	0.0
	NBLTR	0.16	3.8	A	4.4	0.06	1.7	A	1.4
	SBLTR	0.00	0.0	A	0.0	0.00	0.0	A	0.0

## 2. Transportation Demand Management

This section provides a description of the existing transit services and active transportation facilities within the study area as well as a set of recommended TDM measures for the subject development. There are no residential, institutional, recreational or natural land uses identified that would be impacted if traffic volumes generated by the proposed development are higher than expected. Increased transit frequency, along with the presence of cycling infrastructure and parking around the vicinity of the site would improve the likelihood of achieving the sustainable mode share targets. The estimated number of employees per occupations and their shift times area outlined in the figure below.


	Start	End	No	Designation	Percentage
1st shift	1:30 AM	12:30 PM	90	Associates	19%
2nd shift	5:30 AM	2:30 PM	28	Associates	6%
3rd shift	1:00 PM	10:00 PM	28	Associates	6%
PFSD shift	1:30 PM	6:00 PM	22	Associates	5%
RTS shift	11:30 AM	10:30 PM	5	Associates	1%
Drivers	9:00 AM	9:30 PM	298	Drivers	63%

**Figure 2. Employee Shift Breakdown**

For this purpose, the City of Ottawa TDM Measures Checklist for a Non-Residential Development was used. The following provides a checklist which examines the site plan and transportation components for the proposed site.

## 3. TDM Measures Checklist:

Non-Residential Developments (office, institutional, retail or industrial)

<b>Legend</b>	
<b>BASIC</b>	The measure is generally feasible and effective, and in most cases would benefit the development and its users
<b>BETTER</b>	The measure could maximize support for users of sustainable modes, and optimize development performance
	The measure is one of the most dependably effective tools to encourage the use of sustainable modes

TDM measures: <i>Non-residential developments</i>		check if proposed & add descriptions
<b>1. TDM PROGRAM MANAGEMENT</b>		
<b>1.1 Program coordinator</b>		
BASIC	★ ✱ 1.1.1 Designate an internal coordinator, or contract with an external coordinator	<input type="checkbox"/>
<b>1.2 Travel surveys</b>		
BETTER	1.2.1 Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	<input type="checkbox"/>
<b>2. WALKING AND CYCLING</b>		
<b>2.1 Information on walking/cycling routes &amp; destinations</b>		
BASIC	2.1.1 Display local area maps with walking/cycling access routes and key destinations at major entrances	■ local area maps with walking/cycling access routes and facilities can be displayed on the information board
<b>2.2 Bicycle skills training</b>		
<i>Commuter travel</i>		
BETTER	★ ✱ 2.2.1 Offer on-site cycling courses for commuters, or subsidize off-site courses	<input type="checkbox"/>
<b>Valet bike parking</b>		
<i>Visitor travel</i>		
BETTER	2.3.1 Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	<input type="checkbox"/>

TDM measures: <i>Non-residential developments</i>		check if proposed & add descriptions
<b>3. TRANSIT</b>		
<b>3.1 Transit information</b>		
BASIC	3.1.1 Display relevant transit schedules and route maps at entrances	■ Transit schedule and route maps can be displayed on the information board
BASIC	3.1.2 Provide online links to OC Transpo and STO information	■ links to OC Transpo and STO information can be displayed on the information board
BETTER	3.1.3 Provide real-time arrival information display at entrances	<input type="checkbox"/>
<b>3.2 Transit fare incentives</b>		
<i>Commuter travel</i>		
BETTER	3.2.1 Offer preloaded PRESTO cards to encourage commuters to use transit	<input type="checkbox"/>

<b>BETTER</b> ★	3.2.2 Subsidize or reimburse monthly transit pass purchases by employees	<input type="checkbox"/>
<i>Visitor travel</i>		
<b>BETTER</b>	3.2.3 Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games)	<input type="checkbox"/>
<b>3.3 Enhanced public transit service</b>		
<i>Commuter travel</i>		
<b>BETTER</b>	3.3.1 Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	<input type="checkbox"/> Consider since Route 47 may not provide adequate service for the development's shift changes.
<i>Visitor travel</i>		
<b>BETTER</b>	3.3.2 Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	<input type="checkbox"/>
<b>3.4 Private transit service</b>		
<i>Commuter travel</i>		
<b>BETTER</b>	3.4.1 Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for shift changes, weekends)	<input type="checkbox"/>
<i>Visitor travel</i>		
<b>BETTER</b>	3.4.2 Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for festivals, concerts, games)	<input type="checkbox"/>

TDM measures: <i>Non-residential developments</i>		Check if proposed & add descriptions
<b>4. RIDESHARING</b>		
<b>4.1 Ridematching service</b>		
<i>Commuter travel</i>		
<b>BASIC</b> ★	4.1.1 Provide a dedicated ridematching portal at OttawaRideMatch.com	<input type="checkbox"/>
<b>4.2 Carpool parking price incentives</b>		
<i>Commuter travel</i>		
<b>BETTER</b>	4.2.1 Provide discounts on parking costs for registered carpools	<input type="checkbox"/>
<b>4.3 Vanpool service</b>		
<i>Commuter travel</i>		
<b>BETTER</b>	4.3.1 Provide a vanpooling service for long-distance commuters	<input type="checkbox"/>
<b>5. CARSHARING &amp; BIKESHARING</b>		
<b>5.1 Bikeshare stations &amp; memberships</b>		
<b>BETTER</b>	5.1.1 Contract with provider to install on-site bikeshare station for use by commuters and visitors	<input type="checkbox"/>
<i>Commuter travel</i>		

BETTER	5.1.2 Provide employees with bikeshare memberships for local business travel	<input type="checkbox"/>
<b>5.2 Carshare vehicles &amp; memberships</b>		
<i>Commuter travel</i>		
BETTER	5.2.1 Contract with provider to install on-site carshare vehicles and promote their use by tenants	<input type="checkbox"/>
BETTER	5.2.2 Provide employees with carshare memberships for local business travel	<input type="checkbox"/>
<b>6. PARKING</b>		
<b>6.1 Priced parking</b>		
<i>Commuter travel</i>		
BASIC	★ 6.1.1 Charge for long-term parking (daily, weekly, monthly)	<input type="checkbox"/>
BASIC	6.1.2 Unbundle parking cost from lease rates at multi-tenant sites	<input type="checkbox"/>
<i>Visitor travel</i>		
BETTER	6.1.3 Charge for short-term parking (hourly)	<input type="checkbox"/>

TDM measures: <i>Non-residential developments</i>		Check if proposed & add descriptions
<b>7. TDM MARKETING &amp; COMMUNICATIONS</b>		
<b>7.1 Multimodal travel information</b>		
<i>Commuter travel</i>		
BASIC	★ 7.1.1 Provide a multimodal travel option information package to new/relocating employees and students	<input type="checkbox"/>
<i>Visitor travel</i>		
BETTER	★ 7.1.2 Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games)	<input type="checkbox"/>
<b>7.2 Personalized trip planning</b>		
<i>Commuter travel</i>		
BETTER	★ 7.2.1 Offer personalized trip planning to new/relocating employees	<input type="checkbox"/>
<b>7.3 Promotions</b>		
<i>Commuter travel</i>		
BETTER	7.3.1 Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes	<input type="checkbox"/>
<b>8. OTHER INCENTIVES &amp; AMENITIES</b>		
<b>8.1 Emergency ride home</b>		
<i>Commuter travel</i>		

BETTER	★	8.1.1 Provide emergency ride home service to non-driving commuters	<input type="checkbox"/>
<b>8.2 Alternative work arrangements</b>			
<i>Commuter travel</i>			
BASIC	★	8.2.1 Encourage flexible work hours	<input type="checkbox"/>
BETTER		8.2.2 Encourage compressed workweeks	<input type="checkbox"/>
BETTER	★	8.2.3 Encourage telework	<input type="checkbox"/>
<b>8.3 Local business travel options</b>			
<i>Commuter travel</i>			
BASIC	★	8.3.1 Provide local business travel options that minimize the need for employees to bring a personal car to work	<input type="checkbox"/>
<b>8.4 Commuter incentives</b>			
<i>Commuter travel</i>			
BETTER		8.4.1 Offer employees a taxable, mode-neutral commuting allowance	<input type="checkbox"/>
<b>8.5 On-site amenities</b>			
<i>Commuter travel</i>			
BETTER		8.5.1 Provide on-site amenities/services to minimize mid-day or mid-commute errands	<input type="checkbox"/>

## 4. Neighbourhood Traffic Management

As noted in the scoping memo, this section is exempted from this TIA.

## 5. Transit

OC Transpo is the main transit agency that operates the transit routes in Ottawa. The existing transit route that services the subject site is the Transpo bus route #47 running north-south along Sheffield Road, and east-west along Walkley Road. The first stop of the bus route is St-Laurent A and the last stop is Russell / Hydro. Route 47 has 40 stops, and the total trip duration for this route is approximately 32 minutes. The nearest to the site bus stops are located at the intersection of the north-west site access driveway and Sheffield Road.

The number of future transit passengers when compared to the existing transit capacity should remain very similar. The majority of trips generated by this site will be vehicle trips due to the nature of the site. The previous site at this location had a land use similar to the proposed site, and thus the increase in transit passengers due to the reconfigured development is not expected to be substantial and thus more transit capacity in the area is not required. Additionally, the development should not have a significant impact on transit travel times in the area.

## **6. Review of Network Concept**

As noted in the scoping memo, this section is exempted from this TIA.

## **7. Intersection Design**

### ***7.1 Intersection Control***

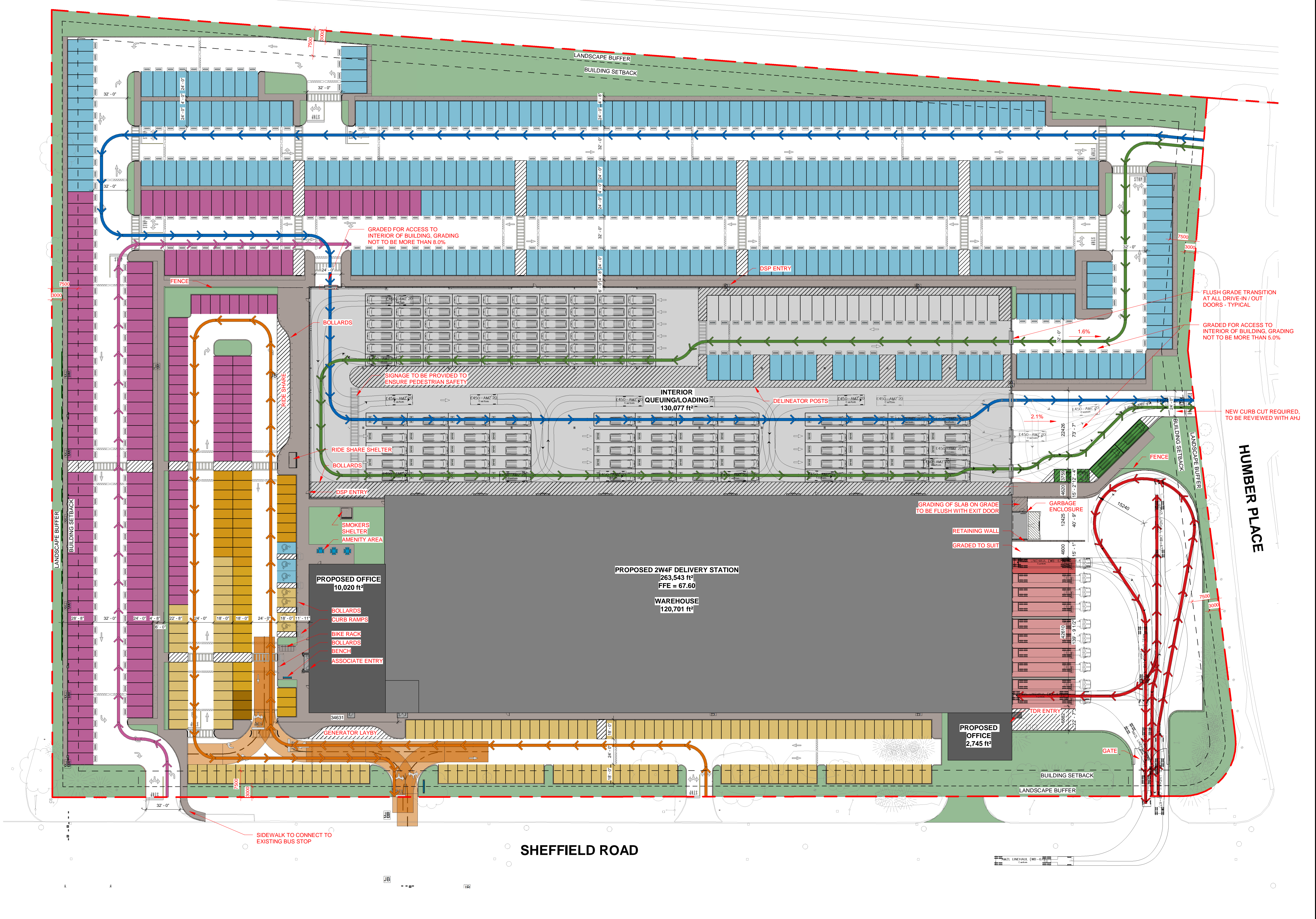
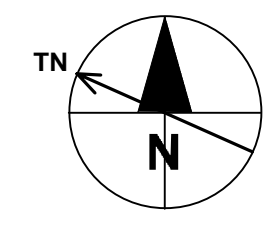
Detailed intersection control was described in section 1.4.2 of this memo.

### ***7.2 Intersection Design***

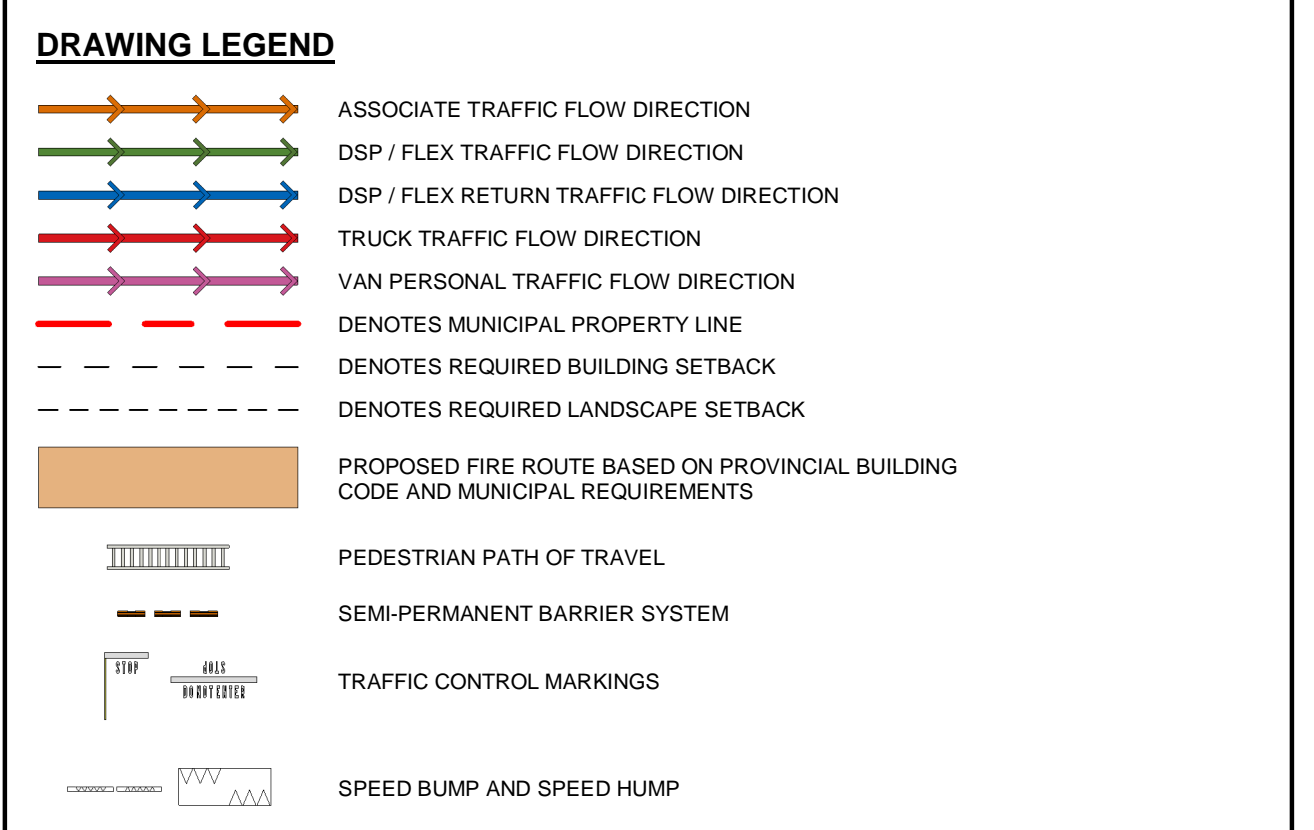
Detailed intersection designed was described in section 1.4.3 of this memo.

**APPENDIX A**  
**SITE PLAN**



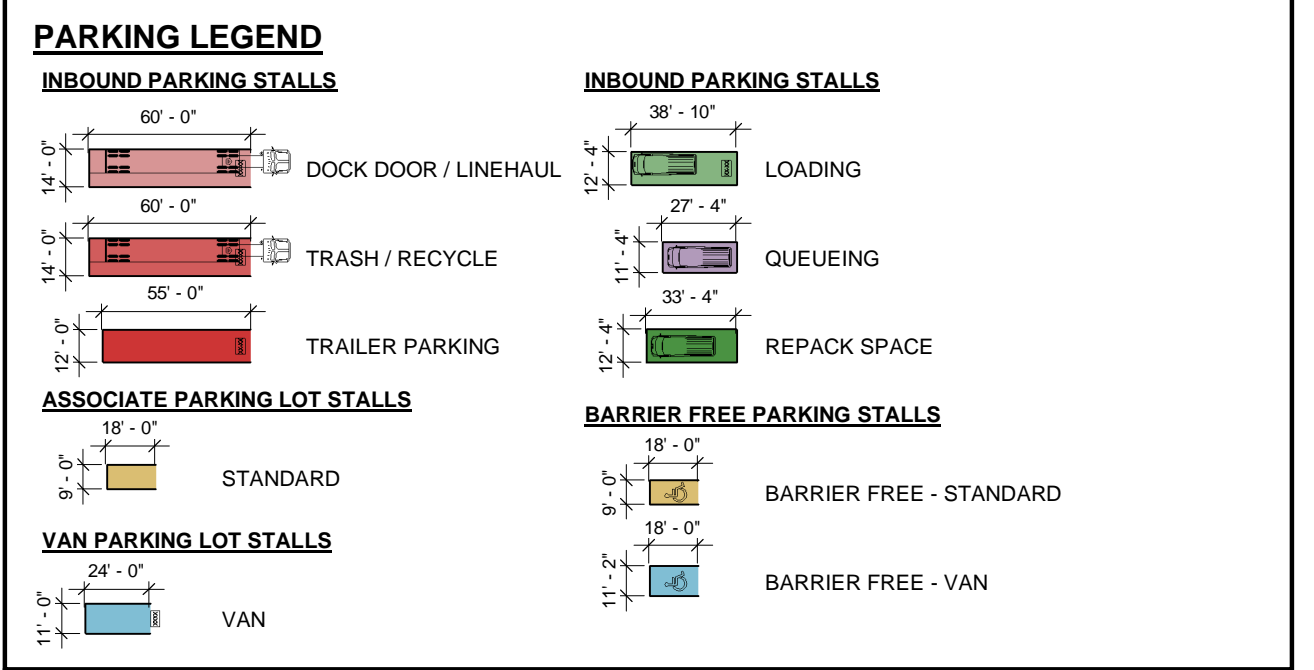


PARKING BREAKDOWN				
PARKING STALL TYPE	REQUIRED	PROPOSED ON-SITE	PROPOSED OFF-SITE	DIFFERENCE
DOCK DOOR / LINEHAUL	9	9	0	0
TRASH / RECYCLE	1	1	0	0
INBOUND STALLS: 10				
LOADING	60	60	0	0
QUEUEING	60	60	0	0
REPACK	3	3	0	0
DISPATCH STALLS TOTAL: 123				
ASSOCIATE	149	147	0	-2
MANAGER	15	15	0	0
DSP MANAGERS	26	26	0	0
VISITOR	3	3	0	0
VAN PERSONAL VEHICLE - STANDARD	60	60	0	0
ASSOCIATE PARKING LOT TOTAL: 251				
BARRIER FREE - STANDARD	0	4	0	4
BARRIER FREE - VAN	0	3	0	3
BARRIER FREE STALLS TOTAL: 7				
VAN PARKING	430	371	0	-59
VAN PERSONAL VEHICLE	120	120	0	0
VAN PARKING LOT TOTAL: 491				



- GENERAL NOTES**
- PARKING LAYOUTS PROPOSED WITHIN THE EXISTING FACILITY HAVE BEEN LAID OUT WITHOUT KNOWLEDGE OF THE FINAL INTERIOR LAYOUT OR COLUMN GRID. FURTHER VERIFICATION REQUIRED.
  - FINAL PARKING LAYOUT WILL INCLUDE PEDESTRIAN PATH OF TRAVEL WHEN INTERIOR LAYOUT AND BUILDING ACCESS POINTS ARE ESTABLISHED.
  - PROPOSED RETAINING WALLS AND VEHICULAR RAMPS ARE BASED ON CURRENT AVAILABLE DATA. CONFIRMATION OF THESE ITEMS WILL BE FINALIZED ONCE LAYOUT IS APPROVED.
  - SNOW STORAGE HAS NOT BEEN ACCOMMODATED AT THIS STAGE. INVESTIGATION OF THE LOCAL REGULATIONS WILL BE REQUIRED.

- SITE SPECIFIC CHALLENGES & TEMPLATE DEVIATIONS**
- LAYOUT TO PROVIDE AT GRADE EXIT FOR LAUNCH VEHICLES AND REPACK STALL CART FLOW. GRADING TO BE DETERMINED.
  - BUILDING SHAPE MATCHES CURRENT 3.1 TEMPLATE DRAFT BUILDING SIZE FOR 2W4F.
  - MANY TREES LOST DUE TO PARKING LOT AT SOUTH SIDE OF SITE. THE CITY WILL MOST LIKELY REQUIRE TREES TO BE REPLANTED ON THE SITE IN OTHER LOCATIONS.
  - BOTH VAN BUFFER (22 STALLS REQUIRED) AND DRIVER TRAINING (44 STALLS REQUIRED) STALL TOTALS HAVE BEEN REDUCED TO ZERO (0) FOR THIS SITE LAYOUT, PER RECOMMENDATION FROM CLIENT DE.



SITE INFORMATION	
SITE	DY3
LOCATION	OTTAWA, ON
ADDRESS	2625 Sheffield Road, Ottawa Ontario
LAUNCH YEAR	2025
BUILDING TYPE	SPEC
LAYOUT	2W4F TD
BUILDING SHELL (GROSS SF)	263,543 SF
OPERATIONAL SPACE (GROSS SF)	120,701 SF
OFFICE SPACE (GROSS SF)	12,765 SF
TOTAL PLOT SIZE (ACRES)	17.5 AC
USABLE ACREAGE (ACRES)	16.7 AC
IMPERVIOUS AREA: ALLOWABLE BY CODE AND PROPOSED	
CAPACITY	109,050 / 244 SPR
DISPATCH WAVES	6

**SITE PLAN - SSA CONCEPT**

1 : 550



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**DY3 GEN 3.1 BTS, OTTAWA, ONTARIO**  
2625 SHEFFIELD ROAD - SSA OPTION 1

I/R	DATE	DESCRIPTION
9	2022-09-31	SSA CONCEPT V1.9
8	2022-07-28	SSA CONCEPT V1.8
7	2022-07-26	SSA CONCEPT V1.7
6	2022-07-13	SSA CONCEPT V1.6



**APPENDIX B**  
**SYNCHRO OUTPUTS**

# Lanes, Volumes, Timings

## 3: Walkley Road & Lancaster Road

03/03/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	198	713	1375	624	90	164
Future Volume (vph)	198	713	1375	624	90	164
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0			0.0	0.0	70.0
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1647	3007	3232	1517	3135	1406
Flt Permitted	0.113				0.950	
Satd. Flow (perm)	196	3007	3232	1517	3135	1406
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				599		169
Link Speed (k/h)		80	80		48	
Link Distance (m)		248.5	361.1		367.8	
Travel Time (s)		11.2	16.2		27.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	15%	7%	2%	7%	10%
Adj. Flow (vph)	204	735	1418	643	93	169
Shared Lane Traffic (%)						
Lane Group Flow (vph)	204	735	1418	643	93	169
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	24.0	122.0	98.0	98.0	28.0	28.0
Total Split (%)	16.0%	81.3%	65.3%	65.3%	18.7%	18.7%
Maximum Green (s)	21.0	117.0	93.0	93.0	23.0	23.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effect Green (s)	119.0	117.0	93.0	93.0	23.0	23.0
Actuated g/C Ratio	0.79	0.78	0.62	0.62	0.15	0.15

Lanes, Volumes, Timings  
 3: Walkley Road & Lancaster Road

03/03/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.57	0.31	0.71	0.55	0.19	0.47
Control Delay	18.8	5.2	10.8	2.0	56.6	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.8	5.2	10.8	2.0	56.6	12.2
LOS	B	A	B	A	E	B
Approach Delay		8.1	8.0		27.9	
Approach LOS		A	A		C	

Intersection Summary

Area Type:	Other
Cycle Length:	150
Actuated Cycle Length:	150
Offset:	50 (33%), Referenced to phase 4:EBTL, Start of Green
Natural Cycle:	80
Control Type:	Pretimed
Maximum v/c Ratio:	0.71
Intersection Signal Delay:	9.7
Intersection Capacity Utilization	67.5%
Analysis Period (min)	15
Intersection LOS:	A
ICU Level of Service	C

Splits and Phases: 3: Walkley Road & Lancaster Road



# HCM Signalized Intersection Capacity Analysis

## 3: Walkley Road & Lancaster Road

03/03/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	198	713	1375	624	90	164
Future Volume (vph)	198	713	1375	624	90	164
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1647	3007	3232	1517	3135	1406
Flt Permitted	0.11	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	196	3007	3232	1517	3135	1406
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	204	735	1418	643	93	169
RTOR Reduction (vph)	0	0	0	228	0	143
Lane Group Flow (vph)	204	735	1418	415	93	26
Heavy Vehicles (%)	5%	15%	7%	2%	7%	10%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	117.0	117.0	93.0	93.0	23.0	23.0
Effective Green, g (s)	117.0	117.0	93.0	93.0	23.0	23.0
Actuated g/C Ratio	0.78	0.78	0.62	0.62	0.15	0.15
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	356	2345	2003	940	480	215
v/s Ratio Prot	c0.08	0.24	c0.44		c0.03	
v/s Ratio Perm	0.37			0.27		0.02
v/c Ratio	0.57	0.31	0.71	0.44	0.19	0.12
Uniform Delay, d1	18.1	4.8	19.3	14.9	55.4	54.8
Progression Factor	1.00	1.00	0.50	0.74	1.00	1.00
Incremental Delay, d2	6.6	0.4	1.0	0.7	0.9	1.1
Delay (s)	24.6	5.2	10.6	11.8	56.3	55.9
Level of Service	C	A	B	B	E	E
Approach Delay (s)		9.4	11.0		56.1	
Approach LOS		A	B		E	

### Intersection Summary

HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Walkley Road & Sheffield Road

03/03/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	275	439	1752	260	51	230
Future Volume (vph)	275	439	1752	260	51	230
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0			30.0	0.0	70.0
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Fr <sub>t</sub>				0.850		0.850
Fl <sub>t</sub> Protected	0.950				0.950	
Satd. Flow (prot)	1491	3060	3357	1459	2396	1190
Fl <sub>t</sub> Permitted	0.044				0.950	
Satd. Flow (perm)	69	3060	3357	1459	2396	1190
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				80		235
Link Speed (k/h)		80	80		48	
Link Distance (m)		361.1	363.2		830.1	
Travel Time (s)		16.2	16.3		62.3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	16%	13%	3%	6%	40%	30%
Adj. Flow (vph)	281	448	1788	265	52	235
Shared Lane Traffic (%)						
Lane Group Flow (vph)	281	448	1788	265	52	235
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	32.0	124.0	92.0	92.0	26.0	26.0
Total Split (%)	21.3%	82.7%	61.3%	61.3%	17.3%	17.3%
Maximum Green (s)	29.0	119.0	87.0	87.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	121.0	119.0	87.0	87.0	21.0	21.0
Actuated g/C Ratio	0.81	0.79	0.58	0.58	0.14	0.14

Lanes, Volumes, Timings  
 6: Walkley Road & Sheffield Road

03/03/2021

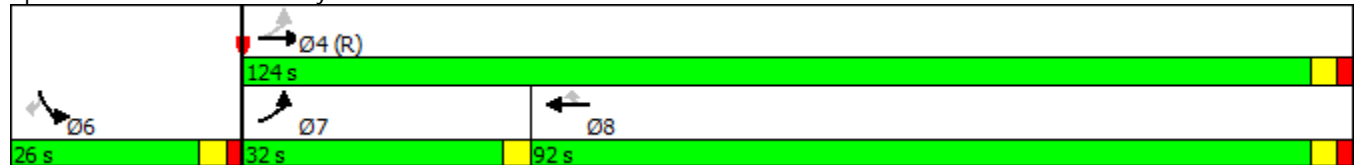


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.85	0.18	0.92	0.30	0.16	0.64
Control Delay	61.0	3.6	37.2	11.8	58.1	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.0	3.6	37.2	11.8	58.1	15.2
LOS	E	A	D	B	E	B
Approach Delay		25.7	33.9		23.0	
Approach LOS		C	C		C	

Intersection Summary

Area Type:	Other
Cycle Length:	150
Actuated Cycle Length:	150
Offset:	50 (33%), Referenced to phase 4:EBTL, Start of Green
Natural Cycle:	100
Control Type:	Pretimed
Maximum v/c Ratio:	0.92
Intersection Signal Delay:	31.0
Intersection LOS:	C
Intersection Capacity Utilization	83.0%
ICU Level of Service	E
Analysis Period (min)	15

Splits and Phases: 6: Walkley Road & Sheffield Road



# HCM Signalized Intersection Capacity Analysis

## 6: Walkley Road & Sheffield Road

03/03/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	275	439	1752	260	51	230
Future Volume (vph)	275	439	1752	260	51	230
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1491	3060	3357	1459	2396	1190
Flt Permitted	0.04	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	70	3060	3357	1459	2396	1190
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	281	448	1788	265	52	235
RTOR Reduction (vph)	0	0	0	34	0	202
Lane Group Flow (vph)	281	448	1788	231	52	33
Heavy Vehicles (%)	16%	13%	3%	6%	40%	30%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	119.0	119.0	87.0	87.0	21.0	21.0
Effective Green, g (s)	119.0	119.0	87.0	87.0	21.0	21.0
Actuated g/C Ratio	0.79	0.79	0.58	0.58	0.14	0.14
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	330	2427	1947	846	335	166
v/s Ratio Prot	c0.16	0.15	c0.53		0.02	
v/s Ratio Perm	0.51			0.16		c0.03
v/c Ratio	0.85	0.18	0.92	0.27	0.16	0.20
Uniform Delay, d1	50.0	3.8	28.3	15.7	56.7	57.1
Progression Factor	0.84	0.90	1.00	1.00	1.00	1.00
Incremental Delay, d2	22.6	0.2	8.5	0.8	1.0	2.7
Delay (s)	64.6	3.5	36.8	16.5	57.7	59.7
Level of Service	E	A	D	B	E	E
Approach Delay (s)		27.1	34.1		59.3	
Approach LOS		C	C		E	

### Intersection Summary

HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Lanes, Volumes, Timings  
 7: Walkley Road & Highway SB terminal

03/03/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (vph)	0	435	946	0	22	884
Future Volume (vph)	0	435	946	0	22	884
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Fr t						0.850
Fl t Protected					0.950	
Satd. Flow (prot)	0	3390	3390	0	1695	1517
Fl t Permitted					0.950	
Satd. Flow (perm)	0	3390	3390	0	1695	1517
Link Speed (k/h)		80	80		80	
Link Distance (m)		131.6	322.4		492.9	
Travel Time (s)		5.9	14.5		22.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	448	975	0	23	911
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	448	975	0	23	911
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	92.0%
Analysis Period (min)	15
	ICU Level of Service F

# HCM Unsignalized Intersection Capacity Analysis

## 7: Walkley Road & Highway SB terminal

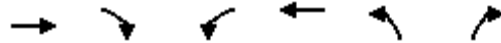
03/03/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (veh/h)	0	435	946	0	22	884
Future Volume (Veh/h)	0	435	946	0	22	884
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	448	975	0	23	911
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	975				1199	488
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	975				1199	488
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				87	0
cM capacity (veh/h)	703				178	526
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	224	224	488	488	23	911
Volume Left	0	0	0	0	23	0
Volume Right	0	0	0	0	0	911
cSH	1700	1700	1700	1700	178	526
Volume to Capacity	0.13	0.13	0.29	0.29	0.13	1.73
Queue Length 95th (m)	0.0	0.0	0.0	0.0	3.3	413.5
Control Delay (s)	0.0	0.0	0.0	0.0	28.2	356.7
Lane LOS					D	F
Approach Delay (s)	0.0		0.0		348.6	
Approach LOS					F	
Intersection Summary						
Average Delay			138.1			
Intersection Capacity Utilization			92.0%		ICU Level of Service	F
Analysis Period (min)			15			

Lanes, Volumes, Timings  
 10: Highway NB terminal & Walkley Road

03/03/2021



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Traffic Volume (vph)	51	409	0	580	397	7
Future Volume (vph)	51	409	0	580	397	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.867			0.998		
Flt Protected				0.953		
Satd. Flow (prot)	2939	0	0	3390	1697	0
Flt Permitted				0.953		
Satd. Flow (perm)	2939	0	0	3390	1697	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	322.4			108.3	295.7	
Travel Time (s)	14.5			8.1	22.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	55	440	0	624	427	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	495	0	0	624	435	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14		24	24		14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	47.3% ICU Level of Service A
Analysis Period (min)	15

# HCM Unsignalized Intersection Capacity Analysis

## 10: Highway NB terminal & Walkley Road

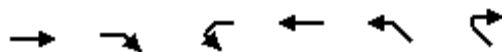
03/03/2021



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (veh/h)	51	409	0	580	397	7
Future Volume (Veh/h)	51	409	0	580	397	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	55	440	0	624	427	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)	383					
pX, platoon unblocked						
vC, conflicting volume			495		587	248
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			495		587	248
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		3	99
cM capacity (veh/h)			1065		441	753
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	37	458	312	312	435	
Volume Left	0	0	0	0	427	
Volume Right	0	440	0	0	8	
cSH	1700	1700	1700	1700	444	
Volume to Capacity	0.02	0.27	0.18	0.18	0.98	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	92.9	
Control Delay (s)	0.0	0.0	0.0	0.0	68.5	
Lane LOS						F
Approach Delay (s)	0.0		0.0		68.5	
Approach LOS						F
Intersection Summary						
Average Delay			19.2			
Intersection Capacity Utilization			47.3%	ICU Level of Service	A	
Analysis Period (min)	15					

Lanes, Volumes, Timings  
11: SB off ramp & Walkley Road

03/03/2021



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑	↑		↑↑↑		
Traffic Volume (vph)	435	131	0	1830	0	0
Future Volume (vph)	435	131	0	1830	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		60.0	0.0		0.0	0.0
Storage Lanes		1	0		0	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3390	1517	0	4871	0	0
Flt Permitted						
Satd. Flow (perm)	3390	1517	0	4871	0	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	363.2			131.6	210.3	
Travel Time (s)	16.3			9.9	15.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	483	146	0	2033	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	483	146	0	2033	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	40.7%
	ICU Level of Service A
Analysis Period (min)	15

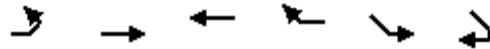
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Intersection Sign configuration not allowed in HCM analysis.

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Lanes, Volumes, Timings  
 13: Walkley Road & NB off ramp

03/03/2021



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑	↗		
Traffic Volume (vph)	0	58	580	206	0	0
Future Volume (vph)	0	58	580	206	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			70.0	0.0	0.0
Storage Lanes	0			1	0	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3390	1784	1517	0	0
Flt Permitted						
Satd. Flow (perm)	0	3390	1784	1517	0	0
Link Speed (k/h)		80	80		48	
Link Distance (m)		108.3	195.3		199.6	
Travel Time (s)		4.9	8.8		15.0	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	62	624	222	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	62	624	222	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Free	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	35.6%
ICU Level of Service	A
Analysis Period (min)	15

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Intersection Sign configuration not allowed in HCM analysis.

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Lanes, Volumes, Timings  
15: Sheffield Road & Humber Place

03/03/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	20	0	69	4	1	3	146	374	3	3	205	15
Future Volume (vph)	20	0	69	4	1	3	146	374	3	3	205	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.895			0.949			0.999			0.991	
Flt Protected		0.989			0.976			0.986			0.999	
Satd. Flow (prot)	0	1290	0	0	1225	0	0	1581	0	0	1389	0
Flt Permitted		0.989			0.976			0.986			0.999	
Satd. Flow (perm)	0	1290	0	0	1225	0	0	1581	0	0	1389	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		152.4			148.3			830.1			120.3	
Travel Time (s)		11.4			11.1			62.3			9.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	35%	2%	22%	50%	2%	33%	12%	14%	0%	33%	30%	26%
Adj. Flow (vph)	22	0	77	4	1	3	162	416	3	3	228	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	99	0	0	8	0	0	581	0	0	248	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	58.0%
ICU Level of Service	B
Analysis Period (min)	15

# HCM Unsignalized Intersection Capacity Analysis

## 15: Sheffield Road & Humber Place

03/03/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	20	0	69	4	1	3	146	374	3	3	205	15
Future Volume (Veh/h)	20	0	69	4	1	3	146	374	3	3	205	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	0	77	4	1	3	162	416	3	3	228	17
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	988	986	236	1061	992	418	245			419		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	988	986	236	1061	992	418	245			419		
tC, single (s)	7.4	6.5	6.4	7.6	6.5	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.8	4.0	3.5	4.0	4.0	3.6	2.3			2.5		
p0 queue free %	87	100	90	97	100	99	87			100		
cM capacity (veh/h)	176	216	756	133	213	574	1265			992		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	99	8	581	248								
Volume Left	22	4	162	3								
Volume Right	77	3	3	17								
cSH	436	200	1265	992								
Volume to Capacity	0.23	0.04	0.13	0.00								
Queue Length 95th (m)	6.6	0.9	3.3	0.1								
Control Delay (s)	15.7	23.8	3.3	0.1								
Lane LOS	C	C	A	A								
Approach Delay (s)	15.7	23.8	3.3	0.1								
Approach LOS	C	C										
<b>Intersection Summary</b>												
Average Delay			4.0									
Intersection Capacity Utilization			58.0%	ICU Level of Service						B		
Analysis Period (min)			15									

Lanes, Volumes, Timings  
18: Sheffield Road & Way #5

03/03/2021



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	2	3	394	8	4	223
Future Volume (vph)	2	3	394	8	4	223
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.919		0.997			
Flt Protected	0.980					0.999
Satd. Flow (prot)	1607	0	1779	0	0	916
Flt Permitted	0.980					0.999
Satd. Flow (perm)	1607	0	1779	0	0	916
Link Speed (k/h)	48		48			48
Link Distance (m)	56.2		120.3			89.9
Travel Time (s)	4.2		9.0			6.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	100%
Adj. Flow (vph)	2	3	438	9	4	248
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	0	447	0	0	252
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.4%
Analysis Period (min)	15
	ICU Level of Service A

# HCM Unsignalized Intersection Capacity Analysis

## 18: Sheffield Road & Way #5

03/03/2021



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	3	394	8	4	223
Future Volume (Veh/h)	2	3	394	8	4	223
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	3	438	9	4	248
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	698	442			447	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	698	442			447	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	405	615			1113	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	5	447	252			
Volume Left	2	0	4			
Volume Right	3	9	0			
cSH	509	1700	1113			
Volume to Capacity	0.01	0.26	0.00			
Queue Length 95th (m)	0.2	0.0	0.1			
Control Delay (s)	12.1	0.0	0.2			
Lane LOS	B		A			
Approach Delay (s)	12.1	0.0	0.2			
Approach LOS	B					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization		32.4%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
20: Sheffield Road & Way #4

03/03/2021



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	2	3	389	8	4	225
Future Volume (vph)	2	3	389	8	4	225
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.919		0.997			
Flt Protected	0.980					0.999
Satd. Flow (prot)	1607	0	1779	0	0	1783
Flt Permitted	0.980					0.999
Satd. Flow (perm)	1607	0	1779	0	0	1783
Link Speed (k/h)	48		48			48
Link Distance (m)	60.6		89.9			135.3
Travel Time (s)	4.5		6.7			10.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	3	432	9	4	250
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	0	441	0	0	254
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.1%
Analysis Period (min)	15
	ICU Level of Service A

# HCM Unsignalized Intersection Capacity Analysis

## 20: Sheffield Road & Way #4

03/03/2021



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	3	389	8	4	225
Future Volume (Veh/h)	2	3	389	8	4	225
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	3	432	9	4	250
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	694	436			441	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	694	436			441	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	407	620			1119	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	5	441	254			
Volume Left	2	0	4			
Volume Right	3	9	0			
cSH	513	1700	1119			
Volume to Capacity	0.01	0.26	0.00			
Queue Length 95th (m)	0.2	0.0	0.1			
Control Delay (s)	12.1	0.0	0.2			
Lane LOS	B		A			
Approach Delay (s)	12.1	0.0	0.2			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization			32.1%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
24: Sheffield Road & Way #2

03/03/2021



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	2	3	384	8	4	227
Future Volume (vph)	2	3	384	8	4	227
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.919		0.997			
Flt Protected	0.980					0.999
Satd. Flow (prot)	1607	0	1779	0	0	1783
Flt Permitted	0.980					0.999
Satd. Flow (perm)	1607	0	1779	0	0	1783
Link Speed (k/h)	48		48			48
Link Distance (m)	65.0		135.3			74.6
Travel Time (s)	4.9		10.1			5.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	3	427	9	4	252
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	0	436	0	0	256
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	31.8%
Analysis Period (min)	15
	ICU Level of Service A

# HCM Unsignalized Intersection Capacity Analysis

## 24: Sheffield Road & Way #2

03/03/2021



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	3	384	8	4	227
Future Volume (Veh/h)	2	3	384	8	4	227
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	3	427	9	4	252
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	692	432			436	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	692	432			436	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	409	624			1124	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	5	436	256			
Volume Left	2	0	4			
Volume Right	3	9	0			
cSH	515	1700	1124			
Volume to Capacity	0.01	0.26	0.00			
Queue Length 95th (m)	0.2	0.0	0.1			
Control Delay (s)	12.1	0.0	0.2			
Lane LOS	B		A			
Approach Delay (s)	12.1	0.0	0.2			
Approach LOS	B					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			31.8%		ICU Level of Service	A
Analysis Period (min)			15			



Lanes, Volumes, Timings  
26: Sheffield Road & Way #1

03/03/2021



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	2	3	379	8	4	229
Future Volume (vph)	2	3	379	8	4	229
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.919		0.997			
Flt Protected	0.980					0.999
Satd. Flow (prot)	1607	0	1779	0	0	1783
Flt Permitted	0.980					0.999
Satd. Flow (perm)	1607	0	1779	0	0	1783
Link Speed (k/h)	48		48			48
Link Distance (m)	58.8		74.6			272.6
Travel Time (s)	4.4		5.6			20.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	3	421	9	4	254
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	0	430	0	0	258
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	31.6%
Analysis Period (min)	15
	ICU Level of Service A

# HCM Unsignalized Intersection Capacity Analysis

## 26: Sheffield Road & Way #1

03/03/2021



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	3	379	8	4	229
Future Volume (Veh/h)	2	3	379	8	4	229
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	3	421	9	4	254
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	688	426			430	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	688	426			430	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	411	629			1129	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	5	430	258			
Volume Left	2	0	4			
Volume Right	3	9	0			
cSH	519	1700	1129			
Volume to Capacity	0.01	0.25	0.00			
Queue Length 95th (m)	0.2	0.0	0.1			
Control Delay (s)	12.0	0.0	0.2			
Lane LOS	B		A			
Approach Delay (s)	12.0	0.0	0.2			
Approach LOS	B					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			31.6%	ICU Level of Service	A	
Analysis Period (min)	15					

Summary of All Intervals

Run Number	1	2	3	Avg
Start Time	6:57	6:57	6:57	6:57
End Time	8:00	8:00	8:00	8:00
Total Time (min)	63	63	63	63
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	4434	4448	4393	4422
Vehs Exited	4391	4349	4301	4349
Starting Vehs	134	125	136	130
Ending Vehs	177	224	228	209
Travel Distance (km)	5683	5700	5644	5676
Travel Time (hr)	174.2	223.4	183.3	193.6
Total Delay (hr)	74.5	123.6	84.0	94.1
Total Stops	4395	5819	4824	5012
Fuel Used (l)	550.1	584.1	549.8	561.3

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	2	3	Avg
Vehs Entered	4434	4448	4393	4422
Vehs Exited	4391	4349	4301	4349
Starting Vehs	134	125	136	130
Ending Vehs	177	224	228	209
Travel Distance (km)	5683	5700	5644	5676
Travel Time (hr)	174.2	223.4	183.3	193.6
Total Delay (hr)	74.5	123.6	84.0	94.1
Total Stops	4395	5819	4824	5012
Fuel Used (l)	550.1	584.1	549.8	561.3

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3: Walkley Road & Lancaster Road Performance by movement

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6: Walkley Road & Sheffield Road Performance by movement

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7: Walkley Road & Highway SB terminal Performance by movement

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10: Highway NB terminal & Walkley Road Performance by movement

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11: SB off ramp & Walkley Road Performance by movement

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13: Walkley Road & NB off ramp Performance by movement

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15: Sheffield Road & Humber Place Performance by movement

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18: Sheffield Road & Way #5 Performance by movement

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20: Sheffield Road & Way #4 Performance by movement

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24: Sheffield Road & Way #2 Performance by movement

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26: Sheffield Road & Way #1 Performance by movement

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Total Network Performance

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Intersection: 3: Walkley Road & Lancaster Road

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	R	L	L	R
Maximum Queue (m)	82.5	61.2	48.9	84.4	92.1	174.7	46.5	43.7	31.7
Average Queue (m)	43.2	23.5	14.4	54.6	58.6	16.7	19.8	6.3	6.0
95th Queue (m)	73.7	52.6	35.3	79.7	86.2	83.9	37.4	22.5	22.6
Link Distance (m)		240.3	240.3	340.1	340.1	340.1	353.4	353.4	
Upstream Blk Time (%)						1			
Queuing Penalty (veh)						5			
Storage Bay Dist (m)	100.0								70.0
Storage Blk Time (%)	0								
Queuing Penalty (veh)	0								

Intersection: 6: Walkley Road & Sheffield Road

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	R	L	L	R
Maximum Queue (m)	107.4	140.4	95.8	337.3	344.1	37.6	48.5	93.7	77.1
Average Queue (m)	77.2	25.6	10.3	220.6	241.6	21.8	9.9	17.9	43.5
95th Queue (m)	116.0	105.8	40.3	345.9	359.7	50.9	31.1	64.1	81.6
Link Distance (m)		340.1	340.1	343.8	343.8		803.4	803.4	
Upstream Blk Time (%)				0	1				
Queuing Penalty (veh)				1	8				
Storage Bay Dist (m)	100.0					30.0			70.0
Storage Blk Time (%)	8	0			38	0		0	4
Queuing Penalty (veh)	17	0			99	2		0	1

Intersection: 7: Walkley Road & Highway SB terminal

Movement	SB	SB
Directions Served	L	R
Maximum Queue (m)	17.7	62.4
Average Queue (m)	5.4	3.7
95th Queue (m)	14.0	44.7
Link Distance (m)	480.6	480.6
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: Highway NB terminal & Walkley Road

Movement	NB
Directions Served	LR
Maximum Queue (m)	82.6
Average Queue (m)	38.2
95th Queue (m)	71.5
Link Distance (m)	283.2
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: SB off ramp & Walkley Road

Movement	EB	EB	WB	WB	WB
Directions Served	T	R	T	T	T
Maximum Queue (m)	10.6	7.7	59.7	70.9	116.1
Average Queue (m)	0.4	0.3	14.1	31.6	38.9
95th Queue (m)	5.9	4.2	50.2	72.3	109.3
Link Distance (m)	343.8		118.3	118.3	118.3
Upstream Blk Time (%)					2
Queuing Penalty (veh)					15
Storage Bay Dist (m)		60.0			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 13: Walkley Road & NB off ramp

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 15: Sheffield Road & Humber Place

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	27.6	19.1	293.8	8.9
Average Queue (m)	13.3	3.0	18.4	0.3
95th Queue (m)	23.3	11.8	160.5	3.7
Link Distance (m)	139.5	139.5	803.4	101.3
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			0	
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 18: Sheffield Road & Way #5

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	8.8	3.0
Average Queue (m)	1.7	0.1
95th Queue (m)	7.4	1.7
Link Distance (m)	47.2	72.4
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: Sheffield Road & Way #4

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	8.9	8.3
Average Queue (m)	1.5	0.6
95th Queue (m)	7.0	4.7
Link Distance (m)	51.7	118.0
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

## Queuing and Blocking Report Baseline

03/03/2021

### Intersection: 24: Sheffield Road & Way #2

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	9.1	13.6
Average Queue (m)	1.7	0.8
95th Queue (m)	7.3	5.8
Link Distance (m)	56.4	57.3
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

### Intersection: 26: Sheffield Road & Way #1

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	9.0	3.0
Average Queue (m)	1.2	0.1
95th Queue (m)	6.3	1.7
Link Distance (m)	49.8	265.6
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

### Network Summary

Network wide Queuing Penalty: 146



# Lanes, Volumes, Timings

## 3: Walkley Road & Lancaster Road

03/03/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	122	1704	924	159	469	199
Future Volume (vph)	122	1704	924	159	469	199
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.5			0.0	0.0	30.5
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Fr <sub>t</sub>				0.850		0.850
Fl <sub>t</sub> Protected	0.950				0.950	
Satd. Flow (prot)	1695	3293	3172	1419	3288	1502
Fl <sub>t</sub> Permitted	0.206				0.950	
Satd. Flow (perm)	368	3293	3172	1419	3288	1502
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				175		139
Link Speed (k/h)		80	80		48	
Link Distance (m)		306.2	364.1		701.3	
Travel Time (s)		13.8	16.4		52.6	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	5%	9%	9%	2%	3%
Adj. Flow (vph)	134	1873	1015	175	515	219
Shared Lane Traffic (%)						
Lane Group Flow (vph)	134	1873	1015	175	515	219
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	22.0	102.0	80.0	80.0	28.0	28.0
Total Split (%)	16.9%	78.5%	61.5%	61.5%	21.5%	21.5%
Maximum Green (s)	19.0	97.0	75.0	75.0	23.0	23.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	99.0	97.0	75.0	75.0	23.0	23.0
Actuated g/C Ratio	0.76	0.75	0.58	0.58	0.18	0.18

Lanes, Volumes, Timings  
 3: Walkley Road & Lancaster Road

03/03/2021

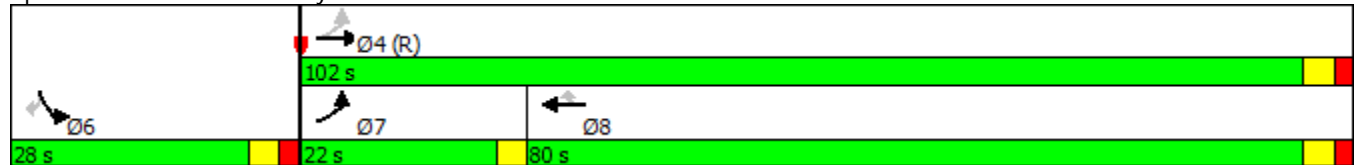


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.28	0.76	0.55	0.20	0.89	0.58
Control Delay	5.6	12.4	17.6	4.1	70.3	24.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.6	12.4	17.6	4.1	70.3	24.9
LOS	A	B	B	A	E	C
Approach Delay		11.9	15.6		56.8	
Approach LOS		B	B		E	

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	50 (38%), Referenced to phase 4:EBTL, Start of Green
Natural Cycle:	75
Control Type:	Pretimed
Maximum v/c Ratio:	0.89
Intersection Signal Delay:	21.4
Intersection LOS:	C
Intersection Capacity Utilization	72.2%
ICU Level of Service	C
Analysis Period (min)	15

Splits and Phases: 3: Walkley Road & Lancaster Road



# HCM Signalized Intersection Capacity Analysis

## 3: Walkley Road & Lancaster Road

03/03/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	122	1704	924	159	469	199
Future Volume (vph)	122	1704	924	159	469	199
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1695	3293	3172	1419	3288	1502
Flt Permitted	0.21	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	367	3293	3172	1419	3288	1502
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	134	1873	1015	175	515	219
RTOR Reduction (vph)	0	0	0	74	0	114
Lane Group Flow (vph)	134	1873	1015	101	515	105
Heavy Vehicles (%)	2%	5%	9%	9%	2%	3%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	97.0	97.0	75.0	75.0	23.0	23.0
Effective Green, g (s)	97.0	97.0	75.0	75.0	23.0	23.0
Actuated g/C Ratio	0.75	0.75	0.58	0.58	0.18	0.18
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	467	2457	1830	818	581	265
v/s Ratio Prot	0.04	c0.57	0.32		c0.16	
v/s Ratio Perm	0.17			0.07		0.07
v/c Ratio	0.29	0.76	0.55	0.12	0.89	0.39
Uniform Delay, d1	6.9	9.7	17.1	12.5	52.2	47.3
Progression Factor	1.00	1.00	0.95	2.04	1.00	1.00
Incremental Delay, d2	1.5	2.3	1.1	0.3	17.9	4.4
Delay (s)	8.4	12.0	17.4	25.9	70.1	51.7
Level of Service	A	B	B	C	E	D
Approach Delay (s)		11.8	18.6		64.6	
Approach LOS		B	B		E	

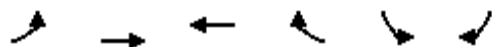
### Intersection Summary

HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Walkley Road & Sheffield Road

03/03/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	207	1873	688	90	300	378
Future Volume (vph)	207	1873	688	90	300	378
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.5			50.0	0.0	30.5
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Fr <sub>t</sub>				0.850		0.850
Fl <sub>t</sub> Protected	0.950				0.950	
Satd. Flow (prot)	1383	3390	3172	1146	3164	1381
Fl <sub>t</sub> Permitted	0.325				0.950	
Satd. Flow (perm)	473	3390	3172	1146	3164	1381
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				93		390
Link Speed (k/h)		80	80		48	
Link Distance (m)		364.1	339.6		830.6	
Travel Time (s)		16.4	15.3		62.3	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	25%	2%	9%	35%	6%	12%
Adj. Flow (vph)	213	1931	709	93	309	390
Shared Lane Traffic (%)						
Lane Group Flow (vph)	213	1931	709	93	309	390
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.0	23.0	23.0	23.0	23.0
Total Split (s)	22.0	104.0	82.0	82.0	26.0	26.0
Total Split (%)	16.9%	80.0%	63.1%	63.1%	20.0%	20.0%
Maximum Green (s)	19.0	99.0	77.0	77.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	101.0	99.0	77.0	77.0	21.0	21.0
Actuated g/C Ratio	0.78	0.76	0.59	0.59	0.16	0.16

Lanes, Volumes, Timings  
 6: Walkley Road & Sheffield Road

03/03/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.43	0.75	0.38	0.13	0.60	0.71
Control Delay	5.0	7.5	14.6	2.6	56.3	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.0	7.5	14.6	2.6	56.3	12.5
LOS	A	A	B	A	E	B
Approach Delay		7.3	13.2		31.9	
Approach LOS		A	B		C	

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	13 (10%), Referenced to phase 4:EBTL, Start of Green
Natural Cycle:	70
Control Type:	Pretimed
Maximum v/c Ratio:	0.75
Intersection Signal Delay:	13.3
Intersection LOS:	B
Intersection Capacity Utilization	72.0%
ICU Level of Service	C
Analysis Period (min)	15

Splits and Phases: 6: Walkley Road & Sheffield Road



# HCM Signalized Intersection Capacity Analysis

## 6: Walkley Road & Sheffield Road

03/03/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	207	1873	688	90	300	378
Future Volume (vph)	207	1873	688	90	300	378
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1383	3390	3172	1146	3164	1381
Flt Permitted	0.33	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	474	3390	3172	1146	3164	1381
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	213	1931	709	93	309	390
RTOR Reduction (vph)	0	0	0	38	0	327
Lane Group Flow (vph)	213	1931	709	55	309	63
Heavy Vehicles (%)	25%	2%	9%	35%	6%	12%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	99.0	99.0	77.0	77.0	21.0	21.0
Effective Green, g (s)	99.0	99.0	77.0	77.0	21.0	21.0
Actuated g/C Ratio	0.76	0.76	0.59	0.59	0.16	0.16
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	493	2581	1878	678	511	223
v/s Ratio Prot	0.06	c0.57	0.22		c0.10	
v/s Ratio Perm	0.27			0.05		0.05
v/c Ratio	0.43	0.75	0.38	0.08	0.60	0.28
Uniform Delay, d1	5.2	8.6	13.9	11.4	50.6	47.9
Progression Factor	0.88	0.71	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	1.2	0.6	0.2	5.2	3.1
Delay (s)	6.2	7.3	14.5	11.6	55.9	51.0
Level of Service	A	A	B	B	E	D
Approach Delay (s)		7.2	14.2		53.2	
Approach LOS		A	B		D	

### Intersection Summary

HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
 7: Walkley Road & Highway SB terminal

03/03/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (vph)	0	1471	174	0	167	594
Future Volume (vph)	0	1471	174	0	167	594
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Fr <sub>t</sub>						0.850
Fl <sub>t</sub> Protected					0.950	
Satd. Flow (prot)	0	3390	3390	0	1695	1517
Fl <sub>t</sub> Permitted					0.950	
Satd. Flow (perm)	0	3390	3390	0	1695	1517
Link Speed (k/h)		80	80		80	
Link Distance (m)		118.5	305.1		468.0	
Travel Time (s)		5.3	13.7		21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1548	183	0	176	625
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1548	183	0	176	625
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	59.4%
Analysis Period (min)	15
	ICU Level of Service B

# HCM Unsignalized Intersection Capacity Analysis

## 7: Walkley Road & Highway SB terminal

03/03/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (veh/h)	0	1471	174	0	167	594
Future Volume (Veh/h)	0	1471	174	0	167	594
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1548	183	0	176	625
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	183				957	92
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	183				957	92
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				31	34
cM capacity (veh/h)	1389				256	948
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	774	774	92	92	176	625
Volume Left	0	0	0	0	176	0
Volume Right	0	0	0	0	0	625
cSH	1700	1700	1700	1700	256	948
Volume to Capacity	0.46	0.46	0.05	0.05	0.69	0.66
Queue Length 95th (m)	0.0	0.0	0.0	0.0	34.6	39.1
Control Delay (s)	0.0	0.0	0.0	0.0	45.3	15.8
Lane LOS					E	C
Approach Delay (s)	0.0		0.0		22.3	
Approach LOS					C	
Intersection Summary						
Average Delay			7.1			
Intersection Capacity Utilization			59.4%		ICU Level of Service	B
Analysis Period (min)			15			



Lanes, Volumes, Timings  
 10: Highway NB terminal & Walkley Road

03/03/2021



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Traffic Volume (vph)	580	1062	0	63	129	31
Future Volume (vph)	580	1062	0	63	129	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.903			0.974		
Flt Protected				0.961		
Satd. Flow (prot)	3061	0	0	3390	1670	0
Flt Permitted				0.961		
Satd. Flow (perm)	3061	0	0	3390	1670	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	305.1			95.4	443.2	
Travel Time (s)	13.7			7.2	33.2	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	637	1167	0	69	142	34
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1804	0	0	69	176	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14		24	24		14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	69.3% ICU Level of Service C
Analysis Period (min)	15

# HCM Unsignalized Intersection Capacity Analysis

## 10: Highway NB terminal & Walkley Road

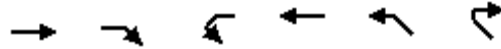
03/03/2021



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘↘	
Traffic Volume (veh/h)	580	1062	0	63	129	31
Future Volume (Veh/h)	580	1062	0	63	129	31
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	637	1167	0	69	142	34
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			1804		1255	902
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1804		1255	902
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		13	88
cM capacity (veh/h)			338		164	281
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	425	1379	34	34	176	
Volume Left	0	0	0	0	142	
Volume Right	0	1167	0	0	34	
cSH	1700	1700	1700	1700	178	
Volume to Capacity	0.25	0.81	0.02	0.02	0.99	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	60.8	
Control Delay (s)	0.0	0.0	0.0	0.0	117.7	
Lane LOS					F	
Approach Delay (s)	0.0		0.0		117.7	
Approach LOS					F	
Intersection Summary						
Average Delay			10.1			
Intersection Capacity Utilization			69.3%	ICU Level of Service	C	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
 11: SB off ramp & Walkley Road

03/03/2021



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑	↑		↑↑↑		
Traffic Volume (vph)	1471	511	0	768	0	0
Future Volume (vph)	1471	511	0	768	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		50.0	0.0		0.0	0.0
Storage Lanes		1	0		0	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3390	1517	0	4871	0	0
Flt Permitted						
Satd. Flow (perm)	3390	1517	0	4871	0	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	339.6			118.5	265.8	
Travel Time (s)	15.3			8.9	19.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1548	538	0	808	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1548	538	0	808	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.3%
	ICU Level of Service A
Analysis Period (min)	15

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Intersection Sign configuration not allowed in HCM analysis.

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Lanes, Volumes, Timings  
 13: Walkley Road & NB off ramp

03/03/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑	↗		
Traffic Volume (vph)	0	611	63	59	0	0
Future Volume (vph)	0	611	63	59	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			50.0	0.0	0.0
Storage Lanes	0			1	0	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3390	1784	1517	0	0
Flt Permitted						
Satd. Flow (perm)	0	3390	1784	1517	0	0
Link Speed (k/h)		80	48		48	
Link Distance (m)		95.4	197.1		264.7	
Travel Time (s)		4.3	14.8		19.9	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	671	69	65	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	671	69	65	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Free	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	21.2%
Analysis Period (min)	15
	ICU Level of Service A

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Intersection Sign configuration not allowed in HCM analysis.

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Lanes, Volumes, Timings  
15: Sheffield Road & Humber Place

03/03/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	14	0	134	3	0	0	56	260	2	2	488	19
Future Volume (vph)	14	0	134	3	0	0	56	260	2	2	488	19
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.878						0.999			0.995	
Flt Protected		0.995			0.950			0.991				
Satd. Flow (prot)	0	1452	0	0	1300	0	0	1376	0	0	1661	0
Flt Permitted		0.995			0.950			0.991				
Satd. Flow (perm)	0	1452	0	0	1300	0	0	1376	0	0	1661	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		152.4			148.3			830.6			80.7	
Travel Time (s)		11.4			11.1			62.3			6.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	14%	2%	9%	33%	2%	2%	21%	33%	50%	0%	9%	10%
Adj. Flow (vph)	16	0	149	3	0	0	62	289	2	2	542	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	165	0	0	3	0	0	353	0	0	565	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	65.4%
Analysis Period (min)	15
	ICU Level of Service C

# HCM Unsignalized Intersection Capacity Analysis

## 15: Sheffield Road & Humber Place

03/03/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	14	0	134	3	0	0	56	260	2	2	488	19
Future Volume (Veh/h)	14	0	134	3	0	0	56	260	2	2	488	19
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	16	0	149	3	0	0	62	289	2	2	542	21
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	970	972	552	1120	981	290	563			291		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	970	972	552	1120	981	290	563			291		
tC, single (s)	7.2	6.5	6.3	7.4	6.5	6.2	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.4	3.8	4.0	3.3	2.4			2.2		
p0 queue free %	92	100	71	97	100	100	93			100		
cM capacity (veh/h)	209	235	520	108	232	749	920			1282		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	165	3	353	565								
Volume Left	16	3	62	2								
Volume Right	149	0	2	21								
cSH	454	108	920	1282								
Volume to Capacity	0.36	0.03	0.07	0.00								
Queue Length 95th (m)	12.4	0.6	1.6	0.0								
Control Delay (s)	17.4	39.2	2.2	0.0								
Lane LOS	C	E	A	A								
Approach Delay (s)	17.4	39.2	2.2	0.0								
Approach LOS	C	E										
<b>Intersection Summary</b>												
Average Delay			3.5									
Intersection Capacity Utilization			65.4%	ICU Level of Service		C						
Analysis Period (min)			15									



Lanes, Volumes, Timings  
 18: Sheffield Road & Way #5

03/03/2021



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	10	5	274	2	4	509
Future Volume (vph)	10	5	274	2	4	509
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.952		0.999			
Flt Protected	0.969					
Satd. Flow (prot)	1646	0	1783	0	0	1071
Flt Permitted	0.969					
Satd. Flow (perm)	1646	0	1783	0	0	1071
Link Speed (k/h)	48		48			48
Link Distance (m)	56.2		80.7			63.2
Travel Time (s)	4.2		6.1			4.7
Peak Hour Factor	0.90	0.90	0.92	0.90	0.90	0.90
Bus Blockages (#/hr)	0	0	0	0	0	100
Adj. Flow (vph)	11	6	298	2	4	566
Shared Lane Traffic (%)						
Lane Group Flow (vph)	17	0	300	0	0	570
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.96
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.6%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
 18: Sheffield Road & Way #5

03/03/2021



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	5	274	2	4	509
Future Volume (Veh/h)	10	5	274	2	4	509
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.92	0.90	0.90	0.90
Hourly flow rate (vph)	11	6	298	2	4	566
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	873	299			300	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	873	299			300	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			100	
cM capacity (veh/h)	320	741			1261	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	17	300	570			
Volume Left	11	0	4			
Volume Right	6	2	0			
cSH	400	1700	1261			
Volume to Capacity	0.04	0.18	0.00			
Queue Length 95th (m)	1.0	0.0	0.1			
Control Delay (s)	14.4	0.0	0.1			
Lane LOS	B		A			
Approach Delay (s)	14.4	0.0	0.1			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization			41.6%	ICU Level of Service	A	
Analysis Period (min)	15					

Lanes, Volumes, Timings  
20: Sheffield Road & Way #4

03/03/2021



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	10	5	274	2	4	509
Future Volume (vph)	10	5	274	2	4	509
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.952		0.999			
Flt Protected	0.969					
Satd. Flow (prot)	1646	0	1783	0	0	1784
Flt Permitted	0.969					
Satd. Flow (perm)	1646	0	1783	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	60.6		63.2			102.2
Travel Time (s)	4.5		4.7			7.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	11	6	304	2	4	566
Shared Lane Traffic (%)						
Lane Group Flow (vph)	17	0	306	0	0	570
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.6%
Analysis Period (min)	15
	ICU Level of Service A

# HCM Unsignalized Intersection Capacity Analysis

## 20: Sheffield Road & Way #4

03/03/2021



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	5	274	2	4	509
Future Volume (Veh/h)	10	5	274	2	4	509
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	6	304	2	4	566
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	879	305			306	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	879	305			306	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			100	
cM capacity (veh/h)	317	735			1255	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	17	306	570			
Volume Left	11	0	4			
Volume Right	6	2	0			
cSH	397	1700	1255			
Volume to Capacity	0.04	0.18	0.00			
Queue Length 95th (m)	1.0	0.0	0.1			
Control Delay (s)	14.5	0.0	0.1			
Lane LOS	B		A			
Approach Delay (s)	14.5	0.0	0.1			
Approach LOS	B					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			41.6%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
24: Sheffield Road & Way #2

03/03/2021



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	10	5	274	2	4	509
Future Volume (vph)	10	5	274	2	4	509
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.952		0.999			
Flt Protected	0.969					
Satd. Flow (prot)	1646	0	1783	0	0	1784
Flt Permitted	0.969					
Satd. Flow (perm)	1646	0	1783	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	65.0		102.2			76.9
Travel Time (s)	4.9		7.7			5.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	11	6	304	2	4	566
Shared Lane Traffic (%)						
Lane Group Flow (vph)	17	0	306	0	0	570
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.6%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
 24: Sheffield Road & Way #2

03/03/2021



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	5	274	2	4	509
Future Volume (Veh/h)	10	5	274	2	4	509
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	6	304	2	4	566
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	879	305			306	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	879	305			306	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			100	
cM capacity (veh/h)	317	735			1255	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	17	306	570			
Volume Left	11	0	4			
Volume Right	6	2	0			
cSH	397	1700	1255			
Volume to Capacity	0.04	0.18	0.00			
Queue Length 95th (m)	1.0	0.0	0.1			
Control Delay (s)	14.5	0.0	0.1			
Lane LOS	B		A			
Approach Delay (s)	14.5	0.0	0.1			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization			41.6%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
26: Sheffield Road & Way #1

03/03/2021



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	10	5	274	2	4	509
Future Volume (vph)	10	5	274	2	4	509
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.952		0.999			
Flt Protected	0.969					
Satd. Flow (prot)	1646	0	1783	0	0	1784
Flt Permitted	0.969					
Satd. Flow (perm)	1646	0	1783	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	58.8		76.9			181.8
Travel Time (s)	4.4		5.8			13.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	11	6	304	2	4	566
Shared Lane Traffic (%)						
Lane Group Flow (vph)	17	0	306	0	0	570
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.6%
Analysis Period (min)	15
	ICU Level of Service A

# HCM Unsignalized Intersection Capacity Analysis

## 26: Sheffield Road & Way #1

03/03/2021



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	5	274	2	4	509
Future Volume (Veh/h)	10	5	274	2	4	509
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	6	304	2	4	566
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	879	305			306	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	879	305			306	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			100	
cM capacity (veh/h)	317	735			1255	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	17	306	570			
Volume Left	11	0	4			
Volume Right	6	2	0			
cSH	397	1700	1255			
Volume to Capacity	0.04	0.18	0.00			
Queue Length 95th (m)	1.0	0.0	0.1			
Control Delay (s)	14.5	0.0	0.1			
Lane LOS	B		A			
Approach Delay (s)	14.5	0.0	0.1			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization		41.6%		ICU Level of Service		A
Analysis Period (min)		15				



Summary of All Intervals

Run Number	1	2	3	Avg
Start Time	6:57	6:57	6:57	6:57
End Time	8:00	8:00	8:00	8:00
Total Time (min)	63	63	63	63
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	4511	4459	4593	4522
Vehs Exited	4397	4397	4480	4422
Starting Vehs	167	143	145	150
Ending Vehs	281	205	258	246
Travel Distance (km)	6803	6815	6887	6835
Travel Time (hr)	259.1	236.7	235.1	243.6
Total Delay (hr)	139.9	116.8	114.8	123.8
Total Stops	4036	3952	4129	4035
Fuel Used (l)	674.4	659.7	660.0	664.7

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	2	3	Avg
Vehs Entered	4511	4459	4593	4522
Vehs Exited	4397	4397	4480	4422
Starting Vehs	167	143	145	150
Ending Vehs	281	205	258	246
Travel Distance (km)	6803	6815	6887	6835
Travel Time (hr)	259.1	236.7	235.1	243.6
Total Delay (hr)	139.9	116.8	114.8	123.8
Total Stops	4036	3952	4129	4035
Fuel Used (l)	674.4	659.7	660.0	664.7

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3: Walkley Road & Lancaster Road Performance by movement

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6: Walkley Road & Sheffield Road Performance by movement

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7: Walkley Road & Highway SB terminal Performance by movement

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10: Highway NB terminal & Walkley Road Performance by movement

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11: SB off ramp & Walkley Road Performance by movement

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13: Walkley Road & NB off ramp Performance by movement

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15: Sheffield Road & Humber Place Performance by movement

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18: Sheffield Road & Way #5 Performance by movement

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20: Sheffield Road & Way #4 Performance by movement

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24: Sheffield Road & Way #2 Performance by movement

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26: Sheffield Road & Way #1 Performance by movement

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Total Network Performance

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Queuing and Blocking Report  
Baseline

03/03/2021

Intersection: 3: Walkley Road & Lancaster Road

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	R	L	L	R
Maximum Queue (m)	37.9	103.2	92.6	77.0	83.6	19.4	91.9	110.6	38.1
Average Queue (m)	18.4	52.0	50.0	43.7	47.0	1.4	60.8	73.6	30.6
95th Queue (m)	35.9	89.4	79.4	69.5	72.6	9.9	88.2	108.2	53.9
Link Distance (m)		298.2	298.2	343.0	343.0	343.0	687.0	687.0	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)	30.5								30.5
Storage Blk Time (%)	1	10						45	0
Queuing Penalty (veh)	5	12						90	1

Intersection: 6: Walkley Road & Sheffield Road

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	R	L	L	R
Maximum Queue (m)	38.0	144.9	136.7	68.4	80.2	57.5	96.5	168.4	38.1
Average Queue (m)	27.2	77.6	84.4	32.3	36.7	5.1	37.2	73.8	33.6
95th Queue (m)	45.0	126.9	129.7	59.9	66.0	30.6	70.7	147.1	50.8
Link Distance (m)		343.0	343.0	321.0	321.0		803.9	803.9	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)	30.5					50.0			30.5
Storage Blk Time (%)	6	13			2	0		27	4
Queuing Penalty (veh)	56	26			2	0		101	6

Intersection: 7: Walkley Road & Highway SB terminal

Movement	SB	SB
Directions Served	L	R
Maximum Queue (m)	456.7	458.7
Average Queue (m)	286.8	147.6
95th Queue (m)	515.0	479.1
Link Distance (m)	450.2	450.2
Upstream Blk Time (%)	23	19
Queuing Penalty (veh)	0	0
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report  
Baseline

03/03/2021

Intersection: 10: Highway NB terminal & Walkley Road

Movement	EB	NB
Directions Served	TR	LR
Maximum Queue (m)	31.2	34.6
Average Queue (m)	1.1	16.6
95th Queue (m)	17.4	28.3
Link Distance (m)	287.6	430.9
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 11: SB off ramp & Walkley Road

Movement	WB
Directions Served	T
Maximum Queue (m)	3.1
Average Queue (m)	0.3
95th Queue (m)	3.0
Link Distance (m)	104.9
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 13: Walkley Road & NB off ramp

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

## Queuing and Blocking Report Baseline

03/03/2021

### Intersection: 15: Sheffield Road & Humber Place

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	30.2	16.0	307.5	10.5
Average Queue (m)	14.5	1.5	21.9	0.6
95th Queue (m)	24.1	8.7	164.2	5.3
Link Distance (m)	139.5	139.6	803.9	61.6
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			0	
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

### Intersection: 18: Sheffield Road & Way #5

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	11.2	3.1
Average Queue (m)	3.0	0.1
95th Queue (m)	10.3	1.7
Link Distance (m)	47.3	45.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

### Intersection: 20: Sheffield Road & Way #4

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	11.6	9.2
Average Queue (m)	3.4	0.4
95th Queue (m)	11.0	3.5
Link Distance (m)	51.7	84.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Intersection: 24: Sheffield Road & Way #2

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Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	9.1	5.6
Average Queue (m)	3.6	0.3
95th Queue (m)	10.7	3.6
Link Distance (m)	56.3	59.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Intersection: 26: Sheffield Road & Way #1

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Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	15.6	11.1
Average Queue (m)	4.0	0.6
95th Queue (m)	12.3	5.8
Link Distance (m)	49.6	174.5
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Network Summary

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Network wide Queuing Penalty: 300

Lanes, Volumes, Timings  
3: Walkley Road & Lancaster Road

Future BG 2025 AM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	207	745	1437	652	94	171
Future Volume (vph)	207	745	1437	652	94	171
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0			0.0	0.0	70.0
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1647	3007	3232	1517	3135	1406
Flt Permitted	0.100				0.950	
Satd. Flow (perm)	173	3007	3232	1517	3135	1406
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				599		176
Link Speed (k/h)		80	80		48	
Link Distance (m)		248.5	361.1		367.8	
Travel Time (s)		11.2	16.2		27.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	15%	7%	2%	7%	10%
Adj. Flow (vph)	213	768	1481	672	97	176
Shared Lane Traffic (%)						
Lane Group Flow (vph)	213	768	1481	672	97	176
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	24.0	122.0	98.0	98.0	28.0	28.0
Total Split (%)	16.0%	81.3%	65.3%	65.3%	18.7%	18.7%
Maximum Green (s)	21.0	117.0	93.0	93.0	23.0	23.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	119.0	117.0	93.0	93.0	23.0	23.0
Actuated g/C Ratio	0.79	0.78	0.62	0.62	0.15	0.15

Lanes, Volumes, Timings  
3: Walkley Road & Lancaster Road

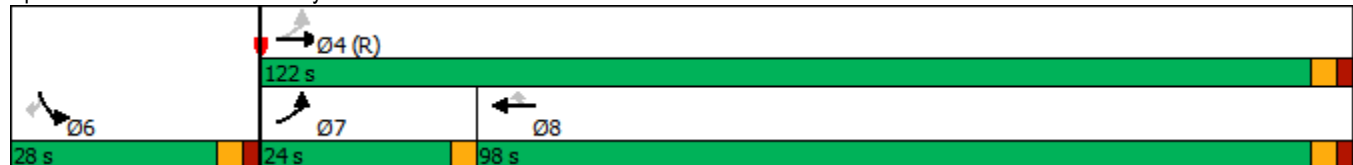


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.62	0.33	0.74	0.58	0.20	0.48
Control Delay	25.8	5.3	11.5	2.3	56.7	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.8	5.3	11.5	2.3	56.7	12.1
LOS	C	A	B	A	E	B
Approach Delay		9.7	8.6		28.0	
Approach LOS		A	A		C	
Queue Length 50th (m)	22.4	31.0	51.9	12.5	13.1	0.0
Queue Length 95th (m)	50.8	38.1	m67.3	m20.7	21.9	22.0
Internal Link Dist (m)		224.5	337.1		343.8	
Turn Bay Length (m)	100.0					70.0
Base Capacity (vph)	343	2345	2003	1168	480	364
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	0.62	0.33	0.74	0.58	0.20	0.48

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 50 (33%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.74  
 Intersection Signal Delay: 10.5  
 Intersection LOS: B  
 Intersection Capacity Utilization 69.9%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

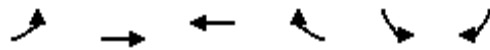
Splits and Phases: 3: Walkley Road & Lancaster Road





HCM Signalized Intersection Capacity Analysis  
3: Walkley Road & Lancaster Road

Future BG 2025 AM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↙	↑↑	↑↑	↘	↙↘	↘
Traffic Volume (vph)	207	745	1437	652	94	171
Future Volume (vph)	207	745	1437	652	94	171
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1647	3007	3232	1517	3135	1406
Flt Permitted	0.10	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	174	3007	3232	1517	3135	1406
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	213	768	1481	672	97	176
RTOR Reduction (vph)	0	0	0	228	0	149
Lane Group Flow (vph)	213	768	1481	444	97	27
Heavy Vehicles (%)	5%	15%	7%	2%	7%	10%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	117.0	117.0	93.0	93.0	23.0	23.0
Effective Green, g (s)	117.0	117.0	93.0	93.0	23.0	23.0
Actuated g/C Ratio	0.78	0.78	0.62	0.62	0.15	0.15
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	341	2345	2003	940	480	215
v/s Ratio Prot	c0.09	0.26	c0.46		c0.03	
v/s Ratio Perm	0.40			0.29		0.02
v/c Ratio	0.62	0.33	0.74	0.47	0.20	0.13
Uniform Delay, d1	25.3	4.9	20.0	15.3	55.5	54.8
Progression Factor	1.00	1.00	0.51	0.77	1.00	1.00
Incremental Delay, d2	8.4	0.4	1.0	0.7	0.9	1.2
Delay (s)	33.7	5.2	11.3	12.5	56.4	56.0
Level of Service	C	A	B	B	E	E
Approach Delay (s)		11.4	11.7		56.2	
Approach LOS		B	B		E	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Walkley Road & Sheffield Road

Future BG 2025 AM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	287	459	1831	272	53	240
Future Volume (vph)	287	459	1831	272	53	240
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0			30.0	0.0	70.0
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1491	3060	3357	1459	2396	1190
Flt Permitted	0.044				0.950	
Satd. Flow (perm)	69	3060	3357	1459	2396	1190
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				80		245
Link Speed (k/h)		80	80		48	
Link Distance (m)		361.1	363.2		830.1	
Travel Time (s)		16.2	16.3		62.3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	16%	13%	3%	6%	40%	30%
Adj. Flow (vph)	293	468	1868	278	54	245
Shared Lane Traffic (%)						
Lane Group Flow (vph)	293	468	1868	278	54	245
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	32.0	124.0	92.0	92.0	26.0	26.0
Total Split (%)	21.3%	82.7%	61.3%	61.3%	17.3%	17.3%
Maximum Green (s)	29.0	119.0	87.0	87.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	121.0	119.0	87.0	87.0	21.0	21.0
Actuated g/C Ratio	0.81	0.79	0.58	0.58	0.14	0.14

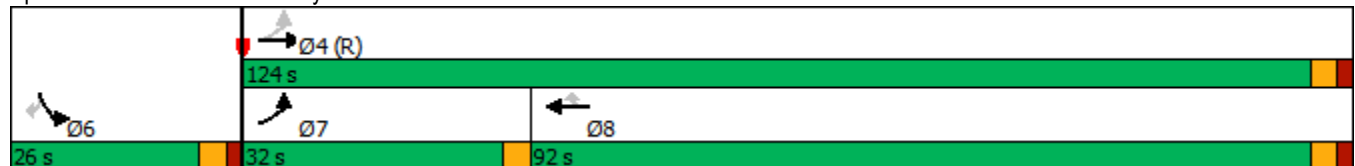


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.89	0.19	0.96	0.32	0.16	0.65
Control Delay	66.5	3.6	42.9	12.2	58.2	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.5	3.6	42.9	12.2	58.2	15.3
LOS	E	A	D	B	E	B
Approach Delay		27.8	38.9		23.0	
Approach LOS		C	D		C	
Queue Length 50th (m)	54.3	14.6	267.0	28.2	7.4	0.0
Queue Length 95th (m)	#118.7	18.0	#331.2	45.7	14.2	27.9
Internal Link Dist (m)		337.1	339.2		806.1	
Turn Bay Length (m)	100.0			30.0		70.0
Base Capacity (vph)	330	2427	1947	879	335	377
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	0.89	0.19	0.96	0.32	0.16	0.65

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 50 (33%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 110  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.96  
 Intersection Signal Delay: 34.8  
 Intersection LOS: C  
 Intersection Capacity Utilization 86.0%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 6: Walkley Road & Sheffield Road



HCM Signalized Intersection Capacity Analysis  
6: Walkley Road & Sheffield Road

Future BG 2025 AM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	287	459	1831	272	53	240
Future Volume (vph)	287	459	1831	272	53	240
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1491	3060	3357	1459	2396	1190
Flt Permitted	0.04	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	70	3060	3357	1459	2396	1190
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	293	468	1868	278	54	245
RTOR Reduction (vph)	0	0	0	34	0	211
Lane Group Flow (vph)	293	468	1868	244	54	34
Heavy Vehicles (%)	16%	13%	3%	6%	40%	30%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	119.0	119.0	87.0	87.0	21.0	21.0
Effective Green, g (s)	119.0	119.0	87.0	87.0	21.0	21.0
Actuated g/C Ratio	0.79	0.79	0.58	0.58	0.14	0.14
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	330	2427	1947	846	335	166
v/s Ratio Prot	c0.17	0.15	c0.56		0.02	
v/s Ratio Perm	0.53			0.17		c0.03
v/c Ratio	0.89	0.19	0.96	0.29	0.16	0.21
Uniform Delay, d1	51.3	3.8	29.8	15.9	56.8	57.1
Progression Factor	0.85	0.89	1.00	1.00	1.00	1.00
Incremental Delay, d2	27.1	0.2	12.8	0.9	1.0	2.8
Delay (s)	70.5	3.6	42.7	16.8	57.8	59.9
Level of Service	E	A	D	B	E	E
Approach Delay (s)		29.3	39.3		59.5	
Approach LOS		C	D		E	

Intersection Summary

HCM 2000 Control Delay	38.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
7: Walkley Road & Highway SB terminal

Future BG 2025 AM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↘
Traffic Volume (vph)	0	455	989	0	23	924
Future Volume (vph)	0	455	989	0	23	924
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Flt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3390	3390	0	1695	1517
Flt Permitted					0.950	
Satd. Flow (perm)	0	3390	3390	0	1695	1517
Link Speed (k/h)		80	80		80	
Link Distance (m)		131.6	322.4		492.9	
Travel Time (s)		5.9	14.5		22.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	469	1020	0	24	953
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	469	1020	0	24	953
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	95.9%
Analysis Period (min)	15
	ICU Level of Service F

HCM Unsignalized Intersection Capacity Analysis  
7: Walkley Road & Highway SB terminal

Future BG 2025 AM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (veh/h)	0	455	989	0	23	924
Future Volume (Veh/h)	0	455	989	0	23	924
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	469	1020	0	24	953
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1020				1254	510
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1020				1254	510
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				85	0
cM capacity (veh/h)	676				164	509
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>	<b>SB 2</b>
Volume Total	234	234	510	510	24	953
Volume Left	0	0	0	0	24	0
Volume Right	0	0	0	0	0	953
cSH	1700	1700	1700	1700	164	509
Volume to Capacity	0.14	0.14	0.30	0.30	0.15	1.87
Queue Length 95th (m)	0.0	0.0	0.0	0.0	3.8	466.5
Control Delay (s)	0.0	0.0	0.0	0.0	30.7	420.0
Lane LOS					D	F
Approach Delay (s)	0.0		0.0		410.5	
Approach LOS					F	
<b>Intersection Summary</b>						
Average Delay			162.6			
Intersection Capacity Utilization			95.9%		ICU Level of Service	F
Analysis Period (min)			15			

Lanes, Volumes, Timings  
 10: Highway NB terminal & Walkley Road

Future BG 2025 AM - Adjacent Peak  
 10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘↘	
Traffic Volume (vph)	53	427	0	606	415	7
Future Volume (vph)	53	427	0	606	415	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.867			0.998		
Flt Protected				0.953		
Satd. Flow (prot)	2939	0	0	3390	1697	0
Flt Permitted				0.953		
Satd. Flow (perm)	2939	0	0	3390	1697	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	322.4			108.3	295.7	
Travel Time (s)	14.5			8.1	22.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	57	459	0	652	446	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	516	0	0	652	454	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14		24	24		14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	49.1% ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
 10: Highway NB terminal & Walkley Road

Future BG 2025 AM - Adjacent Peak  
 10-24-2022

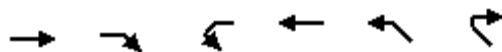


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (veh/h)	53	427	0	606	415	7
Future Volume (Veh/h)	53	427	0	606	415	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	57	459	0	652	446	8
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			516		612	258
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			516		612	258
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		0	99
cM capacity (veh/h)			1046		425	741
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	
Volume Total	38	478	326	326	454	
Volume Left	0	0	0	0	446	
Volume Right	0	459	0	0	8	
cSH	1700	1700	1700	1700	428	
Volume to Capacity	0.02	0.28	0.19	0.19	1.06	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	112.4	
Control Delay (s)	0.0	0.0	0.0	0.0	92.1	
Lane LOS					F	
Approach Delay (s)	0.0		0.0		92.1	
Approach LOS					F	
<b>Intersection Summary</b>						
Average Delay			25.8			
Intersection Capacity Utilization			49.1%	ICU Level of Service	A	
Analysis Period (min)			15			



Lanes, Volumes, Timings  
11: SB off ramp & Walkley Road

Future BG 2025 AM - Adjacent Peak  
10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑	↑		↑↑↑		
Traffic Volume (vph)	455	137	0	1913	0	0
Future Volume (vph)	455	137	0	1913	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		60.0	0.0		0.0	0.0
Storage Lanes		1	0		0	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3390	1517	0	4871	0	0
Flt Permitted						
Satd. Flow (perm)	3390	1517	0	4871	0	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	363.2			131.6	210.3	
Travel Time (s)	16.3			9.9	15.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	506	152	0	2126	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	506	152	0	2126	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

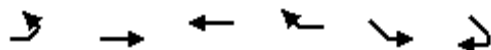
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	42.3%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings  
13: Walkley Road & NB off ramp

Future BG 2025 AM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑	↗		
Traffic Volume (vph)	0	60	606	215	0	0
Future Volume (vph)	0	60	606	215	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			70.0	0.0	0.0
Storage Lanes	0			1	0	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3390	1784	1517	0	0
Flt Permitted						
Satd. Flow (perm)	0	3390	1784	1517	0	0
Link Speed (k/h)		80	80		48	
Link Distance (m)		108.3	195.3		199.6	
Travel Time (s)		4.9	8.8		15.0	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	65	652	231	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	65	652	231	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Free	

















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	37.0%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings  
15: Sheffield Road & Humber Place

Future BG 2025 AM - Adjacent Peak  
10-24-2022

















												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	0	72	4	1	3	153	413	3	3	214	16
Future Volume (vph)	21	0	72	4	1	3	153	413	3	3	214	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.895			0.949			0.999			0.991	
Flt Protected		0.989			0.976			0.987			0.999	
Satd. Flow (prot)	0	1290	0	0	1225	0	0	1583	0	0	1389	0
Flt Permitted		0.989			0.976			0.987			0.999	
Satd. Flow (perm)	0	1290	0	0	1225	0	0	1583	0	0	1389	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		152.4			148.3			830.1			120.3	
Travel Time (s)		11.4			11.1			62.3			9.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	35%	2%	22%	50%	2%	33%	12%	14%	0%	33%	30%	26%
Adj. Flow (vph)	23	0	80	4	1	3	170	459	3	3	238	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	103	0	0	8	0	0	632	0	0	259	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	61.4%
ICU Level of Service	B
Analysis Period (min)	15










HCM Unsignalized Intersection Capacity Analysis  
 15: Sheffield Road & Humber Place

Future BG 2025 AM - Adjacent Peak  
 10-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	0	72	4	1	3	153	413	3	3	214	16
Future Volume (Veh/h)	21	0	72	4	1	3	153	413	3	3	214	16
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	23	0	80	4	1	3	170	459	3	3	238	18
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1057	1055	247	1134	1062	460	256			462		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1057	1055	247	1134	1062	460	256			462		
tC, single (s)	7.4	6.5	6.4	7.6	6.5	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.8	4.0	3.5	4.0	4.0	3.6	2.3			2.5		
p0 queue free %	85	100	89	97	99	99	86			100		
cM capacity (veh/h)	156	194	745	116	192	542	1253			954		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	103	8	632	259								
Volume Left	23	4	170	3								
Volume Right	80	3	3	18								
cSH	404	177	1253	954								
Volume to Capacity	0.25	0.05	0.14	0.00								
Queue Length 95th (m)	7.6	1.1	3.6	0.1								
Control Delay (s)	16.9	26.3	3.4	0.1								
Lane LOS	C	D	A	A								
Approach Delay (s)	16.9	26.3	3.4	0.1								
Approach LOS	C	D										
Intersection Summary												
Average Delay			4.1									
Intersection Capacity Utilization			61.4%		ICU Level of Service					B		
Analysis Period (min)			15									

Lanes, Volumes, Timings  
18: Sheffield Road & Way #5

Future BG 2025 AM - Adjacent Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	404	29	7	243
Future Volume (vph)	0	0	404	29	7	243
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.991			
Flt Protected						0.999
Satd. Flow (prot)	1784	0	1768	0	0	922
Flt Permitted						0.999
Satd. Flow (perm)	1784	0	1768	0	0	922
Link Speed (k/h)	48		48			48
Link Distance (m)	56.2		120.3			89.9
Travel Time (s)	4.2		9.0			6.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	100%
Adj. Flow (vph)	0	0	449	32	8	270
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	481	0	0	278
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	27.6%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 18: Sheffield Road & Way #5

Future BG 2025 AM - Adjacent Peak  
 10-24-2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	404	29	7	243
Future Volume (Veh/h)	0	0	404	29	7	243
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	449	32	8	270
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	751	465			481	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	751	465			481	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	376	597			1082	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	481	278			
Volume Left	0	0	8			
Volume Right	0	32	0			
cSH	1700	1700	1082			
Volume to Capacity	0.00	0.28	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.0	0.0	0.3			
Lane LOS	A		A			
Approach Delay (s)	0.0	0.0	0.3			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization			27.6%	ICU Level of Service	A	
Analysis Period (min)			15			





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	2	404	0	0	241
Future Volume (vph)	9	2	404	0	0	241
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.977					
Flt Protected	0.960					
Satd. Flow (prot)	1674	0	1784	0	0	1784
Flt Permitted	0.960					
Satd. Flow (perm)	1674	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	60.6		89.9			135.3
Travel Time (s)	4.5		6.7			10.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	10	2	449	0	0	268
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	449	0	0	268
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.4%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
20: Sheffield Road & Way #4

Future BG 2025 AM - Adjacent Peak  
10-24-2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	2	404	0	0	241
Future Volume (Veh/h)	9	2	404	0	0	241
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	2	449	0	0	268
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	717	449			449	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	717	449			449	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	100			100	
cM capacity (veh/h)	396	610			1111	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	12	449	268			
Volume Left	10	0	0			
Volume Right	2	0	0			
cSH	421	1700	1111			
Volume to Capacity	0.03	0.26	0.00			
Queue Length 95th (m)	0.7	0.0	0.0			
Control Delay (s)	13.8	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	13.8	0.0	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.2			
Intersection Capacity Utilization			32.4%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
24: Sheffield Road & Way #2

Future BG 2025 AM - Adjacent Peak  
10-24-2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	398	8	2	241
Future Volume (vph)	0	0	398	8	2	241
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.997					
Flt Protected						
Satd. Flow (prot)	1784	0	1779	0	0	1784
Flt Permitted						
Satd. Flow (perm)	1784	0	1779	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	65.0		135.3			74.6
Travel Time (s)	4.9		10.1			5.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	442	9	2	268
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	451	0	0	270
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	26.0%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
 24: Sheffield Road & Way #2

Future BG 2025 AM - Adjacent Peak  
 10-24-2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	398	8	2	241
Future Volume (Veh/h)	0	0	398	8	2	241
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	442	9	2	268
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	718	446			451	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	718	446			451	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	395	612			1109	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	451	270			
Volume Left	0	0	2			
Volume Right	0	9	0			
cSH	1700	1700	1109			
Volume to Capacity	0.00	0.27	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.1			
Lane LOS	A		A			
Approach Delay (s)	0.0	0.0	0.1			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			26.0%	ICU Level of Service	A	
Analysis Period (min)			15			



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	2	1	407	0	0	239
Future Volume (vph)	2	1	407	0	0	239
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.955					
Fl <sub>t</sub> Protected	0.968					
Satd. Flow (prot)	1649	0	1784	0	0	1784
Fl <sub>t</sub> Permitted	0.968					
Satd. Flow (perm)	1649	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	58.8		74.6			272.6
Travel Time (s)	4.4		5.6			20.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	1	452	0	0	266
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	0	452	0	0	266
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.6%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
26: Sheffield Road & Way #1

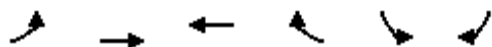
Future BG 2025 AM - Adjacent Peak  
10-24-2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	1	407	0	0	239
Future Volume (Veh/h)	2	1	407	0	0	239
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	1	452	0	0	266
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	718	452			452	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	718	452			452	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	396	608			1109	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	3	452	266			
Volume Left	2	0	0			
Volume Right	1	0	0			
cSH	448	1700	1109			
Volume to Capacity	0.01	0.27	0.00			
Queue Length 95th (m)	0.2	0.0	0.0			
Control Delay (s)	13.1	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	13.1	0.0	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization			32.6%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
3: Walkley Road & Lancaster Road

Future BG 2025 PM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	127	1781	966	166	490	208
Future Volume (vph)	127	1781	966	166	490	208
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.5			0.0	0.0	30.5
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1695	3293	3172	1419	3288	1502
Flt Permitted	0.191				0.950	
Satd. Flow (perm)	341	3293	3172	1419	3288	1502
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				182		139
Link Speed (k/h)		80	80		48	
Link Distance (m)		306.2	364.1		701.3	
Travel Time (s)		13.8	16.4		52.6	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	5%	9%	9%	2%	3%
Adj. Flow (vph)	140	1957	1062	182	538	229
Shared Lane Traffic (%)						
Lane Group Flow (vph)	140	1957	1062	182	538	229
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	22.0	102.0	80.0	80.0	28.0	28.0
Total Split (%)	16.9%	78.5%	61.5%	61.5%	21.5%	21.5%
Maximum Green (s)	19.0	97.0	75.0	75.0	23.0	23.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	99.0	97.0	75.0	75.0	23.0	23.0
Actuated g/C Ratio	0.76	0.75	0.58	0.58	0.18	0.18

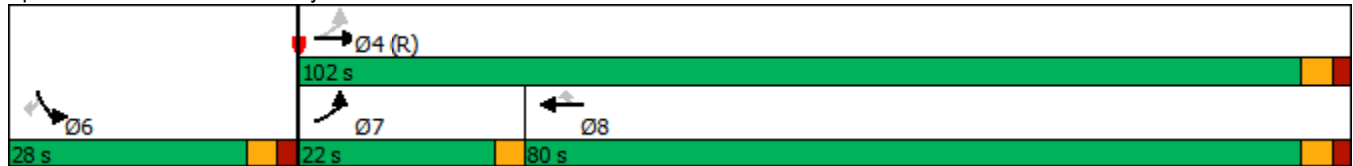


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.31	0.80	0.58	0.20	0.93	0.60
Control Delay	5.8	13.5	18.2	4.0	75.7	26.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.8	13.5	18.2	4.0	75.7	26.7
LOS	A	B	B	A	E	C
Approach Delay		13.0	16.1		61.1	
Approach LOS		B	B		E	
Queue Length 50th (m)	8.1	144.9	104.7	9.9	70.7	20.6
Queue Length 95th (m)	13.2	175.3	122.0	m19.6	#102.6	48.1
Internal Link Dist (m)		282.2	340.1		677.3	
Turn Bay Length (m)	30.5					30.5
Base Capacity (vph)	457	2457	1830	895	581	380
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	0.31	0.80	0.58	0.20	0.93	0.60

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 50 (38%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.93  
 Intersection Signal Delay: 22.9  
 Intersection LOS: C  
 Intersection Capacity Utilization 75.1%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

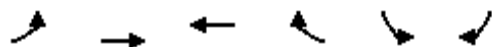
Splits and Phases: 3: Walkley Road & Lancaster Road





HCM Signalized Intersection Capacity Analysis  
3: Walkley Road & Lancaster Road

Future BG 2025 PM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	127	1781	966	166	490	208
Future Volume (vph)	127	1781	966	166	490	208
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1695	3293	3172	1419	3288	1502
Flt Permitted	0.19	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	340	3293	3172	1419	3288	1502
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	140	1957	1062	182	538	229
RTOR Reduction (vph)	0	0	0	77	0	114
Lane Group Flow (vph)	140	1957	1062	105	538	115
Heavy Vehicles (%)	2%	5%	9%	9%	2%	3%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	97.0	97.0	75.0	75.0	23.0	23.0
Effective Green, g (s)	97.0	97.0	75.0	75.0	23.0	23.0
Actuated g/C Ratio	0.75	0.75	0.58	0.58	0.18	0.18
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	451	2457	1830	818	581	265
v/s Ratio Prot	0.05	c0.59	0.33		c0.16	
v/s Ratio Perm	0.19			0.07		0.08
v/c Ratio	0.31	0.80	0.58	0.13	0.93	0.43
Uniform Delay, d1	7.4	10.3	17.5	12.6	52.7	47.7
Progression Factor	1.00	1.00	0.96	2.02	1.00	1.00
Incremental Delay, d2	1.8	2.8	1.2	0.3	22.9	5.1
Delay (s)	9.2	13.1	17.9	25.7	75.6	52.8
Level of Service	A	B	B	C	E	D
Approach Delay (s)		12.8	19.1		68.8	
Approach LOS		B	B		E	

Intersection Summary

HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Walkley Road & Sheffield Road

Future BG 2025 PM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	216	1957	719	94	314	395
Future Volume (vph)	216	1957	719	94	314	395
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.5			50.0	0.0	30.5
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1383	3390	3172	1146	3164	1381
Flt Permitted	0.315				0.950	
Satd. Flow (perm)	459	3390	3172	1146	3164	1381
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				96		389
Link Speed (k/h)		80	80		48	
Link Distance (m)		364.1	339.6		830.6	
Travel Time (s)		16.4	15.3		62.3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.97
Heavy Vehicles (%)	25%	2%	9%	35%	6%	12%
Adj. Flow (vph)	220	1997	734	96	320	407
Shared Lane Traffic (%)						
Lane Group Flow (vph)	220	1997	734	96	320	407
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.0	23.0	23.0	23.0	23.0
Total Split (s)	22.0	104.0	82.0	82.0	26.0	26.0
Total Split (%)	16.9%	80.0%	63.1%	63.1%	20.0%	20.0%
Maximum Green (s)	19.0	99.0	77.0	77.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	101.0	99.0	77.0	77.0	21.0	21.0
Actuated g/C Ratio	0.78	0.76	0.59	0.59	0.16	0.16

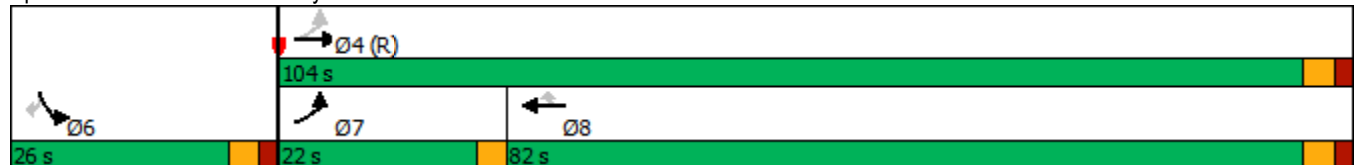


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.45	0.77	0.39	0.13	0.63	0.74
Control Delay	5.3	8.3	14.8	2.6	56.9	15.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.3	8.3	14.8	2.6	56.9	15.0
LOS	A	A	B	A	E	B
Approach Delay		8.0	13.4		33.5	
Approach LOS		A	B		C	
Queue Length 50th (m)	9.8	87.0	49.8	0.0	39.8	4.0
Queue Length 95th (m)	m17.9	120.1	62.8	7.1	55.5	39.4
Internal Link Dist (m)		340.1	315.6		806.6	
Turn Bay Length (m)	30.5			50.0		30.5
Base Capacity (vph)	491	2581	1878	717	511	549
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	0.45	0.77	0.39	0.13	0.63	0.74

Intersection Summary

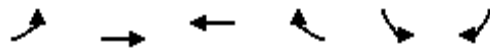
Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 13 (10%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 14.1  
 Intersection LOS: B  
 Intersection Capacity Utilization 74.9%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Walkley Road & Sheffield Road



HCM Signalized Intersection Capacity Analysis  
6: Walkley Road & Sheffield Road

Future BG 2025 PM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	216	1957	719	94	314	395
Future Volume (vph)	216	1957	719	94	314	395
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1383	3390	3172	1146	3164	1381
Flt Permitted	0.31	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	458	3390	3172	1146	3164	1381
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.97
Adj. Flow (vph)	220	1997	734	96	320	407
RTOR Reduction (vph)	0	0	0	39	0	326
Lane Group Flow (vph)	220	1997	734	57	320	81
Heavy Vehicles (%)	25%	2%	9%	35%	6%	12%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	99.0	99.0	77.0	77.0	21.0	21.0
Effective Green, g (s)	99.0	99.0	77.0	77.0	21.0	21.0
Actuated g/C Ratio	0.76	0.76	0.59	0.59	0.16	0.16
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	483	2581	1878	678	511	223
v/s Ratio Prot	0.07	c0.59	0.23		c0.10	
v/s Ratio Perm	0.28			0.05		0.06
v/c Ratio	0.46	0.77	0.39	0.08	0.63	0.36
Uniform Delay, d1	5.4	9.0	14.1	11.4	50.8	48.5
Progression Factor	0.93	0.76	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7	1.3	0.6	0.2	5.7	4.5
Delay (s)	6.7	8.1	14.7	11.6	56.5	53.1
Level of Service	A	A	B	B	E	D
Approach Delay (s)		7.9	14.3		54.6	
Approach LOS		A	B		D	

Intersection Summary

HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
7: Walkley Road & Highway SB terminal

Future BG 2025 PM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (vph)	0	1537	182	0	175	621
Future Volume (vph)	0	1537	182	0	175	621
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Fr <sub>t</sub>						0.850
Fl <sub>t</sub> Protected					0.950	
Satd. Flow (prot)	0	3390	3390	0	1695	1517
Fl <sub>t</sub> Permitted					0.950	
Satd. Flow (perm)	0	3390	3390	0	1695	1517
Link Speed (k/h)		80	80		80	
Link Distance (m)		118.5	305.1		468.0	
Travel Time (s)		5.3	13.7		21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1618	192	0	184	654
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1618	192	0	184	654
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	61.7%
Analysis Period (min)	15
	ICU Level of Service B

HCM Unsignalized Intersection Capacity Analysis  
 7: Walkley Road & Highway SB terminal

Future BG 2025 PM - Adjacent Peak  
 10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (veh/h)	0	1537	182	0	175	621
Future Volume (Veh/h)	0	1537	182	0	175	621
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1618	192	0	184	654
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	192				1001	96
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	192				1001	96
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				23	31
cM capacity (veh/h)	1379				239	942
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>	<b>SB 2</b>
Volume Total	809	809	96	96	184	654
Volume Left	0	0	0	0	184	0
Volume Right	0	0	0	0	0	654
cSH	1700	1700	1700	1700	239	942
Volume to Capacity	0.48	0.48	0.06	0.06	0.77	0.69
Queue Length 95th (m)	0.0	0.0	0.0	0.0	42.1	44.6
Control Delay (s)	0.0	0.0	0.0	0.0	56.9	17.0
Lane LOS					F	C
Approach Delay (s)	0.0		0.0		25.8	
Approach LOS					D	
<b>Intersection Summary</b>						
Average Delay			8.2			
Intersection Capacity Utilization			61.7%		ICU Level of Service	B
Analysis Period (min)			15			

Lanes, Volumes, Timings  
 10: Highway NB terminal & Walkley Road

Future BG 2025 PM - Adjacent Peak  
 10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (vph)	606	1110	0	66	135	32
Future Volume (vph)	606	1110	0	66	135	32
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.903			0.974		
Flt Protected				0.961		
Satd. Flow (prot)	3061	0	0	3390	1670	0
Flt Permitted				0.961		
Satd. Flow (perm)	3061	0	0	3390	1670	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	305.1			95.4	443.2	
Travel Time (s)	13.7			7.2	33.2	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	666	1220	0	73	148	35
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1886	0	0	73	183	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14		24	24		14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	72.1% ICU Level of Service C
Analysis Period (min)	15

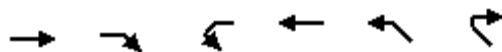
HCM Unsignalized Intersection Capacity Analysis  
 10: Highway NB terminal & Walkley Road

Future BG 2025 PM - Adjacent Peak  
 10-24-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (veh/h)	606	1110	0	66	135	32
Future Volume (Veh/h)	606	1110	0	66	135	32
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	666	1220	0	73	148	35
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			1886		1312	943
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1886		1312	943
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		1	87
cM capacity (veh/h)			314		150	264
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	
Volume Total	444	1442	36	36	183	
Volume Left	0	0	0	0	148	
Volume Right	0	1220	0	0	35	
cSH	1700	1700	1700	1700	163	
Volume to Capacity	0.26	0.85	0.02	0.02	1.12	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	72.9	
Control Delay (s)	0.0	0.0	0.0	0.0	162.7	
Lane LOS					F	
Approach Delay (s)	0.0		0.0		162.7	
Approach LOS					F	
<b>Intersection Summary</b>						
Average Delay			13.9			
Intersection Capacity Utilization			72.1%	ICU Level of Service	C	
Analysis Period (min)			15			





Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑	↑		↑↑↑		
Traffic Volume (vph)	1537	534	0	803	0	0
Future Volume (vph)	1537	534	0	803	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		50.0	0.0		0.0	0.0
Storage Lanes		1	0		0	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3390	1517	0	4871	0	0
Flt Permitted						
Satd. Flow (perm)	3390	1517	0	4871	0	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	339.6			118.5	265.8	
Travel Time (s)	15.3			8.9	19.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1618	562	0	845	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1618	562	0	845	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

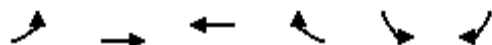
**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	48.2%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings  
13: Walkley Road & NB off ramp

Future BG 2025 PM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑	↗		
Traffic Volume (vph)	0	638	66	62	0	0
Future Volume (vph)	0	638	66	62	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			50.0	0.0	0.0
Storage Lanes	0			1	0	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3390	1784	1517	0	0
Flt Permitted						
Satd. Flow (perm)	0	3390	1784	1517	0	0
Link Speed (k/h)		80	48		48	
Link Distance (m)		95.4	197.1		264.7	
Travel Time (s)		4.3	14.8		19.9	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	701	73	68	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	701	73	68	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Free	

















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	21.9%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

















Lanes, Volumes, Timings  
15: Sheffield Road & Humber Place

Future BG 2025 PM - Adjacent Peak  
10-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	140	3	0	0	59	303	2	2	547	20
Future Volume (vph)	15	0	140	3	0	0	59	303	2	2	547	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>		0.878						0.999			0.995	
Fl <sub>t</sub> Protected		0.995			0.950			0.992				
Satd. Flow (prot)	0	1452	0	0	1300	0	0	1375	0	0	1661	0
Fl <sub>t</sub> Permitted		0.995			0.950			0.992				
Satd. Flow (perm)	0	1452	0	0	1300	0	0	1375	0	0	1661	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		152.4			148.3			830.6			80.7	
Travel Time (s)		11.4			11.1			62.3			6.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	14%	2%	9%	33%	2%	2%	21%	33%	50%	0%	9%	10%
Adj. Flow (vph)	17	0	156	3	0	0	66	337	2	2	608	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	173	0	0	3	0	0	405	0	0	632	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	71.8%						ICU Level of Service C					
Analysis Period (min)	15											










HCM Unsignalized Intersection Capacity Analysis  
15: Sheffield Road & Humber Place

Future BG 2025 PM - Adjacent Peak  
10-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	140	3	0	0	59	303	2	2	547	20
Future Volume (Veh/h)	15	0	140	3	0	0	59	303	2	2	547	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	0	156	3	0	0	66	337	2	2	608	22
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1093	1094	619	1249	1104	338	630			339		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1093	1094	619	1249	1104	338	630			339		
tC, single (s)	7.2	6.5	6.3	7.4	6.5	6.2	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.4	3.8	4.0	3.3	2.4			2.2		
p0 queue free %	90	100	67	96	100	100	92			100		
cM capacity (veh/h)	171	197	476	82	195	704	867			1231		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	173	3	405	632								
Volume Left	17	3	66	2								
Volume Right	156	0	2	22								
cSH	405	82	867	1231								
Volume to Capacity	0.43	0.04	0.08	0.00								
Queue Length 95th (m)	15.9	0.9	1.9	0.0								
Control Delay (s)	20.4	50.6	2.3	0.0								
Lane LOS	C	F	A	A								
Approach Delay (s)	20.4	50.6	2.3	0.0								
Approach LOS	C	F										
Intersection Summary												
Average Delay			3.8									
Intersection Capacity Utilization			71.8%		ICU Level of Service					C		
Analysis Period (min)			15									

Lanes, Volumes, Timings  
18: Sheffield Road & Way #5

Future BG 2025 PM - Adjacent Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	286	9	2	555
Future Volume (vph)	0	0	286	9	2	555
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.996					
Flt Protected						
Satd. Flow (prot)	1784	0	1777	0	0	1071
Flt Permitted						
Satd. Flow (perm)	1784	0	1777	0	0	1071
Link Speed (k/h)	48		48			48
Link Distance (m)	56.2		80.7			63.2
Travel Time (s)	4.2		6.1			4.7
Peak Hour Factor	0.90	0.90	0.92	0.90	0.90	0.90
Bus Blockages (#/hr)	0	0	0	0	0	100
Adj. Flow (vph)	0	0	311	10	2	617
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	321	0	0	619
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.96
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	35.8%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 18: Sheffield Road & Way #5

Future BG 2025 PM - Adjacent Peak  
 10-24-2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	286	9	2	555
Future Volume (Veh/h)	0	0	286	9	2	555
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.92	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	311	10	2	617
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	937	316			321	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	937	316			321	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	293	724			1239	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	321	619			
Volume Left	0	0	2			
Volume Right	0	10	0			
cSH	1700	1700	1239			
Volume to Capacity	0.00	0.19	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A		A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			35.8%	ICU Level of Service	A	
Analysis Period (min)			15			





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	37	8	286	0	0	518
Future Volume (vph)	37	8	286	0	0	518
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.976					
Flt Protected	0.961					
Satd. Flow (prot)	1674	0	1784	0	0	1784
Flt Permitted	0.961					
Satd. Flow (perm)	1674	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	60.6		63.2			102.2
Travel Time (s)	4.5		4.7			7.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	41	9	318	0	0	576
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	0	318	0	0	576
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	38.8%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
 20: Sheffield Road & Way #4

Future BG 2025 PM - Adjacent Peak  
 10-24-2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	37	8	286	0	0	518
Future Volume (Veh/h)	37	8	286	0	0	518
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	41	9	318	0	0	576
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	894	318			318	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	894	318			318	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	87	99			100	
cM capacity (veh/h)	312	723			1242	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	50	318	576			
Volume Left	41	0	0			
Volume Right	9	0	0			
cSH	347	1700	1242			
Volume to Capacity	0.14	0.19	0.00			
Queue Length 95th (m)	3.8	0.0	0.0			
Control Delay (s)	17.1	0.0	0.0			
Lane LOS	C					
Approach Delay (s)	17.1	0.0	0.0			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay			0.9			
Intersection Capacity Utilization			38.8%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
24: Sheffield Road & Way #2

Future BG 2025 PM - Adjacent Peak  
10-24-2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	292	3	1	518
Future Volume (vph)	0	0	292	3	1	518
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.999					
Fl <sub>t</sub> Protected						
Satd. Flow (prot)	1784	0	1783	0	0	1784
Fl <sub>t</sub> Permitted						
Satd. Flow (perm)	1784	0	1783	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	65.0		102.2			76.9
Travel Time (s)	4.9		7.7			5.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	324	3	1	576
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	327	0	0	577
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.9%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
24: Sheffield Road & Way #2

Future BG 2025 PM - Adjacent Peak  
10-24-2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	292	3	1	518
Future Volume (Veh/h)	0	0	292	3	1	518
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	324	3	1	576
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	904	326			327	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	904	326			327	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	307	716			1233	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	327	577			
Volume Left	0	0	1			
Volume Right	0	3	0			
cSH	1700	1700	1233			
Volume to Capacity	0.00	0.19	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A		A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			32.9%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
26: Sheffield Road & Way #1

Future BG 2025 PM - Adjacent Peak  
10-24-2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	2	295	0	0	513
Future Volume (vph)	5	2	295	0	0	513
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.966					
Fl <sub>t</sub> Protected	0.964					
Satd. Flow (prot)	1662	0	1784	0	0	1784
Fl <sub>t</sub> Permitted	0.964					
Satd. Flow (perm)	1662	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	58.8		76.9			181.8
Travel Time (s)	4.4		5.8			13.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	2	328	0	0	570
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	0	328	0	0	570
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	38.5%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
 26: Sheffield Road & Way #1

Future BG 2025 PM - Adjacent Peak  
 10-24-2022



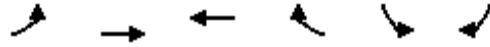
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	2	295	0	0	513
Future Volume (Veh/h)	5	2	295	0	0	513
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	2	328	0	0	570
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	898	328			328	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	898	328			328	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	310	713			1232	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	8	328	570			
Volume Left	6	0	0			
Volume Right	2	0	0			
cSH	361	1700	1232			
Volume to Capacity	0.02	0.19	0.00			
Queue Length 95th (m)	0.5	0.0	0.0			
Control Delay (s)	15.2	0.0	0.0			
Lane LOS	C					
Approach Delay (s)	15.2	0.0	0.0			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization			38.5%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
3: Walkley Road & Lancaster Road

Future BG 2025 AM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	201	723	1394	632	91	166
Future Volume (vph)	201	723	1394	632	91	166
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0			0.0	0.0	70.0
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1647	3007	3232	1517	3135	1406
Flt Permitted	0.109				0.950	
Satd. Flow (perm)	189	3007	3232	1517	3135	1406
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				599		171
Link Speed (k/h)		80	80		48	
Link Distance (m)		248.5	361.1		367.8	
Travel Time (s)		11.2	16.2		27.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	15%	7%	2%	7%	10%
Adj. Flow (vph)	207	745	1437	652	94	171
Shared Lane Traffic (%)						
Lane Group Flow (vph)	207	745	1437	652	94	171
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	24.0	122.0	98.0	98.0	28.0	28.0
Total Split (%)	16.0%	81.3%	65.3%	65.3%	18.7%	18.7%
Maximum Green (s)	21.0	117.0	93.0	93.0	23.0	23.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	119.0	117.0	93.0	93.0	23.0	23.0
Actuated g/C Ratio	0.79	0.78	0.62	0.62	0.15	0.15



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.58	0.32	0.72	0.56	0.20	0.47
Control Delay	20.8	5.2	11.0	2.1	56.7	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.8	5.2	11.0	2.1	56.7	12.2
LOS	C	A	B	A	E	B
Approach Delay		8.6	8.2		27.9	
Approach LOS		A	A		C	
Queue Length 50th (m)	16.8	29.7	44.5	6.7	12.7	0.0
Queue Length 95th (m)	44.3	36.7	m67.2	m20.5	21.4	21.3
Internal Link Dist (m)		224.5	337.1		343.8	
Turn Bay Length (m)	100.0					70.0
Base Capacity (vph)	354	2345	2003	1168	480	360
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	0.58	0.32	0.72	0.56	0.20	0.47

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 50 (33%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.72  
 Intersection Signal Delay: 9.9  
 Intersection LOS: A  
 Intersection Capacity Utilization 68.3%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Walkley Road & Lancaster Road

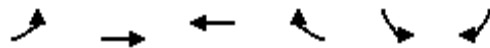




# HCM Signalized Intersection Capacity Analysis

## 3: Walkley Road & Lancaster Road

Future BG 2025 AM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	201	723	1394	632	91	166
Future Volume (vph)	201	723	1394	632	91	166
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1647	3007	3232	1517	3135	1406
Flt Permitted	0.11	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	189	3007	3232	1517	3135	1406
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	207	745	1437	652	94	171
RTOR Reduction (vph)	0	0	0	228	0	145
Lane Group Flow (vph)	207	745	1437	424	94	26
Heavy Vehicles (%)	5%	15%	7%	2%	7%	10%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	117.0	117.0	93.0	93.0	23.0	23.0
Effective Green, g (s)	117.0	117.0	93.0	93.0	23.0	23.0
Actuated g/C Ratio	0.78	0.78	0.62	0.62	0.15	0.15
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	351	2345	2003	940	480	215
v/s Ratio Prot	c0.08	0.25	c0.44		c0.03	
v/s Ratio Perm	0.38			0.28		0.02
v/c Ratio	0.59	0.32	0.72	0.45	0.20	0.12
Uniform Delay, d1	20.4	4.8	19.5	15.0	55.4	54.8
Progression Factor	1.00	1.00	0.50	0.76	1.00	1.00
Incremental Delay, d2	7.1	0.4	1.0	0.7	0.9	1.2
Delay (s)	27.5	5.2	10.9	12.2	56.3	55.9
Level of Service	C	A	B	B	E	E
Approach Delay (s)		10.0	11.3		56.1	
Approach LOS		B	B		E	

### Intersection Summary

HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Walkley Road & Sheffield Road

Future BG 2025 AM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	278	445	1776	264	51	233
Future Volume (vph)	278	445	1776	264	51	233
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0			30.0	0.0	70.0
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1491	3060	3357	1459	2396	1190
Flt Permitted	0.044				0.950	
Satd. Flow (perm)	69	3060	3357	1459	2396	1190
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				80		238
Link Speed (k/h)		80	80		48	
Link Distance (m)		361.1	363.2		830.1	
Travel Time (s)		16.2	16.3		62.3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	16%	13%	3%	6%	40%	30%
Adj. Flow (vph)	284	454	1812	269	52	238
Shared Lane Traffic (%)						
Lane Group Flow (vph)	284	454	1812	269	52	238
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	32.0	124.0	92.0	92.0	26.0	26.0
Total Split (%)	21.3%	82.7%	61.3%	61.3%	17.3%	17.3%
Maximum Green (s)	29.0	119.0	87.0	87.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	121.0	119.0	87.0	87.0	21.0	21.0
Actuated g/C Ratio	0.81	0.79	0.58	0.58	0.14	0.14

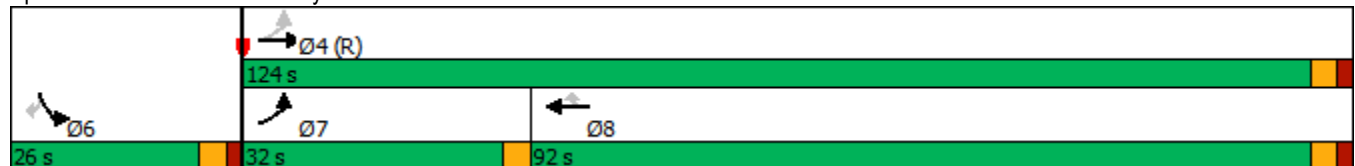


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.86	0.19	0.93	0.31	0.16	0.64
Control Delay	62.3	3.6	38.7	11.9	58.1	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.3	3.6	38.7	11.9	58.1	15.2
LOS	E	A	D	B	E	B
Approach Delay		26.2	35.2		22.9	
Approach LOS		C	D		C	
Queue Length 50th (m)	52.3	14.1	249.3	26.7	7.1	0.0
Queue Length 95th (m)	#112.3	17.6	291.1	43.6	13.8	27.4
Internal Link Dist (m)		337.1	339.2		806.1	
Turn Bay Length (m)	100.0			30.0		70.0
Base Capacity (vph)	330	2427	1947	879	335	371
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	0.86	0.19	0.93	0.31	0.16	0.64

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 50 (33%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 100  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.93  
 Intersection Signal Delay: 31.9  
 Intersection LOS: C  
 Intersection Capacity Utilization 83.9%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 6: Walkley Road & Sheffield Road



HCM Signalized Intersection Capacity Analysis  
6: Walkley Road & Sheffield Road

Future BG 2025 AM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	278	445	1776	264	51	233
Future Volume (vph)	278	445	1776	264	51	233
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1491	3060	3357	1459	2396	1190
Flt Permitted	0.04	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	70	3060	3357	1459	2396	1190
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	284	454	1812	269	52	238
RTOR Reduction (vph)	0	0	0	34	0	205
Lane Group Flow (vph)	284	454	1812	235	52	33
Heavy Vehicles (%)	16%	13%	3%	6%	40%	30%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	119.0	119.0	87.0	87.0	21.0	21.0
Effective Green, g (s)	119.0	119.0	87.0	87.0	21.0	21.0
Actuated g/C Ratio	0.79	0.79	0.58	0.58	0.14	0.14
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	330	2427	1947	846	335	166
v/s Ratio Prot	c0.17	0.15	c0.54		0.02	
v/s Ratio Perm	0.52			0.16		c0.03
v/c Ratio	0.86	0.19	0.93	0.28	0.16	0.20
Uniform Delay, d1	50.4	3.8	28.7	15.8	56.7	57.1
Progression Factor	0.84	0.90	1.00	1.00	1.00	1.00
Incremental Delay, d2	23.7	0.2	9.5	0.8	1.0	2.7
Delay (s)	66.0	3.5	38.3	16.6	57.7	59.8
Level of Service	E	A	D	B	E	E
Approach Delay (s)		27.6	35.5		59.4	
Approach LOS		C	D		E	

Intersection Summary

HCM 2000 Control Delay	35.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
7: Walkley Road & Highway SB terminal

Future BG 2025 AM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (vph)	0	441	959	0	22	896
Future Volume (vph)	0	441	959	0	22	896
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Fr <sub>t</sub>						0.850
Fl <sub>t</sub> Protected					0.950	
Satd. Flow (prot)	0	3390	3390	0	1695	1517
Fl <sub>t</sub> Permitted					0.950	
Satd. Flow (perm)	0	3390	3390	0	1695	1517
Link Speed (k/h)		80	80		80	
Link Distance (m)		131.6	322.4		492.9	
Travel Time (s)		5.9	14.5		22.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	455	989	0	23	924
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	455	989	0	23	924
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	93.2%
Analysis Period (min)	15
	ICU Level of Service F

HCM Unsignalized Intersection Capacity Analysis  
7: Walkley Road & Highway SB terminal

Future BG 2025 AM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↓	↓
Traffic Volume (veh/h)	0	441	959	0	22	896
Future Volume (Veh/h)	0	441	959	0	22	896
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	455	989	0	23	924
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	989			1216	494	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	989			1216	494	
tC, single (s)	4.1			6.8	6.9	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	100			87	0	
cM capacity (veh/h)	695			173	521	
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>	<b>SB 2</b>
Volume Total	228	228	494	494	23	924
Volume Left	0	0	0	0	23	0
Volume Right	0	0	0	0	0	924
cSH	1700	1700	1700	1700	173	521
Volume to Capacity	0.13	0.13	0.29	0.29	0.13	1.78
Queue Length 95th (m)	0.0	0.0	0.0	0.0	3.4	429.9
Control Delay (s)	0.0	0.0	0.0	0.0	28.9	375.9
Lane LOS					D	F
Approach Delay (s)	0.0	0.0		367.5		
Approach LOS					F	
<b>Intersection Summary</b>						
Average Delay			145.6			
Intersection Capacity Utilization			93.2%		ICU Level of Service	
Analysis Period (min)			15			
					F	

Lanes, Volumes, Timings  
10: Highway NB terminal & Walkley Road

Future BG 2025 AM - Site Peak  
10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (vph)	51	414	0	588	403	7
Future Volume (vph)	51	414	0	588	403	7
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.866			0.998		
Flt Protected				0.953		
Satd. Flow (prot)	2936	0	0	3390	1697	0
Flt Permitted				0.953		
Satd. Flow (perm)	2936	0	0	3390	1697	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	322.4			108.3	295.7	
Travel Time (s)	14.5			8.1	22.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	55	445	0	632	433	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	500	0	0	632	441	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14		24	24		14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	47.8% ICU Level of Service A
Analysis Period (min)	15

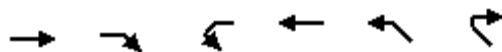
HCM Unsignalized Intersection Capacity Analysis  
 10: Highway NB terminal & Walkley Road

Future BG 2025 AM - Site Peak  
 10-24-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (veh/h)	51	414	0	588	403	7
Future Volume (Veh/h)	51	414	0	588	403	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	55	445	0	632	433	8
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			500		594	250
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			500		594	250
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		1	99
cM capacity (veh/h)			1060		436	750
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	
Volume Total	37	463	316	316	441	
Volume Left	0	0	0	0	433	
Volume Right	0	445	0	0	8	
cSH	1700	1700	1700	1700	440	
Volume to Capacity	0.02	0.27	0.19	0.19	1.00	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	98.3	
Control Delay (s)	0.0	0.0	0.0	0.0	74.6	
Lane LOS						F
Approach Delay (s)	0.0		0.0		74.6	
Approach LOS						F
<b>Intersection Summary</b>						
Average Delay			20.9			
Intersection Capacity Utilization			47.8%	ICU Level of Service	A	
Analysis Period (min)			15			



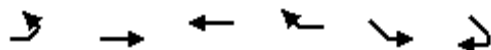


Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑	↑		↑↑↑		
Traffic Volume (vph)	441	133	0	1855	0	0
Future Volume (vph)	441	133	0	1855	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		60.0	0.0		0.0	0.0
Storage Lanes		1	0		0	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3390	1517	0	4871	0	0
Flt Permitted						
Satd. Flow (perm)	3390	1517	0	4871	0	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	363.2			131.6	210.3	
Travel Time (s)	16.3			9.9	15.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	490	148	0	2061	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	490	148	0	2061	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.2%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑	↗		
Traffic Volume (vph)	0	58	588	209	0	0
Future Volume (vph)	0	58	588	209	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			70.0	0.0	0.0
Storage Lanes	0			1	0	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3390	1784	1517	0	0
Flt Permitted						
Satd. Flow (perm)	0	3390	1784	1517	0	0
Link Speed (k/h)		80	80		48	
Link Distance (m)		108.3	195.3		199.6	
Travel Time (s)		4.9	8.8		15.0	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	62	632	225	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	62	632	225	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Free	

















**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.0%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

















Lanes, Volumes, Timings  
15: Sheffield Road & Humber Place

Future BG 2025 AM - Site Peak  
10-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	0	70	4	1	3	148	401	3	3	208	16
Future Volume (vph)	20	0	70	4	1	3	148	401	3	3	208	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.895			0.949			0.999			0.990	
Flt Protected		0.989			0.976			0.987			0.999	
Satd. Flow (prot)	0	1290	0	0	1225	0	0	1583	0	0	1387	0
Flt Permitted		0.989			0.976			0.987			0.999	
Satd. Flow (perm)	0	1290	0	0	1225	0	0	1583	0	0	1387	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		152.4			148.3			830.1			120.3	
Travel Time (s)		11.4			11.1			62.3			9.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	35%	2%	22%	50%	2%	33%	12%	14%	0%	33%	30%	26%
Adj. Flow (vph)	22	0	78	4	1	3	164	446	3	3	231	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	100	0	0	8	0	0	613	0	0	252	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	59.9%						ICU Level of Service B					
Analysis Period (min)	15											










HCM Unsignalized Intersection Capacity Analysis  
 15: Sheffield Road & Humber Place

Future BG 2025 AM - Site Peak  
 10-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	0	70	4	1	3	148	401	3	3	208	16
Future Volume (Veh/h)	20	0	70	4	1	3	148	401	3	3	208	16
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	0	78	4	1	3	164	446	3	3	231	18
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1025	1023	240	1100	1030	448	249			449		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1025	1023	240	1100	1030	448	249			449		
tC, single (s)	7.4	6.5	6.4	7.6	6.5	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.8	4.0	3.5	4.0	4.0	3.6	2.3			2.5		
p0 queue free %	87	100	90	97	100	99	87			100		
cM capacity (veh/h)	165	204	752	124	202	551	1260			966		
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	100	8	613	252								
Volume Left	22	4	164	3								
Volume Right	78	3	3	18								
cSH	422	188	1260	966								
Volume to Capacity	0.24	0.04	0.13	0.00								
Queue Length 95th (m)	6.9	1.0	3.4	0.1								
Control Delay (s)	16.2	25.0	3.3	0.1								
Lane LOS	C	D	A	A								
Approach Delay (s)	16.2	25.0	3.3	0.1								
Approach LOS	C	D										
Intersection Summary												
Average Delay			4.0									
Intersection Capacity Utilization			59.9%	ICU Level of Service	B							
Analysis Period (min)			15									










Lanes, Volumes, Timings  
18: Sheffield Road & Way #5

Future BG 2025 AM - Site Peak  
10-24-2022










						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	392	28	7	236
Future Volume (vph)	0	0	392	28	7	236
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.991					
Flt Protected	0.999					
Satd. Flow (prot)	1784	0	1768	0	0	922
Flt Permitted	0.999					
Satd. Flow (perm)	1784	0	1768	0	0	922
Link Speed (k/h)	48		48		48	
Link Distance (m)	56.2		120.3		89.9	
Travel Time (s)	4.2		9.0		6.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	100%
Adj. Flow (vph)	0	0	436	31	8	262
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	467	0	0	270
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.9		4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free		Free	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	26.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
18: Sheffield Road & Way #5

Future BG 2025 AM - Site Peak  
10-24-2022










						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	392	28	7	236
Future Volume (Veh/h)	0	0	392	28	7	236
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	436	31	8	262
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	730	452			467	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	730	452			467	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	387	608			1094	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	467	270			
Volume Left	0	0	8			
Volume Right	0	31	0			
cSH	1700	1700	1094			
Volume to Capacity	0.00	0.27	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.0	0.0	0.3			
Lane LOS	A		A			
Approach Delay (s)	0.0	0.0	0.3			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization			26.9%	ICU Level of Service	A	
Analysis Period (min)			15			



						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	2	392	0	0	234
Future Volume (vph)	9	2	392	0	0	234
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.977					
Flt Protected	0.960					
Satd. Flow (prot)	1674	0	1784	0	0	1784
Flt Permitted	0.960					
Satd. Flow (perm)	1674	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	60.6		89.9			135.3
Travel Time (s)	4.5		6.7			10.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	10	2	436	0	0	260
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	436	0	0	260
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	31.8%		ICU Level of Service A			
Analysis Period (min)	15					










HCM Unsignalized Intersection Capacity Analysis  
20: Sheffield Road & Way #4

Future BG 2025 AM - Site Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	2	392	0	0	234
Future Volume (Veh/h)	9	2	392	0	0	234
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	2	436	0	0	260
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	696	436			436	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	696	436			436	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	408	620			1124	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	12	436	260			
Volume Left	10	0	0			
Volume Right	2	0	0			
cSH	432	1700	1124			
Volume to Capacity	0.03	0.26	0.00			
Queue Length 95th (m)	0.6	0.0	0.0			
Control Delay (s)	13.6	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	13.6	0.0	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.2			
Intersection Capacity Utilization			31.8%		ICU Level of Service	A
Analysis Period (min)			15			










Lanes, Volumes, Timings  
24: Sheffield Road & Way #2

Future BG 2025 AM - Site Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	386	8	2	234
Future Volume (vph)	0	0	386	8	2	234
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.997					
Flt Protected						
Satd. Flow (prot)	1784	0	1779	0	0	1784
Flt Permitted						
Satd. Flow (perm)	1784	0	1779	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	65.0		135.3			74.6
Travel Time (s)	4.9		10.1			5.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	429	9	2	260
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	438	0	0	262
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	25.3%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 24: Sheffield Road & Way #2

Future BG 2025 AM - Site Peak  
 10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	386	8	2	234
Future Volume (Veh/h)	0	0	386	8	2	234
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	429	9	2	260
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	698	434			438	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	698	434			438	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	406	622			1122	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	438	262			
Volume Left	0	0	2			
Volume Right	0	9	0			
cSH	1700	1700	1122			
Volume to Capacity	0.00	0.26	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.1			
Lane LOS	A		A			
Approach Delay (s)	0.0	0.0	0.1			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			25.3%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
26: Sheffield Road & Way #1

Future BG 2025 AM - Site Peak  
10-24-2022












Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	2	1	395	0	0	232
Future Volume (vph)	2	1	395	0	0	232
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.955					
Fl <sub>t</sub> Protected	0.968					
Satd. Flow (prot)	1649	0	1784	0	0	1784
Fl <sub>t</sub> Permitted	0.968					
Satd. Flow (perm)	1649	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	58.8		74.6			272.6
Travel Time (s)	4.4		5.6			20.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	1	439	0	0	258
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	0	439	0	0	258
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	31.9%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
26: Sheffield Road & Way #1

Future BG 2025 AM - Site Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	1	395	0	0	232
Future Volume (Veh/h)	2	1	395	0	0	232
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	1	439	0	0	258
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	697	439			439	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	697	439			439	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	407	618			1121	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	3	439	258			
Volume Left	2	0	0			
Volume Right	1	0	0			
cSH	459	1700	1121			
Volume to Capacity	0.01	0.26	0.00			
Queue Length 95th (m)	0.1	0.0	0.0			
Control Delay (s)	12.9	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	12.9	0.0	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization			31.9%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
3: Walkley Road & Lancaster Road

Future BG 2025 PM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	94	1318	715	123	363	154
Future Volume (vph)	94	1318	715	123	363	154
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.5			0.0	0.0	30.5
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1695	3293	3172	1419	3288	1502
Flt Permitted	0.289				0.950	
Satd. Flow (perm)	516	3293	3172	1419	3288	1502
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				135		138
Link Speed (k/h)		80	80		48	
Link Distance (m)		306.2	364.1		701.3	
Travel Time (s)		13.8	16.4		52.6	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	5%	9%	9%	2%	3%
Adj. Flow (vph)	103	1448	786	135	399	169
Shared Lane Traffic (%)						
Lane Group Flow (vph)	103	1448	786	135	399	169
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	22.0	102.0	80.0	80.0	28.0	28.0
Total Split (%)	16.9%	78.5%	61.5%	61.5%	21.5%	21.5%
Maximum Green (s)	19.0	97.0	75.0	75.0	23.0	23.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	99.0	97.0	75.0	75.0	23.0	23.0
Actuated g/C Ratio	0.76	0.75	0.58	0.58	0.18	0.18

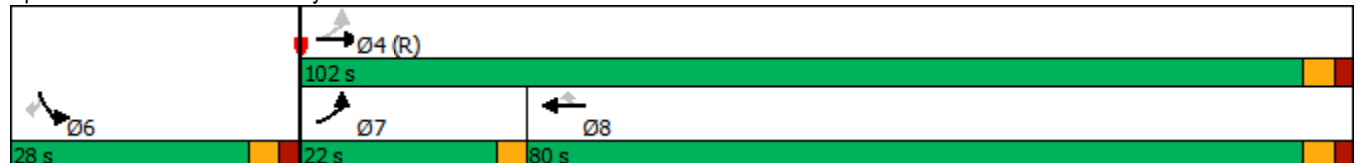


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.18	0.59	0.43	0.15	0.69	0.45
Control Delay	4.7	8.7	15.1	4.3	57.0	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.7	8.7	15.1	4.3	57.0	15.9
LOS	A	A	B	A	E	B
Approach Delay		8.4	13.5		44.8	
Approach LOS		A	B		D	
Queue Length 50th (m)	5.8	77.4	69.6	8.9	49.8	6.8
Queue Length 95th (m)	10.1	93.3	78.8	16.5	67.1	27.7
Internal Link Dist (m)		282.2	340.1		677.3	
Turn Bay Length (m)	30.5					30.5
Base Capacity (vph)	565	2457	1830	875	581	379
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	0.18	0.59	0.43	0.15	0.69	0.45

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 50 (38%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.69  
 Intersection Signal Delay: 16.7  
 Intersection LOS: B  
 Intersection Capacity Utilization 57.7%  
 ICU Level of Service B  
 Analysis Period (min) 15

Splits and Phases: 3: Walkley Road & Lancaster Road

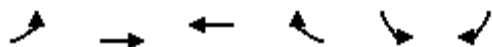




# HCM Signalized Intersection Capacity Analysis

## 3: Walkley Road & Lancaster Road

Future BG 2025 PM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	94	1318	715	123	363	154
Future Volume (vph)	94	1318	715	123	363	154
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1695	3293	3172	1419	3288	1502
Flt Permitted	0.29	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	515	3293	3172	1419	3288	1502
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	103	1448	786	135	399	169
RTOR Reduction (vph)	0	0	0	57	0	114
Lane Group Flow (vph)	103	1448	786	78	399	55
Heavy Vehicles (%)	2%	5%	9%	9%	2%	3%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	97.0	97.0	75.0	75.0	23.0	23.0
Effective Green, g (s)	97.0	97.0	75.0	75.0	23.0	23.0
Actuated g/C Ratio	0.75	0.75	0.58	0.58	0.18	0.18
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	556	2457	1830	818	581	265
v/s Ratio Prot	0.03	c0.44	0.25		c0.12	
v/s Ratio Perm	0.11			0.05		0.04
v/c Ratio	0.19	0.59	0.43	0.10	0.69	0.21
Uniform Delay, d1	5.4	7.5	15.5	12.3	50.1	45.7
Progression Factor	1.00	1.00	0.92	2.00	1.00	1.00
Incremental Delay, d2	0.7	1.0	0.7	0.2	6.5	1.8
Delay (s)	6.1	8.5	14.9	24.8	56.6	47.5
Level of Service	A	A	B	C	E	D
Approach Delay (s)		8.4	16.4		53.9	
Approach LOS		A	B		D	

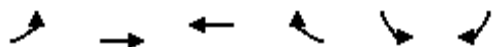
### Intersection Summary

HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Walkley Road & Sheffield Road

Future BG 2025 PM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	160	1448	532	70	232	292
Future Volume (vph)	160	1448	532	70	232	292
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.5			50.0	0.0	30.5
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1383	3390	3172	1146	3164	1381
Flt Permitted	0.404				0.950	
Satd. Flow (perm)	588	3390	3172	1146	3164	1381
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				71		301
Link Speed (k/h)		80	80		48	
Link Distance (m)		364.1	339.6		830.6	
Travel Time (s)		16.4	15.3		62.3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.97
Heavy Vehicles (%)	25%	2%	9%	35%	6%	12%
Adj. Flow (vph)	163	1478	543	71	237	301
Shared Lane Traffic (%)						
Lane Group Flow (vph)	163	1478	543	71	237	301
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.0	23.0	23.0	23.0	23.0
Total Split (s)	22.0	104.0	82.0	82.0	26.0	26.0
Total Split (%)	16.9%	80.0%	63.1%	63.1%	20.0%	20.0%
Maximum Green (s)	19.0	99.0	77.0	77.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	101.0	99.0	77.0	77.0	21.0	21.0
Actuated g/C Ratio	0.78	0.76	0.59	0.59	0.16	0.16

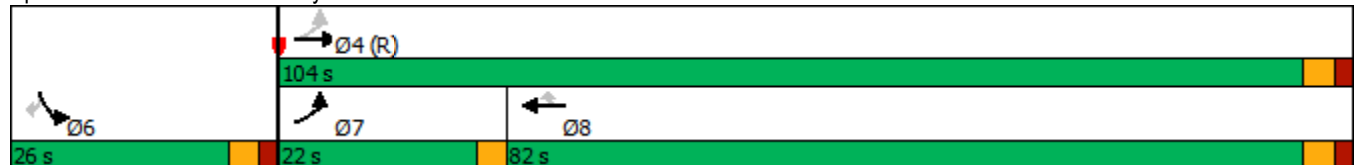


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.28	0.57	0.29	0.10	0.46	0.63
Control Delay	3.8	5.2	13.5	2.8	52.8	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.8	5.2	13.5	2.8	52.8	11.8
LOS	A	A	B	A	D	B
Approach Delay		5.1	12.3		29.9	
Approach LOS		A	B		C	
Queue Length 50th (m)	6.9	49.0	34.2	0.0	28.7	0.0
Queue Length 95th (m)	m10.9	57.0	44.4	6.2	41.7	26.9
Internal Link Dist (m)		340.1	315.6		806.6	
Turn Bay Length (m)	30.5			50.0		30.5
Base Capacity (vph)	573	2581	1878	707	511	475
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	0.28	0.57	0.29	0.10	0.46	0.63

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 13 (10%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.63  
 Intersection Signal Delay: 11.4  
 Intersection LOS: B  
 Intersection Capacity Utilization 57.6%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Walkley Road & Sheffield Road



HCM Signalized Intersection Capacity Analysis  
6: Walkley Road & Sheffield Road

Future BG 2025 PM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	160	1448	532	70	232	292
Future Volume (vph)	160	1448	532	70	232	292
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1383	3390	3172	1146	3164	1381
Flt Permitted	0.40	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	589	3390	3172	1146	3164	1381
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.97
Adj. Flow (vph)	163	1478	543	71	237	301
RTOR Reduction (vph)	0	0	0	29	0	252
Lane Group Flow (vph)	163	1478	543	42	237	49
Heavy Vehicles (%)	25%	2%	9%	35%	6%	12%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	99.0	99.0	77.0	77.0	21.0	21.0
Effective Green, g (s)	99.0	99.0	77.0	77.0	21.0	21.0
Actuated g/C Ratio	0.76	0.76	0.59	0.59	0.16	0.16
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	564	2581	1878	678	511	223
v/s Ratio Prot	0.04	c0.44	0.17		c0.07	
v/s Ratio Perm	0.18			0.04		0.04
v/c Ratio	0.29	0.57	0.29	0.06	0.46	0.22
Uniform Delay, d1	4.5	6.6	13.0	11.2	49.4	47.4
Progression Factor	0.76	0.67	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.7	0.4	0.2	3.0	2.2
Delay (s)	4.5	5.1	13.4	11.4	52.4	49.6
Level of Service	A	A	B	B	D	D
Approach Delay (s)		5.0	13.2		50.8	
Approach LOS		A	B		D	

Intersection Summary

HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
7: Walkley Road & Highway SB terminal

Future BG 2025 PM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (vph)	0	1137	135	0	130	460
Future Volume (vph)	0	1137	135	0	130	460
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Fr <sub>t</sub>						0.850
Fl <sub>t</sub> Protected					0.950	
Satd. Flow (prot)	0	3390	3390	0	1695	1517
Fl <sub>t</sub> Permitted					0.950	
Satd. Flow (perm)	0	3390	3390	0	1695	1517
Link Speed (k/h)		80	80		80	
Link Distance (m)		118.5	305.1		468.0	
Travel Time (s)		5.3	13.7		21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1197	142	0	137	484
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1197	142	0	137	484
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	47.4%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
7: Walkley Road & Highway SB terminal

Future BG 2025 PM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↘
Traffic Volume (veh/h)	0	1137	135	0	130	460
Future Volume (Veh/h)	0	1137	135	0	130	460
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1197	142	0	137	484
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	142			740	71	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	142			740	71	
tC, single (s)	4.1			6.8	6.9	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	100			61	50	
cM capacity (veh/h)	1438			352	977	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	598	598	71	71	137	484
Volume Left	0	0	0	0	137	0
Volume Right	0	0	0	0	0	484
cSH	1700	1700	1700	1700	352	977
Volume to Capacity	0.35	0.35	0.04	0.04	0.39	0.50
Queue Length 95th (m)	0.0	0.0	0.0	0.0	13.6	21.4
Control Delay (s)	0.0	0.0	0.0	0.0	21.6	12.2
Lane LOS					C	B
Approach Delay (s)	0.0	0.0		14.3		
Approach LOS					B	
<b>Intersection Summary</b>						
Average Delay			4.5			
Intersection Capacity Utilization			47.4%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
 10: Highway NB terminal & Walkley Road

Future BG 2025 PM - Site Peak  
 10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (vph)	448	821	0	49	100	24
Future Volume (vph)	448	821	0	49	100	24
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.903			0.974		
Flt Protected				0.961		
Satd. Flow (prot)	3061	0	0	3390	1670	0
Flt Permitted				0.961		
Satd. Flow (perm)	3061	0	0	3390	1670	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	305.1			95.4	443.2	
Travel Time (s)	13.7			7.2	33.2	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	492	902	0	54	110	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1394	0	0	54	136	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14		24	24		14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.1% ICU Level of Service B
Analysis Period (min)	15

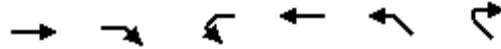
HCM Unsignalized Intersection Capacity Analysis  
 10: Highway NB terminal & Walkley Road

Future BG 2025 PM - Site Peak  
 10-24-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (veh/h)	448	821	0	49	100	24
Future Volume (Veh/h)	448	821	0	49	100	24
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	492	902	0	54	110	26
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			1394		970	697
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1394		970	697
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		56	93
cM capacity (veh/h)			487		251	383
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	
Volume Total	328	1066	27	27	136	
Volume Left	0	0	0	0	110	
Volume Right	0	902	0	0	26	
cSH	1700	1700	1700	1700	268	
Volume to Capacity	0.19	0.63	0.02	0.02	0.51	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	20.2	
Control Delay (s)	0.0	0.0	0.0	0.0	31.4	
Lane LOS					D	
Approach Delay (s)	0.0		0.0		31.4	
Approach LOS					D	
<b>Intersection Summary</b>						
Average Delay			2.7			
Intersection Capacity Utilization			55.1%	ICU Level of Service	B	
Analysis Period (min)			15			





Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑	↑		↑↑↑		
Traffic Volume (vph)	1137	395	0	595	0	0
Future Volume (vph)	1137	395	0	595	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		50.0	0.0		0.0	0.0
Storage Lanes		1	0		0	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3390	1517	0	4871	0	0
Flt Permitted						
Satd. Flow (perm)	3390	1517	0	4871	0	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	339.6			118.5	265.8	
Travel Time (s)	15.3			8.9	19.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1197	416	0	626	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1197	416	0	626	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.5%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings  
13: Walkley Road & NB off ramp

Future BG 2025 PM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑	↗		
Traffic Volume (vph)	0	472	49	46	0	0
Future Volume (vph)	0	472	49	46	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			50.0	0.0	0.0
Storage Lanes	0			1	0	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3390	1784	1517	0	0
Flt Permitted						
Satd. Flow (perm)	0	3390	1784	1517	0	0
Link Speed (k/h)		80	48		48	
Link Distance (m)		95.4	197.1		264.7	
Travel Time (s)		4.3	14.8		19.9	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	519	54	51	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	519	54	51	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Free	

















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	17.1%
Analysis Period (min)	15
	ICU Level of Service A

Intersection Sign configuration not allowed in HCM analysis.

















Lanes, Volumes, Timings  
15: Sheffield Road & Humber Place

Future BG 2025 PM - Site Peak  
10-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	104	2	0	0	44	224	1	1	405	15
Future Volume (vph)	11	0	104	2	0	0	44	224	1	1	405	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>		0.878									0.995	
Fl <sub>t</sub> Protected		0.995			0.950			0.992				
Satd. Flow (prot)	0	1452	0	0	1300	0	0	1377	0	0	1661	0
Fl <sub>t</sub> Permitted		0.995			0.950			0.992				
Satd. Flow (perm)	0	1452	0	0	1300	0	0	1377	0	0	1661	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		152.4			148.3			830.6			80.7	
Travel Time (s)		11.4			11.1			62.3			6.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	14%	2%	9%	33%	2%	2%	21%	33%	50%	0%	9%	10%
Adj. Flow (vph)	12	0	116	2	0	0	49	249	1	1	450	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	128	0	0	2	0	0	299	0	0	468	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	55.7%						ICU Level of Service B					
Analysis Period (min)	15											










HCM Unsignalized Intersection Capacity Analysis  
 15: Sheffield Road & Humber Place

Future BG 2025 PM - Site Peak  
 10-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	0	104	2	0	0	44	224	1	1	405	15
Future Volume (Veh/h)	11	0	104	2	0	0	44	224	1	1	405	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	12	0	116	2	0	0	49	249	1	1	450	17
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	808	808	458	924	816	250	467			250		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	808	808	458	924	816	250	467			250		
tC, single (s)	7.2	6.5	6.3	7.4	6.5	6.2	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.4	3.8	4.0	3.3	2.4			2.2		
p0 queue free %	96	100	80	99	100	100	95			100		
cM capacity (veh/h)	275	299	588	170	296	789	1002			1327		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	128	2	299	468								
Volume Left	12	2	49	1								
Volume Right	116	0	1	17								
cSH	531	170	1002	1327								
Volume to Capacity	0.24	0.01	0.05	0.00								
Queue Length 95th (m)	7.1	0.3	1.2	0.0								
Control Delay (s)	13.9	26.4	1.9	0.0								
Lane LOS	B	D	A	A								
Approach Delay (s)	13.9	26.4	1.9	0.0								
Approach LOS	B	D										
Intersection Summary												
Average Delay			2.7									
Intersection Capacity Utilization			55.7%		ICU Level of Service					B		
Analysis Period (min)			15									

Lanes, Volumes, Timings  
18: Sheffield Road & Way #5

Future BG 2025 PM - Site Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	212	7	1	411
Future Volume (vph)	0	0	212	7	1	411
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.995					
Flt Protected						
Satd. Flow (prot)	1784	0	1775	0	0	1071
Flt Permitted						
Satd. Flow (perm)	1784	0	1775	0	0	1071
Link Speed (k/h)	48		48			48
Link Distance (m)	56.2		80.7			63.2
Travel Time (s)	4.2		6.1			4.7
Peak Hour Factor	0.90	0.90	0.92	0.90	0.90	0.90
Bus Blockages (#/hr)	0	0	0	0	0	100
Adj. Flow (vph)	0	0	230	8	1	457
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	238	0	0	458
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.96
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	27.0%			ICU Level of Service A		
Analysis Period (min)	15					










HCM Unsignalized Intersection Capacity Analysis  
 18: Sheffield Road & Way #5

Future BG 2025 PM - Site Peak  
 10-24-2022












Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	212	7	1	411
Future Volume (Veh/h)	0	0	212	7	1	411
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.92	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	230	8	1	457
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	693	234			238	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	693	234			238	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	409	805			1329	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	238	458			
Volume Left	0	0	1			
Volume Right	0	8	0			
cSH	1700	1700	1329			
Volume to Capacity	0.00	0.14	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A		A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			27.0%	ICU Level of Service		A
Analysis Period (min)			15			



						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	27	6	212	0	0	383
Future Volume (vph)	27	6	212	0	0	383
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.974					
Fl <sub>t</sub> Protected	0.961					
Satd. Flow (prot)	1670	0	1784	0	0	1784
Fl <sub>t</sub> Permitted	0.961					
Satd. Flow (perm)	1670	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	60.6		63.2			102.2
Travel Time (s)	4.5		4.7			7.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	30	7	236	0	0	426
Shared Lane Traffic (%)						
Lane Group Flow (vph)	37	0	236	0	0	426
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	31.3%		ICU Level of Service A			
Analysis Period (min)	15					










HCM Unsignalized Intersection Capacity Analysis  
20: Sheffield Road & Way #4

Future BG 2025 PM - Site Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	27	6	212	0	0	383
Future Volume (Veh/h)	27	6	212	0	0	383
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	30	7	236	0	0	426
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	662	236			236	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	662	236			236	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	99			100	
cM capacity (veh/h)	427	803			1331	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	37	236	426			
Volume Left	30	0	0			
Volume Right	7	0	0			
cSH	468	1700	1331			
Volume to Capacity	0.08	0.14	0.00			
Queue Length 95th (m)	1.9	0.0	0.0			
Control Delay (s)	13.3	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	13.3	0.0	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.7			
Intersection Capacity Utilization			31.3%		ICU Level of Service	A
Analysis Period (min)			15			










Lanes, Volumes, Timings  
24: Sheffield Road & Way #2

Future BG 2025 PM - Site Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	216	2	1	383
Future Volume (vph)	0	0	216	2	1	383
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999					
Flt Protected						
Satd. Flow (prot)	1784	0	1783	0	0	1784
Flt Permitted						
Satd. Flow (perm)	1784	0	1783	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	65.0		102.2			76.9
Travel Time (s)	4.9		7.7			5.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	240	2	1	426
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	242	0	0	427
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	25.4%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
24: Sheffield Road & Way #2

Future BG 2025 PM - Site Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	216	2	1	383
Future Volume (Veh/h)	0	0	216	2	1	383
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	240	2	1	426
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	669	241			242	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	669	241			242	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	422	798			1324	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	242	427			
Volume Left	0	0	1			
Volume Right	0	2	0			
cSH	1700	1700	1324			
Volume to Capacity	0.00	0.14	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A		A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			25.4%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
26: Sheffield Road & Way #1

Future BG 2025 PM - Site Peak  
10-24-2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	4	1	218	0	0	380
Future Volume (vph)	4	1	218	0	0	380
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.973					
Fl <sub>t</sub> Protected	0.962					
Satd. Flow (prot)	1670	0	1784	0	0	1784
Fl <sub>t</sub> Permitted	0.962					
Satd. Flow (perm)	1670	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	58.8		76.9			181.8
Travel Time (s)	4.4		5.8			13.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	1	242	0	0	422
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	0	242	0	0	422
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	31.1%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
26: Sheffield Road & Way #1

Future BG 2025 PM - Site Peak  
10-24-2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	1	218	0	0	380
Future Volume (Veh/h)	4	1	218	0	0	380
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	4	1	242	0	0	422
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	664	242			242	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	664	242			242	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	426	797			1324	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	5	242	422			
Volume Left	4	0	0			
Volume Right	1	0	0			
cSH	469	1700	1324			
Volume to Capacity	0.01	0.14	0.00			
Queue Length 95th (m)	0.2	0.0	0.0			
Control Delay (s)	12.8	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	12.8	0.0	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization			31.1%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
3: Walkley Road & Lancaster Road

Future BG 2030 AM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	222	799	1540	699	101	184
Future Volume (vph)	222	799	1540	699	101	184
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0			0.0	0.0	70.0
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1647	3007	3232	1517	3135	1406
Flt Permitted	0.080				0.950	
Satd. Flow (perm)	139	3007	3232	1517	3135	1406
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				599		190
Link Speed (k/h)		80	80		48	
Link Distance (m)		248.5	361.1		367.8	
Travel Time (s)		11.2	16.2		27.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	15%	7%	2%	7%	10%
Adj. Flow (vph)	229	824	1588	721	104	190
Shared Lane Traffic (%)						
Lane Group Flow (vph)	229	824	1588	721	104	190
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	24.0	122.0	98.0	98.0	28.0	28.0
Total Split (%)	16.0%	81.3%	65.3%	65.3%	18.7%	18.7%
Maximum Green (s)	21.0	117.0	93.0	93.0	23.0	23.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	119.0	117.0	93.0	93.0	23.0	23.0
Actuated g/C Ratio	0.79	0.78	0.62	0.62	0.15	0.15

Lanes, Volumes, Timings  
3: Walkley Road & Lancaster Road

Future BG 2030 AM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.71	0.35	0.79	0.62	0.22	0.51
Control Delay	40.1	5.5	12.5	2.6	57.0	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	5.5	12.5	2.6	57.0	12.1
LOS	D	A	B	A	E	B
Approach Delay		13.0	9.4		28.0	
Approach LOS		B	A		C	
Queue Length 50th (m)	35.7	34.1	64.0	22.2	14.1	0.0
Queue Length 95th (m)	65.9	41.7	m68.0	m21.2	23.2	22.7
Internal Link Dist (m)		224.5	337.1		343.8	
Turn Bay Length (m)	100.0					70.0
Base Capacity (vph)	321	2345	2003	1168	480	376
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	0.71	0.35	0.79	0.62	0.22	0.51

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 50 (33%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 12.0  
 Intersection LOS: B  
 Intersection Capacity Utilization 73.8%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Walkley Road & Lancaster Road





HCM Signalized Intersection Capacity Analysis  
3: Walkley Road & Lancaster Road

Future BG 2030 AM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	222	799	1540	699	101	184
Future Volume (vph)	222	799	1540	699	101	184
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1647	3007	3232	1517	3135	1406
Flt Permitted	0.08	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	139	3007	3232	1517	3135	1406
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	229	824	1588	721	104	190
RTOR Reduction (vph)	0	0	0	228	0	161
Lane Group Flow (vph)	229	824	1588	493	104	29
Heavy Vehicles (%)	5%	15%	7%	2%	7%	10%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	117.0	117.0	93.0	93.0	23.0	23.0
Effective Green, g (s)	117.0	117.0	93.0	93.0	23.0	23.0
Actuated g/C Ratio	0.78	0.78	0.62	0.62	0.15	0.15
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	319	2345	2003	940	480	215
v/s Ratio Prot	c0.10	0.27	c0.49		c0.03	
v/s Ratio Perm	0.46			0.33		0.02
v/c Ratio	0.72	0.35	0.79	0.52	0.22	0.14
Uniform Delay, d1	35.9	5.0	21.3	16.1	55.6	54.9
Progression Factor	1.00	1.00	0.53	0.75	1.00	1.00
Incremental Delay, d2	13.0	0.4	1.0	0.6	1.0	1.3
Delay (s)	48.9	5.4	12.3	12.6	56.6	56.2
Level of Service	D	A	B	B	E	E
Approach Delay (s)		14.9	12.4		56.4	
Approach LOS		B	B		E	

Intersection Summary

HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Walkley Road & Sheffield Road

Future BG 2030 AM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	308	492	1962	291	57	258
Future Volume (vph)	308	492	1962	291	57	258
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0			30.0	0.0	70.0
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1491	3060	3357	1459	2396	1190
Flt Permitted	0.044				0.950	
Satd. Flow (perm)	69	3060	3357	1459	2396	1190
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				80		263
Link Speed (k/h)		80	80		48	
Link Distance (m)		361.1	363.2		830.1	
Travel Time (s)		16.2	16.3		62.3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	16%	13%	3%	6%	40%	30%
Adj. Flow (vph)	314	502	2002	297	58	263
Shared Lane Traffic (%)						
Lane Group Flow (vph)	314	502	2002	297	58	263
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	32.0	124.0	92.0	92.0	26.0	26.0
Total Split (%)	21.3%	82.7%	61.3%	61.3%	17.3%	17.3%
Maximum Green (s)	29.0	119.0	87.0	87.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	121.0	119.0	87.0	87.0	21.0	21.0
Actuated g/C Ratio	0.81	0.79	0.58	0.58	0.14	0.14

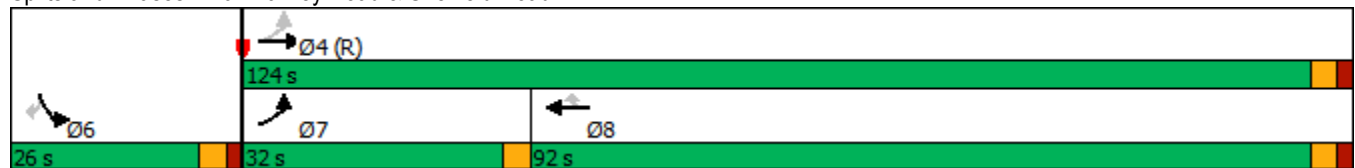


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.95	0.21	1.03	0.34	0.17	0.67
Control Delay	79.2	3.6	59.2	12.8	58.4	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.2	3.6	59.2	12.8	58.4	15.5
LOS	E	A	E	B	E	B
Approach Delay		32.7	53.2		23.3	
Approach LOS		C	D		C	
Queue Length 50th (m)	59.2	15.6	~333.7	31.5	7.9	0.0
Queue Length 95th (m)	#133.1	19.2	#374.3	50.0	15.0	29.4
Internal Link Dist (m)		337.1	339.2		806.1	
Turn Bay Length (m)	100.0			30.0		70.0
Base Capacity (vph)	330	2427	1947	879	335	392
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	0.95	0.21	1.03	0.34	0.17	0.67

Intersection Summary

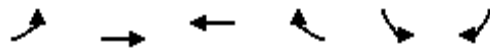
Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 50 (33%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 150  
 Control Type: Pretimed  
 Maximum v/c Ratio: 1.03  
 Intersection Signal Delay: 45.5  
 Intersection LOS: D  
 Intersection Capacity Utilization 91.1%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 6: Walkley Road & Sheffield Road



HCM Signalized Intersection Capacity Analysis  
6: Walkley Road & Sheffield Road

Future BG 2030 AM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗↗	↗↗	↖	↖↖	↖
Traffic Volume (vph)	308	492	1962	291	57	258
Future Volume (vph)	308	492	1962	291	57	258
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1491	3060	3357	1459	2396	1190
Flt Permitted	0.04	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	70	3060	3357	1459	2396	1190
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	314	502	2002	297	58	263
RTOR Reduction (vph)	0	0	0	34	0	226
Lane Group Flow (vph)	314	502	2002	263	58	37
Heavy Vehicles (%)	16%	13%	3%	6%	40%	30%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	119.0	119.0	87.0	87.0	21.0	21.0
Effective Green, g (s)	119.0	119.0	87.0	87.0	21.0	21.0
Actuated g/C Ratio	0.79	0.79	0.58	0.58	0.14	0.14
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	330	2427	1947	846	335	166
v/s Ratio Prot	c0.18	0.16	c0.60		0.02	
v/s Ratio Perm	0.57			0.18		c0.03
v/c Ratio	0.95	0.21	1.03	0.31	0.17	0.22
Uniform Delay, d1	53.5	3.8	31.5	16.1	56.8	57.2
Progression Factor	0.87	0.89	1.00	1.00	1.00	1.00
Incremental Delay, d2	37.6	0.2	28.0	1.0	1.1	3.1
Delay (s)	83.9	3.6	59.5	17.1	58.0	60.3
Level of Service	F	A	E	B	E	E
Approach Delay (s)		34.5	54.0		59.9	
Approach LOS		C	D		E	

Intersection Summary

HCM 2000 Control Delay	49.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	91.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
7: Walkley Road & Highway SB terminal

Future BG 2030 AM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (vph)	0	487	1060	0	25	990
Future Volume (vph)	0	487	1060	0	25	990
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Fr <sub>t</sub>						0.850
Fl <sub>t</sub> Protected					0.950	
Satd. Flow (prot)	0	3390	3390	0	1695	1517
Fl <sub>t</sub> Permitted					0.950	
Satd. Flow (perm)	0	3390	3390	0	1695	1517
Link Speed (k/h)		80	80		80	
Link Distance (m)		131.6	322.4		492.9	
Travel Time (s)		5.9	14.5		22.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	502	1093	0	26	1021
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	502	1093	0	26	1021
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	102.3%
ICU Level of Service	G
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
7: Walkley Road & Highway SB terminal

Future BG 2030 AM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↘
Traffic Volume (veh/h)	0	487	1060	0	25	990
Future Volume (Veh/h)	0	487	1060	0	25	990
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	502	1093	0	26	1021
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1093				1344	546
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1093				1344	546
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				82	0
cM capacity (veh/h)	634				143	481
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>	<b>SB 2</b>
Volume Total	251	251	546	546	26	1021
Volume Left	0	0	0	0	26	0
Volume Right	0	0	0	0	0	1021
cSH	1700	1700	1700	1700	143	481
Volume to Capacity	0.15	0.15	0.32	0.32	0.18	2.12
Queue Length 95th (m)	0.0	0.0	0.0	0.0	4.9	552.7
Control Delay (s)	0.0	0.0	0.0	0.0	35.7	530.7
Lane LOS					E	F
Approach Delay (s)	0.0		0.0		518.4	
Approach LOS					F	
<b>Intersection Summary</b>						
Average Delay			205.4			
Intersection Capacity Utilization			102.3%		ICU Level of Service	G
Analysis Period (min)			15			

Lanes, Volumes, Timings  
 10: Highway NB terminal & Walkley Road

Future BG 2030 AM - Adjacent Peak  
 10-24-2022



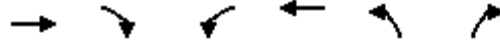
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Traffic Volume (vph)	57	458	0	650	445	8
Future Volume (vph)	57	458	0	650	445	8
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.867			0.998		
Flt Protected				0.953		
Satd. Flow (prot)	2939	0	0	3390	1697	0
Flt Permitted				0.953		
Satd. Flow (perm)	2939	0	0	3390	1697	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	322.4			108.3	295.7	
Travel Time (s)	14.5			8.1	22.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	61	492	0	699	478	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	553	0	0	699	487	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14		24	24		14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	52.2%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
 10: Highway NB terminal & Walkley Road

Future BG 2030 AM - Adjacent Peak  
 10-24-2022

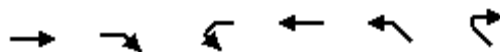


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (veh/h)	57	458	0	650	445	8
Future Volume (Veh/h)	57	458	0	650	445	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	61	492	0	699	478	9
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			553		656	276
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			553		656	276
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		0	99
cM capacity (veh/h)			1013		398	721
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	
Volume Total	41	512	350	350	487	
Volume Left	0	0	0	0	478	
Volume Right	0	492	0	0	9	
cSH	1700	1700	1700	1700	401	
Volume to Capacity	0.02	0.30	0.21	0.21	1.21	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	151.1	
Control Delay (s)	0.0	0.0	0.0	0.0	146.8	
Lane LOS						F
Approach Delay (s)	0.0		0.0		146.8	
Approach LOS						F
<b>Intersection Summary</b>						
Average Delay			41.1			
Intersection Capacity Utilization			52.2%	ICU Level of Service	A	
Analysis Period (min)			15			



Lanes, Volumes, Timings  
11: SB off ramp & Walkley Road

Future BG 2030 AM - Adjacent Peak  
10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑	↑		↑↑↑		
Traffic Volume (vph)	487	147	0	2050	0	0
Future Volume (vph)	487	147	0	2050	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		60.0	0.0		0.0	0.0
Storage Lanes		1	0		0	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3390	1517	0	4871	0	0
Flt Permitted						
Satd. Flow (perm)	3390	1517	0	4871	0	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	363.2			131.6	210.3	
Travel Time (s)	16.3			9.9	15.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	541	163	0	2278	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	541	163	0	2278	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

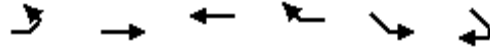
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	45.1%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings  
13: Walkley Road & NB off ramp

Future BG 2030 AM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑	↗		
Traffic Volume (vph)	0	65	650	231	0	0
Future Volume (vph)	0	65	650	231	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			70.0	0.0	0.0
Storage Lanes	0			1	0	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3390	1784	1517	0	0
Flt Permitted						
Satd. Flow (perm)	0	3390	1784	1517	0	0
Link Speed (k/h)		80	80		48	
Link Distance (m)		108.3	195.3		199.6	
Travel Time (s)		4.9	8.8		15.0	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	70	699	248	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	70	699	248	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Free	

















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.4%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

















Lanes, Volumes, Timings  
15: Sheffield Road & Humber Place

Future BG 2030 AM - Adjacent Peak  
10-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	0	77	4	1	3	164	442	3	3	230	17
Future Volume (vph)	22	0	77	4	1	3	164	442	3	3	230	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.894			0.949			0.999			0.991	
Flt Protected		0.989			0.976			0.987			0.999	
Satd. Flow (prot)	0	1289	0	0	1225	0	0	1582	0	0	1389	0
Flt Permitted		0.989			0.976			0.987			0.999	
Satd. Flow (perm)	0	1289	0	0	1225	0	0	1582	0	0	1389	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		152.4			148.3			830.1			120.3	
Travel Time (s)		11.4			11.1			62.3			9.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	35%	2%	22%	50%	2%	33%	12%	14%	0%	33%	30%	26%
Adj. Flow (vph)	24	0	86	4	1	3	182	491	3	3	256	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	110	0	0	8	0	0	676	0	0	278	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	65.0%						ICU Level of Service C					
Analysis Period (min)	15											










HCM Unsignalized Intersection Capacity Analysis  
 15: Sheffield Road & Humber Place

Future BG 2030 AM - Adjacent Peak  
 10-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	0	77	4	1	3	164	442	3	3	230	17
Future Volume (Veh/h)	22	0	77	4	1	3	164	442	3	3	230	17
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	24	0	86	4	1	3	182	491	3	3	256	19
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1132	1130	266	1214	1138	492	275			494		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1132	1130	266	1214	1138	492	275			494		
tC, single (s)	7.4	6.5	6.4	7.6	6.5	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.8	4.0	3.5	4.0	4.0	3.6	2.3			2.5		
p0 queue free %	82	100	88	96	99	99	85			100		
cM capacity (veh/h)	136	173	727	99	171	519	1233			927		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	110	8	676	278								
Volume Left	24	4	182	3								
Volume Right	86	3	3	19								
cSH	374	154	1233	927								
Volume to Capacity	0.29	0.05	0.15	0.00								
Queue Length 95th (m)	9.2	1.2	3.9	0.1								
Control Delay (s)	18.6	29.7	3.6	0.1								
Lane LOS	C	D	A	A								
Approach Delay (s)	18.6	29.7	3.6	0.1								
Approach LOS	C	D										
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization			65.0%		ICU Level of Service					C		
Analysis Period (min)			15									

Lanes, Volumes, Timings  
18: Sheffield Road & Way #5

Future BG 2030 AM - Adjacent Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	433	31	8	261
Future Volume (vph)	0	0	433	31	8	261
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.991					
Flt Protected	0.998					
Satd. Flow (prot)	1784	0	1768	0	0	922
Flt Permitted	0.998					
Satd. Flow (perm)	1784	0	1768	0	0	922
Link Speed (k/h)	48		48			48
Link Distance (m)	56.2		120.3			89.9
Travel Time (s)	4.2		9.0			6.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	100%
Adj. Flow (vph)	0	0	481	34	9	290
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	515	0	0	299
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	29.4%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 18: Sheffield Road & Way #5

Future BG 2030 AM - Adjacent Peak  
 10-24-2022












Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	433	31	8	261
Future Volume (Veh/h)	0	0	433	31	8	261
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	481	34	9	290
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	806	498			515	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	806	498			515	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	348	572			1051	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	515	299			
Volume Left	0	0	9			
Volume Right	0	34	0			
cSH	1700	1700	1051			
Volume to Capacity	0.00	0.30	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.0	0.0	0.3			
Lane LOS	A		A			
Approach Delay (s)	0.0	0.0	0.3			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization			29.4%	ICU Level of Service	A	
Analysis Period (min)			15			



Lanes, Volumes, Timings  
20: Sheffield Road & Way #4

Future BG 2030 AM - Adjacent Peak  
10-24-2022










						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	10	2	433	0	0	259
Future Volume (vph)	10	2	433	0	0	259
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.979					
Flt Protected	0.959					
Satd. Flow (prot)	1675	0	1784	0	0	1784
Flt Permitted	0.959					
Satd. Flow (perm)	1675	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	60.6		89.9			135.3
Travel Time (s)	4.5		6.7			10.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	11	2	481	0	0	288
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	0	481	0	0	288
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	34.1%			ICU Level of Service A		
Analysis Period (min)	15					



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	2	433	0	0	259
Future Volume (Veh/h)	10	2	433	0	0	259
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	2	481	0	0	288
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	769	481			481	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	769	481			481	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	100			100	
cM capacity (veh/h)	369	585			1082	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	13	481	288			
Volume Left	11	0	0			
Volume Right	2	0	0			
cSH	392	1700	1082			
Volume to Capacity	0.03	0.28	0.00			
Queue Length 95th (m)	0.8	0.0	0.0			
Control Delay (s)	14.5	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	14.5	0.0	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.2			
Intersection Capacity Utilization			34.1%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
24: Sheffield Road & Way #2

Future BG 2030 AM - Adjacent Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	427	9	2	259
Future Volume (vph)	0	0	427	9	2	259
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.997					
Flt Protected						
Satd. Flow (prot)	1784	0	1779	0	0	1784
Flt Permitted						
Satd. Flow (perm)	1784	0	1779	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	65.0		135.3			74.6
Travel Time (s)	4.9		10.1			5.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	474	10	2	288
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	484	0	0	290
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	27.6%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 24: Sheffield Road & Way #2

Future BG 2030 AM - Adjacent Peak  
 10-24-2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T	R		L
Traffic Volume (veh/h)	0	0	427	9	2	259
Future Volume (Veh/h)	0	0	427	9	2	259
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	474	10	2	288
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	771	479			484	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	771	479			484	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	368	587			1079	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	484	290			
Volume Left	0	0	2			
Volume Right	0	10	0			
cSH	1700	1700	1079			
Volume to Capacity	0.00	0.28	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.1			
Lane LOS	A		A			
Approach Delay (s)	0.0	0.0	0.1			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			27.6%	ICU Level of Service		A
Analysis Period (min)			15			



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	2	1	436	0	0	256
Future Volume (vph)	2	1	436	0	0	256
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.955					
Fl <sub>t</sub> Protected	0.968					
Satd. Flow (prot)	1649	0	1784	0	0	1784
Fl <sub>t</sub> Permitted	0.968					
Satd. Flow (perm)	1649	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	58.8		74.6			272.6
Travel Time (s)	4.4		5.6			20.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	1	484	0	0	284
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	0	484	0	0	284
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	34.2%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
26: Sheffield Road & Way #1

Future BG 2030 AM - Adjacent Peak  
10-24-2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	1	436	0	0	256
Future Volume (Veh/h)	2	1	436	0	0	256
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	1	484	0	0	284
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	768	484			484	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	768	484			484	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	370	583			1079	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	3	484	284			
Volume Left	2	0	0			
Volume Right	1	0	0			
cSH	421	1700	1079			
Volume to Capacity	0.01	0.28	0.00			
Queue Length 95th (m)	0.2	0.0	0.0			
Control Delay (s)	13.6	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	13.6	0.0	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization			34.2%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
3: Walkley Road & Lancaster Road

Future BG 2030 PM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	137	1908	1035	178	525	223
Future Volume (vph)	137	1908	1035	178	525	223
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.5			0.0	0.0	30.5
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1695	3293	3172	1419	3288	1502
Flt Permitted	0.169				0.950	
Satd. Flow (perm)	302	3293	3172	1419	3288	1502
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				196		139
Link Speed (k/h)		80	80		48	
Link Distance (m)		306.2	364.1		701.3	
Travel Time (s)		13.8	16.4		52.6	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	5%	9%	9%	2%	3%
Adj. Flow (vph)	151	2097	1137	196	577	245
Shared Lane Traffic (%)						
Lane Group Flow (vph)	151	2097	1137	196	577	245
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	22.0	102.0	80.0	80.0	28.0	28.0
Total Split (%)	16.9%	78.5%	61.5%	61.5%	21.5%	21.5%
Maximum Green (s)	19.0	97.0	75.0	75.0	23.0	23.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	99.0	97.0	75.0	75.0	23.0	23.0
Actuated g/C Ratio	0.76	0.75	0.58	0.58	0.18	0.18



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.35	0.85	0.62	0.22	0.99	0.64
Control Delay	6.3	16.2	18.9	3.8	89.0	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.3	16.2	18.9	3.8	89.0	29.7
LOS	A	B	B	A	F	C
Approach Delay		15.5	16.6		71.3	
Approach LOS		B	B		E	
Queue Length 50th (m)	8.8	173.4	110.8	10.9	76.9	24.9
Queue Length 95th (m)	14.1	211.5	134.2	m17.5	#114.1	53.8
Internal Link Dist (m)		282.2	340.1		677.3	
Turn Bay Length (m)	30.5					30.5
Base Capacity (vph)	433	2457	1830	901	581	380
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	0.35	0.85	0.62	0.22	0.99	0.64

Intersection Summary

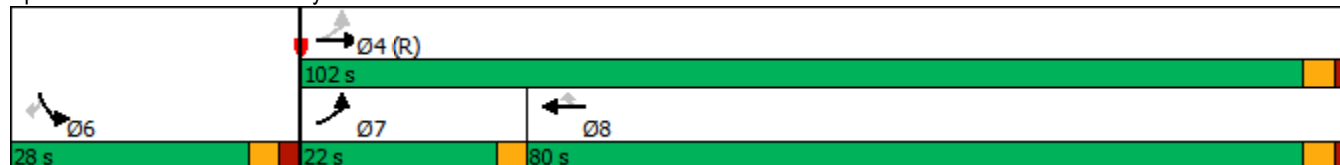
Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 50 (38%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.99  
 Intersection Signal Delay: 26.3  
 Intersection LOS: C  
 Intersection Capacity Utilization 79.8%  
 ICU Level of Service D  
 Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

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

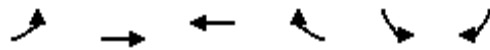
Splits and Phases: 3: Walkley Road & Lancaster Road





HCM Signalized Intersection Capacity Analysis  
3: Walkley Road & Lancaster Road

Future BG 2030 PM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	137	1908	1035	178	525	223
Future Volume (vph)	137	1908	1035	178	525	223
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1695	3293	3172	1419	3288	1502
Flt Permitted	0.17	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	301	3293	3172	1419	3288	1502
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	151	2097	1137	196	577	245
RTOR Reduction (vph)	0	0	0	83	0	114
Lane Group Flow (vph)	151	2097	1137	113	577	131
Heavy Vehicles (%)	2%	5%	9%	9%	2%	3%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	97.0	97.0	75.0	75.0	23.0	23.0
Effective Green, g (s)	97.0	97.0	75.0	75.0	23.0	23.0
Actuated g/C Ratio	0.75	0.75	0.58	0.58	0.18	0.18
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	428	2457	1830	818	581	265
v/s Ratio Prot	0.05	c0.64	0.36		c0.18	
v/s Ratio Perm	0.21			0.08		0.09
v/c Ratio	0.35	0.85	0.62	0.14	0.99	0.49
Uniform Delay, d1	8.3	11.5	18.1	12.6	53.4	48.2
Progression Factor	1.00	1.00	0.95	1.99	1.00	1.00
Incremental Delay, d2	2.3	4.0	1.4	0.3	35.7	6.4
Delay (s)	10.6	15.6	18.6	25.4	89.1	54.7
Level of Service	B	B	B	C	F	D
Approach Delay (s)		15.2	19.6		78.8	
Approach LOS		B	B		E	

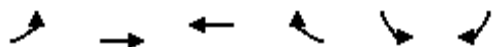
Intersection Summary

HCM 2000 Control Delay	28.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Walkley Road & Sheffield Road

Future BG 2030 PM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	232	2098	771	101	336	423
Future Volume (vph)	232	2098	771	101	336	423
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.5			50.0	0.0	30.5
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1383	3390	3172	1146	3164	1381
Flt Permitted	0.293				0.950	
Satd. Flow (perm)	427	3390	3172	1146	3164	1381
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				103		369
Link Speed (k/h)		80	80		48	
Link Distance (m)		364.1	339.6		830.6	
Travel Time (s)		16.4	15.3		62.3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.97
Heavy Vehicles (%)	25%	2%	9%	35%	6%	12%
Adj. Flow (vph)	237	2141	787	103	343	436
Shared Lane Traffic (%)						
Lane Group Flow (vph)	237	2141	787	103	343	436
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.0	23.0	23.0	23.0	23.0
Total Split (s)	22.0	104.0	82.0	82.0	26.0	26.0
Total Split (%)	16.9%	80.0%	63.1%	63.1%	20.0%	20.0%
Maximum Green (s)	19.0	99.0	77.0	77.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	101.0	99.0	77.0	77.0	21.0	21.0
Actuated g/C Ratio	0.78	0.76	0.59	0.59	0.16	0.16



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.50	0.83	0.42	0.14	0.67	0.82
Control Delay	5.7	10.3	15.2	2.5	58.5	23.2
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	5.7	10.4	15.2	2.5	58.5	23.2
LOS	A	B	B	A	E	C
Approach Delay		10.0	13.8		38.8	
Approach LOS		A	B		D	
Queue Length 50th (m)	13.1	108.9	54.6	0.0	43.1	15.3
Queue Length 95th (m)	m17.8	m199.2	68.3	7.3	59.2	#69.0
Internal Link Dist (m)		340.1	315.6		806.6	
Turn Bay Length (m)	30.5			50.0		30.5
Base Capacity (vph)	471	2581	1878	720	511	532
Starvation Cap Reductn	0	32	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	0.50	0.84	0.42	0.14	0.67	0.82

Intersection Summary

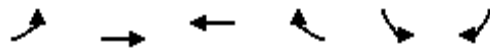
Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 13 (10%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.83  
 Intersection Signal Delay: 16.3  
 Intersection LOS: B  
 Intersection Capacity Utilization 79.7%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Walkley Road & Sheffield Road



HCM Signalized Intersection Capacity Analysis  
6: Walkley Road & Sheffield Road

Future BG 2030 PM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	232	2098	771	101	336	423
Future Volume (vph)	232	2098	771	101	336	423
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1383	3390	3172	1146	3164	1381
Flt Permitted	0.29	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	426	3390	3172	1146	3164	1381
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.97
Adj. Flow (vph)	237	2141	787	103	343	436
RTOR Reduction (vph)	0	0	0	42	0	309
Lane Group Flow (vph)	237	2141	787	61	343	127
Heavy Vehicles (%)	25%	2%	9%	35%	6%	12%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	99.0	99.0	77.0	77.0	21.0	21.0
Effective Green, g (s)	99.0	99.0	77.0	77.0	21.0	21.0
Actuated g/C Ratio	0.76	0.76	0.59	0.59	0.16	0.16
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	464	2581	1878	678	511	223
v/s Ratio Prot	0.07	c0.63	0.25		c0.11	
v/s Ratio Perm	0.31			0.05		0.09
v/c Ratio	0.51	0.83	0.42	0.09	0.67	0.57
Uniform Delay, d1	5.8	10.0	14.4	11.4	51.3	50.3
Progression Factor	1.01	0.84	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	1.5	0.7	0.3	6.9	10.1
Delay (s)	7.7	9.9	15.1	11.7	58.1	60.4
Level of Service	A	A	B	B	E	E
Approach Delay (s)		9.7	14.7		59.4	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
7: Walkley Road & Highway SB terminal

Future BG 2030 PM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↓	↓
Traffic Volume (vph)	0	1648	195	0	187	665
Future Volume (vph)	0	1648	195	0	187	665
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Fr <sub>t</sub>						0.850
Fl <sub>t</sub> Protected					0.950	
Satd. Flow (prot)	0	3390	3390	0	1695	1517
Fl <sub>t</sub> Permitted					0.950	
Satd. Flow (perm)	0	3390	3390	0	1695	1517
Link Speed (k/h)		80	80		80	
Link Distance (m)		118.5	305.1		468.0	
Travel Time (s)		5.3	13.7		21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1735	205	0	197	700
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1735	205	0	197	700
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	65.7%
Analysis Period (min)	15
	ICU Level of Service C

HCM Unsignalized Intersection Capacity Analysis  
7: Walkley Road & Highway SB terminal

Future BG 2030 PM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↓	↓
Traffic Volume (veh/h)	0	1648	195	0	187	665
Future Volume (Veh/h)	0	1648	195	0	187	665
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1735	205	0	197	700
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	205			1072	102	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	205			1072	102	
tC, single (s)	4.1			6.8	6.9	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	100			8	25	
cM capacity (veh/h)	1364			215	933	
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>	<b>SB 2</b>
Volume Total	868	868	102	102	197	700
Volume Left	0	0	0	0	197	0
Volume Right	0	0	0	0	0	700
cSH	1700	1700	1700	1700	215	933
Volume to Capacity	0.51	0.51	0.06	0.06	0.92	0.75
Queue Length 95th (m)	0.0	0.0	0.0	0.0	57.3	54.9
Control Delay (s)	0.0	0.0	0.0	0.0	87.9	19.5
Lane LOS					F	C
Approach Delay (s)	0.0	0.0		34.5		
Approach LOS					D	
<b>Intersection Summary</b>						
Average Delay			10.9			
Intersection Capacity Utilization			65.7%		ICU Level of Service	
Analysis Period (min)			15			
				C		

Lanes, Volumes, Timings  
 10: Highway NB terminal & Walkley Road

Future BG 2030 PM - Adjacent Peak  
 10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Traffic Volume (vph)	650	1189	0	71	144	35
Future Volume (vph)	650	1189	0	71	144	35
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.903			0.974		
Flt Protected				0.961		
Satd. Flow (prot)	3061	0	0	3390	1670	0
Flt Permitted				0.961		
Satd. Flow (perm)	3061	0	0	3390	1670	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	305.1			95.4	443.2	
Travel Time (s)	13.7			7.2	33.2	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	714	1307	0	78	158	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2021	0	0	78	196	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14		24	24		14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	76.8% ICU Level of Service D
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
 10: Highway NB terminal & Walkley Road

Future BG 2030 PM - Adjacent Peak  
 10-24-2022

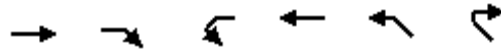


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (veh/h)	650	1189	0	71	144	35
Future Volume (Veh/h)	650	1189	0	71	144	35
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	714	1307	0	78	158	38
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			2021		1406	1010
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2021		1406	1010
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		0	84
cM capacity (veh/h)			278		130	238
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	
Volume Total	476	1545	39	39	196	
Volume Left	0	0	0	0	158	
Volume Right	0	1307	0	0	38	
cSH	1700	1700	1700	1700	143	
Volume to Capacity	0.28	0.91	0.02	0.02	1.37	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	95.3	
Control Delay (s)	0.0	0.0	0.0	0.0	265.4	
Lane LOS					F	
Approach Delay (s)	0.0		0.0		265.4	
Approach LOS					F	
<b>Intersection Summary</b>						
Average Delay			22.7			
Intersection Capacity Utilization			76.8%	ICU Level of Service	D	
Analysis Period (min)			15			



Lanes, Volumes, Timings  
11: SB off ramp & Walkley Road

Future BG 2030 PM - Adjacent Peak  
10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑	↑		↑↑↑		
Traffic Volume (vph)	1648	572	0	860	0	0
Future Volume (vph)	1648	572	0	860	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		50.0	0.0		0.0	0.0
Storage Lanes		1	0		0	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3390	1517	0	4871	0	0
Flt Permitted						
Satd. Flow (perm)	3390	1517	0	4871	0	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	339.6			118.5	265.8	
Travel Time (s)	15.3			8.9	19.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1735	602	0	905	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1735	602	0	905	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

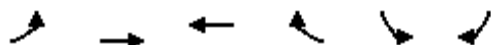
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.4%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings  
13: Walkley Road & NB off ramp

Future BG 2030 PM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑	↗		
Traffic Volume (vph)	0	685	71	66	0	0
Future Volume (vph)	0	685	71	66	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			50.0	0.0	0.0
Storage Lanes	0			1	0	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3390	1784	1517	0	0
Flt Permitted						
Satd. Flow (perm)	0	3390	1784	1517	0	0
Link Speed (k/h)		80	48		48	
Link Distance (m)		95.4	197.1		264.7	
Travel Time (s)		4.3	14.8		19.9	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	753	78	73	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	753	78	73	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Free	

















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.3%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

















Lanes, Volumes, Timings  
15: Sheffield Road & Humber Place

Future BG 2030 PM - Adjacent Peak  
10-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	0	150	3	0	0	63	325	2	2	586	21
Future Volume (vph)	16	0	150	3	0	0	63	325	2	2	586	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>		0.878						0.999			0.995	
Fl <sub>t</sub> Protected		0.995			0.950			0.992				
Satd. Flow (prot)	0	1452	0	0	1300	0	0	1375	0	0	1661	0
Fl <sub>t</sub> Permitted		0.995			0.950			0.992				
Satd. Flow (perm)	0	1452	0	0	1300	0	0	1375	0	0	1661	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		152.4			148.3			830.6			80.7	
Travel Time (s)		11.4			11.1			62.3			6.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	14%	2%	9%	33%	2%	2%	21%	33%	50%	0%	9%	10%
Adj. Flow (vph)	18	0	167	3	0	0	70	361	2	2	651	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	185	0	0	3	0	0	433	0	0	676	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	76.1%						ICU Level of Service D					
Analysis Period (min)	15											










HCM Unsignalized Intersection Capacity Analysis  
 15: Sheffield Road & Humber Place

Future BG 2030 PM - Adjacent Peak  
 10-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	0	150	3	0	0	63	325	2	2	586	21
Future Volume (Veh/h)	16	0	150	3	0	0	63	325	2	2	586	21
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	18	0	167	3	0	0	70	361	2	2	651	23
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1168	1170	662	1336	1180	362	674			363		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1168	1170	662	1336	1180	362	674			363		
tC, single (s)	7.2	6.5	6.3	7.4	6.5	6.2	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.4	3.8	4.0	3.3	2.4			2.2		
p0 queue free %	88	100	63	95	100	100	92			100		
cM capacity (veh/h)	151	176	449	66	174	683	834			1207		
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	185	3	433	676								
Volume Left	18	3	70	2								
Volume Right	167	0	2	23								
cSH	377	66	834	1207								
Volume to Capacity	0.49	0.05	0.08	0.00								
Queue Length 95th (m)	19.8	1.1	2.1	0.0								
Control Delay (s)	23.4	62.2	2.4	0.0								
Lane LOS	C	F	A	A								
Approach Delay (s)	23.4	62.2	2.4	0.0								
Approach LOS	C	F										
Intersection Summary												
Average Delay			4.3									
Intersection Capacity Utilization			76.1%	ICU Level of Service						D		
Analysis Period (min)			15									

Lanes, Volumes, Timings  
18: Sheffield Road & Way #5

Future BG 2030 PM - Adjacent Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	307	10	2	595
Future Volume (vph)	0	0	307	10	2	595
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.996					
Flt Protected						
Satd. Flow (prot)	1784	0	1777	0	0	1071
Flt Permitted						
Satd. Flow (perm)	1784	0	1777	0	0	1071
Link Speed (k/h)	48		48			48
Link Distance (m)	56.2		80.7			63.2
Travel Time (s)	4.2		6.1			4.7
Peak Hour Factor	0.90	0.90	0.92	0.90	0.90	0.90
Bus Blockages (#/hr)	0	0	0	0	0	100
Adj. Flow (vph)	0	0	334	11	2	661
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	345	0	0	663
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.96
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	38.1%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 18: Sheffield Road & Way #5

Future BG 2030 PM - Adjacent Peak  
 10-24-2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	307	10	2	595
Future Volume (Veh/h)	0	0	307	10	2	595
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.92	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	334	11	2	661
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1004	340			345	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1004	340			345	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	267	703			1214	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	345	663			
Volume Left	0	0	2			
Volume Right	0	11	0			
cSH	1700	1700	1214			
Volume to Capacity	0.00	0.20	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A		A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			38.1%	ICU Level of Service		A
Analysis Period (min)			15			





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	39	9	307	0	0	556
Future Volume (vph)	39	9	307	0	0	556
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.975					
Fl <sub>t</sub> Protected	0.961					
Satd. Flow (prot)	1672	0	1784	0	0	1784
Fl <sub>t</sub> Permitted	0.961					
Satd. Flow (perm)	1672	0	1784	0	0	1784
Link Speed (k/h)	48		48		48	
Link Distance (m)	60.6		63.2		102.2	
Travel Time (s)	4.5		4.7		7.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	43	10	341	0	0	618
Shared Lane Traffic (%)						
Lane Group Flow (vph)	53	0	341	0	0	618
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.9		4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free		Free	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	40.9%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
 20: Sheffield Road & Way #4

Future BG 2030 PM - Adjacent Peak  
 10-24-2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	39	9	307	0	0	556
Future Volume (Veh/h)	39	9	307	0	0	556
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	43	10	341	0	0	618
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	959	341			341	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	959	341			341	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	99			100	
cM capacity (veh/h)	285	701			1218	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	53	341	618			
Volume Left	43	0	0			
Volume Right	10	0	0			
cSH	321	1700	1218			
Volume to Capacity	0.17	0.20	0.00			
Queue Length 95th (m)	4.4	0.0	0.0			
Control Delay (s)	18.4	0.0	0.0			
Lane LOS	C					
Approach Delay (s)	18.4	0.0	0.0			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay			1.0			
Intersection Capacity Utilization			40.9%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
24: Sheffield Road & Way #2

Future BG 2030 PM - Adjacent Peak  
10-24-2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	312	3	1	556
Future Volume (vph)	0	0	312	3	1	556
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.999					
Fl <sub>t</sub> Protected						
Satd. Flow (prot)	1784	0	1783	0	0	1784
Fl <sub>t</sub> Permitted						
Satd. Flow (perm)	1784	0	1783	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	65.0		102.2			76.9
Travel Time (s)	4.9		7.7			5.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	347	3	1	618
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	350	0	0	619
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	35.1%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
 24: Sheffield Road & Way #2

Future BG 2030 PM - Adjacent Peak  
 10-24-2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	312	3	1	556
Future Volume (Veh/h)	0	0	312	3	1	556
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	347	3	1	618
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	968	348			350	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	968	348			350	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	281	695			1209	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	350	619			
Volume Left	0	0	1			
Volume Right	0	3	0			
cSH	1700	1700	1209			
Volume to Capacity	0.00	0.21	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A		A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			35.1%	ICU Level of Service	A	
Analysis Period (min)			15			



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	6	2	316	0	0	550
Future Volume (vph)	6	2	316	0	0	550
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.970					
Flt Protected	0.963					
Satd. Flow (prot)	1667	0	1784	0	0	1784
Flt Permitted	0.963					
Satd. Flow (perm)	1667	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	58.8		76.9			181.8
Travel Time (s)	4.4		5.8			13.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	2	351	0	0	611
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	0	351	0	0	611
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	40.6%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
26: Sheffield Road & Way #1

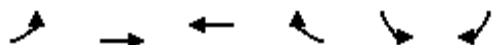
Future BG 2030 PM - Adjacent Peak  
10-24-2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	6	2	316	0	0	550
Future Volume (Veh/h)	6	2	316	0	0	550
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	2	351	0	0	611
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	962	351			351	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	962	351			351	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	284	692			1208	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	9	351	611			
Volume Left	7	0	0			
Volume Right	2	0	0			
cSH	327	1700	1208			
Volume to Capacity	0.03	0.21	0.00			
Queue Length 95th (m)	0.6	0.0	0.0			
Control Delay (s)	16.3	0.0	0.0			
Lane LOS	C					
Approach Delay (s)	16.3	0.0	0.0			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay			0.2			
Intersection Capacity Utilization			40.6%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
3: Walkley Road & Lancaster Road

Future BG 2030 AM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	215	775	1494	678	98	178
Future Volume (vph)	215	775	1494	678	98	178
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0			0.0	0.0	70.0
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1647	3007	3232	1517	3135	1406
Flt Permitted	0.089				0.950	
Satd. Flow (perm)	154	3007	3232	1517	3135	1406
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				599		184
Link Speed (k/h)		80	80		48	
Link Distance (m)		248.5	361.1		367.8	
Travel Time (s)		11.2	16.2		27.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	15%	7%	2%	7%	10%
Adj. Flow (vph)	222	799	1540	699	101	184
Shared Lane Traffic (%)						
Lane Group Flow (vph)	222	799	1540	699	101	184
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	24.0	122.0	98.0	98.0	28.0	28.0
Total Split (%)	16.0%	81.3%	65.3%	65.3%	18.7%	18.7%
Maximum Green (s)	21.0	117.0	93.0	93.0	23.0	23.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	119.0	117.0	93.0	93.0	23.0	23.0
Actuated g/C Ratio	0.79	0.78	0.62	0.62	0.15	0.15



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.67	0.34	0.77	0.60	0.21	0.50
Control Delay	33.6	5.4	12.2	2.5	56.9	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.6	5.4	12.2	2.5	56.9	12.1
LOS	C	A	B	A	E	B
Approach Delay		11.5	9.2		28.0	
Approach LOS		B	A		C	
Queue Length 50th (m)	29.8	32.7	61.5	20.4	13.7	0.0
Queue Length 95th (m)	59.2	40.1	m67.6	m21.0	22.7	22.3
Internal Link Dist (m)		224.5	337.1		343.8	
Turn Bay Length (m)	100.0					70.0
Base Capacity (vph)	331	2345	2003	1168	480	371
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	0.67	0.34	0.77	0.60	0.21	0.50

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 50 (33%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 11.4  
 Intersection LOS: B  
 Intersection Capacity Utilization 72.0%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Walkley Road & Lancaster Road

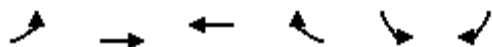




# HCM Signalized Intersection Capacity Analysis

## 3: Walkley Road & Lancaster Road

Future BG 2030 AM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	215	775	1494	678	98	178
Future Volume (vph)	215	775	1494	678	98	178
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1647	3007	3232	1517	3135	1406
Flt Permitted	0.09	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	154	3007	3232	1517	3135	1406
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	222	799	1540	699	101	184
RTOR Reduction (vph)	0	0	0	228	0	156
Lane Group Flow (vph)	222	799	1540	471	101	28
Heavy Vehicles (%)	5%	15%	7%	2%	7%	10%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	117.0	117.0	93.0	93.0	23.0	23.0
Effective Green, g (s)	117.0	117.0	93.0	93.0	23.0	23.0
Actuated g/C Ratio	0.78	0.78	0.62	0.62	0.15	0.15
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	329	2345	2003	940	480	215
v/s Ratio Prot	c0.09	0.27	c0.48		c0.03	
v/s Ratio Perm	0.43			0.31		0.02
v/c Ratio	0.67	0.34	0.77	0.50	0.21	0.13
Uniform Delay, d1	31.4	4.9	20.7	15.7	55.6	54.9
Progression Factor	1.00	1.00	0.53	0.78	1.00	1.00
Incremental Delay, d2	10.6	0.4	1.0	0.7	1.0	1.3
Delay (s)	42.0	5.3	12.0	12.8	56.6	56.1
Level of Service	D	A	B	B	E	E
Approach Delay (s)		13.3	12.3		56.3	
Approach LOS		B	B		E	

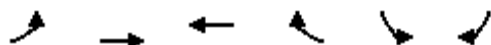
### Intersection Summary

HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Walkley Road & Sheffield Road

Future BG 2030 AM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	299	477	1903	282	55	250
Future Volume (vph)	299	477	1903	282	55	250
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0			30.0	0.0	70.0
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1491	3060	3357	1459	2396	1190
Flt Permitted	0.044				0.950	
Satd. Flow (perm)	69	3060	3357	1459	2396	1190
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				80		255
Link Speed (k/h)		80	80		48	
Link Distance (m)		361.1	363.2		830.1	
Travel Time (s)		16.2	16.3		62.3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	16%	13%	3%	6%	40%	30%
Adj. Flow (vph)	305	487	1942	288	56	255
Shared Lane Traffic (%)						
Lane Group Flow (vph)	305	487	1942	288	56	255
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	32.0	124.0	92.0	92.0	26.0	26.0
Total Split (%)	21.3%	82.7%	61.3%	61.3%	17.3%	17.3%
Maximum Green (s)	29.0	119.0	87.0	87.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	121.0	119.0	87.0	87.0	21.0	21.0
Actuated g/C Ratio	0.81	0.79	0.58	0.58	0.14	0.14

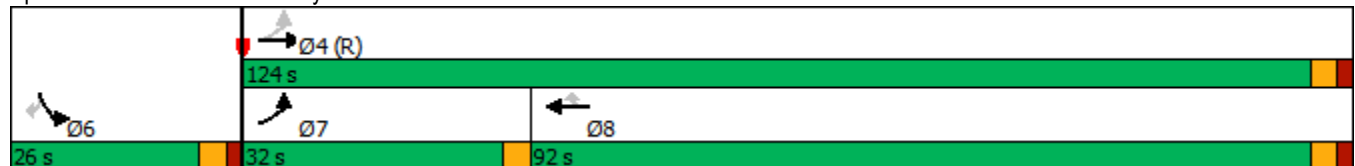


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.92	0.20	1.00	0.33	0.17	0.66
Control Delay	73.2	3.6	51.0	12.5	58.3	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.2	3.6	51.0	12.5	58.3	15.4
LOS	E	A	D	B	E	B
Approach Delay		30.4	46.0		23.1	
Approach LOS		C	D		C	
Queue Length 50th (m)	57.1	15.2	291.8	30.0	7.6	0.0
Queue Length 95th (m)	#127.2	18.7	#354.8	48.1	14.5	28.9
Internal Link Dist (m)		337.1	339.2		806.1	
Turn Bay Length (m)	100.0			30.0		70.0
Base Capacity (vph)	330	2427	1947	879	335	385
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	0.92	0.20	1.00	0.33	0.17	0.66

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 50 (33%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 130  
 Control Type: Pretimed  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 40.2  
 Intersection LOS: D  
 Intersection Capacity Utilization 88.8%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 6: Walkley Road & Sheffield Road



HCM Signalized Intersection Capacity Analysis  
6: Walkley Road & Sheffield Road

Future BG 2030 AM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	299	477	1903	282	55	250
Future Volume (vph)	299	477	1903	282	55	250
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1491	3060	3357	1459	2396	1190
Flt Permitted	0.04	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	70	3060	3357	1459	2396	1190
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	305	487	1942	288	56	255
RTOR Reduction (vph)	0	0	0	34	0	219
Lane Group Flow (vph)	305	487	1942	254	56	36
Heavy Vehicles (%)	16%	13%	3%	6%	40%	30%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	119.0	119.0	87.0	87.0	21.0	21.0
Effective Green, g (s)	119.0	119.0	87.0	87.0	21.0	21.0
Actuated g/C Ratio	0.79	0.79	0.58	0.58	0.14	0.14
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	330	2427	1947	846	335	166
v/s Ratio Prot	c0.18	0.16	c0.58		0.02	
v/s Ratio Perm	0.56			0.17		c0.03
v/c Ratio	0.92	0.20	1.00	0.30	0.17	0.22
Uniform Delay, d1	52.6	3.8	31.4	16.0	56.8	57.2
Progression Factor	0.85	0.89	1.00	1.00	1.00	1.00
Incremental Delay, d2	32.7	0.2	19.8	0.9	1.1	2.9
Delay (s)	77.6	3.6	51.2	16.9	57.9	60.1
Level of Service	E	A	D	B	E	E
Approach Delay (s)		32.1	46.8		59.7	
Approach LOS		C	D		E	

Intersection Summary

HCM 2000 Control Delay	44.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
7: Walkley Road & Highway SB terminal

Future BG 2030 AM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (vph)	0	472	1028	0	24	960
Future Volume (vph)	0	472	1028	0	24	960
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Flt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3390	3390	0	1695	1517
Flt Permitted					0.950	
Satd. Flow (perm)	0	3390	3390	0	1695	1517
Link Speed (k/h)		80	80		80	
Link Distance (m)		131.6	322.4		492.9	
Travel Time (s)		5.9	14.5		22.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	487	1060	0	25	990
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	487	1060	0	25	990
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	99.4% ICU Level of Service F
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
7: Walkley Road & Highway SB terminal

Future BG 2030 AM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (veh/h)	0	472	1028	0	24	960
Future Volume (Veh/h)	0	472	1028	0	24	960
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	487	1060	0	25	990
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1060				1304	530
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1060				1304	530
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				84	0
cM capacity (veh/h)	653				152	493
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>	<b>SB 2</b>
Volume Total	244	244	530	530	25	990
Volume Left	0	0	0	0	25	0
Volume Right	0	0	0	0	0	990
cSH	1700	1700	1700	1700	152	493
Volume to Capacity	0.14	0.14	0.31	0.31	0.16	2.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	4.3	513.5
Control Delay (s)	0.0	0.0	0.0	0.0	33.3	479.2
Lane LOS					D	F
Approach Delay (s)	0.0		0.0		468.2	
Approach LOS					F	
<b>Intersection Summary</b>						
Average Delay			185.5			
Intersection Capacity Utilization			99.4%		ICU Level of Service	F
Analysis Period (min)			15			

Lanes, Volumes, Timings  
 10: Highway NB terminal & Walkley Road

Future BG 2030 AM - Site Peak  
 10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (vph)	55	444	0	631	432	8
Future Volume (vph)	55	444	0	631	432	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.867			0.997		
Flt Protected				0.953		
Satd. Flow (prot)	2939	0	0	3390	1695	0
Flt Permitted				0.953		
Satd. Flow (perm)	2939	0	0	3390	1695	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	322.4			108.3	295.7	
Travel Time (s)	14.5			8.1	22.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	59	477	0	678	465	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	536	0	0	678	474	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14		24	24		14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.9%
ICU Level of Service	A
Analysis Period (min)	15

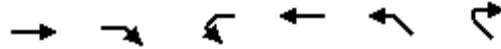
HCM Unsignalized Intersection Capacity Analysis  
 10: Highway NB terminal & Walkley Road

Future BG 2030 AM - Site Peak  
 10-24-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (veh/h)	55	444	0	631	432	8
Future Volume (Veh/h)	55	444	0	631	432	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	59	477	0	678	465	9
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			536		636	268
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			536		636	268
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		0	99
cM capacity (veh/h)			1028		410	730
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	
Volume Total	39	497	339	339	474	
Volume Left	0	0	0	0	465	
Volume Right	0	477	0	0	9	
cSH	1700	1700	1700	1700	413	
Volume to Capacity	0.02	0.29	0.20	0.20	1.15	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	134.1	
Control Delay (s)	0.0	0.0	0.0	0.0	121.4	
Lane LOS					F	
Approach Delay (s)	0.0		0.0		121.4	
Approach LOS					F	
<b>Intersection Summary</b>						
Average Delay			34.1			
Intersection Capacity Utilization			50.9%	ICU Level of Service	A	
Analysis Period (min)			15			



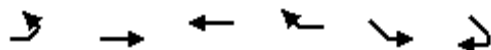


Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑	↑		↑↑↑		
Traffic Volume (vph)	472	143	0	1988	0	0
Future Volume (vph)	472	143	0	1988	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		60.0	0.0		0.0	0.0
Storage Lanes		1	0		0	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3390	1517	0	4871	0	0
Flt Permitted						
Satd. Flow (perm)	3390	1517	0	4871	0	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	363.2			131.6	210.3	
Travel Time (s)	16.3			9.9	15.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	524	159	0	2209	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	524	159	0	2209	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	43.9%
	ICU Level of Service A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑	↗		
Traffic Volume (vph)	0	63	631	224	0	0
Future Volume (vph)	0	63	631	224	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			70.0	0.0	0.0
Storage Lanes	0			1	0	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3390	1784	1517	0	0
Flt Permitted						
Satd. Flow (perm)	0	3390	1784	1517	0	0
Link Speed (k/h)		80	80		48	
Link Distance (m)		108.3	195.3		199.6	
Travel Time (s)		4.9	8.8		15.0	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	68	678	241	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	68	678	241	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Free	

















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	38.4%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

















Lanes, Volumes, Timings  
15: Sheffield Road & Humber Place










Future BG 2030 AM - Site Peak  
10-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	0	75	4	1	3	159	429	3	3	223	16
Future Volume (vph)	21	0	75	4	1	3	159	429	3	3	223	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>		0.894			0.949			0.999			0.991	
Fl <sub>t</sub> Protected		0.989			0.976			0.987			0.999	
Satd. Flow (prot)	0	1289	0	0	1225	0	0	1583	0	0	1389	0
Fl <sub>t</sub> Permitted		0.989			0.976			0.987			0.999	
Satd. Flow (perm)	0	1289	0	0	1225	0	0	1583	0	0	1389	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		152.4			148.3			830.1			120.3	
Travel Time (s)		11.4			11.1			62.3			9.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	35%	2%	22%	50%	2%	33%	12%	14%	0%	33%	30%	26%
Adj. Flow (vph)	23	0	83	4	1	3	177	477	3	3	248	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	106	0	0	8	0	0	657	0	0	269	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	63.3%						ICU Level of Service B					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis  
 15: Sheffield Road & Humber Place










Future BG 2030 AM - Site Peak  
 10-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	0	75	4	1	3	159	429	3	3	223	16
Future Volume (Veh/h)	21	0	75	4	1	3	159	429	3	3	223	16
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	23	0	83	4	1	3	177	477	3	3	248	18
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1099	1097	257	1178	1104	478	266			480		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1099	1097	257	1178	1104	478	266			480		
tC, single (s)	7.4	6.5	6.4	7.6	6.5	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.8	4.0	3.5	4.0	4.0	3.6	2.3			2.5		
p0 queue free %	84	100	89	96	99	99	86			100		
cM capacity (veh/h)	145	182	735	106	180	529	1242			939		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	106	8	657	269								
Volume Left	23	4	177	3								
Volume Right	83	3	3	18								
cSH	390	164	1242	939								
Volume to Capacity	0.27	0.05	0.14	0.00								
Queue Length 95th (m)	8.3	1.2	3.8	0.1								
Control Delay (s)	17.6	28.1	3.5	0.1								
Lane LOS	C	D	A	A								
Approach Delay (s)	17.6	28.1	3.5	0.1								
Approach LOS	C	D										
Intersection Summary												
Average Delay			4.2									
Intersection Capacity Utilization			63.3%		ICU Level of Service					B		
Analysis Period (min)			15									










						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	420	30	8	253
Future Volume (vph)	0	0	420	30	8	253
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.991					
Flt Protected	0.998					
Satd. Flow (prot)	1784	0	1768	0	0	922
Flt Permitted	0.998					
Satd. Flow (perm)	1784	0	1768	0	0	922
Link Speed (k/h)	48		48			48
Link Distance (m)	56.2		120.3			89.9
Travel Time (s)	4.2		9.0			6.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	100%
Adj. Flow (vph)	0	0	467	33	9	281
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	500	0	0	290
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	28.6%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 18: Sheffield Road & Way #5

Future BG 2030 AM - Site Peak  
 10-24-2022










						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	420	30	8	253
Future Volume (Veh/h)	0	0	420	30	8	253
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	467	33	9	281
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	782	484			500	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	782	484			500	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	360	583			1064	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	500	290			
Volume Left	0	0	9			
Volume Right	0	33	0			
cSH	1700	1700	1064			
Volume to Capacity	0.00	0.29	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.0	0.0	0.3			
Lane LOS	A		A			
Approach Delay (s)	0.0	0.0	0.3			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization			28.6%	ICU Level of Service	A	
Analysis Period (min)			15			



						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	10	2	420	0	0	251
Future Volume (vph)	10	2	420	0	0	251
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.979					
Flt Protected	0.959					
Satd. Flow (prot)	1675	0	1784	0	0	1784
Flt Permitted	0.959					
Satd. Flow (perm)	1675	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	60.6		89.9			135.3
Travel Time (s)	4.5		6.7			10.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	11	2	467	0	0	279
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	0	467	0	0	279
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	33.3%		ICU Level of Service A			
Analysis Period (min)	15					










HCM Unsignalized Intersection Capacity Analysis  
20: Sheffield Road & Way #4

Future BG 2030 AM - Site Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	2	420	0	0	251
Future Volume (Veh/h)	10	2	420	0	0	251
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	2	467	0	0	279
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	746	467			467	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	746	467			467	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	100			100	
cM capacity (veh/h)	381	596			1094	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	13	467	279			
Volume Left	11	0	0			
Volume Right	2	0	0			
cSH	403	1700	1094			
Volume to Capacity	0.03	0.27	0.00			
Queue Length 95th (m)	0.8	0.0	0.0			
Control Delay (s)	14.2	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	14.2	0.0	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.2			
Intersection Capacity Utilization			33.3%		ICU Level of Service	A
Analysis Period (min)			15			










Lanes, Volumes, Timings  
24: Sheffield Road & Way #2

Future BG 2030 AM - Site Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	414	9	2	251
Future Volume (vph)	0	0	414	9	2	251
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.997					
Flt Protected						
Satd. Flow (prot)	1784	0	1779	0	0	1784
Flt Permitted						
Satd. Flow (perm)	1784	0	1779	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	65.0		135.3			74.6
Travel Time (s)	4.9		10.1			5.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	460	10	2	279
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	470	0	0	281
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	26.9%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
24: Sheffield Road & Way #2

Future BG 2030 AM - Site Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	414	9	2	251
Future Volume (Veh/h)	0	0	414	9	2	251
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	460	10	2	279
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	748	465			470	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	748	465			470	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	379	597			1092	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	470	281			
Volume Left	0	0	2			
Volume Right	0	10	0			
cSH	1700	1700	1092			
Volume to Capacity	0.00	0.28	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.1			
Lane LOS	A		A			
Approach Delay (s)	0.0	0.0	0.1			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			26.9%	ICU Level of Service	A	
Analysis Period (min)			15			



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	2	1	423	0	0	248
Future Volume (vph)	2	1	423	0	0	248
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.955					
Fl <sub>t</sub> Protected	0.968					
Satd. Flow (prot)	1649	0	1784	0	0	1784
Fl <sub>t</sub> Permitted	0.968					
Satd. Flow (perm)	1649	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	58.8		74.6			272.6
Travel Time (s)	4.4		5.6			20.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	1	470	0	0	276
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	0	470	0	0	276
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.5%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
26: Sheffield Road & Way #1

Future BG 2030 AM - Site Peak  
10-24-2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	1	423	0	0	248
Future Volume (Veh/h)	2	1	423	0	0	248
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	1	470	0	0	276
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	746	470			470	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	746	470			470	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	381	594			1092	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	3	470	276			
Volume Left	2	0	0			
Volume Right	1	0	0			
cSH	433	1700	1092			
Volume to Capacity	0.01	0.28	0.00			
Queue Length 95th (m)	0.2	0.0	0.0			
Control Delay (s)	13.4	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	13.4	0.0	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization			33.5%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
3: Walkley Road & Lancaster Road

Future BG 2030 PM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	101	1412	766	132	389	165
Future Volume (vph)	101	1412	766	132	389	165
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.5			0.0	0.0	30.5
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1695	3293	3172	1419	3288	1502
Flt Permitted	0.267				0.950	
Satd. Flow (perm)	476	3293	3172	1419	3288	1502
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				145		139
Link Speed (k/h)		80	80		48	
Link Distance (m)		306.2	364.1		701.3	
Travel Time (s)		13.8	16.4		52.6	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	5%	9%	9%	2%	3%
Adj. Flow (vph)	111	1552	842	145	427	181
Shared Lane Traffic (%)						
Lane Group Flow (vph)	111	1552	842	145	427	181
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	22.0	102.0	80.0	80.0	28.0	28.0
Total Split (%)	16.9%	78.5%	61.5%	61.5%	21.5%	21.5%
Maximum Green (s)	19.0	97.0	75.0	75.0	23.0	23.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	99.0	97.0	75.0	75.0	23.0	23.0
Actuated g/C Ratio	0.76	0.75	0.58	0.58	0.18	0.18

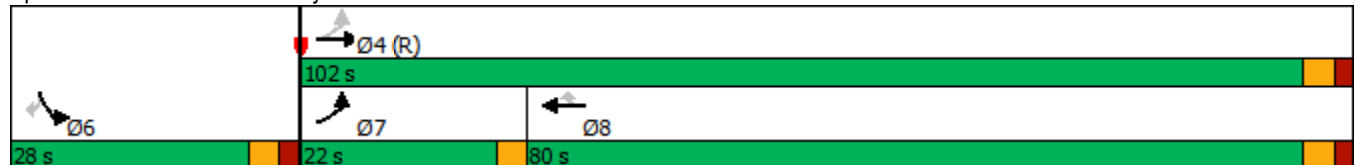


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.21	0.63	0.46	0.16	0.73	0.48
Control Delay	4.9	9.3	15.6	4.3	59.1	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.9	9.3	15.6	4.3	59.1	17.8
LOS	A	A	B	A	E	B
Approach Delay		9.0	14.0		46.8	
Approach LOS		A	B		D	
Queue Length 50th (m)	6.3	88.2	76.5	9.6	53.9	9.2
Queue Length 95th (m)	10.8	105.9	86.3	m17.2	71.8	31.0
Internal Link Dist (m)		282.2	340.1		677.3	
Turn Bay Length (m)	30.5					30.5
Base Capacity (vph)	540	2457	1830	880	581	380
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	0.21	0.63	0.46	0.16	0.73	0.48

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 50 (38%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.73  
 Intersection Signal Delay: 17.6  
 Intersection Capacity Utilization 61.2%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service B  
 m Volume for 95th percentile queue is metered by upstream signal.

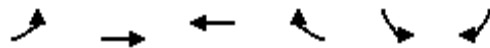
Splits and Phases: 3: Walkley Road & Lancaster Road





HCM Signalized Intersection Capacity Analysis  
3: Walkley Road & Lancaster Road

Future BG 2030 PM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	101	1412	766	132	389	165
Future Volume (vph)	101	1412	766	132	389	165
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1695	3293	3172	1419	3288	1502
Flt Permitted	0.27	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	476	3293	3172	1419	3288	1502
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	111	1552	842	145	427	181
RTOR Reduction (vph)	0	0	0	61	0	114
Lane Group Flow (vph)	111	1552	842	84	427	67
Heavy Vehicles (%)	2%	5%	9%	9%	2%	3%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	97.0	97.0	75.0	75.0	23.0	23.0
Effective Green, g (s)	97.0	97.0	75.0	75.0	23.0	23.0
Actuated g/C Ratio	0.75	0.75	0.58	0.58	0.18	0.18
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	533	2457	1830	818	581	265
v/s Ratio Prot	0.03	c0.47	0.27		c0.13	
v/s Ratio Perm	0.12			0.06		0.04
v/c Ratio	0.21	0.63	0.46	0.10	0.73	0.25
Uniform Delay, d1	5.7	7.9	15.8	12.4	50.6	46.1
Progression Factor	1.00	1.00	0.93	2.02	1.00	1.00
Incremental Delay, d2	0.9	1.2	0.8	0.2	8.0	2.3
Delay (s)	6.6	9.2	15.4	25.3	58.7	48.3
Level of Service	A	A	B	C	E	D
Approach Delay (s)		9.0	16.9		55.6	
Approach LOS		A	B		E	

Intersection Summary

HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Walkley Road & Sheffield Road

Future BG 2030 PM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	172	1553	571	75	249	313
Future Volume (vph)	172	1553	571	75	249	313
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.5			50.0	0.0	30.5
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1383	3390	3172	1146	3164	1381
Flt Permitted	0.384				0.950	
Satd. Flow (perm)	559	3390	3172	1146	3164	1381
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				77		323
Link Speed (k/h)		80	80		48	
Link Distance (m)		364.1	339.6		830.6	
Travel Time (s)		16.4	15.3		62.3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.97
Heavy Vehicles (%)	25%	2%	9%	35%	6%	12%
Adj. Flow (vph)	176	1585	583	77	254	323
Shared Lane Traffic (%)						
Lane Group Flow (vph)	176	1585	583	77	254	323
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.0	23.0	23.0	23.0	23.0
Total Split (s)	22.0	104.0	82.0	82.0	26.0	26.0
Total Split (%)	16.9%	80.0%	63.1%	63.1%	20.0%	20.0%
Maximum Green (s)	19.0	99.0	77.0	77.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	101.0	99.0	77.0	77.0	21.0	21.0
Actuated g/C Ratio	0.78	0.76	0.59	0.59	0.16	0.16

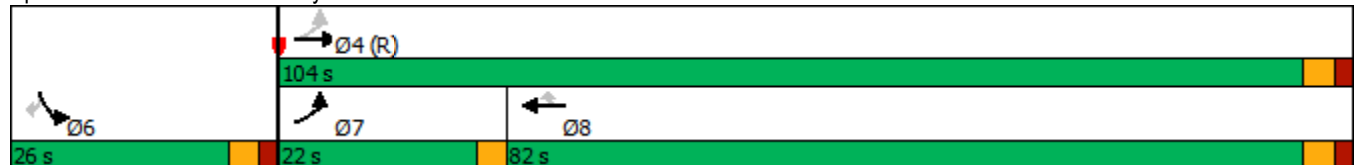


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.32	0.61	0.31	0.11	0.50	0.66
Control Delay	4.0	5.5	13.8	2.7	53.5	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.0	5.5	13.8	2.7	53.5	12.0
LOS	A	A	B	A	D	B
Approach Delay		5.3	12.5		30.3	
Approach LOS		A	B		C	
Queue Length 50th (m)	7.5	54.6	37.3	0.0	30.9	0.0
Queue Length 95th (m)	m11.5	63.3	48.0	6.4	44.5	28.2
Internal Link Dist (m)		340.1	315.6		806.6	
Turn Bay Length (m)	30.5			50.0		30.5
Base Capacity (vph)	554	2581	1878	710	511	493
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	0.32	0.61	0.31	0.11	0.50	0.66

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 13 (10%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.66  
 Intersection Signal Delay: 11.7  
 Intersection Capacity Utilization 61.1%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service B  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Walkley Road & Sheffield Road



HCM Signalized Intersection Capacity Analysis  
6: Walkley Road & Sheffield Road

Future BG 2030 PM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	172	1553	571	75	249	313
Future Volume (vph)	172	1553	571	75	249	313
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1383	3390	3172	1146	3164	1381
Flt Permitted	0.38	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	559	3390	3172	1146	3164	1381
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.97
Adj. Flow (vph)	176	1585	583	77	254	323
RTOR Reduction (vph)	0	0	0	31	0	271
Lane Group Flow (vph)	176	1585	583	46	254	52
Heavy Vehicles (%)	25%	2%	9%	35%	6%	12%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	99.0	99.0	77.0	77.0	21.0	21.0
Effective Green, g (s)	99.0	99.0	77.0	77.0	21.0	21.0
Actuated g/C Ratio	0.76	0.76	0.59	0.59	0.16	0.16
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	546	2581	1878	678	511	223
v/s Ratio Prot	0.05	c0.47	0.18		c0.08	
v/s Ratio Perm	0.20			0.04		0.04
v/c Ratio	0.32	0.61	0.31	0.07	0.50	0.23
Uniform Delay, d1	4.7	6.9	13.2	11.3	49.7	47.5
Progression Factor	0.76	0.65	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.8	0.4	0.2	3.4	2.4
Delay (s)	4.7	5.4	13.7	11.4	53.1	49.9
Level of Service	A	A	B	B	D	D
Approach Delay (s)		5.3	13.4		51.3	
Approach LOS		A	B		D	

Intersection Summary

HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
7: Walkley Road & Highway SB terminal

Future BG 2030 PM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (vph)	0	1220	144	0	138	492
Future Volume (vph)	0	1220	144	0	138	492
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Fr <sub>t</sub>						0.850
Fl <sub>t</sub> Protected					0.950	
Satd. Flow (prot)	0	3390	3390	0	1695	1517
Fl <sub>t</sub> Permitted					0.950	
Satd. Flow (perm)	0	3390	3390	0	1695	1517
Link Speed (k/h)		80	80		80	
Link Distance (m)		118.5	305.1		468.0	
Travel Time (s)		5.3	13.7		21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1284	152	0	145	518
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1284	152	0	145	518
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.3%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
7: Walkley Road & Highway SB terminal

Future BG 2030 PM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (veh/h)	0	1220	144	0	138	492
Future Volume (Veh/h)	0	1220	144	0	138	492
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1284	152	0	145	518
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	152			794	76	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	152			794	76	
tC, single (s)	4.1			6.8	6.9	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	100			55	47	
cM capacity (veh/h)	1426			325	970	
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>	<b>SB 2</b>
Volume Total	642	642	76	76	145	518
Volume Left	0	0	0	0	145	0
Volume Right	0	0	0	0	0	518
cSH	1700	1700	1700	1700	325	970
Volume to Capacity	0.38	0.38	0.04	0.04	0.45	0.53
Queue Length 95th (m)	0.0	0.0	0.0	0.0	16.7	24.7
Control Delay (s)	0.0	0.0	0.0	0.0	24.7	12.9
Lane LOS					C	B
Approach Delay (s)	0.0	0.0		15.5		
Approach LOS					C	
<b>Intersection Summary</b>						
Average Delay			4.9			
Intersection Capacity Utilization			50.3%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
 10: Highway NB terminal & Walkley Road

Future BG 2030 PM - Site Peak  
 10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (vph)	481	880	0	53	107	26
Future Volume (vph)	481	880	0	53	107	26
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.903			0.973		
Flt Protected				0.961		
Satd. Flow (prot)	3061	0	0	3390	1668	0
Flt Permitted				0.961		
Satd. Flow (perm)	3061	0	0	3390	1668	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	305.1			95.4	443.2	
Travel Time (s)	13.7			7.2	33.2	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	529	967	0	58	118	29
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1496	0	0	58	147	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14		24	24		14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	58.6%
Analysis Period (min)	15
	ICU Level of Service B

HCM Unsignalized Intersection Capacity Analysis  
 10: Highway NB terminal & Walkley Road

Future BG 2030 PM - Site Peak  
 10-24-2022

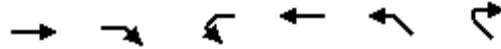


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (veh/h)	481	880	0	53	107	26
Future Volume (Veh/h)	481	880	0	53	107	26
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	529	967	0	58	118	29
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			1496		1042	748
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1496		1042	748
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		48	92
cM capacity (veh/h)			444		225	355
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	
Volume Total	353	1143	29	29	147	
Volume Left	0	0	0	0	118	
Volume Right	0	967	0	0	29	
cSH	1700	1700	1700	1700	243	
Volume to Capacity	0.21	0.67	0.02	0.02	0.61	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	27.0	
Control Delay (s)	0.0	0.0	0.0	0.0	40.2	
Lane LOS					E	
Approach Delay (s)	0.0		0.0		40.2	
Approach LOS					E	
<b>Intersection Summary</b>						
Average Delay			3.5			
Intersection Capacity Utilization			58.6%	ICU Level of Service	B	
Analysis Period (min)			15			



Lanes, Volumes, Timings  
11: SB off ramp & Walkley Road

Future BG 2030 PM - Site Peak  
10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑	↑		↑↑↑		
Traffic Volume (vph)	1220	423	0	636	0	0
Future Volume (vph)	1220	423	0	636	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		50.0	0.0		0.0	0.0
Storage Lanes		1	0		0	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3390	1517	0	4871	0	0
Flt Permitted						
Satd. Flow (perm)	3390	1517	0	4871	0	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	339.6			118.5	265.8	
Travel Time (s)	15.3			8.9	19.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1284	445	0	669	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1284	445	0	669	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	38.9%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings  
13: Walkley Road & NB off ramp

Future BG 2030 PM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑	↗		
Traffic Volume (vph)	0	507	53	49	0	0
Future Volume (vph)	0	507	53	49	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			50.0	0.0	0.0
Storage Lanes	0			1	0	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3390	1784	1517	0	0
Flt Permitted						
Satd. Flow (perm)	0	3390	1784	1517	0	0
Link Speed (k/h)		80	48		48	
Link Distance (m)		95.4	197.1		264.7	
Travel Time (s)		4.3	14.8		19.9	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	557	58	54	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	557	58	54	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Free	

















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.1%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

















Lanes, Volumes, Timings  
15: Sheffield Road & Humber Place

Future BG 2030 PM - Site Peak  
10-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	0	111	2	0	0	47	241	1	1	434	16
Future Volume (vph)	12	0	111	2	0	0	47	241	1	1	434	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>		0.878										0.995
Fl <sub>t</sub> Protected		0.995			0.950			0.992				
Satd. Flow (prot)	0	1452	0	0	1300	0	0	1377	0	0	1661	0
Fl <sub>t</sub> Permitted		0.995			0.950			0.992				
Satd. Flow (perm)	0	1452	0	0	1300	0	0	1377	0	0	1661	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		152.4			148.3			830.6			80.7	
Travel Time (s)		11.4			11.1			62.3			6.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	14%	2%	9%	33%	2%	2%	21%	33%	50%	0%	9%	10%
Adj. Flow (vph)	13	0	123	2	0	0	52	268	1	1	482	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	136	0	0	2	0	0	321	0	0	501	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	59.0%						ICU Level of Service B					
Analysis Period (min)	15											










HCM Unsignalized Intersection Capacity Analysis  
 15: Sheffield Road & Humber Place

Future BG 2030 PM - Site Peak  
 10-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	0	111	2	0	0	47	241	1	1	434	16
Future Volume (Veh/h)	12	0	111	2	0	0	47	241	1	1	434	16
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	13	0	123	2	0	0	52	268	1	1	482	18
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	866	866	491	988	874	268	500			269		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	866	866	491	988	874	268	500			269		
tC, single (s)	7.2	6.5	6.3	7.4	6.5	6.2	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.4	3.8	4.0	3.3	2.4			2.2		
p0 queue free %	95	100	78	99	100	100	95			100		
cM capacity (veh/h)	250	275	564	149	272	770	973			1306		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	136	2	321	501								
Volume Left	13	2	52	1								
Volume Right	123	0	1	18								
cSH	503	149	973	1306								
Volume to Capacity	0.27	0.01	0.05	0.00								
Queue Length 95th (m)	8.2	0.3	1.3	0.0								
Control Delay (s)	14.8	29.5	1.9	0.0								
Lane LOS	B	D	A	A								
Approach Delay (s)	14.8	29.5	1.9	0.0								
Approach LOS	B	D										
Intersection Summary												
Average Delay			2.8									
Intersection Capacity Utilization			59.0%		ICU Level of Service					B		
Analysis Period (min)			15									










Lanes, Volumes, Timings  
18: Sheffield Road & Way #5

Future BG 2030 PM - Site Peak  
10-24-2022










						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	227	7	1	440
Future Volume (vph)	0	0	227	7	1	440
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.996					
Flt Protected						
Satd. Flow (prot)	1784	0	1777	0	0	1071
Flt Permitted						
Satd. Flow (perm)	1784	0	1777	0	0	1071
Link Speed (k/h)	48		48			48
Link Distance (m)	56.2		80.7			63.2
Travel Time (s)	4.2		6.1			4.7
Peak Hour Factor	0.90	0.90	0.92	0.90	0.90	0.90
Bus Blockages (#/hr)	0	0	0	0	0	100
Adj. Flow (vph)	0	0	247	8	1	489
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	255	0	0	490
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.96
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	28.6%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 18: Sheffield Road & Way #5

Future BG 2030 PM - Site Peak  
 10-24-2022










						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	227	7	1	440
Future Volume (Veh/h)	0	0	227	7	1	440
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.92	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	247	8	1	489
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	742	251			255	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	742	251			255	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	383	788			1310	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	255	490			
Volume Left	0	0	1			
Volume Right	0	8	0			
cSH	1700	1700	1310			
Volume to Capacity	0.00	0.15	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A		A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			28.6%	ICU Level of Service		A
Analysis Period (min)			15			



						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	29	6	227	0	0	411
Future Volume (vph)	29	6	227	0	0	411
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.976					
Flt Protected	0.961					
Satd. Flow (prot)	1674	0	1784	0	0	1784
Flt Permitted	0.961					
Satd. Flow (perm)	1674	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	60.6		63.2			102.2
Travel Time (s)	4.5		4.7			7.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	32	7	252	0	0	457
Shared Lane Traffic (%)						
Lane Group Flow (vph)	39	0	252	0	0	457
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	32.8%			ICU Level of Service A		
Analysis Period (min)	15					










HCM Unsignalized Intersection Capacity Analysis  
20: Sheffield Road & Way #4

Future BG 2030 PM - Site Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	29	6	227	0	0	411
Future Volume (Veh/h)	29	6	227	0	0	411
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	32	7	252	0	0	457
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	709	252			252	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	709	252			252	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	99			100	
cM capacity (veh/h)	401	787			1313	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	39	252	457			
Volume Left	32	0	0			
Volume Right	7	0	0			
cSH	439	1700	1313			
Volume to Capacity	0.09	0.15	0.00			
Queue Length 95th (m)	2.2	0.0	0.0			
Control Delay (s)	14.0	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	14.0	0.0	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.7			
Intersection Capacity Utilization			32.8%	ICU Level of Service	A	
Analysis Period (min)			15			










Lanes, Volumes, Timings  
24: Sheffield Road & Way #2

Future BG 2030 PM - Site Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	231	2	1	411
Future Volume (vph)	0	0	231	2	1	411
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999					
Flt Protected						
Satd. Flow (prot)	1784	0	1783	0	0	1784
Flt Permitted						
Satd. Flow (perm)	1784	0	1783	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	65.0		102.2			76.9
Travel Time (s)	4.9		7.7			5.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	257	2	1	457
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	259	0	0	458
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	27.0%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
24: Sheffield Road & Way #2

Future BG 2030 PM - Site Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	231	2	1	411
Future Volume (Veh/h)	0	0	231	2	1	411
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	257	2	1	457
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	717	258			259	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	717	258			259	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	396	781			1306	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	259	458			
Volume Left	0	0	1			
Volume Right	0	2	0			
cSH	1700	1700	1306			
Volume to Capacity	0.00	0.15	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A		A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			27.0%	ICU Level of Service	A	
Analysis Period (min)			15			












Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	4	1	234	0	0	407
Future Volume (vph)	4	1	234	0	0	407
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.973					
Fl <sub>t</sub> Protected	0.962					
Satd. Flow (prot)	1670	0	1784	0	0	1784
Fl <sub>t</sub> Permitted	0.962					
Satd. Flow (perm)	1670	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	58.8		76.9			181.8
Travel Time (s)	4.4		5.8			13.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	1	260	0	0	452
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	0	260	0	0	452
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.6%
Analysis Period (min)	15
	ICU Level of Service A

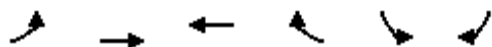
HCM Unsignalized Intersection Capacity Analysis  
26: Sheffield Road & Way #1

Future BG 2030 PM - Site Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	1	234	0	0	407
Future Volume (Veh/h)	4	1	234	0	0	407
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	4	1	260	0	0	452
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	712	260			260	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	712	260			260	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	399	779			1304	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	5	260	452			
Volume Left	4	0	0			
Volume Right	1	0	0			
cSH	442	1700	1304			
Volume to Capacity	0.01	0.15	0.00			
Queue Length 95th (m)	0.3	0.0	0.0			
Control Delay (s)	13.2	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	13.2	0.0	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization			32.6%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
3: Walkley Road & Lancaster Road

Future Total 2025 AM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	207	735	1433	652	94	171
Future Volume (vph)	207	735	1433	652	94	171
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0			0.0	0.0	70.0
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1647	3007	3232	1517	3135	1406
Flt Permitted	0.101				0.950	
Satd. Flow (perm)	175	3007	3232	1517	3135	1406
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				601		176
Link Speed (k/h)		80	80		48	
Link Distance (m)		248.5	361.1		367.8	
Travel Time (s)		11.2	16.2		27.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	15%	7%	2%	7%	10%
Adj. Flow (vph)	213	758	1477	672	97	176
Shared Lane Traffic (%)						
Lane Group Flow (vph)	213	758	1477	672	97	176
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	24.0	122.0	98.0	98.0	28.0	28.0
Total Split (%)	16.0%	81.3%	65.3%	65.3%	18.7%	18.7%
Maximum Green (s)	21.0	117.0	93.0	93.0	23.0	23.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	119.0	117.0	93.0	93.0	23.0	23.0
Actuated g/C Ratio	0.79	0.78	0.62	0.62	0.15	0.15

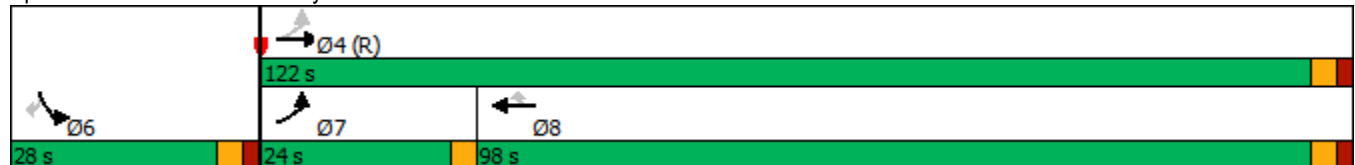


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.62	0.32	0.74	0.58	0.20	0.48
Control Delay	25.3	5.3	11.5	2.2	56.7	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.3	5.3	11.5	2.2	56.7	12.1
LOS	C	A	B	A	E	B
Approach Delay		9.7	8.6		28.0	
Approach LOS		A	A		C	
Queue Length 50th (m)	22.0	30.4	51.6	12.4	13.1	0.0
Queue Length 95th (m)	50.3	37.4	m66.9	m20.7	21.9	22.0
Internal Link Dist (m)		224.5	337.1		343.8	
Turn Bay Length (m)	100.0					70.0
Base Capacity (vph)	344	2345	2003	1168	480	364
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	0.62	0.32	0.74	0.58	0.20	0.48

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 50 (33%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.74  
 Intersection Signal Delay: 10.4  
 Intersection LOS: B  
 Intersection Capacity Utilization 69.8%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Walkley Road & Lancaster Road





HCM Signalized Intersection Capacity Analysis  
3: Walkley Road & Lancaster Road

Future Total 2025 AM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	207	735	1433	652	94	171
Future Volume (vph)	207	735	1433	652	94	171
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1647	3007	3232	1517	3135	1406
Flt Permitted	0.10	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	175	3007	3232	1517	3135	1406
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	213	758	1477	672	97	176
RTOR Reduction (vph)	0	0	0	228	0	149
Lane Group Flow (vph)	213	758	1477	444	97	27
Heavy Vehicles (%)	5%	15%	7%	2%	7%	10%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	117.0	117.0	93.0	93.0	23.0	23.0
Effective Green, g (s)	117.0	117.0	93.0	93.0	23.0	23.0
Actuated g/C Ratio	0.78	0.78	0.62	0.62	0.15	0.15
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	342	2345	2003	940	480	215
v/s Ratio Prot	c0.09	0.25	c0.46		c0.03	
v/s Ratio Perm	0.40			0.29		0.02
v/c Ratio	0.62	0.32	0.74	0.47	0.20	0.13
Uniform Delay, d1	24.9	4.9	20.0	15.3	55.5	54.8
Progression Factor	1.00	1.00	0.51	0.78	1.00	1.00
Incremental Delay, d2	8.3	0.4	1.0	0.7	0.9	1.2
Delay (s)	33.2	5.2	11.3	12.6	56.4	56.0
Level of Service	C	A	B	B	E	E
Approach Delay (s)		11.4	11.7		56.2	
Approach LOS		B	B		E	

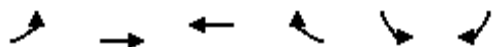
Intersection Summary

HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Walkley Road & Sheffield Road

Future Total 2025 AM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	277	459	1831	242	42	236
Future Volume (vph)	277	459	1831	242	42	236
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0			30.0	0.0	70.0
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1491	3060	3357	1459	2396	1190
Flt Permitted	0.044				0.950	
Satd. Flow (perm)	69	3060	3357	1459	2396	1190
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				71		241
Link Speed (k/h)		80	80		48	
Link Distance (m)		361.1	363.2		830.1	
Travel Time (s)		16.2	16.3		62.3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	16%	13%	3%	6%	40%	30%
Adj. Flow (vph)	283	468	1868	247	43	241
Shared Lane Traffic (%)						
Lane Group Flow (vph)	283	468	1868	247	43	241
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	32.0	124.0	92.0	92.0	26.0	26.0
Total Split (%)	21.3%	82.7%	61.3%	61.3%	17.3%	17.3%
Maximum Green (s)	29.0	119.0	87.0	87.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	121.0	119.0	87.0	87.0	21.0	21.0
Actuated g/C Ratio	0.81	0.79	0.58	0.58	0.14	0.14

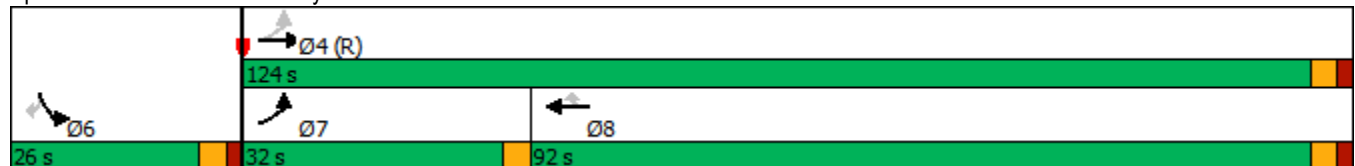


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.86	0.19	0.96	0.28	0.13	0.65
Control Delay	61.9	3.6	42.9	11.9	57.7	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.9	3.6	42.9	11.9	57.7	15.3
LOS	E	A	D	B	E	B
Approach Delay		25.6	39.3		21.7	
Approach LOS		C	D		C	
Queue Length 50th (m)	52.1	14.7	267.0	24.4	5.8	0.0
Queue Length 95th (m)	#111.9	18.2	#331.2	40.5	11.9	27.3
Internal Link Dist (m)		337.1	339.2		806.1	
Turn Bay Length (m)	100.0			30.0		70.0
Base Capacity (vph)	330	2427	1947	876	335	373
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	0.86	0.19	0.96	0.28	0.13	0.65

Intersection Summary

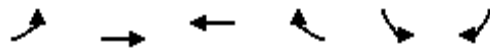
Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 50 (33%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 110  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.96  
 Intersection Signal Delay: 34.4  
 Intersection LOS: C  
 Intersection Capacity Utilization 85.5%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 6: Walkley Road & Sheffield Road



HCM Signalized Intersection Capacity Analysis  
6: Walkley Road & Sheffield Road

Future Total 2025 AM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	277	459	1831	242	42	236
Future Volume (vph)	277	459	1831	242	42	236
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1491	3060	3357	1459	2396	1190
Flt Permitted	0.04	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	70	3060	3357	1459	2396	1190
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	283	468	1868	247	43	241
RTOR Reduction (vph)	0	0	0	30	0	207
Lane Group Flow (vph)	283	468	1868	217	43	34
Heavy Vehicles (%)	16%	13%	3%	6%	40%	30%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	119.0	119.0	87.0	87.0	21.0	21.0
Effective Green, g (s)	119.0	119.0	87.0	87.0	21.0	21.0
Actuated g/C Ratio	0.79	0.79	0.58	0.58	0.14	0.14
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	330	2427	1947	846	335	166
v/s Ratio Prot	c0.17	0.15	c0.56		0.02	
v/s Ratio Perm	0.52			0.15		c0.03
v/c Ratio	0.86	0.19	0.96	0.26	0.13	0.20
Uniform Delay, d1	50.7	3.8	29.8	15.5	56.5	57.1
Progression Factor	0.84	0.90	1.00	1.00	1.00	1.00
Incremental Delay, d2	23.3	0.2	12.8	0.7	0.8	2.7
Delay (s)	65.9	3.6	42.7	16.3	57.3	59.8
Level of Service	E	A	D	B	E	E
Approach Delay (s)		27.1	39.6		59.5	
Approach LOS		C	D		E	

Intersection Summary

HCM 2000 Control Delay	38.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
7: Walkley Road & Highway SB terminal

Future Total 2025 AM - Adjacent Peak  
10-24-2022



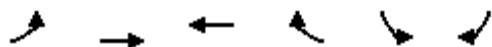
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↘
Traffic Volume (vph)	0	444	974	0	23	909
Future Volume (vph)	0	444	974	0	23	909
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Fr <sub>t</sub>						0.850
Fl <sub>t</sub> Protected					0.950	
Satd. Flow (prot)	0	3390	3390	0	1695	1517
Fl <sub>t</sub> Permitted					0.950	
Satd. Flow (perm)	0	3390	3390	0	1695	1517
Link Speed (k/h)		80	80		80	
Link Distance (m)		131.6	322.4		492.9	
Travel Time (s)		5.9	14.5		22.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	458	1004	0	24	937
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	458	1004	0	24	937
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	94.5%
Analysis Period (min)	15
	ICU Level of Service F

HCM Unsignalized Intersection Capacity Analysis  
7: Walkley Road & Highway SB terminal

Future Total 2025 AM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (veh/h)	0	444	974	0	23	909
Future Volume (Veh/h)	0	444	974	0	23	909
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	458	1004	0	24	937
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1004				1233	502
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1004				1233	502
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				86	0
cM capacity (veh/h)	686				169	515
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>	<b>SB 2</b>
Volume Total	229	229	502	502	24	937
Volume Left	0	0	0	0	24	0
Volume Right	0	0	0	0	0	937
cSH	1700	1700	1700	1700	169	515
Volume to Capacity	0.13	0.13	0.30	0.30	0.14	1.82
Queue Length 95th (m)	0.0	0.0	0.0	0.0	3.7	446.6
Control Delay (s)	0.0	0.0	0.0	0.0	29.8	396.2
Lane LOS					D	F
Approach Delay (s)	0.0		0.0		387.0	
Approach LOS					F	
<b>Intersection Summary</b>						
Average Delay			153.5			
Intersection Capacity Utilization			94.5%		ICU Level of Service	F
Analysis Period (min)			15			

Lanes, Volumes, Timings  
 10: Highway NB terminal & Walkley Road

Future Total 2025 AM - Adjacent Peak  
 10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (vph)	53	416	0	606	400	7
Future Volume (vph)	53	416	0	606	400	7
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.867			0.998		
Flt Protected				0.953		
Satd. Flow (prot)	2939	0	0	3390	1697	0
Flt Permitted				0.953		
Satd. Flow (perm)	2939	0	0	3390	1697	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	322.4			108.3	295.7	
Travel Time (s)	14.5			8.1	22.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	57	447	0	652	430	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	504	0	0	652	438	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14		24	24		14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	48.2% ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
 10: Highway NB terminal & Walkley Road

Future Total 2025 AM - Adjacent Peak  
 10-24-2022

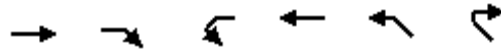


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (veh/h)	53	416	0	606	400	7
Future Volume (Veh/h)	53	416	0	606	400	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	57	447	0	652	430	8
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			504		606	252
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			504		606	252
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		0	99
cM capacity (veh/h)			1057		428	748
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	
Volume Total	38	466	326	326	438	
Volume Left	0	0	0	0	430	
Volume Right	0	447	0	0	8	
cSH	1700	1700	1700	1700	432	
Volume to Capacity	0.02	0.27	0.19	0.19	1.01	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	100.5	
Control Delay (s)	0.0	0.0	0.0	0.0	78.5	
Lane LOS						F
Approach Delay (s)	0.0		0.0		78.5	
Approach LOS						F
<b>Intersection Summary</b>						
Average Delay			21.6			
Intersection Capacity Utilization			48.2%	ICU Level of Service	A	
Analysis Period (min)			15			



Lanes, Volumes, Timings  
11: SB off ramp & Walkley Road

Future Total 2025 AM - Adjacent Peak  
10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑	↑		↑↑↑		
Traffic Volume (vph)	444	138	0	1883	0	0
Future Volume (vph)	444	138	0	1883	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		60.0	0.0		0.0	0.0
Storage Lanes		1	0		0	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3390	1517	0	4871	0	0
Flt Permitted						
Satd. Flow (perm)	3390	1517	0	4871	0	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	363.2			131.6	210.3	
Travel Time (s)	16.3			9.9	15.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	493	153	0	2092	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	493	153	0	2092	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

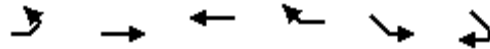
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.7%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings  
13: Walkley Road & NB off ramp

Future Total 2025 AM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑	↗		
Traffic Volume (vph)	0	60	606	215	0	0
Future Volume (vph)	0	60	606	215	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			70.0	0.0	0.0
Storage Lanes	0			1	0	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3390	1784	1517	0	0
Flt Permitted						
Satd. Flow (perm)	0	3390	1784	1517	0	0
Link Speed (k/h)		80	80		48	
Link Distance (m)		108.3	195.3		199.6	
Travel Time (s)		4.9	8.8		15.0	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	65	652	231	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	65	652	231	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Free	

















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	37.0%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings  
15: Sheffield Road & Humber Place

Future Total 2025 AM - Adjacent Peak  
10-24-2022

















												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	0	72	0	0	0	153	376	0	0	204	16
Future Volume (vph)	21	0	72	0	0	0	153	376	0	0	204	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>		0.895										0.990
Fl <sub>t</sub> Protected		0.989						0.986				
Satd. Flow (prot)	0	1290	0	0	1784	0	0	1582	0	0	1389	0
Fl <sub>t</sub> Permitted		0.989						0.986				
Satd. Flow (perm)	0	1290	0	0	1784	0	0	1582	0	0	1389	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		152.4			148.3			830.1			120.3	
Travel Time (s)		11.4			11.1			62.3			9.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	35%	2%	22%	50%	2%	33%	12%	14%	0%	33%	30%	26%
Adj. Flow (vph)	23	0	80	0	0	0	170	418	0	0	227	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	103	0	0	0	0	0	588	0	0	245	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	58.1%
ICU Level of Service	B
Analysis Period (min)	15










HCM Unsignalized Intersection Capacity Analysis  
 15: Sheffield Road & Humber Place

Future Total 2025 AM - Adjacent Peak  
 10-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	0	72	0	0	0	153	376	0	0	204	16
Future Volume (Veh/h)	21	0	72	0	0	0	153	376	0	0	204	16
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	23	0	80	0	0	0	170	418	0	0	227	18
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	994	994	236	1074	1003	418	245			418		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	994	994	236	1074	1003	418	245			418		
tC, single (s)	7.4	6.5	6.4	7.6	6.5	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.8	4.0	3.5	4.0	4.0	3.6	2.3			2.5		
p0 queue free %	87	100	89	100	100	100	87			100		
cM capacity (veh/h)	175	212	756	129	210	574	1265			993		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	103	0	588	245								
Volume Left	23	0	170	0								
Volume Right	80	0	0	18								
cSH	434	1700	1265	993								
Volume to Capacity	0.24	0.05	0.13	0.00								
Queue Length 95th (m)	6.9	0.0	3.5	0.0								
Control Delay (s)	15.9	0.0	3.4	0.0								
Lane LOS	C	A	A									
Approach Delay (s)	15.9	0.0	3.4	0.0								
Approach LOS	C	A										
Intersection Summary												
Average Delay			3.9									
Intersection Capacity Utilization			58.1%		ICU Level of Service					B		
Analysis Period (min)			15									










Lanes, Volumes, Timings  
18: Sheffield Road & Way #5

Future Total 2025 AM - Adjacent Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	393	0	0	229
Future Volume (vph)	0	0	393	0	0	229
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Flt</b>						
Flt Protected						
Satd. Flow (prot)	1784	0	1784	0	0	910
Flt Permitted						
Satd. Flow (perm)	1784	0	1784	0	0	910
Link Speed (k/h)	48		48			48
Link Distance (m)	56.2		120.3			89.9
Travel Time (s)	4.2		9.0			6.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	100%
Adj. Flow (vph)	0	0	437	0	0	254
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	437	0	0	254
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
<b>Two way Left Turn Lane</b>						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	25.2%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 18: Sheffield Road & Way #5

Future Total 2025 AM - Adjacent Peak  
 10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	393	0	0	229
Future Volume (Veh/h)	0	0	393	0	0	229
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	437	0	0	254
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	691	437			437	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	691	437			437	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	410	620			1123	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	437	254			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1123			
Volume to Capacity	0.00	0.26	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			25.2%	ICU Level of Service	A	
Analysis Period (min)			15			














Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	0	393	0	0	229
Future Volume (vph)	1	0	393	0	0	229
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fr</b>						
Flt Protected	0.950					
Satd. Flow (prot)	1695	0	1784	0	0	1784
Flt Permitted	0.950					
Satd. Flow (perm)	1695	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	60.6		89.9			135.3
Travel Time (s)	4.5		6.7			10.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1	0	437	0	0	254
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	1	0	437	0	0	254
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
<b>Two way Left Turn Lane</b>						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	31.8%
Analysis Period (min)	15
	ICU Level of Service A










HCM Unsignalized Intersection Capacity Analysis  
 20: Sheffield Road & Way #4

Future Total 2025 AM - Adjacent Peak  
 10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	0	393	0	0	229
Future Volume (Veh/h)	1	0	393	0	0	229
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	0	437	0	0	254
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	691	437			437	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	691	437			437	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	410	620			1123	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	1	437	254			
Volume Left	1	0	0			
Volume Right	0	0	0			
cSH	410	1700	1123			
Volume to Capacity	0.00	0.26	0.00			
Queue Length 95th (m)	0.1	0.0	0.0			
Control Delay (s)	13.8	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	13.8	0.0	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			31.8%	ICU Level of Service	A	
Analysis Period (min)			15			










Lanes, Volumes, Timings  
24: Sheffield Road & Way #2

Future Total 2025 AM - Adjacent Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	393	0	0	229
Future Volume (vph)	0	0	393	0	0	229
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fr</b>						
Flt Protected						
Satd. Flow (prot)	1784	0	1784	0	0	1784
Flt Permitted						
Satd. Flow (perm)	1784	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	65.0		135.3			74.6
Travel Time (s)	4.9		10.1			5.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	437	0	0	254
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	437	0	0	254
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	25.2%		ICU Level of Service A			
Analysis Period (min)	15					










HCM Unsignalized Intersection Capacity Analysis  
24: Sheffield Road & Way #2

Future Total 2025 AM - Adjacent Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	393	0	0	229
Future Volume (Veh/h)	0	0	393	0	0	229
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	437	0	0	254
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	691	437			437	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	691	437			437	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	410	620			1123	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	437	254			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1123			
Volume to Capacity	0.00	0.26	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			25.2%	ICU Level of Service	A	
Analysis Period (min)			15			










Lanes, Volumes, Timings  
26: Sheffield Road & Way #1

Future Total 2025 AM - Adjacent Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	402	0	0	227
Future Volume (vph)	0	0	402	0	0	227
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fr</b>						
Flt Protected						
Satd. Flow (prot)	1784	0	1784	0	0	1784
Flt Permitted						
Satd. Flow (perm)	1784	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	58.8		74.6			272.6
Travel Time (s)	4.4		5.6			20.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	447	0	0	252
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	0	0	447	0	0	252
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
<b>Two way Left Turn Lane</b>						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	25.7%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
26: Sheffield Road & Way #1

Future Total 2025 AM - Adjacent Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	402	0	0	227
Future Volume (Veh/h)	0	0	402	0	0	227
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	447	0	0	252
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	699	447			447	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	699	447			447	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	406	612			1113	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	447	252			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1113			
Volume to Capacity	0.00	0.26	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			25.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
3: Walkley Road & Lancaster Road

Future Total 2025 PM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	127	1788	966	166	490	208
Future Volume (vph)	127	1788	966	166	490	208
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.5			0.0	0.0	30.5
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1695	3293	3172	1419	3288	1502
Flt Permitted	0.191				0.950	
Satd. Flow (perm)	341	3293	3172	1419	3288	1502
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				182		139
Link Speed (k/h)		80	80		48	
Link Distance (m)		306.2	364.1		701.3	
Travel Time (s)		13.8	16.4		52.6	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	5%	9%	9%	2%	3%
Adj. Flow (vph)	140	1965	1062	182	538	229
Shared Lane Traffic (%)						
Lane Group Flow (vph)	140	1965	1062	182	538	229
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	22.0	102.0	80.0	80.0	28.0	28.0
Total Split (%)	16.9%	78.5%	61.5%	61.5%	21.5%	21.5%
Maximum Green (s)	19.0	97.0	75.0	75.0	23.0	23.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	99.0	97.0	75.0	75.0	23.0	23.0
Actuated g/C Ratio	0.76	0.75	0.58	0.58	0.18	0.18

Lanes, Volumes, Timings  
3: Walkley Road & Lancaster Road

Future Total 2025 PM - Adjacent Peak  
10-24-2022

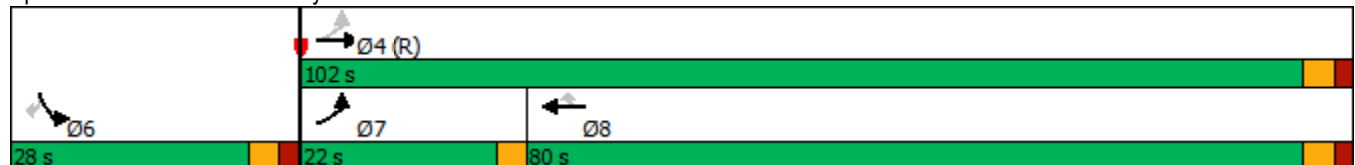


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.31	0.80	0.58	0.20	0.93	0.60
Control Delay	5.8	13.6	18.2	4.0	75.7	26.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.8	13.6	18.2	4.0	75.7	26.7
LOS	A	B	B	A	E	C
Approach Delay		13.1	16.1		61.1	
Approach LOS		B	B		E	
Queue Length 50th (m)	8.1	146.6	105.0	10.0	70.7	20.6
Queue Length 95th (m)	13.2	177.4	121.7	m19.9	#102.6	48.1
Internal Link Dist (m)		282.2	340.1		677.3	
Turn Bay Length (m)	30.5					30.5
Base Capacity (vph)	457	2457	1830	895	581	380
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	0.31	0.80	0.58	0.20	0.93	0.60

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 50 (38%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.93  
 Intersection Signal Delay: 23.0  
 Intersection LOS: C  
 Intersection Capacity Utilization 75.3%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

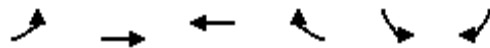
Splits and Phases: 3: Walkley Road & Lancaster Road





HCM Signalized Intersection Capacity Analysis  
3: Walkley Road & Lancaster Road

Future Total 2025 PM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	127	1788	966	166	490	208
Future Volume (vph)	127	1788	966	166	490	208
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1695	3293	3172	1419	3288	1502
Flt Permitted	0.19	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	340	3293	3172	1419	3288	1502
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	140	1965	1062	182	538	229
RTOR Reduction (vph)	0	0	0	77	0	114
Lane Group Flow (vph)	140	1965	1062	105	538	115
Heavy Vehicles (%)	2%	5%	9%	9%	2%	3%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	97.0	97.0	75.0	75.0	23.0	23.0
Effective Green, g (s)	97.0	97.0	75.0	75.0	23.0	23.0
Actuated g/C Ratio	0.75	0.75	0.58	0.58	0.18	0.18
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	451	2457	1830	818	581	265
v/s Ratio Prot	0.05	c0.60	0.33		c0.16	
v/s Ratio Perm	0.19			0.07		0.08
v/c Ratio	0.31	0.80	0.58	0.13	0.93	0.43
Uniform Delay, d1	7.4	10.4	17.5	12.6	52.7	47.7
Progression Factor	1.00	1.00	0.96	2.03	1.00	1.00
Incremental Delay, d2	1.8	2.8	1.2	0.3	22.9	5.1
Delay (s)	9.2	13.2	17.9	25.8	75.6	52.8
Level of Service	A	B	B	C	E	D
Approach Delay (s)		13.0	19.1		68.8	
Approach LOS		B	B		E	

Intersection Summary

HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Walkley Road & Sheffield Road

Future Total 2025 PM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	223	1957	719	117	300	391
Future Volume (vph)	223	1957	719	117	300	391
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.5			50.0	0.0	30.5
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1383	3390	3172	1146	3164	1381
Flt Permitted	0.315				0.950	
Satd. Flow (perm)	459	3390	3172	1146	3164	1381
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				119		389
Link Speed (k/h)		80	80		48	
Link Distance (m)		364.1	339.6		830.6	
Travel Time (s)		16.4	15.3		62.3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.97
Heavy Vehicles (%)	25%	2%	9%	35%	6%	12%
Adj. Flow (vph)	228	1997	734	119	306	403
Shared Lane Traffic (%)						
Lane Group Flow (vph)	228	1997	734	119	306	403
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.0	23.0	23.0	23.0	23.0
Total Split (s)	22.0	104.0	82.0	82.0	26.0	26.0
Total Split (%)	16.9%	80.0%	63.1%	63.1%	20.0%	20.0%
Maximum Green (s)	19.0	99.0	77.0	77.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	101.0	99.0	77.0	77.0	21.0	21.0
Actuated g/C Ratio	0.78	0.76	0.59	0.59	0.16	0.16

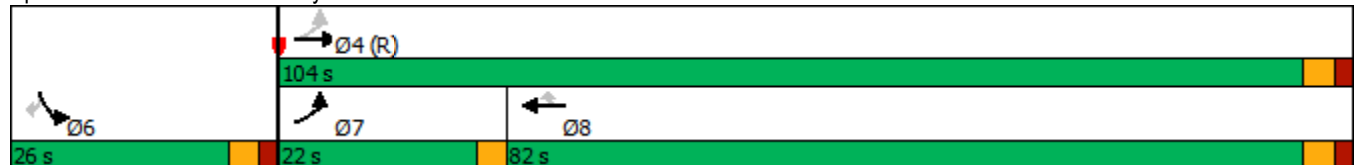


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.46	0.77	0.39	0.16	0.60	0.73
Control Delay	5.4	8.4	14.8	2.5	56.1	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.4	8.4	14.8	2.5	56.1	14.4
LOS	A	A	B	A	E	B
Approach Delay		8.1	13.1		32.4	
Approach LOS		A	B		C	
Queue Length 50th (m)	10.4	88.0	49.8	0.0	37.9	3.1
Queue Length 95th (m)	m18.7	122.8	62.8	7.8	52.9	37.4
Internal Link Dist (m)		340.1	315.6		806.6	
Turn Bay Length (m)	30.5			50.0		30.5
Base Capacity (vph)	491	2581	1878	727	511	549
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	0.46	0.77	0.39	0.16	0.60	0.73

Intersection Summary

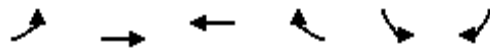
Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 13 (10%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 13.8  
 Intersection LOS: B  
 Intersection Capacity Utilization 74.5%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Walkley Road & Sheffield Road



HCM Signalized Intersection Capacity Analysis  
6: Walkley Road & Sheffield Road

Future Total 2025 PM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	223	1957	719	117	300	391
Future Volume (vph)	223	1957	719	117	300	391
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1383	3390	3172	1146	3164	1381
Flt Permitted	0.31	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	458	3390	3172	1146	3164	1381
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.97
Adj. Flow (vph)	228	1997	734	119	306	403
RTOR Reduction (vph)	0	0	0	49	0	326
Lane Group Flow (vph)	228	1997	734	70	306	77
Heavy Vehicles (%)	25%	2%	9%	35%	6%	12%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	99.0	99.0	77.0	77.0	21.0	21.0
Effective Green, g (s)	99.0	99.0	77.0	77.0	21.0	21.0
Actuated g/C Ratio	0.76	0.76	0.59	0.59	0.16	0.16
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	483	2581	1878	678	511	223
v/s Ratio Prot	0.07	c0.59	0.23		c0.10	
v/s Ratio Perm	0.29			0.06		0.06
v/c Ratio	0.47	0.77	0.39	0.10	0.60	0.34
Uniform Delay, d1	5.5	9.0	14.1	11.5	50.6	48.4
Progression Factor	0.94	0.76	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	1.3	0.6	0.3	5.1	4.2
Delay (s)	6.9	8.1	14.7	11.8	55.7	52.6
Level of Service	A	A	B	B	E	D
Approach Delay (s)		8.0	14.3		53.9	
Approach LOS		A	B		D	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
7: Walkley Road & Highway SB terminal

Future Total 2025 PM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (vph)	0	1509	191	0	175	635
Future Volume (vph)	0	1509	191	0	175	635
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Fr <sub>t</sub>						0.850
Fl <sub>t</sub> Protected					0.950	
Satd. Flow (prot)	0	3390	3390	0	1695	1517
Fl <sub>t</sub> Permitted					0.950	
Satd. Flow (perm)	0	3390	3390	0	1695	1517
Link Speed (k/h)		80	80		80	
Link Distance (m)		118.5	305.1		468.0	
Travel Time (s)		5.3	13.7		21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1588	201	0	184	668
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1588	201	0	184	668
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	60.9%
Analysis Period (min)	15
	ICU Level of Service B

HCM Unsignalized Intersection Capacity Analysis  
7: Walkley Road & Highway SB terminal

Future Total 2025 PM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (veh/h)	0	1509	191	0	175	635
Future Volume (Veh/h)	0	1509	191	0	175	635
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1588	201	0	184	668
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	201				995	100
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	201				995	100
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				24	29
cM capacity (veh/h)	1368				242	935
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	794	794	100	100	184	668
Volume Left	0	0	0	0	184	0
Volume Right	0	0	0	0	0	668
cSH	1700	1700	1700	1700	242	935
Volume to Capacity	0.47	0.47	0.06	0.06	0.76	0.71
Queue Length 95th (m)	0.0	0.0	0.0	0.0	41.5	47.9
Control Delay (s)	0.0	0.0	0.0	0.0	55.6	17.8
Lane LOS					F	C
Approach Delay (s)	0.0		0.0		26.0	
Approach LOS					D	
Intersection Summary						
Average Delay			8.4			
Intersection Capacity Utilization			60.9%		ICU Level of Service	B
Analysis Period (min)			15			

Lanes, Volumes, Timings  
 10: Highway NB terminal & Walkley Road

Future Total 2025 PM - Adjacent Peak  
 10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (vph)	606	1082	0	66	144	32
Future Volume (vph)	606	1082	0	66	144	32
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.904			0.976		
Flt Protected				0.961		
Satd. Flow (prot)	3065	0	0	3390	1674	0
Flt Permitted				0.961		
Satd. Flow (perm)	3065	0	0	3390	1674	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	305.1			95.4	443.2	
Travel Time (s)	13.7			7.2	33.2	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	666	1189	0	73	158	35
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1855	0	0	73	193	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14		24	24		14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	71.6% ICU Level of Service C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
 10: Highway NB terminal & Walkley Road

Future Total 2025 PM - Adjacent Peak  
 10-24-2022

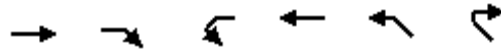


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (veh/h)	606	1082	0	66	144	32
Future Volume (Veh/h)	606	1082	0	66	144	32
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	666	1189	0	73	158	35
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			1855		1297	928
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1855		1297	928
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		0	87
cM capacity (veh/h)			322		154	270
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	
Volume Total	444	1411	36	36	193	
Volume Left	0	0	0	0	158	
Volume Right	0	1189	0	0	35	
cSH	1700	1700	1700	1700	167	
Volume to Capacity	0.26	0.83	0.02	0.02	1.16	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	78.4	
Control Delay (s)	0.0	0.0	0.0	0.0	174.4	
Lane LOS					F	
Approach Delay (s)	0.0		0.0		174.4	
Approach LOS					F	
<b>Intersection Summary</b>						
Average Delay			15.9			
Intersection Capacity Utilization			71.6%	ICU Level of Service	C	
Analysis Period (min)			15			



Lanes, Volumes, Timings  
 11: SB off ramp & Walkley Road

Future Total 2025 PM - Adjacent Peak  
 10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑	↑		↑↑↑		
Traffic Volume (vph)	1509	534	0	826	0	0
Future Volume (vph)	1509	534	0	826	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		50.0	0.0		0.0	0.0
Storage Lanes		1	0		0	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3390	1517	0	4871	0	0
Flt Permitted						
Satd. Flow (perm)	3390	1517	0	4871	0	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	339.6			118.5	265.8	
Travel Time (s)	15.3			8.9	19.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1588	562	0	869	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1588	562	0	869	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	47.4%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings  
13: Walkley Road & NB off ramp

Future Total 2025 PM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑	↗		
Traffic Volume (vph)	0	638	66	62	0	0
Future Volume (vph)	0	638	66	62	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			50.0	0.0	0.0
Storage Lanes	0			1	0	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3390	1784	1517	0	0
Flt Permitted						
Satd. Flow (perm)	0	3390	1784	1517	0	0
Link Speed (k/h)		80	48		48	
Link Distance (m)		95.4	197.1		264.7	
Travel Time (s)		4.3	14.8		19.9	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	701	73	68	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	701	73	68	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Free	

















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	21.9%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

















Lanes, Volumes, Timings  
15: Sheffield Road & Humber Place

Future Total 2025 PM - Adjacent Peak  
10-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	140	0	0	0	59	334	0	0	531	20
Future Volume (vph)	15	0	140	0	0	0	59	334	0	0	531	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>		0.878										0.995
Fl <sub>t</sub> Protected		0.995						0.993				
Satd. Flow (prot)	0	1452	0	0	1784	0	0	1378	0	0	1661	0
Fl <sub>t</sub> Permitted		0.995						0.993				
Satd. Flow (perm)	0	1452	0	0	1784	0	0	1378	0	0	1661	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		152.4			148.3			830.6			80.7	
Travel Time (s)		11.4			11.1			62.3			6.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	14%	2%	9%	33%	2%	2%	21%	33%	50%	0%	9%	10%
Adj. Flow (vph)	17	0	156	0	0	0	66	371	0	0	590	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	173	0	0	0	0	0	437	0	0	612	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	72.8%						ICU Level of Service C					
Analysis Period (min)	15											










HCM Unsignalized Intersection Capacity Analysis  
 15: Sheffield Road & Humber Place

Future Total 2025 PM - Adjacent Peak  
 10-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	140	0	0	0	59	334	0	0	531	20
Future Volume (Veh/h)	15	0	140	0	0	0	59	334	0	0	531	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	0	156	0	0	0	66	371	0	0	590	22
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1104	1104	601	1260	1115	371	612			371		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1104	1104	601	1260	1115	371	612			371		
tC, single (s)	7.2	6.5	6.3	7.4	6.5	6.2	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.4	3.8	4.0	3.3	2.4			2.2		
p0 queue free %	90	100	68	100	100	100	93			100		
cM capacity (veh/h)	168	195	488	82	192	675	881			1199		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	173	0	437	612								
Volume Left	17	0	66	0								
Volume Right	156	0	0	22								
cSH	411	1700	881	1199								
Volume to Capacity	0.42	0.00	0.07	0.00								
Queue Length 95th (m)	15.5	0.0	1.8	0.0								
Control Delay (s)	20.0	0.0	2.2	0.0								
Lane LOS	C	A	A									
Approach Delay (s)	20.0	0.0	2.2	0.0								
Approach LOS	C	A										
Intersection Summary												
Average Delay			3.6									
Intersection Capacity Utilization			72.8%		ICU Level of Service					C		
Analysis Period (min)			15									










Lanes, Volumes, Timings  
18: Sheffield Road & Way #5

Future Total 2025 PM - Adjacent Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	325	1	0	537
Future Volume (vph)	0	0	325	1	0	537
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Flt</b>						
Flt Protected						
Satd. Flow (prot)	1784	0	1784	0	0	1071
Flt Permitted						
Satd. Flow (perm)	1784	0	1784	0	0	1071
Link Speed (k/h)	48		48			48
Link Distance (m)	56.2		80.7			63.2
Travel Time (s)	4.2		6.1			4.7
Peak Hour Factor	0.90	0.90	0.92	0.90	0.90	0.90
Bus Blockages (#/hr)	0	0	0	0	0	100
Adj. Flow (vph)	0	0	353	1	0	597
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	354	0	0	597
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
<b>Two way Left Turn Lane</b>						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.96
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	33.2%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 18: Sheffield Road & Way #5










Future Total 2025 PM - Adjacent Peak  
 10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	325	1	0	537
Future Volume (Veh/h)	0	0	325	1	0	537
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.92	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	353	1	0	597
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	950	354			354	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	950	354			354	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	288	690			1205	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	354	597			
Volume Left	0	0	0			
Volume Right	0	1	0			
cSH	1700	1700	1205			
Volume to Capacity	0.00	0.21	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			33.2%	ICU Level of Service	A	
Analysis Period (min)			15			












Lanes, Volumes, Timings  
20: Sheffield Road & Way #4

Future Total 2025 PM - Adjacent Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	325	0	0	535
Future Volume (vph)	0	0	325	0	0	535
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fr</b>						
<b>Flt Protected</b>						
Satd. Flow (prot)	1784	0	1784	0	0	1784
<b>Flt Permitted</b>						
Satd. Flow (perm)	1784	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	60.6		63.2			102.2
Travel Time (s)	4.5		4.7			7.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	361	0	0	594
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	0	0	361	0	0	594
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
<b>Two way Left Turn Lane</b>						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	33.1%		ICU Level of Service A			
Analysis Period (min)	15					










HCM Unsignalized Intersection Capacity Analysis  
20: Sheffield Road & Way #4

Future Total 2025 PM - Adjacent Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	325	0	0	535
Future Volume (Veh/h)	0	0	325	0	0	535
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	361	0	0	594
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	955	361			361	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	955	361			361	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	287	684			1198	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	361	594			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1198			
Volume to Capacity	0.00	0.21	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			33.1%	ICU Level of Service	A	
Analysis Period (min)			15			










Lanes, Volumes, Timings  
24: Sheffield Road & Way #2

Future Total 2025 PM - Adjacent Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	284	42	10	535
Future Volume (vph)	0	0	284	42	10	535
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.983					
Fl <sub>t</sub> Protected	0.999					
Satd. Flow (prot)	1784	0	1754	0	0	1783
Fl <sub>t</sub> Permitted	0.999					
Satd. Flow (perm)	1784	0	1754	0	0	1783
Link Speed (k/h)	48		48			48
Link Distance (m)	65.0		102.2			76.9
Travel Time (s)	4.9		7.7			5.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	316	47	11	594
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	363	0	0	605
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	41.5%			ICU Level of Service A		
Analysis Period (min)	15					










HCM Unsignalized Intersection Capacity Analysis  
24: Sheffield Road & Way #2

Future Total 2025 PM - Adjacent Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	284	42	10	535
Future Volume (Veh/h)	0	0	284	42	10	535
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	316	47	11	594
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	956	340			363	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	956	340			363	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	284	703			1196	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	363	605			
Volume Left	0	0	11			
Volume Right	0	47	0			
cSH	1700	1700	1196			
Volume to Capacity	0.00	0.21	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.0	0.0	0.3			
Lane LOS	A		A			
Approach Delay (s)	0.0	0.0	0.3			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.2			
Intersection Capacity Utilization			41.5%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
26: Sheffield Road & Way #1

Future Total 2025 PM - Adjacent Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	20	6	287	0	0	514
Future Volume (vph)	20	6	287	0	0	514
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.967					
Flt Protected	0.963					
Satd. Flow (prot)	1662	0	1784	0	0	1784
Flt Permitted	0.963					
Satd. Flow (perm)	1662	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	58.8		76.9			181.8
Travel Time (s)	4.4		5.8			13.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	22	7	319	0	0	571
Shared Lane Traffic (%)						
Lane Group Flow (vph)	29	0	319	0	0	571
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	38.6%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 26: Sheffield Road & Way #1

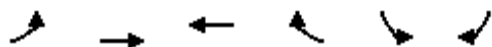
Future Total 2025 PM - Adjacent Peak  
 10-24-2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	6	287	0	0	514
Future Volume (Veh/h)	20	6	287	0	0	514
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	7	319	0	0	571
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	890	319			319	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	890	319			319	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	99			100	
cM capacity (veh/h)	313	722			1241	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	29	319	571			
Volume Left	22	0	0			
Volume Right	7	0	0			
cSH	363	1700	1241			
Volume to Capacity	0.08	0.19	0.00			
Queue Length 95th (m)	2.0	0.0	0.0			
Control Delay (s)	15.8	0.0	0.0			
Lane LOS	C					
Approach Delay (s)	15.8	0.0	0.0			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization			38.6%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
3: Walkley Road & Lancaster Road

Future Total 2025 AM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	201	749	1390	632	91	166
Future Volume (vph)	201	749	1390	632	91	166
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0			0.0	0.0	70.0
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1647	3007	3232	1517	3135	1406
Flt Permitted	0.110				0.950	
Satd. Flow (perm)	191	3007	3232	1517	3135	1406
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				601		171
Link Speed (k/h)		80	80		48	
Link Distance (m)		248.5	361.1		367.8	
Travel Time (s)		11.2	16.2		27.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	15%	7%	2%	7%	10%
Adj. Flow (vph)	207	772	1433	652	94	171
Shared Lane Traffic (%)						
Lane Group Flow (vph)	207	772	1433	652	94	171
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	24.0	122.0	98.0	98.0	28.0	28.0
Total Split (%)	16.0%	81.3%	65.3%	65.3%	18.7%	18.7%
Maximum Green (s)	21.0	117.0	93.0	93.0	23.0	23.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	119.0	117.0	93.0	93.0	23.0	23.0
Actuated g/C Ratio	0.79	0.78	0.62	0.62	0.15	0.15



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.58	0.33	0.72	0.56	0.20	0.47
Control Delay	20.4	5.3	11.0	2.0	56.7	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.4	5.3	11.0	2.0	56.7	12.2
LOS	C	A	B	A	E	B
Approach Delay		8.5	8.2		27.9	
Approach LOS		A	A		C	
Queue Length 50th (m)	16.3	31.2	44.3	6.7	12.7	0.0
Queue Length 95th (m)	43.8	38.3	m67.3	m20.4	21.4	21.3
Internal Link Dist (m)		224.5	337.1		343.8	
Turn Bay Length (m)	100.0					70.0
Base Capacity (vph)	355	2345	2003	1168	480	360
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	0.58	0.33	0.72	0.56	0.20	0.47

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 50 (33%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.72  
 Intersection Signal Delay: 9.8  
 Intersection Capacity Utilization 68.1%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service C  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Walkley Road & Lancaster Road





HCM Signalized Intersection Capacity Analysis  
3: Walkley Road & Lancaster Road

Future Total 2025 AM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	201	749	1390	632	91	166
Future Volume (vph)	201	749	1390	632	91	166
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1647	3007	3232	1517	3135	1406
Flt Permitted	0.11	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	191	3007	3232	1517	3135	1406
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	207	772	1433	652	94	171
RTOR Reduction (vph)	0	0	0	228	0	145
Lane Group Flow (vph)	207	772	1433	424	94	26
Heavy Vehicles (%)	5%	15%	7%	2%	7%	10%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	117.0	117.0	93.0	93.0	23.0	23.0
Effective Green, g (s)	117.0	117.0	93.0	93.0	23.0	23.0
Actuated g/C Ratio	0.78	0.78	0.62	0.62	0.15	0.15
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	352	2345	2003	940	480	215
v/s Ratio Prot	c0.08	0.26	c0.44		c0.03	
v/s Ratio Perm	0.38			0.28		0.02
v/c Ratio	0.59	0.33	0.72	0.45	0.20	0.12
Uniform Delay, d1	20.0	4.9	19.5	15.0	55.4	54.8
Progression Factor	1.00	1.00	0.51	0.77	1.00	1.00
Incremental Delay, d2	7.0	0.4	0.9	0.7	0.9	1.2
Delay (s)	27.1	5.3	10.8	12.3	56.3	55.9
Level of Service	C	A	B	B	E	E
Approach Delay (s)		9.9	11.3		56.1	
Approach LOS		A	B		E	

Intersection Summary

HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Walkley Road & Sheffield Road

Future Total 2025 AM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	304	445	1776	342	156	269
Future Volume (vph)	304	445	1776	342	156	269
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0			30.0	0.0	70.0
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1491	3060	3357	1459	2396	1190
Flt Permitted	0.044				0.950	
Satd. Flow (perm)	69	3060	3357	1459	2396	1190
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				103		274
Link Speed (k/h)		80	80		48	
Link Distance (m)		361.1	363.2		830.1	
Travel Time (s)		16.2	16.3		62.3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	16%	13%	3%	6%	40%	30%
Adj. Flow (vph)	310	454	1812	349	159	274
Shared Lane Traffic (%)						
Lane Group Flow (vph)	310	454	1812	349	159	274
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	32.0	124.0	92.0	92.0	26.0	26.0
Total Split (%)	21.3%	82.7%	61.3%	61.3%	17.3%	17.3%
Maximum Green (s)	29.0	119.0	87.0	87.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	121.0	119.0	87.0	87.0	21.0	21.0
Actuated g/C Ratio	0.81	0.79	0.58	0.58	0.14	0.14

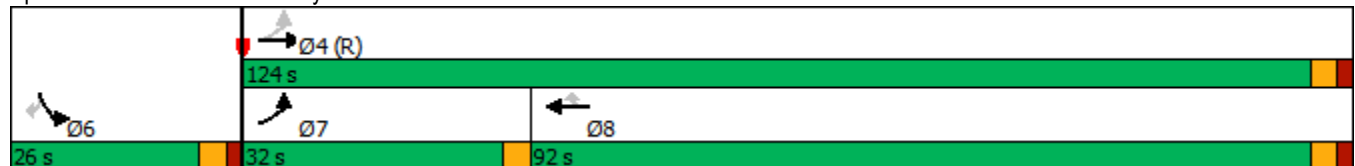


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.94	0.19	0.93	0.39	0.47	0.68
Control Delay	76.1	3.5	38.7	13.0	64.7	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.1	3.5	38.7	13.0	64.7	15.6
LOS	E	A	D	B	E	B
Approach Delay		33.0	34.5		33.6	
Approach LOS		C	C		C	
Queue Length 50th (m)	58.2	13.9	249.3	37.2	22.7	0.0
Queue Length 95th (m)	#130.1	17.3	291.1	58.6	34.8	29.6
Internal Link Dist (m)		337.1	339.2		806.1	
Turn Bay Length (m)	100.0			30.0		70.0
Base Capacity (vph)	330	2427	1947	889	335	402
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	0.94	0.19	0.93	0.39	0.47	0.68

Intersection Summary

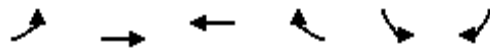
Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 50 (33%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 110  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.94  
 Intersection Signal Delay: 34.1  
 Intersection LOS: C  
 Intersection Capacity Utilization 86.0%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 6: Walkley Road & Sheffield Road



HCM Signalized Intersection Capacity Analysis  
6: Walkley Road & Sheffield Road

Future Total 2025 AM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	304	445	1776	342	156	269
Future Volume (vph)	304	445	1776	342	156	269
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1491	3060	3357	1459	2396	1190
Flt Permitted	0.04	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	70	3060	3357	1459	2396	1190
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	310	454	1812	349	159	274
RTOR Reduction (vph)	0	0	0	43	0	236
Lane Group Flow (vph)	310	454	1812	306	159	38
Heavy Vehicles (%)	16%	13%	3%	6%	40%	30%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	119.0	119.0	87.0	87.0	21.0	21.0
Effective Green, g (s)	119.0	119.0	87.0	87.0	21.0	21.0
Actuated g/C Ratio	0.79	0.79	0.58	0.58	0.14	0.14
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	330	2427	1947	846	335	166
v/s Ratio Prot	c0.18	0.15	0.54		c0.07	
v/s Ratio Perm	c0.57			0.21		0.03
v/c Ratio	0.94	0.19	0.93	0.36	0.47	0.23
Uniform Delay, d1	52.1	3.8	28.7	16.7	59.4	57.3
Progression Factor	0.85	0.89	1.00	1.00	1.00	1.00
Incremental Delay, d2	35.5	0.2	9.5	1.2	4.8	3.2
Delay (s)	79.7	3.5	38.3	17.9	64.2	60.6
Level of Service	E	A	D	B	E	E
Approach Delay (s)		34.4	35.0		61.9	
Approach LOS		C	C		E	

Intersection Summary			
HCM 2000 Control Delay	38.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
7: Walkley Road & Highway SB terminal

Future Total 2025 AM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↘
Traffic Volume (vph)	0	466	987	0	22	946
Future Volume (vph)	0	466	987	0	22	946
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Fr <sub>t</sub>						0.850
Fl <sub>t</sub> Protected					0.950	
Satd. Flow (prot)	0	3390	3390	0	1695	1517
Fl <sub>t</sub> Permitted					0.950	
Satd. Flow (perm)	0	3390	3390	0	1695	1517
Link Speed (k/h)		80	80		80	
Link Distance (m)		131.6	322.4		492.9	
Travel Time (s)		5.9	14.5		22.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	480	1018	0	23	975
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	480	1018	0	23	975
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	97.3% ICU Level of Service F
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
7: Walkley Road & Highway SB terminal

Future Total 2025 AM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (veh/h)	0	466	987	0	22	946
Future Volume (Veh/h)	0	466	987	0	22	946
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	480	1018	0	23	975
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1018				1258	509
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1018				1258	509
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				86	0
cM capacity (veh/h)	677				163	509
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>	<b>SB 2</b>
Volume Total	240	240	509	509	23	975
Volume Left	0	0	0	0	23	0
Volume Right	0	0	0	0	0	975
cSH	1700	1700	1700	1700	163	509
Volume to Capacity	0.14	0.14	0.30	0.30	0.14	1.91
Queue Length 95th (m)	0.0	0.0	0.0	0.0	3.6	485.9
Control Delay (s)	0.0	0.0	0.0	0.0	30.7	437.9
Lane LOS					D	F
Approach Delay (s)	0.0		0.0		428.5	
Approach LOS					F	
<b>Intersection Summary</b>						
Average Delay			171.3			
Intersection Capacity Utilization			97.3%		ICU Level of Service	F
Analysis Period (min)			15			

Lanes, Volumes, Timings  
 10: Highway NB terminal & Walkley Road

Future Total 2025 AM - Site Peak  
 10-24-2022















Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (vph)	51	439	0	588	431	7
Future Volume (vph)	51	439	0	588	431	7
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.866			0.998		
Flt Protected				0.953		
Satd. Flow (prot)	2936	0	0	3390	1697	0
Flt Permitted				0.953		
Satd. Flow (perm)	2936	0	0	3390	1697	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	322.4			108.3	295.7	
Travel Time (s)	14.5			8.1	22.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	55	472	0	632	463	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	527	0	0	632	471	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14		24	24		14
Sign Control	Free			Free	Stop	

Intersection Summary

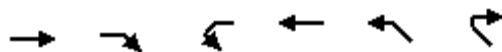
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	49.5% ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
 10: Highway NB terminal & Walkley Road

Future Total 2025 AM - Site Peak  
 10-24-2022

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	 			 	 	
Traffic Volume (veh/h)	51	439	0	588	431	7
Future Volume (Veh/h)	51	439	0	588	431	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	55	472	0	632	463	8
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			527		607	264
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			527		607	264
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		0	99
cM capacity (veh/h)			1036		428	735
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	
Volume Total	37	490	316	316	471	
Volume Left	0	0	0	0	463	
Volume Right	0	472	0	0	8	
cSH	1700	1700	1700	1700	431	
Volume to Capacity	0.02	0.29	0.19	0.19	1.09	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	121.8	
Control Delay (s)	0.0	0.0	0.0	0.0	101.6	
Lane LOS					F	
Approach Delay (s)	0.0		0.0		101.6	
Approach LOS					F	
<b>Intersection Summary</b>						
Average Delay			29.4			
Intersection Capacity Utilization			49.5%	ICU Level of Service	A	
Analysis Period (min)			15			





Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑	↑		↑↑↑		
Traffic Volume (vph)	466	214	0	1933	0	0
Future Volume (vph)	466	214	0	1933	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		60.0	0.0		0.0	0.0
Storage Lanes		1	0		0	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3390	1517	0	4871	0	0
Flt Permitted						
Satd. Flow (perm)	3390	1517	0	4871	0	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	363.2			131.6	210.3	
Travel Time (s)	16.3			9.9	15.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	518	238	0	2148	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	518	238	0	2148	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

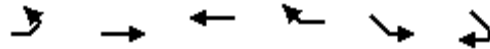
**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	42.8%
	ICU Level of Service A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings  
13: Walkley Road & NB off ramp

Future Total 2025 AM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑	↗		
Traffic Volume (vph)	0	58	588	209	0	0
Future Volume (vph)	0	58	588	209	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			70.0	0.0	0.0
Storage Lanes	0			1	0	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3390	1784	1517	0	0
Flt Permitted						
Satd. Flow (perm)	0	3390	1784	1517	0	0
Link Speed (k/h)		80	80		48	
Link Distance (m)		108.3	195.3		199.6	
Travel Time (s)		4.9	8.8		15.0	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	62	632	225	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	62	632	225	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Free	

















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.0%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

















Lanes, Volumes, Timings  
15: Sheffield Road & Humber Place










Future Total 2025 AM - Site Peak  
10-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	0	70	0	0	0	148	507	0	0	354	16
Future Volume (vph)	20	0	70	0	0	0	148	507	0	0	354	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>		0.895										0.994
Fl <sub>t</sub> Protected		0.989						0.989				
Satd. Flow (prot)	0	1290	0	0	1784	0	0	1585	0	0	1393	0
Fl <sub>t</sub> Permitted		0.989						0.989				
Satd. Flow (perm)	0	1290	0	0	1784	0	0	1585	0	0	1393	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		152.4			148.3			830.1			120.3	
Travel Time (s)		11.4			11.1			62.3			9.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	35%	2%	22%	50%	2%	33%	12%	14%	0%	33%	30%	26%
Adj. Flow (vph)	22	0	78	0	0	0	164	563	0	0	393	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	100	0	0	0	0	0	727	0	0	411	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	73.2%						ICU Level of Service D					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis  
 15: Sheffield Road & Humber Place










Future Total 2025 AM - Site Peak  
 10-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	0	70	0	0	0	148	507	0	0	354	16
Future Volume (Veh/h)	20	0	70	0	0	0	148	507	0	0	354	16
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	0	78	0	0	0	164	563	0	0	393	18
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1293	1293	402	1371	1302	563	411			563		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1293	1293	402	1371	1302	563	411			563		
tC, single (s)	7.4	6.5	6.4	7.6	6.5	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.8	4.0	3.5	4.0	4.0	3.6	2.3			2.5		
p0 queue free %	79	100	87	100	100	100	85			100		
cM capacity (veh/h)	106	138	607	75	137	471	1096			871		
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	100	0	727	411								
Volume Left	22	0	164	0								
Volume Right	78	0	0	18								
cSH	297	1700	1096	871								
Volume to Capacity	0.34	0.00	0.15	0.00								
Queue Length 95th (m)	10.9	0.0	4.0	0.0								
Control Delay (s)	23.2	0.0	3.5	0.0								
Lane LOS	C	A	A									
Approach Delay (s)	23.2	0.0	3.5	0.0								
Approach LOS	C	A										
Intersection Summary												
Average Delay			3.9									
Intersection Capacity Utilization			73.2%		ICU Level of Service					D		
Analysis Period (min)			15									

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	0	381	142	35	378
Future Volume (vph)	1	0	381	142	35	378
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.963					
Flt Protected	0.950					0.996
Satd. Flow (prot)	1695	0	1718	0	0	946
Flt Permitted	0.950					0.996
Satd. Flow (perm)	1695	0	1718	0	0	946
Link Speed (k/h)	48		48			48
Link Distance (m)	56.2		120.3			89.9
Travel Time (s)	4.2		9.0			6.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	100%
Adj. Flow (vph)	1	0	423	158	39	420
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	581	0	0	459
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	61.6%			ICU Level of Service B		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 18: Sheffield Road & Way #5










Future Total 2025 AM - Site Peak  
 10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	0	381	142	35	378
Future Volume (Veh/h)	1	0	381	142	35	378
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	0	423	158	39	420
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1000	502			581	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1000	502			581	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			96	
cM capacity (veh/h)	259	569			993	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	1	581	459			
Volume Left	1	0	39			
Volume Right	0	158	0			
cSH	259	1700	993			
Volume to Capacity	0.00	0.34	0.04			
Queue Length 95th (m)	0.1	0.0	0.9			
Control Delay (s)	19.0	0.0	1.2			
Lane LOS	C		A			
Approach Delay (s)	19.0	0.0	1.2			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization			61.6%	ICU Level of Service	B	
Analysis Period (min)			15			












Lanes, Volumes, Timings  
20: Sheffield Road & Way #4

Future Total 2025 AM - Site Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	156	39	392	0	0	257
Future Volume (vph)	156	39	392	0	0	257
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.973					
Fl <sub>t</sub> Protected	0.961					
Satd. Flow (prot)	1668	0	1784	0	0	1784
Fl <sub>t</sub> Permitted	0.961					
Satd. Flow (perm)	1668	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	60.6		89.9			135.3
Travel Time (s)	4.5		6.7			10.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	173	43	436	0	0	286
Shared Lane Traffic (%)						
Lane Group Flow (vph)	216	0	436	0	0	286
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	40.1%			ICU Level of Service A		
Analysis Period (min)	15					










HCM Unsignalized Intersection Capacity Analysis  
20: Sheffield Road & Way #4

Future Total 2025 AM - Site Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	156	39	392	0	0	257
Future Volume (Veh/h)	156	39	392	0	0	257
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	173	43	436	0	0	286
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	722	436			436	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	722	436			436	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	56	93			100	
cM capacity (veh/h)	394	620			1124	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	216	436	286			
Volume Left	173	0	0			
Volume Right	43	0	0			
cSH	424	1700	1124			
Volume to Capacity	0.51	0.26	0.00			
Queue Length 95th (m)	21.3	0.0	0.0			
Control Delay (s)	21.9	0.0	0.0			
Lane LOS	C					
Approach Delay (s)	21.9	0.0	0.0			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay			5.1			
Intersection Capacity Utilization			40.1%		ICU Level of Service	A
Analysis Period (min)			15			










Lanes, Volumes, Timings  
24: Sheffield Road & Way #2

Future Total 2025 AM - Site Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	420	0	0	257
Future Volume (vph)	0	0	420	0	0	257
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fr</b>						
<b>Flt Protected</b>						
Satd. Flow (prot)	1784	0	1784	0	0	1784
<b>Flt Permitted</b>						
Satd. Flow (perm)	1784	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	65.0		135.3			74.6
Travel Time (s)	4.9		10.1			5.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	467	0	0	286
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	0	0	467	0	0	286
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
<b>Two way Left Turn Lane</b>						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	26.7%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
24: Sheffield Road & Way #2

Future Total 2025 AM - Site Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	420	0	0	257
Future Volume (Veh/h)	0	0	420	0	0	257
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	467	0	0	286
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	753	467			467	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	753	467			467	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	377	596			1094	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	467	286			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1094			
Volume to Capacity	0.00	0.27	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			26.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
26: Sheffield Road & Way #1

Future Total 2025 AM - Site Peak  
10-24-2022












Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	429	0	0	255
Future Volume (vph)	0	0	429	0	0	255
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fr</b>						
Flt Protected						
Satd. Flow (prot)	1784	0	1784	0	0	1784
Flt Permitted						
Satd. Flow (perm)	1784	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	58.8		74.6			272.6
Travel Time (s)	4.4		5.6			20.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	477	0	0	283
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	0	0	477	0	0	283
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
<b>Two way Left Turn Lane</b>						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	27.2%
Analysis Period (min)	15
	ICU Level of Service A

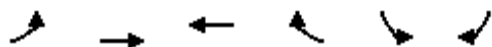
HCM Unsignalized Intersection Capacity Analysis  
26: Sheffield Road & Way #1

Future Total 2025 AM - Site Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	429	0	0	255
Future Volume (Veh/h)	0	0	429	0	0	255
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	477	0	0	283
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	760	477			477	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	760	477			477	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	374	588			1085	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	477	283			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1085			
Volume to Capacity	0.00	0.28	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			27.2%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
3: Walkley Road & Lancaster Road

Future Total 2025 PM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	94	1348	743	123	363	154
Future Volume (vph)	94	1348	743	123	363	154
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.5			0.0	0.0	30.5
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1695	3293	3172	1419	3288	1502
Flt Permitted	0.277				0.950	
Satd. Flow (perm)	494	3293	3172	1419	3288	1502
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				135		138
Link Speed (k/h)		80	80		48	
Link Distance (m)		306.2	364.1		701.3	
Travel Time (s)		13.8	16.4		52.6	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	5%	9%	9%	2%	3%
Adj. Flow (vph)	103	1481	816	135	399	169
Shared Lane Traffic (%)						
Lane Group Flow (vph)	103	1481	816	135	399	169
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	22.0	102.0	80.0	80.0	28.0	28.0
Total Split (%)	16.9%	78.5%	61.5%	61.5%	21.5%	21.5%
Maximum Green (s)	19.0	97.0	75.0	75.0	23.0	23.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	99.0	97.0	75.0	75.0	23.0	23.0
Actuated g/C Ratio	0.76	0.75	0.58	0.58	0.18	0.18

Lanes, Volumes, Timings  
 3: Walkley Road & Lancaster Road

Future Total 2025 PM - Site Peak  
 10-24-2022

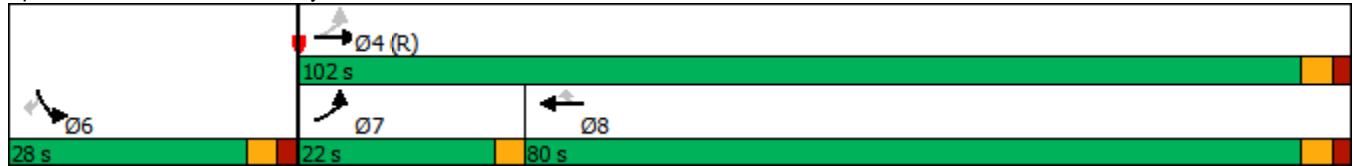


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.19	0.60	0.45	0.15	0.69	0.45
Control Delay	4.7	8.9	15.5	4.2	57.0	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.7	8.9	15.5	4.2	57.0	15.9
LOS	A	A	B	A	E	B
Approach Delay		8.6	13.9		44.8	
Approach LOS		A	B		D	
Queue Length 50th (m)	5.8	80.7	72.8	8.6	49.8	6.8
Queue Length 95th (m)	10.1	97.3	82.4	m15.7	67.1	27.7
Internal Link Dist (m)		282.2	340.1		677.3	
Turn Bay Length (m)	30.5					30.5
Base Capacity (vph)	551	2457	1830	875	581	379
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	0.19	0.60	0.45	0.15	0.69	0.45

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 50 (38%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.69  
 Intersection Signal Delay: 16.8  
 Intersection LOS: B  
 Intersection Capacity Utilization 58.6%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Walkley Road & Lancaster Road





HCM Signalized Intersection Capacity Analysis  
3: Walkley Road & Lancaster Road

Future Total 2025 PM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	94	1348	743	123	363	154
Future Volume (vph)	94	1348	743	123	363	154
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1695	3293	3172	1419	3288	1502
Flt Permitted	0.28	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	494	3293	3172	1419	3288	1502
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	103	1481	816	135	399	169
RTOR Reduction (vph)	0	0	0	57	0	114
Lane Group Flow (vph)	103	1481	816	78	399	55
Heavy Vehicles (%)	2%	5%	9%	9%	2%	3%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	97.0	97.0	75.0	75.0	23.0	23.0
Effective Green, g (s)	97.0	97.0	75.0	75.0	23.0	23.0
Actuated g/C Ratio	0.75	0.75	0.58	0.58	0.18	0.18
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	544	2457	1830	818	581	265
v/s Ratio Prot	0.03	c0.45	0.26		c0.12	
v/s Ratio Perm	0.11			0.05		0.04
v/c Ratio	0.19	0.60	0.45	0.10	0.69	0.21
Uniform Delay, d1	5.5	7.6	15.7	12.3	50.1	45.7
Progression Factor	1.00	1.00	0.93	1.93	1.00	1.00
Incremental Delay, d2	0.8	1.1	0.7	0.2	6.5	1.8
Delay (s)	6.3	8.7	15.3	24.0	56.6	47.5
Level of Service	A	A	B	C	E	D
Approach Delay (s)		8.6	16.5		53.9	
Approach LOS		A	B		D	

Intersection Summary

HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Walkley Road & Sheffield Road

Future Total 2025 PM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	190	1448	532	162	313	320
Future Volume (vph)	190	1448	532	162	313	320
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.5			50.0	0.0	30.5
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1383	3390	3172	1146	3164	1381
Flt Permitted	0.404				0.950	
Satd. Flow (perm)	588	3390	3172	1146	3164	1381
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				165		330
Link Speed (k/h)		80	80		48	
Link Distance (m)		364.1	339.6		830.6	
Travel Time (s)		16.4	15.3		62.3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.97
Heavy Vehicles (%)	25%	2%	9%	35%	6%	12%
Adj. Flow (vph)	194	1478	543	165	319	330
Shared Lane Traffic (%)						
Lane Group Flow (vph)	194	1478	543	165	319	330
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.0	23.0	23.0	23.0	23.0
Total Split (s)	22.0	104.0	82.0	82.0	26.0	26.0
Total Split (%)	16.9%	80.0%	63.1%	63.1%	20.0%	20.0%
Maximum Green (s)	19.0	99.0	77.0	77.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	101.0	99.0	77.0	77.0	21.0	21.0
Actuated g/C Ratio	0.78	0.76	0.59	0.59	0.16	0.16



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.34	0.57	0.29	0.22	0.62	0.66
Control Delay	4.2	5.2	13.5	2.4	56.9	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.2	5.2	13.5	2.4	56.9	12.1
LOS	A	A	B	A	E	B
Approach Delay		5.1	10.9		34.1	
Approach LOS		A	B		C	
Queue Length 50th (m)	8.4	49.4	34.2	0.0	39.7	0.0
Queue Length 95th (m)	m13.0	57.4	44.4	8.9	55.3	28.3
Internal Link Dist (m)		340.1	315.6		806.6	
Turn Bay Length (m)	30.5			50.0		30.5
Base Capacity (vph)	573	2581	1878	746	511	499
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	0.34	0.57	0.29	0.22	0.62	0.66

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 13 (10%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.66  
 Intersection Signal Delay: 12.7  
 Intersection LOS: B  
 Intersection Capacity Utilization 60.0%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Walkley Road & Sheffield Road



HCM Signalized Intersection Capacity Analysis  
6: Walkley Road & Sheffield Road

Future Total 2025 PM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	190	1448	532	162	313	320
Future Volume (vph)	190	1448	532	162	313	320
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1383	3390	3172	1146	3164	1381
Flt Permitted	0.40	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	589	3390	3172	1146	3164	1381
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.97
Adj. Flow (vph)	194	1478	543	165	319	330
RTOR Reduction (vph)	0	0	0	67	0	277
Lane Group Flow (vph)	194	1478	543	98	319	53
Heavy Vehicles (%)	25%	2%	9%	35%	6%	12%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	99.0	99.0	77.0	77.0	21.0	21.0
Effective Green, g (s)	99.0	99.0	77.0	77.0	21.0	21.0
Actuated g/C Ratio	0.76	0.76	0.59	0.59	0.16	0.16
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	564	2581	1878	678	511	223
v/s Ratio Prot	0.05	c0.44	0.17		c0.10	
v/s Ratio Perm	0.21			0.09		0.04
v/c Ratio	0.34	0.57	0.29	0.14	0.62	0.24
Uniform Delay, d1	4.6	6.6	13.0	11.8	50.8	47.5
Progression Factor	0.76	0.67	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	0.7	0.4	0.4	5.7	2.5
Delay (s)	4.8	5.1	13.4	12.3	56.5	50.0
Level of Service	A	A	B	B	E	D
Approach Delay (s)		5.1	13.2		53.2	
Approach LOS		A	B		D	

Intersection Summary

HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
7: Walkley Road & Highway SB terminal

Future Total 2025 PM - Site Peak  
10-24-2022



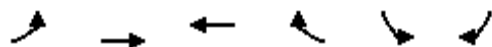
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (vph)	0	1144	171	0	130	516
Future Volume (vph)	0	1144	171	0	130	516
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Flt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3390	3390	0	1695	1517
Flt Permitted					0.950	
Satd. Flow (perm)	0	3390	3390	0	1695	1517
Link Speed (k/h)		80	80		80	
Link Distance (m)		118.5	305.1		468.0	
Travel Time (s)		5.3	13.7		21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1204	180	0	137	543
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1204	180	0	137	543
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	47.6%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
7: Walkley Road & Highway SB terminal

Future Total 2025 PM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (veh/h)	0	1144	171	0	130	516
Future Volume (Veh/h)	0	1144	171	0	130	516
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1204	180	0	137	543
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	180				782	90
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	180				782	90
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				59	43
cM capacity (veh/h)	1393				331	950
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>	<b>SB 2</b>
Volume Total	602	602	90	90	137	543
Volume Left	0	0	0	0	137	0
Volume Right	0	0	0	0	0	543
cSH	1700	1700	1700	1700	331	950
Volume to Capacity	0.35	0.35	0.05	0.05	0.41	0.57
Queue Length 95th (m)	0.0	0.0	0.0	0.0	14.9	28.3
Control Delay (s)	0.0	0.0	0.0	0.0	23.3	13.7
Lane LOS					C	B
Approach Delay (s)	0.0		0.0		15.7	
Approach LOS					C	
<b>Intersection Summary</b>						
Average Delay			5.2			
Intersection Capacity Utilization			47.6%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
 10: Highway NB terminal & Walkley Road

Future Total 2025 PM - Site Peak  
 10-24-2022















Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘↘	
Traffic Volume (vph)	448	828	0	49	136	24
Future Volume (vph)	448	828	0	49	136	24
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.903			0.980		
Flt Protected				0.959		
Satd. Flow (prot)	3061	0	0	3390	1677	0
Flt Permitted				0.959		
Satd. Flow (perm)	3061	0	0	3390	1677	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	305.1			95.4	443.2	
Travel Time (s)	13.7			7.2	33.2	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	492	910	0	54	149	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1402	0	0	54	175	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14		24	24		14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	57.4%
Analysis Period (min)	15
	ICU Level of Service B

HCM Unsignalized Intersection Capacity Analysis  
 10: Highway NB terminal & Walkley Road

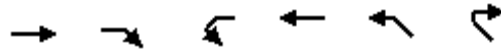
Future Total 2025 PM - Site Peak  
 10-24-2022

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	 			 	 	
Traffic Volume (veh/h)	448	828	0	49	136	24
Future Volume (Veh/h)	448	828	0	49	136	24
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	492	910	0	54	149	26
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			1402		974	701
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1402		974	701
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		40	93
cM capacity (veh/h)			483		249	381
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	
Volume Total	328	1074	27	27	175	
Volume Left	0	0	0	0	149	
Volume Right	0	910	0	0	26	
cSH	1700	1700	1700	1700	263	
Volume to Capacity	0.19	0.63	0.02	0.02	0.67	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	32.7	
Control Delay (s)	0.0	0.0	0.0	0.0	42.3	
Lane LOS					E	
Approach Delay (s)	0.0		0.0		42.3	
Approach LOS					E	
<b>Intersection Summary</b>						
Average Delay			4.5			
Intersection Capacity Utilization			57.4%	ICU Level of Service	B	
Analysis Period (min)			15			



Lanes, Volumes, Timings  
11: SB off ramp & Walkley Road

Future Total 2025 PM - Site Peak  
10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑	↑		↑↑↑		
Traffic Volume (vph)	1144	468	0	687	0	0
Future Volume (vph)	1144	468	0	687	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		50.0	0.0		0.0	0.0
Storage Lanes		1	0		0	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3390	1517	0	4871	0	0
Flt Permitted						
Satd. Flow (perm)	3390	1517	0	4871	0	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	339.6			118.5	265.8	
Travel Time (s)	15.3			8.9	19.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1204	493	0	723	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1204	493	0	723	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.7%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings  
13: Walkley Road & NB off ramp

Future Total 2025 PM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑	↗		
Traffic Volume (vph)	0	472	49	46	0	0
Future Volume (vph)	0	472	49	46	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			50.0	0.0	0.0
Storage Lanes	0			1	0	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3390	1784	1517	0	0
Flt Permitted						
Satd. Flow (perm)	0	3390	1784	1517	0	0
Link Speed (k/h)		80	48		48	
Link Distance (m)		95.4	197.1		264.7	
Travel Time (s)		4.3	14.8		19.9	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	519	54	51	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	519	54	51	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Free	

















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	17.1%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

















Lanes, Volumes, Timings  
15: Sheffield Road & Humber Place










Future Total 2025 PM - Site Peak  
10-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	104	0	0	0	44	347	0	0	515	15
Future Volume (vph)	11	0	104	0	0	0	44	347	0	0	515	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>		0.878									0.996	
Fl <sub>t</sub> Protected		0.995						0.994				
Satd. Flow (prot)	0	1452	0	0	1784	0	0	1374	0	0	1663	0
Fl <sub>t</sub> Permitted		0.995						0.994				
Satd. Flow (perm)	0	1452	0	0	1784	0	0	1374	0	0	1663	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		152.4			148.3			830.6			80.7	
Travel Time (s)		11.4			11.1			62.3			6.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	14%	2%	9%	33%	2%	2%	21%	33%	50%	0%	9%	10%
Adj. Flow (vph)	12	0	116	0	0	0	49	386	0	0	572	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	128	0	0	0	0	0	435	0	0	589	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	68.8%						ICU Level of Service C					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis  
 15: Sheffield Road & Humber Place










Future Total 2025 PM - Site Peak  
 10-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	0	104	0	0	0	44	347	0	0	515	15
Future Volume (Veh/h)	11	0	104	0	0	0	44	347	0	0	515	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	12	0	116	0	0	0	49	386	0	0	572	17
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1064	1064	580	1180	1073	386	589			386		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1064	1064	580	1180	1073	386	589			386		
tC, single (s)	7.2	6.5	6.3	7.4	6.5	6.2	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.4	3.8	4.0	3.3	2.4			2.2		
p0 queue free %	93	100	77	100	100	100	95			100		
cM capacity (veh/h)	182	211	501	107	208	662	899			1184		
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	128	0	435	589								
Volume Left	12	0	49	0								
Volume Right	116	0	0	17								
cSH	430	1700	899	1184								
Volume to Capacity	0.30	0.00	0.05	0.00								
Queue Length 95th (m)	9.3	0.0	1.3	0.0								
Control Delay (s)	16.9	0.0	1.6	0.0								
Lane LOS	C	A	A									
Approach Delay (s)	16.9	0.0	1.6	0.0								
Approach LOS	C	A										
Intersection Summary												
Average Delay			2.5									
Intersection Capacity Utilization			68.8%	ICU Level of Service						C		
Analysis Period (min)			15									

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	0	210	132	32	519
Future Volume (vph)	1	0	210	132	32	519
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.947			
Flt Protected	0.950					0.997
Satd. Flow (prot)	1695	0	1690	0	0	1067
Flt Permitted	0.950					0.997
Satd. Flow (perm)	1695	0	1690	0	0	1067
Link Speed (k/h)	48		48			48
Link Distance (m)	56.2		80.7			63.2
Travel Time (s)	4.2		6.1			4.7
Peak Hour Factor	0.90	0.90	0.92	0.90	0.90	0.90
Bus Blockages (#/hr)	0	0	0	0	0	100
Adj. Flow (vph)	1	0	228	147	36	577
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	375	0	0	613
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.96
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	64.2%			ICU Level of Service C		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 18: Sheffield Road & Way #5










Future Total 2025 PM - Site Peak  
 10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	0	210	132	32	519
Future Volume (Veh/h)	1	0	210	132	32	519
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.92	0.90	0.90	0.90
Hourly flow rate (vph)	1	0	228	147	36	577
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	950	302			375	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	950	302			375	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			97	
cM capacity (veh/h)	280	738			1183	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	1	375	613			
Volume Left	1	0	36			
Volume Right	0	147	0			
cSH	280	1700	1183			
Volume to Capacity	0.00	0.22	0.03			
Queue Length 95th (m)	0.1	0.0	0.7			
Control Delay (s)	17.9	0.0	0.8			
Lane LOS	C		A			
Approach Delay (s)	17.9	0.0	0.8			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization			64.2%	ICU Level of Service	C	
Analysis Period (min)			15			












Lanes, Volumes, Timings  
20: Sheffield Road & Way #4

Future Total 2025 PM - Site Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	140	34	210	0	0	409
Future Volume (vph)	140	34	210	0	0	409
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.974					
Fl <sub>t</sub> Protected	0.961					
Satd. Flow (prot)	1670	0	1784	0	0	1784
Fl <sub>t</sub> Permitted	0.961					
Satd. Flow (perm)	1670	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	60.6		63.2			102.2
Travel Time (s)	4.5		4.7			7.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	156	38	233	0	0	454
Shared Lane Traffic (%)						
Lane Group Flow (vph)	194	0	233	0	0	454
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	39.8%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
20: Sheffield Road & Way #4

Future Total 2025 PM - Site Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	140	34	210	0	0	409
Future Volume (Veh/h)	140	34	210	0	0	409
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	156	38	233	0	0	454
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	687	233			233	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	687	233			233	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	62	95			100	
cM capacity (veh/h)	413	806			1335	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	194	233	454			
Volume Left	156	0	0			
Volume Right	38	0	0			
cSH	456	1700	1335			
Volume to Capacity	0.43	0.14	0.00			
Queue Length 95th (m)	15.9	0.0	0.0			
Control Delay (s)	18.6	0.0	0.0			
Lane LOS	C					
Approach Delay (s)	18.6	0.0	0.0			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay			4.1			
Intersection Capacity Utilization			39.8%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
24: Sheffield Road & Way #2

Future Total 2025 PM - Site Peak  
10-24-2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	244	0	0	409
Future Volume (vph)	0	0	244	0	0	409
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fr</b>						
Flt Protected						
Satd. Flow (prot)	1784	0	1784	0	0	1784
Flt Permitted						
Satd. Flow (perm)	1784	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	65.0		102.2			76.9
Travel Time (s)	4.9		7.7			5.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	271	0	0	454
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	271	0	0	454
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	26.1%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 24: Sheffield Road & Way #2

Future Total 2025 PM - Site Peak  
 10-24-2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	244	0	0	409
Future Volume (Veh/h)	0	0	244	0	0	409
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	271	0	0	454
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	725	271			271	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	725	271			271	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	392	768			1292	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	271	454			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1292			
Volume to Capacity	0.00	0.16	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			26.1%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
26: Sheffield Road & Way #1










Future Total 2025 PM - Site Peak  
10-24-2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	246	0	0	409
Future Volume (vph)	0	0	246	0	0	409
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fr</b>						
Flt Protected						
Satd. Flow (prot)	1784	0	1784	0	0	1784
Flt Permitted						
Satd. Flow (perm)	1784	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	58.8		76.9			181.8
Travel Time (s)	4.4		5.8			13.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	273	0	0	454
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	0	0	273	0	0	454
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
<b>Two way Left Turn Lane</b>						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	26.1%		ICU Level of Service A			
Analysis Period (min)	15					

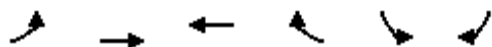
HCM Unsignalized Intersection Capacity Analysis  
26: Sheffield Road & Way #1

Future Total 2025 PM - Site Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	246	0	0	409
Future Volume (Veh/h)	0	0	246	0	0	409
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	273	0	0	454
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	727	273			273	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	727	273			273	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	391	766			1290	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	273	454			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1290			
Volume to Capacity	0.00	0.16	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			26.1%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
3: Walkley Road & Lancaster Road

Future Total 2030 AM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	222	788	1536	699	101	184
Future Volume (vph)	222	788	1536	699	101	184
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0			0.0	0.0	70.0
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1647	3007	3232	1517	3135	1406
Flt Permitted	0.081				0.950	
Satd. Flow (perm)	140	3007	3232	1517	3135	1406
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				601		190
Link Speed (k/h)		80	80		48	
Link Distance (m)		248.5	361.1		367.8	
Travel Time (s)		11.2	16.2		27.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	15%	7%	2%	7%	10%
Adj. Flow (vph)	229	812	1584	721	104	190
Shared Lane Traffic (%)						
Lane Group Flow (vph)	229	812	1584	721	104	190
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	24.0	122.0	98.0	98.0	28.0	28.0
Total Split (%)	16.0%	81.3%	65.3%	65.3%	18.7%	18.7%
Maximum Green (s)	21.0	117.0	93.0	93.0	23.0	23.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	119.0	117.0	93.0	93.0	23.0	23.0
Actuated g/C Ratio	0.79	0.78	0.62	0.62	0.15	0.15

Lanes, Volumes, Timings  
3: Walkley Road & Lancaster Road

Future Total 2030 AM - Adjacent Peak  
10-24-2022

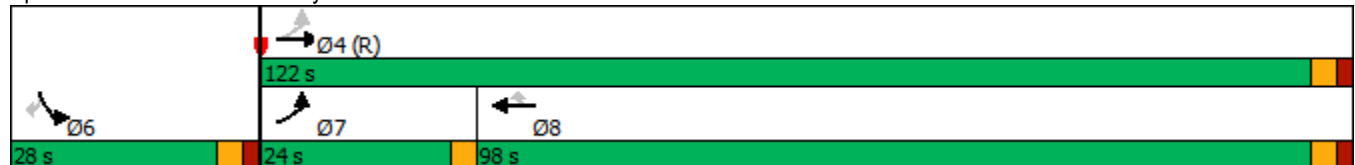


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.71	0.35	0.79	0.62	0.22	0.51
Control Delay	39.7	5.4	12.5	2.6	57.0	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.7	5.4	12.5	2.6	57.0	12.1
LOS	D	A	B	A	E	B
Approach Delay		13.0	9.4		28.0	
Approach LOS		B	A		C	
Queue Length 50th (m)	35.5	33.4	63.7	22.2	14.1	0.0
Queue Length 95th (m)	65.7	40.8	m67.6	m21.1	23.2	22.7
Internal Link Dist (m)		224.5	337.1		343.8	
Turn Bay Length (m)	100.0					70.0
Base Capacity (vph)	322	2345	2003	1168	480	376
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	0.71	0.35	0.79	0.62	0.22	0.51

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 50 (33%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 11.9  
 Intersection LOS: B  
 Intersection Capacity Utilization 73.6%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

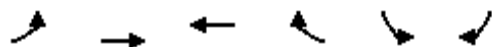
Splits and Phases: 3: Walkley Road & Lancaster Road





HCM Signalized Intersection Capacity Analysis  
3: Walkley Road & Lancaster Road

Future Total 2030 AM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	222	788	1536	699	101	184
Future Volume (vph)	222	788	1536	699	101	184
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1647	3007	3232	1517	3135	1406
Flt Permitted	0.08	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	140	3007	3232	1517	3135	1406
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	229	812	1584	721	104	190
RTOR Reduction (vph)	0	0	0	228	0	161
Lane Group Flow (vph)	229	812	1584	493	104	29
Heavy Vehicles (%)	5%	15%	7%	2%	7%	10%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	117.0	117.0	93.0	93.0	23.0	23.0
Effective Green, g (s)	117.0	117.0	93.0	93.0	23.0	23.0
Actuated g/C Ratio	0.78	0.78	0.62	0.62	0.15	0.15
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	320	2345	2003	940	480	215
v/s Ratio Prot	c0.10	0.27	c0.49		c0.03	
v/s Ratio Perm	0.46			0.32		0.02
v/c Ratio	0.72	0.35	0.79	0.52	0.22	0.14
Uniform Delay, d1	35.6	5.0	21.2	16.0	55.6	54.9
Progression Factor	1.00	1.00	0.53	0.75	1.00	1.00
Incremental Delay, d2	12.9	0.4	1.0	0.6	1.0	1.3
Delay (s)	48.5	5.4	12.3	12.6	56.6	56.2
Level of Service	D	A	B	B	E	E
Approach Delay (s)		14.9	12.4		56.4	
Approach LOS		B	B		E	

Intersection Summary

HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Walkley Road & Sheffield Road

Future Total 2030 AM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	297	492	1962	259	46	254
Future Volume (vph)	297	492	1962	259	46	254
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0			30.0	0.0	70.0
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1491	3060	3357	1459	2396	1190
Flt Permitted	0.044				0.950	
Satd. Flow (perm)	69	3060	3357	1459	2396	1190
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				71		259
Link Speed (k/h)		80	80		48	
Link Distance (m)		361.1	363.2		830.1	
Travel Time (s)		16.2	16.3		62.3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	16%	13%	3%	6%	40%	30%
Adj. Flow (vph)	303	502	2002	264	47	259
Shared Lane Traffic (%)						
Lane Group Flow (vph)	303	502	2002	264	47	259
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	32.0	124.0	92.0	92.0	26.0	26.0
Total Split (%)	21.3%	82.7%	61.3%	61.3%	17.3%	17.3%
Maximum Green (s)	29.0	119.0	87.0	87.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	121.0	119.0	87.0	87.0	21.0	21.0
Actuated g/C Ratio	0.81	0.79	0.58	0.58	0.14	0.14



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.92	0.21	1.03	0.30	0.14	0.67
Control Delay	72.3	3.6	59.2	12.4	57.9	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.3	3.6	59.2	12.4	57.9	15.4
LOS	E	A	E	B	E	B
Approach Delay		29.5	53.7		21.9	
Approach LOS		C	D		C	
Queue Length 50th (m)	56.8	15.7	~333.7	27.3	6.4	0.0
Queue Length 95th (m)	#125.8	19.3	#374.3	44.2	12.8	28.8
Internal Link Dist (m)		337.1	339.2		806.1	
Turn Bay Length (m)	100.0			30.0		70.0
Base Capacity (vph)	330	2427	1947	876	335	389
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	0.92	0.21	1.03	0.30	0.14	0.67

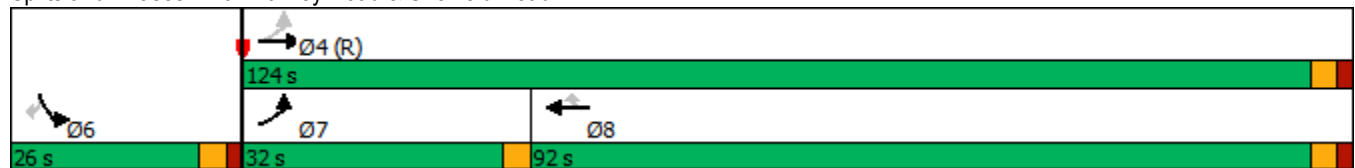
Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 50 (33%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 140  
 Control Type: Pretimed  
 Maximum v/c Ratio: 1.03  
 Intersection Signal Delay: 45.1  
 Intersection Capacity Utilization 90.4%  
 Analysis Period (min) 15  
 Intersection LOS: D  
 ICU Level of Service E

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

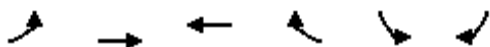
# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 6: Walkley Road & Sheffield Road



HCM Signalized Intersection Capacity Analysis  
6: Walkley Road & Sheffield Road

Future Total 2030 AM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	297	492	1962	259	46	254
Future Volume (vph)	297	492	1962	259	46	254
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1491	3060	3357	1459	2396	1190
Flt Permitted	0.04	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	70	3060	3357	1459	2396	1190
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	303	502	2002	264	47	259
RTOR Reduction (vph)	0	0	0	30	0	223
Lane Group Flow (vph)	303	502	2002	234	47	36
Heavy Vehicles (%)	16%	13%	3%	6%	40%	30%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	119.0	119.0	87.0	87.0	21.0	21.0
Effective Green, g (s)	119.0	119.0	87.0	87.0	21.0	21.0
Actuated g/C Ratio	0.79	0.79	0.58	0.58	0.14	0.14
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	330	2427	1947	846	335	166
v/s Ratio Prot	c0.18	0.16	c0.60		0.02	
v/s Ratio Perm	0.55			0.16		c0.03
v/c Ratio	0.92	0.21	1.03	0.28	0.14	0.22
Uniform Delay, d1	52.8	3.8	31.5	15.8	56.6	57.2
Progression Factor	0.86	0.89	1.00	1.00	1.00	1.00
Incremental Delay, d2	31.6	0.2	28.0	0.8	0.9	3.0
Delay (s)	77.0	3.6	59.5	16.6	57.5	60.2
Level of Service	E	A	E	B	E	E
Approach Delay (s)		31.2	54.5		59.8	
Approach LOS		C	D		E	

Intersection Summary

HCM 2000 Control Delay	49.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
7: Walkley Road & Highway SB terminal

Future Total 2030 AM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (vph)	0	475	1044	0	25	974
Future Volume (vph)	0	475	1044	0	25	974
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Flt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3390	3390	0	1695	1517
Flt Permitted					0.950	
Satd. Flow (perm)	0	3390	3390	0	1695	1517
Link Speed (k/h)		80	80		80	
Link Distance (m)		131.6	322.4		492.9	
Travel Time (s)		5.9	14.5		22.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	490	1076	0	26	1004
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	490	1076	0	26	1004
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	100.8%
ICU Level of Service	G
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
7: Walkley Road & Highway SB terminal

Future Total 2030 AM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (veh/h)	0	475	1044	0	25	974
Future Volume (Veh/h)	0	475	1044	0	25	974
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	490	1076	0	26	1004
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1076				1321	538
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1076				1321	538
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				82	0
cM capacity (veh/h)	644				148	488
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	245	245	538	538	26	1004
Volume Left	0	0	0	0	26	0
Volume Right	0	0	0	0	0	1004
cSH	1700	1700	1700	1700	148	488
Volume to Capacity	0.14	0.14	0.32	0.32	0.18	2.06
Queue Length 95th (m)	0.0	0.0	0.0	0.0	4.7	531.5
Control Delay (s)	0.0	0.0	0.0	0.0	34.4	503.0
Lane LOS					D	F
Approach Delay (s)	0.0		0.0		491.2	
Approach LOS					F	
Intersection Summary						
Average Delay			194.9			
Intersection Capacity Utilization			100.8%		ICU Level of Service	G
Analysis Period (min)			15			

Lanes, Volumes, Timings  
 10: Highway NB terminal & Walkley Road

Future Total 2030 AM - Adjacent Peak  
 10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (vph)	57	446	0	650	429	8
Future Volume (vph)	57	446	0	650	429	8
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Fr <sub>t</sub>	0.867			0.997		
Fl <sub>t</sub> Protected				0.953		
Satd. Flow (prot)	2939	0	0	3390	1695	0
Fl <sub>t</sub> Permitted				0.953		
Satd. Flow (perm)	2939	0	0	3390	1695	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	322.4			108.3	295.7	
Travel Time (s)	14.5			8.1	22.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	61	480	0	699	461	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	541	0	0	699	470	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14		24	24		14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.2%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
 10: Highway NB terminal & Walkley Road

Future Total 2030 AM - Adjacent Peak  
 10-24-2022

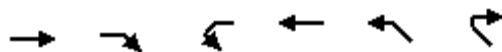


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (veh/h)	57	446	0	650	429	8
Future Volume (Veh/h)	57	446	0	650	429	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	61	480	0	699	461	9
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			541		650	270
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			541		650	270
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		0	99
cM capacity (veh/h)			1024		402	727
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	
Volume Total	41	500	350	350	470	
Volume Left	0	0	0	0	461	
Volume Right	0	480	0	0	9	
cSH	1700	1700	1700	1700	405	
Volume to Capacity	0.02	0.29	0.21	0.21	1.16	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	136.3	
Control Delay (s)	0.0	0.0	0.0	0.0	127.0	
Lane LOS					F	
Approach Delay (s)	0.0		0.0		127.0	
Approach LOS					F	
<b>Intersection Summary</b>						
Average Delay			34.9			
Intersection Capacity Utilization			51.2%	ICU Level of Service	A	
Analysis Period (min)			15			



Lanes, Volumes, Timings  
11: SB off ramp & Walkley Road

Future Total 2030 AM - Adjacent Peak  
10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑	↑		↑↑↑		
Traffic Volume (vph)	475	148	0	2018	0	0
Future Volume (vph)	475	148	0	2018	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		60.0	0.0		0.0	0.0
Storage Lanes		1	0		0	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3390	1517	0	4871	0	0
Flt Permitted						
Satd. Flow (perm)	3390	1517	0	4871	0	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	363.2			131.6	210.3	
Travel Time (s)	16.3			9.9	15.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	528	164	0	2242	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	528	164	0	2242	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

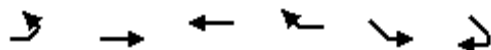
Intersection Capacity Utilization 44.5% ICU Level of Service A

Analysis Period (min) 15

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings  
13: Walkley Road & NB off ramp

Future Total 2030 AM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑	↗		
Traffic Volume (vph)	0	65	650	231	0	0
Future Volume (vph)	0	65	650	231	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			70.0	0.0	0.0
Storage Lanes	0			1	0	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3390	1784	1517	0	0
Flt Permitted						
Satd. Flow (perm)	0	3390	1784	1517	0	0
Link Speed (k/h)		80	80		48	
Link Distance (m)		108.3	195.3		199.6	
Travel Time (s)		4.9	8.8		15.0	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	70	699	248	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	70	699	248	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Free	

















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.4%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

















Lanes, Volumes, Timings  
15: Sheffield Road & Humber Place

Future Total 2030 AM - Adjacent Peak  
10-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	0	77	0	0	0	164	402	0	0	219	17
Future Volume (vph)	22	0	77	0	0	0	164	402	0	0	219	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>		0.894									0.990	
Fl <sub>t</sub> Protected		0.989						0.986				
Satd. Flow (prot)	0	1289	0	0	1784	0	0	1582	0	0	1389	0
Fl <sub>t</sub> Permitted		0.989						0.986				
Satd. Flow (perm)	0	1289	0	0	1784	0	0	1582	0	0	1389	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		152.4			148.3			830.1			120.3	
Travel Time (s)		11.4			11.1			62.3			9.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	35%	2%	22%	50%	2%	33%	12%	14%	0%	33%	30%	26%
Adj. Flow (vph)	24	0	86	0	0	0	182	447	0	0	243	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	110	0	0	0	0	0	629	0	0	262	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	61.5%						ICU Level of Service B					
Analysis Period (min)	15											










HCM Unsignalized Intersection Capacity Analysis  
 15: Sheffield Road & Humber Place

Future Total 2030 AM - Adjacent Peak  
 10-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	0	77	0	0	0	164	402	0	0	219	17
Future Volume (Veh/h)	22	0	77	0	0	0	164	402	0	0	219	17
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	24	0	86	0	0	0	182	447	0	0	243	19
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1064	1064	252	1150	1073	447	262			447		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1064	1064	252	1150	1073	447	262			447		
tC, single (s)	7.4	6.5	6.4	7.6	6.5	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.8	4.0	3.5	4.0	4.0	3.6	2.3			2.5		
p0 queue free %	84	100	88	100	100	100	85			100		
cM capacity (veh/h)	155	190	740	111	188	552	1246			967		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	110	0	629	262								
Volume Left	24	0	182	0								
Volume Right	86	0	0	19								
cSH	405	1700	1246	967								
Volume to Capacity	0.27	0.00	0.15	0.00								
Queue Length 95th (m)	8.3	0.0	3.9	0.0								
Control Delay (s)	17.2	0.0	3.6	0.0								
Lane LOS	C	A	A									
Approach Delay (s)	17.2	0.0	3.6	0.0								
Approach LOS	C	A										
Intersection Summary												
Average Delay			4.2									
Intersection Capacity Utilization			61.5%		ICU Level of Service					B		
Analysis Period (min)			15									










Lanes, Volumes, Timings  
18: Sheffield Road & Way #5

Future Total 2030 AM - Adjacent Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	0	421	1	0	246
Future Volume (vph)	1	0	421	1	0	246
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fr</b>						
Flt Protected	0.950					
Satd. Flow (prot)	1695	0	1784	0	0	910
Flt Permitted	0.950					
Satd. Flow (perm)	1695	0	1784	0	0	910
Link Speed (k/h)	48		48			48
Link Distance (m)	56.2		120.3			89.9
Travel Time (s)	4.2		9.0			6.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	100%
Adj. Flow (vph)	1	0	468	1	0	273
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	1	0	469	0	0	273
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
<b>Two way Left Turn Lane</b>						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	33.5%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 18: Sheffield Road & Way #5










Future Total 2030 AM - Adjacent Peak  
 10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	0	421	1	0	246
Future Volume (Veh/h)	1	0	421	1	0	246
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	0	468	1	0	273
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	742	468			469	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	742	468			469	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	383	595			1093	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	1	469	273			
Volume Left	1	0	0			
Volume Right	0	1	0			
cSH	383	1700	1093			
Volume to Capacity	0.00	0.28	0.00			
Queue Length 95th (m)	0.1	0.0	0.0			
Control Delay (s)	14.4	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	14.4	0.0	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			33.5%	ICU Level of Service	A	
Analysis Period (min)			15			












Lanes, Volumes, Timings  
20: Sheffield Road & Way #4

Future Total 2030 AM - Adjacent Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	421	0	0	246
Future Volume (vph)	0	0	421	0	0	246
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fr</b>						
Flt Protected						
Satd. Flow (prot)	1784	0	1784	0	0	1784
Flt Permitted						
Satd. Flow (perm)	1784	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	60.6		89.9			135.3
Travel Time (s)	4.5		6.7			10.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	468	0	0	273
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	0	0	468	0	0	273
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
<b>Two way Left Turn Lane</b>						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	26.7%		ICU Level of Service A			
Analysis Period (min)	15					










HCM Unsignalized Intersection Capacity Analysis  
 20: Sheffield Road & Way #4

Future Total 2030 AM - Adjacent Peak  
 10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	421	0	0	246
Future Volume (Veh/h)	0	0	421	0	0	246
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	468	0	0	273
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	741	468			468	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	741	468			468	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	384	595			1094	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	468	273			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1094			
Volume to Capacity	0.00	0.28	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			26.7%	ICU Level of Service	A	
Analysis Period (min)			15			










Lanes, Volumes, Timings  
24: Sheffield Road & Way #2

Future Total 2030 AM - Adjacent Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	422	0	0	246
Future Volume (vph)	0	0	422	0	0	246
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fr</b>						
<b>Flt Protected</b>						
Satd. Flow (prot)	1784	0	1784	0	0	1784
<b>Flt Permitted</b>						
Satd. Flow (perm)	1784	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	65.0		135.3			74.6
Travel Time (s)	4.9		10.1			5.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	469	0	0	273
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	0	0	469	0	0	273
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
<b>Two way Left Turn Lane</b>						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	26.8%			ICU Level of Service A		
Analysis Period (min)	15					










HCM Unsignalized Intersection Capacity Analysis  
24: Sheffield Road & Way #2

Future Total 2030 AM - Adjacent Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	422	0	0	246
Future Volume (Veh/h)	0	0	422	0	0	246
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	469	0	0	273
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	742	469			469	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	742	469			469	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	383	594			1093	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	469	273			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1093			
Volume to Capacity	0.00	0.28	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			26.8%	ICU Level of Service	A	
Analysis Period (min)			15			










Lanes, Volumes, Timings  
26: Sheffield Road & Way #1

Future Total 2030 AM - Adjacent Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	431	0	0	243
Future Volume (vph)	0	0	431	0	0	243
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fr</b>						
Flt Protected						
Satd. Flow (prot)	1784	0	1784	0	0	1784
Flt Permitted						
Satd. Flow (perm)	1784	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	58.8		74.6			272.6
Travel Time (s)	4.4		5.6			20.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	479	0	0	270
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	0	0	479	0	0	270
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
<b>Two way Left Turn Lane</b>						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	27.3%			ICU Level of Service A		
Analysis Period (min)	15					

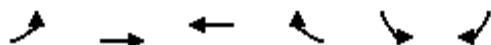
HCM Unsignalized Intersection Capacity Analysis  
26: Sheffield Road & Way #1

Future Total 2030 AM - Adjacent Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	431	0	0	243
Future Volume (Veh/h)	0	0	431	0	0	243
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	479	0	0	270
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	749	479			479	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	749	479			479	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	379	587			1083	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	479	270			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1083			
Volume to Capacity	0.00	0.28	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			27.3%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
3: Walkley Road & Lancaster Road

Future Total 2030 PM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	137	1915	1030	178	525	223
Future Volume (vph)	137	1915	1030	178	525	223
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.5			0.0	0.0	30.5
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1695	3293	3172	1419	3288	1502
Flt Permitted	0.170				0.950	
Satd. Flow (perm)	303	3293	3172	1419	3288	1502
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				196		139
Link Speed (k/h)		80	80		48	
Link Distance (m)		306.2	364.1		701.3	
Travel Time (s)		13.8	16.4		52.6	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	5%	9%	9%	2%	3%
Adj. Flow (vph)	151	2104	1132	196	577	245
Shared Lane Traffic (%)						
Lane Group Flow (vph)	151	2104	1132	196	577	245
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	22.0	102.0	80.0	80.0	28.0	28.0
Total Split (%)	16.9%	78.5%	61.5%	61.5%	21.5%	21.5%
Maximum Green (s)	19.0	97.0	75.0	75.0	23.0	23.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	99.0	97.0	75.0	75.0	23.0	23.0
Actuated g/C Ratio	0.76	0.75	0.58	0.58	0.18	0.18

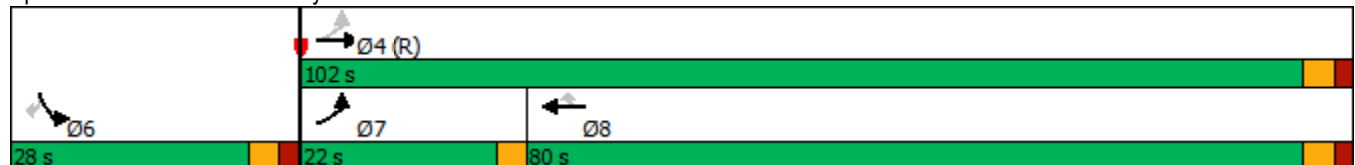


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.35	0.86	0.62	0.22	0.99	0.64
Control Delay	6.3	16.3	18.8	3.8	89.0	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.3	16.3	18.8	3.8	89.0	29.7
LOS	A	B	B	A	F	C
Approach Delay		15.6	16.6		71.3	
Approach LOS		B	B		E	
Queue Length 50th (m)	8.8	174.7	110.8	10.9	76.9	24.9
Queue Length 95th (m)	14.1	213.9	133.6	m17.8	#114.1	53.8
Internal Link Dist (m)		282.2	340.1		677.3	
Turn Bay Length (m)	30.5					30.5
Base Capacity (vph)	434	2457	1830	901	581	380
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	0.35	0.86	0.62	0.22	0.99	0.64

**Intersection Summary**

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 50 (38%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.99  
 Intersection Signal Delay: 26.3  
 Intersection LOS: C  
 Intersection Capacity Utilization 80.0%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

**Splits and Phases: 3: Walkley Road & Lancaster Road**





HCM Signalized Intersection Capacity Analysis  
3: Walkley Road & Lancaster Road

Future Total 2030 PM - Adjacent Peak  
10-24-2022



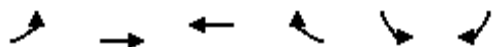
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	137	1915	1030	178	525	223
Future Volume (vph)	137	1915	1030	178	525	223
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1695	3293	3172	1419	3288	1502
Flt Permitted	0.17	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	303	3293	3172	1419	3288	1502
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	151	2104	1132	196	577	245
RTOR Reduction (vph)	0	0	0	83	0	114
Lane Group Flow (vph)	151	2104	1132	113	577	131
Heavy Vehicles (%)	2%	5%	9%	9%	2%	3%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	97.0	97.0	75.0	75.0	23.0	23.0
Effective Green, g (s)	97.0	97.0	75.0	75.0	23.0	23.0
Actuated g/C Ratio	0.75	0.75	0.58	0.58	0.18	0.18
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	429	2457	1830	818	581	265
v/s Ratio Prot	0.05	c0.64	0.36		c0.18	
v/s Ratio Perm	0.21			0.08		0.09
v/c Ratio	0.35	0.86	0.62	0.14	0.99	0.49
Uniform Delay, d1	8.3	11.6	18.1	12.6	53.4	48.2
Progression Factor	1.00	1.00	0.95	2.00	1.00	1.00
Incremental Delay, d2	2.3	4.1	1.4	0.3	35.7	6.4
Delay (s)	10.5	15.7	18.5	25.5	89.1	54.7
Level of Service	B	B	B	C	F	D
Approach Delay (s)		15.4	19.5		78.8	
Approach LOS		B	B		E	

Intersection Summary			
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Walkley Road & Sheffield Road

Future Total 2030 PM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	239	2098	771	123	319	418
Future Volume (vph)	239	2098	771	123	319	418
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.5			50.0	0.0	30.5
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1383	3390	3172	1146	3164	1381
Flt Permitted	0.293				0.950	
Satd. Flow (perm)	427	3390	3172	1146	3164	1381
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				126		369
Link Speed (k/h)		80	80		48	
Link Distance (m)		364.1	339.6		830.6	
Travel Time (s)		16.4	15.3		62.3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.97
Heavy Vehicles (%)	25%	2%	9%	35%	6%	12%
Adj. Flow (vph)	244	2141	787	126	326	431
Shared Lane Traffic (%)						
Lane Group Flow (vph)	244	2141	787	126	326	431
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.0	23.0	23.0	23.0	23.0
Total Split (s)	22.0	104.0	82.0	82.0	26.0	26.0
Total Split (%)	16.9%	80.0%	63.1%	63.1%	20.0%	20.0%
Maximum Green (s)	19.0	99.0	77.0	77.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	101.0	99.0	77.0	77.0	21.0	21.0
Actuated g/C Ratio	0.78	0.76	0.59	0.59	0.16	0.16



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.52	0.83	0.42	0.17	0.64	0.81
Control Delay	5.9	10.4	15.2	2.5	57.3	22.2
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	5.9	10.5	15.2	2.5	57.3	22.2
LOS	A	B	B	A	E	C
Approach Delay		10.0	13.5		37.3	
Approach LOS		A	B		D	
Queue Length 50th (m)	13.7	109.4	54.6	0.0	40.7	14.1
Queue Length 95th (m)	m18.4	m200.0	68.3	8.0	56.3	#66.3
Internal Link Dist (m)		340.1	315.6		806.6	
Turn Bay Length (m)	30.5			50.0		30.5
Base Capacity (vph)	471	2581	1878	730	511	532
Starvation Cap Reductn	0	32	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	0.52	0.84	0.42	0.17	0.64	0.81

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 13 (10%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.83  
 Intersection Signal Delay: 15.9  
 Intersection LOS: B  
 Intersection Capacity Utilization 79.2%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Walkley Road & Sheffield Road



HCM Signalized Intersection Capacity Analysis  
6: Walkley Road & Sheffield Road

Future Total 2030 PM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	239	2098	771	123	319	418
Future Volume (vph)	239	2098	771	123	319	418
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1383	3390	3172	1146	3164	1381
Flt Permitted	0.29	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	426	3390	3172	1146	3164	1381
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.97
Adj. Flow (vph)	244	2141	787	126	326	431
RTOR Reduction (vph)	0	0	0	51	0	309
Lane Group Flow (vph)	244	2141	787	75	326	122
Heavy Vehicles (%)	25%	2%	9%	35%	6%	12%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	99.0	99.0	77.0	77.0	21.0	21.0
Effective Green, g (s)	99.0	99.0	77.0	77.0	21.0	21.0
Actuated g/C Ratio	0.76	0.76	0.59	0.59	0.16	0.16
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	464	2581	1878	678	511	223
v/s Ratio Prot	0.08	c0.63	0.25		c0.10	
v/s Ratio Perm	0.32			0.07		0.09
v/c Ratio	0.53	0.83	0.42	0.11	0.64	0.55
Uniform Delay, d1	5.9	10.0	14.4	11.6	50.9	50.1
Progression Factor	1.01	0.85	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	1.5	0.7	0.3	6.0	9.3
Delay (s)	7.8	10.0	15.1	11.9	56.9	59.4
Level of Service	A	A	B	B	E	E
Approach Delay (s)		9.8	14.6		58.3	
Approach LOS		A	B		E	

Intersection Summary

HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
7: Walkley Road & Highway SB terminal

Future Total 2030 PM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (vph)	0	1618	203	0	187	679
Future Volume (vph)	0	1618	203	0	187	679
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Fr <sub>t</sub>						0.850
Fl <sub>t</sub> Protected					0.950	
Satd. Flow (prot)	0	3390	3390	0	1695	1517
Fl <sub>t</sub> Permitted					0.950	
Satd. Flow (perm)	0	3390	3390	0	1695	1517
Link Speed (k/h)		80	80		80	
Link Distance (m)		118.5	305.1		468.0	
Travel Time (s)		5.3	13.7		21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1703	214	0	197	715
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1703	214	0	197	715
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	64.8%
Analysis Period (min)	15
	ICU Level of Service C

HCM Unsignalized Intersection Capacity Analysis  
7: Walkley Road & Highway SB terminal

Future Total 2030 PM - Adjacent Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (veh/h)	0	1618	203	0	187	679
Future Volume (Veh/h)	0	1618	203	0	187	679
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1703	214	0	197	715
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	214				1066	107
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	214				1066	107
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				9	23
cM capacity (veh/h)	1353				217	926
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	852	852	107	107	197	715
Volume Left	0	0	0	0	197	0
Volume Right	0	0	0	0	0	715
cSH	1700	1700	1700	1700	217	926
Volume to Capacity	0.50	0.50	0.06	0.06	0.91	0.77
Queue Length 95th (m)	0.0	0.0	0.0	0.0	56.3	59.5
Control Delay (s)	0.0	0.0	0.0	0.0	85.3	20.7
Lane LOS					F	C
Approach Delay (s)	0.0		0.0		34.6	
Approach LOS					D	
Intersection Summary						
Average Delay			11.2			
Intersection Capacity Utilization			64.8%		ICU Level of Service	C
Analysis Period (min)			15			

Lanes, Volumes, Timings  
 10: Highway NB terminal & Walkley Road

Future Total 2030 PM - Adjacent Peak  
 10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (vph)	650	1159	0	71	152	35
Future Volume (vph)	650	1159	0	71	152	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Fr <sub>t</sub>	0.904			0.975		
Fl <sub>t</sub> Protected				0.961		
Satd. Flow (prot)	3065	0	0	3390	1672	0
Fl <sub>t</sub> Permitted				0.961		
Satd. Flow (perm)	3065	0	0	3390	1672	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	305.1			95.4	443.2	
Travel Time (s)	13.7			7.2	33.2	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	714	1274	0	78	167	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1988	0	0	78	205	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14		24	24		14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	76.2% ICU Level of Service D
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
 10: Highway NB terminal & Walkley Road

Future Total 2030 PM - Adjacent Peak  
 10-24-2022

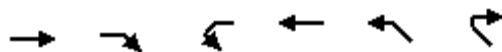


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (veh/h)	650	1159	0	71	152	35
Future Volume (Veh/h)	650	1159	0	71	152	35
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	714	1274	0	78	167	38
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			1988		1390	994
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1988		1390	994
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		0	84
cM capacity (veh/h)			286		133	244
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	
Volume Total	476	1512	39	39	205	
Volume Left	0	0	0	0	167	
Volume Right	0	1274	0	0	38	
cSH	1700	1700	1700	1700	146	
Volume to Capacity	0.28	0.89	0.02	0.02	1.41	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	100.6	
Control Delay (s)	0.0	0.0	0.0	0.0	276.9	
Lane LOS					F	
Approach Delay (s)	0.0		0.0		276.9	
Approach LOS					F	
<b>Intersection Summary</b>						
Average Delay			25.0			
Intersection Capacity Utilization			76.2%	ICU Level of Service	D	
Analysis Period (min)			15			



Lanes, Volumes, Timings  
11: SB off ramp & Walkley Road

Future Total 2030 PM - Adjacent Peak  
10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑	↑		↑↑↑		
Traffic Volume (vph)	1618	585	0	882	0	0
Future Volume (vph)	1618	585	0	882	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		50.0	0.0		0.0	0.0
Storage Lanes		1	0		0	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3390	1517	0	4871	0	0
Flt Permitted						
Satd. Flow (perm)	3390	1517	0	4871	0	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	339.6			118.5	265.8	
Travel Time (s)	15.3			8.9	19.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1703	616	0	928	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1703	616	0	928	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

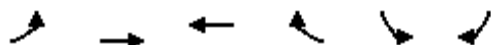
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.5%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings  
13: Walkley Road & NB off ramp

Future Total 2030 PM - Adjacent Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑	↗		
Traffic Volume (vph)	0	685	71	66	0	0
Future Volume (vph)	0	685	71	66	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			50.0	0.0	0.0
Storage Lanes	0			1	0	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3390	1784	1517	0	0
Flt Permitted						
Satd. Flow (perm)	0	3390	1784	1517	0	0
Link Speed (k/h)		80	48		48	
Link Distance (m)		95.4	197.1		264.7	
Travel Time (s)		4.3	14.8		19.9	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	753	78	73	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	753	78	73	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Free	

















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.3%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

















Lanes, Volumes, Timings  
15: Sheffield Road & Humber Place

Future Total 2030 PM - Adjacent Peak  
10-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	0	150	0	0	0	63	355	0	0	567	21
Future Volume (vph)	16	0	150	0	0	0	63	355	0	0	567	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>		0.878										0.995
Fl <sub>t</sub> Protected		0.995						0.993				
Satd. Flow (prot)	0	1452	0	0	1784	0	0	1378	0	0	1661	0
Fl <sub>t</sub> Permitted		0.995						0.993				
Satd. Flow (perm)	0	1452	0	0	1784	0	0	1378	0	0	1661	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		152.4			148.3			830.6			80.7	
Travel Time (s)		11.4			11.1			62.3			6.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	14%	2%	9%	33%	2%	2%	21%	33%	50%	0%	9%	10%
Adj. Flow (vph)	18	0	167	0	0	0	70	394	0	0	630	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	185	0	0	0	0	0	464	0	0	653	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	77.0%						ICU Level of Service D					
Analysis Period (min)	15											










HCM Unsignalized Intersection Capacity Analysis  
 15: Sheffield Road & Humber Place

Future Total 2030 PM - Adjacent Peak  
 10-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	0	150	0	0	0	63	355	0	0	567	21
Future Volume (Veh/h)	16	0	150	0	0	0	63	355	0	0	567	21
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	18	0	167	0	0	0	70	394	0	0	630	23
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1176	1176	642	1342	1187	394	653			394		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1176	1176	642	1342	1187	394	653			394		
tC, single (s)	7.2	6.5	6.3	7.4	6.5	6.2	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.4	3.8	4.0	3.3	2.4			2.2		
p0 queue free %	88	100	64	100	100	100	92			100		
cM capacity (veh/h)	149	176	462	66	173	655	850			1176		
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	185	0	464	653								
Volume Left	18	0	70	0								
Volume Right	167	0	0	23								
cSH	384	1700	850	1176								
Volume to Capacity	0.48	0.00	0.08	0.00								
Queue Length 95th (m)	19.3	0.0	2.0	0.0								
Control Delay (s)	22.8	0.0	2.3	0.0								
Lane LOS	C	A	A									
Approach Delay (s)	22.8	0.0	2.3	0.0								
Approach LOS	C	A										
Intersection Summary												
Average Delay			4.1									
Intersection Capacity Utilization			77.0%	ICU Level of Service							D	
Analysis Period (min)			15									










Lanes, Volumes, Timings  
18: Sheffield Road & Way #5

Future Total 2030 PM - Adjacent Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	0	346	1	0	574
Future Volume (vph)	1	0	346	1	0	574
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fr</b>						
Flt Protected	0.950					
Satd. Flow (prot)	1695	0	1784	0	0	1071
Flt Permitted	0.950					
Satd. Flow (perm)	1695	0	1784	0	0	1071
Link Speed (k/h)	48		48			48
Link Distance (m)	56.2		80.7			63.2
Travel Time (s)	4.2		6.1			4.7
Peak Hour Factor	0.90	0.90	0.92	0.90	0.90	0.90
Bus Blockages (#/hr)	0	0	0	0	0	100
Adj. Flow (vph)	1	0	376	1	0	638
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	1	0	377	0	0	638
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
<b>Two way Left Turn Lane</b>						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.96
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	41.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 18: Sheffield Road & Way #5

Future Total 2030 PM - Adjacent Peak  
 10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	0	346	1	0	574
Future Volume (Veh/h)	1	0	346	1	0	574
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.92	0.90	0.90	0.90
Hourly flow rate (vph)	1	0	376	1	0	638
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1014	376			377	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1014	376			377	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	264	670			1181	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	1	377	638			
Volume Left	1	0	0			
Volume Right	0	1	0			
cSH	264	1700	1181			
Volume to Capacity	0.00	0.22	0.00			
Queue Length 95th (m)	0.1	0.0	0.0			
Control Delay (s)	18.7	0.0	0.0			
Lane LOS	C					
Approach Delay (s)	18.7	0.0	0.0			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			41.9%	ICU Level of Service	A	
Analysis Period (min)			15			



Lanes, Volumes, Timings  
20: Sheffield Road & Way #4

Future Total 2030 PM - Adjacent Peak  
10-24-2022












Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	346	0	0	572
Future Volume (vph)	0	0	346	0	0	572
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fr</b>						
Flt Protected						
Satd. Flow (prot)	1784	0	1784	0	0	1784
Flt Permitted						
Satd. Flow (perm)	1784	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	60.6		63.2			102.2
Travel Time (s)	4.5		4.7			7.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	384	0	0	636
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	384	0	0	636
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	35.1%
Analysis Period (min)	15
	ICU Level of Service A










HCM Unsignalized Intersection Capacity Analysis  
20: Sheffield Road & Way #4

Future Total 2030 PM - Adjacent Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	346	0	0	572
Future Volume (Veh/h)	0	0	346	0	0	572
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	384	0	0	636
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1020	384			384	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1020	384			384	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	262	664			1174	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	384	636			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1174			
Volume to Capacity	0.00	0.23	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			35.1%	ICU Level of Service	A	
Analysis Period (min)			15			










Lanes, Volumes, Timings  
24: Sheffield Road & Way #2

Future Total 2030 PM - Adjacent Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	303	42	10	572
Future Volume (vph)	0	0	303	42	10	572
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.983					
Flt Protected	0.999					
Satd. Flow (prot)	1784	0	1754	0	0	1783
Flt Permitted	0.999					
Satd. Flow (perm)	1784	0	1754	0	0	1783
Link Speed (k/h)	48		48			48
Link Distance (m)	65.0		102.2			76.9
Travel Time (s)	4.9		7.7			5.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	337	47	11	636
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	384	0	0	647
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	43.6%			ICU Level of Service A		
Analysis Period (min)	15					










HCM Unsignalized Intersection Capacity Analysis  
24: Sheffield Road & Way #2

Future Total 2030 PM - Adjacent Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	303	42	10	572
Future Volume (Veh/h)	0	0	303	42	10	572
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	337	47	11	636
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1018	360			384	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1018	360			384	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	260	684			1174	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	384	647			
Volume Left	0	0	11			
Volume Right	0	47	0			
cSH	1700	1700	1174			
Volume to Capacity	0.00	0.23	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.0	0.0	0.3			
Lane LOS	A		A			
Approach Delay (s)	0.0	0.0	0.3			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.2			
Intersection Capacity Utilization			43.6%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
26: Sheffield Road & Way #1

Future Total 2030 PM - Adjacent Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	20	6	307	0	0	551
Future Volume (vph)	20	6	307	0	0	551
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.967					
Fl <sub>t</sub> Protected	0.963					
Satd. Flow (prot)	1662	0	1784	0	0	1784
Fl <sub>t</sub> Permitted	0.963					
Satd. Flow (perm)	1662	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	58.8		76.9			181.8
Travel Time (s)	4.4		5.8			13.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	22	7	341	0	0	612
Shared Lane Traffic (%)						
Lane Group Flow (vph)	29	0	341	0	0	612
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	40.6%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 26: Sheffield Road & Way #1

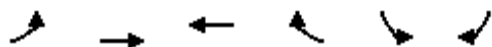
Future Total 2030 PM - Adjacent Peak  
 10-24-2022



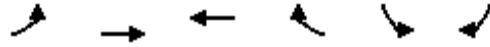
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	6	307	0	0	551
Future Volume (Veh/h)	20	6	307	0	0	551
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	7	341	0	0	612
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	953	341			341	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	953	341			341	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	99			100	
cM capacity (veh/h)	287	701			1218	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	29	341	612			
Volume Left	22	0	0			
Volume Right	7	0	0			
cSH	335	1700	1218			
Volume to Capacity	0.09	0.20	0.00			
Queue Length 95th (m)	2.1	0.0	0.0			
Control Delay (s)	16.8	0.0	0.0			
Lane LOS	C					
Approach Delay (s)	16.8	0.0	0.0			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization			40.6%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
3: Walkley Road & Lancaster Road

Future Total 2030 AM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	215	800	1490	678	98	178
Future Volume (vph)	215	800	1490	678	98	178
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0			0.0	0.0	70.0
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1647	3007	3232	1517	3135	1406
Flt Permitted	0.090				0.950	
Satd. Flow (perm)	156	3007	3232	1517	3135	1406
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				601		184
Link Speed (k/h)		80	80		48	
Link Distance (m)		248.5	361.1		367.8	
Travel Time (s)		11.2	16.2		27.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	15%	7%	2%	7%	10%
Adj. Flow (vph)	222	825	1536	699	101	184
Shared Lane Traffic (%)						
Lane Group Flow (vph)	222	825	1536	699	101	184
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	24.0	122.0	98.0	98.0	28.0	28.0
Total Split (%)	16.0%	81.3%	65.3%	65.3%	18.7%	18.7%
Maximum Green (s)	21.0	117.0	93.0	93.0	23.0	23.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	119.0	117.0	93.0	93.0	23.0	23.0
Actuated g/C Ratio	0.79	0.78	0.62	0.62	0.15	0.15



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.67	0.35	0.77	0.60	0.21	0.50
Control Delay	33.0	5.5	12.2	2.4	56.9	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.0	5.5	12.2	2.4	56.9	12.1
LOS	C	A	B	A	E	B
Approach Delay		11.3	9.1		28.0	
Approach LOS		B	A		C	
Queue Length 50th (m)	29.3	34.0	62.0	20.1	13.7	0.0
Queue Length 95th (m)	58.7	41.7	m68.4	m20.6	22.7	22.3
Internal Link Dist (m)		224.5	337.1		343.8	
Turn Bay Length (m)	100.0					70.0
Base Capacity (vph)	332	2345	2003	1168	480	371
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	0.67	0.35	0.77	0.60	0.21	0.50

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 50 (33%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 11.3  
 Intersection LOS: B  
 Intersection Capacity Utilization 71.9%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

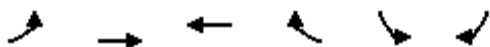
Splits and Phases: 3: Walkley Road & Lancaster Road





HCM Signalized Intersection Capacity Analysis  
3: Walkley Road & Lancaster Road

Future Total 2030 AM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	215	800	1490	678	98	178
Future Volume (vph)	215	800	1490	678	98	178
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1647	3007	3232	1517	3135	1406
Flt Permitted	0.09	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	156	3007	3232	1517	3135	1406
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	222	825	1536	699	101	184
RTOR Reduction (vph)	0	0	0	228	0	156
Lane Group Flow (vph)	222	825	1536	471	101	28
Heavy Vehicles (%)	5%	15%	7%	2%	7%	10%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	117.0	117.0	93.0	93.0	23.0	23.0
Effective Green, g (s)	117.0	117.0	93.0	93.0	23.0	23.0
Actuated g/C Ratio	0.78	0.78	0.62	0.62	0.15	0.15
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	330	2345	2003	940	480	215
v/s Ratio Prot	c0.09	0.27	c0.48		c0.03	
v/s Ratio Perm	0.43			0.31		0.02
v/c Ratio	0.67	0.35	0.77	0.50	0.21	0.13
Uniform Delay, d1	31.1	5.0	20.6	15.7	55.6	54.9
Progression Factor	1.00	1.00	0.54	0.79	1.00	1.00
Incremental Delay, d2	10.5	0.4	0.9	0.6	1.0	1.3
Delay (s)	41.6	5.4	12.0	13.0	56.6	56.1
Level of Service	D	A	B	B	E	E
Approach Delay (s)		13.1	12.3		56.3	
Approach LOS		B	B		E	

Intersection Summary

HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Walkley Road & Sheffield Road

Future Total 2030 AM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	324	477	1903	358	159	286
Future Volume (vph)	324	477	1903	358	159	286
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	100.0			30.0	0.0	70.0
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1491	3060	3357	1459	2396	1190
Flt Permitted	0.044				0.950	
Satd. Flow (perm)	69	3060	3357	1459	2396	1190
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				101		281
Link Speed (k/h)		80	80		48	
Link Distance (m)		361.1	363.2		830.1	
Travel Time (s)		16.2	16.3		62.3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	16%	13%	3%	6%	40%	30%
Adj. Flow (vph)	331	487	1942	365	162	292
Shared Lane Traffic (%)						
Lane Group Flow (vph)	331	487	1942	365	162	292
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	32.0	124.0	92.0	92.0	26.0	26.0
Total Split (%)	21.3%	82.7%	61.3%	61.3%	17.3%	17.3%
Maximum Green (s)	29.0	119.0	87.0	87.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	121.0	119.0	87.0	87.0	21.0	21.0
Actuated g/C Ratio	0.81	0.79	0.58	0.58	0.14	0.14

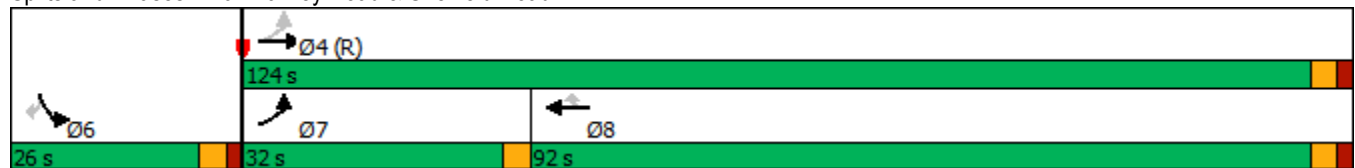


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	1.00	0.20	1.00	0.41	0.48	0.72
Control Delay	91.7	3.6	51.0	13.6	64.9	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.7	3.6	51.0	13.6	64.9	18.1
LOS	F	A	D	B	E	B
Approach Delay		39.2	45.1		34.8	
Approach LOS		D	D		C	
Queue Length 50th (m)	~63.5	15.0	291.8	40.7	23.2	2.9
Queue Length 95th (m)	#144.6	18.5	#354.8	62.9	35.5	35.5
Internal Link Dist (m)		337.1	339.2		806.1	
Turn Bay Length (m)	100.0			30.0		70.0
Base Capacity (vph)	330	2427	1947	888	335	408
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	1.00	0.20	1.00	0.41	0.48	0.72

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 50 (33%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 140  
 Control Type: Pretimed  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 42.4  
 Intersection LOS: D  
 Intersection Capacity Utilization 90.9%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 6: Walkley Road & Sheffield Road



HCM Signalized Intersection Capacity Analysis  
6: Walkley Road & Sheffield Road

Future Total 2030 AM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑↑	↑↑	↑	↙↘	↘
Traffic Volume (vph)	324	477	1903	358	159	286
Future Volume (vph)	324	477	1903	358	159	286
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1491	3060	3357	1459	2396	1190
Flt Permitted	0.04	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	70	3060	3357	1459	2396	1190
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	331	487	1942	365	162	292
RTOR Reduction (vph)	0	0	0	42	0	242
Lane Group Flow (vph)	331	487	1942	323	162	50
Heavy Vehicles (%)	16%	13%	3%	6%	40%	30%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	119.0	119.0	87.0	87.0	21.0	21.0
Effective Green, g (s)	119.0	119.0	87.0	87.0	21.0	21.0
Actuated g/C Ratio	0.79	0.79	0.58	0.58	0.14	0.14
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	330	2427	1947	846	335	166
v/s Ratio Prot	c0.19	0.16	0.58		c0.07	
v/s Ratio Perm	c0.60			0.22		0.04
v/c Ratio	1.00	0.20	1.00	0.38	0.48	0.30
Uniform Delay, d1	54.1	3.8	31.4	17.0	59.5	57.9
Progression Factor	0.87	0.88	1.00	1.00	1.00	1.00
Incremental Delay, d2	49.3	0.2	19.8	1.3	4.9	4.7
Delay (s)	96.2	3.5	51.2	18.3	64.4	62.6
Level of Service	F	A	D	B	E	E
Approach Delay (s)		41.0	46.0		63.2	
Approach LOS		D	D		E	

Intersection Summary

HCM 2000 Control Delay	47.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
7: Walkley Road & Highway SB terminal

Future Total 2030 AM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (vph)	0	495	1055	0	24	1009
Future Volume (vph)	0	495	1055	0	24	1009
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Fr <sub>t</sub>						0.850
Fl <sub>t</sub> Protected					0.950	
Satd. Flow (prot)	0	3390	3390	0	1695	1517
Fl <sub>t</sub> Permitted					0.950	
Satd. Flow (perm)	0	3390	3390	0	1695	1517
Link Speed (k/h)		80	80		80	
Link Distance (m)		131.6	322.4		492.9	
Travel Time (s)		5.9	14.5		22.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	510	1088	0	25	1040
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	510	1088	0	25	1040
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	103.4%
ICU Level of Service	G
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
 7: Walkley Road & Highway SB terminal

Future Total 2030 AM - Site Peak  
 10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (veh/h)	0	495	1055	0	24	1009
Future Volume (Veh/h)	0	495	1055	0	24	1009
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	510	1088	0	25	1040
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1088				1343	544
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1088				1343	544
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				83	0
cM capacity (veh/h)	637				143	483
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>	<b>SB 2</b>
Volume Total	255	255	544	544	25	1040
Volume Left	0	0	0	0	25	0
Volume Right	0	0	0	0	0	1040
cSH	1700	1700	1700	1700	143	483
Volume to Capacity	0.15	0.15	0.32	0.32	0.17	2.15
Queue Length 95th (m)	0.0	0.0	0.0	0.0	4.6	568.6
Control Delay (s)	0.0	0.0	0.0	0.0	35.4	544.6
Lane LOS					E	F
Approach Delay (s)	0.0		0.0		532.6	
Approach LOS					F	
<b>Intersection Summary</b>						
Average Delay			213.0			
Intersection Capacity Utilization			103.4%		ICU Level of Service	G
Analysis Period (min)			15			

Lanes, Volumes, Timings  
 10: Highway NB terminal & Walkley Road

Future Total 2030 AM - Site Peak  
 10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (vph)	55	467	0	631	459	8
Future Volume (vph)	55	467	0	631	459	8
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.866			0.998		
Flt Protected				0.953		
Satd. Flow (prot)	2936	0	0	3390	1697	0
Flt Permitted				0.953		
Satd. Flow (perm)	2936	0	0	3390	1697	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	322.4			108.3	295.7	
Travel Time (s)	14.5			8.1	22.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	59	502	0	678	494	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	561	0	0	678	503	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14		24	24		14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	52.4%
Analysis Period (min)	15
	ICU Level of Service A

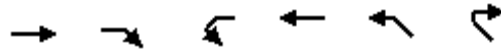
HCM Unsignalized Intersection Capacity Analysis  
 10: Highway NB terminal & Walkley Road

Future Total 2030 AM - Site Peak  
 10-24-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (veh/h)	55	467	0	631	459	8
Future Volume (Veh/h)	55	467	0	631	459	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	59	502	0	678	494	9
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			561		649	280
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			561		649	280
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		0	99
cM capacity (veh/h)			1006		402	717
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	
Volume Total	39	522	339	339	503	
Volume Left	0	0	0	0	494	
Volume Right	0	502	0	0	9	
cSH	1700	1700	1700	1700	406	
Volume to Capacity	0.02	0.31	0.20	0.20	1.24	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	160.4	
Control Delay (s)	0.0	0.0	0.0	0.0	156.5	
Lane LOS					F	
Approach Delay (s)	0.0		0.0		156.5	
Approach LOS					F	
<b>Intersection Summary</b>						
Average Delay			45.2			
Intersection Capacity Utilization			52.4%	ICU Level of Service	A	
Analysis Period (min)			15			





Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑	↑		↑↑↑		
Traffic Volume (vph)	495	224	0	2064	0	0
Future Volume (vph)	495	224	0	2064	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		60.0	0.0		0.0	0.0
Storage Lanes		1	0		0	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3390	1517	0	4871	0	0
Flt Permitted						
Satd. Flow (perm)	3390	1517	0	4871	0	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	363.2			131.6	210.3	
Travel Time (s)	16.3			9.9	15.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	550	249	0	2293	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	550	249	0	2293	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

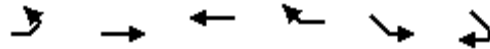
**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	45.4%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings  
13: Walkley Road & NB off ramp

Future Total 2030 AM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑	↗		
Traffic Volume (vph)	0	63	631	224	0	0
Future Volume (vph)	0	63	631	224	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			70.0	0.0	0.0
Storage Lanes	0			1	0	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3390	1784	1517	0	0
Flt Permitted						
Satd. Flow (perm)	0	3390	1784	1517	0	0
Link Speed (k/h)		80	80		48	
Link Distance (m)		108.3	195.3		199.6	
Travel Time (s)		4.9	8.8		15.0	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	68	678	241	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	68	678	241	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Free	

















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	38.4%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

















Lanes, Volumes, Timings  
15: Sheffield Road & Humber Place

Future Total 2030 AM - Site Peak  
10-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	0	75	0	0	0	159	532	0	0	368	16
Future Volume (vph)	21	0	75	0	0	0	159	532	0	0	368	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.894									0.994	
Flt Protected		0.989						0.989				
Satd. Flow (prot)	0	1289	0	0	1784	0	0	1585	0	0	1393	0
Flt Permitted		0.989						0.989				
Satd. Flow (perm)	0	1289	0	0	1784	0	0	1585	0	0	1393	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		152.4			148.3			830.1			120.3	
Travel Time (s)		11.4			11.1			62.3			9.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	35%	2%	22%	50%	2%	33%	12%	14%	0%	33%	30%	26%
Adj. Flow (vph)	23	0	83	0	0	0	177	591	0	0	409	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	106	0	0	0	0	0	768	0	0	427	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	76.4%						ICU Level of Service D					
Analysis Period (min)	15											










HCM Unsignalized Intersection Capacity Analysis  
 15: Sheffield Road & Humber Place

Future Total 2030 AM - Site Peak  
 10-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	0	75	0	0	0	159	532	0	0	368	16
Future Volume (Veh/h)	21	0	75	0	0	0	159	532	0	0	368	16
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	23	0	83	0	0	0	177	591	0	0	409	18
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1363	1363	418	1446	1372	591	427			591		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1363	1363	418	1446	1372	591	427			591		
tC, single (s)	7.4	6.5	6.4	7.6	6.5	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.8	4.0	3.5	4.0	4.0	3.6	2.3			2.5		
p0 queue free %	75	100	86	100	100	100	84			100		
cM capacity (veh/h)	93	124	594	65	122	454	1081			849		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	106	0	768	427								
Volume Left	23	0	177	0								
Volume Right	83	0	0	18								
cSH	274	1700	1081	849								
Volume to Capacity	0.39	0.00	0.16	0.00								
Queue Length 95th (m)	13.3	0.0	4.4	0.0								
Control Delay (s)	26.2	0.0	3.8	0.0								
Lane LOS	D	A	A									
Approach Delay (s)	26.2	0.0	3.8	0.0								
Approach LOS	D	A										
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization			76.4%		ICU Level of Service					D		
Analysis Period (min)			15									

Lanes, Volumes, Timings  
18: Sheffield Road & Way #5

Future Total 2030 AM - Site Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	0	408	142	35	394
Future Volume (vph)	1	0	408	142	35	394
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.965					
Flt Protected	0.950					0.996
Satd. Flow (prot)	1695	0	1722	0	0	944
Flt Permitted	0.950					0.996
Satd. Flow (perm)	1695	0	1722	0	0	944
Link Speed (k/h)	48		48			48
Link Distance (m)	56.2		120.3			89.9
Travel Time (s)	4.2		9.0			6.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	100%
Adj. Flow (vph)	1	0	453	158	39	438
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	611	0	0	477
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	62.5%			ICU Level of Service B		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 18: Sheffield Road & Way #5

Future Total 2030 AM - Site Peak  
 10-24-2022












Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	0	408	142	35	394
Future Volume (Veh/h)	1	0	408	142	35	394
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	0	453	158	39	438
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1048	532			611	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1048	532			611	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			96	
cM capacity (veh/h)	242	547			968	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	1	611	477			
Volume Left	1	0	39			
Volume Right	0	158	0			
cSH	242	1700	968			
Volume to Capacity	0.00	0.36	0.04			
Queue Length 95th (m)	0.1	0.0	1.0			
Control Delay (s)	19.9	0.0	1.2			
Lane LOS	C		A			
Approach Delay (s)	19.9	0.0	1.2			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization			62.5%	ICU Level of Service	B	
Analysis Period (min)			15			












Lanes, Volumes, Timings  
20: Sheffield Road & Way #4

Future Total 2030 AM - Site Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	156	39	408	0	0	273
Future Volume (vph)	156	39	408	0	0	273
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.973					
Fl <sub>t</sub> Protected	0.961					
Satd. Flow (prot)	1668	0	1784	0	0	1784
Fl <sub>t</sub> Permitted	0.961					
Satd. Flow (perm)	1668	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	60.6		89.9			135.3
Travel Time (s)	4.5		6.7			10.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	173	43	453	0	0	303
Shared Lane Traffic (%)						
Lane Group Flow (vph)	216	0	453	0	0	303
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	41.0%			ICU Level of Service A		
Analysis Period (min)	15					










HCM Unsignalized Intersection Capacity Analysis  
20: Sheffield Road & Way #4

Future Total 2030 AM - Site Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	156	39	408	0	0	273
Future Volume (Veh/h)	156	39	408	0	0	273
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	173	43	453	0	0	303
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	756	453			453	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	756	453			453	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	54	93			100	
cM capacity (veh/h)	376	607			1108	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	216	453	303			
Volume Left	173	0	0			
Volume Right	43	0	0			
cSH	407	1700	1108			
Volume to Capacity	0.53	0.27	0.00			
Queue Length 95th (m)	22.9	0.0	0.0			
Control Delay (s)	23.4	0.0	0.0			
Lane LOS	C					
Approach Delay (s)	23.4	0.0	0.0			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay			5.2			
Intersection Capacity Utilization			41.0%		ICU Level of Service	A
Analysis Period (min)			15			










Lanes, Volumes, Timings  
24: Sheffield Road & Way #2

Future Total 2030 AM - Site Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	448	0	0	273
Future Volume (vph)	0	0	448	0	0	273
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fr</b>						
Flt Protected						
Satd. Flow (prot)	1784	0	1784	0	0	1784
Flt Permitted						
Satd. Flow (perm)	1784	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	65.0		135.3			74.6
Travel Time (s)	4.9		10.1			5.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	498	0	0	303
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	498	0	0	303
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	28.2%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
24: Sheffield Road & Way #2

Future Total 2030 AM - Site Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	448	0	0	273
Future Volume (Veh/h)	0	0	448	0	0	273
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	498	0	0	303
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	801	498			498	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	801	498			498	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	354	572			1066	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	498	303			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1066			
Volume to Capacity	0.00	0.29	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			28.2%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
26: Sheffield Road & Way #1










Future Total 2030 AM - Site Peak  
10-24-2022



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	457	0	0	270
Future Volume (vph)	0	0	457	0	0	270
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fr</b>						
Flt Protected						
Satd. Flow (prot)	1784	0	1784	0	0	1784
Flt Permitted						
Satd. Flow (perm)	1784	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	58.8		74.6			272.6
Travel Time (s)	4.4		5.6			20.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	508	0	0	300
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	508	0	0	300
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	28.7%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 26: Sheffield Road & Way #1

Future Total 2030 AM - Site Peak  
 10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	457	0	0	270
Future Volume (Veh/h)	0	0	457	0	0	270
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	508	0	0	300
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	808	508			508	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	808	508			508	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	350	565			1057	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	508	300			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1057			
Volume to Capacity	0.00	0.30	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			28.7%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
3: Walkley Road & Lancaster Road

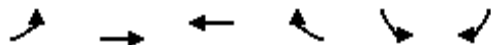
Future Total 2030 PM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	101	1442	794	132	389	165
Future Volume (vph)	101	1442	794	132	389	165
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.5			0.0	0.0	30.5
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1695	3293	3172	1419	3288	1502
Flt Permitted	0.255				0.950	
Satd. Flow (perm)	455	3293	3172	1419	3288	1502
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				145		139
Link Speed (k/h)		80	80		48	
Link Distance (m)		306.2	364.1		701.3	
Travel Time (s)		13.8	16.4		52.6	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	5%	9%	9%	2%	3%
Adj. Flow (vph)	111	1585	873	145	427	181
Shared Lane Traffic (%)						
Lane Group Flow (vph)	111	1585	873	145	427	181
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.5	23.5	23.5	23.5	23.5
Total Split (s)	22.0	102.0	80.0	80.0	28.0	28.0
Total Split (%)	16.9%	78.5%	61.5%	61.5%	21.5%	21.5%
Maximum Green (s)	19.0	97.0	75.0	75.0	23.0	23.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	99.0	97.0	75.0	75.0	23.0	23.0
Actuated g/C Ratio	0.76	0.75	0.58	0.58	0.18	0.18

Lanes, Volumes, Timings  
3: Walkley Road & Lancaster Road

Future Total 2030 PM - Site Peak  
10-24-2022

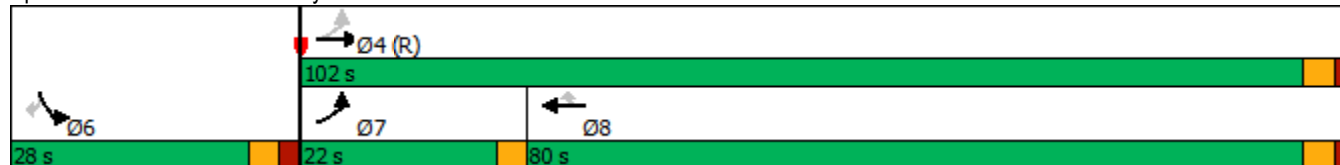


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.21	0.65	0.48	0.16	0.73	0.48
Control Delay	4.9	9.6	16.1	4.2	59.1	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.9	9.6	16.1	4.2	59.1	17.8
LOS	A	A	B	A	E	B
Approach Delay		9.3	14.4		46.8	
Approach LOS		A	B		D	
Queue Length 50th (m)	6.3	91.8	78.9	6.3	53.9	9.2
Queue Length 95th (m)	10.8	110.5	91.3	m16.1	71.8	31.0
Internal Link Dist (m)		282.2	340.1		677.3	
Turn Bay Length (m)	30.5					30.5
Base Capacity (vph)	527	2457	1830	880	581	380
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	0.21	0.65	0.48	0.16	0.73	0.48

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 50 (38%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.73  
 Intersection Signal Delay: 17.7  
 Intersection LOS: B  
 Intersection Capacity Utilization 62.1%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Walkley Road & Lancaster Road





HCM Signalized Intersection Capacity Analysis  
3: Walkley Road & Lancaster Road

Future Total 2030 PM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	101	1442	794	132	389	165
Future Volume (vph)	101	1442	794	132	389	165
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1695	3293	3172	1419	3288	1502
Flt Permitted	0.25	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	455	3293	3172	1419	3288	1502
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	111	1585	873	145	427	181
RTOR Reduction (vph)	0	0	0	61	0	114
Lane Group Flow (vph)	111	1585	873	84	427	67
Heavy Vehicles (%)	2%	5%	9%	9%	2%	3%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	97.0	97.0	75.0	75.0	23.0	23.0
Effective Green, g (s)	97.0	97.0	75.0	75.0	23.0	23.0
Actuated g/C Ratio	0.75	0.75	0.58	0.58	0.18	0.18
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	520	2457	1830	818	581	265
v/s Ratio Prot	0.03	c0.48	0.28		c0.13	
v/s Ratio Perm	0.13			0.06		0.04
v/c Ratio	0.21	0.65	0.48	0.10	0.73	0.25
Uniform Delay, d1	5.8	8.1	16.1	12.4	50.6	46.1
Progression Factor	1.00	1.00	0.94	1.96	1.00	1.00
Incremental Delay, d2	0.9	1.3	0.8	0.2	8.0	2.3
Delay (s)	6.8	9.4	15.9	24.4	58.7	48.3
Level of Service	A	A	B	C	E	D
Approach Delay (s)		9.2	17.1		55.6	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Walkley Road & Sheffield Road

Future Total 2030 PM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	202	1553	571	167	327	341
Future Volume (vph)	202	1553	571	167	327	341
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.5			50.0	0.0	30.5
Storage Lanes	1			1	2	1
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1383	3390	3172	1146	3164	1381
Flt Permitted	0.384				0.950	
Satd. Flow (perm)	559	3390	3172	1146	3164	1381
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				170		339
Link Speed (k/h)		80	80		48	
Link Distance (m)		364.1	339.6		830.6	
Travel Time (s)		16.4	15.3		62.3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.97
Heavy Vehicles (%)	25%	2%	9%	35%	6%	12%
Adj. Flow (vph)	206	1585	583	170	334	352
Shared Lane Traffic (%)						
Lane Group Flow (vph)	206	1585	583	170	334	352
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Minimum Split (s)	9.5	23.0	23.0	23.0	23.0	23.0
Total Split (s)	22.0	104.0	82.0	82.0	26.0	26.0
Total Split (%)	16.9%	80.0%	63.1%	63.1%	20.0%	20.0%
Maximum Green (s)	19.0	99.0	77.0	77.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Walk Time (s)		7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0
Act Effct Green (s)	101.0	99.0	77.0	77.0	21.0	21.0
Actuated g/C Ratio	0.78	0.76	0.59	0.59	0.16	0.16

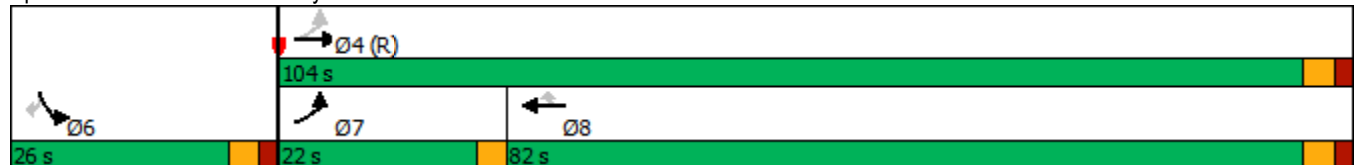


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.37	0.61	0.31	0.23	0.65	0.69
Control Delay	4.4	5.5	13.8	2.4	57.9	14.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.4	5.5	13.8	2.4	57.9	14.0
LOS	A	A	B	A	E	B
Approach Delay		5.4	11.2		35.4	
Approach LOS		A	B		D	
Queue Length 50th (m)	8.9	54.8	37.3	0.0	41.8	2.9
Queue Length 95th (m)	m13.6	63.8	48.0	9.1	57.7	34.2
Internal Link Dist (m)		340.1	315.6		806.6	
Turn Bay Length (m)	30.5			50.0		30.5
Base Capacity (vph)	554	2581	1878	748	511	507
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	0.37	0.61	0.31	0.23	0.65	0.69

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 13 (10%), Referenced to phase 4:EBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.69  
 Intersection Signal Delay: 13.1  
 Intersection LOS: B  
 Intersection Capacity Utilization 63.5%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Walkley Road & Sheffield Road



HCM Signalized Intersection Capacity Analysis  
6: Walkley Road & Sheffield Road

Future Total 2030 PM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	202	1553	571	167	327	341
Future Volume (vph)	202	1553	571	167	327	341
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1383	3390	3172	1146	3164	1381
Flt Permitted	0.38	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	559	3390	3172	1146	3164	1381
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.97
Adj. Flow (vph)	206	1585	583	170	334	352
RTOR Reduction (vph)	0	0	0	69	0	284
Lane Group Flow (vph)	206	1585	583	101	334	68
Heavy Vehicles (%)	25%	2%	9%	35%	6%	12%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	99.0	99.0	77.0	77.0	21.0	21.0
Effective Green, g (s)	99.0	99.0	77.0	77.0	21.0	21.0
Actuated g/C Ratio	0.76	0.76	0.59	0.59	0.16	0.16
Clearance Time (s)	3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	546	2581	1878	678	511	223
v/s Ratio Prot	0.06	c0.47	0.18		c0.11	
v/s Ratio Perm	0.23			0.09		0.05
v/c Ratio	0.38	0.61	0.31	0.15	0.65	0.30
Uniform Delay, d1	4.8	6.9	13.2	11.8	51.1	48.1
Progression Factor	0.76	0.66	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	0.8	0.4	0.5	6.4	3.5
Delay (s)	5.1	5.4	13.7	12.3	57.5	51.5
Level of Service	A	A	B	B	E	D
Approach Delay (s)		5.3	13.4		54.4	
Approach LOS		A	B		D	

Intersection Summary

HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
7: Walkley Road & Highway SB terminal

Future Total 2030 PM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (vph)	0	1225	180	0	138	548
Future Volume (vph)	0	1225	180	0	138	548
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Fr <sub>t</sub>						0.850
Fl <sub>t</sub> Protected					0.950	
Satd. Flow (prot)	0	3390	3390	0	1695	1517
Fl <sub>t</sub> Permitted					0.950	
Satd. Flow (perm)	0	3390	3390	0	1695	1517
Link Speed (k/h)		80	80		80	
Link Distance (m)		118.5	305.1		468.0	
Travel Time (s)		5.3	13.7		21.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1289	189	0	145	577
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1289	189	0	145	577
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.5%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
7: Walkley Road & Highway SB terminal

Future Total 2030 PM - Site Peak  
10-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Traffic Volume (veh/h)	0	1225	180	0	138	548
Future Volume (Veh/h)	0	1225	180	0	138	548
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1289	189	0	145	577
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	189				834	94
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	189				834	94
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				53	39
cM capacity (veh/h)	1382				307	944
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>	<b>SB 2</b>
Volume Total	644	644	94	94	145	577
Volume Left	0	0	0	0	145	0
Volume Right	0	0	0	0	0	577
cSH	1700	1700	1700	1700	307	944
Volume to Capacity	0.38	0.38	0.06	0.06	0.47	0.61
Queue Length 95th (m)	0.0	0.0	0.0	0.0	18.3	32.8
Control Delay (s)	0.0	0.0	0.0	0.0	26.8	14.6
Lane LOS					D	B
Approach Delay (s)	0.0		0.0		17.1	
Approach LOS					C	
<b>Intersection Summary</b>						
Average Delay			5.6			
Intersection Capacity Utilization			50.5%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
10: Highway NB terminal & Walkley Road

Future Total 2030 PM - Site Peak  
10-24-2022









Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (vph)	481	885	0	53	143	26
Future Volume (vph)	481	885	0	53	143	26
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.903			0.979		
Flt Protected				0.960		
Satd. Flow (prot)	3061	0	0	3390	1677	0
Flt Permitted				0.960		
Satd. Flow (perm)	3061	0	0	3390	1677	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	305.1			95.4	443.2	
Travel Time (s)	13.7			7.2	33.2	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	529	973	0	58	157	29
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1502	0	0	58	186	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	14		24	24		14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	60.8% ICU Level of Service B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
 10: Highway NB terminal & Walkley Road

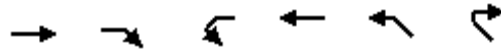
Future Total 2030 PM - Site Peak  
 10-24-2022

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Traffic Volume (veh/h)	481	885	0	53	143	26
Future Volume (Veh/h)	481	885	0	53	143	26
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	529	973	0	58	157	29
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			1502		1044	751
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1502		1044	751
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		30	92
cM capacity (veh/h)			442		224	353
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	
Volume Total	353	1149	29	29	186	
Volume Left	0	0	0	0	157	
Volume Right	0	973	0	0	29	
cSH	1700	1700	1700	1700	238	
Volume to Capacity	0.21	0.68	0.02	0.02	0.78	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	43.4	
Control Delay (s)	0.0	0.0	0.0	0.0	59.0	
Lane LOS					F	
Approach Delay (s)	0.0		0.0		59.0	
Approach LOS					F	
<b>Intersection Summary</b>						
Average Delay			6.3			
Intersection Capacity Utilization			60.8%	ICU Level of Service	B	
Analysis Period (min)			15			



Lanes, Volumes, Timings  
11: SB off ramp & Walkley Road

Future Total 2030 PM - Site Peak  
10-24-2022



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑	↑		↑↑↑		
Traffic Volume (vph)	1225	496	0	728	0	0
Future Volume (vph)	1225	496	0	728	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)		50.0	0.0		0.0	0.0
Storage Lanes		1	0		0	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3390	1517	0	4871	0	0
Flt Permitted						
Satd. Flow (perm)	3390	1517	0	4871	0	0
Link Speed (k/h)	80			48	48	
Link Distance (m)	339.6			118.5	265.8	
Travel Time (s)	15.3			8.9	19.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1289	522	0	766	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1289	522	0	766	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

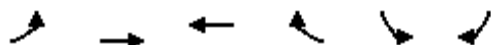
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.1%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings  
13: Walkley Road & NB off ramp

Future Total 2030 PM - Site Peak  
10-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑	↗		
Traffic Volume (vph)	0	507	53	49	0	0
Future Volume (vph)	0	507	53	49	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0			50.0	0.0	0.0
Storage Lanes	0			1	0	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3390	1784	1517	0	0
Flt Permitted						
Satd. Flow (perm)	0	3390	1784	1517	0	0
Link Speed (k/h)		80	48		48	
Link Distance (m)		95.4	197.1		264.7	
Travel Time (s)		4.3	14.8		19.9	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	557	58	54	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	557	58	54	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Free	

















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.1%
ICU Level of Service	A
Analysis Period (min)	15

Intersection Sign configuration not allowed in HCM analysis.

















Lanes, Volumes, Timings  
15: Sheffield Road & Humber Place

Future Total 2030 PM - Site Peak  
10-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	0	111	0	0	0	47	364	0	0	542	16
Future Volume (vph)	12	0	111	0	0	0	47	364	0	0	542	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>		0.878									0.996	
Fl <sub>t</sub> Protected		0.995						0.994				
Satd. Flow (prot)	0	1452	0	0	1784	0	0	1374	0	0	1663	0
Fl <sub>t</sub> Permitted		0.995						0.994				
Satd. Flow (perm)	0	1452	0	0	1784	0	0	1374	0	0	1663	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		152.4			148.3			830.6			80.7	
Travel Time (s)		11.4			11.1			62.3			6.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	14%	2%	9%	33%	2%	2%	21%	33%	50%	0%	9%	10%
Adj. Flow (vph)	13	0	123	0	0	0	52	404	0	0	602	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	136	0	0	0	0	0	456	0	0	620	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	72.0%						ICU Level of Service C					
Analysis Period (min)	15											










HCM Unsignalized Intersection Capacity Analysis  
15: Sheffield Road & Humber Place

Future Total 2030 PM - Site Peak  
10-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	0	111	0	0	0	47	364	0	0	542	16
Future Volume (Veh/h)	12	0	111	0	0	0	47	364	0	0	542	16
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	13	0	123	0	0	0	52	404	0	0	602	18
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1119	1119	611	1242	1128	404	620			404		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1119	1119	611	1242	1128	404	620			404		
tC, single (s)	7.2	6.5	6.3	7.4	6.5	6.2	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.4	3.8	4.0	3.3	2.4			2.2		
p0 queue free %	92	100	74	100	100	100	94			100		
cM capacity (veh/h)	166	194	481	93	192	647	875			1166		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	136	0	456	620								
Volume Left	13	0	52	0								
Volume Right	123	0	0	18								
cSH	408	1700	875	1166								
Volume to Capacity	0.33	0.00	0.06	0.00								
Queue Length 95th (m)	11.0	0.0	1.4	0.0								
Control Delay (s)	18.2	0.0	1.7	0.0								
Lane LOS	C	A	A									
Approach Delay (s)	18.2	0.0	1.7	0.0								
Approach LOS	C	A										
Intersection Summary												
Average Delay			2.7									
Intersection Capacity Utilization			72.0%		ICU Level of Service					C		
Analysis Period (min)			15									










Lanes, Volumes, Timings  
18: Sheffield Road & Way #5

Future Total 2030 PM - Site Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	0	225	132	32	546
Future Volume (vph)	1	0	225	132	32	546
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.949			
Flt Protected	0.950					0.997
Satd. Flow (prot)	1695	0	1693	0	0	1067
Flt Permitted	0.950					0.997
Satd. Flow (perm)	1695	0	1693	0	0	1067
Link Speed (k/h)	48		48			48
Link Distance (m)	56.2		80.7			63.2
Travel Time (s)	4.2		6.1			4.7
Peak Hour Factor	0.90	0.90	0.92	0.90	0.90	0.90
Bus Blockages (#/hr)	0	0	0	0	0	100
Adj. Flow (vph)	1	0	245	147	36	607
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	392	0	0	643
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.96
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	66.5%			ICU Level of Service C		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 18: Sheffield Road & Way #5










Future Total 2030 PM - Site Peak  
 10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	0	225	132	32	546
Future Volume (Veh/h)	1	0	225	132	32	546
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.92	0.90	0.90	0.90
Hourly flow rate (vph)	1	0	245	147	36	607
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	998	318			392	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	998	318			392	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			97	
cM capacity (veh/h)	262	722			1167	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	1	392	643			
Volume Left	1	0	36			
Volume Right	0	147	0			
cSH	262	1700	1167			
Volume to Capacity	0.00	0.23	0.03			
Queue Length 95th (m)	0.1	0.0	0.7			
Control Delay (s)	18.8	0.0	0.8			
Lane LOS	C		A			
Approach Delay (s)	18.8	0.0	0.8			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization			66.5%		ICU Level of Service	C
Analysis Period (min)			15			



Lanes, Volumes, Timings  
20: Sheffield Road & Way #4

Future Total 2030 PM - Site Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	140	34	225	0	0	437
Future Volume (vph)	140	34	225	0	0	437
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.974					
Fl <sub>t</sub> Protected	0.961					
Satd. Flow (prot)	1670	0	1784	0	0	1784
Fl <sub>t</sub> Permitted	0.961					
Satd. Flow (perm)	1670	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	60.6		63.2			102.2
Travel Time (s)	4.5		4.7			7.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	156	38	250	0	0	486
Shared Lane Traffic (%)						
Lane Group Flow (vph)	194	0	250	0	0	486
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	41.3%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 20: Sheffield Road & Way #4










Future Total 2030 PM - Site Peak  
 10-24-2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	140	34	225	0	0	437
Future Volume (Veh/h)	140	34	225	0	0	437
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	156	38	250	0	0	486
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	736	250			250	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	736	250			250	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	60	95			100	
cM capacity (veh/h)	386	789			1316	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	194	250	486			
Volume Left	156	0	0			
Volume Right	38	0	0			
cSH	429	1700	1316			
Volume to Capacity	0.45	0.15	0.00			
Queue Length 95th (m)	17.4	0.0	0.0			
Control Delay (s)	20.1	0.0	0.0			
Lane LOS	C					
Approach Delay (s)	20.1	0.0	0.0			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay			4.2			
Intersection Capacity Utilization			41.3%	ICU Level of Service	A	
Analysis Period (min)			15			










Lanes, Volumes, Timings  
24: Sheffield Road & Way #2

Future Total 2030 PM - Site Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	258	0	0	437
Future Volume (vph)	0	0	258	0	0	437
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fr</b>						
Flt Protected						
Satd. Flow (prot)	1784	0	1784	0	0	1784
Flt Permitted						
Satd. Flow (perm)	1784	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	65.0		102.2			76.9
Travel Time (s)	4.9		7.7			5.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	287	0	0	486
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	0	0	287	0	0	486
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
<b>Two way Left Turn Lane</b>						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	27.6%			ICU Level of Service A		
Analysis Period (min)	15					










HCM Unsignalized Intersection Capacity Analysis  
 24: Sheffield Road & Way #2

Future Total 2030 PM - Site Peak  
 10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	258	0	0	437
Future Volume (Veh/h)	0	0	258	0	0	437
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	287	0	0	486
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	773	287			287	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	773	287			287	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	367	752			1275	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	287	486			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1275			
Volume to Capacity	0.00	0.17	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			27.6%	ICU Level of Service	A	
Analysis Period (min)			15			










Lanes, Volumes, Timings  
26: Sheffield Road & Way #1

Future Total 2030 PM - Site Peak  
10-24-2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	261	0	0	436
Future Volume (vph)	0	0	261	0	0	436
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fr</b>						
Flt Protected						
Satd. Flow (prot)	1784	0	1784	0	0	1784
Flt Permitted						
Satd. Flow (perm)	1784	0	1784	0	0	1784
Link Speed (k/h)	48		48			48
Link Distance (m)	58.8		76.9			181.8
Travel Time (s)	4.4		5.8			13.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	290	0	0	484
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	290	0	0	484
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	27.6%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
26: Sheffield Road & Way #1

Future Total 2030 PM - Site Peak  
10-24-2022

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	261	0	0	436
Future Volume (Veh/h)	0	0	261	0	0	436
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	290	0	0	484
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	774	290			290	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	774	290			290	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	367	749			1272	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	290	484			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1272			
Volume to Capacity	0.00	0.17	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			27.6%	ICU Level of Service	A	
Analysis Period (min)			15			

**APPENDIX C**  
**MMLOS WORKSHEETS**

# Multi-Modal Level of Service - Segments Form

Consultant	AECOM	Project	DYT3
Scenario	MMLOS Assessment - Existing Conditions (2020)	Date	22/06/2020

SEGMENTS	Sheffield Road	Section		
		Sheffield Road	Section	
Pedestrian	C	Sidewalk Width	1.5 m	
		Boulevard Width	0.5 - 2 m	
		Avg Daily Curb Lane Traffic Volume	≤ 3000	
		Operating Speed	> 30 to 50 km/h	
		On-Street Parking	no	
		Exposure to Traffic PLoS	C	-
		Effective Sidewalk Width	1.5 m	
Bicycle	B	Pedestrian Volume	250 ped/hr	
		Crowding PLoS	B	-
		Level of Service	C	-
		Type of Cycling Facility	Mixed Traffic	
Bicycle	B	Number of Travel Lanes	≤ 2 (no centreline)	
		Operating Speed	>40 to <50 km/h	
		# of Lanes & Operating Speed LoS	B	-
		Bike Lane (+ Parking Lane) Width	≥ 1.8 m	
		Bike Lane Width LoS	A	-
		Bike Lane Blockages	Rare	
		Blockage LoS	A	-
		Median Refuge Width (no median = < 1.8 m)	< 1.8 m refuge	
		No. of Lanes at Unsignalized Crossing	≤ 3 lanes	
		Sidestreet Operating Speed	>40 to 50 km/h	
		Unsignalized Crossing - Lowest LoS	B	-
Level of Service	B	-		
Transit	D	Facility Type	Mixed Traffic	
		Friction or Ratio Transit:Posted Speed	Vt/Vp ≥ 0.8	
		Level of Service	D	-



# Multi-Modal Level of Service - Intersections Form

Consultant **AECOM**  
 Scenario **MMLOS Assessment - Existing Conditions (2021)**

Project **2625 Sheffield Road**  
 Date **21/01/2021**

INTERSECTIONS		Lancaster Road / Walkley Road				Sheffield Road / Walkley Road			
Crossing Side		NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	3	0 - 2	3	3	3	0 - 2	3	3
	Median	No Median - 2.4 m	No Median - 2.4 m	Median > 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	Median > 2.4 m	No Median - 2.4 m
	Conflicting Left Turns	Protected	No left turn / Prohib.	No left turn / Prohib.	Protected	Protected	No left turn / Prohib.	No left turn / Prohib.	Protected
	Conflicting Right Turns	Permissive or yield control	No right turn	Permissive or yield control	No right turn	Permissive or yield control	No right turn	Permissive or yield control	No right turn
	Right Turns on Red (RTOR) ? Ped Signal Leading Interval?	RTOR allowed No	RTOR prohibited No	RTOR allowed No	RTOR prohibited No	RTOR allowed No	RTOR prohibited No	RTOR allowed No	RTOR prohibited No
	Right Turn Channel	Conventional with Receiving Lane	No Right Turn	Conv'tl without Receiving Lane	No Right Turn	Conventional with Receiving Lane	No Right Turn	Conv'tl without Receiving Lane	No Right Turn
	Corner Radius	10-15m	No Right Turn	10-15m	No Right Turn	10-15m	No Right Turn	10-15m	No Right Turn
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings
	<b>PETSI Score</b>	<b>79</b>	<b>111</b>	<b>82</b>	<b>96</b>	<b>79</b>	<b>111</b>	<b>82</b>	<b>96</b>
	<b>Ped. Exposure to Traffic LoS</b>	<b>B</b>	<b>A</b>	<b>B</b>	<b>A</b>	<b>B</b>	<b>A</b>	<b>B</b>	<b>A</b>
	Cycle Length	150	150	150	150	90	90	90	90
	Effective Walk Time	47	47	47	47	27	27	19	19
	<b>Average Pedestrian Delay</b>	<b>35</b>	<b>35</b>	<b>35</b>	<b>35</b>	<b>22</b>	<b>22</b>	<b>28</b>	<b>28</b>
	<b>Pedestrian Delay LoS</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>
<b>Level of Service</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	
<b>Approach From</b>		<b>D</b>				<b>C</b>			
Bicycle Lane Arrangement on Approach		Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
IF Dedicated Right Turn Lane, THEN Right Turn Configuration, ELSE <blank> Dedicated Right Turning Speed									
Bicycle	<b>Cyclist Through Movement</b>								
	<b>Separated or Mixed Traffic</b>	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Left Turn Approach Operating Speed	≥ 2 lanes crossed ≥ 60 km/h	No lane crossed ≥ 60 km/h	No lane crossed ≥ 60 km/h	≥ 2 lanes crossed ≥ 60 km/h	≥ 2 lanes crossed ≥ 60 km/h	No lane crossed ≥ 60 km/h	No lane crossed ≥ 60 km/h	≥ 2 lanes crossed ≥ 60 km/h
	<b>Left Turning Cyclist</b>	<b>F</b>	<b>C</b>	<b>C</b>	<b>F</b>	<b>F</b>	<b>C</b>	<b>C</b>	<b>F</b>
	<b>Level of Service</b>	<b>F</b>	<b>C</b>	<b>C</b>	<b>F</b>	<b>F</b>	<b>C</b>	<b>C</b>	<b>F</b>
<b>Level of Service</b>		<b>F</b>				<b>F</b>			
Transit	Average Signal Delay	≤ 10 sec	0 sec	≤ 30 sec	≤ 30 sec	≤ 10 sec	0 sec	≤ 30 sec	≤ 30 sec
	<b>Level of Service</b>	<b>B</b>	<b>A</b>	<b>D</b>	<b>D</b>	<b>B</b>	<b>A</b>	<b>D</b>	<b>D</b>
<b>Level of Service</b>		<b>D</b>				<b>D</b>			

**APPENDIX D**  
**SIGNAL WARRANT JUSTIFICATION SHEETS**  
**Walkley Road and Highway 417 East Ramp Terminal**

## Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road?

2 or more



b.- Number of lanes on the Minor Road?

2 or more



c.- How many approaches?

3



d.- What is the operating environment?

Urban



Population >= 10,000

AND

Speed < 70 km/hr

e.- What is the eight hour vehicle volume at the intersection? (Please fill in table below)

Hour Ending	Main Eastbound Approach			Minor Northbound Approach			Main Westbound Approach			Minor Southbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
8:15	0	435	131	22	0	884	0	946	27	0	0	0	0
9:15	0	593	100	25	0	793	0	619	23	0	0	0	0
12:15	0	757	155	39	0	657	0	237	10	0	0	0	0
13:15	0	744	165	44	0	653	0	202	7	0	0	0	0
14:15	0	735	203	45	0	686	0	204	16	0	0	0	0
16:15	0	1,116	413	60	0	608	0	217	5	0	0	0	0
17:15	0	1,471	511	167	0	594	0	174	2	0	0	0	0
18:15	0	1,158	306	87	0	479	0	185	8	0	0	0	0
<b>Total</b>	<b>0</b>	<b>7,009</b>	<b>1,984</b>	<b>489</b>	<b>0</b>	<b>5,354</b>	<b>0</b>	<b>2,784</b>	<b>98</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Intersection: Walkley and 417 NB Terminal

Count Date: 2022

## Summary Results

Justification		Compliance		Signal Justified?	
				YES	NO
1. Minimum Vehicular Volume	A Total Volume	100	%	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	B Crossing Volume	100	%	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Delay to Cross Traffic	A Main Road	100	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Crossing Road	64	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Combination	A Justificaton 1	100	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Justification 2	64	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. 4-Hr Volume		100	%	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5. Collision Experience		0	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Pedestrians	A Volume	Justification not met		<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Delay	Justification not met		<input type="checkbox"/>	<input checked="" type="checkbox"/>