Ontario Line

Integrated Transit Oriented Communities – Exhibition Station

Draft Transportation Impact Assessment Issued for Rezoning

Site A: 1-1A ATLANTIC AVENUE TORONTO, ONTARIO, M6K 3E7

Site B: 2-20 ATLANTIC AVENUE, 1 JEFFERSON AVENUE TORONTO, ONTARIO

Contract RFS-2019-NAFC-110

PO 214244

HDR Project 10206938

Ontario Line Technical Advisor
TORONTO, ONTARIO
September 2021

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1 Introduction

HDR Corporation was retained by Metrolinx to undertake a Transportation Impact Assessment (TIA) and Parking Assessment for a proposed mixed-use Transit Oriented Community (TOC) development to be located on the future Ontario Line Exhibition Station site.

The subject properties are located on the north side of the future Liberty New Street, between Jefferson Avenue and Hanna Avenue. The existing uses on the sites are generally comprised of low-rise office and parking lot space.

The proposed redevelopment consists of three separate sites:

- Site A: 1-1A Atlantic Avenue
 - Consisting of 265 residential units, 1,078 m² of retail space, and 13,166 m² of office space.
 - The first floor will provide access to the eastern tunnel at Exhibition Station, which
 provides a through connection between Liberty Village and Exhibition Place, and
 emergency egress from the station.
- Site B: 2-20 Atlantic Avenue and 1 Jefferson Avenue
 - Consisting of 303 residential units, 4,226 m² of retail space, and 10,427 m² of office space.
 - The first floor will provide access to an underground concourse for Exhibition Station, which will connect to the Ontario Line and GO Station platforms.

The development site locations and study area are illustrated in **Figure 1-1**. The sites will be highly transit-oriented given the proximity to Ontario Line, GO, and TTC services, and the mixed-use nature of the area which includes employment use and other commercial-retail and services that will support the residential component of the sites. Vehicular parking is proposed on-site at a reduced rate consistent with recently proposed rates in the area.

The Traffic Impact Assessment report includes documentation of the following components:

- Existing Conditions
- Background Traffic Conditions
- Proposed TOC Trip Generation
- Future Total Traffic Conditions with the TOC
- Parking Assessment
- Loading Assessment
- Transportation Demand Management
- Preliminary Findings and Next Steps





Figure 1-1: Study Area and Site Context

1.1 Scope of Work

The scope of work has been prepared in accordance with the **City of Toronto Guidelines for the Preparation of Transportation Impact Studies** (2013), and is as follows:

| Study Area | Bounded by King Street West to the north, Strachan Avenue to the east, Lake Shore Boulevard to the south, and British Columbia Road/Dufferin Street to the west. |
|---|---|
| Analysis Scenarios | Existing 2020 Traffic Conditions Future 2030 Background Traffic Conditions (10-year Horizon) Includes general background traffic growth, and growth associated with the Exhibition GO Station and Ontario Line Station Future 2030 Total Traffic Conditions (10-year Horizon) Includes future background traffic volumes plus traffic resulting from the proposed development |
| Analysis Time Periods | The following time periods were analyzed as they represent peak trip generation times for residential developments: Weekday AM peak hour between 7:00am and 9:00am Weekday PM peak hour between 3:00pm and 6:00pm |
| Study Area Intersections for Analysis | The following intersections were analyzed for capacity, level of service, and delays: Dufferin Street and King Street West King Street West and Joe Shuster Way King Street West and Atlantic Avenue |



- King Street West and Sudbury Street
- King Street West and Shaw Street
- King Street West and Strachan Avenue
- Strachan Avenue and Fleet Street
- Strachan Avenue and Lakeshore Boulevard
- Lakeshore Boulevard and British Columbia Road
- Dufferin Street/British Columbia Road and Saskatchewan Road
- Dufferin Street and Liberty Street
- Liberty New Street and Dufferin Street (Future Intersection)
- Liberty New Street and Atlantic Avenue (Future Intersection)
- TOC Site Driveway Intersections (Future Intersections)

Parking and Loading Review

A parking and loading assessment was undertaken for the proposed development using the City of Toronto Zoning By-law 569-2013 as the basis of the assessment, and in the context of the site as a transit-oriented community.

Multi-Modal Level of Service (MMLOS)

Multi-modal Level of Service (MMLOS) for the Exhibition TOC development has been reviewed under a separate cover, in the report Ontario Line Exhibition Station Site Plan Review Transportation Impact Assessment (Ontario Line Technical Advisor, May 2021), which was submitted as part of a Site Plan Review Package for the proposed station – referred to herein as the "Station SPR". The Station SPR study assessed the 2041 horizon year, which is 11 years beyond the horizon year assessed in this report. While the station related pedestrian traffic may continue to grow, the TOC related pedestrian traffic will remain relatively constant based on ultimate development of the site, and the presence of the proposed station.

A MMLOS analysis for the 2041 horizon year is included in that assessment and incorporates projected pedestrian demand related to background, TOC, and Station trips to identify pedestrian levels of service at sidewalks, intersection corners and crosswalks, and bus bays. This TOC report does not duplicate the SPR analysis findings but includes a MMLOS analysis of existing pedestrian, bicycle, and transit conditions for the key segments and intersections near TOC sites.

Please refer to the Station SPR report for detailed 2041 horizon year Fruin level of service analysis of the study area, which includes the Exhibition TOC development trip generation.

1.2 Analysis Methodology

1.1.1 Pedestrian Level of Service

The pedestrian analysis within the study area is based on the City of Ottawa Multi-Modal Level of Service (MMLOS) Guidelines, which evaluates the pedestrian LOS based on pedestrian comfort, safety, and convenience. A detailed evaluation of pedestrian density levels of service and intersection HCM analysis can be found in the Ontario Line Exhibition Station Site Plan Review Transportation Impact Assessment (Ontario Line Technical Advisor, May 2021).

1.1.2 Bicycle Level of Service

The bicycle level of service for existing conditions was determined through the City of Ottawa multi-modal level of service methodology, which analyzes the segments and intersections primarily based on qualitative parameters, such as street width, presence / type of dedicated cycling facilities, and vehicular operating speeds.



1.1.3 Transit Analysis

The transit level of service for existing conditions was determined through the City of Ottawa multi-modal level of service methodology, which analyzes the segments and intersections based on the transit facility type, driveway friction, and intersection signal delay.

1.1.4 Automobile Level of Service

Intersection operations were assessed for the study area intersections using the Synchro Traffic Signal Coordination Software Version 10, which employs methodology from the **Highway Capacity Manual** (HCM 2000) published by the Transportation Research Board National Research Council. Synchro can analyze both signalized and unsignalized intersections in a road corridor or network taking into account the spacing, interaction, queues and operations between intersections.

The signalized and unsignalized intersection analysis considers three separate measures of performance:

- The capacity of all intersection movements, represented by the volume to capacity (v/c) ratio;
- The level of service (LOS) for all intersection turning movements as well as for the overall intersection. The overall intersection LOS is based on the average control delay per vehicle (weighted) for the various movements through the intersection; and,
- The forecasted queue lengths (95th percentile queue length) and storage requirements.

LOS is an indicator of how long a vehicle must wait to complete a movement and is represented by a letter between 'A' and 'F', with 'F' being the longest delay. The volume to capacity (v/c) ratio is a measure of the degree of capacity utilized at an intersection. HCM definitions are summarized in **Table 1-1**.

Table 1-1: Highway Capacity Manual Level of Service Definitions

| Level of Service (LOS) | Signalized Control Delay per Vehicle (s) | Unsignalized Control Delay per Vehicle (s) | Description |
|---------------------------|---|--|----------------------|
| A | ≤ 10 | ≤ 10 | ldeal |
| В | > 10 and ≤ 20 | > 10 and ≤ 15 | Acceptable |
| С | > 20 and ≤ 35 | > 15 and ≤ 25 | Acceptable |
| D | > 35 and ≤ 55 | > 25 and ≤ 35 | Somewhat undesirable |
| E | > 55 and ≤ 80 | > 35 and ≤ 50 | Undesirable |
| F | > 80 | > 50 | Poor |

The analysis undertaken in this study also follows the City of Toronto Guidelines for Using Synchro 9 (Including SimTraffic 9¹) (March 18, 2016), City of Toronto 'Guidelines for the Preparation of Transportation Impact Studies²', and City of Toronto 'Traffic Signal Operations Policies and Strategies' (May 2015)³.

https://www.toronto.ca/wp-content/uploads/2017/11/99bc-0_2016-04-28_Guidelines-for-Using-Synchro-9-Including-SimTraffic-9 Final-a.pdf

² http://arris.ca/~arris2/ARCHIVE/traffic-impact-study-guidelines.pdf

³ https://www.toronto.ca/wp-content/uploads/2017/11/91d6-0_2015-11-13_Traffic-Signal-Operations-Policies-and-Strategies_Final-a.pdf



2 Existing Conditions

2.1 Community Context

Liberty Village is a dense urban community in the City of Toronto and has experienced significant growth in recent years with the construction of several new developments, doubling its population between 2011 and 2016. This population growth has largely been on the eastern end of Liberty Village. The community was historically a heavy industrial area and has retained much of the factory architecture throughout its redevelopment.

As shown in **Figure 2-1**, the majority of Liberty Village is currently designated as a Core Employment Area generally to the west of Hanna Ave or a Mixed Use Area generally to the east of Hanna Ave, with a Park area being designated where Allan A. Lamport Stadium is located. South of the railway corridor below Liberty Village, the lands covering Exhibition Place are designated as either Other Open Space Areas or Regeneration Areas.



Figure 2-1: Land Use Designations (City of Toronto Official Plan)

2.2 Site Context

The Exhibition TOC sites are located just north of the future Liberty New Street connection between Jefferson Avenue and Hanna Avenue. The sites will be situated in an area with excellent surface transit service, accommodating short- and long-distance travel through various routes and services, as described in Section 2.4 Existing Transit Services. The nearby Exhibition GO Station and TTC Exhibition Loop will be accessible from Liberty Village via the existing underground tunnel, as well as via the new proposed station headhouse for the Ontario Line station between Jefferson and Atlantic Avenues.



The area is generally mixed-use and there are many amenities in the area that will support both residential and employment uses within this mixed-use downtown urbanized environment.

2.3 Existing Road Network

The community of Liberty Village does not have the same fine-grid network connectivity characteristic of downtown Toronto due to the barriers imposed by the railway corridors to the north and to the south. There are currently no north-south roadway links across the railway corridors between Dufferin Street and Strachan Avenue; however, the community is still well served for automobile trips due to the connections to King Street, Dufferin Street, Strachan Avenue, and the nearby interchange with the Gardiner Expressway.

The existing network and the future Liberty New Street traffic controls and lane configurations in the vicinity of the study area are shown in **Figure 2-2**. All study roadways are under the jurisdiction of the City of Toronto.

The existing arterial and collector road network is described below:

King Street W

King Street is a two-way east-west major arterial street with a posted speed limit of 40 km/h. It has a four-lane cross section, with sidewalks on both sides of the street. There are westbound streetcar stops at Strachan Avenue, Shaw Street, Sudbury Street, Jefferson Avenue, Joe Shuster Way, and Dufferin Street. Eastbound streetcar stops are available at Dufferin Street, Joe Shuster Way, Atlantic Avenue, Sudbury Street, Shaw Street, and Strachan Avenue.

Dufferin Street

Dufferin Street is a two-way north-south minor arterial street with a speed limit of 50 km/h. It has a four-lane cross section north of Springhurst Avenue, and a two-lane cross section to the south. Streetcars operate in mixed traffic north of Springhurst Avenue where the Dufferin Loop is located; stops are located northbound at Liberty Street and King Street, and southbound at King Street, Liberty Street, and Springhurst Avenue. Dufferin Street connects to British Columbia Road within Exhibition Place, which in turn provides access to Lake Shore Boulevard and Gardiner Expressway.

Liberty Street

Liberty Street is a two-way east-west collector road with a posted speed limit of 40 km/h. It has a two-lane cross-section within the study area and has no centerline on midblock sections of roadway. Liberty Street is currently the only roadway in Liberty Village that connects Dufferin Street and Strachan Avenue, until the Liberty New Street connection is constructed to the south.

Strachan Avenue

Strachan Avenue is a two-way north-south major arterial street with a speed limit of 40 km/h. It has a four-lane cross section, with sidewalks on both sides of the street. Bulwer Street also provides primary access to some buildings on the north side of the street, such as Ogden Jr Public School.

Lake Shore Boulevard

Lake Shore Boulevard is a two-way east-west major arterial street with a speed limit of 60 km/h. Through the study area, it has a 6-lane cross-section, with three through-lanes per direction, and auxiliary left-turn lanes at major intersections.

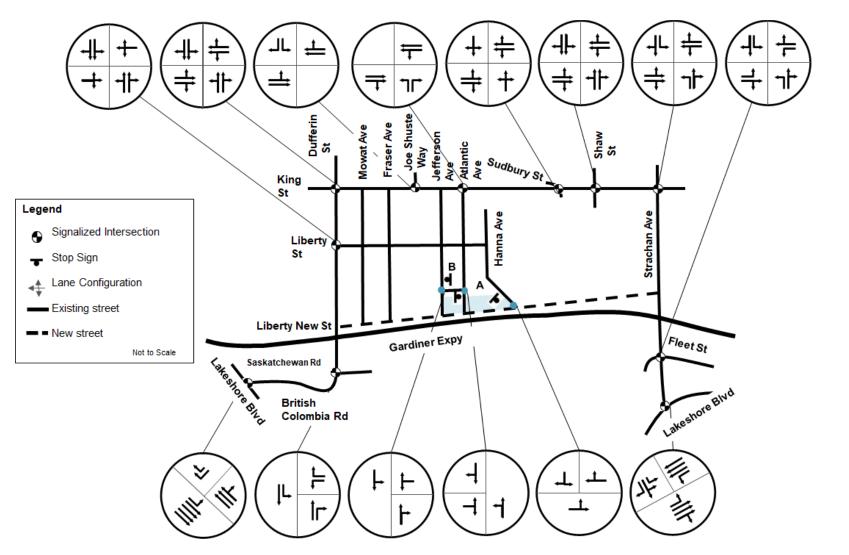


Figure 2-2: Existing Network and Future Liberty New Street Lane Configuration and Traffic Control



2.4 Existing Transit Services

The TTC operates streetcar services along King Street, Dufferin Street (south of King), and Fleet Street. All surface transit routes provide direct access to the Toronto Subway System via Line 1 (Yonge-University-Spadina) at St Andrew Station and Union Station, or Line 2 (Bloor-Danforth) at Dufferin Station, and Bathurst Station. Regional rail service is provided by GO Transit and can be accessed from the existing Exhibition GO Station which will be integrated with the Exhibition Ontario Line Station.

Existing transit services in the vicinity of Exhibition Station are summarized below and an excerpt from the TTC system map is shown in **Figure 2-3**.

- 504/509/511 Streetcar. The 511 and 509 streetcar routes directly serve Exhibition Place with a stop on the south side of the Gardiner Expressway at Manitoba Drive and Nova Scotia Drive at the Exhibition Loop. The 504 streetcar route runs east-west along King Street. The 504 streetcar operates on a 3-minute headway and has a nearby stop at Dufferin Street / Atlantic Avenue. The 509 and 511 streetcar routes operate on approximately 6 to 8 minute headways with a nearby stop at the Exhibition GO Station.
- 29A and 29C Bus. The 29A bus runs north-south along Dufferin Street terminating at the
 Dufferin Gate Loop. The 29C bus directly serves Exhibition Place with limited service
 stopping at the Exhibition Loop and Princes' Gate Loop. The 29C (Wilson StationExhibition/Princes' Gate) branch operates during the peak periods from Monday to
 Friday, and during the daytime on Saturdays, Sundays, and holidays during the fall and
 winter. Route 29 operates on an 8-minute headway and the nearest available stop is
 located at Dufferin Gate / Liberty Street.
- 121A and 121D Bus. The 121 Fort York-Esplanade bus route operates between Exhibition Place, the Fort York neighbourhood and the Distillery neighbourhood. Two services are operated. The 121A (Exhibition (Princes' Gates)-Distillery via Union Station) branch operates all day, every day, outside the summer months. The 121D (Ontario Place-Cherry Beach via Union Station and Distillery) seasonal branch operates from mid-May to mid-October.
- 63 Ossington Bus. The 63 Ossington bus route operates between Eglinton West Station on Line 1 Yonge-University and King Street West and the Liberty Village, generally in a north-south direction. The route does not directly serve the Exhibition Place or Ontario Place sites. Service between Liberty Village and St Clair Avenue is part of the 10 Minute Network, and operates 10 minutes or better, all day, every day. Two services are operated. The 63A (Eglinton West Station-Liberty Village) branch operates between 5 AM and 2 AM, seven days a week, with the 636 Ossington Blue Night bus (Ossington to Eglinton) operating between 2 AM and 5 AM. The 63B (St Clair-Liberty Village) short-turn branch operates during the peak periods, from Monday to Friday only. Route 63 operates on a headway of 3 to 5 minutes and has a nearby stop located at Liberty Street / Atlantic Avenue.
- Lakeshore West GO Line. The Lakeshore West line delivers two-way, all-day service seven days a week, from Toronto to Aldershot. It delivers rush-hour service from Hamilton to Toronto in the morning and back again in the afternoon. On weekdays,



- trains run on the Lakeshore West line every 30 minutes, with 15 minute frequencies in the peak flow direction (EB in AM peak period and WB in PM peak period).
- Overall, the study area has excellent transit coverage for both short-distance and longdistance trips and provides excellent headways for passengers. Transit priority measures such as those currently along King Street also help improve the speed, reliability, and attractiveness of transit for transportation across the City.

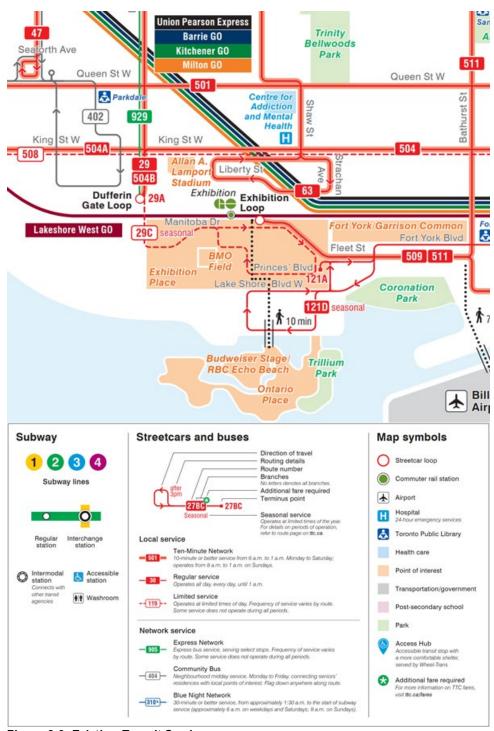


Figure 2-3: Existing Transit Services



2.5 Existing Cycling and Pedestrian Facilities

The surrounding areas of Liberty Village and Exhibition Place have significant gaps in the existing sidewalk network and sidewalks that are partially obstructed by utility poles, fire hydrants, bicycle posts, and garbage bins, which constrain effective sidewalk widths. Gaps in the sidewalk network require pedestrians to walk across commercial boulevard parking spaces or on the roadways which can present unsafe conditions, especially as the population of Liberty Village continues to grow, and that a significant supply of public and private parking in the community accommodates automobile trips in the area. Examples of missing links in the pedestrian network are illustrated below in **Figure 2-4** and **Figure 2-5**.

An excerpt of The Toronto Cycling Map from the City of Toronto website is highlighted in **Figure 2-6**. Existing connections that were not included in the City's cycling map include Douro Street (both directions), Saskatchewan Road between Dufferin Street and Manitoba Drive (north side), Princes' Boulevard between Manitoba Drive and Canada Boulevard (both directions), and New Brunswick Way (both directions).

The existing cycling network within the study area is rather limited, particularly throughout Liberty Village and the surrounding neighbourhoods which would be most likely to travel to and from Exhibition Station via bicycle due to the proximity. The only significant bicycle facilities in the area are located on Strachan Avenue, and the Martin Goodman Trail south of Lake Shore Boulevard. Richmond Street and Adelaide Street, and King Street (from the Transit Priority Corridor) east of Bathurst provide for excellent connections into the downtown core of the City. The Liberty Village New Street EA Study prepared by LEA in October 2015 identifies a new multi-use trail as an additional cycling facility that will connect Dufferin Street to Strachan Avenue once completed.



Figure 2-4: Liberty Street / Fraser Avenue Pedestrian Facilities (Facing East)



Figure 2-5: Liberty Street Pedestrian Facilities (Facing East Towards Mowat Avenue)

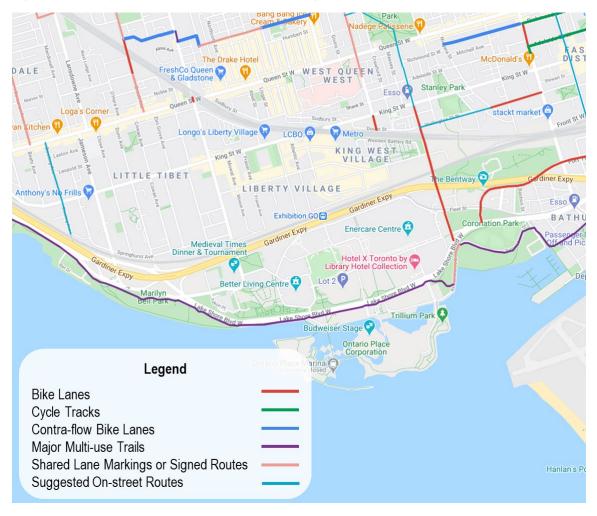


Figure 2-6: Existing Cycling Facilities

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2.6 Walkshed Analysis

A multi-modal level of service analysis was undertaken for the key links around the TOC sites. The assessment was completed using the City of Ottawa's Multi-Modal Level of Service (MMLOS) Methodology⁴. Due to the scope of this study and data availability, the following items are noted:

- Existing facility widths were estimated based on aerial photography (Google);
- Daily curb lanes volumes were estimated based on available traffic data and street classification; and
- Intersection delays for pedestrians were estimated based on estimated cycle lengths and walk times.

2.6.1 Existing Pedestrian Level of Service

The pedestrian level of service (PLOS) on roadway segments in the study area were analyzed using the methodology detailed in the City of Ottawa MMLOS Guidelines. The detailed inputs used for the analysis can be found in **Appendix A**.

The PLOS for the existing network is illustrated below in Figure 2-7.

Based on the PLOS analysis, the following observations were made on the pedestrian network:

- No Sidewalks: Several of the north-south connections in Liberty Village do not currently
 have sidewalks available and instead accommodate parking for vehicles along these
 stretches. As Liberty Village continues to develop, it will be important that these
 pedestrian connectivity gaps be filled to ensure that pedestrians can move safely around
 the area, especially as demand grows to and from the future Liberty New Street and
 Ontario Line station. Pedestrian gaps are also noted throughout the Exhibition Place
 area
- Narrow Effective Sidewalk Width: The north side of Liberty Street between Mowat Avenue and Atlantic Avenue has several locations with constrained sidewalks due to utility poles, fire hydrants, and garbage bins being placed on the sidewalk, resulting in effective sidewalk widths of less than or equal to 1.5 metres. These narrow effective sidewalk widths are substandard pedestrian clearway by current standards for accessibility. These locations make it difficult for pedestrians to pass by each other and do not easily accommodate mobility impaired users on the sidewalk. Similarly, obstructed sections of sidewalk were observed on the east side of Fraser Avenue (south of Liberty Street), south side of King Street (between Dufferin Street and Joe Shuster Way, and the east side of Hanna Avenue (north of Liberty Street). A narrow sidewalk width of 1.5 metres is observed on Liberty Street on the north side between Hanna Avenue and Pirandello Street, and the south side between Lynn Williams Street and Pirandello Street.

Multi-Modal Level of Service (MMLOS) Guidelines, City of Ottawa, https://app05.ottawa.ca/sirepub/cache/2/csqkiwq23jjanozog31sq3r1/31504601272021034735933.PDF



• Dufferin Street / Saskatchewan Road: The intersection operates at a LOS of F for pedestrians due to the poor crossing conditions on the east leg of the intersection. The east leg has a wide crossing distance of approximately 22 metres and conflicts with a slightly channelized right turn lane which results in an increased approaching speed of vehicles. Pedestrian comfort and safety at the intersection would improve by reducing the sidewalk corner curb radii on the east side of the intersection and bringing the westbound right turn lane to a 90-degree intercept angle.

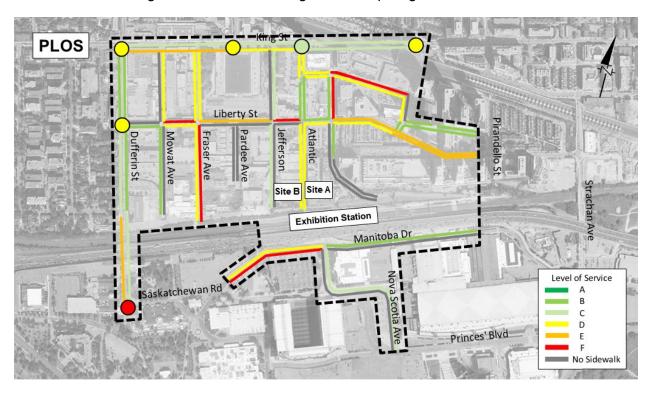


Figure 2-7: Existing Pedestrian Level of Service

2.6.2 Bicycle Level of Service

The bicycle level of service (BLOS) on roadway segments in the walkshed area were analyzed using the methodology detailed in the City of Ottawa MMLOS Guidelines. The detailed inputs used for the analysis can be found in **Appendix A**.

The following observations are made for bicycle levels of service in the network:

 Using the Ottawa MMLOS methodology, many of the smaller roadways within the Liberty Village community operate at a BLOS of A, despite the absence of separated bicycle facilities. Bicycles would be expected to experience higher degrees of safety and comfort on the slow and narrow roadways, however, it is a limitation of the methodology that onstreet parking obstructions and traffic demand are not considered for mixed traffic facilities, as these would also affect the cycling experience by increasing friction and conflict with automobiles.

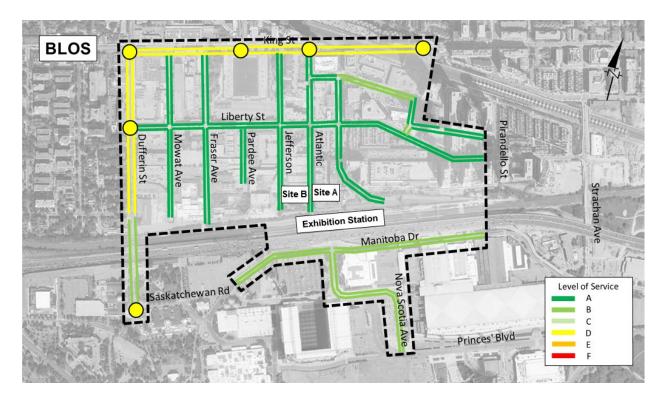


Figure 2-8: Existing Bicycle Level of Service

2.6.3 Transit Level of Service

The transit level of service (TLOS) on roadway segments in the study area were analyzed using the methodology detailed in the City of Ottawa MMLOS Guidelines. Specifically, the factor of transit speed vs. posted speed was estimated based on the driveway and parking friction thresholds for mixed traffic, i.e. segments that experience limited parking/driveway friction result in an LOS of "D", and segments with moderate friction result in an LOS of "E". The detailed inputs used for the analysis can be found in **Appendix A**.

As shown in the transit LOS figure, the segments with transit routes generally operate at a LOS of "D" in the walkshed area with the exception of the segment of Liberty Street between Atlantic Avenue and Hanna Avenue, and along Dufferin Street between King Street and Springhurst Avenue. The LOS E segment along Liberty Street experiences a higher level of friction than others in the area due to a large parking lot on the southern side of Liberty Street. The parking lot is expected to primarily accommodate commuter trips which will increase friction and lower the speed of transit vehicles on the segment during the peak hours. A higher transit friction is experienced along Dufferin Street due to a relatively high number of driveways and on-street parking along the segments.

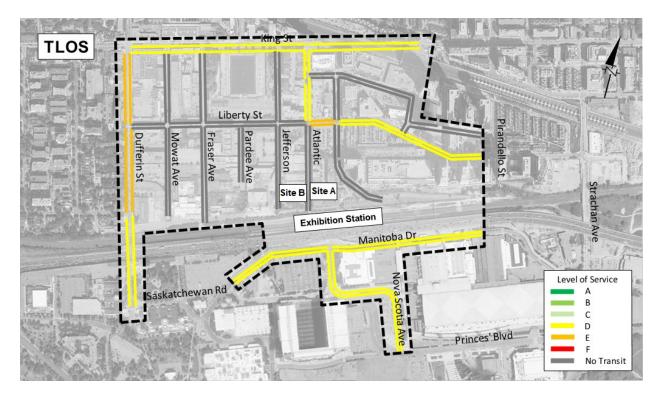


Figure 2-9: Existing Transit Level of Service

2.7 Existing Traffic Volumes

A summary of the intersections and count sources for traffic volumes are provided in **Table 2-1**. HDR used counts from the 2020 Ontario Line Environmental Assessment prepared by AECOM and HDR to maintain consistency with the study where possible and supplemented the counts with additional counts from the City's database or Synchro models. The existing volumes are described as representing 2020 conditions in order to relate them to the 2030 future horizon year, however, they represent typical pre-pandemic traffic volumes and conditions as they were developed using pre-pandemic volumes that were adjusted with a 1% annual growth factor to represent a 'typical' 2020 demand. The annual growth rate is considered to be conservative relative to growth assumptions used in traffic impact studies undertaken for nearby developments but is consistent with the Existing Transportation Conditions Report prepared by AECOM for the Ontario Line Environmental Assessment.

Appendix C shows the existing traffic and active transportation volumes at the study area intersections. Individual intersection peak hour traffic volumes are shown and were used in the study analysis, which is more conservative than calculating a global peak hour set of volumes. Volume balancing between intersections was also reviewed.

Table 2-1: Traffic Count Sources

| Synchro / TIS ID | Intersection | Source used |
|---------------------|-----------------------------|------------------------------------|
| 539 | King/Dufferin | 2017 King Street Synchro Model |
| 2081 | King/Joe Shuster Way | 2017 King Street Synchro Model |
| 1912 | King/Atlantic | 2017 King Street Synchro Model |
| 1851 | King/Sudbury | 2017 King Street Synchro Model |
| 1628 | King/Shaw | 2017 King Street Synchro Model |
| 538 | King/Strachan | 2017 King Street Synchro Model |
| 1449 | Dufferin/Liberty | 2020 Ontario Line Existing EA |
| 2134 | Dufferin/Saskatchewan | 2016 Dufferin Street Synchro Model |
| 571 | Strachan/Fleet | 2014 Pan Am Park Synchro Model |
| 1344 | Lake Shore/British Columbia | 2014 Pan Am Park Synchro Model |
| 222 | Lake Shore/Strachan | 2014 Pan Am Park Synchro Model |

To be conservative, counts were grown by an annual growth factor of 1% to reach existing 2020 volumes, which is consistent with the 2020 Ontario Line EA Existing Transportation Conditions Report prepared by AECOM, and conservative relative to Traffic Impact Studies undertaken for proposed developments nearby.

2.8 Existing Traffic Operations

Based on the existing traffic volumes shown in **Appendix C** and the existing road network illustrated in **Figure 2-2**, intersection operations were assessed using the Synchro 10 traffic analysis software. Existing signal timings are provided in **Appendix B**.

As discussed previously, frequent streetcar service runs in mixed traffic along King Street, as well as along Dufferin Street south of King Street. An adjusted ideal saturation flow rate was derived along King Street to estimate the impact of the streetcars running in mixed traffic based on the operational conditions during the AM and PM peak hours. Assuming that a movement would be operating at-capacity during either the AM or PM peak hour in the existing conditions between Dufferin Street and Strachan Avenue, an ideal saturation flow rate of 1250 was identified and applied along King Street east-west.

Table 2-2 summarizes the level-of-service (LOS), volume/capacity ratio (v/c ratio), and 95th percentile queue for each movement under existing conditions using the HCM 2000 methodology. Detailed Synchro results and reports for all study area intersections are provided in **Appendix D**.

Under existing traffic conditions, the majority of movements are well within capacity. However, the following critical movements exist:

- Eastbound approach to King/Dufferin during the AM peak hour operates at capacity, and the southbound approach is approaching capacity during the AM and PM peak hours. The eastbound approach experiences high delays as a result of the mixed streetcar traffic.
- Northbound approach to Dufferin/Liberty during the AM peak hour operates near capacity
 due to the heavy right turning flows into Liberty Village, causing the lane to operate as a



dedicated right turn lane. The westbound approach to the intersection operates at capacity during the PM peak hour due to the heavy outbound flow in the evenings. Alternative routing options for traffic to and from the south are limited without the construction of Liberty New Street.

- Westbound at King/Strachan during the AM peak hour.
- Northbound left and southbound-through at Strachan/Fleet during the PM peak hour. The northbound left movement is at capacity.
- Eastbound through-right at Lake Shore/Strachan operates near capacity during the AM peak hour. During the PM peak hour, the eastbound left and westbound-through movements are near or at capacity.
- Eastbound-through movement at Lake Shore/British Columbia operates at capacity during the PM peak hour.

Table 2-2: Existing Conditions - Summary of Traffic Analysis Results

| | | | Al | /I Peak H | our | PM Peak Hour | | |
|----------------------------|----------|-------------------|-----|--------------|-----------------------|--------------|--------------|-----------------------|
| Intersection | Movement | Storage length | LOS | v/c Ratio | 95th %ile Q (m) | LOS | v/c Ratio | 95th %ile Q (m) |
| | Overall | - | D | 0.92 | - | С | 0.76 | - |
| King/Dufferin | EBLTR | 267 | D | 1.00 | 90.7 | В | 0.57 | 45.8 |
| (Signalized) | WBLTR | 292 | С | 0.80 | 22.4 | В | 0.66 | 67.7 |
| (Olgridii20d) | NBLTR | 188 | В | 0.43 | 13.0 | С | 0.62 | 50.4 |
| | SBLTR | 361 | D | 0.93 | 71.2 | Е | 0.98 | 70.0 |
| | Overall | - | В | 0.62 | - | Α | 0.46 | - |
| King/Joe Shuster | EBLT | 292 | В | 0.63 | 38.8 | Α | 0.29 | 26.0 |
| Way (Signalized) | WBTR | 167 | Α | 0.53 | 35.0 | Α | 0.47 | 44.7 |
| | SBLR | 76 | С | 0.56 | 45.2 | С | 0.42 | 29.1 |
| | Overall | - | С | 0.74 | - | В | 0.53 | - |
| King/Atlantic | EBTR | 167 | В | 0.78 | 54.3 | В | 0.50 | 27.8 |
| (Signalized) | WBLT | 294 | В | 0.78 | 56.2 | В | 0.50 | 40.8 |
| (Olghalized) | NBL | 30 | С | 0.64 | 50.9 | С | 0.55 | 43.7 |
| | NBR | 174 | С | 0.41 | 27.5 | С | 0.53 | 36.4 |
| | Overall | • | В | 0.75 | • | В | 0.45 | - |
| King/Sudbury | EBLTR | 294 | В | 0.72 | 56.8 | Α | 0.36 | 31.8 |
| (Signalized) | WBLTR | 175 | В | 0.67 | 49.8 | Α | 0.45 | 39.5 |
| (Olghalized) | NBLTR | 134 | С | 0.02 | 3.2 | 0 | 0 | 0 |
| | SBLTR | 172 | D | 0.81 | 72.4 | С | 0.44 | 32.3 |
| | Overall | • | В | 0.63 | • | В | 0.57 | - |
| King/Shaw | EBLTR | 175 | В | 0.72 | 47.9 | Α | 0.39 | 27.3 |
| (Signalized) | WBLTR | 231 | В | 0.57 | 35.5 | В | 0.57 | 49.4 |
| (Olghalized) | NBLTR | 103 | С | 0.47 | 29.1 | С | 0.58 | 33.0 |
| | SBLTR | 356 | В | 0.32 | 16.1 | С | 0.49 | 26.4 |
| | Overall | - | С | 0.82 | - | С | 0.74 | - |
| Dufferin/Liberty | EBLTR | 82 | С | 0.01 | 0.4 | В | 0.02 | 3.7 |
| (Signalized) | WBLTR | 82 | D | 0.80 | 66.3 | Е | 1.00 | 146.8 |
| (Oighanzed) | NBLTR | 225 | В | 0.98 | 82.4 | В | 0.46 | m46.0 |
| | SBLTR | 188 | С | 0.61 | 42.7 | В | 0.41 | 35.0 |
| Dufferin/ | Overall | - | Α | 0.40 | - | Α | 0.53 | - |
| Durrenn/ Saskatchewan | WBL | 30 | D | 0.15 | 5.6 | С | 0.20 | 14.9 |
| (Signalized) | WBR | 124 | С | 0.07 | 5.6 | С | 0.09 | 8.3 |
| (Cignalized) | NBT | 241 | Α | 0.28 | 53.1 | В | 0.52 | 96.7 |



| | | | AM Peak Hour | | | PM Peak Hour | | |
|------------------------------|----------|-------------------|--------------|--------------|-----------------------|--------------|--------------|-----------------------|
| Intersection | Movement | Storage length | LOS | v/c Ratio | 95th %ile Q (m) | LOS | v/c Ratio | 95th %ile Q (m) |
| | NBR | 15 | Α | 0.03 | 5.5 | Α | 0.02 | 4.9 |
| | SBL | 30 | Α | 0.14 | 9.1 | Α | 0.20 | 0.5 |
| | SBT | 167 | Α | 0.39 | 59.8 | Α | 0.57 | 73.7 |
| | Overall | - | С | 0.86 | - | В | 0.59 | - |
| | EBLTR | 231 | С | 0.75 | 55.2 | В | 0.36 | 29.8 |
| King/Strachan | WBLTR | 334 | D | 0.94 | 70.4 | Α | 0.56 | 16.3 |
| | NBL | 25 | С | 0.32 | 26.6 | C | 0.48 | 24.6 |
| (Signalized) | NBTR | 400 | D | 0.75 | 91.3 | С | 0.63 | 62.8 |
| | SBL | 25 | С | 0.17 | 7.4 | С | 0.14 | 7.8 |
| | SBTR | 355 | С | 0.31 | 41.3 | С | 0.35 | 47.9 |
| | Overall | - | С | 0.57 | - | D | 0.80 | - |
| | EBL | 25 | D | 0.40 | 39.5 | D | 0.58 | 57.6 |
| | EBTR | 119 | D | 0.29 | 46.2 | C | 0.18 | 21.0 |
| 0, 1, (5) | WBLT | 205 | D | 0.60 | 71.9 | D | 0.62 | 67.0 |
| Strachan/Fleet | WBR | 50 | С | 0.07 | 2.9 | С | 0.05 | 0.0 |
| (Signalized) | NBL | 30 | С | 0.23 | 28.4 | F | 0.99 | 77.7 |
| | NBTR | 181 | С | 0.59 | 124.5 | С | 0.60 | 128.4 |
| | SBL | 25 | C | 0.21 | 19.2 | C | 0.37 | 32.5 |
| | SBTR | 217 | C | 0.34 | 68.6 | D | 0.85 | 228.9 |
| | Overall | - | D | 0.83 | - | D | 0.95 | - |
| | EBL | 60 | Е | 0.95 | 145.8 | F | 1.01 | 165.7 |
| | EBTR | 286 | С | 0.98 | 295.3 | В | 0.53 | 98.6 |
| Lake Shore/ | WBL | 60 | C | 0.16 | 6.3 | C | 0.08 | 3.9 |
| Strachan | WBT | 172 | D | 0.64 | 94.6 | D | 0.95 | 211.7 |
| (Signalized) | NBLTR | 92 | 0 | 0 | 0 | 0 | 0 | 0 |
| (e.g.ianzea) | SBL | 140 | Č | 0.22 | 35.1 | D | 0.46 | 68.5 |
| | SBLT | 181 | C | 0.20 | 34.9 | D | 0.44 | 68.8 |
| | SBR | 50 | В | 0.14 | 9.9 | В | 0.30 | 24.5 |
| | Overall | - | C | 0.65 | J.0 | D | 0.92 | _ 1.0 |
| Lake Shore/British | EBL | 15 | В | 0.04 | 3.2 | D | 0.03 | 7.6 |
| Columbia | EBT | 387 | C | 0.76 | 119.0 | F | 1.11 | 201.0 |
| (Signalized) | WBR | 80 | C | 0.14 | 0.0 | E | 0.79 | 72.9 |
| (Olghanzoa) | NBTR | 776 | C | 0.67 | 77.3 | C | 0.89 | 252.0 |
| | Overall | - | A | 0.31 | | A | 0.31 | 202.0 |
| | EBL | 30 | A | 0.00 | 0.3 | A | 0.00 | 0.3 |
| | EBTR | 140 | A | 0.32 | 26.3 | A | 0.32 | 26.3 |
| British | WBL | 20 | A | 0.00 | 0.3 | A | 0.00 | 0.3 |
| Columbia/Yukon | WBT | 241 | A | 0.24 | 18.3 | A | 0.24 | 18.3 |
| (Signalized) | WBR | 20 | A | 0.00 | 0.0 | A | 0.00 | 0.0 |
| | NBLTR | 68 | Ĉ | 0.00 | 4.6 | C | 0.00 | 4.6 |
| | SBLTR | 97 | C | 0.09 | 0.0 | C | 0.09 | 0.0 |
| Note: LOS - level of service | | | | | | | | |

Note: LOS = level of service; v/c = volume to capacity ratio; Critical movements are highlighted in **red** as defined by the City's TIS Guidelines.

3 Background Traffic Conditions

3.1 Planned Roadway Improvements

A new street along the southern boundary of Liberty Street is proposed, named "Liberty New Street". The new street will have a two-lane cross-section and will extend between Dufferin Street and Strachan Avenue, immediately north of the railway corridor, intersecting with Mowat Avenue, Fraser Avenue, Jefferson Avenue, Atlantic Avenue, Hanna Avenue, and Pirandello Street. Sidewalks will be provided along the north side of Liberty New Street, and a multi-use path will be provided along the south side to accommodate pedestrians and cyclists. Since the control type at each intersection was not specified in the EA, the intersection control measures recommended in the Ontario Line Exhibition Station Site Plan Review Transportation Impact Assessment (Ontario Line Technical Advisor, May 2021) were carried forward, with the intersection of Jefferson Avenue and Liberty New Street being all-way stop-controlled, Atlantic Avenue and Liberty New Street being signalized, Dufferin Street and Liberty New Street being signalized, and Strachan Avenue and Liberty New Street being a right-in/right-out configuration.

Liberty New Street was assumed to be completed by the 2030 analysis horizon year.

3.2 Planned Transit Improvements

The following future transit improvements are expected in the study area as part of the planned and committed improvements from Metrolinx and the TTC:

- Ontario Line: Exhibition Station will be a terminal station for the proposed Ontario Line subway, which will operate at 90-second headways, connecting Liberty Village and Exhibition Place with the neighbourhoods along the Ontario Line alignment to the east. Exhibition Station will also provide convenient access to the Lakeshore West GO rail and TTC streetcar services nearby.
- Lakeshore West GO Train: GO train frequencies are expected to increase over time
 following electrification of the corridor, resulting in 15-minute peak service, and 30minute off peak services in both directions. New eastbound and westbound express GO
 platforms will be added to Exhibition Station, to be located in the middle of the station
 just north of the eastbound local GO platform at the southern end.
- Streetcar Extension: The TTC has plans to extend the existing streetcar services from the Exhibition Loop to the Dufferin Gates Loop as part of the Waterfront LRT, providing enhanced streetcar connections within the network west of Exhibition Place. Changes resulting from the extension project will include:
 - o New westbound streetcar platform at Manitoba Drive / Nova Scotia Avenue;
 - Possible grade-separated north-south crossings for pedestrians at Manitoba Drive / Nova Scotia Avenue to be used during special event peak hours;
 - New streetcar stop at Centennial Park for both directions, located north of Centennial Park east of Dufferin Street. The west side of the intersection to be protected for a future westerly extension; and
 - Signalization of Dufferin Street at the Dufferin Loop.

Bus Transit Services: Bus bays will be located on Liberty New Street to accommodate redirection of bus routes through Liberty Village. The westbound bus bay will be located between Jefferson Avenue and Atlantic Avenue, and the eastbound bus bay will be located just east of Atlantic Avenue (based on current assumptions and subject to change based on City of Toronto and TTC future plans). The new bus bays will accommodate Route 29A (Dufferin) with a 3.3-minute headway, 63 (Ossington) with a 3.5-minute headway, and 929 (Dufferin Express). The planned future routes in the vicinity of Exhibition Station are illustrated in Figure 3-1.

Based on the above planned service improvements, the future growth around Exhibition Station will be serviced with multiple modes of public transit, providing connecting options in all directions.

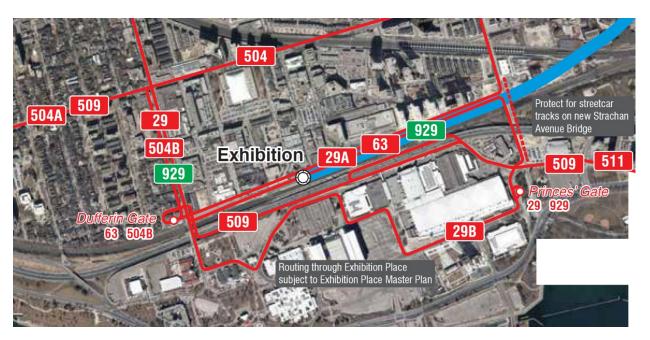


Figure 3-1: Future Transit Routes

3.3 Background Traffic Volumes

Background traffic volumes are comprised of existing traffic volumes plus general background traffic growth, trip reassignment due to the future Liberty New Street connection, and demand growth associated with Exhibition GO and Ontario Line Station.

Future Background traffic volumes were derived in the following manner:

- 1. The existing trips associated with the Exhibition GO Station were removed from the network (since new forecasts for the integrated station will be added).
- 2. A compound annual growth rate of 2% per year was applied between 2020 and 2030 to reflect background traffic growth, including growth associated with nearby developments.
- 3. Traffic volumes within the study area were reassigned to reflect new patterns expected following the completion of Liberty New Street, between Dufferin Street and Strachan Avenue.

- В
- 4. The future Exhibition GO Station trips were added to the network, which include a small number of vehicle trips associated with passenger pick-up/drop-off, as well as walking, cycling, and transit trips to and from the GO station.
- 5. Trips associated with Exhibition Ontario Line Station were assigned to the network, which also include a small number of vehicle trips associated with passenger pick-up/drop-off, as well as walking, cycling, and transit trips to and from the Ontario Line Station.
- 6. Trips to and from the proposed future bus bays that don't use either the GO station or the OL station were also added to the network in order to assess traffic operations at the intersections along Liberty New Street.

It is noted that future growth from Exhibition Place has been solely estimated based on the forecasted demand growth from the Metrolinx EMME model for the Greater Golden Horseshoe, and additional trips have not been assigned to account for any potential redevelopment plans within Exhibition Place or Ontario Place.

3.3.1 Existing Exhibition GO Station Trips

The existing trips generated by the Exhibition GO Station within the study area was estimated to be removed before the application of the compound annual background growth rate. The future trips were then added on top of the grown traffic volumes.

This process relied on TTS data, which is collected by a survey of households within the Greater Golden Horseshoe including the Greater Toronto Area. The TTS data summarizes travel patterns and other related transportation information that can be used to aid in planning, such as mode splits. The 2016 TTS divides geographical areas into 'zones' for the purposes of determining trip patterns from one zone to another.

The following methodology was applied in the calculation of the existing Exhibition GO Station trip layers:

- 1. The daily boarding and alighting trips and existing mode splits were taken from Metrolinx's 2016 GO Rail Station Access Plan to determine the daily trips per mode at Exhibition GO Station.
- 2. The 2016 Transportation Tomorrow Survey (TTS) dataset was queried for transit boarding and alighting trips at Exhibition GO Station in 15-minute time intervals to determine the conversion of daily trips to AM and PM peak hour trips. The conversion factors were applied to the daily trips by mode calculated with the GO Rail Station Access Plan data.
- 3. The 2016 TTS dataset was queried to identify the origin-destination trip travel patterns by mode to and from the existing Exhibition GO Station, and the distribution patterns were applied to the AM and PM peak hour trips by mode.
- 4. The existing Exhibition GO Station trips by mode were subtracted from the study area network.

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To identify the AM and PM peak hour of total station usage (boardings plus alightings), the following assumptions were made for the 2016 TTS data to estimate the time of day a trip would use the station:

- Boardings: It was assumed that the time of arrival to the station to board a train was equal to the start time of the trip.
- Alightings: It was assumed that alightings from the station represent a point near the end
 of a trip. Since alightings at a station generally occur well after the start time of a
 commute, it was assumed that all commute trips using the station are one hour in
 duration. Therefore, the alighting time of a trip was assumed to be one hour after the
 start time of the trip indicated by the TTS data.

The total hourly demand at Exhibition GO Station based on the 2016 TTS data queries was used to identify the AM and PM peak hour and the corresponding peak hour demand relative to the daily demand. The ratio of AM and PM peak hour demand to daily demand (summarized in **Table 3-1**) was applied to the daily demand from the GO Rail Station Access plan to identify the boarding and alighting demand by mode during the AM and PM peak hours (summarized in **Table 3-2** and **Table 3-3** for boardings and alightings, respectively).

Table 3-1: 2016 TTS Data on Exhibition GO Station Usage

| Direction | Daily Trips | AM Peak Hour Trips | PM Peak Hour Trips | AM Pk Hr: Daily Ratio | PM Pk Hr: Daily Ratio |
|------------|-------------|-----------------------|-----------------------|--------------------------|--------------------------|
| Boardings | 2,158 | 155 | 759 | 7% | 35% |
| Alightings | 2,198 | 585 | 280 | 27% | 13% |

Table 3-2: Estimated 2016 Peak Hour Boardings

| Mode | Mode Split* | Daily Boardings | AM Pk Hr: Daily Ratio | AM Peak Hour | PM Pk Hr: Daily Ratio | PM Peak Hour |
|-----------------|----------------|--------------------|--------------------------|-----------------|--------------------------|-----------------|
| Total Boardings | 100% | 1,650* | | 119 | | 580 |
| Walk | 76% | 1,262 | | 91 | | 444 |
| Local Transit | 17% | 275 | 7% | 20 | 35% | 97 |
| Cycling | 1% | 16 | | 1 | | 6 |
| Pickup Dropoff | 6% | 97 | | 7 | | 34 |

*Source: 2016 GO Rail Station Access Plan

Table 3-3: Estimated 2016 Peak Hour Alightings

| Mode | Mode Split* | Daily Alightings | AM Pk Hr: Daily Ratio | AM Peak Hour | PM Pk Hr: Daily Ratio | PM Peak Hour |
|------------------|----------------|---------------------|--------------------------|-----------------|--------------------------|-----------------|
| Total Alightings | 100% | 1,650 | | 439 | | 210 |
| Walk | 76% | 1,262 | | 336 | | 161 |
| Local Transit | 17% | 275 | 27% | 73 | 13% | 35 |
| Cycling | 1% | 16 | | 4 | | 2 |
| Pickup Dropoff | 6% | 97 | | 26 | | 12 |

*Source: 2016 GO Rail Station Access Plan

The 2016 TTS data that contained trips using Exhibition GO Station, in conjunction with knowledge of the local transportation network, were also used to estimate trip distribution and assignment of these existing station trips for each mode as described below:

- For PUDO trips, the TTS dataset contained trips destined to and from the traffic zones containing the existing GO station whose trip purpose was to "facilitate passenger".
- For all other modes, including walking trips transferring to and from other transit routes, pure-walking trips, and bike trips, the TTS dataset contained all trips whose boarding or alighting station was the existing Exhibition GO Station.

The directional distributions of existing GO station PUDO and active transportation trips are shown in **Table 3-4** and **Table 3-5**. TTS data is shown in **Appendix E**.

Table 3-4: Directional Distribution for Existing GO Station for PUDO Trips

| Time Periods | | AM (IN) | AM (OUT) | PM (IN) | PM (OUT) |
|------------------------|----|---------|----------|---------|----------|
| | NW | 0% | 17% | 0% | 0% |
| | N | 9% | 0% | 0% | 9% |
| | NE | 8% | 5% | 0% | 62% |
| Local Short-Distance | E | 27% | 0% | 0% | 29% |
| Trips | SE | 0% | 0% | 0% | 0% |
| · | S | 0% | 0% | 0% | 0% |
| | SW | 0% | 0% | 0% | 0% |
| | W | 0% | 0% | 0% | 0% |
| | NW | 0% | 0% | 0% | 0% |
| | N | 0% | 0% | 0% | 0% |
| | NE | 0% | 34% | 24% | 0% |
| Regional Long-Distance | E | 12% | 0% | 0% | 0% |
| Trips | SE | 0% | 0% | 0% | 0% |
| | S | 0% | 0% | 0% | 0% |
| | SW | 0% | 0% | 0% | 0% |
| | W | 44% | 44% | 76% | 0% |
| Total | | 100% | 100% | 100% | 100% |

Table 3-5: Directional Distribution for Existing GO Station for Walk and Bike Trips

| Time Periods | | AM (IN) | AM (OUT) | PM (IN) | PM (OUT) |
|------------------------|----|---------|----------|---------|----------|
| | NW | 6% | 1% | 1% | 4% |
| | N | 33% | 2% | 4% | 13% |
| | NE | 9% | 17% | 19% | 21% |
| Local Short-Distance | E | 52% | 79% | 73% | 41% |
| Trips | SE | 0% | 0% | 0% | 21% |
| | S | 0% | 0% | 0% | 0% |
| | SW | 0% | 0% | 1% | 0% |
| | W | 0% | 0% | 0% | 0% |
| | NW | 0% | 0% | 0% | 0% |
| Regional Long-Distance | N | 0% | 0% | 0% | 0% |
| Trips | NE | 0% | 0% | 1% | 0% |
| | E | 0% | 0% | 0% | 0% |

| Time Periods | | AM (IN) | AM (OUT) | PM (IN) | PM (OUT) |
|--------------|----|---------|----------|---------|----------|
| | SE | 0% | 0% | 0% | 0% |
| | S | 0% | 0% | 0% | 0% |
| | SW | 0% | 0% | 0% | 0% |
| | W | 0% | 0% | 1% | 0% |
| Total | | 100% | 100% | 100% | 100% |

The multi-modal assignment for the existing GO station trips is shown in **Appendix C**.

3.3.2 General Background Automobile Growth

The background traffic growth per year was estimated based on automobile travel demand data from Metrolinx's 2041 macroscopic travel demand forecasting model for the study area zones, relative to the 2016 TTS demand for the same area coverage. All automobile trips that began or ended in these zones were aggregated for the 2041 and 2016 years. A compound annual background growth rate of 2% per year was determined from the Metrolinx model outputs. The 2% per year growth rate was applied between 2020 and 2030. As the Metrolinx model includes assumptions for nearby developments, it was assumed that the increase in trips generated by nearby planned developments has been incorporated through the annual growth. These growth rates were applied to:

- All through-movements along major and minor arterial streets, which include Dufferin Street, King Street West, Strachan Avenue, and Lakeshore Boulevard; and
- All left and right-turning movements at minor intersections along King Street West and Dufferin Street. This growth component was assumed to represent all future background developments within Liberty Village until the year 2030.

Existing trips associated with Exhibition GO station were removed from the network before the above growth rate was applied.

A compound annual background growth of 1.0% was assumed for all pedestrian and bicycle demand in the study area. The general grown traffic is shown in **Appendix C**.

3.3.3 Liberty New Street Traffic Reassignment

The Liberty New Street connection that will be constructed just north of the railway corridor below Liberty Village between Dufferin Street and Strachan Avenue will provide additional routing options to traffic in the vicinity and will help support the development of lands above the railway corridor. The forecasted trip change shown in Figure 6-6 and Figure 6-7 of the Transportation Report of the Liberty Village New Street EA Study prepared by LEA in October 2015 was used to estimate proportional changes in the future traffic patterns following the completion of Liberty New Street.

The change in volumes as a result of Liberty New Street is shown in **Appendix C** and the total future background traffic volumes are shown in **Appendix C**. Traffic volumes along Liberty New Street in the future total conditions are forecasted to be approximately 100 trips eastbound and westbound during the AM and PM peak hours respectively, between Strachan Avenue and

Atlantic Avenue. The other volumes east-west along Liberty New Street are generally between 200 trips and 300 trips per direction.

3.3.4 Exhibition GO Station Future Trip Generation

The net change in trips generated by Exhibition GO Station by the 2030 analysis horizon year was estimated by removing the existing GO Station trips and adding the forecast gross 2030 trips for walking, cycling, and automobile passenger pick-up/drop-off trips. The methodology for calculating the existing Exhibition GO Station trip generation layer was outlined in Section 3.3.1.

The future 2030 Exhibition GO Station trips were estimated based on the ingress and egress trips from the scaled-back 2080 trip transfer matrix derived from the Metrolinx EMME model, which is shown in **Appendix F**. A 1% compound annual growth rate was assumed between 2030 and 2080 for Exhibition Station related trips. Since only the AM peak hour trip transfer matrix was available, an opposite trend was assumed for the PM peak hour and the trip matrix was transposed. The analysis was conducted using the most recent iteration of the station trip forecasts provided by Metrolinx at the time of the preparation of this report.

Ingress and egress mode splits for 2030 conditions were based on:

- The trip transfer matrix for all trips transferring from other transit routes; and
- Projected 2031 mode splits for Exhibition GO Station from Metrolinx's 2016 GO Rail Station Access Plan for trips accessing and egressing the station by walking, biking and driving/carpooling.

The 2030 gross trip generation for the GO Station is summarized in **Table 3-6**.

Table 3-6: 2030 GO Station Gross Trip Generation By Access and Egress Mode

| | AM Pe | ak | PM Peak | |
|---|-------------|-------|-------------|-------|
| Trip Type | Mode share* | Trips | Mode share* | Trips |
| Total to GO ingress trips | | 760 | | 6,762 |
| From OL to GO transfer trips | - | 362 | - | 5,251 |
| Total Local transit to GO transfers | | 118 | | 1,041 |
| Total walk/bike/PUDO to GO access trips | 100% | 281 | 100% | 471 |
| Walk to GO | 70% | 198 | 70% | 332 |
| TOC to GO trips | | 15 | | 38 |
| Walk to GO (excludes TOC trips) | - | 183 | - | 294 |
| Cycle to GO | 7% | 19 | 7% | 32 |
| PUDO to GO | 23% | 64 | 23% | 107 |
| Total GO egress trips | | 6,762 | | 760 |
| From GO to OL transfer trips | - | 5,251 | - | 362 |
| Total GO to Local transit transfers | | 1,041 | | 118 |
| Total GO to walk/bike/PUDO egress trips | 100% | 471 | 100% | 281 |
| Walk from GO | 70% | 332 | 70% | 198 |
| GO to TOC | | 29 | | 13 |
| Walk from GO (excludes TOC trips) | | 302 | _ | 184 |
| Cycle from GO | 7% | 32 | 7% | 19 |



| | AM Pe | ak | PM Peak | |
|--------------|-------------|-------|-------------|-------|
| Trip Type | Mode share* | Trips | Mode share* | Trips |
| PUDO from GO | 23% | 107 | 23% | 64 |

^{*}Mode share represents access and egress mode shares other than transfers from local transit.

The future directional distribution and route choice for gross future GO station trips were derived in the following manner:

- For future PUDO trips to and from the GO station, the same directional distribution was assumed for existing PUDO trips shown in **Table 3-4**, since growth in station usage will largely be accounted for by non-auto access and egress modes.
- For biking trips, a directional distribution similar to the existing GO station (Table 3-5) was assumed. To account for additional development potential to the south of the railway tracks, the south directional share was increased by 15%, and the other directions were decreased proportionally. The final directional distribution is shown in Table 3-7.
- For all walking trips transferring from other local transit routes, as well as pure walking trips, the directional distribution was obtained directly from the 2041 Station Transfer Matrices. The directional distributions are summarized in **Table 3-8** and **Table 3-9** for local transit transfer trips and pure walking trips, respectively. The regions from which these walking trips start and end are depicted in **Figure 3-2**.

Table 3-7: Directional Distribution for Future Bike-GO Station Trips

| Time Perio | d | AM (IN) | AM (OUT) | PM (IN) | PM (OUT) |
|--------------------------------|----|---------|----------|---------|----------|
| | NW | 4.9% | 1.1% | 0.9% | 3.6% |
| | N | 28.1% | 1.9% | 3.7% | 11.2% |
| | NE | 7.4% | 14.6% | 16.3% | 18.0% |
| Local Short- Distance Trips | Е | 44.5% | 67.1% | 61.9% | 34.7% |
| Distance mps | SE | 0.0% | 0.0% | 0.0% | 17.5% |
| | S | 15.0% | 15.0% | 15.0% | 15.0% |
| | SW | 0.0% | 0.4% | 0.7% | 0.0% |
| Regional Long- | NE | 0.0% | 0.0% | 0.9% | 0.0% |
| Distance Trips | W | 0.0% | 0.0% | 0.4% | 0.0% |
| Total | | 100% | 100% | 100% | 100% |

^{*}Directions omitted have 0% directional share at all times of day and all directions

Table 3-8: 2041 Route Choice Distribution To and From GO Station for Local Transit Transfer Trips

| Location | AM (IN) | AM (OUT) | PM (IN) | PM (OUT) |
|--------------|---------|----------|---------|----------|
| North via 29 | 0.0% | 3.0% | 3.0% | 0.0% |
| North via 63 | 0.0% | 5.4% | 5.4% | 0.0% |
| East via 509 | 14.3% | 2.3% | 2.3% | 14.3% |
| East via 511 | 14.3% | 4.1% | 4.1% | 14.3% |
| South via 29 | 0.0% | 0.2% | 0.2% | 0.0% |

| South via 929 | 0.0% | 0.2% | 0.2% | 0.0% |
|---------------|-------|-------|-------|-------|
| East via OL | 71.4% | 80.4% | 80.4% | 71.4% |
| West via 509 | 0.0% | 1.3% | 1.3% | 0.0% |
| North via 929 | 0.0% | 3.0% | 3.0% | 0.0% |
| TOTAL | 100% | 100% | 100% | 100% |

^{*}Derived from 2041 Station Transfer Matrix

Table 3-9 2041 Directional Distribution for Walking Trips to and from GO Station

| Location | AM (IN) | AM (OUT) | PM (IN) | PM (OUT) |
|------------------|---------|----------|---------|----------|
| North | 27.7% | 39.3% | 39.3% | 27.7% |
| Liberty Village | 36.9% | 60.7% | 60.7% | 36.9% |
| Exhibition Place | 3.1% | 0.0% | 0.0% | 3.1% |
| South West | 22.6% | 0.0% | 0.0% | 22.6% |
| South East | 9.7% | 0.0% | 0.0% | 9.7% |



Figure 3-2: Regions for Station Walking Trips

3.3.5 Exhibition Ontario Line Station Trip Generation

Similar to the future GO station ridership, the Ontario Line Exhibition Station (OL Station) trips were estimated based on the ingress and egress trips from the scaled-back 2080 trip transfer matrix derived from the Metrolinx EMME model, which is shown in Appendix F. A 1% compound annual growth rate was assumed between 2030 and 2080. Since only the AM peak hour trip transfer matrix was available, an opposite trend was assumed for the PM peak hour

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and the trip matrix was transposed. Ingress and egress mode splits for 2030 conditions were based on:

- The trip transfer matrix for all trips transferring from other transit routes; and
- Existing 2016 TTS data for trips boarding and alighting Exhibition GO Station for trips accessing and egressing the station by walking, biking and driving/carpooling.

The 2030 trip generation for the OL station is summarized in **Table 3-10**.

Table 3-10: 2030 OL Station Gross Trip Generation By Access and Egress Mode and by Analysis Period

| Tain True | AN | 1 | PI | И |
|---|-------------|-------|-------------|-------|
| Trip Type | Mode share* | Trips | Mode share* | Trips |
| Total to OL ingress trips | | 7,306 | | 2,499 |
| From GO to OL transfer trips | - | 5,251 | - | 362 |
| Total Local transit to OL transfers | | 733 | | 380 |
| Total walk/bike/PUDO trips to OL access trips | 100% | 1,322 | 100% | 1,756 |
| Walk to OL | 67% | 883 | 70% | 1,689 |
| TOC to OL trips | | 33 | | 33 |
| walk to OL (excludes TOC trips) | - | 851 | - | 1,656 |
| Cycle to OL | 26% | 349 | 7% | 14 |
| PUDO to OL | 7% | 89 | 23% | 53 |
| Total OL egress trips | | 2,499 | | 7,306 |
| From OL to GO transfer trips | - | 362 | - | 5,251 |
| Total OL to Local transit transfers | | 380 | | 733 |
| Total OL to walk/bike/PUDO egress trips | 100% | 1,756 | 100% | 1,322 |
| Walk from OL | 96% | 1,689 | 70% | 883 |
| OL to TOC | | 26 | | 29 |
| Walk from OL (excludes TOC trips) | • | 1,663 | - | 854 |
| Cycle from OL | 1% | 14 | 7% | 349 |
| PUDO from OL | 3% | 53 | 23% | 89 |

^{*}Mode share represents access and egress mode shares other than transfers from local transit.

The directional distribution for OL station trips were derived in the following manner:

- For PUDO trips to and from the OL station, the directional distribution was based on 2016 TTS data of all trips beginning within a 3km radius of the station and ending in East York or the east side of North York (represented by Planning Districts 5 and 6), since these regions generally follow the proposed OL alignment. Trips starting beyond 3km to the east of the OL station were discounted to minimize backtracking, since it was assumed that these trips would use other stations along OL. The resulting directional distribution is shown in Table 3-11.
- For biking trips, a directional distribution similar to that of PUDO trips to the OL station
 (Table 3-11) was assumed. To account for additional development potential to the south
 of the railway tracks, the south directional share was increased by 15%, and the other
 directions were decreased proportionally. The final directional distribution is shown in
 Table 3-12.
- For all walking trips transferring from other local transit routes, as well as pure walking trips, the directional distribution was obtained directly from the 2041 Station Transfer Matrices. The directional distributions are summarized in Table 3-13 and Table 3-14 for

local transit transfer trips and pure walking trips, respectively. The regions from which these walking trips start, and end are depicted in Figure 3-2.

Table 3-11: PUDO OL Trip Distribution

| Direct | tion | AM (IN) | AM (OUT) | PM (IN) | PM (OUT) |
|-------------|------|---------|----------|---------|----------|
| | NW | 48.1% | 30.0% | 29.9% | 48.6% |
| | N | 28.7% | 33.9% | 40.7% | 29.8% |
| | NE | 0.0% | 0.0% | 0.0% | 0.0% |
| Local Trips | E | 23.2% | 35.4% | 28.8% | 19.9% |
| | SE | 0.0% | 0.7% | 0.0% | 0.7% |
| | S | 0.0% | 0.0% | 0.0% | 0.0% |
| | SW | 0.0% | 0.0% | 0.6% | 1.1% |
| | W | 0.0% | 0.0% | 0.0% | 0.0% |
| Tota | al | 100% | 100% | 100% | 100% |

Table 3-12: Directional Distribution for Bike-OL Station Trips

| Direct | tion | AM (IN) | AM (OUT) | PM (IN) | PM (OUT) |
|-------------|------|---------|----------|---------|----------|
| | NW | 40.9% | 25.5% | 25.4% | 41.3% |
| | N | 24.4% | 28.8% | 34.6% | 25.3% |
| | NE | 0.0% | 0.0% | 0.0% | 0.0% |
| Local Trips | Е | 19.7% | 30.1% | 24.5% | 16.9% |
| | SE | 0.0% | 0.6% | 0.0% | 0.6% |
| | S | 15.0% | 15.0% | 15.0% | 15.0% |
| | SW | 0.0% | 0.0% | 0.5% | 0.9% |
| | W | 0.0% | 0.0% | 0.0% | 0.0% |
| Tota | al | 100% | 100% | 100% | 100% |

Table 3-13: 2041 Route Choice Distribution To and From OL Station for Local Transit Transfer Trips

| Location | AM (IN) | AM (OUT) | PM (IN) | PM (OUT) |
|---------------------|---------|----------|---------|----------|
| North via 29 | 0.2% | 14.9% | 14.9% | 0.2% |
| North via 63 | 1.0% | 26.9% | 26.9% | 1.0% |
| East via 509 | 0.0% | 0.0% | 0.0% | 0.0% |
| East via 511 | 4.7% | 20.9% | 20.9% | 4.7% |
| South via 29 | 0.1% | 0.7% | 0.7% | 0.1% |
| South via 929 | 0.1% | 0.7% | 0.7% | 0.1% |
| West via GO local | 53.5% | 14.9% | 14.9% | 53.5% |
| West via GO express | 39.9% | 0.0% | 0.0% | 39.9% |
| West via 509 | 0.3% | 6.0% | 6.0% | 0.3% |
| North via 929 | 0.2% | 14.9% | 14.9% | 0.2% |
| TOTAL | 100% | 100% | 100% | 100% |

^{*}Derived from 2041 Station Transfer Matrix

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Table 3-14 2041 Directional Distribution for Walking Trips To and From GO Station

| Location | AM (IN) | AM (OUT) | PM (IN) | PM (OUT) |
|----------|---------|----------|---------|----------|
| North | 13.6% | 9.1% | 9.1% | 13.6% |
| LV | 34.5% | 89.7% | 89.7% | 34.5% |
| EP | 3.6% | 1.2% | 1.2% | 3.6% |
| SouthW | 33.7% | 0.0% | 0.0% | 33.7% |
| SouthE | 14.5% | 0.0% | 0.0% | 14.5% |

3.3.6 Local Bus and Streetcar Platform Trips

Aside from transfer trips to and from the OL and GO stations, it was assumed that other local trips would originate from Liberty Village and Exhibition Place. The trip generation and route choice distribution from these three areas were estimated separately as explained below.

3.3.6.1 BUS AND STREETCAR TRIPS TO/FROM LIBERTY VILLAGE

The volume of trips between Liberty Village and the bus and streetcar platforms around the OL station was estimated using the 2041 AM Transit OD matrix from the Metrolinx 2041 Greater Golden Horseshoe model. The following forecasts are estimated after scaling down the model transit-based trips to represent the 2030 AM peak hour:

- AM inbound to Liberty Village: 3,098 transit-based trips; and
- AM outbound from Liberty Village: 1,697 transit-based trips.

It was assumed that the PM inbound and outbound transit trips were the opposite of the AM inbound and outbound transit trips to and from Liberty Village, with 1697 and 3098 inbound and outbound trips, respectively.

The transit route choice was based on a directional distribution that was itself derived from the 2041 GGH AM Transit OD matrix, in conjunction with knowledge of each transit route's future convenience, such as speed and accessibility. The directional distribution is shown in **Table 3-15**, and the resulting route choice distribution to and from Liberty Village is shown in **Table 3-16**. It was assumed that the directional distribution would remain the same in the 2030 horizon.

Table 3-15: 2041 GGH Transit Trips Directional Distribution

| Direct | tion | AM (IN) | AM (OUT) | PM (IN) | PM (OUT) |
|-----------------------------------|------|---------|----------|---------|----------|
| | NW | 6.9% | 11.1% | 11.1% | 6.9% |
| | N | 6.0% | 8.0% | 8.0% | 6.0% |
| Local Short- Distance Trips | NE | 11.8% | 20.2% | 20.2% | 11.8% |
| | E | 11.5% | 37.3% | 37.3% | 11.5% |
| | SE | 0.1% | 0.1% | 0.1% | 0.1% |
| | SW | 0.0% | 0.1% | 0.1% | 0.0% |
| | W | 2.8% | 0.8% | 0.8% | 2.8% |
| Regional | NW | 8.6% | 4.5% | 4.5% | 8.6% |
| Long- Distance | N | 14.8% | 5.6% | 5.6% | 14.8% |
| Trips | NE | 16.9% | 4.4% | 4.4% | 16.9% |

| Г | J | く |
|---|---|---|

| Direction | | AM (IN) | AM (OUT) | PM (IN) | PM (OUT) | |
|-----------|----|---------|----------|---------|----------|--|
| | Е | 7.9% | 1.9% | 1.9% | 7.9% | |
| | SW | 2.1% | 0.7% | 0.7% | 2.1% | |
| | W | 10.6% | 5.3% | 5.3% | 10.6% | |
| Total | | 100% | 100% | 100% | 100% | |

Local S, Regional S and Regional SE were 0%.

Table 3-16: 2041 Transit Route Choice To and From Liberty Village

| Direction | AM(IN) | AM(OUT) | PM(IN) | PM(OUT) |
|---------------------|--------|---------|--------|---------|
| North via 29 | 17% | 17% | 17% | 17% |
| North via 63 | 5% | 6% | 6% | 5% |
| East via 504 | 11% | 24% | 24% | 11% |
| East via 509 | 5% | 4% | 4% | 5% |
| East via 511 | 6% | 5% | 5% | 6% |
| South via 29 | 5% | 1% | 1% | 5% |
| East via GO local | 2% | 1% | 1% | 2% |
| East via GO express | 6% | 2% | 2% | 6% |
| West via GO local | 5% | 2% | 2% | 5% |
| West via GO express | 8% | 4% | 4% | 8% |
| West via 504 | 6% | 6% | 6% | 6% |
| East via OL | 21% | 26% | 26% | 21% |
| West via 509 | 1% | 0% | 0% | 1% |
| North via 929 | 1% | 1% | 1% | 1% |
| Total | 100% | 100% | 100% | 100% |

Since passengers from Liberty Village can access each route from more than one stop, it was necessary to assume a proportion of transit trips opting to use the OL station's bus and streetcar platforms, as opposed to other stops elsewhere around Liberty Village. These percentage shares of passengers choosing to use the bus and streetcar platforms, in conjunction with the total transit trips from Liberty Village, were used to derive the final number of peak hour trips between Liberty Village and the bus and streetcar platforms, and are shown in Table 3-17.

Table 3-17: 2030 Future Total Transit Trips by Platform to/from Liberty Village

| Route Gateway* | Percentage of trips using station bus and streetcar platforms for each route | Inbound Platform | Outbound Platform | AM(IN) | AM(OUT) | PM(IN) | PM(OUT) |
|-------------------|--|---------------------------|------------------------|--------|---------|--------|---------|
| North via 29 | 50% | Eastbound bus bays | Westbound bus bays | 263 | 143 | 143 | 263 |
| North via 63 | 50% | Westbound bus bays | Eastbound bus bays | 78 | 55 | 55 | 78 |
| East via 504 | 0% | Elsewhere | Elsewhere | 0 | 0 | 0 | 0 |
| East via 509 | 100% | Westbound LRT platform | Eastbound LRT platform | 161 | 68 | 68 | 161 |
| East via 511 | 100% | Eastbound LRT platform | Eastbound LRT platform | 194 | 77 | 77 | 194 |
| South via 29/929 | 50% | Westbound bus bays | Eastbound bus bays | 76 | 10 | 10 | 76 |

| Route Gateway* | Percentage of trips using station bus and streetcar platforms for each route | Inbound Platform | Outbound Platform | AM(IN) | AM(OUT) | PM(IN) | PM(OUT) |
|----------------------|--|------------------------|------------------------|--------|---------|--------|---------|
| East via GO local | 100% | | | 53 | 15 | 15 | 53 |
| East via GO express | 100% | | 184 | 38 | 38 | 184 | |
| West via GO local | 100% | Within Station | | 145 | 35 | 35 | 145 |
| West via GO express | 100% | | | 257 | 71 | 71 | 257 |
| East via OL | 100% | | | 663 | 449 | 449 | 663 |
| West via 504 | 0% | Elsewhere | Elsewhere | 0 | 0 | 0 | 0 |
| West via 509 | 100% | Eastbound LRT platform | Westbound LRT platform | 39 | 7 | 7 | 39 |
| North via 929 | 50% | Eastbound bus bays | Westbound bus bays | 23 | 5 | 5 | 23 |

^{*}For the northbound and southbound travel directions, the inbound directions are represented by south and north, respectively. For eastbound and westbound travel directions, the inbound directions are represented by west and east, respectively.

3.3.6.2 BUS/STREETCAR TRIPS TO/FROM EXHIBITION PLACE

The volume of trips between Exhibition Place (EP) and the bus and streetcar platforms around the OL station was also estimated using the 2041 AM Transit OD matrix from the Metrolinx 2041 Greater Golden Horseshoe model for the AM and PM peak hours. The following transit-based trips are forecasted after scaling to represent 2030 conditions, and include only the transit trips that opt for the westbound bus bays, eastbound bus bays, and Exhibition LRT stop:

- AM inbound to Exhibition Place: 102 transit-based trips.
- AM outbound from Exhibition Place: 6 transit-based trips.

It was assumed that the PM inbound and outbound transit trips were the opposite of the AM inbound and outbound transit trips to and from Exhibition Place, with 6 and 102 inbound and outbound trips, respectively.

The final combined 2030 future background traffic volumes can be found in **Appendix C**.

Table 3-18: 2030 Future Total Transit Trips by Route to/from Exhibition Place

| Route* | Inbound Platform | Outbound Platform | AM(IN) | AM(OUT) | PM(IN) | PM(OUT) |
|---------------------|---------------------------|---------------------------|--------|---------|--------|---------|
| North via 29/929 | Eastbound bus bay | Westbound bus bay | 32 | 3 | 3 | 32 |
| North via 63 | Westbound bus bay | Eastbound bus bay | 9 | 1 | 1 | 9 |
| East via 504 | Elsewhere | Elsewhere | 0 | 0 | 0 | 0 |
| East via 509 | Westbound LRT platform | Eastbound LRT platform | 20 | 1 | 1 | 20 |
| East via 511 | Eastbound LRT platform | N/A | 24 | 1 | 1 | 24 |
| South via 29 | Westbound bus bay | Eastbound bus bay | 9 | 0 | 0 | 9 |
| West via 509 | Eastbound LRT platform | Westbound LRT Platform | 5 | 0 | 0 | 5 |

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*For the northbound and southbound travel directions, the inbound directions are represented by south and north, respectively. For eastbound and westbound travel directions, the inbound directions are represented by west and east, respectively.

3.4 Background Traffic Operations

Table 3-19 summarizes the LOS, v/c ratio, and 95th percentile queue for movements under future background conditions based on the forecast traffic volumes shown in **Appendix C**. Signal timing splits were optimized whilst maintaining the cycle length and phasing structure. Detailed Synchro results and reports for the study area intersection are provided in **Appendix D**.

Under 2030 background traffic conditions, the addition of background traffic from general background traffic growth, GO Station growth, and new trips associated with Ontario Line has resulted in at-capacity conditions throughout the study area. These locations include new critical movements at all study intersections along King Street with the exception of King/Joe Shuster, at the intersection of Dufferin/Liberty Street, Lake Shore/Strachan, and King/Strachan. Although the Ontario Line Exhibition Station does not generate a significant number of vehicle trips, the station is expected to add a substantial number of conflicting pedestrians and bicycle volumes, with the majority of these volumes being directed to capacity-constrained locations along King Street.

The westbound approach to Dufferin/Liberty improves due to the newly available routing option for outbound traffic travelling to the southwest which is provided by Liberty New Street.

Further improvements were assessed at the intersections of Strachan/Fleet and Dufferin/Liberty New Street during the PM peak hour to identify mitigation opportunities, as summarized in **Table 3-20**. The improvements applied included:

- **Strachan/Fleet:** Add northbound left turn advanced phase and increase cycle length by 10 seconds.
- Dufferin/Liberty New Street: Increase cycle length to 80 seconds.

With the additional improvements, the intersection of Dufferin/Liberty New will operate without critical movements, and the overall intersection of Strachan/Fleet will operate within capacity. Despite the improvements at Strachan/Fleet, high delays are still expected on the eastbound left, westbound left/through, northbound left, and southbound through/right movements, with the southbound through/right operating at capacity. Mitigation measures to alleviate the remaining overcapacity movements are limited due to right-of-way constraints. Additionally, further road widening at locations such as Lakeshore/Strachan, and Strachan/Fleet may have a detrimental impact on experience for pedestrians and cyclists.

Table 3-19: 2030 Background Conditions – Summary of Traffic Analysis Results

| | | | Al | M Peak H | our | PI | M Peak H | our |
|-------------------------------|----------|-------------------|-----|--------------|-----------------------|-----|--------------|-----------------------|
| Intersection | Movement | Storage length | LOS | v/c Ratio | 95th %ile Q (m) | LOS | v/c Ratio | 95th %ile Q (m) |
| | Overall | - | F | 1.28 | - | D | 0.95 | - |
| King/Dufferin | EBLTR | 267 | F | 1.36 | 137.4 | D | 0.90 | 85.1 |
| (Signalized) | WBLTR | 292 | Е | 1.09 | 87.6 | D | 0.93 | 124.4 |
| (Signalized) | NBLTR | 188 | В | 0.64 | 18.5 | C | 0.81 | 73.3 |
| | SBLTR | 361 | F | 1.29 | 117.2 | Е | 1.00 | 81.6 |
| | Overall | 1 | В | 0.74 | - | Α | 0.55 | - |
| King/Joe Shuster | EBLT | 292 | В | 0.79 | 34.1 | Α | 0.36 | 32.3 |
| Way (Signalized) | WBTR | 167 | В | 0.67 | 49.9 | Α | 0.58 | 62.3 |
| | SBLR | 76 | С | 0.58 | 46.3 | С | 0.42 | 29.1 |
| | Overall | 1 | D | 0.94 | - | В | 0.70 | - |
| Vina/Atlantia | EBTR | 167 | D | 0.96 | 88.5 | В | 0.65 | 47.0 |
| King/Atlantic (Signalized) | WBLT | 294 | D | 0.97 | 91.1 | В | 0.54 | 47.0 |
| (Signalized) | NBL | 30 | D | 0.83 | 76.6 | C | 0.64 | 50.6 |
| | NBR | 174 | С | 0.59 | 39.3 | C | 0.74 | 55.3 |
| | Overall | - | С | 0.88 | - | В | 0.54 | - |
| IZ: /C | EBLTR | 294 | С | 0.88 | 98.0 | Α | 0.44 | 43.7 |
| King/Sudbury | WBLTR | 175 | С | 0.84 | 83.3 | В | 0.57 | 59.0 |
| (Signalized) | NBLTR | 134 | С | 0.01 | 3.2 | 0 | 0 | 0 |
| | SBLTR | 172 | D | 0.86 | 77.7 | С | 0.48 | 33.7 |
| | Overall | - | С | 0.75 | - | В | 0.74 | - |
| IC:/OI | EBLTR | 175 | С | 0.88 | 79.1 | В | 0.47 | 32.7 |
| King/Shaw | WBLTR | 231 | В | 0.76 | 54.7 | В | 0.80 | 78.1 |
| (Signalized) | NBLTR | 103 | С | 0.48 | 29.5 | С | 0.60 | 34.0 |
| | SBLTR | 356 | С | 0.53 | 24.2 | С | 0.65 | 33.7 |
| | Overall | - | D | 0.97 | - | С | 0.77 | - |
| Deaff and the first of | EBLTR | 82.6 | С | 0.01 | 0.5 | В | 0.02 | 3.7 |
| Dufferin/Liberty | WBLTR | 82.9 | D | 0.75 | 59.7 | С | 0.86 | 104.6 |
| (Signalized) | NBLTR | 225 | D | 1.19 | 112.4 | В | 0.66 | 73.2 |
| | SBLTR | 188 | Е | 1.06 | 48.0 | В | 0.60 | 51.0 |
| | Overall | - | Α | 0.55 | - | В | 0.71 | - |
| | WBL | 30 | D | 0.17 | 5.9 | C | 0.22 | 16.0 |
| Dufferin/ | WBR | 124 | С | 0.07 | 5.6 | C | 0.40 | 23.4 |
| Saskatchewan | NBT | 241 | Α | 0.43 | 86.8 | В | 0.78 | 184.8 |
| (Signalized) | NBR | 15 | Α | 0.03 | 6.3 | Α | 0.03 | 4.9 |
| , | SBL | 30 | Α | 0.34 | 11.0 | Α | 0.32 | 10.2 |
| | SBT | 167 | Α | 0.55 | 41.7 | В | 0.71 | 164.9 |
| | Overall | - | В | 0.59 | - | С | 0.87 | - |
| 5 66 1 11 11 1 | WBL | 15 | С | 0.60 | 43.9 | В | 0.51 | 24.6 |
| Dufferin/Liberty | WBR | 83 | C | 0.06 | 9.0 | В | 0.27 | 12.1 |
| New (Circus III) | NBTR | 167 | В | 0.46 | 121.2 | C | 0.97 | 176.6 |
| (Signalized) | SBL | 50 | A | 0.05 | 0.9 | A | 0.09 | 3.0 |
| | SBT | 50 | A | 0.58 | 56.6 | В | 0.77 | 132.6 |
| | Overall | - | D | 1.06 | _ | С | 0.81 | - |
| | EBLTR | 231 | D | 0.95 | 94.8 | В | 0.50 | 45.3 |
| King/Strachan | WBLTR | 334 | E | 1.05 | 93.3 | В | 0.81 | 59.5 |
| (Signalized) | NBL | 25 | D | 0.64 | 37.8 | D | 0.80 | 75.4 |
| (=1911411204) | NBTR | 400 | F | 1.10 | 136.6 | С | 0.77 | 109.0 |
| | SBL | 25 | D | 0.41 | 9.1 | C | 0.16 | 8.0 |



| | | | Al | / Peak H | our | PN | M Peak H | our |
|------------------------------------|----------|-------------------|-----|--------------|-----------------------|-----|--------------|-----------------------|
| Intersection | Movement | Storage length | LOS | v/c Ratio | 95th %ile Q (m) | LOS | v/c Ratio | 95th %ile Q (m) |
| | SBTR | 355 | С | 0.50 | 54.4 | С | 0.38 | 56.6 |
| | Overall | - | С | 0.65 | - | F | 1.62 | - |
| | EBL | 25 | D | 0.45 | 41.2 | D | 0.66 | 67.5 |
| | EBTR | 119 | D | 0.30 | 47.6 | D | 0.18 | 22.1 |
| Strachan/Fleet | WBLT | 205 | D | 0.64 | 74.4 | D | 0.66 | 73.1 |
| 0 11 010 110 11 110 110 11 | WBR | 50 | С | 0.08 | 2.9 | С | 0.06 | 0.0 |
| (Signalized) | NBL | 30 | С | 0.31 | 30.3 | F | 2.36 | 84.5 |
| | NBTR | 181 | С | 0.72 | 166.2 | С | 0.76 | 182.0 |
| | SBL | 25 | С | 0.29 | 21.2 | D | 0.53 | 38.9 |
| | SBTR | 217 | С | 0.53 | 112.9 | Е | 1.04 | 316.4 |
| | Overall | - | F | 1.16 | - | F | 1.39 | - |
| | EBL | 60 | F | 1.31 | 267.9 | F | 1.55 | 298.7 |
| | EBTR | 286 | F | 1.26 | 557.7 | С | 0.71 | 178.4 |
| Lake Shore/ | WBL | 60 | D | 0.16 | 7.4 | С | 0.13 | 5.5 |
| Strachan | WBT | 172 | D | 0.84 | 160.6 | F | 1.16 | 361.5 |
| (Signalized) | NBLTR | 92 | Е | 0.28 | 23.4 | Е | 0.18 | 10.5 |
| , | SBL | 140 | Е | 0.72 | 66.1 | F | 0.94 | 141.4 |
| | SBLT | 181 | Е | 0.74 | 70.2 | Е | 0.90 | 140.1 |
| | SBR | 50 | С | 0.18 | 13.9 | С | 0.49 | 66.7 |
| | Overall | - | С | 0.77 | - | F | 1.10 | - |
| Lake Shore/British | EBL | 15 | В | 0.04 | 3.0 | D | 0.03 | 7.2 |
| Columbia | EBT | 387 | D | 0.83 | 139.0 | F | 1.16 | 260.1 |
| (Signalized) | WBR | 80 | D | 0.18 | 0.0 | Е | 0.72 | 54.4 |
| , | NBTR | 776 | С | 0.83 | 111.7 | F | 1.15 | 409.5 |
| | Overall | - | Α | 0.31 | - | Α | 0.31 | - |
| | EBL | 30 | Α | 0.00 | 0.3 | Α | 0.00 | 0.3 |
| Duiti di | EBTR | 140 | Α | 0.32 | 26.4 | Α | 0.32 | 26.4 |
| British | WBL | 20 | Α | 0.00 | 0.3 | Α | 0.00 | 0.3 |
| Columbia/Yukon | WBT | 241 | Α | 0.24 | 18.3 | Α | 0.24 | 18.3 |
| (Signalized) | WBR | 20 | Α | 0.00 | 0.0 | Α | 0.00 | 0.0 |
| | NBLTR | 68 | С | 0.09 | 4.5 | С | 0.09 | 4.5 |
| | SBLTR | 97 | С | 0.02 | 0.0 | С | 0.02 | 0.0 |
| A 41 = 10.41 = /1 - 11 = 11.41 = 1 | Overall | - | С | 0.44 | - | В | 0.39 | - |
| Atlantic/Liberty | EBLT | 63 | Α | 0.09 | 8.9 | Α | 0.22 | 20.8 |
| New (Signalized) | WBTR | 174 | Α | 0.17 | 17.6 | Α | 0.07 | 7.6 |
| (Signalized) | SBLR | 30 | D | 0.83 | 37.8 | С | 0.67 | 27.5 |

Note: LOS = level of service; v/c = volume to capacity ratio; Critical movements are highlighted in **red** as defined by the City's TIS Guidelines.

Table 3-20: Future Background with Improvements (PM Only)

| | | | P | M Peak H | our |
|---------------------|----------|-------------------|-----|--------------|-----------------------|
| Intersection | Movement | Storage length | LOS | v/c Ratio | 95th %ile Q (m) |
| | Overall | - | В | 0.81 | - |
| | WBL | 15 | D | 0.61 | 47.3 |
| Dufferin/Liberty | WBR | 83 | С | 0.06 | 9.7 |
| New (Signalized) | NBTR | 167 | В | 0.85 | 249.9 |
| (Signalized) | SBL | 50 | Α | 0.08 | 2.8 |
| | SBT | 50 | Α | 0.64 | 116.4 |
| | Overall | - | F | 0.98 | - |
| | EBL | 25 | Е | 0.76 | 77.1 |
| | EBTR | 119 | D | 0.19 | 23.7 |
| Strachan/Fleet | WBLT | 205 | Е | 0.77 | 86.9 |
| | WBR | 50 | D | 0.06 | 0.0 |
| (Signalized) | NBL | 30 | Е | 0.86 | 62.7 |
| | NBTR | 181 | С | 0.70 | 178.5 |
| | SBL | 25 | D | 0.44 | 38.3 |
| | SBTR | 217 | F | 1.21 | 366.8 |

Note: LOS = level of service; v/c = volume to capacity ratio; Critical movements are highlighted in **red** as defined by the City's TIS Guidelines.



4 Proposed TOC Development

4.1 Conceptual Site Plan

The proposed development is comprised of three separate sites, as shown in **Figure 1-1**. The site statistics for both sites are reported in **Table 4-1**. The conceptual site plan as of September 2021 for Site A and Site B are shown in **Figure 4-1** to **Figure 4-2**.

Table 4-1: Site Plan Statistics (May 17, 2021)

| Site | Residential Units | Retail GFA | Office GFA | Transit GFA |
|--------|-------------------|---|---|--|
| Site A | 265 | 1,078 m² (11,603 ft²) | 13,166 m² (141,717 ft²) | 340 m² (3,659 ft²) |
| Site B | 303 | 4,226 m ² (45,488 ft ²) | 10,427 m ² (112,235 ft ²) | 428 m ² (4,606 ft ²) |
| Total | 568 | 5,304 m² (57,091 ft²) | 23,593 m² (253,952 ft²) | 768 m² (8,266 ft²) |

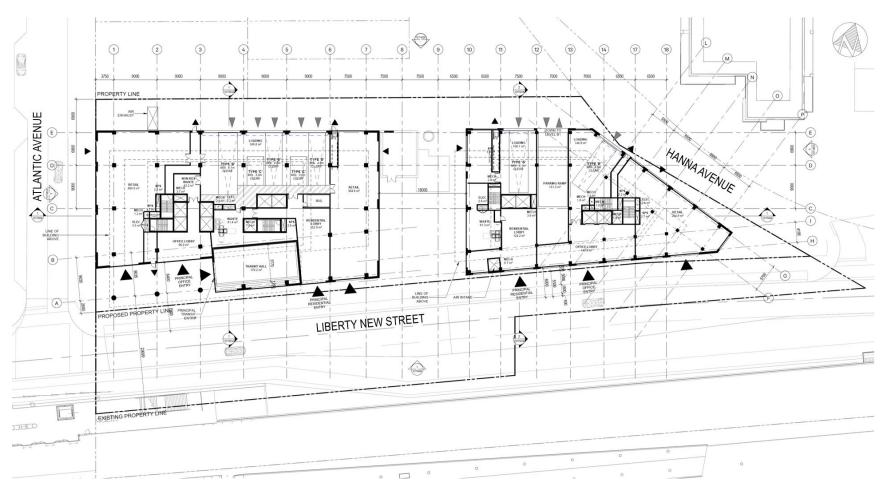


Figure 4-1: Site A (1-1A Atlantic Avenue) Site Plan

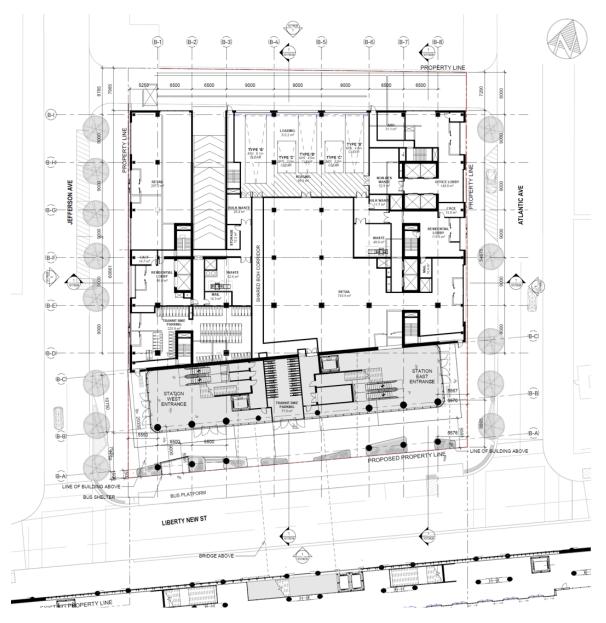


Figure 4-2: Site B (2-20 Atlantic Avenue, 1 Jefferson Avenue) Site Plan

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4.2 Total Traffic Volumes

The 2030 future total traffic volumes are comprised of 2030 future background traffic volumes and TOC site trips.

4.2.1 TOC Site Trip Generation

4.2.1.1 MODE SPLITS

The 2016 TTS was used to inform the mode split assumptions for the development using existing information for nearby uses. The mode split for the area was obtained through review of TTS (2006) Zones 85, and 88-90, which are the zones surrounding the subject site. A proposed mode split was applied to each land use to account for improved transit service and modal shifts in the future. The TTS data and the proposed mode splits are summarized in **Table 4-2**.

Table 4-2: Existing and Proposed Mode Splits (2016 Transportation Tomorrow Survey)

| | | Existing (TTS) | | | | Proposed | | | |
|-------------------|---------|----------------|---------|-------------|---------|-------------|---------|-------------|--|
| Mode | AM (In) | AM (Out) | PM (In) | PM (Out) | AM (In) | AM (Out) | PM (In) | PM (Out) | |
| Transit | 36% | 34% | 31% | 33% | 40% | 40% | 40% | 40% | |
| Cycle | 5% | 8% | 8% | 6% | 5% | 8% | 8% | 6% | |
| Auto driver | 41% | 30% | 30% | 40% | 37% | 24% | 21% | 33% | |
| Auto Passenger | 4% | 3% | 5% | 5% | 4% | 3% | 5% | 5% | |
| Taxi/Ride Hail | 1% | 3% | 3% | 3% | 1% | 3% | 3% | 3% | |
| Walk | 13% | 22% | 24% | 14% | 13% | 22% | 24% | 14% | |
| Total | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | |

4.2.1.2 PERSON-TRIP GENERATION

Trips were generated for the proposed development using the information provided in the Institute of Transportation Engineers (ITE) Trip Generation Informational Report (10th edition). Trip generation rates for Land Use 222 (Multifamily Housing – High-Rise), Land Use 820 (Shopping Centre), and Land Use 710 (General Office Building) were used.

The land use assumes dense multi-use conditions for Land Use 222, and general urban/suburban conditions were used for the other land uses as a dense multi-use category was not available.

Table 4-3 shows the ITE trip generation rates used for each site's land use, and it includes estimated person trips per vehicle trip. The purpose of generating person trips rather than vehicle trips was to be able to assign pedestrian, cycling and transit trips to the study network. **Table 4-4** shows the resulting trip generation by mode for all four sites.

Table 4-3: ITE Trip Generation Rates and Total Person Trip Generation

| | Land Use | Multifamily Housing (High Rise) | Shopping Centre | General Office Building | Total |
|-------|---|------------------------------------|---------------------------|----------------------------|-------|
| Total | LUC# | 222 | 820 | 710 | - |
| | Total Size Proposed | 830 | 79,415 ft ² | 451,233 ft ² | |
| | Setting/Location | Dense Multi-Use Urban | General Urban/Suburban | Dense Multi-Use Urban | - |
| | Average Rate | 0.21 | 0.94 | 0.83 | - |
| | Equation | Ln(T) = 0.84 Ln(X) - 0.65 | T = 0.50(X) + 151.78 | T = 0.72(X) + 21.64 | - |
| | Entering% | 12% | 62% | 86% | - |
| | Exiting% | 88% | 38% | 14% | - |
| AM | Person Trips per Vehicle | 2.81 | NA | 1.47 | - |
| | Total Person Trips (gross)* | 302 | 54 | 301 | 656 |
| | Total Person Trips (multi-use interaction)* | 257 | 46 | 256 | 558 |
| | Total Inbound Person Trips | 31 | 28 | 220 | 279 |
| | Total Outbound Person Trips | 226 | 17 | 36 | 279 |
| | Average Rate | 0.19 | 3.81 | 0.87 | - |
| | Equation | Ln(T) = 0.81 Ln(X) - 0.60 | Ln(T) = 0.74 Ln(X) + 2.89 | T = 0.83(X) + 7.99 | - |
| | Entering% | 70% | 48% | 17% | - |
| | Exiting% | 30% | 52% | 83% | - |
| PM | Person Trips per Vehicle | 2.17 | 1.43 | 1.46 | - |
| | Total Person Trips (gross)* | 203 | 218 | 319 | 740 |
| | Total Person Trips (multi-use interaction)* | 173 | 186 | 273 | 632 |
| | Total Inbound Person Trips | 121 | 89 | 46 | 257 |
| | Total Outbound Person Trips | 52 | 97 | 227 | 375 |

Note: The trip generation equation was used for residential and office land use, for retail land use, the total person trips were calculated using the average vehicular trip generation rate. For retail AM, it assumed there would be 1 person per vehicle. *Assumed 15% reduction in trip generation to account for internal trips between land uses.

^{*}Gross trip generation for all TOC sites is the summation of trip generation of each site calculated using the equation or average rate.

Table 4-4: Trip Generation by Mode

| Peak Hour | Direction | Mode | Mode Shares | Total Person Trips |
|-----------|-----------|----------------|-------------|--------------------|
| | | Total | 100% | 279 |
| | | Transit | 40% | 111 |
| | | Cycle | 5% | 15 |
| | Inbound | Auto driver | 37% | 103 |
| | | Auto passenger | 4% | 10 |
| | | Taxi | 1% | 4 |
| AM | | Walk | 13% | 36 |
| Alvi | | Total | 100% | 279 |
| | | Transit | 40% | 112 |
| | | Cycle | 8% | 22 |
| | Outbound | Auto driver | 24% | 67 |
| | | Auto passenger | 3% | 10 |
| | | Taxi | 3% | 7 |
| | | Walk | 22% | 61 |
| | | Total | 100% | 257 |
| | | Transit | 40% | 102 |
| | | Cycle | 8% | 20 |
| | Inbound | Auto driver | 21% | 54 |
| | | Auto passenger | 5% | 12 |
| | | Taxi | 3% | 8 |
| PM | | Walk | 24% | 61 |
| I IVI | | Total | 100% | 375 |
| | | Transit | 40% | 152 |
| | | Cycle | 6% | 22 |
| | Outbound | Auto driver | 33% | 123 |
| | | Auto passenger | 5% | 18 |
| | | Taxi | 3% | 10 |
| | | Walk | 14% | 51 |

Table 4-5: Assumed Trip Distribution for Auto Mode

| Location | AM (IN) | AM (OUT) | PM (IN) | PM (OUT) |
|----------------------|---------|----------|---------|----------|
| North via Dufferin | 11% | 7% | 7% | 11% |
| North via Shaw | 12% | 13% | 14% | 15% |
| North via Strachan | 6% | 5% | 6% | 6% |
| East via King | 4% | 8% | 8% | 7% |
| East via Wellington | 4% | 10% | 7% | 4% |
| East via Lakeshore | 25% | 27% | 25% | 22% |
| West via Lakeshore | 31% | 26% | 29% | 26% |
| West via Springhurst | 2% | 1% | 2% | 3% |
| West via King | 3% | 1% | 1% | 3% |
| North via Sudbury | 1% | 1% | 1% | 2% |
| TOTAL | 100% | 100% | 100% | 100% |

Table 4-6: Assumed Trip Distribution for Transit Mode

| Location | AM(IN) | AM(OUT) | PM(IN) | PM(OUT) |
|-----------------------|--------|---------|--------|---------|
| North via 29 | 20% | 9% | 12% | 18% |
| North via 63 | 5% | 5% | 6% | 4% |
| East via 504 | 10% | 32% | 28% | 11% |
| East via 509 | 6% | 5% | 5% | 5% |
| East via 511 | 6% | 5% | 5% | 6% |
| East via GO | 12% | 4% | 5% | 10% |
| West via GO | 13% | 2% | 5% | 15% |
| West via 504 | 7% | 1% | 3% | 6% |
| East via Ontario Line | 22% | 36% | 33% | 23% |
| TOTAL | 100% | 100% | 100% | 100% |

Table 4-7: Assumed Trip Distribution for Walk-only Mode

| Location | AM (IN) | AM (OUT) | PM (IN) | PM (OUT) |
|---|---------|----------|---------|----------|
| North via Dufferin West | 3% | 0% | 1% | 2% |
| North via Dufferin East | 3% | 0% | 1% | 2% |
| North via Joe Shuster West | 2% | 0% | 1% | 1% |
| North via Joe Shuster East | 2% | 0% | 1% | 1% |
| North via Shaw West | 2% | 0% | 1% | 1% |
| North via Shaw East | 2% | 0% | 1% | 1% |
| North via Strachan West | 8% | 8% | 7% | 6% |
| North via Strachan East | 8% | 8% | 7% | 6% |
| East via King North | 14% | 21% | 20% | 15% |
| East via King South | 14% | 21% | 20% | 15% |
| East via Wellington North | 4% | 7% | 7% | 5% |
| East via Wellington South | 4% | 7% | 7% | 5% |
| East via Fleet North | 6% | 10% | 10% | 9% |
| East via Fleet South | 6% | 10% | 10% | 9% |
| South via Martin Goodman West side | 4% | 7% | 7% | 6% |
| West via Lakeshore EB South | 1% | 0% | 0% | 1% |
| West via Springhurst South | 1% | 0% | 0% | 1% |
| West via Springhurst North | 1% | 0% | 0% | 1% |
| West via King South | 5% | 1% | 1% | 4% |
| West via King North | 5% | 1% | 1% | 4% |
| South of Liberty between Jefferson & Atlantic | 3% | 0% | 1% | 2% |
| Southeast of King/Atlantic | 2% | 0% | 1% | 1% |
| TOTAL | 100% | 100% | 100% | 100% |

Table 4-8: Assumed Trip Distribution for Bicycle Mode

| Location | AM (IN) | AM (OUT) | PM (IN) | PM (OUT) |
|-----------------------|---------|----------|---------|----------|
| North via Dufferin | 29% | 2% | 2% | 28% |
| North via Joe Shuster | 0% | 0% | 0% | 0% |
| North via Shaw | 26% | 13% | 20% | 26% |
| North via Strachan | 7% | 0% | 1% | 6% |



| Location | AM (IN) | AM (OUT) | PM (IN) | PM (OUT) |
|--------------------------|---------|----------|---------|----------|
| East via King | 7% | 18% | 18% | 8% |
| East via Wellington | 10% | 27% | 27% | 12% |
| South via Martin Goodman | 12% | 34% | 27% | 12% |
| West via Lakeshore | 0% | 5% | 5% | 0% |
| West via King | 10% | 0% | 2% | 8% |
| TOTAL | 100% | 100% | 100% | 100% |

Trips between the TOC and the combined GO and Ontario Line Exhibition Station were estimated by applying the resulting transit gateway percentages for Ontario and GO Lines, which is listed in **Table 4-10**.

Table 4-9: Trips Between OL and GO Exhibition Station and TOC Site

| Time and Direction | All modes | Transit mode% | Transit trips | Choosing OL | TOC-OL Trips | Choosing GO | TOC-GO Trips |
|--------------------|--------------|------------------|------------------|----------------|-----------------|----------------|-----------------|
| AM(IN) | 274 | 40% | 109 | 21% | 23 | 24% | 26 |
| AM(OUT) | 279 | 40% | 112 | 26% | 29 | 12% | 14 |
| PM(IN) | 243 | 40% | 97 | 26% | 25 | 12% | 12 |
| PM(OUT) | 347 | 40% | 140 | 21% | 30 | 24% | 34 |

The total traffic volumes are shown in **Appendix C**, comprised of future background traffic and TOC site trips. Due to limited data, a conservative approach was taken in the analysis and site traffic associated with land uses within the footprint of the proposed TOC's and OL station facilities was not subtracted before adding in the new site traffic.



5 Total Traffic Conditions

5.1 Future Total Traffic Operations

5.1.1 Pedestrian Operations

The future pedestrian density level of service operations for the 2041 horizon year were analyzed in the Ontario Line Exhibition Station Site Plan Review Transportation Impact Assessment (Ontario Line Technical Advisor, May 2021) report and found that there are no critical conditions on the sidewalks, bus bays, and intersection crosswalks during the AM and PM peak hours. Deficiencies were found on the north intersection corners at the future intersection of Liberty New Street and Atlantic Avenue; however, adjacent plaza space may be used to spread intersection queues. Detailed analysis and discussion can be found in the Ontario Line Exhibition Station Site Plan Review Transportation Impact Assessment (Ontario Line Technical Advisor, May 2021) report.

5.1.2 Automobile Operations

Total traffic operations were assessed based on the future total traffic volumes shown in **Appendix C**. **Table 5-1** summarizes the future total traffic operations. Signal timing split optimization was performed to ensure realistic operations. There was no activation or deactivation of left turns, and no further geometric improvements outside of those described in **Section 3.1** and **Section 3.4**. Detailed results and reports for all study area intersections are provided in **Appendix D**.

Under future total conditions, site traffic associated with the TOC generally results in marginal increases in v/c ratios and delay. Movements that experience capacity issues under future total conditions were critical or experienced capacity issues under future background conditions. However, the Site B driveway onto Jefferson Avenue is expected to operate with high delays, primarily due to the high conflicting pedestrian volumes walking to the station headhouse. However, the driveways are expected to be well within capacity. Other movements that emerge as critical or at capacity include:

- King/Dufferin will experience exacerbated conditions during the PM peak hour, with both the eastbound and westbound approaches reaching capacity.
- Dufferin/Liberty will experience exacerbated conditions during the AM peak hour, increasing the overall intersection delay from an LOS of "D" to an LOS of "E", with the overall intersection reaching a volume to capacity ratio of 0.99.
- King/Strachan will experience exacerbated conditions during the AM peak hour, increasing the overall intersection delay from an LOS of "D" to an LOS of "E", with the eastbound approach reaching capacity.

All other critical movements highlighted in the results summary table were carried forward from the existing or future background conditions.



Table 5-1: 2030 Future Total Conditions - Summary of Synchro Results

| | | Al | M Peak Ho | our | | PM Peak | Hour |
|------------------|----------|-----|-----------|-----------|-----|---------|-----------|
| Intersection | Movement | LOS | v/c | 95th %ile | LOS | v/c | 95th %ile |
| | | LOS | Ratio | Q (m) | LUS | Ratio | Q (m) |
| | Overall | F | 1.31 | - | D | 0.97 | - |
| King/Dufferin | EBLTR | F | 1.38 | 139.3 | D | 1.04 | 92.2 |
| (Signalized) | WBLTR | F | 1.12 | 89.5 | D | 1.00 | 133.0 |
| (Signalized) | NBLTR | В | 0.68 | 19.4 | С | 0.79 | 73.1 |
| | SBLTR | F | 1.33 | 121.5 | Е | 0.97 | 81.3 |
| | Overall | В | 0.75 | • | Α | 0.56 | - |
| King/Joe Shuster | EBLT | В | 0.80 | 34.1 | Α | 0.36 | 32.7 |
| Way (Signalized) | WBTR | В | 0.68 | 50.9 | Α | 0.59 | 63.8 |
| | SBLR | С | 0.58 | 46.3 | С | 0.42 | 29.1 |
| | Overall | D | 0.94 | - | В | 0.70 | - |
| King/Atlantic | EBTR | D | 0.98 | 90.6 | В | 0.65 | 47.0 |
| (Signalized) | WBLT | D | 0.97 | 91.1 | В | 0.54 | 47.0 |
| (Signalized) | NBL | D | 0.84 | 78.3 | С | 0.66 | 52.0 |
| | NBR | С | 0.59 | 39.5 | С | 0.75 | 57.1 |
| | Overall | С | 0.88 | - | В | 0.55 | - |
| King/Sudbury | EBLTR | С | 0.90 | 99.8 | Α | 0.44 | 44.1 |
| (Signalized) | WBLTR | С | 0.86 | 94.7 | В | 0.58 | 60.3 |
| (Signalized) | NBLTR | С | 0.01 | 3.1 | Α | 0.00 | 0.0 |
| | SBLTR | D | 0.85 | 76.9 | С | 0.49 | 34.0 |
| | Overall | С | 0.78 | - | В | 0.78 | - |
| Ving/Show | EBLTR | С | 0.88 | 79.6 | В | 0.47 | 33.0 |
| King/Shaw | WBLTR | В | 0.78 | 57.2 | В | 0.82 | 82.3 |
| (Signalized) | NBLTR | С | 0.48 | 29.5 | С | 0.60 | 34.2 |
| | SBLTR | С | 0.59 | 26.9 | С | 0.69 | 35.7 |
| | Overall | E | 0.99 | - | С | 0.78 | - |
| Dufferin/Liberty | EBLTR | С | 0.01 | 0.5 | В | 0.02 | 3.8 |
| (Signalized) | WBLTR | D | 0.76 | 59.7 | D | 0.88 | 107.1 |
| (Signalized) | NBLTR | D | 1.18 | 115.0 | В | 0.68 | 74.6 |
| | SBLTR | Е | 1.08 | 47.5 | В | 0.60 | 51.2 |
| | Overall | Α | 0.56 | • | В | 0.77 | - |
| | WBL | D | 0.17 | 5.9 | С | 0.22 | 16.0 |
| Dufferin/ | WBR | С | 0.07 | 5.7 | С | 0.59 | 34.5 |
| Saskatchewan | NBT | Α | 0.46 | 90.6 | С | 0.81 | 188.3 |
| (Signalized) | NBR | Α | 0.03 | 6.2 | Α | 0.03 | 4.9 |
| | SBL | Α | 0.35 | 11.5 | Α | 0.33 | 10.2 |
| | SBT | Α | 0.56 | 43.9 | В | 0.73 | 192.8 |
| | Overall | В | 0.60 | - | В | 0.84 | - |
| Dufferin/Liberty | WBL | С | 0.62 | 46.8 | D | 0.66 | 54.2 |
| New | WBR | С | 0.09 | 10.6 | С | 0.10 | 12.2 |
| (Signalized) | NBTR | В | 0.49 | 125.8 | В | 0.87 | 254.4 |
| (Signalized) | SBL | Α | 0.11 | 1.9 | Α | 0.20 | 6.0 |
| | SBT | Α | 0.59 | 54.0 | Α | 0.65 | 116.4 |
| | Overall | Ε | 1.09 | - | С | 0.86 | - |
| | EBLTR | D | 1.00 | 101.0 | В | 0.55 | 49.3 |
| King/Strachan | WBLTR | E | 1.06 | 93.8 | В | 0.86 | 71.0 |
| (Signalized) | NBL | D | 0.78 | 48.6 | D | 0.85 | 84.2 |
| (Olghalized) | NBTR | F | 1.14 | 142.5 | С | 0.76 | 106.4 |
| | SBL | D | 0.41 | 9.4 | С | 0.15 | 7.6 |
| | SBTR | С | 0.53 | 57.5 | С | 0.37 | 57.3 |



| | | Al | M Peak Ho | our | PM Peak Hour | | | |
|-------------------------------------|----------------|----------|--------------|-----------|--------------|--------------|-----------|--|
| Intersection | Movement | LOS | v/c | 95th %ile | LOS | v/c | 95th %ile | |
| | | | Ratio | Q (m) | LUS | Ratio | Q (m) | |
| | Overall | С | 0.67 | - | F | 1.00 | - | |
| | EBL | D | 0.46 | 41.4 | E | 0.77 | #78.0 | |
| | EBTR | D | 0.30 | 47.6 | D | 0.19 | 23.7 | |
| Strachan/Fleet | WBLT | D | 0.64 | 74.4 | E | 0.77 | 86.9 | |
| (Signalized) | WBR | С | 0.09 | 3.1 | D | 0.06 | 0.0 | |
| (Olgitalizad) | NBL | С | 0.32 | 30.8 | Е | 0.86 | 62.7 | |
| | NBTR | С | 0.75 | 176.3 | С | 0.71 | 184.5 | |
| | SBL | С | 0.31 | 22.0 | D | 0.46 | 39.6 | |
| | SBTR | С | 0.55 | 118.4 | F | 1.24 | 379.1 | |
| | Overall | F | 1.17 | - | F | 1.40 | - | |
| | EBL | F | 1.32 | 272.2 | F | 1.57 | 298.7 | |
| | EBTR | F | 1.27 | 566.5 | С | 0.71 | 178.4 | |
| Lake Shore/ | WBL | D | 0.16 | 7.5 | С | 0.13 | 5.5 | |
| Strachan | WBT | D | 0.84 | 163.6 | F | 1.18 | 361.5 | |
| (Signalized) | NBLTR | E | 0.30 | 24.0 | E | 0.24 | 12.5 | |
| | SBL | <u>E</u> | 0.72 | 67.8 | F | 0.94 | 149.2 | |
| | SBLT | E | 0.76 | 73.8 | E | 0.91 | 146.7 | |
| | SBR | C | 0.18 | 13.9 | С | 0.49 | 66.7 | |
| Later Ober 17 / Duitiete | <u>Overall</u> | B | 0.79 | 2.9 | F | 1.11 | - 7.1 | |
| Lake Shore/British | EBL | D B | 0.04 | | D F | 0.03 | | |
| Columbia (Signalized) | EBT | D D | 0.83 | 145.1 | E | 1.15 | 262.6 | |
| (Signalized) | WBR NBTR | С | 0.18 | 0.0 | F | 0.73 1.17 | 56.7 | |
| | Overall | A | 0.86 0.31 | 113.8 | A | 0.31 | 413.3 | |
| | EBL | A | 0.00 | 0.3 | A | 0.00 | 0.3 | |
| | EBTR | A | 0.32 | 26.4 | A | 0.32 | 26.4 | |
| British Columbia/ | WBL | A | 0.00 | 0.3 | A | 0.00 | 0.3 | |
| Yukon | WBT | A | 0.24 | 18.3 | A | 0.24 | 18.3 | |
| (Signalized) | WBR | A | 0.00 | 0.0 | A | 0.00 | 0.0 | |
| | NBLTR | C | 0.09 | 4.5 | C | 0.09 | 4.5 | |
| | SBLTR | C | 0.02 | 0.0 | Ċ | 0.02 | 0.0 | |
| | Overall | В | 0.51 | - | В | 0.45 | - | |
| Atlantic/Liberty New | EBLT | Α | 0.19 | 12.5 | Α | 0.27 | 24.2 | |
| (Signalized) | WBTR | Α | 0.24 | 19.2 | Α | 0.12 | 9.4 | |
| , | SBLR | С | 0.79 | 44.1 | В | 0.68 | 32.0 | |
| leffereen/Liberty | Overall | В | - | - | Α | - | - | |
| Jefferson/Liberty New | EBLT | В | 0.38 | 0 | Α | 0.44 | 8.1 | |
| (Unsignalized) | WBTR | Α | 0.31 | 0 | Α | 0.21 | 0.0 | |
| (Onsignalized) | SBLR | Α | 0.06 | 0 | Α | 0.29 | 86.9 | |
| Atlantic/Site A | Overall | С | - | - | В | - | - | |
| Driveway | WBLR | С | 0.06 | 1.4 | В | 0.07 | 1.8 | |
| (Unsignalized) | NBTR | Α | 0.05 | 0.0 | Α | 0.03 | 0.0 | |
| (3 | SBLT | A | 0.01 | 0.2 | A | 0.00 | 0.1 | |
| Hanna/Liberty New (Unsignalized) | Overall | F | | - | F | - | - | |
| | EBLT | В | 0.22 | 6.2 | A | 0.21 | 6.0 | |
| | WBTR | A | 0.15 | 0.0 | A | 0.06 | 0.0 | |
| | SBLR | F | 0.18 | 4.7 | F | 0.53 | 16.8 | |
| Jefferson/Site B | Overall | F | 0.05 | - 0.4 | F | 0.04 | 40.4 | |
| Driveway | WBLR | F | 0.35 | 9.4 | F | 0.61 | 19.1 | |
| (Unsignalized) | NBTR SBLT | Α | 0.10 | 0.0 | A | 0.12 | 0.0 | |
| | SBLT | Α | 0.00 | 0.0 | Α | 0.00 | 0.0 | |



| | | Al | AM Peak Hour | | | | PM Peak Hour | | | |
|----------------------------|----------|-----|--------------|--------------------|-----|--------------|--------------------|--|--|--|
| Intersection | Movement | LOS | v/c Ratio | 95th %ile Q (m) | LOS | v/c Ratio | 95th %ile Q (m) | | | |
| A 41 4: - /C:4 - D | Overall | С | - | | С | | - | | | |
| Atlantic/Site B | EBLR | D | 0.23 | 6.6 | D | 0.30 | 9.2 | | | |
| Driveway (Unsignalized) | NBLT | Α | 0.03 | 0.7 | Α | 0.02 | 0.5 | | | |
| | SBTR | Α | 0.12 | 0.0 | Α | 0.11 | 0.0 | | | |

Note: LOS = level of service; v/c = volume to capacity ratio; Critical movements are highlighted in red.



6 Parking and Loading Assessment

This section of the report reviews the proposed parking supply and the requirements of the new City-wide Zoning By-law 569-2013, as amended (Office Consolidation) Version Date: May 1, 2020. The by-law includes specific requirements for parking (bicycle and vehicle) as well as loading.

6.1 Policy Area Designations and Parking Requirements

The current city-wide Zoning By-law 569-2013 is typically applied to new developments throughout the City. The By-law includes multiple sets of vehicle parking rates with diminishing requirements for certain areas that have better transit accessibility. The Exhibition TOC area does not fall under any Policy Area designation and would typically use the general "in all other areas of the City" requirements in the regulations; however, due to the excellent transit available along King Street and the future Ontario Line subway which will be located directly adjacent to the sites, it is assumed that in the future this area will be designated as Policy Area 1. The policy areas in the City of Toronto are illustrated in **Figure 6-1**.

For comparison, the Policy Area 1 rates and Policy Area 3 rates are summarized below. Policy Area 3 rates are generally applied adjacent to subway lines beyond Downtown Toronto; however, the proposed Exhibition site will have better accessibility to the Downtown core than areas typically classified as Policy Area 3.

Table 6-1: Policy Area 1 and Policy Area 3 Minimum Parking Requirements

| Use | Policy Area 1 | Policy Area 3 |
|--|---|---|
| Dwelling Unit in an Apartment Building (Resident Requirement) | 0.3 for each bachelor dwelling unit up to 45 square metres and 1.0 for each bachelor dwelling unit greater than 45 square metres; 0.5 for each one-bedroom dwelling unit; 0.8 for each two-bedroom dwelling unit; and 1.0 for each three or more bedroom dwelling unit | 0.6 for each bachelor dwelling unit up to 45 square metres and 1.0 for each bachelor dwelling unit greater than 45 square metres; 0.7 for each one-bedroom dwelling unit; 0.9 for each two-bedroom dwelling unit; and 1.0 for each three or more bedroom dwelling unit |
| Dwelling Unit in an Apartment Building (Visitor Requirement) | a minimum rate of 0.1 for each dwelling unit | a minimum rate of 0.1 for each dwelling unit |
| Retail Store | minimum of 1.0 for each 100 square metres of GFA | minimum of 1.0 for each 100 square metres of GFA |
| Office | a minimum rate of 0.35 for each 100 square metres of GFA | a minimum rate of 1.0 for each 100 square metres of GFA |

According to By-law No. 569-2013, within Bicycle Zone 1, if bicycle parking is provided in excess of the required minimums, then the minimum vehicle parking requirements can be reduced by 1 vehicle space for every 5 bicycle parking spaces provided beyond the minimum, to a maximum of 20% of the required minimum vehicle parking. The subject site is located in Bicycle Zone 1, which is defined as the area of the City bounded by the Humber River on the



west, Lawrence Avenue on the north, Victoria Park Avenue on the east and Lake Ontario on the south.

6.2 Vehicular Parking Supply

6.2.1 Site A (1-1A Atlantic Avenue)

The total proposed vehicular parking supply for Site A is 102 spaces, comprised of a mix of residential tenant parking, car-share spaces, and shared parking spaces. Two levels of belowgrade parking garage will serve residents and commercial patrons; no surface parking is proposed.

6.2.2 Site B (2-20 Atlantic Avenue, 1 Jefferson Avenue)

The total proposed vehicular parking supply for Site B is 112 spaces, comprised of resident tenant parking, residential visitor parking, car-share spaces, shared parking spaces, and transit staff parking spaces. Three levels of below-grade parking garage will serve residents and commercial patrons; no surface parking is proposed.

The parking supply for all sites is summarized in **Table 6-2**.

Table 6-2: Vehicle Parking Supply

| | | Vehicle Parking Space Type | | | | | | | | | | |
|--------|--------|----------------------------|---------|-------------------|---------------|-------|--|--|--|--|--|--|
| Site | Tenant | Car-Share | Visitor | Shared Parking | Transit Staff | TOTAL | | | | | | |
| Site A | 50 | 4 | 0 | 48 | 0 | 102 | | | | | | |
| Site B | 55 | 5 | 7 | 39 | 6 | 112 | | | | | | |
| TOTAL | 105 | 9 | 7 | 87 | 6 | 214 | | | | | | |

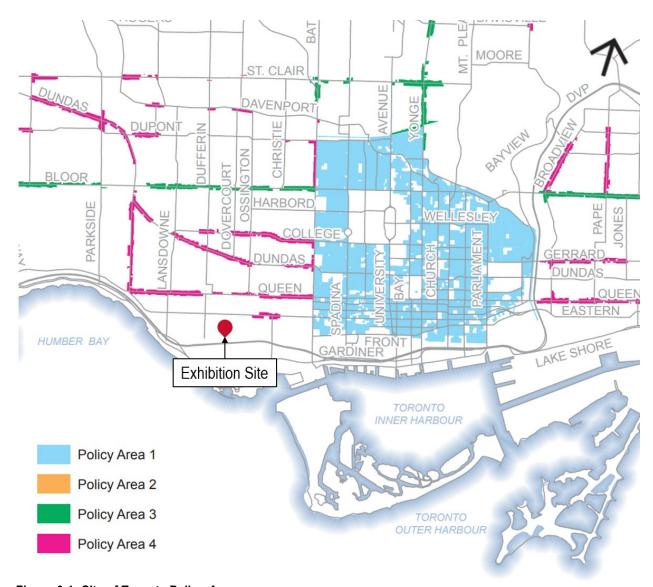


Figure 6-1: City of Toronto Policy Areas



6.3 Vehicle Parking Requirements

Vehicle parking requirements were reviewed using By-law 569-2013 with Policy Area 1 rates; the requirements are shown in **Table 6-3**.

Table 6-3: Vehicle Parking Zoning By-law Requirements

| Site | Land Use | Size (Unit or m2) | By-law No. 569-20 |)13 (PA1) | | | | | | |
|------|----------------|-----------------------|-------------------|---------------|--|--|--|--|--|--|
| Site | Land USE | Size (Unit or m2) | Rate | # Spaces Req. | | | | | | |
| | Bachelor | 4 | 0.3 / Unit | 1 | | | | | | |
| | 1-Bed | 154 | 0.5 / Unit | 77 | | | | | | |
| | 2-Bed | 72 | 0.8 / Unit | 57 | | | | | | |
| A | 3-Bed | 35 | 1.0 / Unit | 35 | | | | | | |
| | Visitors | 265 | 0.1 / Unit | 26 | | | | | | |
| | Retail | 1,078 m ² | 1.0 / 100 m2 | 10 | | | | | | |
| | Office | 13,166 m ² | 0.35 / 100 m2 | 46 | | | | | | |
| | | 252 | | | | | | | | |
| | Bachelor | 22 | 0.3 / Unit | 6 | | | | | | |
| | 1-Bed | 172 | 0.5 / Unit | 86 | | | | | | |
| | 2-Bed | 52 | 0.8 / Unit | 41 | | | | | | |
| В | 3-Bed | 57 | 1.0 / Unit | 57 | | | | | | |
| В | Visitors | 303 | 0.1 / Unit | 30 | | | | | | |
| | Retail | 4,226 m ² | 1.0 / 100 m2 | 42 | | | | | | |
| | Office | 10,427 m ² | 0.35 / 100 m2 | 36 | | | | | | |
| | | | Subtotal | 299 | | | | | | |
| | Total Required | | | | | | | | | |

Based on the Policy Area 1 minimum parking requirements, a total of 551 parking spaces would be required; for comparison, a total of 790 parking spaces would be required if Policy Area 3 was used. However, considering the urban trends, downtown location and access to transit, it is neither practical nor reasonable to provide the number of parking spaces required by the prevailing Zoning By-law for the proposed development. In recent years, City Council has acknowledged this and has adopted lower standards for approval for new developments in Downtown Toronto. These actions have been bolstered by Ontario's New Five-Year Climate Change Action Plan and numerous other initiatives by the City of Toronto. There has also been a steep decline in residential parking demand and vehicle ownership in the Downtown Toronto area. There have been developments with 'zero' parking across North America, including Downtown Toronto, where transit accessibility is reasonable. The area is well served by transit, Site B will have direct internal access to the Exhibition Ontario Line station, and all sites are very close to the King and Dufferin streetcars, Exhibition GO Station, and a number of bus routes. Also, a very high transit-dependency is the fundamental characteristic of Transit Oriented Developments / Communities, as they promote reduced automobile dependency.

Recently approved parking supply ratios for condominium buildings in the downtown area included rates as low as 0.03 spaces per unit. After reviewing a few similar developments in the nearby area, it was determined that an effective parking supply rate of 0.25 spaces per unit for



resident parking and 0.10 spaces per unit for visitor parking would be a conservative estimate for a TOC development at Exhibition Station. Nearby proxy sites are summarized below in **Table 6-4** which shows several developments near the Exhibition TOC sites providing proposed parking in the range of 28% to 40% of the required parking at the sites. By comparison, the TOC sites are proposing to provide 42% of the overall parking requirement, prior to reductions.

The by-law minimum rate of 0.35 spaces per 100 m² of office space was maintained for the TOC sites as sufficient samples in the nearby area were not observed to support office space parking reductions. The developments at 25 Liberty Street and 950 King Street both proposed zero retail parking spaces due to the small sizes of the retail uses and the expectation that the businesses will primarily serve local foot traffic. Visitor parking rates of 0.1 spaces per unit were generally maintained, except at 2 Tecumseth Street which proposed a visitor parking rate of 0.06 spaces per unit. The development at 2 Tecumseth Street had also proposed adjusted resident parking rates for each unit type. The introduction of Ontario Line, the new Liberty New Street bus bays, and the proximity of the TOC sites will reduce resident, visitor, staff, and customer reliance on single occupant vehicles to reach the site and support the provision of reduced parking at the sites.

The non-residential parking requirements have been estimated through a shared-use parking scheme that is summarized in **Table 6-5**. Shared use parking enables the efficient use of parking spaces, as different uses have higher demands for parking at different times of the day. The percentage of parking demand (as a portion of the overall rate) were from the City of Toronto's Table 200.5.10.1 as recommended in the By-law 569-2013.

It is noted that ancillary retail units will be constructed on the ground-level of the sites to which destination vehicular trips are not expected, as the businesses will primarily serve local foot traffic; therefore, the number of required retail spaces has been omitted. As per the shared parking calculations, and omitting the retail spaces, it is recommended that 48 spaces are allocated to non-residential use on Site A and 39 spaces on Site B.

Table 6-4: Parking Proxy Sites

| Site Study D | Reg. | Req. | arking Darking | % of | Site Characteristics | | | Proposed Rates | | | |
|----------------------|------------|---------|------------------|------------------|----------------------|----------------|--------------------------|----------------|---------|----------------------------------|----------------------------------|
| | Study Date | Parking | | Req. Proposed | Res. (DU) | Retail (m²) | Office (m ²) | Tenant | Visitor | Retail (per 100 m ²) | Office (per 100 m ²) |
| 25 Liberty Street | Apr. 2017 | 302 | 108 | 36% | - | 2,699 | 22,677 | - | - | NA | NA |
| 950 King Street | Mar. 2018 | 185 | 74 | 40% | 217 | 588 | - | 0.24 | 0.1 | 0 | - |
| 1071 King Street | Dec. 2019 | 238 | 66 | 28% | 230 | 489 | ı | 0.187 | 0.1 | 0 | - |
| 2 Tecumseth | May 2019 | 1335 | 379 | 28% | 680 | 6,269 | 31,206 | By Unit* | 0.06 | 1 | 0.35 |

*Proposed by unit:

Bachelor: 0.1 per unit
1 Bedroom: 0.3 per unit
2 Bedroom: 0.5 per unit
3 Bedroom: 1.0 per unit

Table 6-5: Shared Parking Calculations

| | Land | Size (Unit or m²) | | By-law No. 569-2013 (PA1) | | | | | | |
|--------|----------|-------------------|---------------|---------------------------|-----------|-----------|-----------|--|--|--|
| Site | Use | | Rate | # Spaces Req. | AM | PM | Eve | | | |
| | Visitors | 265 | 0.1 / Unit | 26 | 2 (10%) | 9 (35%) | 26 (100%) | | | |
| Site A | Retail | 1,078 | 1.0 / 100m2 | 10 | 2 (20%) | 10 (100%) | 10 (100%) | | | |
| | Office | 13,166 | 0.35 / 100 m2 | 46 | 46 (100%) | 27 (60%) | 0 (0%) | | | |
| | Subtotal | | | 82 | 50 | 46 | 36 | | | |
| | | Maxim | um Required | | 50 | | | | | |
| | Visitors | 303 | 0.1 / Unit | 30 | 3 (10%) | 10 (35%) | 30 (100%) | | | |
| | Retail | 4,226 | 1.0 / 100m2 | 42 | 8 (20%) | 42 (100%) | 42 (100%) | | | |
| Site B | Office | 10,427 | 0.35 / 100m2 | 36 | 36 (100%) | 21 (60%) | 0 (0%) | | | |
| | | Subtotal | | | 47 | 74 | 72 | | | |
| | | Maximum Required | | | | 74 | | | | |

The number of shared parking spaces that can be realized with the currently proposed parking supply is summarized in **Table 6-6**, assuming that a rate of 0.25 spaces per residential unit will be provided to residential unit tenants, that the shared parking spaces will be provided for the tenants, and that no parking will be required for retail uses. As shown, the final proposed spaces will satisfy requirements for all sites. Accounting for a further reduction based on the surplus bicycle parking on each site (calculation detailed below in Section 6.5), a surplus of 15 to 19 parking spaces is provided at the sites. The surplus parking has been assigned to visitor parking to help separate the uses and provide a more reliable source of parking for residential visitors to the sites

Table 6-6: Proposed Parking Reassignment

| Parking Assignment | Site A | Site B |
|--|--------|--------|
| Total Parking Proposed | 102 | 112 |
| Residential Units | 265 | 303 |
| Base Tenant Spaces Required (based on proposed 0.25 spaces/unit) | 66 | 75 |
| Car-Share Spaces | 4 | 5 |
| Total Tenant Spaces Required | 54 | 60 |
| Proposed Parking Remaining | 48 | 52 |
| Required Shared Parking (Excluding Retail) | 48 | 39 |
| Difference: | 0 | +13 |
| Vehicle Parking Reduction from Providing Surplus Bicycle Parking | +15 | +4 |
| Final Parking Difference: | +15 | +19 |

6.4 Accessible Parking Spaces

Accessible parking requirements were reviewed using By-law 569-2013, Chapter 200.15.10, which stipulates the following:

(1) Parking Rates - Accessible Parking Spaces

If the total **parking space** requirement is 5 or more, clearly identified off-**street** accessible **parking spaces** must be provided on the same **lot** as every **building** or **structure** erected or enlarged, as follows:



- (A) if the number of required parking spaces is less than 13, a minimum of 1 parking space must comply with all regulations for an accessible parking space in Section 200.15;
- (B) if the number of required parking spaces is 13 to 100, a minimum of 1 parking space for every 25 parking spaces or part thereof must comply with all regulations for an accessible parking space in Section 200.15; and
- (C) if the number of required **parking spaces** is more than 100, a minimum of 5 **parking spaces** plus 1 **parking space** for every 50 **parking spaces** or part thereof in excess of 100 **parking spaces**, must comply with all regulations for an accessible **parking space** in Section 200.15. [By-law: 579-2017]

With the parking requirements summarized in **Table 6-6**, all site requirements fall within 100 to 150 parking spaces, which will result in a requirement of 5 accessible parking spaces per site. At a minimum, 5 accessible parking spaces will be provided per site.

6.5 Bicycle Parking Supply

Bicycle parking for the site will be provided in the form of short-term and long-term bicycle parking spaces. Short-term bicycle parking will be provided at-grade (internally or weather protected if outdoors) as well as underground, and will serve residential visitors, commercial patrons, and potentially residents who are making short stops at home. Long-term bicycle parking will be located on the underground parking levels under each building. The bicycle parking supply is summarized in **Table 6-7**.

Table 6-7: Bicycle Parking Supply

| | | Bicycle Parking Space Type | | | | | | | | | |
|--------|--------------------------|----------------------------|------------------------------|-------------------------------|---------|-------|--|--|--|--|--|
| Area | Residential Long Term | Residential Short Term | Non-Residential Long Term | Non-Residential Short Term | Transit | Total | | | | | |
| Site A | 289 | 48 | 34 | 38 | 0 | 409 | | | | | |
| Site B | 285 | 34 | 30 | 49 | 82 | 480 | | | | | |

6.6 Bicycle Parking Requirements

Bicycle parking requirements were reviewed for By-law 569-2013. Based on the requirements summarized in **Table 6-8**, overall, there will be a surplus in bicycle parking indicating the opportunity to off-set the vehicular parking demand.

Site A will have a total surplus of 76 bicycle parking spaces, while Site B will have 24 surplus bicycle parking spaces. With the bicycle surplus offset in By-law 569-2013 which stipulates that vehicular parking can be reduced by surplus bicycle parking at a rate of 1 vehicle spaces per 5 bicycle spaces, up to a limit of 20% parking reduction, Site A could be reduced by 15 vehicle parking spaces and Site B by 4 spaces, which would result in all sites satisfying the required parking supply following the reassignment of spaces.

Table 6-8: Bicycle Parking Zoning By-law Requirements

| | | 11 | | By-law No | . 569-2013 | |
|----------|-------------|-----------------------|------|------------|------------|------------|
| Land Use | | Unit or per 100 m2 | Long | g-Term | Short-Term | |
| | | 1001112 | Rate | # Required | Rate | # Required |
| Site A | Residential | 265 | 0.9 | 239 | 0.1 | 27 |
| Site A | Retail | 1,078 | 0.2 | 3 | 3+0.3(x) | 7 |

| | | lleit or nor | By-law No. 569-2013 | | | | | | | |
|--------|-------------|-----------------------|---------------------|------------|------------|------------|--|--|--|--|
| | Land Use | Unit or per 100 m2 | Lon | g-Term | Short-Term | | | | | |
| | | | Rate | # Required | Rate | # Required | | | | |
| | Office | 13,166 | 0.2 | 27 | 3+0.2(x) | 30 | | | | |
| | Total Req | uired | - | 269 | 64 | | | | | |
| | Propos | ed | - | 323 | - | 86 | | | | |
| | Surplus / [| Deficit | - | +54 | 1 | +22 | | | | |
| | Residential | 303 | 0.9 | 273 | 0.1 | 31 | | | | |
| | Retail | 4,226 | 0.2 | 9 | 3+0.3(x) | 16 | | | | |
| Site B | Office | 10,427 | 0.2 | 21 | 3+0.2(x) | 24 | | | | |
| Site B | Total Req | uired | - | 303 | - | 71 | | | | |
| | Propos | ed | - | 315 | 1 | 83 | | | | |
| | Surplus / [| Deficit | - | +12 | - | +12 | | | | |

6.7 Loading Space Requirements

Loading space requirements of Zoning By-law 569-2013 were also reviewed for the proposed sites. The loading space requirements as per the By-law, and loading spaces provided, are shown in **Table 6-9** below. It is noted that the shared loading space calculations are used from Zoning By-law 569-2013, which stipulates that the Type "B" and Type "C" loading spaces can be shared between retail and office uses and that the highest requirement for each use is used as the overall requirement for the shared loading.

Table 6-9: Loading Spaces Required Based on By-Law Rates

| Site | Land Use Type | Units or m ² | Loading Space Required and Provided | | | | | |
|------|------------------|-------------------------|--|--|--|--|--|--|
| | Residential | 265 | 1 Type "G" | | | | | |
| | Retail | 1,078 | 1 Type "B" | | | | | |
| Α | Office | 13,166 | 2 Type "B" and 2 Type "C" | | | | | |
| | Total Req. (Sha | ared Loading) | 2 Type "B", 2 Type "C", and 1 Type "G" | | | | | |
| | То | tal Proposed | 3 Type "B", 2 Type "C", and 2 Type "G" | | | | | |
| | Residential | 303 | 1 Type "G" | | | | | |
| | Retail | 4,226 | 2 Type "B" | | | | | |
| В | Office | 10,427 | 2 Type "B" and 2 Type "C" | | | | | |
| | Total Req. (Sha | ared Loading) | 2 Type "B", 2 Type "C", and 1 Type "G" | | | | | |
| | То | tal Proposed | 2 Type "B", 2 Type "C", and 1 Type "G" | | | | | |

The dimensions of the proposed loadings spaces meet the By-law requirements, with the dimensions of each type listed below.

Type "G"

Minimum Length: 13.0 metres
Minimum Width: 4.0 metres
Minimum Clearance: 6.1 metres



Type "B"

Minimum Length: 11.0 metres
Minimum Width: 3.5 metres
Minimum Clearance: 4.0 metres

Type "C"

Minimum Length: 6.0 metres
Minimum Width: 3.5 metres
Minimum Clearance: 3.0 metres

6.8 Loading Swept Path Analysis

The loading areas were tested throughout the development process of the TOC site designs using AutoTURN software (within AutoCAD) to check the loading space accessibility for anticipated design vehicles entering the sites. The largest commercial vehicle anticipated to enter the site is a Medium Single-Unit Truck ('MSU') style delivery or moving vehicle. For garbage trucks, a City of Toronto front-loading garbage truck was tested. The swept path analysis for all sites is shown in **Appendix G**. As shown, all sites have sufficient space to accommodate movements inbound/outbound for all design vehicles. Some movements at Site A will have slightly constrained widths, at which garbage trucks and medium sized trucks entering and exiting the Type "G" and Type "B" loading spaces may need to make a three-point turn to complete the movement. It is also noted that staging areas are not provided at the Type "G" and Type "B" loading docks in the east building on Site A; staging areas should be provided to avoid having the trucks extend beyond the building envelope and obstruct traffic on the site driveway.



7 Transportation Demand Management

Transportation Demand Management (TDM) measures are methods employed to reduce the traffic impacts of a development through the reduction of Single-Occupant Vehicle (SOV) trips as well as the encouragement of more sustainable forms of travel and more efficient use of the transportation network for all modes of travel.

TDM measures can be 'hard measures', such as infrastructure like bicycle parking, or can be 'soft measures' such as policies that allow for working-from-home or flex hours. TDM measures must also be tied to the surrounding transportation network context of the development. For example, bicycle parking will be ineffective if there is no surrounding bicycle infrastructure like bicycle lanes, multi-use paths, or a lack of bicycle parking at the ultimate destination. For this reason, successful TDM implementation requires a united effort and coordination between the City and developers.

Hard measures are physically infrastructure improvements that encourage alternative modes of travel and mode shifts away from single-occupant vehicles. This can include the provision of bicycle parking or enhanced pedestrian and cyclist facilities on-site including shower and change facilities for employment uses.

Soft measures are programs or policies, such as unbundling or condo units to parking spaces, work-from-home policies, transit subsidies, etc. In many cases, hard and soft measures work together and provide mutual benefit. For instance, transit pass subsidies are soft measures, but when paired with hard measures like improved waiting areas, can have a greater impact on mode choice.

The Toronto Green Standard (Version 3) requires measures that will support a 15% or greater reduction in single occupancy vehicle (SOV) trips.

For the subject site, the general context of the area as a downtown city centre-core, mixed-use environment with excellent transit access and future direct transit access to the Ontario Line, will have an impact on the potential TDM measures. In fact, the inherent nature of the area and the presence of the Ontario Line, GO Transit, and streetcar surface transit routes throughout the study area will make this location an excellent candidate to benefit from TDM initiatives.

The mixed-use nature of downtown allows for synergy and mixed-use interactions between the proposed residential towers, as well as the ancillary retail at the ground floor, and the surrounding retail-commercial and services that are in the area. Additionally, due to the location near the City's central business district, there is an expectation that many of the residents will work within the general area and will not rely on transit to make their daily trips. Rather, these residents will walk or cycle. The mixed-use, and walkable nature of the area will in itself help to reduce vehicle trips by encouraging walking and linked trips.

Since the ancillary retail will primarily serve the surrounding area and the residential condos above, the TDM plan will be geared towards adapting the residential component.



7.1 Local and Regional Transit Accessibility

As already discussed, there is excellent transit coverage within the vicinity of the site even without the construction of Ontario Line. TTC surface transit is provided in the form of streetcars along Fleet Street (in separated right-of-way and dedicated signals at intersections) and King Street (in mixed traffic). Additionally, these streetcar routes provide direct access to the Toronto subway system along Line 1 (easterly to Union Station or St Andrew Station).

The study area already has a fairly high non-vehicle modal split at over 60% non-auto drive and this is expected to increase in general due to the increase in transit availability. The site itself will further benefit and leverage this proximity and access.

7.2 Transit Pass Subsidies

Residents and tenants of the buildings will be given transit pass subsidies that will further encourage the use of transit as a primary mode and will attract those who wish to rely on transit and will utilize the transit passes. The subsidies can be provided in the form of reduced cost passes or can be provided in the form of subsidies to residents.

7.3 Real-Time Transit Information

Real-time transit service updates will be provided in the lobby area of each residential tower. The real-time displays will include arrival time for the nearest transit stops for each of the primary transit services expected to serve the development (as outlined in **Section 2.4** and **Section 3.2**). The real-time displays will allow residents to time leaving their buildings to reduce the amount of time standing at each transit stop, thus making transit more attractive.

7.4 Pedestrian and Cycling Connections

All four buildings will be directly fronting Liberty New Street. Internally, the residential component of one of the condo towers will have access to the transit station lobby area, and there will be no need for residents of Site B to leave the building if they are destined to Ontario Line or GO routes.

There will be a multi-use path along the south side of Liberty New Street.

Bicycles are also allowed on the TTC streetcars and subways outside of peak periods, and at all times on TTC buses. Residents will be able to bring their bicycles on streetcars and use them to complete the last leg of their trips, if it is conducive to their needs.

7.5 Bicycle Parking

The building will be equipped with long-term bicycle parking that will be available to all residents. Long-term bicycle parking ensures that residents are encouraged to own bicycles in the first place by providing them with easily accessible, secure and sheltered bicycle parking. Short-term bicycle parking will be provided for visitors. Long-term bicycle parking is typically provided on P1 parking and only provided on lower parking levels if the bicycle parking takes up more than 50% of the P1 parking level.



The short-term bicycle parking will be placed in safe, well lit, accessible areas at ground level. This will encourage visitors to feel cycling is a viable option. It is noted that only excess bicycle parking beyond the by-law required bicycle parking spaces are considered to be on-site TDM measures.

Bikeshare is also available within the general area. There are 5 bikeshare stations within 400 metres walking distance. These will also be available for use by residents and visitors if they use the bikeshare services. Bikeshare spaces are considered usable if they are occupied or empty, as they can be used by residents or visitors when leaving the site (bicycle is available) or when returning (there is a free "dock").

7.6 Car-Share Services

Car-share services are an effective way to reduce auto dependency and parking needs for both residential and non-residential developments, by providing vehicles that can be used by residents and tenants on an as-needed basis. The result is that the development will attract those who do not own vehicles and typically rely on alternative forms of transportation, thus reducing the number of parking spaces required on site and attracting residents and tenants that will generally produce fewer vehicle trips, but will still occasionally require a vehicle.

For some development proposals, the City of Toronto has accepted proposals that suggest that for each car-share parking space provided on site, the development will be able to reduce the parking supply by 3 parking spaces. This is another example of the City accepting TDM measures to reduce the parking supply.

7.7 Summary of Transportation Demand Management

The following summarizes the measures that will support a reduction in single occupancy vehicle (SOV) trips:

- Direct access to Ontario Line and GO from within one of the buildings;
- Transit passes or subsidies provided to all residents of the buildings, including the commercial-retail components
- Proximity to surface transit routes along Liberty New Street, Dufferin Street, King Street, Manitoba Drive, Fleet Street, and others;
- Real-time transit information;
- Location near a mixed-use city centre core environment to promote walking trips; and
- Proximity to carshare services.



8 Preliminary Findings and Next Steps

8.1 Existing Network

A multi-modal network analysis was completed along key routes near the TOC sites for walking, cycling, and transit modes based on the City of Ottawa's Multi-Modal Level of Service methodology. Automobile operational conditions were analyzed using Synchro based on the requirements from the City of Toronto Guidelines for the Preparation of Transportation Impact Studies (2013). Identified opportunities and constraints included:

Pedestrian Level of Service

- No Sidewalks: Several of the north-south connections in Liberty Village do not currently
 have sidewalks available and instead accommodate parking for vehicles along these
 stretches. As Liberty Village continues to develop, it will be important that these
 pedestrian connectivity gaps be filled to ensure that pedestrians can move safely around
 the area, especially as demand grows to and from the future Liberty New Street and
 Ontario Line station. Pedestrian gaps are also noted throughout the Exhibition Place
 area.
- Narrow Effective Sidewalk Width: The north side of Liberty Street between Mowat Avenue and Atlantic Avenue has several locations with constrained sidewalks due to utility poles, fire hydrants, and garbage bins being placed on the sidewalk, resulting in effective sidewalk widths of less than or equal to 1.5 metres. These locations make it difficult for pedestrians to pass by each other and do not easily accommodate mobility impaired users on the sidewalk. Similarly, obstructed sections of sidewalk were observed on the east side of Fraser Avenue (south of Liberty Street), south side of King Street (between Dufferin Street and Joe Shuster Way, and the east side of Hanna Avenue (north of Liberty Street). A narrow sidewalk width of 1.5 metres is observed on Liberty Street on the north side between Hanna Avenue and Pirandello Street, and the south side between Lynn Williams Street and Pirandello Street.
- Dufferin Street / Saskatchewan Road: The intersection operates at a LOS of F for
 pedestrians due to the poor crossing conditions on the east leg of the intersection. The
 east leg has a wide crossing distance of approximately 22 metres and conflicts with a
 slightly channelized right turn lane which results in an increased approaching speed of
 vehicles. Pedestrian comfort and safety at the intersection would improve by reducing
 the sidewalk corner curb radii on the east side of the intersection and bringing the
 westbound right turn lane to a 90-degree intercept angle.

Bicycle Level of Service

 Using the Ottawa MMLOS methodology, many of the smaller roadways within the Liberty Village community operate at a BLOS of A, despite the absence of separated bicycle facilities. Bicycles would be expected to experience higher degrees of safety and comfort on the slow and narrow roadways, however, it is a limitation of the methodology that onstreet parking obstructions and traffic demand are not considered for mixed traffic



facilities, as these would also affect the cycling experience by increasing friction and conflict with automobiles.

Transit Level of Service

• As shown in the transit LOS figure (Figure 2-9), the segments with transit routes generally operate at a LOS of "D" in the walkshed area with the exception of the segment of Liberty Street between Atlantic Avenue and Hanna Avenue, and along Dufferin Street between King Street and Springhurst Avenue. The LOS E segment along Liberty Street experiences a higher level of friction than others in the area due to a large parking lot on the southern side of Liberty Street. The parking lot is expected to primarily accommodate commuter trips which will increase friction and lower the speed of transit vehicles on the segment during the peak hours. A higher transit friction is experienced along Dufferin Street due to a relatively high number of driveways and on-street parking along the segments.

Automobile Level of Service

- Capacity issues currently exist at King and Dufferin, as well as at Dufferin and Liberty.
 Capacity issues at Dufferin and Liberty are caused by high traffic demand to and from the south turning into and out of Liberty Village from Dufferin Street.
- The northbound left movement at Strachan and Fleet operates at capacity during the PM peak hour.
- The eastbound through/right movement at Lake Shore and Strachan operates near capacity during the AM peak hour. During the PM peak hour, the eastbound left and westbound through movements will operate at capacity.
- The northbound approach to Lake Shore and British Columbia operates near capacity during the AM peak hour, and the eastbound approach operates at capacity during the PM peak hour.

8.2 Proposed Development

The proposed Transit Oriented Community developments around Exhibition Station will comprise of two separate sites:

- Site A: 1-1A Atlantic Avenue
 - Consisting of 265 residential units, 1,078 m² of retail space, and 13,166 m² of office space.
 - The first floor will provide access to the eastern tunnel at Exhibition Station, which
 provides a through connection between Liberty Village and Exhibition Place, and
 emergency egress from the station.
- Site B: 2-20 Atlantic Avenue and 1 Jefferson Avenue
 - Consisting of 303 residential units, 4,226 m² of retail space, and 10,427 m² of office space.
 - The first floor will provide access to an underground concourse for Exhibition Station, which will connect to the Ontario Line and GO Station platforms.



Transit Oriented Community Traffic Forecasts

The Ontario Line Exhibition Station is forecasted to add 9,661 walking, cycling, and transit trips to the surrounding area during the AM and PM peak hours. The proposed developments, Site A and Site B, will add a combined total of 656 and 740 total trips for all modes during the AM and PM peak hours, respectively, with a significant portion of these trips being pedestrian and surface transit trips destined to / from the Station. The TOC's contribution to total traffic volumes for pedestrian and automobile trips at the study area intersections is presented in **Table 8-1**.

The TOC will contribute less than 5% to total vehicle traffic volumes at the study area intersections under 2030 total traffic conditions. Comparatively, the TOC will generate many more active transportation trips as a proportion of the total intersection volume which includes pedestrians on the crosswalks and cyclists riding within the curb lane. Up to 4.1% of total pedestrian traffic will be TOC related.

Table 8-1: Exhibition TOC Transportation Contribution to Study Area Intersections

| Period | Pedestrian Volumes | Traffic Volume | | | |
|--------------|--------------------|----------------|--|--|--|
| AM Peak Hour | 3.3% | 2.7% | | | |
| PM Peak Hour | 4.1% | 2.5% | | | |

8.3 Future Capacity and Operations

2030 Future Background Conditions

Under 2030 background traffic conditions, the addition of background traffic from general background traffic growth, GO Station growth, and new trips associated with Ontario Line has resulted in at-capacity conditions throughout the study area. These locations include new critical movements at all study intersections along King Street with the exception of King/Joe Shuster, at the intersection of Dufferin/Liberty Street, Lake Shore/Strachan, and King/Strachan. Although the Ontario Line Exhibition Station will not generate a significant number of vehicle trips, the station is expected to add a substantial number of conflicting pedestrians and bicycle volumes, with the majority of these volumes being directed to capacity-constrained locations along King Street.

Further improvements were assessed at the intersections of Strachan/Fleet and Dufferin/Liberty during the PM peak hour to identify mitigation opportunities, as summarized in **Table 3-20**. The improvements applied included:

- Strachan/Fleet: Add northbound left turn advanced phase and increase cycle length by 10 seconds.
- **Dufferin/Liberty New Street:** Increase cycle length to 80 seconds.

With the additional improvements, the intersection of Dufferin/Liberty New will operate without critical movements, and the overall intersection of Strachan/Fleet will operate within capacity. Despite the improvements at Strachan/Fleet, high delays are still expected on the eastbound



left, westbound left/through, northbound left, and southbound through/right movements, with the southbound through/right operating at capacity.

2030 Future Total Conditions

The addition of TOC and Station traffic triggers a small number of turning movements at Dufferin/King, Dufferin/Liberty, King/Strachan, and the new intersection at Jefferson Avenue/Site B Driveway to operate with capacity issues. Signal timing optimizations have been applied to the future total scenario, and limited options are available to further mitigate the constraints at these locations due to right-of-way constraints.

8.4 Parking

The vehicular parking requirements based on By-law 569-2013 Policy Area 1 rates are 252 (Site A) and 299 (Site B) without any reductions applied. However, due to the location and nature of the site, a total of 102 (Site A) and 112 (Site B) parking spaces are provided, consistent with reductions applied to nearby developments. The proposed parking on all sites will satisfy the targeted residential tenant parking rate of 0.25 spaces per unit, and the City of Toronto by-law requirement for shared spaces between residential visitor and office uses. Including a reduction for surplus bicycle parking on site, a surplus vehicular parking of 15 to 19 spaces will be provided to the TOC sites. The minimum accessible parking space requirement of 5 spaces per site will be satisfied.

8.5 Loading

Application of Zoning By-laws 569-2013 requires various Type 'G', Type 'B', and Type 'C' loading spaces on all sites. Loading sites provided satisfy all of the requirements.

All sites will have sufficient space to accommodate movements inbound/outbound for all design vehicles. Some movements inbound/outbound from the Type "G" and Type "B" spaces at Site A will have slightly constrained widths, which garbage trucks and medium sized trucks may need to make a three-point turn to complete the movement.

It is noted that staging areas are not provided at the Type "G" and Type "B" loading docks in the east building on Site A; staging areas should be provided to avoid having the trucks extend beyond the building envelope and obstruct traffic on the site driveway.

8.6 Mitigation Measures

The following mitigation measures are recommended to help support the future Exhibition Station Transit Oriented Community sites into the 2030 future horizon:

- Improvements within Liberty Village to fill sidewalk gaps, increase effective sidewalk
 widths at constrained locations, and enhance the visibility of faded crosswalks should be
 considered by the City for implementation.
- Optimize intersection cycle lengths and splits in the future to ensure that changes in travel patterns are accounted for.



- **Strachan/Fleet:** Add northbound left turn advanced phase and increase cycle length by 10 seconds to mitigate future background deficiencies.
- **Dufferin/Liberty New Street:** Increase cycle length to 80 seconds to mitigate future background deficiencies.
- Provide staging areas at the east building loading docks at Site A to prevent parked trucks from extending beyond the building envelope and obstructing driveway traffic.



Appendix A: Multi-Modal Level of Service Analysis

| | INTERSECTIONS | Dufferin / King | | | King / Joe Shuster | | | | King / Atlantic | | | | |
|------------|---|---------------------------------|---------------------------------|---------------------------------|---------------------------------|--------------------------------|-------|----------------------------|--------------------------------|-------|--------------------------------|--------------------------------|----------------------------|
| | Crossing Side | NORTH | SOUTH | EAST | WEST | NORTH | SOUTH | EAST | WEST | NORTH | SOUTH | EAST | WEST |
| | Lanes | 4 | 4 | 4 | 4 | 3 | | 4 | 4 | | 3 | 4 | 4 |
| | Median | No Median - 2.4 m | No Median - 2.4 m | | No Median - 2.4 m | No Median - 2.4 m | | No Median - 2.4 m | No Median - 2.4 m | No Median - 2.4 r |
| | Conflicting Left Turns | Permissive | Permissive | Permissive | Protected/ Permissive | No left turn / Prohib. | | Permissive | No left turn / Prohib. | | No left turn / Prohib. | No left turn / Prohib. | Permissive |
| | Conflicting Right Turns | Permissive or yield control | Permissive or yield control | Permissive or yield control | Permissive or yield control | Permissive or yield control | | No right turn | Permissive or yield control | | Permissive or yield control | Permissive or yield control | No right turn |
| | Right Turns on Red (RToR)? | RTOR allowed | RTOR allowed | RTOR allowed | RTOR allowed | RTOR allowed | | RTOR allowed | RTOR allowed | | RTOR allowed | RTOR allowed | RTOR allowed |
| | Ped Signal Leading Interval? | No | No | No | No | No | | No | No | | No | No | No |
| an | Right Turn Channel | No Channel | No Channel | No Channel | No Channel | No Channel | | No Channel | No Channel | | No Channel | No Channel | No Channel |
| str | Corner Radius | 3-5m | 3-5m | 5-10m | 0-3m | 5-10m | | 0-3m | 5-10m | | 5-10m | 5-10m | 0-3m |
| Pedestrian | Crosswalk Type | Zebra stripe hi-vis markings | Zebra stripe hi-vis markings | Zebra stripe hi-vis markings | Zebra stripe hi-vis markings | Std transverse markings | | Std transverse markings | Std transverse markings | | Std transverse markings | Std transverse markings | Std transverse markings |
| _ | PETSI Score | 58 | 58 | 57 | 59 | 79 | | 61 | 62 | | 79 | 62 | 61 |
| | Ped. Exposure to Traffic LoS | D | D | D | D | В | - | С | С | - | В | С | С |
| | Cycle Length | 90 | 90 | 90 | 90 | 80 | | 80 | 80 | | 70 | 70 | 70 |
| | Effective Walk Time | 34 | 34 | 19 | 8 | 37 | | 8 | 8 | | 22 | 8 | 8 |
| | Average Pedestrian Delay | 17 | 17 | 28 | 37 | 12 | | 32 | 32 | | 16 | 27 | 27 |
| | Pedestrian Delay LoS | В | В | С | D | В | | D | D | - | В | С | С |
| | | D | D | D | D | В | | D | D | | В | С | С |
| | Level of Service | D | | | | | D | | | (| С | | |
| | Approach From | NORTH | SOUTH | EAST | WEST | NORTH | SOUTH | EAST | WEST | NORTH | SOUTH | EAST | WEST |
| | Bicycle Lane Arrangement on Approach | Mixed Traffic | Mixed Traffic | 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></blank> | | | | | | | | | | | | |
| | Dedicated Right Turning Speed | ≤ 25 km/h | ≤ 25 km/h | ≤ 25 km/h | ≤ 25 km/h | ≤ 25 km/h | | ≤ 25 km/h | ≤ 25 km/h | | ≤ 25 km/h | ≤ 25 km/h | ≤ 25 km/h |
| <u>o</u> | Cyclist Through Movement | | | | | | - | | | - | | | |
| Š | Separated or Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic | - | Mixed Traffic | Mixed Traffic | - | Mixed Traffic | Mixed Traffic | Mixed Traffic |
| Bicycle | Left Turn Approach | ≥ 2 lanes crossed | One lane crossed | | No lane crossed | ≥ 2 lanes crossed | | ≥ 2 lanes crossed | ≥ 2 lanes crossed | No lane crossed |
| | Operating Speed | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | | ≤ 40 km/h | ≤ 40 km/h | | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h |
| | Left Turning Cyclist | D | D | D | D | В | | В | D | - | D | D | В |
| | | D | D | D | D | В | - | В | D | - | D | D | В |
| | Level of Service | D | | | | | D | | | 1 | D | | |
| Transit | Average Signal Delay | | | | | | | | | | | | |
| | | - | • | • | • | - | - | - | - | | • | • | - |
| | Level of Service | | | - | | | | - | | | | - | |
| ¥ | Effective Corner Radius | | | | | | | | | | | | |
| | Number of Receiving Lanes on Departure | | | | | | | | | | | | |
| Truck | from Intersection | | | | | | | | | | | | |

Figure A-1: MMLOS Parameters – Intersections

| | INTERSECTIONS | | King / S | Sudbury | | | Dufferin / Sa | askatchewan | | | Duffe rin | / Liberty | |
|------------|---|--------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|---------------------------------|----------------------------------|------|---------------------------------|---------------------------------|---------------------------------|-----|
| | Crossing Side | NORTH | SOUTH | EAST | WEST | NORTH | SOUTH | EAST | WEST | NORTH | SOUTH | EAST | WES |
| | Lanes | 4 | 0 - 2 | 4 | 4 | 4 | 5 | 7 | | 4 | 4 | 3 | |
| | Median | No Median - 2.4 m | No Median - 2.4 m | No Median - 2.4 m | | No Median - 2.4 m | No Median - 2.4 m | No Median - 2.4 m | |
| | Conflicting Left Turns | No left turn / Prohib. | No left turn / Prohib. | Permissive | Permissive | No left turn / Prohib. | Permissive | Protected/ Permissive | | No left turn / Prohib. | Permissive | Permissive | |
| | Conflicting Right Turns | Permissive or yield control | Permissive or yield control | Permissive or yield control | Permissive or yield control | Protected/ Permissive | No right turn | Permissive or yield control | | Permissive or yield control | Permissive or yield control | Permissive or yield control | |
| | Right Turns on Red (RToR) ? | RTOR allowed | RTOR allowed | RTOR allowed | | RTOR allowed | RTOR allowed | RTOR allowed | |
| | Ped Signal Leading Interval? | No | No | No | No | No | No | No | | No | No | No | |
| ä | Right Turn Channel | No Channel | No Channel | No Channel | No Channel | No Channel | No Channel | Convtl without Receiving Lane | | No Channel | No Channel | No Channel | |
| str | Corner Radius | 5-10m | 5-10m | 3-5m | 5-10m | 10-15m | 0-3m | 10-15m | | 5-10m | 0-3m | 5-10m | |
| Pedestrian | Crosswalk Type | Std transverse markings | Std transverse markings | Std transverse markings | Std transverse markings | Zebra stripe hi-vis markings | Zebra stripe hi-vis markings | Zebra stripe hi-vis markings | | Zebra stripe hi-vis markings | Zebra stripe hi-vis markings | Zebra stripe hi-vis markings | |
| - | PETSI Score | 62 | 94 | 55 | 54 | 64 | 48 | 11 | | 65 | 59 | 74 | |
| | Ped. Exposure to Traffic LoS | С | Α | D | D | С | D | F | - | С | D | С | |
| | Cycle Length | 80 | 80 | 80 | 80 | 80 | 80 | 80 | | 80 | 80 | 80 | |
| | Effective Walk Time | 30 | 30 | 8 | 8 | 10 | 10 | 13 | | 24 | 24 | 23 | |
| | Average Pedestrian Delay | 16 | 16 | 32 | 32 | 31 | 31 | 28 | | 20 | 20 | 20 | |
| | Pedestrian Delay LoS | В | В | D | D | D | D | С | - | С | С | С | |
| | | С | В | D | D | D | D | F | | С | D | С | |
| | Level of Service | | | D | | | | F | | | | D | |
| | Approach From | NORTH | SOUTH | EAST | WEST | NORTH | SOUTH | EAST | WEST | NORTH | SOUTH | EAST | WE |
| | | | | | | Curb Bike Lane, | | | WE31 | | | | ,,, |
| | Bicycle Lane Arrangement on Approach IF Dedicated Right Turn Lane, | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic | Cycletrack or MUP | Mixed Traffic | Mixed Traffic | | Mixed Traffic | Mixed Traffic | Mixed Traffic | |
| | THEN Right Turn Configuration, ELSE Stank> | | | | | Not Applicable | ≤ 50 m | ≤ 50 m | | | | | |
| | Dedicated Right Turning Speed | ≤ 25 km/h | ≤ 25 km/h | ≤ 25 km/h | | ≤ 25 km/h | ≤ 25 km/h | ≤ 25 km/h | |
| Φ | Cyclist Through Movement | | | | | Not Applicable | D | D | - | | | | |
| 핓 | Separated or Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic | Separated | Mixed Traffic | Mixed Traffic | - | Mixed Traffic | Mixed Traffic | Mixed Traffic | |
| Bicycle | Left Turn Approach | One lane crossed | One lane crossed | ≥ 2 lanes crossed | ≥ 2 lanes crossed | 1 lane crossed | | ≥ 2 lanes crossed | | ≥ 2 lanes crossed | | One lane crossed | |
| | Operating Speed | ≤ 40 km/h | | ≤ 40 km/h | | ≤ 40 km/h | | ≤ 40 km/h | |
| | Left Turning Cyclist | В | В | D | D | В | - | D | - | D | - | В | |
| | | В | В | D | D | В | - | D | | D | - | В | |
| | Level of Service | | | D | | | | D | | | | D | |
| + | Average Signal Delay | | | | | | | | | | | | |
| nsi | | - | - | - | - | - | - | - | - | - | - | - | |
| Transit | Level of Service | | | - | | | | - | | | | - | |
| | Effective Corner Radius | | | | | | | | | | | | |
| Truck | Number of Receiving Lanes on Departure from Intersection | | | | | | | | | | | | |
| 2 | | | | | | _ | - | - | | - | | | |
| | | | | | | | | | | | | | |
| | Level of Service | | | | | | | | | | | | |

Figure A-2: MMLOS Parameters - Intersections

| | | | King | King | King | Liberty | Dufferin | Dufferin | Dufferin | Mowat | Mowat | Fraser | Fraser | Jefferson | Jefferson |
|----------|---|----------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| SEGMENTS | 5 | Street A | Dufferin-Joe Shuster | Joe Shuster- Atlantic | Atlantic-Sudbury | Dufferin-Mowat | Mowat-Fraser | Fraser- Jefferson | Jefferson- Atlantic | Atlantic-Hanna | Hanna-Lynn Williams | Lynn Williams- Piranello | King-Liberty | Liberty- Springhurst | Springhurst- Saskatchewan | King-Liberty | Liberty-South | King-Liberty | Liberty-South | King-Liberty | Liberty-South |
| | Sidewalk Width Boulevard Width | | ≥ 2 m < 0.5 | ≥ 2 m < 0.5 | ≥ 2 m < 0.5 | no sidewalk n/a | < 1.5 m n/a | 1.5 m < 0.5 m | < 1.5 m n/a | ≥ 2 m < 0.5 | 1.5 m 0.5 - 2 m | 1.5 m 0.5 - 2 m | ≥ 2 m 0.5 - 2 m | ≥ 2 m 0.5 - 2 m | ≥ 2 m < 0.5 | 1.5 m < 0.5 m | no sidewalk n/a | 1.5 m < 0.5 m | < 1.5 m n/a | 1.5 m 0.5 - 2 m | no sidewalk n/a |
| 1 | Avg Daily Curb Lane Traffic Volume | | > 3000 | > 3000 | > 3000 | > 3000 | > 3000 | > 3000 | > 3000 | > 3000 | > 3000 | > 3000 | > 3000 | > 3000 | > 3000 | ≤ 3000 | ≤ 3000 | ≤ 3000 | ≤ 3000 | ≤ 3000 | ≤ 3000 |
| strian | Operating Speed On-Street Parking | | > 30 to 50 km/h no | > 30 to 50 km/h yes | > 30 to 50 km/h yes | > 30 to 50 km/h no | ≤ 30 km/h no | ≤ 30 km/h no | ≤ 30 km/h yes | ≤ 30 km/h yes | ≤ 30 km/h yes | ≤ 30 km/h no |
| st | Exposure to Traffic PLoS | F | С | С | С | F | F | E | F | С | E | E | В | В | С | D | С | D | F | С | С |
| Pede | Effective Sidewalk Width | | 2.0 m | 2.0 m | 2.0 m | | 1.2 m | 1.5 m | 1.2 m | 1.2 m | 1.5 m | 1.5 m | 2.0 m | 2.0 m | 2.0 m | 1.5 m | | 1.5 m | 1.2 m | 1.5 m | |
| <u> </u> | Pedestrian Volume | | 500 ped /hr | 250 ped/hr | 500 ped /hr | 250 ped/hr | 250 ped/hr | 250 ped/hr | 250 ped/hr | 250 ped/hr | 250 ped/hr | 250 ped/hr | 250 ped/hr |
| 1 | Crowding PLoS | | В | В | В | - | В | В | В | В | В | В | В | В | В | В | - | В | В | В | - |
| | Level of Service | | С | С | С | - | F | E | F | С | E | E | В | В | С | D | - | D | F | С | - |
| | Type of Cycling Facility | | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic |
| | Number of Travel Lanes | | 4-5 lanes total | 4-5 lanes total | 4-5 lanes total | ≤ 2 (no centreline) | 4-5 lanes total | 4-5 lanes total | 2-3 lanes total | ≤ 2 (no centreline) |
| 1 | Operating Speed | 1 | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h |
| | # of Lanes & Operating Speed LoS | | D | D | D | Α | Α | Α | Α | Α | A | Α | D | D | В | A | Α | Α | Α | Α | A |
| Bicycle | Bike Lane (+ Parking Lane) Width | | | | | | | | | | | | | | | | | | | | |
| - Š | Bike Lane Width LoS | D | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 面 | Bike Lane Blockages | | | | | | | | | | | | | | | | | | | | |
| 1 | Blockage LoS Median Refuge Width (no median = < 1.8 m) | | | | | | | | | | | | | | | | | | | - | |
| 1 | No. of Lanes at Unsignalized Crossing | | < 1.8 m refuge 4-5 lanes | < 1.8 m refuge 4-5 lanes | < 1.8 m refuge 4-5 lanes | < 1.8 m refuge ≤ 3 lanes | < 1.8 m refuge 4-5 lanes | < 1.8 m refuge 4-5 lanes | < 1.8 m refuge 4-5 lanes | < 1.8 m refuge ≤ 3 lanes | < 1.8 m refuge ≤ 3 lanes | < 1.8 m refuge ≤ 3 lanes | < 1.8 m refuge ≤ 3 lanes | < 1.8 m refuge ≤ 3 lanes | < 1.8 m refuge ≤ 3 lanes |
| 1 | Sidestreet Operating Speed | | 4-5 lailes ≤ 40 km/h | ≤ 40 km/h | 4-5 lanes ≤ 40 km/h | ≤ 40 km/h | s 3 lanes s 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | 4-5 lanes ≤ 40 km/h | ≤ 40 km/h | 4-5 lanes ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h |
| | Unsignalized Crossing - Lowest LoS | | B | B | B | A | A | A | A | A | A | A | B | B | B | A | A | A | A | A | A |
| | Level of Service | | D | D | D | Α | Α | Α | Α | Α | A | Α | D | D | В | Α | Α | Α | Α | Α | Α |
| # | Facility Type | | Mixed Traffic | Mixed Traffic | Mixed Traffic | | | | | Mixed Traffic | | | | | | |
| Si | Friction or Ratio Transit:Posted Speed | E | Vt/Vp ≥ 0.8 | Vt/Vp ≥ 0.8 | Vt/Vp ≥ 0.8 | | | | | Vt/Vp ≤ 0.6 | Vt/Vp ≥ 0.8 | Vt/Vp ≥ 0.8 | Vt/Vp ≤ 0.6 | Vt/Vp ≤ 0.6 | Vt/Vp ≥ 0.8 | | | | | | |
| Transit | Level of Service | _ | D | D | D | - | - | - | - | E | D | D | E | E | D | - | - | - | - | - | - |
| × | Truck Lane Width | | | | | | | | | | | | | | | | | | | | |
| Truck | Travel Lanes per Direction | - | | | | | | | | | | | | | | | | | | | |
| F | Level of Service | | _ | | | _ | | | | _ | | | | _ | _ | _ | | _ | | _ | _ |

Figure A-3: MMLOS Parameters - North & East Sides

| | | | Atlantic | Atlantic | Atlantic | Hanna | Hanna | Hanna | Manitoba | Manitoba | Nova Scotia | Lynn Williams | Lynn Williams | Metro Diveway | Metro Diveway | Metro Diveway | Metro Diveway |
|------------|---|----------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|------------------------|----------------------|-----------------------------------|-------------------------------|------------------------|------------------------|---------------------------------|---------------------------|
| SEGMENT | s | Street A | King-Snooker | Snooker-Liberty | Liberty-South | Snooker-Liberty | Liberty-Alley | Alley-South | Quebec-Nova Scotia | Nova Scotia- Canada | Manitoba- Princes | Lynn Williams- Western Battery | Western Battery Pirandello | Atlantic-Hanna | Hanna-Metro E Alley | Metro E Alley- Lynn Williams | Lynn Williams- Liberty |
| | Sidewalk Width Boulevard Width | | 1.5 m < 0.5 m | 1.8 m < 0.5 m | 1.5 m < 0.5 m | < 1.5 m n/a | 1.8 m < 0.5 m | no sidewalk n/a | 1.5 m < 0.5 m | 1.8 m > 2 m | 1.5 m 0.5 - 2 m | ≥ 2 m < 0.5 | ≥ 2 m < 0.5 | 1.5 m < 0.5 m | < 1.5 m n/a | no sidewalk n/a | ≥ 2 m < 0.5 |
| | Avg Daily Curb Lane Traffic Volume | | > 3000 | > 3000 | s 3000 | ≤ 3000 | ≤ 3000 | ≤ 3000 | ≤ 3000 | ≤ 3000 | ≤ 3000 | s 3000 | ≤ 3000 | ≤ 3000 | s 3000 | ≤ 3000 | ≤ 3000 |
| Pedestrian | Operating Speed On-Street Parking | | ≤ 30 km/h no | ≤ 30 km/h no | ≤ 30 km/h yes | ≤ 30 km/h yes | ≤ 30 km/h no | ≤ 30 km/h no | ≤ 30 km/h no | ≤ 30 km/h no | ≤ 30 km/h no | ≤ 30 km/h no | ≤ 30 km/h yes | ≤ 30 km/h yes | ≤ 30 km/h yes | ≤ 30 km/h no | ≤ 30 km/h no |
| est | Exposure to Traffic PLoS | F | D | С | D | F | Α | С | D | Α | С | Α | Α | D | F | С | Α |
| Ď | Effective Sidewalk Width | | 1.5 m | 2.0 m | 1.5 m | 1.2 m | 2.0 m | | 1.5 m | 2.0 m | 1.5 m | 2.0 m | 2.0 m | 1.5 m | 1.2 m | | 2.0 m |
| <u> </u> | Pedestrian Volume | | 250 ped/hr | 250 ped/hr | 250 ped/hr | 250 ped/hr | 250 ped/hr | 250 ped/hr | 250 ped/hr | 250 ped/hr | 250 ped/hr | 250 ped/hr |
| | Crowding PLoS | | В | В | В | В | В | - | В | В | В | В | В | В | В | - | В |
| | Level of Service | | D | С | D | F | В | | D | В | С | В | В | D | F | - | В |
| | Type of Cycling Facility | | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic |
| | Number of Travel Lanes | | ≤ 2 (no centreline) | 2-3 lanes total | 2-3 lanes total | 2-3 lanes total | ≤ 2 (no centreline) | ≤ 2 (no centreline) | ≤ 2 (no centreline) | 2-3 lanes total | ≤ 2 (no centreline) | 2-3 lanes total |
| | Operating Speed | | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h |
| | # of Lanes & Operating Speed LoS | | A | Α | Α | A | Α | Α | В | В | В | Α | A | Α | В | Α | В |
| Bicycle | Bike Lane (+ Parking Lane) Width | | | | | | | | | | | | | | | | |
| Š | Bike Lane Width LoS | D | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ä | Bike Lane Blockages | | | | | | | | | | | | | | | | |
| | Blockage LoS | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Median Refuge Width (no median = < 1.8 m) | | < 1.8 m refuge | < 1.8 m refuge | < 1.8 m refuge | < 1.8 m refuge | < 1.8 m refuge | < 1.8 m refuge | < 1.8 m refuge | < 1.8 m refuge | < 1.8 m refuge | < 1.8 m refuge |
| | No. of Lanes at Unsignalized Crossing Sidestreet Operating Speed | | ≤ 3 lanes | ≤ 3 lanes | ≤ 3 lanes | ≤ 3 lanes | ≤ 3 lanes | ≤ 3 lanes | ≤ 3 lanes | ≤ 3 lanes | ≤ 3 lanes | ≤ 3 lanes |
| | Unsignalized Crossing - Lowest LoS | | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | s 40 km/h | s 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | s 40 km/h | ≤ 40 km/h | ≤ 40 km/h A | s 40 km/h |
| | Level of Service | | A | A | A | A | A | A | В | В | В | A | A | A | В | A | В |
| # | Facility Type | | Mixed Traffic | Mixed Traffic | | | | | Mixed Traffic | Mixed Traffic | Mixed Traffic | | | | | | |
| Transit | Friction or Ratio Transit Posted Speed | E | VtVp ≥ 0.8 | Vt/Vp ≥ 0.8 | | | | | Vt/Vp ≥ 0.8 | VtVp ≥ 0.8 | Vt/Vp ≥ 0.8 | | | | | | |
| Ē. | Level of Service | _ | D | D | - | - | - | | D | D | D | - | - | | - | - | - |
| | Truck Lane Width | | | | | | | | | | | | | | | | |
| 충 | Travel Lanes per Direction | | | | | | | | | | | | | | | | |
| Truck | Level of Service | - | | | | | | | | | | | | | | | - |

Figure A-4: MMLOS Parameters - North & East Sides

| Secretary Secr | Fraser | Fraser | | Mowat | Mowat | Dufferin | Dufferi | Dufferin | Dufferin | iberty | | Liberty | Liberty | Liberty | Liberty | Liberty | Liberty | King | King | King | Kii | | | |
|--|---------------|------------|--------|---------------|---------------|-------------|-------------|-----------------|---------------|-----------|------------|---------------|----------------|---------------|---------------|---------------|----------------|------------------|-------------|---------------|-----------|----------|--|-----------|
| Common C | _iberty-South | ng-Liberty | outh H | Liberty-Sout | King-Liberty | | | | Ging-Liberty | | | | Atlantic-Hanna | | | Mowat-Fraser | Dufferin-Mowat | Atlantic-Sudbury | | | | Street A | s | SEGMENTS |
| Part Contracting Speed | | | | | | | | | | | | | | | | | | | | | | | | |
| Crowding PLOS E | ≤ 3000 | ≤ 3000 |) | ≤ 3000 | ≤ 3000 | > 3000 | > 300 | > 3000 | > 3000 | 3000 | | > 3000 | > 3000 | > 3000 | > 3000 | > 3000 | > 3000 | > 3000 | > 3000 | 3000 | > 30 | | Avg Daily Curb Lane Traffic Volume | |
| Crowding PLOS E | | | √h | | | | | | | | m/h > 30 | | | | | | | | | | | | | 듩 |
| Crowding PLOS E | | | _ | | | no | no | - | | no | | | | no | no | | | no | | no | n | _ | | ₩ 🛱 |
| Crowding PLOS E | | - | 4 | | С | E | E | | - | E | | | U | F | F | - | - | С | | E | | E | | <u>88</u> |
| Crowding PLOS E | | | | | | | | | | | ٠. | | | | | | | | | | | | | <u>8</u> |
| E D C C D D D E B C E - B D D D D D E B B C E - B D D B D D D B D D D | | | /hr | | 250 ped/hr | | | | 250 ped/hr | | ır 2 | | | 250 ped/hr | 250 ped/hr | | | | | ped/hr 5 | 500 p | | | α. |
| Type of Cycling Facility Mixed Traffic M | В | В | _ | В | | В | В | В | В | В | _ | В | В | | - | В | В | В | В | В | - | | Crowding PLOS | |
| Number of Travel Lanes Operating Speed # 4-5 lanes total 4-5 l | D | D | | В | - | E | E | С | В | E | | D | D | - | - | D | С | С | D | E | E | | Level of Service | |
| Number of Travel Laftes A-5 Janes total Centreline | xed Traffic | d Traffic | c Mix | Mixed Traffic | Mixed Traffic | d Traffic | Mixed Traff | Mixed Traffic | ed Traffic | Traffic N | Mixe | Mixed Traffic | Mixed Traffic | lixed Traffic | lixed Traffic | lixed Traffic | lixed Traffic | Aixed Traffic | ed Traffic | d Traffic Mix | Mixed | | Type of Cycling Facility | |
| Fortunes & Operating Speed LoS | | | | | | lanes total | 2-3 lanes | 4-5 lanes total | 5 lanes total | | | | | | | | | 4-5 lanes total | lanes total | ines total 4- | 4-5 lan | | Number of Travel Lanes | |
| Bike Lane (* Parking Lane) Width Sike Lane (* Parking Lane) Width Sike Lane (* Parking Lane) Width LoS Sike Lane (* Parking Lane) Width (homedan = +1.8 m) No. of Lanes at Unsignalized Crossing Sidestreet Operating Speed Level of Service Servi | | | /h | | | | | | | 0 km/h |) s | | | | | | | | | | | | | |
| Bike Lane Width LoS | A | Α | | Α | A | В | В | D | D | Α | _ | A | Α | Α | Α | Α | Α | D | D | D | | | # of Lanes & Operating Speed LoS | |
| State Stat | | | | | | | | | | | | | | | | | | | | | | | | <u> </u> |
| State Control Contro | | | _ | - | - | - | - | - | - | - | | - | - | - | - | - | - | | - | - | _ | D | | 5 |
| Median Retuge Width (no median = 1.8 m) No. of Lanes 4.5 lan | | | | | | | | | | | _ | | | | | | | | | | | | | ö |
| No. of Lanes at Unsignalized Crossing 4-5 lanes | 40 | 2 | 1000 | - 4.0 | - 4.0 | | | - 40 40 | 10 | - | | | - 40 40 | - 4.0 | - 4.0 6 | - 4.0 | - 4.0 | - 4.0 | 0 | - | . 4.0 | | | |
| Sidestreet Operating Speed | | | _ | | | | _ | | | | _ | | | | | | | | | | | | | |
| Unsignalized Crossing - Lowest LoS B B B A A A A A A A | | | _ | | | | _ | - | | _ | _ | _ | - | | | | | | | | | | | |
| Level of Service | | | | | | | | | | | | | | | | | | | | | | | | |
| Friction or Ratio Transit Posted Speed | Α | Α | | Α | Α | В | В | D | D | A | | А | Α | Α | Α | Α | Α | D | D | D | | | | |
| Friction or Ratio Transit Posted Speed | | | Т | | | d Traffic | Mixed Traff | Mixed Traffic | ed Traffic | Traffic N | Mixe | Mixed Traffic | Mixed Traffic | | | | | vixed Traffic | ed Traffic | Traffic Mix | Mixed Tr | | Facility Type | ## |
| E laval of Sarvice D D D D E D D E E D | | | | | | ≥ 0.8 | Vt/Vp ≥ 0.8 | Vt/Vp ≤ 0.6 | /p ≤ 0.6 | 0.8 V | VtV | VtVp ≥ 0.8 | Vt/Vp ≤ 0.6 | | | | | /t/Vp ≥ 0.8 | p ≥ 0.8 \ | : 0.8 Vt/\ | Vt/Vp ≥ 0 | Е | Friction or Ratio Transit:Posted Speed | Ĕ |
| | | | | - | • | D | D | E | E | D | | D | E | - | | | • | D | D | D | | | Level of Service | Ĕ |
| Truck Lane Width | | | | | | | | | | | | | | | | | | | | | | | Truck Lane Width | |
| Travel Lanes per Direction | | | | | | | | | | | | | | | | | | | | | | | Travel Lanes per Direction | 출 |
| Travel Lanes per Direction | _ | - | | - | | - | | | | - | | - | | - | | | • | - | - | - | | • | Level of Service | 롣 |

Figure A-5: MMLOS Parameters - South & West Sides

| | | | Atlantic | Atlantic | Atlantic | Hanna | Hanna | Hanna | Manitoba | Manitoba | Nova Scotia | | | | Metro Diveway | Metro Diveway | Metro Diveway |
|------------|---|----------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|------------------------|------------------------|-----------------------------------|-------------------------------|------------------------|------------------------|---------------------------------|---------------------------|
| SEGMENT | S | Street A | King-Snooker | Snooker-Liberty | Liberty-South | Snooker-Liberty | Liberty-Alley | Alley-South | Quebec-Nova Scotia | Nova Scotia- Canada | Manitoba- Princes | Lynn Williams- Western Battery | Western Battery Pirandello | Atlantic-Hanna | Hanna-Metro E Alley | Metro E Alley- Lynn Williams | Lynn Williams- Liberty |
| | Sidewalk Width Boulevard Width | | 1.5 m < 0.5 m | 1.8 m < 0.5 m | 1.5 m < 0.5 m | ≥ 2 m > 2 m | no sidewalk n/a | no sidewalk n/a | < 1.5 m n/a | no sidewalk n/a | no sidewalk n/a | ≥ 2 m < 0.5 | ≥ 2 m < 0.5 | 1.5 m < 0.5 m | 1.5 m < 0.5 m | 1.5 m < 0.5 m | ≥ 2 m < 0.5 |
| | Avg Daily Curb Lane Traffic Volume | | > 3000 | > 3000 | ≤ 3000 | ≤ 3000 | ≤ 3000 | ≤ 3000 | ≤ 3000 | ≤ 3000 | ≤ 3000 | ≤ 3000 | ≤ 3000 | ≤ 3000 | ≤ 3000 | ≤ 3000 | ≤ 3000 |
| Pedestrian | Operating Speed On-Street Parking | | ≤ 30 km/h no | ≤ 30 km/h no | ≤ 30 km/h no | ≤ 30 km/h no | ≤ 30 km/h yes | ≤ 30 km/h no | ≤ 30 km/h no | ≤ 30 km/h no | ≤ 30 km/h no | ≤ 30 km/h yes | ≤ 30 km/h yes | ≤ 30 km/h no | ≤ 30 km/h no | ≤ 30 km/h no | ≤ 30 km/h no |
| est | Exposure to Traffic PLoS | E | D | С | D | Α | С | С | F | С | С | Α | Α | D | D | D | Α |
| Ö | Effective Sidewalk Width | | 1.5 m | 2.0 m | 1.5 m | 2.0 m | | | 1.2 m | | | 2.0 m | 2.0 m | 1.5 m | 1.5 m | 1.5 m | 2.0 m |
| o. | Pedestrian Volume | | 250 ped/hr | 250 ped/hr | 250 ped/hr | 250 ped/hr | 250 ped/hr | 250 ped/hr | 250 ped/hr | 250 ped/hr | 250 ped/hr | 250 ped/hr |
| | Crowding PLoS | | В | В | В | В | - | - | В | - | - | В | В | В | В | В | В |
| | Level of Service | | D | С | D | В | - | - | F | - | - | В | В | D | D | D | В |
| | Type of Cycling Facility | | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic | Mixed Traffic |
| | Number of Travel Lanes | | ≤ 2 (no centreline) | 2-3 lanes total | 2-3 lanes total | 2-3 lanes total | ≤ 2 (no centreline) | ≤ 2 (no centreline) | ≤ 2 (no centreline) | 2-3 lanes total | ≤ 2 (no centreline) | 2-3 lanes total |
| | Operating Speed | | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h |
| | # of Lanes & Operating Speed LoS | | A | Α | A | A | A | Α | В | В | В | A | Α | A | В | Α | В |
| Bicycle | Bike Lane (+ Parking Lane) Width | | | | | | | | | | | | | | | | |
| , š | Bike Lane Width LoS | D | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ă | Bike Lane Blockages | | | | | | | | | | | | | | | | |
| | Blockage LoS | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Median Refuge Width (no median = < 1.8 m) | | < 1.8 m refuge | < 1.8 m refuge | < 1.8 m refuge | < 1.8 m refuge | < 1.8 m refuge | < 1.8 m refuge | < 1.8 m refuge | < 1.8 m refuge | < 1.8 m refuge | < 1.8 m refuge |
| | No. of Lanes at Unsignalized Crossing Sidestreet Operating Speed | | ≤ 3 lanes ≤ 40 km/h | ≤ 3 lanes ≤ 40 km/h | ≤ 3 lanes ≤ 40 km/h | ≤ 3 lanes | ≤ 3 lanes | ≤ 3 lanes | ≤ 3 lanes | ≤ 3 lanes ≤ 40 km/h | ≤ 3 lanes ≤ 40 km/h | ≤ 3 lanes ≤ 40 km/h | ≤ 3 lanes ≤ 40 km/h | ≤ 3 lanes | ≤ 3 lanes ≤ 40 km/h | ≤ 3 lanes | ≤ 3 lanes |
| | Unsignalized Crossing - Lowest LoS | | s 40 km/n | ≤ 40 km/n | ≤ 40 Km/n | ≤ 40 km/h | ≤ 40 km/h | ≤ 40 km/h A | ≤ 40 km/h | \$ 40 KM/N | ≤ 40 km/n | s 40 km/n | ≤ 40 km/n | ≤ 40 km/h | ≤ 40 km/n | ≤ 40 km/h A | ≤ 40 km/h |
| | Level of Service | | A | A | A | A | A | A | В | В | В | A | A | A | В | A | В |
| æ | Facility Type | | Mixed Traffic | Mixed Traffic | | | | | Mixed Traffic | Mixed Traffic | Mixed Traffic | | | | | | |
| II S | Friction or Ratio Transit:Posted Speed | E | Vt/Vp ≥ 0.8 | Vt/Vp ≥ 0.8 | | | | | Vt/Vp ≥ 0.8 | Vt/Vp ≥ 0.8 | VtVp ≥ 0.8 | | | | | | |
| Transit | Level of Service | _ | D | D | - | - | - | - | D | D | D | - | - | - | - | - | - |
| | Truck Lane Width | | | | | | | | | | | | | | | | |
| 충 | Travel Lanes per Direction | | | | | | | | | | | | | | | | |
| Truck | Level of Service | - | - | - | | - | | | - | - | | - | - | | - | | - |

Figure A-6: MMLOS Parameters - South & West Sides



Appendix B: Signal Timing Plans

| LOCATION: | King St & At | lantic Ave | | | | DISTRICT: | Toronto & East York |
|----------------------|-------------------|--------------------|--------------------|--------------------|---------------------|---|--|
| MODE/COMMENT: | SAP with PR | | re- Polara Al | PS* | | COMPUTER SYSTEM: | TransSuite |
| TCS: | 1912 | | | | | CONTROLLER/CABINET TYPE: | PEEK ATC-1000 / TS2 T1 |
| PREPARED BY / DATE: | Ranajamil Ift | ikhar / Nove | mber 19, 201 | 8 | | CONFLICT FLASH: | Red & Red |
| CHECKED BY/ DATE: | Carmen Lam | / November | 21, 2108 | | | DESIGN WALK SPEED: | 1.0 m/s (FDW based on full crossing at 1.2 m/s) |
| IMPLEMENTATION DATE: | November 29 | 9, 2018 | | | | CHANNEL/DROP: | 4026/12 |
| | | OFF | | | | FIRMWARE VERSION: | 3.018.1.2976 |
| | | | AM | PM | Caribana | Phase Mode | |
| NEMA Phase | | All Other Times | 07:00-09:30 M-F | 16:00-18:30 M-F | To be determined | (Fixed/Demanded or Callable) | Remarks |
| | Local Plan | Pattern 1 | Pattern 2 | Pattern 3 | Pattern 4 | + | |
| | Split Table | Split 1 | Split 2 | Split 3 | Split 4 | 1 | |
| | | | | | | | Pedestrian Minimums: |
| 1 | WLK | | | | | | EWWK = 7 sec. EWFD = 14 sec. NSWK = 7 sec. NSFD = 13 sec. |
| NOT USED | MIN | | | | | | NB phase is callable by vehicle or pedestrian |
| () | MAX1 AMB | | | | | | actuation. If a vehicle and/or pedestrian call is |
| | ALR | | | | | | received, the maximum NBG is served. The NSWK & |
| | SPLIT | | | | | | NSFD are displayed on the pedestrian signal heads if a vehicle and/or pedestrian call is received. |
| King St | WIK 7 | | | | | | |
| | WLK 7 FDW 14 | l | | | | Fixed | See back for TSP Instructions. |
| | MIN 21 | 1 | 1 | | | POZ activated by | APS is on during 7 secs of EWWK and NSWK when |
| \ <> / | MAX1 27 | 1 | 1 | | | Request Loop | activated by pushbuttons |
| | AMB 4 ALR 3 | l | | | | (max extension of 30 secs in | Extended Push Activation =3 secs |
| | SPLIT | 33 | 43 | 43 | 53 | Green/Walk) | TSP EB & WB disabled on November 29,2018. |
| | | | | | | | Phase 8 can only be activated by pushbutton to avoid |
| 3 | WLK FDW | 1 | 1 | | | | being constantly actuated if a construction vehicle sits on or close to the stopbar loop for construction |
| NOT USED | MIN | 1 | 1 | | | | Script 4 blocks TSP requests from streetcars less than |
| NOTUSED | MAX1 | | | | | | 90 seconds behind the previous streetcar in the same |
| | AMB ALR | | | | | | direction. Additional 1 second above the pedestrian minimum |
| | SPLIT | | | | | | provided to the Phase 4/8 SPLIT is to be served in |
| Atlantic Ave | | | | | | | Phase 4/8. |
| 4 | WLK 7 FDW 13 | | | | | Callable by Leddar O/H | |
| | MIN 20 | | | | | Detection and/or Pushbutton; | |
| | MAX1 20 | | | | | (truncations allowable to | |
| \ ' \ / | AMB 4 ALR 2 | | | | | pedestrian minimum) | |
| | SPLIT 2 | 27 | 27 | 27 | 27 | | |
| | | | | | | | 1 |
| 5 | WLK | | | | | | |
| | FDW MIN | | | | | | |
| NOT USED | MAX1 | | | | | | |
| | AMB | | | | | | |
| | ALR SPLIT | l | | | | | |
| King St | OFLII | l | | | | | 1 |
| 6 | WLK 7 | l | | | | | |
| / | FDW 14 MIN 21 | l | | | | Fixed POZ activated by | |
| [→ | MAX1 27 | l | | | | Request Loop | |
| | AMB 4 | 1 | 1 | | | (max extension of 30 secs in | |
| | ALR 3 SPLIT | 33 | 43 | 43 | 53 | Green/Walk) | |
| | | - 33 | 43 | 43 | 53 | | 1 |
| 7 | WLK | l | | | | | |
| / \ | FDW | l | | | | | |
| NOT USED | MIN MAX1 | l | | | | | |
| | AMB | l | | | | | |
| | ALR | l | | | | | |
| Atlantic Ave | SPLIT | - | - | | | | - |
| 8 Atlantic Ave | WLK 7 | l | | | | | |
| / ^1 \ | FDW 13 | l | | | | | |
| | MIN 20 MAX1 20 | l | | | | Callable by Pushbutton (truncations allowable to | |
| | AMB 4 | l | | | | pedestrian minimum) | |
| | ALR 2 | | | | | , | |
| | SPLIT | 27 | 27 | 27 | 27 | | - |
| | CL | 60 | 70 | 70 | 80 | | |
| | OF | 6 | 6 | 6 | 29 | | |
| II . | 1 | ı | I | 1 | l | I . | |

LOC: King St & Atlantic Ave T.S.P. PARAMETERS MODE: SAP with PR, TSP & 2 Wire- Polara APS* TSP RUN TSP RUN TCS: 1912 PREPARATION DATE (TIMING CARD): November 19, 2018 PREPARED: # 2 OFFSET CORRECTION PARAMETERS 2.8.2 Transit Run Parameters O.C. 2.3.4 O.C. Extend / Reduce (Max. time added & subtracted in sec.) ATC Green Extend Mode Mode 2 Mode 2 From page 1 Ø1 Ø2 Ø3 Ø4 Ø5 Ø6 Ø7 Ø8 [Cycle] [Slop] (Equivalent TTC Algorithm) Thres. Run Enable (x = Yes) X X 5 - 1 - 5 -Run Config = 1 Re AM,PM 2.8.3 Transit Action Plan 2 (Used for Pattern 2) 18 s Spilt Ext. -- 26 -- -- 26 -- 23.4 Rdc. -- 15 -- 1 -- 15 --Run Enable (x = Yes) X X 16 Caribana .8.3 Transit Action Plan 3 (Used for Pattern 3) 20 s Split Ext. -- 30 -- -- 30 -- 25 -- 1 -- 25 --Run Enable (x = Yes) X X 2.8.4 Transit Run Configuration 1 Delay / Extend / Fail
CALLS (and Extends) Ø 2/6 Ø 2/6 Pattern 1 OC Threshold set to 3x OC Rdc due to limited slop. Controller could take up to three cycles to get back in sync from -TSP Recovery. Reduces (Truncates) Ø 4/8 Ø 4/8 2.8.4 Transit Run Config Delay / Extend / Fail CALLS (and Extends) Ø 2/6 Ø 2/6 2.1.9.2 Advanced I/O Scripts Skips Reduces (Truncates) Input Script 4 'TSP26Timer' Blocks TSP 2 and TSP 6 calls from vehicles with a headway less than 90 sec .8.4 Transit Run Configuration 3 To view current status of TSP inputs, go to screen 2.1.9.2 page 01 and press [C]. Delay / Extend / Fail CALLS (and Extends) Ø 2/6 Ø 2/6 Skips Ø 4/8 Ø 4/8 Ø1 | Ø2 | Ø3 | Ø4 | Ø5 | Ø6 | Ø7 | Ø8 2.8.6 TSP Split Tables: 1, 2, 3 & 4 GRN EXT (SDW Extension) -- --GRN RDC (Reduction) WLK EXT (Walk Extension) -- 30 TSP RUN # 6 Notes: WB Thru SRM #1 Ch #2 TSP Input 6 BIU #3 PIN #12a King St 2 230 m TSP RUN # 2 EB Thru SRM #1 Ch #1 TSP Input 2 BIU #3 PIN #10a ATC Mode 0 2 TTC Algor'm **B-2** A Extensions SDW Walk W/SDW W/SDW TSP SUMMARY Maximum Green Extensions: TSP Loop Legend

Request (Thru)

Cancel (Thru)

TSP Loop Legend
EWG: 30 s Green/Walk
NSG Truncation to ped minimum Schematic of TSP Loops and TSP Runs (N.T.S)

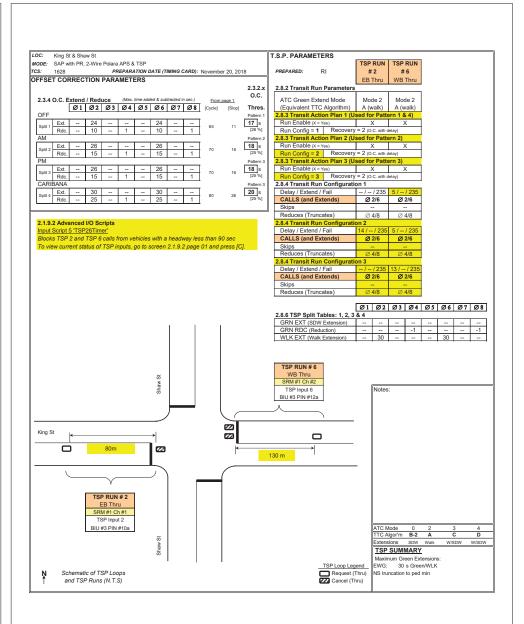
2019-03-14-TCS1912_Current_Timing.xlsx 14/03/2019

APS ready but not activated*

| LOCATION: | King St & S | Shaw St | | | | DISTRICT: | Toronto & East York |
|----------------------|---------------------------|----------------------|----------------------|----------------------|----------------------|---|--|
| MODE/COMMENT: | SAP with P | R, 2-Wire | Polara APS | S & TSP | | COMPUTER SYSTEM: | N TransSuite |
| TCS: | 1628 | | | | | CONTROLLER/CABINET TYPE: | Peek ATC 1000 / TS2 T1 |
| PREPARED BY / DATE: | | lftikhar / I | November 1 | 9, 2018 | | CONFLICT FLASH: | Red & Red |
| CHECKED BY/ DATE: | | | mber 21, 21 | | | DESIGN WALK SPEED: | 1.0 m/s (FDW based on full crossing at 1.2 m/s) |
| IMPLEMENTATION DATE: | November | | | | | CHANNEL/DROP: | 4026/14 |
| | | | | | | FIRMWARE VERSION: | 3.018.1.2976 |
| | | OFF | AM | PM | Gardiner | | |
| | | | | | Closure | - | |
| | | All Other | 06:45-09:30 | 15:45-18:15 | Times to be | Phase Mode | |
| NEMA Phase | | Times | M-F | M-F | determined | (Fixed/Demanded/Callable) | Remarks |
| | | | | | | , | |
| | Local Plan Split Table | Pattern 1 Split 1 | Pattern 2 Split 2 | Pattern 3 Split 3 | Pattern 4 Split 4 | - | |
| | | Opiit 1 | Opiit E | Opin 0 | Opin 4 | | Pedestrian Minimums: |
| 1 | WLK | | | | | | EWWK = 7 secs; EWFD = 15 secs |
| (| FDW MIN | | | | | | NSWK = 7 secs; NSFD = 13 secs NS phase is callable by vehicle or pedestrian actuation. |
| NOT USED | MAX1 | | | | | | If a vehicle and/or pedestrian call is received, the |
| | AMB | | | | | | maximum NSG is served. The NSWK & NSFD are |
| | ALR SPLIT | | | | | | displayed on the pedestrian signal heads if a pedestrian or vehicle call is received. |
| King St | | | | | | | APS on for 7 secs of EWWK and NSWK when activated |
| 2 | WLK 7 FDW 15 | | 1 | | | Fixed POZ activated by | by the push buttons. Extended Push Activation = 3 secs |
| / → \ | MIN 22 | | | | | Request Loop | See back for TSP Instructions. |
| \ ←──→ J | MAX1 33 | | | | | (max extension of 30 secs in | TSP re-enabled for both directions on February 2, |
| | AMB 4 ALR 2 | | | | | Green/Walk) | 2018 Script 5 blocks TSP requests from streetcars less than |
| | SPLIT | 38 | 43 | 43 | 53 | | 90 seconds behind the previous streetcar in the same |
| 2 | | | | | | | direction. |
| 3 | WLK FDW | | | | | | Additional 1 second above the pedestrian minimum provided to the Phase 4/8 SPLIT is to be served in |
| NOT USED | MIN | | | | | | Phase 4/8. |
| (NOT USED) | MAX1 | | | | | | |
| | AMB ALR | | | | | | |
| | SPLIT | | | | | | |
| Shaw St | WLK 7 | | | | | | |
| 4 / 1 1 | WLK 7 FDW 13 | | | | | Callable by Wavetronix detector | |
| / T \ | MIN 20 | | | | | and/or Push Button | |
| | MAX1 21 AMB 4 | | | | | | |
| \ . · \ | AMB 4 ALR 2 | | | | | | |
| | SPLIT | 27 | 27 | 27 | 27 | | |
| 5 | WLK | | | | | | |
| | FDW | | | | | | |
| NOT USED | MIN | | | | | | |
| | MAX1 AMB | | | | | | |
| | ALR | | | | | | |
| 10.00 | SPLIT | | | | | | - |
| King St | WLK 7 | | | | | | |
| | FDW 15 | | | | | Fixed | |
| (<> \ | MIN 22 MAX1 33 | | | | | POZ activated by Request Loop | |
| () | AMB 4 | | | | | | |
| | ALR 2 | | | | | (max extension of 30 secs in Green/Walk) | |
| | SPLIT | 38 | 43 | 43 | 53 | | - |
| 7 | WLK | | | | | 1 | |
| | FDW | | | | | 1 | |
| NOT USED | MIN MAX1 | | 1 | | | | |
| | AMB | | | | | 1 | |
| | ALR | | | | | 1 | |
| Shaw St | SPLIT | - | | | | | - |
| 8 Snaw St | WLK 7 | | 1 | | | | |
| / 1 \ | FDW 13 | | 1 | | | | |
| () | MIN 20 MAX1 21 | | | | | Callable/Extendable by Wavetronix | |
| \ ↓ ♥ / | AMB 4 | | | | | Detector | |
| | ALR 2 | | 0.00 | 0.11 | | 1 | |
| | SPLIT | 27 | 27 | 27 | 27 | | 1 |
| | CL | 65 | 70 | 70 | 80 | | |
| | OF | 1 | 1 | 1 | 42 | 1 | |
| | 1 | 1 | 1 | 1 | 1 | 1 | I |

Vine Ct 0 Chau Ct

NOTES: No EWLT from 7:00AM-10:00AM, M-F; 3:00PM-7:00PM, M-F; public holidays excepted; bicycles excepted; TTC vehicles excepted on EB.



| LOCATION: | King St W & | Strachan Av | Ð | | | | | DISTRICT: | Toronto & East York N |
|----------------------|-------------------|---------------|---------------|-------------|-------------|-------------|-------------|----------------------------------|--|
| MODE/COMMENT: | FXT with TSI | > * | | | | | | COMPUTER SYSTEM: | TransSuite |
| TCS: | 538 | | | | | | | CONTROLLER/CABINET TYPE: | Peek ATC-1000 / TS2 T1 |
| PREPARED BY / DATE: | Ranajamil Ift | ikhar / Nover | nber 19, 2018 | 3 | | | | CONFLICT FLASH: | Red & Red |
| CHECKED BY/ DATE: | Carmen Lam | | | | | | | DESIGN WALK SPEED: | 1.0 m/s (FDW based on full crossing at 1.2 m/s) |
| IMPLEMENTATION DATE: | November 29 | | | | | | | CHANNEL/DROP: | 4026/11 |
| | | , | | | | | | CONTROLLER FIRMWARE: | 3.018.1.2976 |
| | | OFF | AM | PM | NGHT | WKND | SPEC EVENT | Phase Mode | |
| | | All Other | 06:45-09:30 | 15:45-18:15 | 22:00-06:45 | 09:00-19:00 | Times to be | 1 | Remarks |
| NEMA Phase | | Times | M-F | M-F | Daily | Sat & Sun | determined | (Fixed/Demanded or Callable) | |
| | Local Plan | Pattern 1 | Pattern 2 | Pattern 3 | Pattern 4 | Pattern 5 | Pattern 16 | † | |
| | Split Table | Split 1 | Split 2 | Split 3 | Split 4 | Split 5 | Split 16 | Ť | |
| | | | | | | | | | Pedestrian Minimums: |
| 1 | WLK FDW | | | | | | | Demanded | EWWK = 7 sec, EWFD = 13 sec NSWK = 7 sec, NSFD = 14 sec |
| / \ | MIN 6 | | | | | | | (Phase not currently in use - | *See back for TSP Instructions. |
| (1) | MAX1 7 | | | | | | | only implemented for during | WB & EB TSP enabled on Feb 3, 2014. |
| \ \ \ | AMB 3 | | | | | | | Dufferin St bridge rehab) | Script 1 blocks TSP requests from streetcars |
| | ALR 1 | | | | | | | | less than 90 seconds behind the previous |
| 10. 4. | SPLIT | | | | | | | | streetcar in the same direction. |
| 2 King St | WLK 7 | | | | | | | | |
| - / _ \ | FDW 13 | | | | | | | Fixed | |
| (| MIN 20 | | | | | | | POZ activated by | |
| \ <>) | MAX1 32 | | | | | | | Request Loop | |
| | AMB 3 | | | | | | | (max extension of 30 secs in | |
| | ALR 3 SPLIT | 38 | 46 | 46 | 38 | 41 | 42 | EBG/Walk) | |
| | OF EII | 30 | 40 | 40 | 30 | 41 | 42 | | † |
| 3 | WLK | | | | | | | | |
| | FDW | | | | | | | | |
| NOT USED | MIN MAX1 | | | | | | | | |
| (' ' | MAX1 AMB | | | | | | | | |
| | ALR | | | | | | | | |
| | SPLIT | | | | | | | <u> </u> | 1 |
| Strachan Av | | | | | | | | | |
| 4 | WLK 7 | | | | | | | - · | |
| / ↑ 1 \ | FDW 14 MIN 21 | | | | | | | Fixed | |
| | MAX1 22 | | | | | | | (truncations allowable to | |
| \ ↓ / | AMB 4 | | | | | | | pedestrian minimum) | |
| | ALR 2 | | | | | | | | |
| | SPLIT | 32 | 34 | 34 | 32 | 34 | 28 | | |
| 5 | WLK | | | | | | | | |
| - / | FDW | | | | | | | | |
| NOT USED | MIN | | | | | | | | |
| (NOT USED) | MAX1 | | | | | | | | |
| | AMB ALR | | | | | | | | |
| \sim | SPLIT | | | | | | | | |
| King St | | | | | | | | | 1 |
| 6 | WLK 7 | | | | | | | | |
| /<> | FDW 13 | | | 1 | | | | Fixed | |
| | MIN 20 MAX1 32 | | | | | | | POZ activated by Request Loop | |
| \ ◆ → / | AMB 3 | | | | | | | | |
| | ALR 3 | | | | | | | (max extension of 30 secs in | |
| | SPLIT | 38 | 46 | 46 | 38 | 41 | 42 | WBG/Walk) | 1 |
| 7 | MILK | | | | | | | | |
| 7 | WLK FDW | | | | | | | | |
| / | MIN | | | | | | | | |
| NOT USED | MAX1 | | | | | | | | |
| | AMB | | | | | | | | |
| | ALR | | | | | | | | |
| Strachan Av | SPLIT | | - | - | | _ | | | + |
| 8 Strachan Av | WLK 7 | | | | | | | | |
| ~ / ^ ı \ | FDW 14 | | | | | | | Fixed | |
| () | MIN 21 | | | | | | | | |
| \ 1 | MAX1 22 | | | | | | | (truncations allowable to | |
| \ v v / | AMB 4 | | | 1 | | | | pedestrian minimum) | |
| | ALR 2 SPLIT | 32 | 34 | 34 | 32 | 34 | 28 | | |
| | O/ LII | 32 | 34 | 34 | J2 | 34 | 20 | | t |
| | CL | 70 | 80 | 80 | 70 | 75 | 70 | | |
| | OF | 14 | 42 | 50 | 59 | 47 | 14 | | |
| | 1 | | 1 | I | 1 | 1 | | I | I |

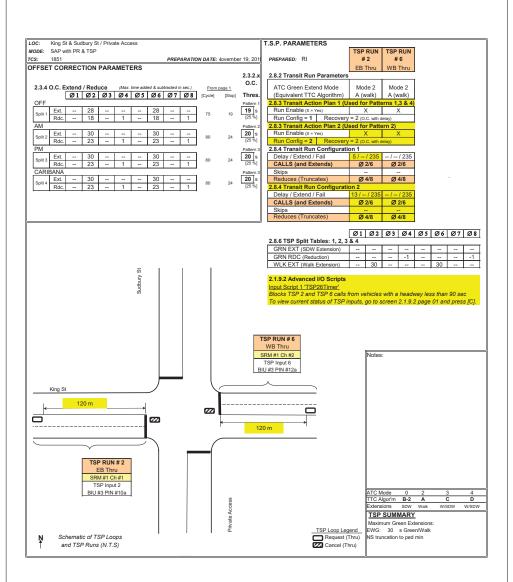
LOC: King St & Strachan Av T.S.P. PARAMETERS TSP RUN TSP RUN MODE: FXT with TSP PREPARATION DATE (TIMING CARD): November 20, 2018 TCS: 538 PREPARED: RI #2 #6 OFFSET CORRECTION PARAMETERS EB Thru WB Thru 2.3.2.x 2.8.2 Transit Run Parameters O.C. 2.3.4 O.C. Extend / Reduce (Max. time added & subtracted in sec.) From page 1

| Ø 1 | Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 7 | Ø 8 | Cycle | Slop | Thres. ATC Green Extend Mode Mode 2 Mode 2 (Equivalent TTC Algorithm) A 2.8.3 Transit Action Plan 1 (Used for Patterns 1, 4, 5, 16)
Run Enable (x = Yes) X X Pattern 17 s [24 %]
 Split 1
 Ext.
 - 13
 - 13
 - 13
 - 13

 Rdc.
 - 5
 - 4
 - 5
 - 4
 Run Config = 1 Recovery = 2 (O.C. with delay) 2.8.3 Transit Action Plan 2 (Used for Pattern 2) 20 s Run Enable (X = Yes) PM 2.8.3 Transit Action Plan 3 (Used for Pattern 3) 20 s -- 15 -- 15 -- 15 -- 15 Spit 3 Ext. -- 15 -- 15 -- 15 Rdc. -- 6 -- 4 -- 6 -- 4 Run Enable (x = Yes) X Run Config = 3 Recovery = 2 (O.C. with delay) NIGHT 2.8.4 Transit Run Configuration 1 18 s -- 13 -- 13 -- 13 -- 13 Delay / Extend / Fail -- / -- / 235 CALLS (and Extends) Ø 2/6 Ø 2/6 Rdc. -- 5 -- 4 -- 5 -- 4 Skips 19 s [25 %] Reduces (Truncates) Ø 4/8 Ø 4/8 Split 5 Ext. -- 14 -- 14 -- 14 -- 14 Rdc. -- 6 -- 4 -- 6 -- 4 2.8.4 Transit Run Configuration 2 SPECIAL EVENT Delay / Extend / Fail
CALLS (and Extends) Pattern 1 18 s [26 %] 13 -- 13 -- 13 -- 13 Ø 2/6 .8.4 Transit Run Configuration 3 2.1.9.2 Advanced I/O Scripts Delay / Extend / Fail 4 / -- / 235 9 / -- / 235 CALLS (and Extends) Blocks TSP 2 and TSP 6 calls from vehicles with a headway less than 90 sec To view current status of TSP inputs, go to screen 2.1.9.2 page 01 and press [C]. Skips Ø 4/8 Reduces (Truncates) 2.8.6 TSP Split Tables: 1 & 4 Ø 1 Ø 2 Ø 3 Ø 4 Ø 5 Ø 6 Ø 7 Ø 8 GRN EXT (SDW Extension)
GRN RDC (Reduction)
WLK EXT (Walk Extension) 2.8.6 TSP Split Tables: 2. 3 & 5 GRN EXT (SDW Extension) --GRN RDC (Reduction) -- 30 WLK EXT (Walk Extension) -- 30 2.8.6 TSP Split Table: 16 GRN EXT (SDW Extension) -- -- -- -- --GRN RDC (Reduction) -- -1 -- ---- -- 30 -- -1 WLK EXT (Walk Extension) TSP RUN # 6 WB Thru SRM #1 Ch #2 TSP Input 6 BIU #3 PIN #12a Dundas St 130 m \square **2 2**2 TSP RUN # 2 SRM #1 Ch #1 TSP Input 2 BIU #3 PIN #10a ATC Mode 0 TTC Algor'm B-2 TSP SUMMARY Maximum Green Extensions TSP Loop Legend EWG: 30 s Green/Walk Schematic of TSP Loops Request (Thru)
Cancel (Thru) Truncation of phases 4 and 8 to ped min and TSP Runs (N.T.S)

14/03/2019

| LOCATION: MODE/COMMENT: TCS: PREPARED BY / DATE: CHECKED BY / DATE: | SAP with PR 1851 Ranajamil Ift Carmen Lam | & TSP ikhar / Nove | mber 19, 201 | | | DISTRICT: COMPUTER SYSTEM: CONTROLLER/CABINET TYPE: CONFLICT FLASH: DESIGN WALK SPEED: | Toronto & East York TransSuite Peek ATC 1000 / TS2 T1 Red & Red 1.0 mis (FDW based on full crossing at 1.2 m/s) |
|---|---|---------------------------------|--|--|--|---|---|
| IMPLEMENTATION DATE: | November 2 | 9, 2018 OFF | AM | PM | CARIBANA | CHANNEL/DROP: CONTROLLER FIRMWARE: Phase Mode | 4026/15 3.018.1.2976 |
| NEMA Phase | Local Plan Split Table | All Other Times Pattern 1 | 06:45-09:30 M-F Pattern 2 Split 2 | 15:45-18:15 M-F Pattern 3 Split 3 | Times to be Determined Pattern 4 | (Fixed/Demanded or Callable) | Remarks |
| 1 NOT USED | WLK FDW MIN MAX1 AMB ALR SPLIT | Split 1 | Зр іі 2 | эрнгэ | Split 4 | | Pedestrian Minimums: NSWK = 7 sec. NSED = 14 sec EWWK = 7 sec. EWED = 17 sec NS phase is calable by wehicle or pedestrian actuation. If a vehicle call and/or a pedestrian call is received, the pedestrian minimum will be served. The NSWK & NSED are only displayed on the pedestrian signal heads if a vehicle and/or |
| 2 King St | WLK 7 FDW 17 MIN 24 MAX1 43 AMB 4 ALR 2 SPLIT | 48 | 53 | 53 | 53 | Fixed POZ activated by Request Loop (max extension of 30 secs in Green/Walk) | pedestrian call is received. See back for TSP Instructions. E8 & WB TSP enabled on Feb 3, 2014 Additional 1 second above the pedestrian minimum provided to the Phase 4/8 SPLIT is to be served in Phase 4/8. |
| 3 NOT USED | WLK FDW MIN MAX1 AMB ALR SPLIT | | | | | | Script 1 blocks TSP requests from streetcars less than 90 seconds behind the previous streetcar in the same direction. |
| Private Access 4 | WLK 7 FDW 14 MIN 21 MAX1 21 AMB 3 ALR 2 SPLIT | 27 | 27 | 27 | 27 | Callable by Stopbar loop and/or Pushbutton; Truncations allowable to pedestrian minimum | |
| 5 NOT USED | WLK FDW MIN MAX1 AMB ALR SPLIT | | | | | | |
| 6 King St | WLK 7 FDW 17 MIN 24 MAX1 43 AMB 4 ALR 2 SPLIT | 48 | 53 | 53 | 53 | Fixed POZ activated by Request Loop (max extension of 30 secs in Green/Walk) | |
| 7 NOT USED | WLK FDW MIN MAX1 AMB ALR SPLIT | | | | | | |
| 8 Sudbury St | WLK 7 FDW 14 MIN 21 MAX1 21 AMB 3 ALR 2 SPLIT | 27 | 27 | 27 | 27 | Callable by Traficam detector and/or Pushbutton; Truncations allowable to pedestrian minimum | |
| | CL OF | 75 1 | 80 1 | 80 1 | 80 52 | | |



| LOCATION: | Ot | 0 M/-III | . W// D Ot | | | DISTRICT: | Towards & Food Work |
|------------------------------|-------------------|------------------|-------------------|-------------------|---------------------------|---|--|
| MODE/COMMENT: | | & Wellington S | t W/ Douro St | | | COMPUTER SYSTEM: | Toronto & East York TransSuite |
| TCS: | FXT with 2-wir | e Polara APS | | | | | |
| TCS: PREPARED/CHECKED BY: | 2403 | | | | | CONTROLLER/CABINET TYPE: CONFLICT FLASH: | PEEK ATC-1000 / TS2T1 |
| | RI/DS | | | | | | Red & Red |
| PREPARATION DATE: | May 16, 2017 | | | | | DESIGN WALK SPEED: | 1.0m/s (FDW based on full crossing @ 1.2m/s) |
| IMPLEMENTATION DATE: | July 19, 2018 | | | | | CHANNEL/DROP: | 4026/30 |
| | | 055 | | | LODEO EVENT | FIRMWARE VERSION: | 3.018.2976 |
| | | OFF All Other | AM 06:45-09:30 | PM 15:45-18:15 | SPEC EVENT Times to be | Phase Mode (Fixed/Demanded or | Remarks |
| NEMA Phase | | Times | M-F | M-F | determined | Callable) | |
| | Local Plan | Pattern 1 | Pattern 2 | Pattern 3 | Pattern 4 | i · | |
| | Split Table | Split 1 | Split 2 | Split 3 | Split 4 | | |
| 1 | WLK | | | | | | Pedestrian Minimums: NSWK = 7 sec. NSFD = 16 sec |
| . / | FDW | | | | | | EWWK = 7 sec, EWFD = 13 sec |
| NOT USED | MIN | | | | | | Left-Turn Passage Time = 2 secs |
| (1101 0025) | MAX 1 AMB | | | | | | Extended APS Push Activation = 3 secs |
| | ALR | | | | | | When activated, actuated APS on during EW & NS walk periods when no arrows are displayed. |
| \sim | SPLIT | | | | | | portodo witari no dirovio die displayed. |
| Strachan Ave | | | | | | | Ť |
| 2 | WLK 7 FDW 16 | | | | | Fixed | |
| / ♠ ↑ \ | MIN 23 | | | | | | |
| () | MAX 1 37 | | | | | | |
| \ \ / | AMB 4 | | | | | | |
| | ALR 2 SPLIT | 43 | 53 | 42 | 53 | | |
| | SPLII | 43 | 53 | 42 | 53 | | + |
| 3 | WLK | | | | | | |
| | FDW | | | | | | |
| () | MIN 6 MAX 1 6 | | | | | Callable and extendable by 9m setback loop | |
| \ \ \ | AMB 3 | | | | | эт ѕетраск гоор | |
| | ALR 1 | | | | | | |
| | SPLIT | | | 11 | | | <u>↓</u> |
| Douro St | WLK 7 | | | | | Firms | |
| 4 | FDW 13 | | | | | Fixed | |
| (| MIN 20 | | | | | | |
| \ | MAX 1 21 | | | | | | |
| | AMB 3 | | | | | | |
| | ALR 3 SPLIT | 27 | 27 | 27 | 27 | | |
| | | | | | | | † |
| 5 | WLK | | | | | | |
| (-) | FDW MIN 6 | | | | | NBLA Fixed | |
| (1 | MAX 1 6 | | | | | NDLA FIXEU | |
| \ / | AMB 3 | | | | | | |
| | ALR 1 | | | | | | |
| Strachan Ave | SPLIT | | | 11 | | | 1 |
| 6 Strachan Ave | WLK 7 | | | | | Fixed | |
| / A | FDW 16 | | 1 | l | 1 | | |
| (I \ | MIN 23 | | | | | | |
| \ 1 / | MAX 1 37 AMB 4 | | | | | | |
| \v v / | AMB 4 ALR 2 | | | | | | |
| | SPLIT | 43 | 53 | 31 | 53 | | 1 |
| | | | | | | | |
| 7 | WLK FDW | | 1 | l | 1 | 1 | |
| () | MIN | | | | | | |
| NOT USED | MAX 1 | | | | | | |
| | AMB | | | | | | |
| | ALR SPLIT | | | | | | |
| Wellington St W | OFLII | | - | | - | | † |
| 8 | WLK 7 | | | | | Fixed | |
| | FDW 13 | | | | | | |
| · > | MIN 20 | | | | | | |
| \ / | MAX 1 21 AMB 3 | | | | | | |
| | ALR 3 | | | | | | |
| | SPLIT | 27 | 27 | 38 | 27 | | <u> </u> |
| | CL | 70 | 80 | 80 | 80 | | |
| | OF OF | 70 27 | 48 | 80 46 | 27 | | |
| | 1-" | ~- | 1 | " | l | | |

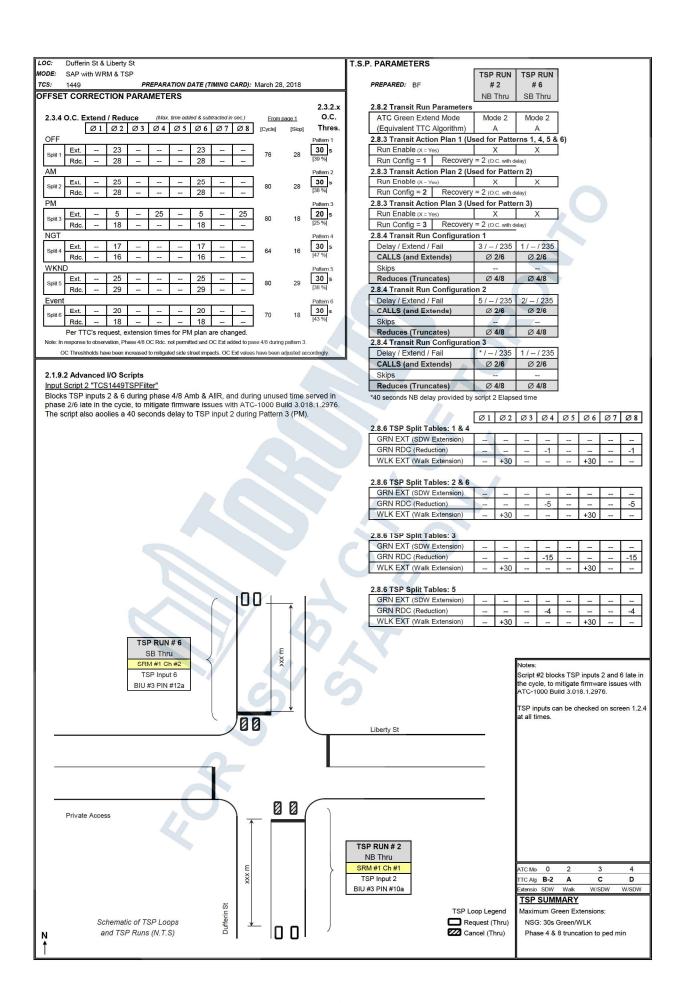
NOTES:

2019-03-14-TCS1628_Current_Timing.xlsx

14/03/2019

| LOCATION: | | | / Private Acc | ess | | | | DISTRICT: | Toronto & East York |
|---|-------------------|--------------------|--------------------|--------------------|----------------------|------------------------|-----------|--|---|
| MODE/COMMENT: | SAP with P | R & TSP | | | | | | COMPUTER SYSTEM: | TransSuite |
| TCS: PREPARED/CHECKED BY: | 1449 BF | | | | | | | CONTROLLER/CABINET TYPE: CONFLICT FLASH: | Peek ATC-1000 / TS2T1 Red & Red |
| PREPARATION DATE: | August 6, 2 | 019 | | | | | | DESIGN WALK SPEED: | 1.0 m/s (FDW based on full crossing at 1.2 m/s) |
| IMPLEMENTATION DATE: | August 6, 2 | | | | | | | CHANNEL/DROP: | 4007/19 |
| | J , | | | | | | | CONTROLLER/FIRMWARE: | 3.018.1.2976 |
| | | OFF | AM | PM | NGHT | WKND | Event | Phase Mode | Remarks |
| NEMA Phase | | All Other Times | 06:30-09:30 M-F | 15:00-19:00 M-F | 23:00-06:30 Daily | 10:00-19:00 Sat/Sun | TBD | (Fixed/Demanded or Callable) | |
| NEMAT HOSE | Local Plan | Pattern 1 | Pattern 2 | Pattern 3 | Pattern 4 | Pattern 5 | Pattern 6 | Callable) | |
| | Split Table | Split 1 | Split 2 | Split 3 | Split 4 | Split 5 | Split 6 | | Pedestrian Minimums. |
| 1 | WLK | | | | | | | | NSWK = 7 sec, NSFD = 11 sec |
| | FDW MIN | | | | | | | | EWWK = 7 sec, EWFD = 11 sec EW phase is callable by vehicle and/or pedestri |
| NOT USED | MAX1 | | | | | | | | actuation. If a vehicle and/or pedestrian call is |
| | AMB | | | | | | | | received, the maximum EWG is served. The |
| | ALR SPLIT | | | | | | | | EWWK & EWFD are displayed on the pedestria signal heads if a vehicle and/or pedestrian call is |
| Dufferin St | | | | | | | | | received. |
| 2 | WLK 7 FDW 11 | | | | | | | Fixed | Side Street Passage Time = 3 sec |
| / ↑ ↑ | MIN 18 | | | | | | | POZ activated by | See back for TSP instructions TSP enabled on May 22, 2015 |
| | MAX1 47 | | | | | | | Request Loop | Script #2 is used to mitigate issues with TSP |
| \ \ \ / | AMB 4 ALR 2 | | | | | | | (Max extension of 30 secs in Green/WLK) | operation in ATC-1000 firmware version 3.018.1.2976 |
| | SPLIT 2 | 52 | 52 | 40 | 40 | 53 | 42 | Green/WLK) | Script #1 is revised to eliminate the extended |
| 3 | WLK | | | | | | | | Walk on Phase 4 and 8 for all times. |
| " | FDW | | | | | | | | <u> </u> |
| NOT USED | MIN | | | | | | | | |
| (NOT GOLD) | MAX1 AMB | | | | | | | | |
| | ALR | | | | | | | | ľ |
| Private Access | SPLIT | | | | | | | | - |
| 4 Private Access | WLK 7 | | | | | | | Callable by Traficam | |
| | FDW 11 | | | | | | | & pushbutton. | |
| | MIN 18 MAX1 18 | | | | | | | Extendable by Traficam. | |
| | AMB 3 | | | | | | | (Truncations allowed to | |
| | ALR 2 SPLIT | 24 | 28 | 40 | 24 | 27 | 28 | pedestrian minimum) | |
| 12 | SFLIT | 24 | 20 | 40 | 24 | 21 | 20 | | 1 |
| 5 | WLK FDW | | | | | | | | |
| () | MIN | | | | | | A | | |
| NOT USED | MAX1 | | | | | 7 | | | |
| | AMB ALR | | | | | | | | |
| | SPLIT | | | | | | | |] |
| Dufferin St | WLK 7 | | | | | | | Fixed | |
| ^ / 1 \ | FDW 11 | | | | | | | Fixed | |
| (| MIN 18 | | | | | | | POZ activated by | |
| \ | MAX1 47 AMB 4 | | | | | | | Request Loop (Max extension of 30 secs in | |
| | ALR 2 | - | - | | / | | | Green/WLK) | |
| | SPLIT | 52 | 52 | 40 | 40 | 53 | 42 | | 1 |
| 7 | WLK | | | | \ \ | | | | |
| | FDW MIN | | | 1 | 4 | | | | |
| NOT USED | MAX1 | | | | | | | | |
| | AMB | | | | | | | | |
| | ALR SPLIT | | 7/ | | | | | | |
| Liberty St | | | | | | | 1 | and the second second | 1 |
| 8 | WLK 7 FDW 11 | | | | | | | Callable by Traficam & pushbutton. | |
| / <> \ | MIN 18 | | | | | | 7 | Extendable by Traficam. | |
| (| MAX1 18 | | | | | CA | | | |
| | AMB 3 ALR 2 | | | (3) | - | | | (Truncations allowed to pedestrian minimum) | |
| | SPLIT | 24 | 28 | 40 | 24 | 27 | 28 | | - |
| | CL | 76 | 80 | 80 | 64 | 80 | 70 | | |
| | OF | 39 | 74 | 79 | 16 | 1 | 1 | | |
| | I | | | | | | | | |

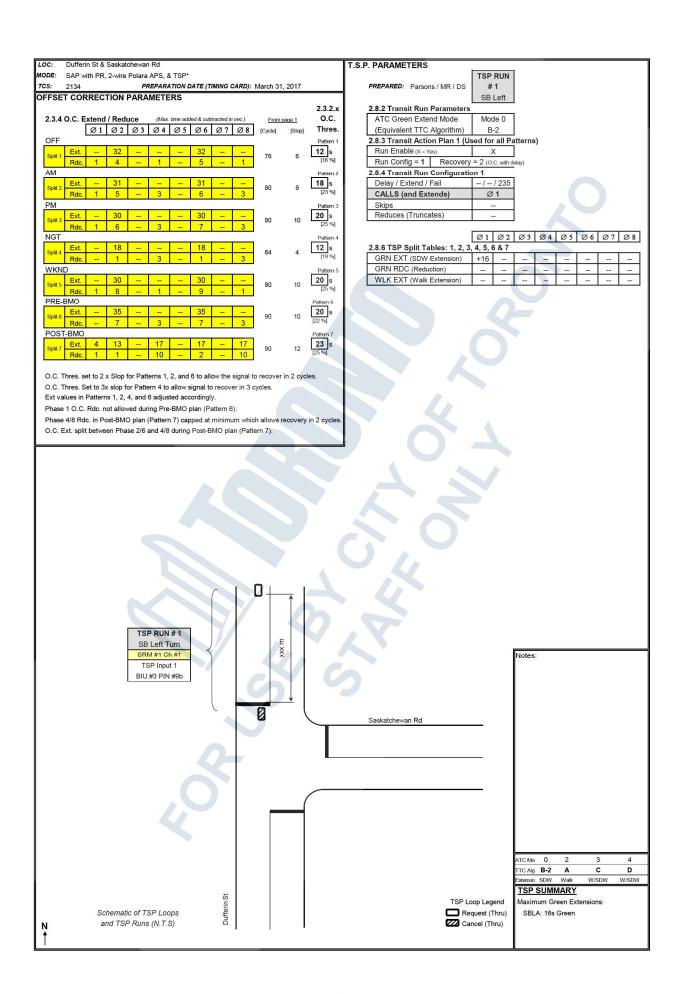
TCSCurrent.xlsx 8/6/2019



TCSCurrent.xlsx 8/6/2019

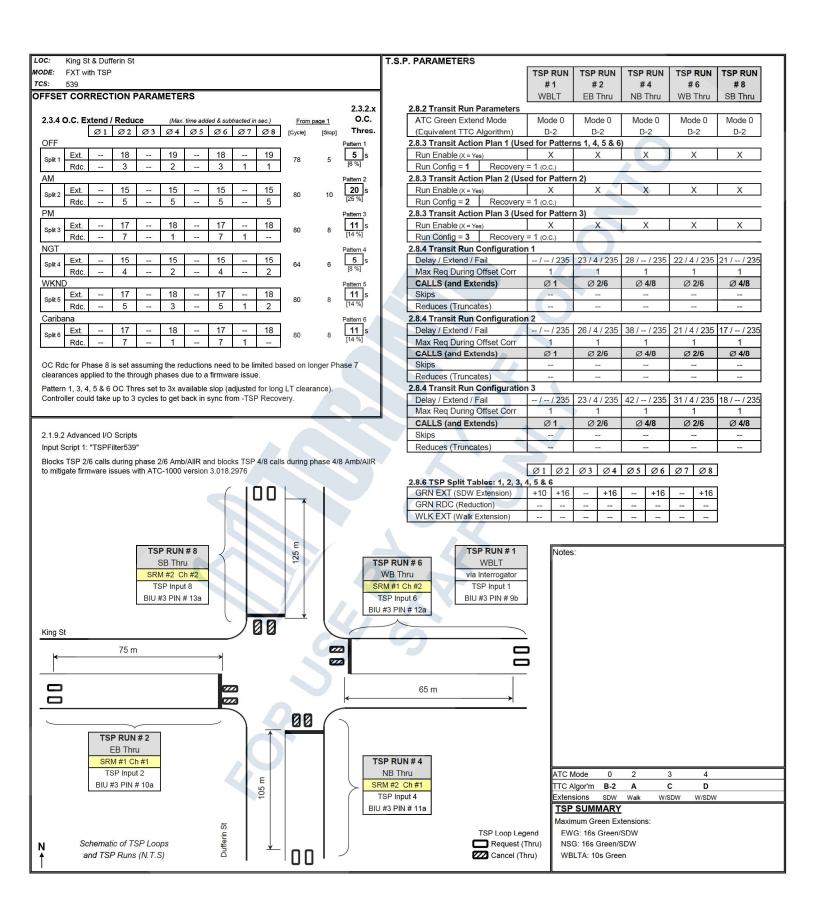
| LOCATION: | Dufferin St | & Saskatche | wan Rd | | | | | | DISTRICT: | Toronto & East York |
|------------------------|---------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|--|---|
| MODE/COMMENT: | | R, 2-wire Pol | | SP | | | | | COMPUTER SYSTEM: | TransSuite |
| TCS: | 2134 | ., | | | | | | | CONTROLLER/CABINET TYPE: | Peek ATC-1000 / TS2T1 |
| PREPARED/CHECKED BY: | Parsons / | MR / DS | | | | | | | CONFLICT FLASH: | Red & Red |
| PREPARATION DATE: | March 31, | | | | | | | | DESIGN WALK SPEED: | 1.0 m/s (FDW based on full crossing at 1.2 m/s) |
| IMPLEMENTATION DATE: | June 22, 20 | | | | | | | | CHANNEL/DROP: | 4007/21 |
| IMIT ELMENTATION DATE. | ourie 22, 2 | J11 | | | | | | | CONTROLLER/FIRMWARE: | 3.018.1.2976 |
| | 1 | OFF | AM | PM | NGHT | WKND | PRE-BMO | POST-BMO | | Remarks |
| | | All Other | 06:30-09:30 | 15:00-19:00 | 23:00-06:30 | 10:00-19:00 | | | (Fixed/Demanded or | Remarks |
| NEMA Phase | | Times | M-F | M-F | Daily | Sat/Sun | TBD | TBD | Callable) | |
| | Local Plan Split Table | Pattern 1 Split 1 | Pattern 2 Split 2 | Pattern 3 Split 3 | Pattern 4 Split 4 | Pattern 5 Split 5 | Pattern 6 Split 6 | Pattern 7 Split 7 | | |
| | Split Table | Spill | Spill 2 | Spill 3 | Spill 4 | Spiles | Spill 6 | Spilt 7 | Callable/Extendable | Pedestrian Minimums: |
| 1 | WLK | | | | // | | | | by 9m long setback loop, | NSWK = 7 sec, NSFD = 20 sec |
| / I A \ | FDW MIN 6 | | | | / | 1 | | | All times except NGHT plan. Callable at all times by transit | EWWK = 7 sec, EWFD = 14 sec |
| | MIN 6 MAX1 7 | | | | | | | | POZ activated by | Left Turn Passage Time = 2 see SBLA and WBRA are displayed |
| \ ┗ / | AMB 3 | | | | | | | | Request Loop | simultaneously. |
| | ALR 1 | | | | | 7.0 | | | (Max extension of 16 secs in | WB phase is callable by vehicle and/or |
| Dufferin St | SPLIT | 11 | 11 | 11 | 0 | 11 | 20 | 11 | Green) | pedestrian actuation. If a vehicle and/or |
| 2 | WLK 7 | | | | | | | | Fixed. | pedestrian call is received, the maximum |
| / A ^ \ | FDW 20 | | | | | | | | | WBG is served. The EWWK & EWFD are displayed on the pedestrian signal heads |
| (T) | MIN 27 | | | | A | | | / | | vehicle and/or pedestrian call is received. |
| \ \ / | MAX1 30 AMB 4 | | | | | | | | 4 | Side Street Passage Time = 3 sec |
| ••• | ALR 3 | | | | | | | | | APS on during 7 sec of NSWK & 7 sec of |
| | SPLIT | 38 | 39 | 40 | 35 | 42 | 41 | 35 | | EWWK when activated by pushbutton. |
| 3 | WLK | | | | | | | | | Extended Push Activation = 3 sec See back for TSP instructions. |
| | FDW | | | | | | 4 | | A . | TSP enabled on May 22, 2015 |
| (NOT USED) | MIN | | | | | | 7 | | | , |
| NOTOSED | MAX1 | | | | | | 7 | | A STATE OF THE STA | |
| | AMB ALR | | | | | | | | | |
| | SPLIT | | | | | | | | | |
| | JUNE 12 | | | | | | | V . | | |
| 4 | WLK 7 | | | | | | A | | Served concurrently with | |
| | FDW 14 MIN 21 | | | | | | | 4 | Phase 8. | |
| ACTIVATED | MAX1 21 | | | | | ~ | | | | |
| | AMB 3 | | | | | | | | | |
| | ALR 2 SPLIT | 27 | 29 | 29 | 29 | 27 | 29 | 44 | | |
| | | | | | | | 4 | | | 1 |
| 5 | WLK | | | | 7 | | 7 | | | |
| | FDW MIN | | | | | | | | | |
| NOT USED | MAX1 | | | | | 4 | | | | |
| | AMB | | | | | | | | | |
| | ALR | | | | 4 | | | 7 | | |
| Dufferin St | SPLIT | | | | | 4 | | | | 1 |
| 6 Dulletin St | WLK 7 | | | | | | | | Fixed. | |
| / I \ | FDW 20 | | | | | | | | | |
| | MIN 27 MAX1 41 | | | | | 7 | | | | |
| \ \ \ | AMB 4 | | | | | | | | | |
| • | ALR 3 | | | - 4 | | | | | | |
| | SPLIT | 49 | 51 | 51 | 35 | 53 | 61 | 46 | | 4 |
| 7 | WLK | | | | | | | | | |
| | FDW | | | U | | | 7 | | | |
| (NOT USED) | MIN | | | | | | | | | |
| (1.5. 6625 | MAX1 AMB | | | | | | | | | |
| | ALR | | | | | | | | | |
| | SPLIT | | | | | | | | | |
| Saskatchewan Rd | | | | | | | | | | 1 |
| 8 | WLK 7 FDW 14 | | | | | | | | Callable by stopbar loop and/or pushbutton. | |
| / <> \ | MIN 21 | | | | | | | | Extendable by stopbar loop. | |
| | MAX1 21 | | | | | | | | ,p | |
| () | AMB 3 | | | * | | | | | | |
| | ALR 2 SPLIT | 27 | 29 | 29 | 29 | 27 | 29 | 44 | | |
| | | | | | | | | | | 1 |
| | CL | 76 | 80 | 80 | 64 | 80 | 90 | 90 | | |
| | OF | 68 | 15 | 31 | 1 | 33 | 1 | 1 | 1 | 1 |

TCSCurrent.xlsx 24/09/2018



LOCATION: King St & Dufferin St Toronto & East York DISTRICT: N MODE/COMMENT: **FXT with TSP** COMPUTER SYSTEM: **TransSuite** TCS: 539 CONTROLLER/CABINET TYPE: Peek ATC-1000 / TS2T1 PREPARED BY / DATE: Kelly Hannah \ September 16, 2020 CONFLICT FLASH: Red & Red CHECKED BY / DATE: Ameneh Dialameh \ September 30, 2020 DESIGN WALK SPEED: 0.9 m/s (FDW based on full crossing at 1.1 m/s) IMPLEMENTATION DATE: January 21, 2021 CHANNEL/DROP: 4026/18 CONTROLLER/FIRMWARE: 3.018.1.2976 Phase Mode AM 06:30-09:30 PM NGHT 23:00-06:30 WKND 10:00-19:00 Caribana Remarks All Other 15:00-19:00 (Fixed/Demanded or TBD **NEMA Phase** Times M-F M-F Daily Sat/Sun Callable) Local Plan Split Table Pattern 6 Pattern 1 Pattern 2 Pattern 3 Pattern 4 Pattern 5 Split 6 Split 1 Split 2 Split 4 Split 5 Split 3 Protected/Permissive Pedestrian Minimums: WBLTGA EWWK = 8 sec, EWFD = 15 sec FDW MIN Callable by WBLT streetcars NSWK = 8 sec, NSFD = 15 sec 10 via interrogator Left Turn Passage Time = 2 sec See back for TSP instructions. MAX1 AMB 10 (Max extension of 10 secs WBLA) ALR 6 Due to restrictions in ATC-1000 firmware 0 SPLIT 0 0 0 version 3.18.2976, phase 2 & 6 splits must be King St programmed as at least 30 during all patterns 2 WIK Fixed at this intersection. FDW 15 MIN POZ activated by TSP re-enabled on January 15, 20221 26 3.3 MAX1 Request Loop (Max extension of 16 secs in AMB ALR 2.2 Green/SDW) 33 SPLIT 3 WLK FDW MIN MAX1 NOT USED AMB ALR SPLIT Dufferin St WLK Fixed FDW MIN POZ activated by 23 MAX1 40 Request Loop
extension of 16 secs in 3.3 2.2 Green/SDW) ALR 47 SPLIT 45 5 WLK Demanded FDW (In Shared Thru-Left Lane) MIN MAX1 6 Reserved for Future Use AMB 3.3 Times to be Determined 4.0 SPLIT King St 6 WLK Fixed FDW 15 MIN MAX1 23 26 3.3 POZ activated by Request Loop (Max extension of 16 secs in AMB AI R 2.2 Green/SDW) SPLIT 7 WLK Demanded FDW (In Shared Thru-Left Lane) MIN MAX1 6 AMB 33 ALR 3.9 14 14 14 Dufferin St 8 WLK Fixed FDW MIN 15 POZ activated by 23 MAX1 AMB Request Loop 26 (Max extension of 16 secs in 3.3 ALR 2.2 Green/SDW) 31 SPLIT 33 CL OF 80 53 24 29 29 45 46 Note

TCSCurrent.xlsx 1/15/2021



TCSCurrent.xlsx 1/15/2021

| LOCATION: | | Lake Shore Blv | vd & Briti | ish Colu | ımbia Dr | | | | | | | UTC Stages Green Returns |
|---------------------------------------|--------------------|---------------------------------|----------------|----------------|----------------|------------------|--------------------|---------------------|---------------------|--------------------|--|---|
| MODE/COMMENT: | | SA2-VMG with | | | | | | | | | | B 2&6 |
| TCS/SCN: | | 1344/30221 | | | | | | | | | | C 3&7 |
| CODER/CHECKED BY: | | TY | | | | | | | | | | F 4 & 8 |
| DATE CREATED DISTRICT: | | July 19, 2018 Toronto and Ea | aet Vork | | | | | | | | | |
| COMPUTER SYSTEM: | | UTC/SCOOT | ust Tork | | | | | | | | | |
| CONTROLLER/CABINET: | | Econolite Coba | alt /TS2T | 1 | | | | | | | | |
| CONTROLLER FIRMWARE | ≣: | 32.63.10 | | | | | | | | | | |
| CONFLICT: DESIGN WALK SPEED: | | Red & Red 1.0 m/s (FDW b | nasad on | full cro | eeina at | | | | | | | |
| TCC/CHANNEL/DROP: | | B/15/2 | Jaseu on | Tull Cro | ssing at | | | | | | | |
| IMPLEMENTATION DATE: | | July 14, 2019 | | | | | | | | | | |
| Dual Ring | | TP1 UTC/SCOOT | TP2 Split 1 | TP3 Split 3 | TP4 Split 5 | OFF All Other | AM 6:30 - 10:00 | PM 15:00 - 19:00 | NGHT 23:00-06:30 | Indy Time to be | Phase Mode (Fixed, Demanded or | |
| NEMA Phase | | Control | | & 4 | Spint 3 | Times | M - F | M - F | Daily | determined | Callable) | Remarks |
| (Green Return) | Local Plan | | | | | Pattern 1 | Pattern 2 | Pattern 3 | Pattern 4 | Pattern 5 | * * | |
| | Split Table WLK | | + | | | Split 1 | Split 2 | Split 3 | Split 4 | Split 5 | | Pedestrian Minimums: |
| 1 | FDW | | | | | | | | | | | EWWK = 7 secs. EWFD = 15 secs. |
| | MIN MAX1 | | | | | | | | | | | NSWK = 7 secs. NSFD = 17 secs. Phases are skippable, callable & extendable by vehicle and/or |
| (NOT USED | MAX2 | | | | | | | | | | | pedestrian actuation depending on current operation i.e. under |
| | AMB ALLR | | | | | | | | | | | UTC/Scoot control or TransSuite control.If a vehicle call is received, the minimum time is served. If ongoing vehicle demand |
| | SPLIT | | | | | | | | | | | exists, the vehicle phase is capable of providing vehicle extensions up to the maximum.Extension time is based on vehicle |
| | WLK | 7 | 7 | 7 | 7 | | | | | | | demand.NB phase is callable & extendable by vehicle actuation |
| 2 | FDW MIN | 15 22 | 15 22 | 15 22 | 15 22 | | | | | 1 | | only.If a pedestrian call is received, the pedestrian minimum will be served. |
| ACTIVATED | MAX1 | 38 | 38 | 75 | 25 | | | | | | Dummy Phase activated | 100 M M M M M M M M M M M M M M M M M M |
| ACTIVATED | MAX2 AMB | 47 | 31 4 | 34 4 | 47 | | | | | 2 | with Phase 6 | Vehicle Passage Time = 3 sec. SF #4 enables MAX2 (time to be determined) |
| | ALLR | 3 | 3 | 3 | 3 | | | | | | | All plans operate as free. TP1 is used for UTC/Scoot control. TP2 |
| | SPLIT | | | | | 0 | 0 | 0 | 0 | 0 | | is used for Pattern 1 & 2 using MAX1 & MAX2 values respectively for green times for all phases. TP3 is used for Patten 3 & 4 using |
| | WLK FDW | | | | | | | | | | | MAX1 & MAX2 values respectively for green times for all |
| 3 | MIN | 7 | 7 | 7 | 7 | | | | | | 5 | phases.TP4 is used for Pattern 5 using MAX1 value for green time for all phases. |
| ACTIVATED | MAX1 MAX2 | 29 53 | 29 68 | 23 23 | 52 53 | | | | | | Dummy Phase activated with Phase 7 | Ring Structure: |
| | AMB | 4 | 4 | 4 | 4 | | | | | | | 2 3 4 |
| | ALLR SPLIT | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | | 6 7 8 Normal Operations |
| | WLK | 7 | 7 | 7 | 7 | - 0 | | ů | 0 | 0 | | Signal operates free all times when on local control. Signal is on |
| | FDW | 17 | 17 | 17 | 17 | | | | • | | | pedestrian recall and rests in Phases 2 & 6 waiting for calls. When called from rest, signal serves callable phase(s) following |
| 4 | MIN MAX1 | 24 | 7 24 | 7 27 | 7 24 | | | | | | Dummy Phase activated | phase sequence. |
| ACTIVATED | MAX2 | 34 | 26 | 24 | 34 | | | | _ | | with Phase 8 | If vehicle demand exists for both the NB & SB (veh and/or ped.) |
| | AMB ALLR | 4 | 4 2 | 4 2 | 4 2 | | | | | | | at the end of the WB phase, the NB phase is served first followed by the SB phase. In any given cycle, the signal may serve the NB |
| | SPLIT | | | | | 0 | 0 | 0 | 0 | 0 | | phase, the SB phase, both in that order, or neither depending on demand. The decision point for the NB phase is at the end of the |
| | WLK FDW | | | | | | | | | | | WBG .The decision point for the SB phase is at the end of the |
| 5 | MIN | | | | | | | | | | | NBG phase or at the end of the WBG in the absence of the NB phase being served. Any calls received after the respective |
| (NOT USED) | MAX1 MAX2 | | | | | | | | | | | decision points will be served after the dwell phase. |
| | AMB | | | | | | | | | | | |
| | ALLR | | | | | | | | | | | Phasing Sequence: |
| Lake Shore Blvd W | SPLIT WLK | 7 | 7 | 7 | 7 | | | | | | | Phases 2 & 6 (Dwell Phase) |
| | FDW | 15 | 15 | 15 | 15 | | | | | | | Phases 3 & 7 |
| 6 | MIN MAX1 | 22 38 | 22 38 | 22 75 | 22 25 | | | | | | Callable by Traficam Detector and/or Pushbuttons; | l |
| \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | MAX2 | 47 | 31 | 34 | 47 | | | | | | Extendable by Traficam | Phases 4 & 8 |
| | AMB | 4 | 4 | 4 | 4 | 1/ | | | | | Detector | ← ↓ |
| | ALLR SPLIT | 3 | 3 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | | Indy Operations |
| British Columbia Dr | WLK | | | | | | | | | | | Signal drops from Scoot control and operates free all times under TransSuite control.TP4 used for Pattern 5 using MAX1 values as |
| | FDW MIN | 7 | 7 | 7 | 7 | | | | | | | green time for all phases. Signal is on min recall and rests in |
| († | MAX1 | 29 | 29 | 23 | 52 | | | | 7 | | Callable & Extendable by | Phases 3 & 7 waiting for calls. When called from rest, signal serves callable phase(s) following phase sequence. |
| | MAX2 AMB | 53 4 | 68 4 | 23 4 | 53 4 | | | | | | Stopbar Loop | If vehicle demand exists for both the SB & WB (veh and/or ped.) |
| | ALLR | 2 | 2 | 2 | 2 | | | | | _ | | at the end of the NB phase, the SB phase is served first followed by the WB phase. In any given cycle, the signal may serve the SB |
| British Columbia Dr | SPLIT WLK | 7 | 7 | 7 | 7 | 0 | 0 | 0 | 0 | 0 | | phase, the WB phase, both in that order, or neither depending on |
| | FDW | 17 | 17 | 17 | 17 | | | | | | | demand. The decision point for the SB phase is at the end of the NBG .The decision point for the WB phase is at the end of the |
| 8 / 1 1 | MIN MAX1 | 7 24 | 7 24 | 7 21 | 7 24 | | | | | | Callable by Stopbar Loop and/or pushbuttons; | SBG phase or at the end of the NBG in the absence of the SB phase being served. Any calls received after the respective |
| | MAX2 | 34 | 26 | 24 | 34 | | | | | | Extendable by Stopbar | decision points will be served after the dwell phase. |
| | AMB | 4 | 4 | 4 | 4 | | | | | | Loop | |
| SBRA | ALLR SPLIT | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | | During Indy event, WB phase is callable by Traficam and/or |
| 35,01 | | | | | | | | | | | | Pushbuttons, and Extendable by Traficam. |
| | CL OFF | | | _ ^ \ | | 0 Free | 0 Free | 0 Free | 0 Free | 0 Free | | Phasing Sequence: Phases 2 & 6 |
| | 3.1 | | | | | , , 66 | | | | 1,00 | | — |
| | | | | V | | | | | | | | Phases 3 & 7 |
| | | | | | | | | | | | | (Dwell Phase) |
| | | | | | | | | | | | | Phases 4 & 8 |
| | | | | | | | | | | | | ~ ↓ |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Notes: | Signal timing | s were reverted fro | om the te | mp. chai | nges for t | the 2019 Hono | da Indy on July 14 | 2019. | | I | I. | |
| | | | | | | | | | | | | |

TCS1344.xlsx 16/07/2019

| MODE/COMMENT: SAC-MIG with UPS, PR & RLC (WB) Ranahamil filtihar / August 15, 2019 Ranahamil filtihar / | LOCATION: | Lake | Shore Blvd | W & Strach | an Av/ Rem | embrance Dr | UTC Stages | Green Returns |
|--|--|------------|-----------------|---------------|------------|--|-------------------------|--|
| Collection Col | MODE/COMMENT: | SA2- | VMG with U | PS, PR & RI | Α | 2 & 5 | | |
| CHECKED BY JOATE : Masoud Rametani / Toronto & East York | TCS#/SCN# | | | | В | 2 & 6 | | |
| DISTRICE: | CODER / DATE: | Rana | Jamil Iftikha | r / August | С | 4 & 8 | | |
| DISTRICE: | CHECKED BY / DATE : | Maso | ud Rameza | ni / | F | 3 & 7 | | |
| Commonwealth Comm | SALES | | | | G | 1000 1000 1000 | | |
| ## CONFILERCABINET: OBSIGN WALK SPEED: MR/LEMENTATION DATE: A mis (FPW based on full crossing @ 1.2 m/s) Phase Motion (Federocename of Callable) | N. 10.00 (10.00 | alee ea | MARI PUFERING C | | | 80 (40) (50) | | |
| COMPLICIT: | | | | / TS2 T1 | | "" | | |
| NEMA Phase (Green Return) | The state of the s | | | 111-1-111 | | | | |
| NEMA Phase (Green Return Local Plan All Other Mark | DESIGN WALK SPEED: | 1.0 m | s (FDW bas | sed on full o | | | | |
| NEMA Phase (Green Return) Coole Plan Times Mark | IMPLEMENTATION DATE: | Janu | ary 16, 2020 | | | | | |
| NEMAP Phase (Green Return) February Pattern 1 Pattern 2 Pattern 3 Spill Table Spill 1 Spill 2 Spill 3 Spil | | | | | | | Rema | arks |
| Split Table Split 1 Split 2 Split 3 | NEMA Phase (Green Return) | Local Plan | Times | M-F | M-F | Will Trouble above commission and property and | | .0 |
| MUK Flow F | | | | | | | | |
| FDW MAX. 15 MAX. 14 MAX. 15 | 1 | \\\\ \\ \\ | | | | Protected/Permissive | | |
| MAX1 15 | ' / | | | | | | | |
| MAX2 25 | | | | | | | NS ped crossing on V | Vest leg only. |
| AME 3 AR 3 SPLIT 3 15 16 Section of the control of | │ | | | | | Stoppar Loop | | |
| ARK 3 | | 1,000 | | | | | | |
| Lake Store Blod W VILK 7 FOW 22 MAXI 41 MXZ 41 AME 4 AME 4 AME 5 AME 6 AME 6 AME 7 AME 6 AME 7 AME 7 AME 6 AME 7 AME 7 AME 7 AME 7 AME 7 AME 8 AME 8 AME 8 AME 9 A | | | 15 | | 16 | | seconds. If ongoing v | ehicle demand |
| Windows Property | | | | | | | | |
| Man | 2 | | | | | Fixed | up to the maximum. It | f a pedestrian call is |
| MAX | | | | | | | | |
| AMB 4 ALR 2 SPLIT 47 78 U2 Strachan AviRemembrance Dr SPLIT 47 78 U2 Callable by Stopbar Loop, 8 or Plush Button Loop & or Plush Button Left Turn Passage Time = 2 sec Left Turn Passage Time = 2 sec Left Turn Passage Time = 3 sec Left Turn Passage Time = 2 sec Left Turn Passage Time = 3 sec Left Turn Passage Time = 2 sec Left Turn Passage Time = 3 sec Left Turn Passage Time = 2 sec Left Turn Passage Time = 2 sec Left Turn Passage Time = 2 sec Left Turn Passage Time = 3 sec Left Turn Passage Time = 2 sec Left Turn Passage Time = 3 sec Left Turn Passage Time = 2 sec Left Turn Pass | (| | | | | | | |
| Alice 2 Alic | | | | | | - A | if a pedestrian call is | received. Extension |
| SPLIT 34 | | ALR 2 | | | | | | |
| Callable by Stophar | Strachan Av/Remembrance Dr | SPLIT | 47 | 78 | 62 | | | |
| MIN | | | | | | | Left Turn Passage Tir | me = 2 sec |
| MAX1 37 MAX2 37 AMB 3 ALR 5 5 5 5 5 5 5 5 5 | | | | | | | | Salar Sa |
| MAXZ 37 ALR 5 SPLIT 45 45 45 45 MIN 12 MIN 14 MIN 15 MIN 16 MIN 16 MIN 16 MIN 16 MIN 18 MIN 19 | | | | | | | | |
| ALR 5 SPLIT 45 45 45 45 45 45 45 45 45 45 45 45 45 | $\setminus \ \lor \ \lor$ | | | | | Remembrance Dr is | 3) before serving the | EBLA. |
| SPLIT | | | | | 7 | one-way SB. | | |
| NB Bike crossing on east leg, callable by ped pushbitton and/or bicycle defector on south leg only AMB 3 ALR 6 SPLIT 21 21 21 21 | | | 45 | 45 | 45 | | | values (times to be |
| See back of timing card for operation during Honda lady Flow See back of timing card for operation during Honda lady Flow See back of timing card for operation during Honda lady Flow See back of timing card for operation during Honda lady Flow See back of timing card for operation during Honda lady Flow See back of timing card for operation during Honda lady Flow See back of timing card for operation during Honda lady Flow See back of timing card for operation during Honda lady Flow See back of timing card for operation S | 4 | WIK | | | | | ISM used to re-sync in | n EWG/EWWK only. |
| MAX2 12 AMB 3 ARR 6 SPLIT 21 21 21 21 21 21 21 2 | / / / | | | | | NB Bike crossing on | Ring Structure: | |
| MAX2 12 AMB 3 ARR 6 SPLIT 21 21 21 21 21 21 21 2 | 8 | | | | | | | |
| AMB 3 ALR 6 SPLIT 21 21 21 5 WLK FDW MN 6 MAX1 35 MAX2 40 AMB 3 ALR 3 SPLIT 24 31 31 Fully Protected. Callable by Stopbar Loop Second Sequence - Phase 3 Third Sequence - Phase 3 Fixed Fixed Fixed Fixed Fixed Fourth Sequence - Phase 3 Fourth Sequence - | \ | | | | | | 56178 | |
| SPLIT 21 21 21 21 21 21 21 2 | · | AMB 3 | | | | | | |
| Fully Protected. Callable/ Extendable by Stopbar Loop MAX 1 35 MAX 2 40 AMB 3 ALR 3 SPLIT 7 NOT USED NOT USED NOT USED WLK FDW MIN 12 MAX 1 37 AMB 3 ALR 5 SPLIT 45 45 45 45 45 45 Fully Protected. Callable/ Extendable by Stopbar Loop Second Sequence - Phase 3 Third Sequence - Phase 4 Fixed Fixed Fixed See back of timing card for operation during Honda Indy File name on USB stick is 222 On field operation, phase 3 is monitored on load switch 8. NOT USED OLIVIA 12 MAX 2 12 MAM 3 ALR 6 SPLIT 21 21 21 21 21 21 21 21 21 21 21 21 21 | | | 21 | 21 | 21 | | | ses 2 & 6 |
| FDW MIN 6 MAX1 35 MAX2 40 AAMB 3 ALR 3 SPLIT 24 31 31 31 Fixed Fixed Shore BNd W WLK 7 FDW 22 MAX2 32 AAMB 4 ALR 2 SPLIT 38 47 47 See back of timing card for operation during Honda Indy File name on USB stick is 222 On field operation, phase 3 is monitored on load switch 8. 8 WLK 7 FDW 30 MAX1 37 MAX2 37 AMB 3 ALR 5 SPLIT 45 45 45 45 WLK FDW MIN 12 MAX1 12 MAX2 12 MAX3 12 MAX3 12 MAX4 12 MAX4 12 MAX4 12 MAX4 12 MAX4 12 MAX5 1 | | | | 21 | | | ← | |
| Min | 5 | | | - | | | | |
| MAX1 35 MAX2 40 AMB 3 ALR 3 SPLIT 24 31 31 Third Sequence - Phase 3 | | | | | | | | |
| AMB 3 ALR 3 SPLIT 24 31 31 Third Sequence - Phase 4 WLK 7 FDW 22 MN 29 MAX1 32 MAX2 32 AMB 4 ALR 2 SPLIT 38 47 47 WLK 7 FDW 30 MN 10 MAX1 37 MAX2 37 AMB 3 ALR 5 SPLIT 45 45 45 NOT USED MIN 12 MAX1 12 MAX2 12 AMB 3 ALR 6 SPLIT 21 21 21 CL 128 144 144 | | MAX1 35 | | | | | Second Sequence - P | hase 3 |
| ALR 3 SPLIT 24 31 31 Third Sequence - Phase 4 WLK 7 FDW 22 MIN 29 MAX1 32 MAX2 32 AMB 4 ALR 2 SPLIT 38 47 47 NOT USED MIN 10 MAX1 37 MAX2 37 AMB 3 ALR 5 SPLIT 45 45 45 NOT USED MIN 12 MAX1 12 MAX2 12 AMB 3 ALR 6 SPLIT 21 21 21 21 CL 128 144 144 | | | | | | 7 | Î | |
| Calcal Shore Blvd W | | ALR 3 | | | | | ↓ ▼ | |
| Fixed WLK 7 FDW 29 MAX1 32 MAX2 32 AMB 4 ALR 2 SPLIT 38 47 47 | Jaka Shora Dh. d M | SPLIT | 24 | 31 | 31 | | Third Sequence - Pha | ise 4 |
| MIN 29 MAX1 32 MAX2 32 AMB 4 ALR 2 SPLIT 38 47 47 WLK 7 FDW 30 MIN 10 MAX1 37 MAX2 37 AMB 3 ALR 5 SPLIT 45 45 45 NOT USED WLK FDW MIN 12 MAX1 12 MAX2 12 AMB 3 ALR 6 SPLIT 21 21 21 CL 128 144 144 | | | | | | Fixed | 1 2 | l |
| MAX1 32 MAX2 32 AMB 4 ALR 2 SPLIT 38 47 47 NOT USED MIN 10 MAX1 37 MAX2 37 AMB 3 ALR 5 SPLIT 45 45 45 NOT USED MIN 12 MAX1 12 MAX2 12 AMB 3 ALR 6 SPLIT 21 21 21 CL 128 144 144 | (| | 1 | | | | | |
| MAX2 32 AMB 4 ALR 2 SPUIT 38 47 47 VILK 7 FDW 30 MIN 10 MAX1 37 MAX2 37 AMB 3 ALR 5 SPLIT 45 45 45 WLK FDW MIN 12 MAX1 12 MAX2 12 AMB 3 ALR 6 SPLIT 21 21 21 CL 128 144 144 | | | | | | | Fourth Sequence - Ph | nases 1 & 5 |
| ALR 2 SPLIT 38 47 47 VICK 7 FDW 30 MIN 10 MAX1 37 MAX2 37 AMB 3 ALR 5 SPLIT 45 45 45 NOT USED MIN 12 MAX1 12 MAX2 12 AMB 3 ALR 6 SPLIT 21 21 21 CL 128 144 144 CL 128 144 144 See back of timing card for operation during Honda Indy File name on USB stick is 222 On field operation, phase 3 is monitored on load switch 8. See back of timing card for operation during Honda Indy File name on USB stick is 222 On field operation, phase 3 is monitored on load switch 8. See back of timing card for operation during Honda Indy File name on USB stick is 222 On field operation, phase 3 is monitored on load switch 8. See back of timing card for operation during Honda Indy File name on USB stick is 222 On field operation, phase 3 is monitored on load switch 8. See back of timing card for operation during Honda Indy File name on USB stick is 222 On field operation, phase 3 is monitored on load switch 8. | | MAX2 32 | | | | | | provide to 1 Mil Mil |
| SPLIT 38 47 47 WLK 7 FDW 30 MIN 10 MAX1 37 MAX2 37 AMB 3 ALR 5 SPLIT 45 45 45 NOT USED W MIN 12 MAX1 12 MAX2 12 AMB 3 ALR 6 SPLIT 21 21 21 CL 128 144 144 | | | | | | | → ∧▼ | |
| Wuk 7 FDW 30 MiN 10 MAX1 37 MAX2 37 AMB 3 ALR 5 SPLIT 45 45 45 | | | 38 | 47 | 47 | | - | |
| File name on USB stick is 222 On field operation, phase 3 is monitored on load switch 8. File name on USB stick is 222 On field operation, phase 3 is monitored on load switch 8. WLK FDW MIN 12 MAX1 12 MAX2 12 AMB 3 ALR 6 SPLIT 21 21 21 CL 128 144 144 | 7 | WIK 7 | | | | | | rd for operation |
| MIN 10 MAX1 37 MAX2 37 AMB 3 ALR 5 SPLIT 45 45 45 WLK FDW MIN 12 MAX1 12 MAX2 12 AMB 3 ALR 6 SPLIT 21 21 21 CL 128 144 144 | ' / | | | | | | | ck is 222 |
| 8 | NOTUSED | | | | | | On field operation, ph | |
| 8 | \ \\ | | | | | | on load switch 8. | |
| SPLIT 45 45 45 WLK FDW MIN 12 MAX1 12 MAX2 12 AMB 3 ALR 6 SPLIT 21 21 21 CL 128 144 144 | | AMB 3 | | | | | | |
| 8 WLK FDW MIN 12 MAX1 12 MAX2 12 AMB 3 ALR 6 SPLIT 21 21 21 CL 128 144 144 | | | 45 | 45 | 45 | | | |
| FDW MIN 12 MAX1 12 MAX2 12 AMB 3 ALR 6 SPLIT 21 21 21 CL 128 144 144 | | | 40 | 40 | 40 | | 1 | l |
| MIN 12 MAX1 12 MAX2 12 AMB 3 ALR 6 SPLIT 21 21 CL 128 144 144 | 8 | | | | | | | |
| MAX1 12 MAX2 12 AMB 3 ALR 6 SPLIT 21 21 CL 128 144 144 | (,,,,,,,,,) | | | | | | | |
| AMB 3 ALR 6 SPLIT 21 21 CL 128 144 144 | NOT USED | MAX1 12 | | | | | | |
| ALR 6 SPLIT 21 21 CL 128 144 144 | | | | | | | | |
| SPLIT 21 21 CL 128 144 144 | | | | | | | | l |
| | | SPLIT | | | | | | |
| | Notes: | ICL | 128 | 144 | 144 | | | |

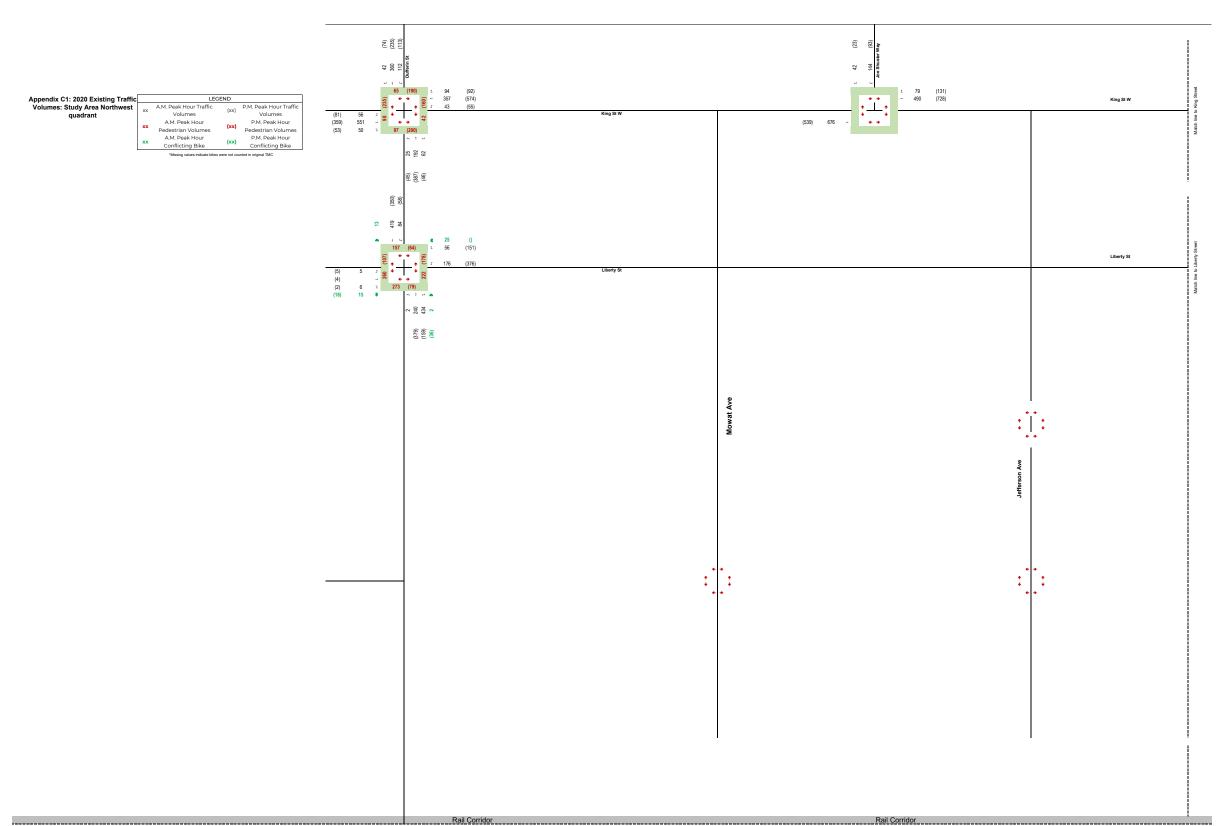
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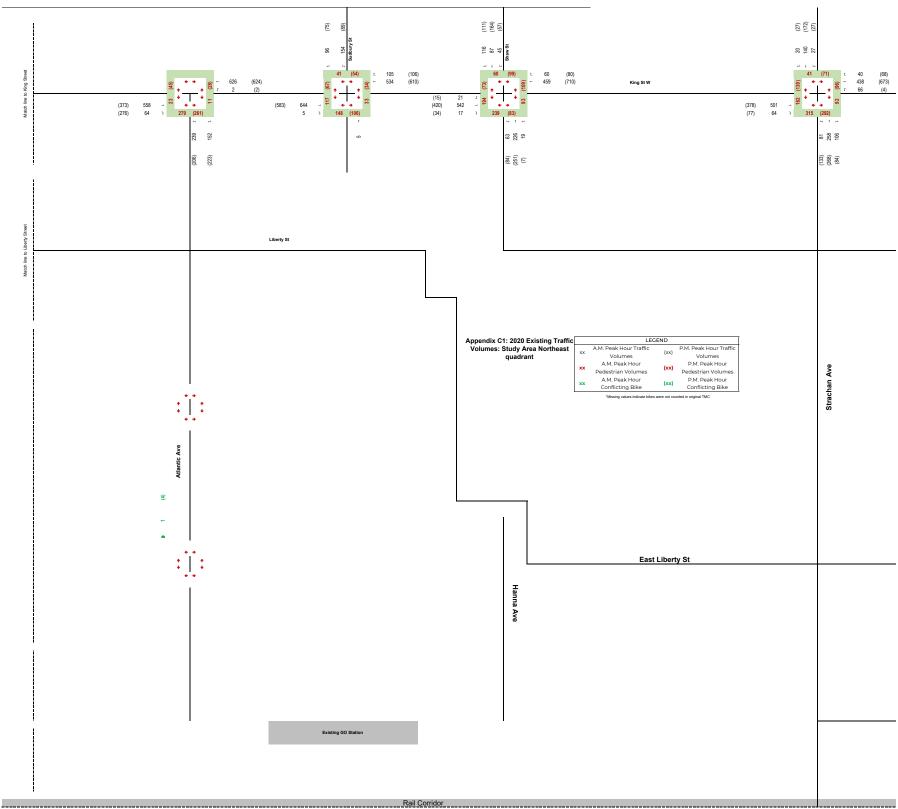
| A | LOCATION: | | Strac | han Ave 8 | k Fleet St / | Manitoba [| Or | | | UTC Stages | Green Returns |
|--|--|--|---------------|--|--------------|-------------------|-------------------|------------------|--------------------------------|---------------------------------------|--|
| Cookers | MODE/COMMENT: | | | | | | • | | | | |
| D 3 & 8 September 4, 2018 Toronto and East York Toronto and East Yor | TCS#/SCN# | | 571/ | 30341 | | | | | | В | 2 & 6 |
| Committee Comm | CODER/CHECKED BY: | | TY | | | | | | | | |
| COMPATION PRINTAL PR | | | | | | | | | | | and the same of th |
| ## 1 | DISTRICT: | | | | ast York | | | | | <u>'</u> | Marie Control of the |
| COUNTING LEAF PREMANDER CONTINUES CO | | | | | | | | | | | 40 100 100 |
| COMPUTED Compute Com | | | | | / TS2T1 | | | | | Н | 1 & 6 |
| 1.0 m/s (FDW based on full crossing at 1.2 m/s Section Secti | SCHOOL STANDARD OF SCHOOL SERVICE STANDARD STANDARD STANDARD STANDARD SCHOOL STANDARD SCHOOL STANDARD SCHOOL SCHOOL SCHOOL SCHOOL STANDARD SCHOOL SCH | ₹E: | | | | | | | | | |
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| Note 1985 | | | | | ased on fu | ılı crossing | at 1.2 m/s) | | | | |
| Doal Bing New York All Chies 303 + 100 500 + 200 Time to be Collabole The Coll | the property of the second control of the se | -1 | | | | | | | | | |
| Common Figure Common C | IMPLEMENTATION DATE | | July | 14, 2019 | Timina | Information | | | | | |
| New Cornes Nature All Other 620 - 1909 1500 2500 7 mine to be determined | F=0.00=0.00 | <u></u> | | | (Se | conds) | | | Phase Mode | | |
| Times | | | ļ | A CONTRACTOR OF THE CONTRACTOR | 10000000 | | | | /Fived Demanded or | Pom | porks |
| Demanded by SF 43 | | | | | | | | | | Keii | iaiks |
| Committed by SF R2 Pediatrium Mismururs: NOTIO 22 1 | (Crossi riolaini) | Loca | l Plan | G/07/99/09/09/09 | CD1/00 (70) | VIII. | | | Ganabic) | | |
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| Add | (| | | | | | | | Demanded by SF #3 | | |
| ALR 1 | | AMB | | | | | | | | | parad |
| Straction Area Fixed Fix | | ALLR | 1 | | | | | | | Exclusive FW Transit Phase | e callable twice per cycle (at |
| Separation | Ctrools A | | 7 | | | | | 12 | | | |
| SEP Fixed SEP Fixed SEP Sequence Fixed SEP SEQ Sequence Fixed SEP SEQ SEQUENCE SEP SEQUENCE SEP SEQUENCE SEP SEQUENCE SEQUENCE SEP SEQUENCE SEQUEN | Stracnan Ave | The state of the s | | | | | | | | | |
| Max1 36 | 2 | PROPERTY IN | | | | | | | | 05 //4 11 1/01/14 (01/ | F 775 - 1 - 1 - 1 - 1 - 1 - 1 - 1 |
| MAX2 30 SEPT 4 44 60 60 64 46 SF #2 demands WBLA for CNE (time to be determined) | _ / • ^ \ | | | | | | | | Fixed | SF #1 enables NBLA for CN | ∟ (time to be determined) |
| SPLIT 44 60 60 64 48 SF #3 demands SBLA for indy (time to be determined) SF #1 enables MAX2 (time to be determined) Overlap A overlap 69 & 61 think har in TiC phase A minute to be determined of the phase of | | | | | | | | | Tixeu | SF #2 demands WRI A for C | ONE (time to be determined) |
| SPLIT | | | | | | | | | | or me demands VVBB (16) c | THE (time to be determined) |
| Victor Common C | | | 4 | 44 | 60 | 60 | 64 | 18 | | SF #3 demands SBLA for In | dy (time to be determined) |
| Section Communication Co | | | \rightarrow | 44 | 00 | 00 | 04 | 40 | | 05 //4 11 1443/0 /// / | 1 11 : 15 |
| MAXX 7 AAB 3 ALR 1 SPLIT | | | | | | | | | | 128 | |
| MAX2 7 AMB 3 ALIR 1 1 12 12 12 12 13 14 14 160 144 14 160 144 14 160 144 14 160 144 144 144 160 144 144 144 160 144 144 144 144 160 144 144 144 144 144 160 144 144 | 3 / \ | | | | | | | | | | |
| AMB 3 ALIR 1 SPLIT Mannicola Dr Fived Max 32 Max 34 Max 35 Max 36 Max 37 Max 36 Max 37 Max 36 Max 39 Max 30 Max 39 Max 30 Ma | | | | | | | | | Demanded by SF #2 | | |
| ALIR 1 SPUIT | \ ▼ / | | | | | | | A | | | |
| SPLIT | | | | | | | | | | A I A | A A |
| Fixed Fixed 2nd Sequence - TTC 2nd Sequence - TTC 2nd Sequence - TTC 2nd Sequence - TTC 3nd Sequence - Phase 4 & 8 3nd Sequence - TTC 3nd Sequence - TTC 3nd Sequence - TTC 3nd Sequence - Phase 4 & 8 3nd Sequence - TTC | | | | | | | 12 | | | 」 ↓ ♦ ♠↑ | │ ↓ ∀ ♠ î` │ |
| MIN 32 MAX 4 MAX 7 MAX 13 MAX 13 MAX 36 MAX 37 MAX 36 MAX 37 MAX 37 MAX 38 MAX | Manitoba Dr | 5000 1009203 | | | | | | | |] | ' ' I Ÿ |
| MAX1 32 AMB 4 ALIR 3 SPLIT 40 40 40 40 40 40 40 4 | | | | | | | | | | 2nd Sequence - TTC | 2nd Sequence - TTC |
| MAX2 32 AMB 4 ALIR 3 SPLIT 40 40 40 40 40 MAX6 A | 4 | | | | 7 | | | | | → | _ ← |
| AMB 4 ALIR 3 SPLIT 40 40 40 40 40 FOW MIN 6 MAX1 7 MAX2 18 AMB 3 AMB 4 ALIR 4 SPLIT 44 60 60 41 60 OVERLAP A OVERLAP A MAX1 14 MAX2 14 MAX2 14 AMB 4 ALIR 4 SPLIT 22 22 22 22 22 22 22 22 22 22 22 22 22 | | | | 1 | | | 1 | | Fixed | → | ├ |
| ALLR 3 40 40 40 40 40 40 40 | \ | | 4 | | | | 1 | | | 3rd Sequence - Phases 4 & 8 | 3rd Sequence - Phases 4 & 8 |
| WLK FDW MIN 6 | | | | | | | | | | F 400 000 | <u> </u> |
| FDW | | | | 40 | 40 | 40 | 40 | 40 | | | |
| Stachan Ave | | | | | | | | | | 4th Sequence - TTC | |
| MAX1 7 MAX2 18 AAMB 3 ALLR 1 AAMB 3 ALLR 4 AALLR 4 | 5 | | | | | | 1 | | Callable/Evtondable | | |
| MAX 18 All R 1 SPUIT 23 SF#1 enables NBLA SF#1 enables NBLA SF#1 enables NBLA SF#1 enables NBLA SPUIT 1st Sequence Phases 2 & 6 Sequence Phases 3 & 8 Sequence Phases | | | | | | | | | | → | |
| AMB 3 ALLR 1 SPLIT Strachan Ave WLK 7 FDW 22 MIN 29 MAX1 36 MAX2 39 AMB 3 ALLR 4 SPLIT 44 60 60 41 60 Callable by TTC loops Exclusive EW Transit Phase callable twice per cycle (at the end of NS/EW vehiclle phases). Unused time is given to the subsequent phase green. Fleet St WLK 7 FDW 32 MIN 7 MAX1 14 MAX2 14 AMB 4 ALLR 4 SPLIT 22 22 22 22 22 25 Fleet St WLK 7 FDW 25 MIN 32 MAX1 32 MAX1 32 MAX2 32 AMB 4 ALLR 3 SPLIT 40 40 40 40 52 40 CYCLE 0FSET 128 144 144 160 144 | \ | | | | 1 | | | A V | | CNIE DL : 2 | FH 0 |
| Strachan Ave | \ '/ | | | | | | | | | | 5th Sequence - Phases 1 & 6 |
| Strachan Ave | | | | | 1 | | 23 | | | A A | 1 |
| Maintoba Dr for NS ped crossing TTC track operates simultaneously with NS ped crossing TTC track operates simultaneously with NS ped crossing Manitoba Dr. | Strachan Ave | WLK | | | | | VI | | | Ţ₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩ | ∀ |
| MAX1 36 MAX2 39 ALLR 4 AMB 3 ALLR 4 | | | | | | CA | | | | , , , , , , , , , , , , , , , , , , , | 100 100 100 100 100 100 100 100 100 100 |
| MAX2 39 AMB 3 ALLR 4 SPLIT | 6 | | | | | | | | | 2nd Sequence - TTC | |
| AMB 3 ALLR 4 SPLIT 44 60 60 41 60 Callable by TTC loops Exclusive EW Transit Phase callable twice per cycle (at the end of NS/EW which phases). Unused time is given to the subsequent phase green. Fleet St WLK 7 FDW 25 MIN 32 MAX2 32 AMB 4 ALLR 3 SPLIT 40 40 40 52 40 CYCLE 0FFSET AMB 144 ALLR 3 SPLIT 40 40 40 52 40 With NS ped crossing Manifoba Dr. Callable by TTC loops Exclusive EW Transit Phase callable twice per cycle (at the end of NS/EW where phases). Unused time is given to the subsequent phase green. Sth Sequence - Phases 2 & 5 Sequence - Phases 3 & 8 Sequence - Phases 2 & 5 Sequence - Phases 2 & 5 Sequence - Phases 2 & 5 Sequence - Phases 3 & 8 Sequence - Phases 3 & 8 Sequence - Phases 2 & 5 Sequence - Phases 2 & 5 | | | | | | | | | | | |
| ALLR 4 SPLIT Fleet St/ Manitoba Dr WLK FDW MIN 7 MAX1 14 MAB 4 ALLR 4 SPLIT 22 22 22 22 22 22 22 22 22 22 22 22 22 | \ | And the second second | | | | | | | | → | |
| Fleet St/ Manitoba Dr OVERLAP A WLK FDW MIN 7 MAX1 14 MAX2 14 AMB 4 ALLR 4 SPLIT 22 22 22 22 22 22 22 32 32 35 Fleet St MIN 32 MAX1 32 MAX2 32 AMB 4 ALLR 3 SPLIT 40 40 40 40 52 40 CYCLE OFFSET Callable by TTC loops Exclusive EW Transit Phase callable twice per cycle (at the end of NS/EW vehicile phases). Unused time is given to the subsequent phase green. Sth Sequence - Phases 4 & 8 6th Sequence - TTC 6th Sequence - Phases 2 & 5 WLK 7 FDW 25 MIN 32 MAX1 32 MAX2 32 AMB 4 ALLR 3 SPLIT 40 40 40 52 40 CYCLE OFFSET | | ALLR | | | | | | | | 3rd Sequence - Phases 3 & 8 |] |
| FDW MilN 7 MAX1 14 MAX2 14 AMB 4 ALLR 4 SPLIT 22 22 22 22 22 22 22 | Fly 1 Court | | | 44 | 60 | 60 | 41 | 60 | Callable to TTO | | |
| OVERLAP A MIN 7 MAX1 14 MAX2 14 ANB 4 ALLR 3 SPLIT 40 40 40 40 52 40 CYCLE 128 144 144 160 144 OVERLAP A MIN 7 MAX1 14 MAX2 14 ANB 4 ALLR 3 SPLIT 40 40 40 52 40 CYCLE 128 144 144 160 144 OFFSET MIN 7 MAX1 14 MAX2 14 ANB 4 ALLR 3 SPLIT 40 40 40 52 40 | Fleet St/ Manitoba Dr | | | | | | | | | | |
| MAX1 14 MAX2 14 AMB 4 ALLR 4 SPLIT 22 22 22 22 22 22 22 32 32 32 | OVERI AD A | | 7 | | | | | | | 4th Sequence - Phases 4 & 8 | |
| MAX2 14 AMB 4 ALLR 4 SPLIT 22 22 22 22 22 32 32 32 | JULICAF A | | | | | | | | | · | |
| AMB 4 ALIR 4 SPLIT 22 22 22 22 22 22 32 32 40 Fixed | | MAX2 | 14 | | | | | | | | |
| ALLR 4 SPLIT 22 22 22 22 22 22 32 Subsequent phase green. Sth Sequence - TTC WLK 7 FDW 25 MIN 32 MAX1 32 MAX2 32 AMB 4 ALLR 3 SPLIT 40 40 40 40 52 40 CYCLE OFFSET 128 144 144 160 144 160 144 | | | | | | | | | | | |
| Fixed | | | 4 | 22 | 22 | 22 | 22 | 22 | | 5th Sequence - TTC | |
| FDW 25 MIN 32 MAX1 32 MAX2 32 AMB 4 ALLR 3 SPLIT 40 40 40 52 40 CYCLE 0FFSET 128 144 144 160 144 OFFSET 128 144 144 160 144 | Fleet St | | 7 | 22 | 22 | 22 | 22 | 22 | | → → | |
| MIN 32 MAX1 32 MAX2 32 AMB 4 ALIR 3 SPLIT 40 40 40 52 40 CYCLE 128 144 144 160 144 OFFSET | T IGET OF | | | | | | | | | 6th Sequence - Phases 2 & 5 | |
| MAX2 32 AMB 4 ALLR 3 SPLIT 40 40 40 52 40 CYCLE 128 144 144 160 144 OFFSET | 8 | MIN | 32 | | | | | | | ◆ 1 1 | |
| MAX2 32 AMB 4 ALLR 3 SPLIT 40 40 40 52 40 CYCLE 128 144 144 160 144 OFFSET | <> | | 32 | | | | | | Fixed | | |
| ALLR 3 SPLIT 40 40 40 52 40 CYCLE 128 144 144 160 144 OFFSET | │ | | | | | | | | | | |
| SPLIT 40 40 40 52 40 CYCLE 128 144 144 160 144 OFFSET | | | | | | | | | | | |
| CYCLE 128 144 144 160 144 OFFSET | | | | 40 | 40 | 40 | 52 | 40 | | | |
| OFFSET | | OI LII | | TU | | 70 | JZ | TU | | 1 | |
| | | | | 128 | 144 | 144 | 160 | 144 | | | |
| | | | | | | | | | | | |
| Notes: If the WBLA & NBLA are activated, SCOOT stages 3 & 6 must be increased to 15 secs (as there are commands in CAST 26 to run the stages at 10 secs to allow region LG to run at a lower cycle length). | Notes: | | | | | iges 3 & 6 must b | e increased to 15 | secs (as there a | ire commands in CAST 26 to rur | n the stages at 10 secs to allow | |

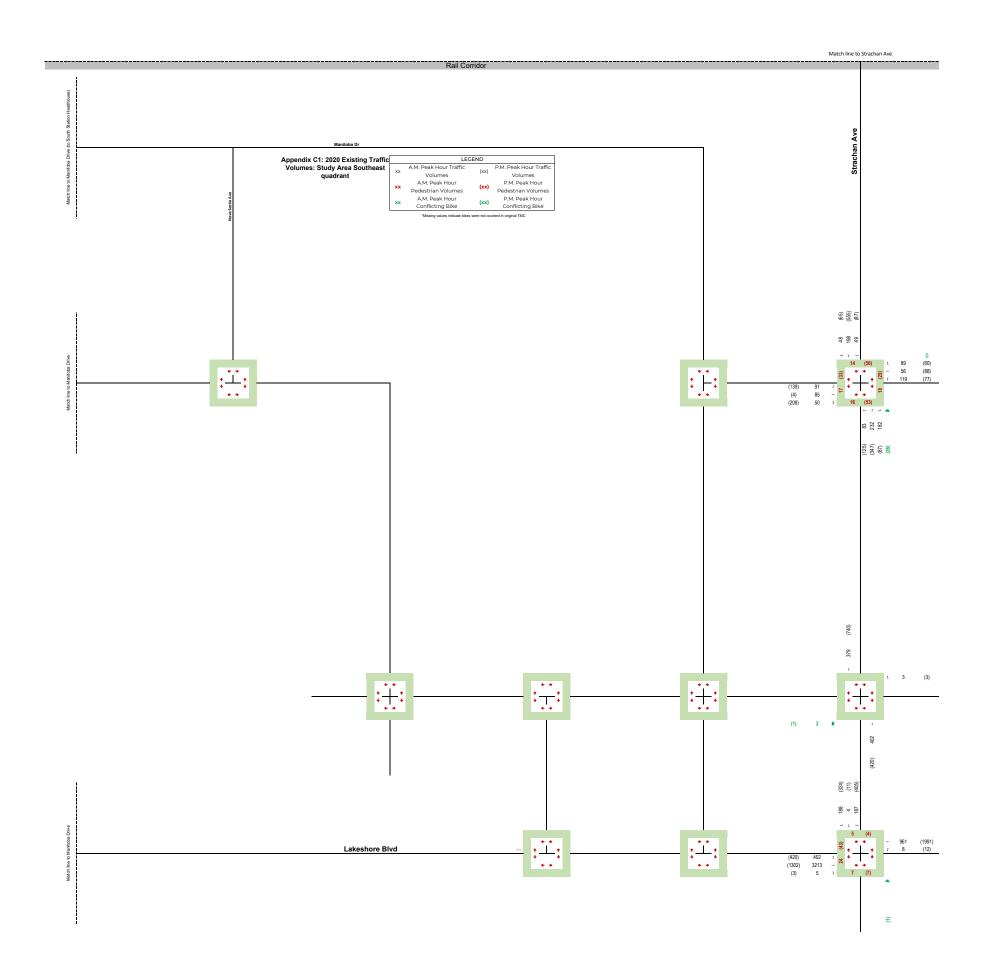
region LG to run at a lower cycle length).
Signal timings were reverted from the temp. changes for the 2018 CNE Event at approx. 9:45 am on September 4, 2018.

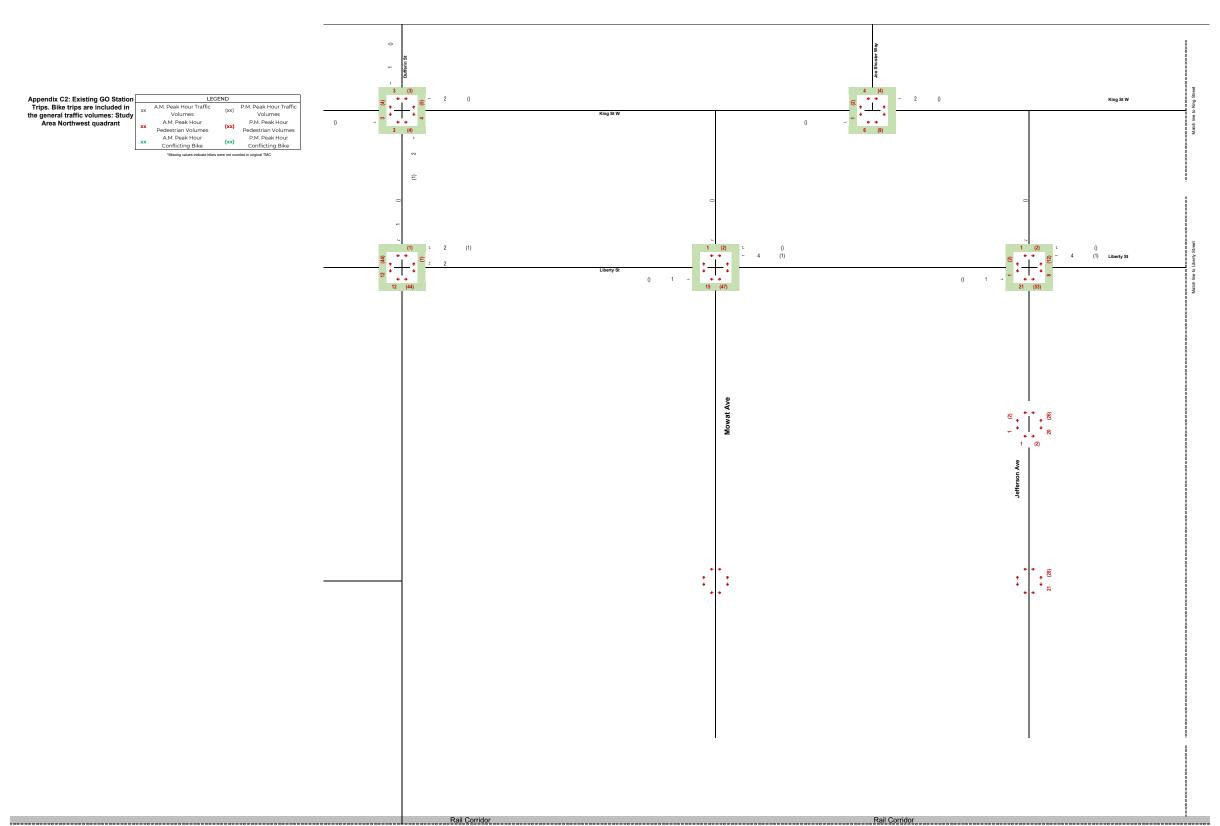


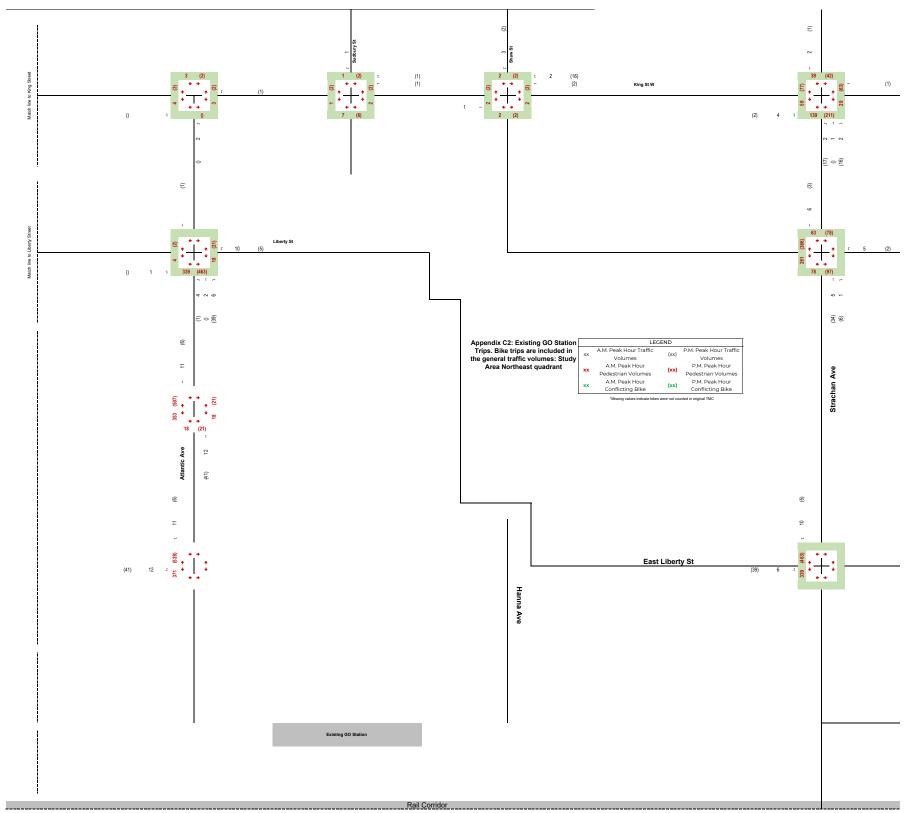
Appendix C: Existing, Exhibition Station, 2030 Future Background, TOC Site and 2030 Total Future Traffic Volumes

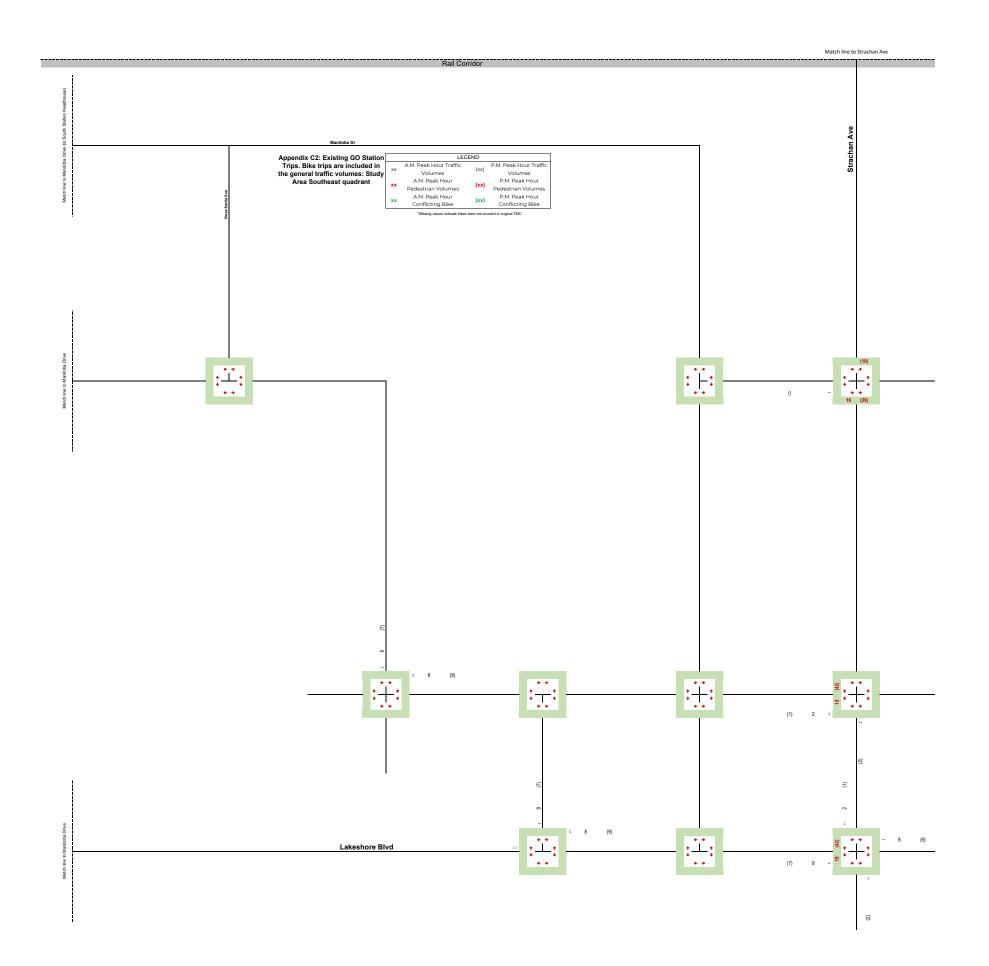


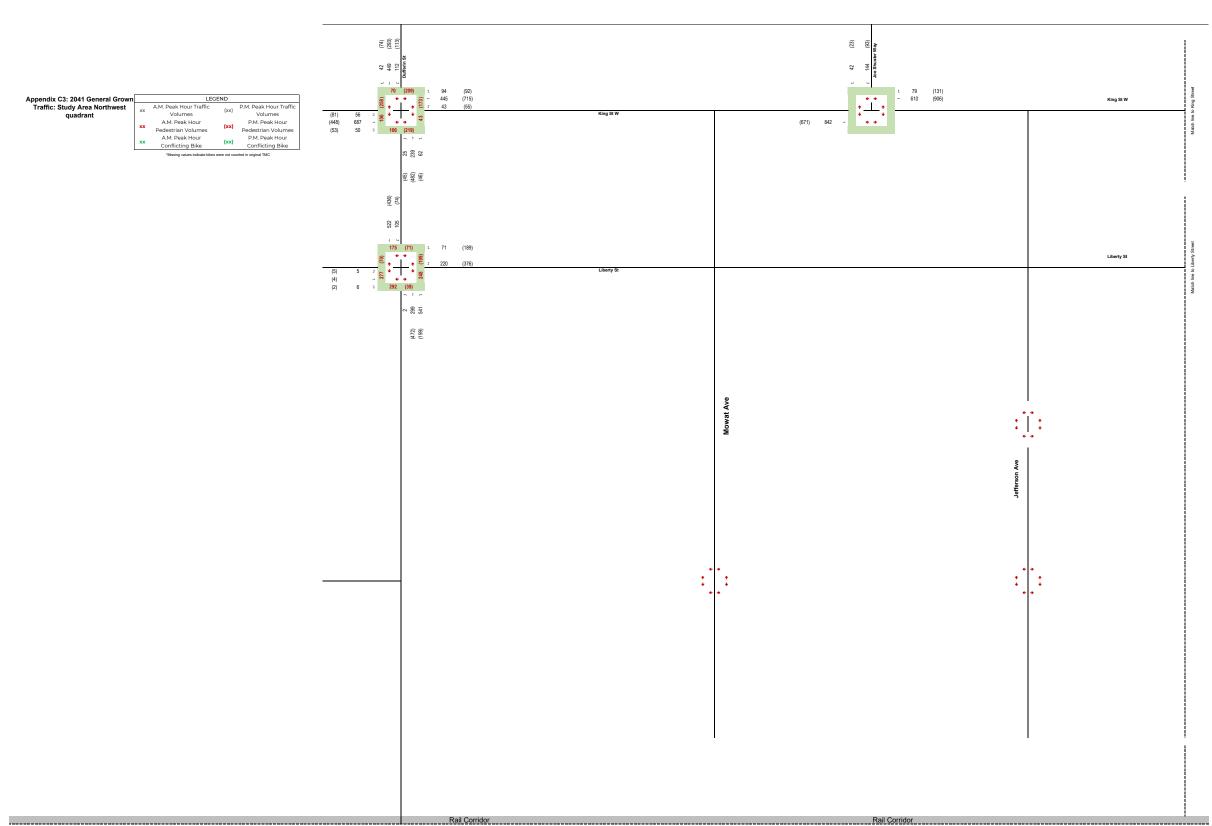


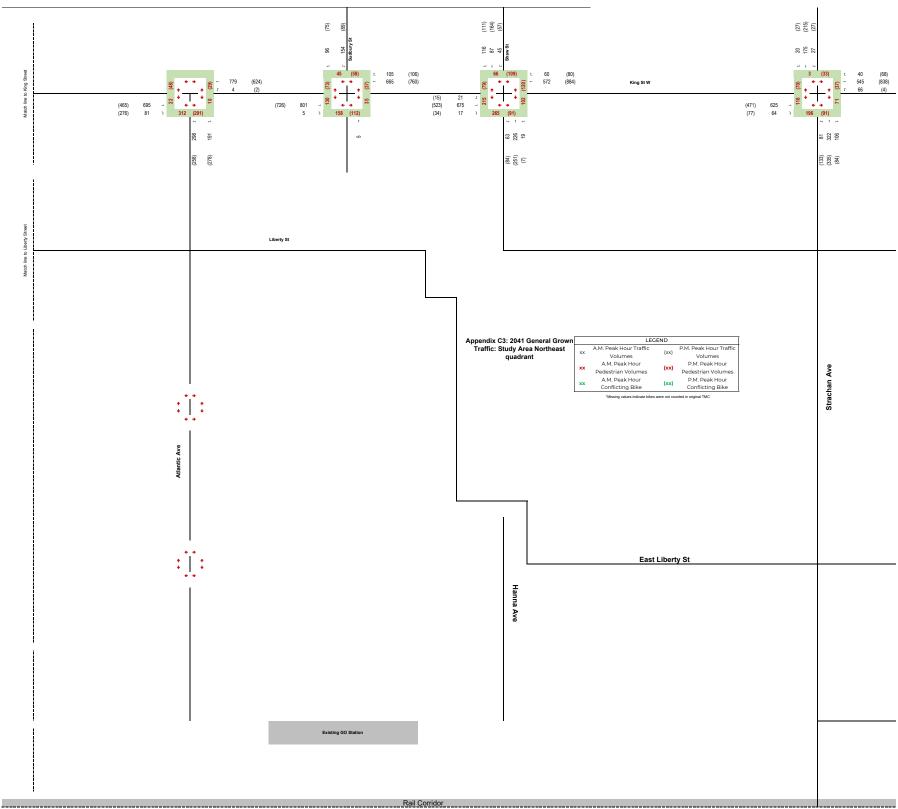


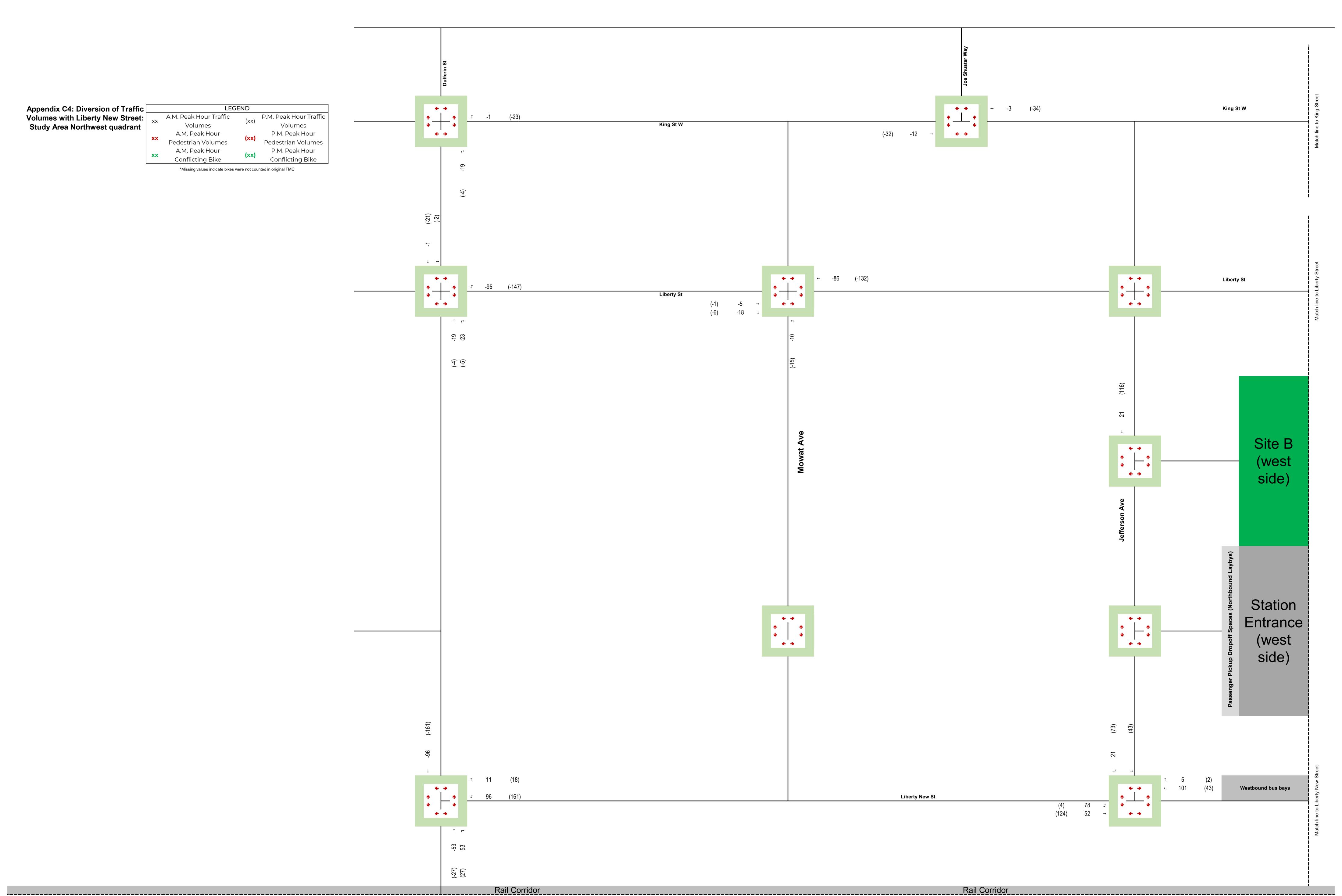


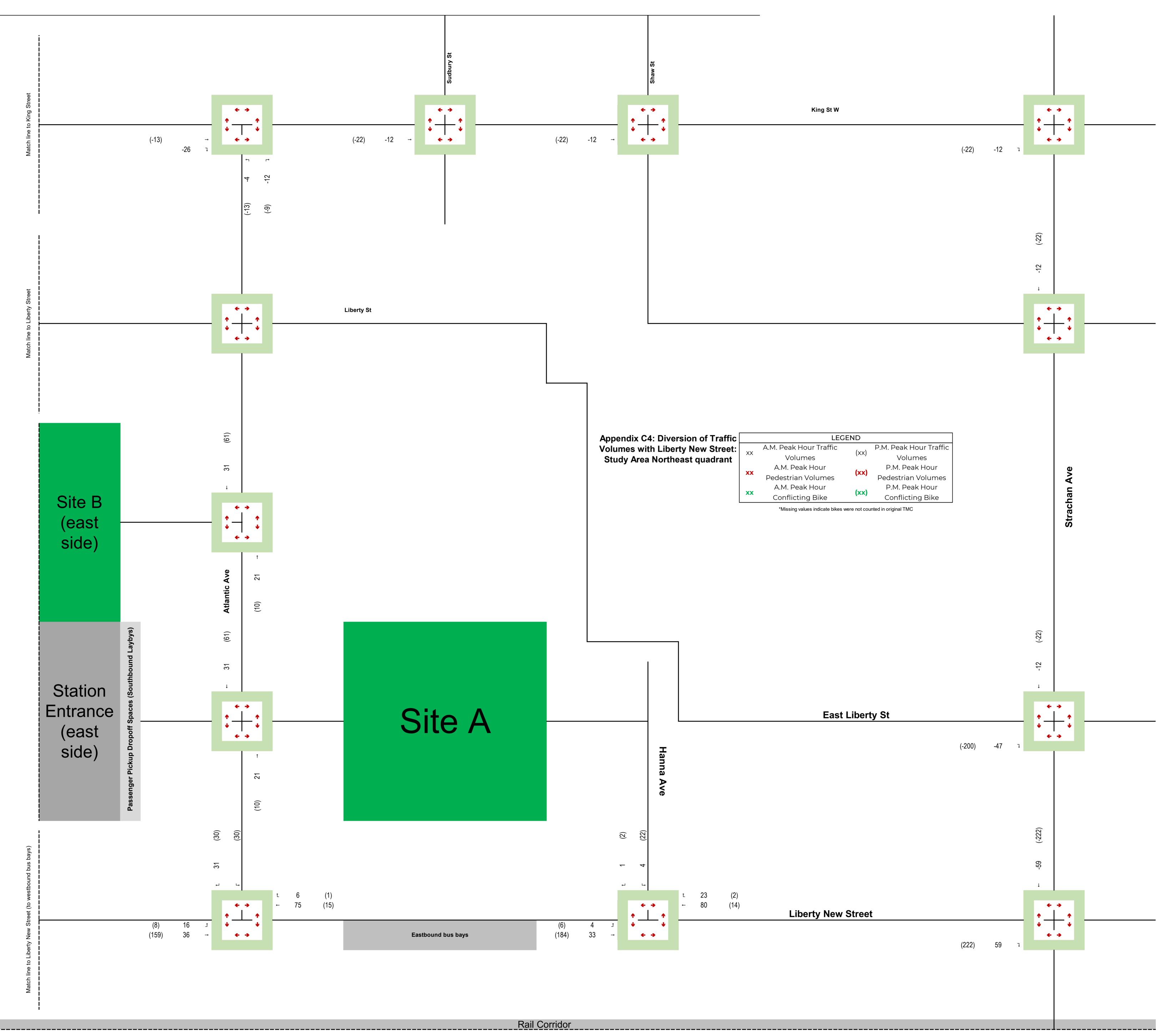


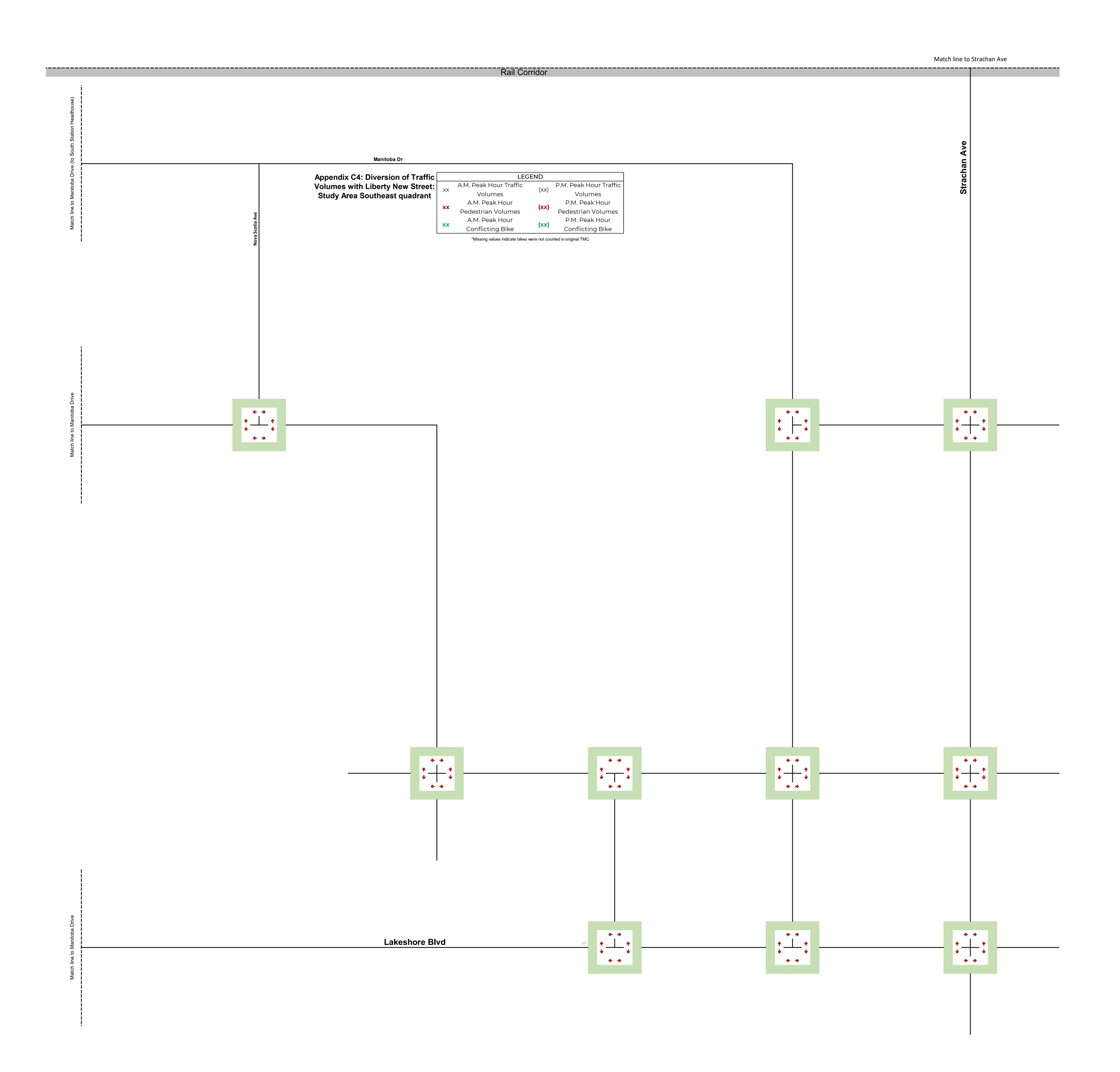




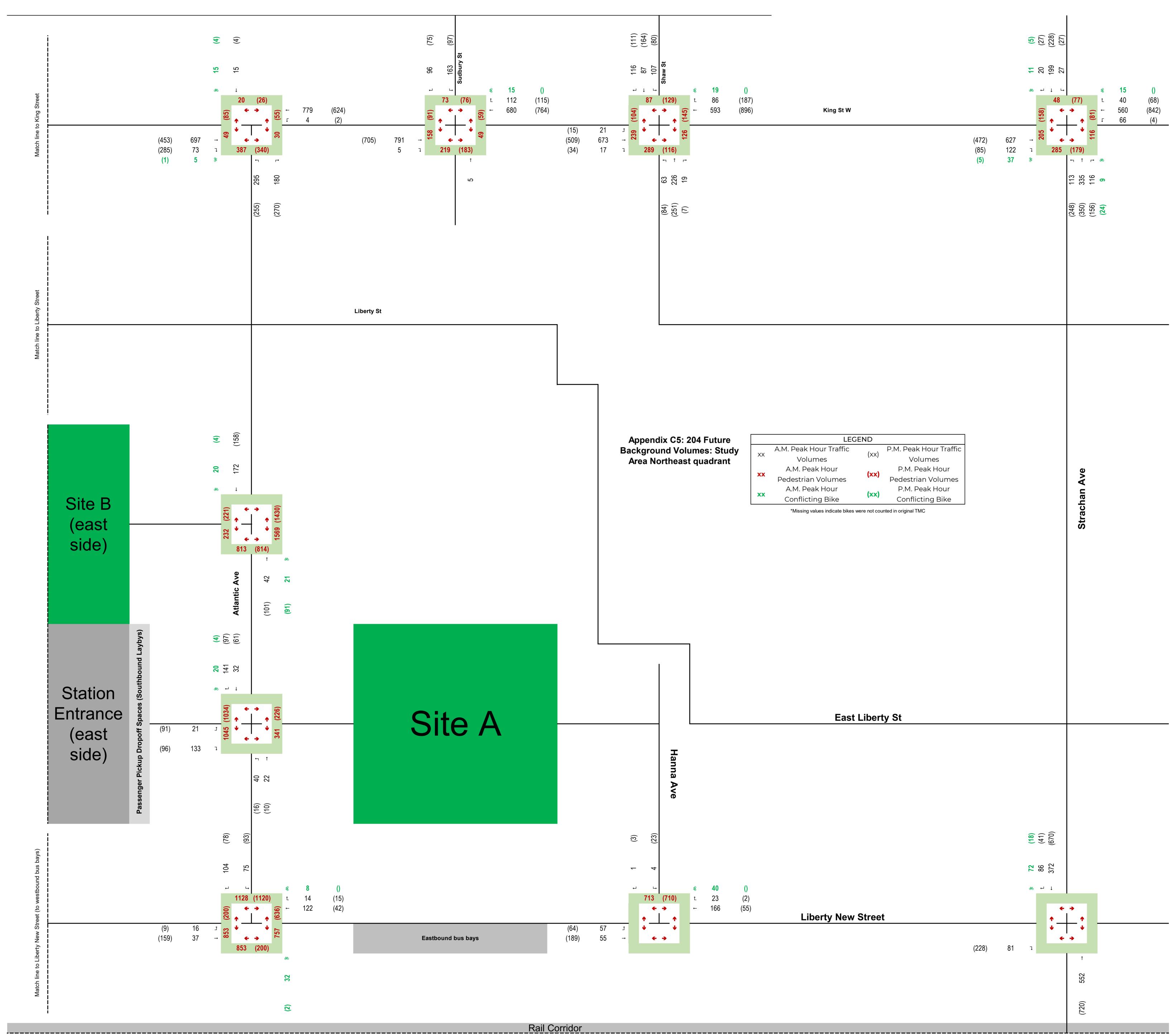


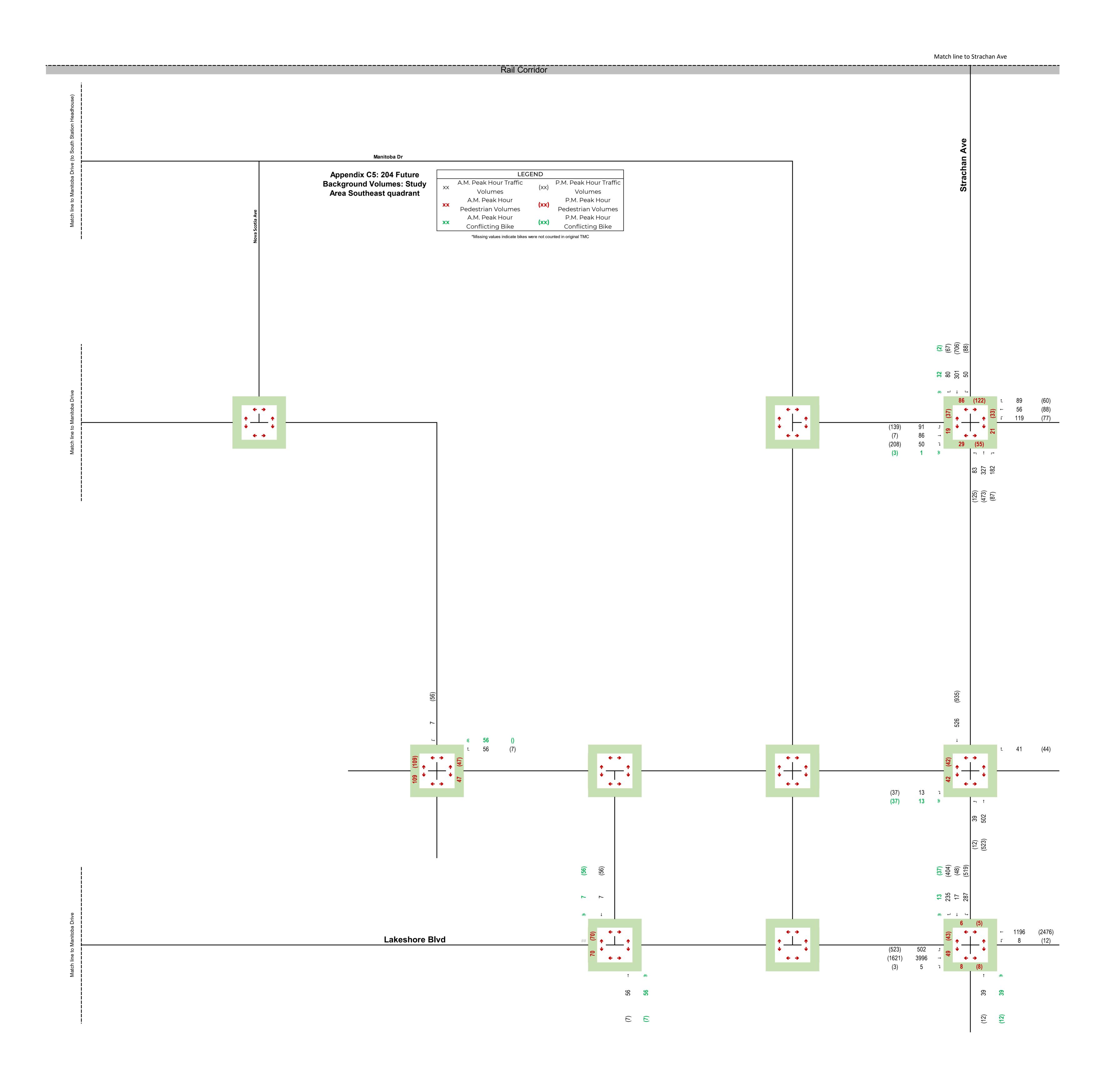


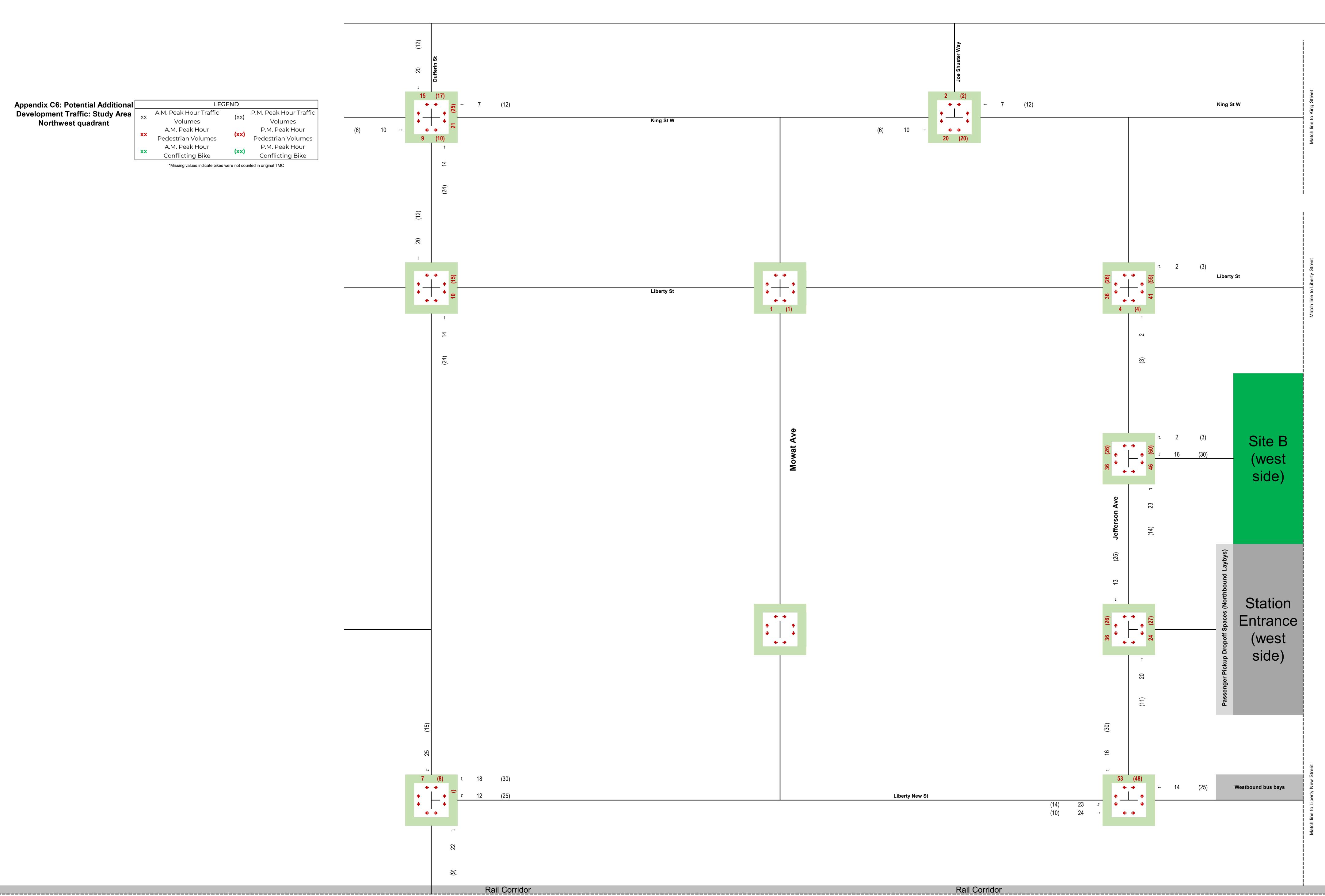


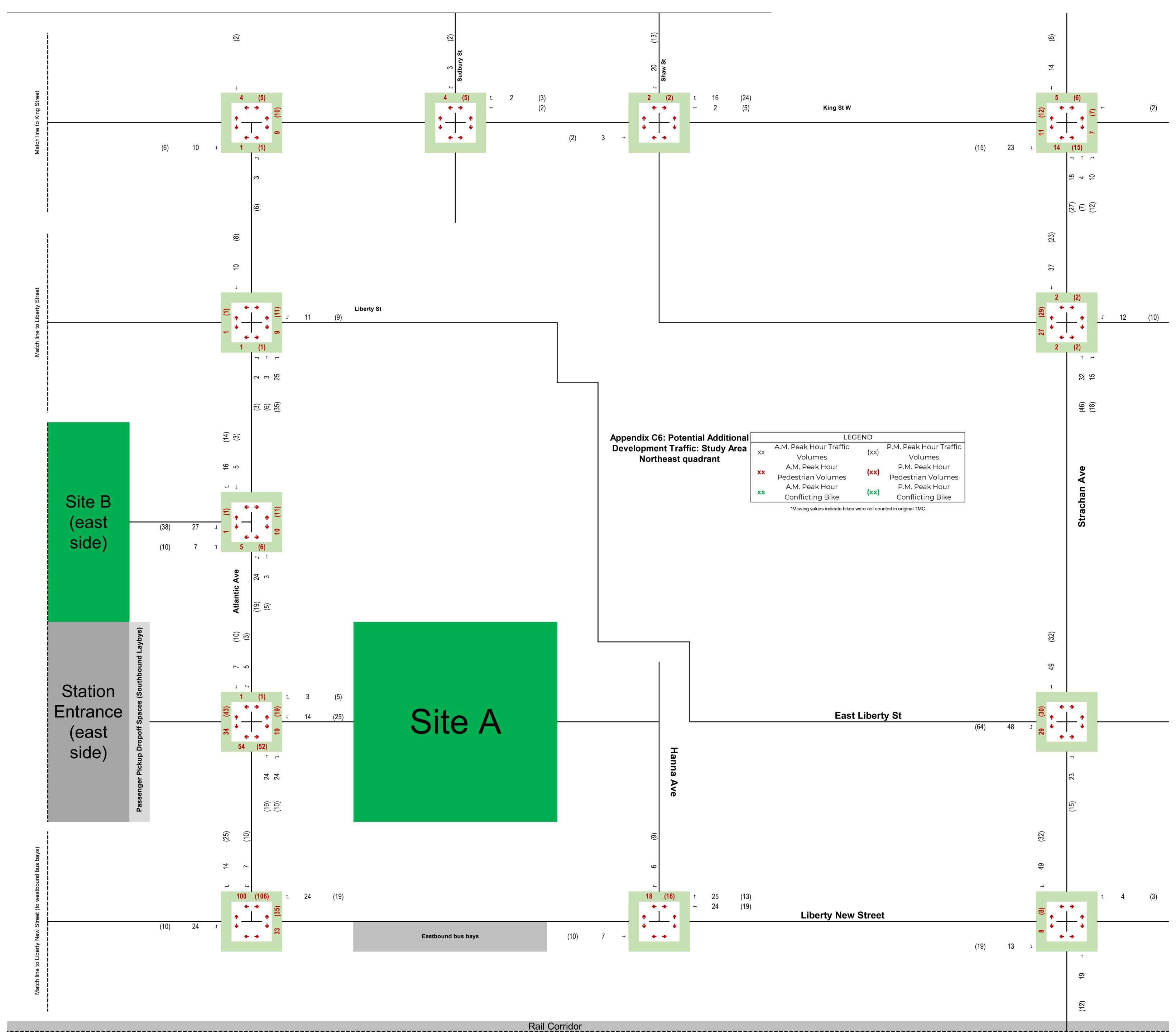


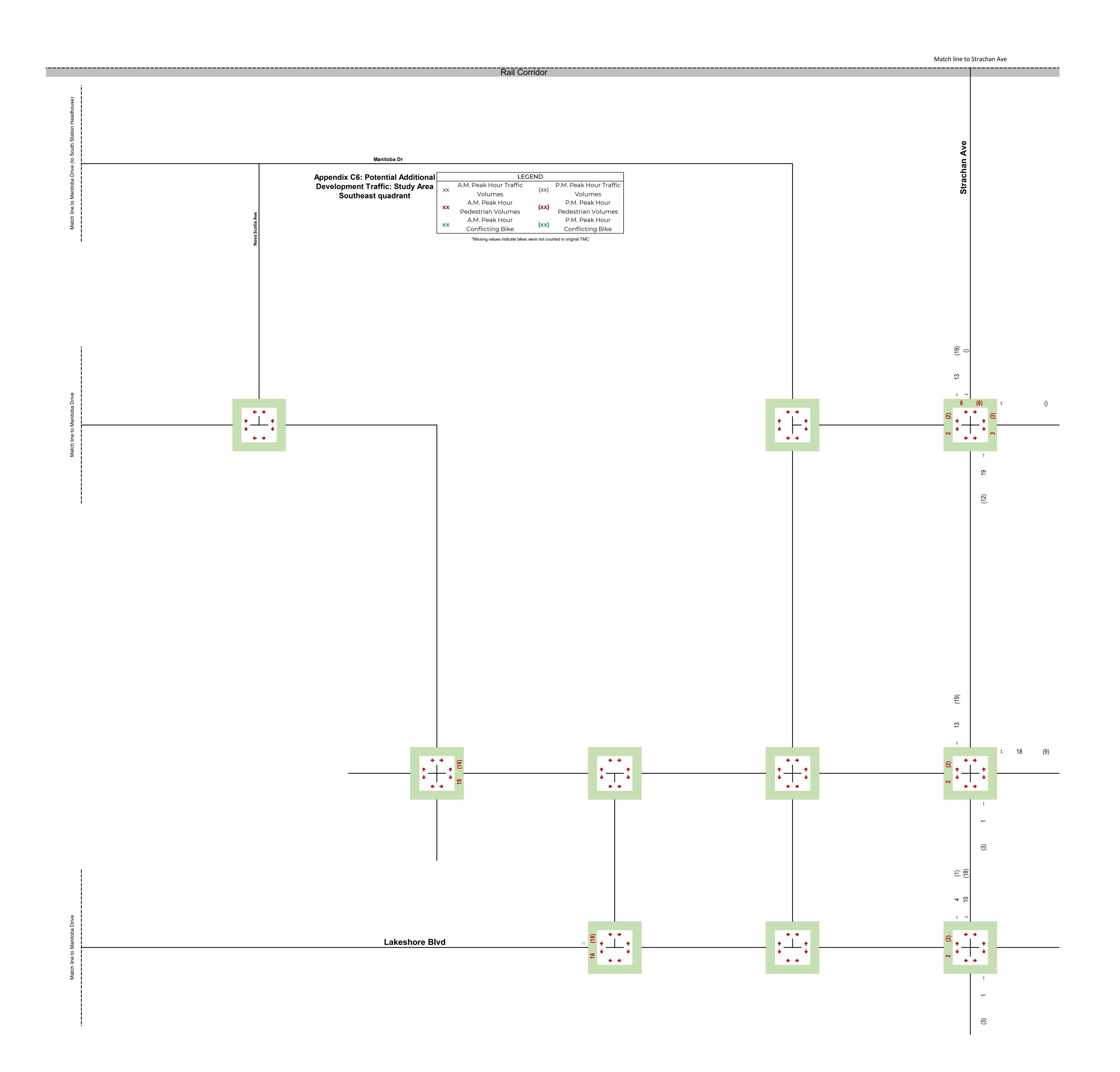
| | 118 (6) 42 (74) 592 (317) 112 (113) Oufferin St | 42 (23) 144 (93) loe Shuster Way | |
|--|---|----------------------------------|---|
| Appendix C5: 204 Future Background Volumes: Study Area Northwest quadrant XX A.M. Peak Hour Traffic Volumes A.M. Peak Hour Pedestrian Volumes A.M. Peak Hour Pedestrian Volumes A.M. Peak Hour Conflicting Bike *Missing values indicate bikes were not counted in original TMC LEGEND P.M. Peak Hour Traffic (xx) Volumes P.M. Peak Hour Conflicting Bike | (81) 56 J (458) 737 - (54) 86 1 (3) 73 * 203 (317) ** ** ** ** ** ** ** ** ** | King St W (647) 852 - (1) 10 * | * 1 () t 79 (131) - 628 (907) King St W |
| | 128) (178) (145) (178) (178) (178) (178) (178) (178) (178) (178) | | Liberty St |
| | (5) 5 1 (4) (2) 6 1 338 (90) (2) (3) 1 1 2 338 (90) (4) (148) 2 1 1 2 338 (90) | Liberty St | (1) (117) |
| | | Mowat Ave | Site B (west side) |
| | | 19 (1) - 43 (129) | Total (10) 1 (10) Station Entrance |
| | (12) | (48) 39 - (48) 37) 1 % | (167) (130) (167) (130) (167) (130) (167) (130) (167) (130) (167) (130) (144) |
| | (3) 75 * T = 36 | Liberty New St | ## Westbound bus bays Match line to Line 1 |
| | $\begin{array}{c} & & & & \\ & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\$ | Rail Co | orridor 9 |

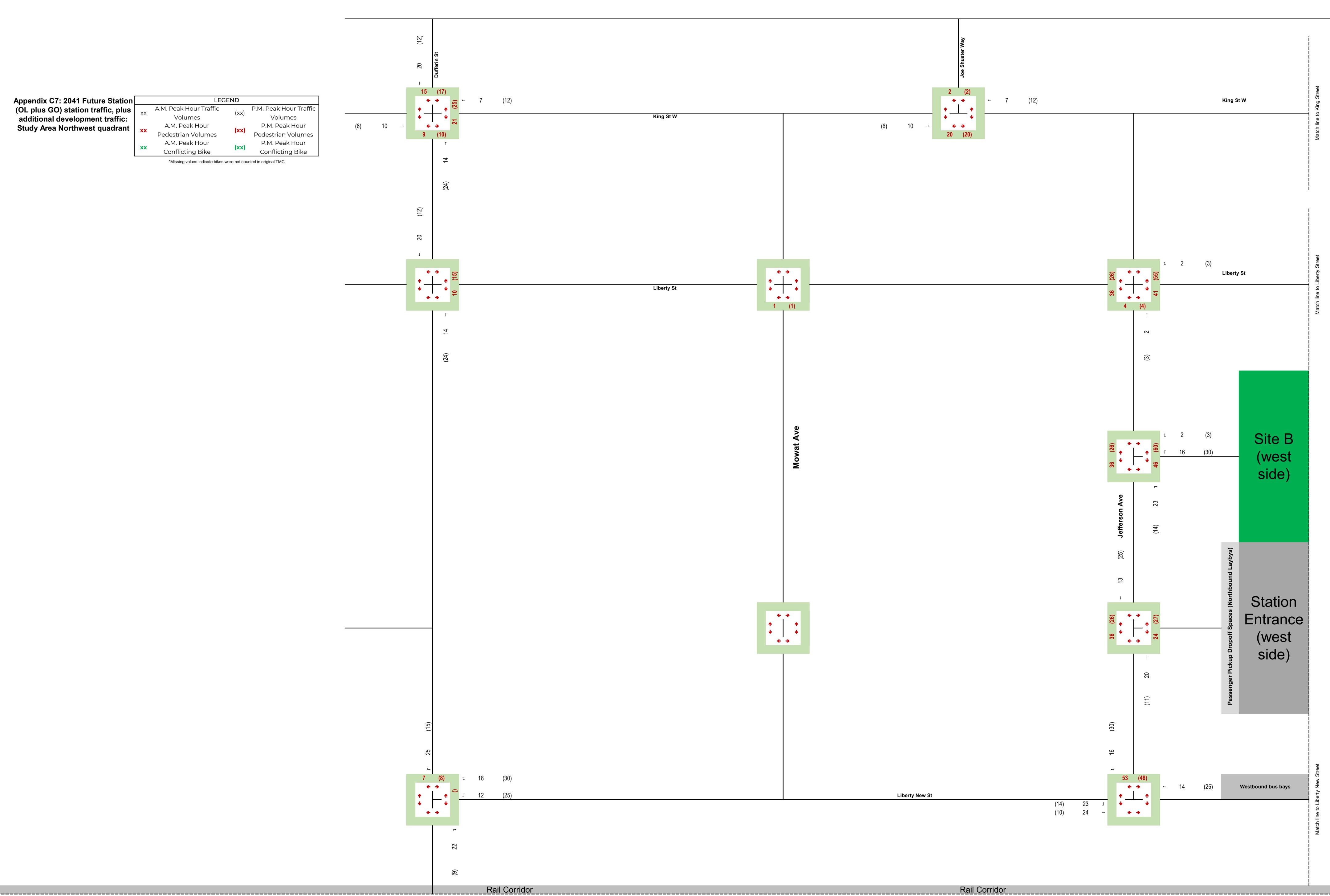




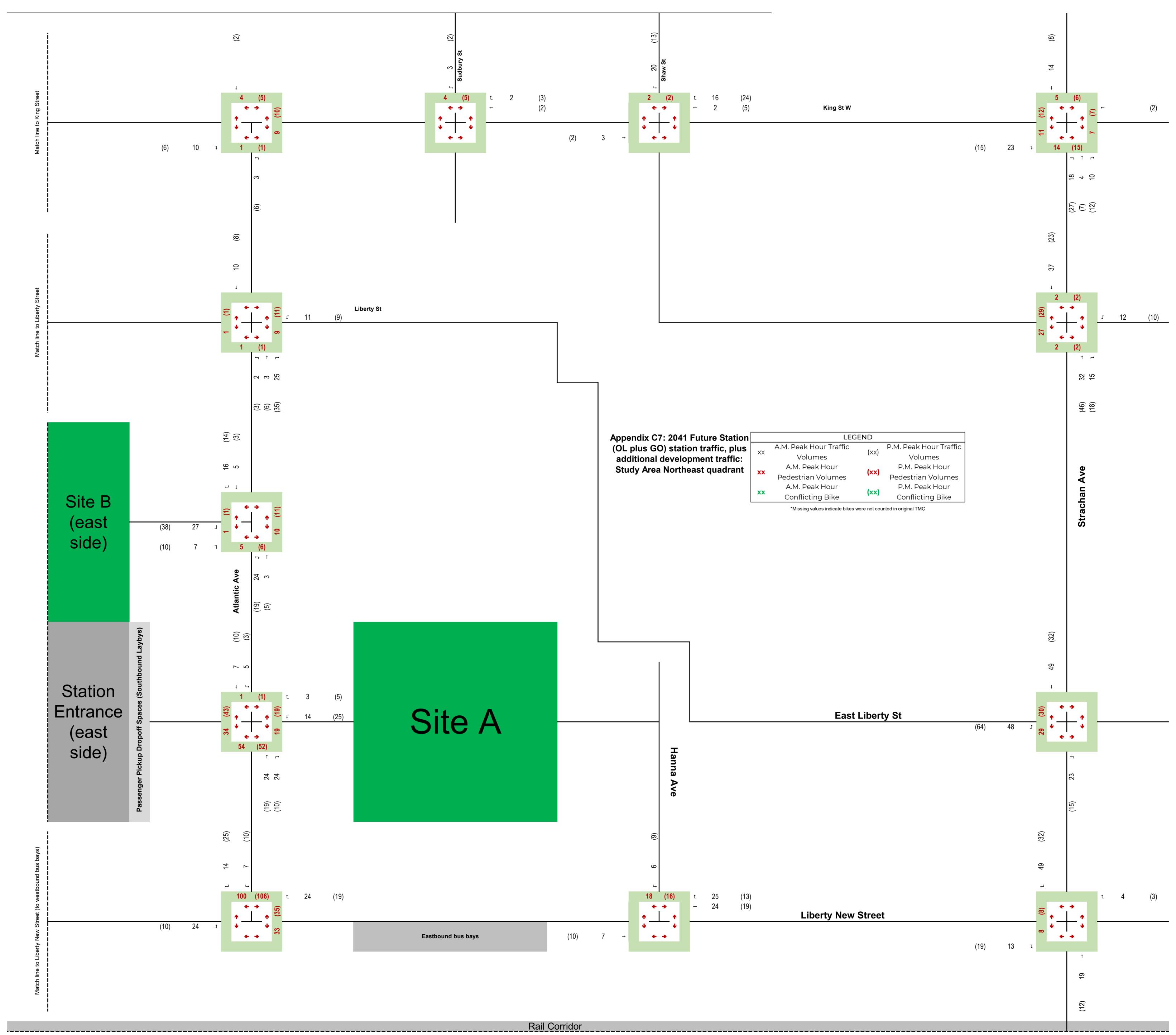


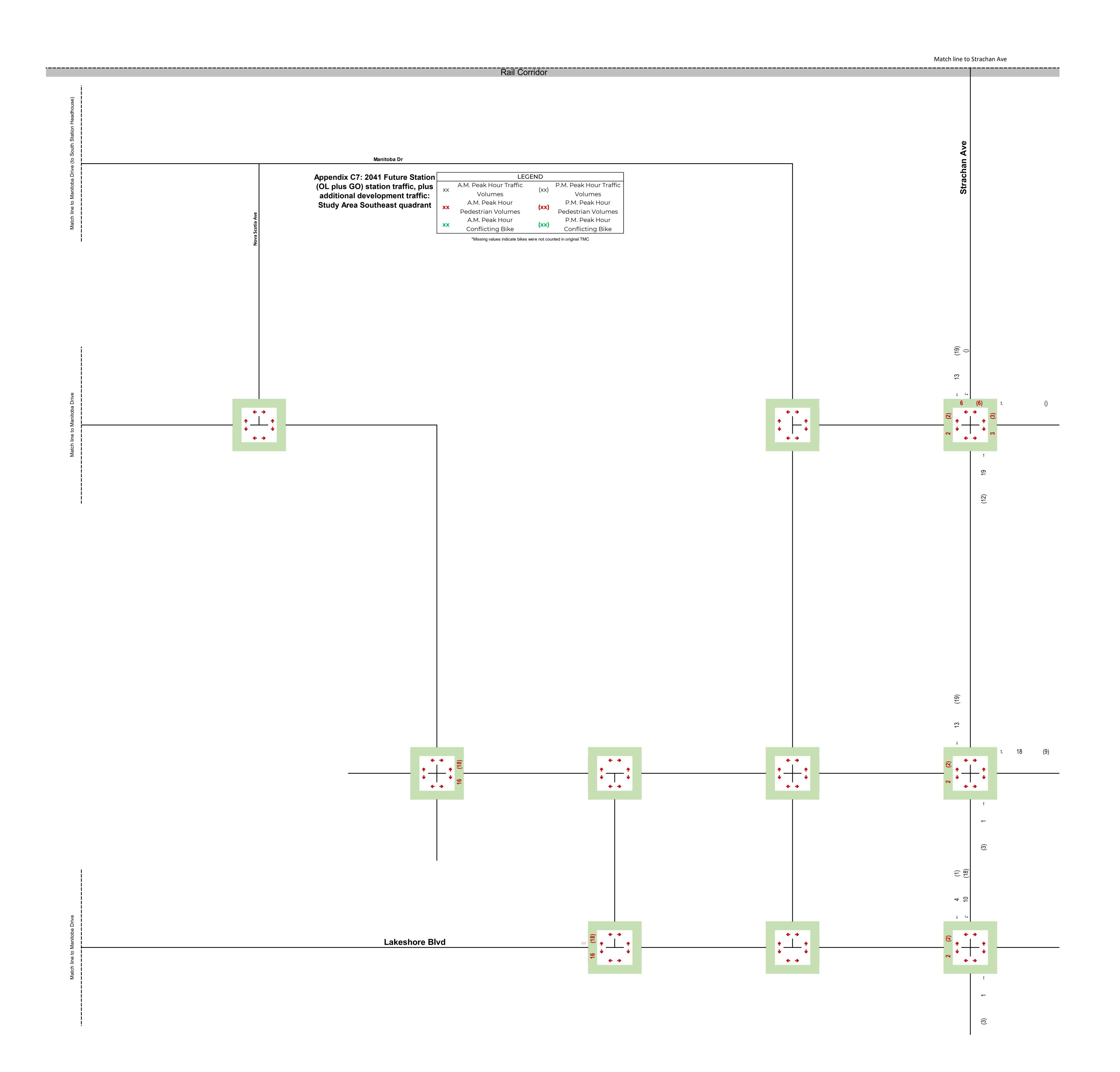






Match line to Dufferin Street Rail Corridor South
Station
Headhouse Appendix C7: 2041 Future Station
(OL plus GO) station traffic, plus
additional development traffic:
Study Area Southwest quadrant P.M. Peak Hour Traffic A.M. Peak Hour Traffic Pedestrian Volumes P.M. Peak Hour *Missing values indicate bikes were not counted in original TMC British Columbia Rd ↑
↓
↓
↓
↓ Lakeshore Blvd



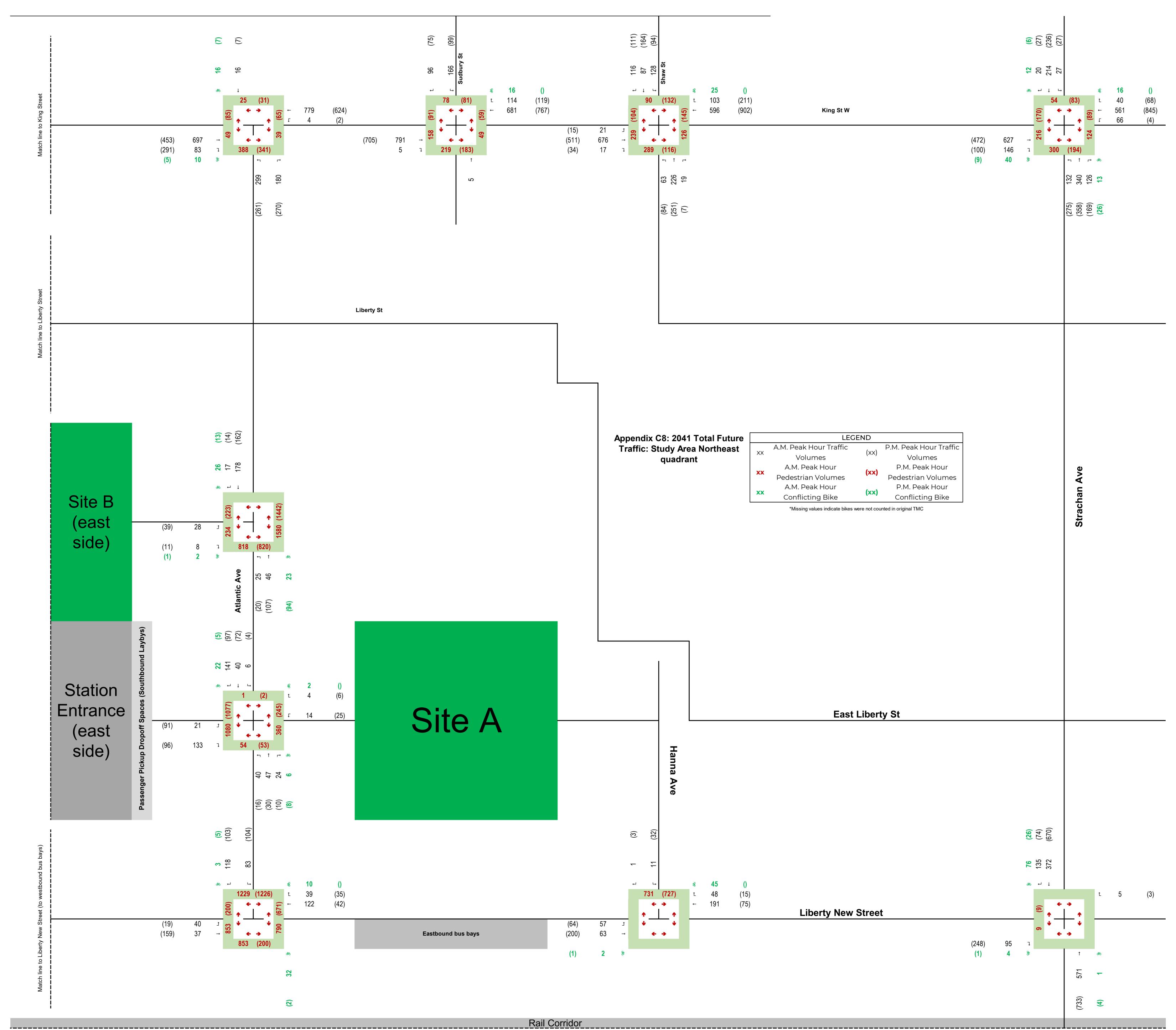


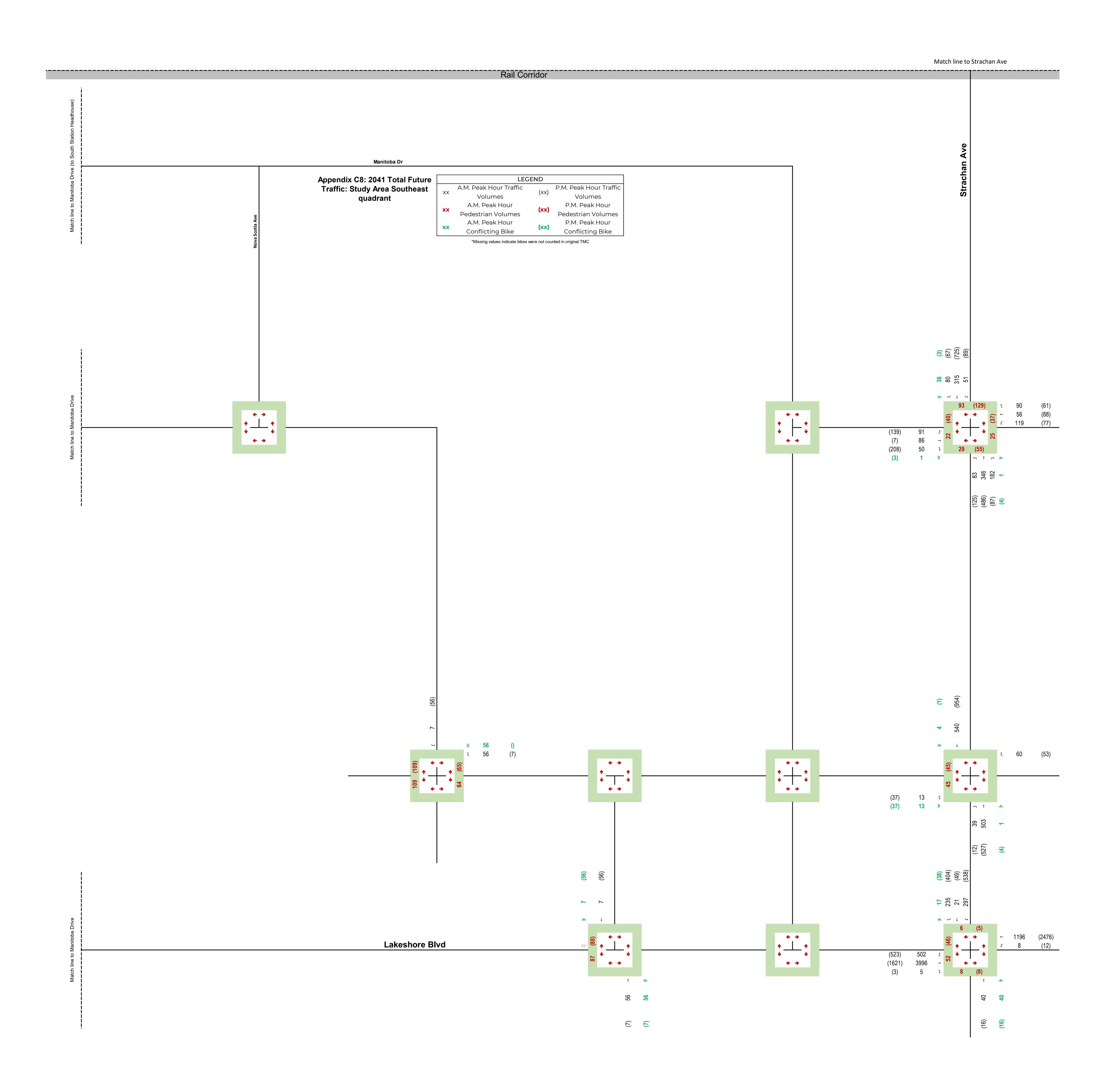
% ← ↓ → Appendix C8: 2041 Total Future
Traffic: Study Area Northwest
quadrant LEGEND

A.M. Peak Hour Traffic

(xx) King St W P.M. Peak Hour Traffic (xx) King St W Volumes (653) 862 → [™] ← → 206 (167) P.M. Peak Hour A.M. Peak Hour Pedestrian Volumes Pedestrian Volumes (5) 15 % P.M. Peak Hour Conflicting Bike A.M. Peak Hour + ↑ → ఈ *Missing values indicate bikes were not counted in original TMC Liberty St **Liberty New St**

Rail Corridor







Appendix D: Detailed Synchro Results

Lane Group

| | ۶ | → | • | • | ← | • | 1 | † | ~ | / | ļ | 4 |
|----------------------------|-------|----------|---------|-------|----------|---------|------|----------|---------|----------|-------|---------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | , j | ^ | | 7 | ^ | | | | | 7 | ર્ન | 7 |
| Traffic Volume (vph) | 402 | 3208 | 5 | 8 | 960 | 0 | 0 | 0 | 0 | 187 | 4 | 188 |
| Future Volume (vph) | 402 | 3208 | 5 | 8 | 960 | 0 | 0 | 0 | 0 | 187 | 4 | 188 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 |
| Storage Length (m) | 60.0 | | 0.0 | 60.0 | | 50.0 | 0.0 | | 0.0 | 140.0 | | 50.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 0 | | 0 | 1 | | 1 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 0.91 | 0.91 | 1.00 | 0.91 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Ped Bike Factor | 1.00 | 1.00 | | | | | | | | | | 0.96 |
| Frt | | | | | | | | | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | | | | 0.950 | 0.954 | |
| Satd. Flow (prot) | 1452 | 4932 | 0 | 1685 | 4885 | 0 | 0 | 0 | 0 | 1585 | 1687 | 1507 |
| Flt Permitted | 0.175 | | | 0.089 | | | | | | 0.950 | 0.954 | |
| Satd. Flow (perm) | 267 | 4932 | 0 | 158 | 4885 | 0 | 0 | 0 | 0 | 1585 | 1687 | 1448 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | | | | | | | | 176 |
| Link Speed (k/h) | | 60 | | | 60 | | | 40 | | | 40 | |
| Link Distance (m) | | 310.3 | | | 196.6 | | | 116.5 | | | 205.6 | |
| Travel Time (s) | | 18.6 | | | 11.8 | | | 10.5 | | | 18.5 | |
| Confl. Peds. (#/hr) | 5 | 10.0 | 7 | 7 | 11.0 | 5 | 24 | 10.0 | | | 10.0 | 24 |
| 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 (%) | 16% | 4% | 0% | 0% | 5% | 33% | 0% | 0% | 0% | 1% | 0% | 0% |
| Adj. Flow (vph) | 447 | 3564 | 6 | 9 | 1067 | 0 | 0 | 0 | 0 | 208 | 4 | 209 |
| Shared Lane Traffic (%) | | | - | - | | - | - | - | - | 49% | | |
| Lane Group Flow (vph) | 447 | 3570 | 0 | 9 | 1067 | 0 | 0 | 0 | 0 | 106 | 106 | 209 |
| 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) | 2011 | 3.0 | · ug.ic | 2010 | 3.0 | . ug.ii | Lon | 3.0 | . ug.it | 2011 | 3.0 | . ug.ii |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.09 | 1.01 | 1.01 | 1.09 | 1.01 | 1.09 | 1.01 | 1.01 | 1.01 | 1.09 | 1.01 | 1.09 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | | | | 1 | 2 | 1 |
| Detector Template | Left | Thru | | Left | Thru | | | | | Left | Thru | Right |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | | | | 6.1 | 30.5 | 6.1 |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | | | | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | | | | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | | | | 6.1 | 1.8 | 6.1 |
| Detector 1 Type | CI+Ex | Cl+Ex | | CI+Ex | CI+Ex | | | | | CI+Ex | CI+Ex | Cl+Ex |
| Detector 1 Channel | 0. 2. | O. LA | | 0. Ex | O. LA | | | | | 0. Ex | 0. LX | O. Ex |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | | | | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | | | | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | | | | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | 0.0 | 28.7 | | 0.0 | 28.7 | | | | | 0.0 | 28.7 | 0.0 |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | | | | CI+Ex | |
| Detector 2 Channel | | OITLX | | | OITEX | | | | | | OITEX | |
| Delector & Challie | | | | | | | | | | | | |

| Lane Group | 03 |
|----------------------------|----|
| Laneconfigurations | |
| Traffic Volume (vph) | |
| Future Volume (vph) | |
| Ideal Flow (vphpl) | |
| Lane Width (m) | |
| Storage Length (m) | |
| Storage Lanes | |
| Taper Length (m) | |
| Lane Util. Factor | |
| Ped Bike Factor | |
| Frt | |
| Flt Protected | |
| Satd. Flow (prot) | |
| Flt Permitted | |
| Satd. Flow (perm) | |
| Right Turn on Red | |
| Satd. Flow (RTOR) | |
| Link Speed (k/h) | |
| Link Distance (m) | |
| Travel Time (s) | |
| Confl. Peds. (#/hr) | |
| Peak Hour Factor | |
| Heavy Vehicles (%) | |
| Adj. Flow (vph) | |
| Shared Lane Traffic (%) | |
| Lane Group Flow (vph) | |
| Enter Blocked Intersection | |
| Lane Alignment | |
| Median Width(m) | |
| Link Offset(m) | |
| Crosswalk Width(m) | |
| Two way Left Turn Lane | |
| Headway Factor | |
| Turning Speed (k/h) | |
| Number of Detectors | |
| Detector Template | |
| Leading Detector (m) | |
| Trailing Detector (m) | |
| Detector 1 Position(m) | |
| Detector 1 Size(m) | |
| Detector 1 Type | |
| Detector 1 Channel | |
| Detector 1 Extend (s) | |
| Detector 1 Queue (s) | |
| Detector 1 Delay (s) | |
| Detector 2 Position(m) | |
| Detector 2 Size(m) | |
| Detector 2 Type | |
| Detector 2 Channel | |
| | |

Existing AM 05/06/2014 HDR Corporation Synchro 10 Report Page 1 Existing AM 05/06/2014 HDR Corporation

Synchro 10 Report Page 2

| | • | - | * | • | • | • | 1 | Ī | ~ | > | ¥ | 4 |
|------------------------------|--------------|------------|----------|-------|-------------|------------|-----|-----|-----|-------------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | | | | 0.0 | |
| Turn Type | pm+pt | NA | | Perm | NA | | | | | Perm | NA | pm+ov |
| Protected Phases | 5 | 2 | | | 6 | | | | | | 4 | 5 |
| Permitted Phases | 2 | | | 6 | | | | | | 4 | | 4 |
| Detector Phase | 5 | 2 | | 6 | 6 | | | | | 4 | 4 | 5 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 30.0 | | 30.0 | 30.0 | | | | | 7.0 | 7.0 | 6.0 |
| Minimum Split (s) | 12.0 | 36.0 | | 36.0 | 36.0 | | | | | 44.0 | 44.0 | 12.0 |
| Total Split (s) | 33.0 | 83.0 | | 50.0 | 50.0 | | | | | 45.0 | 45.0 | 33.0 |
| Total Split (%) | 22.9% | 57.6% | | 34.7% | 34.7% | | | | | 31.3% | 31.3% | 22.9% |
| Maximum Green (s) | 27.0 | 77.0 | | 44.0 | 44.0 | | | | | 38.0 | 38.0 | 27.0 |
| Yellow Time (s) | 3.0 | 4.0 | | 4.0 | 4.0 | | | | | 3.0 | 3.0 | 3.0 |
| All-Red Time (s) | 3.0 | 2.0 | | 2.0 | 2.0 | | | | | 4.0 | 4.0 | 3.0 |
| Lost Time Adjust (s) | -1.0 | -1.0 | | -1.0 | -1.0 | | | | | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | | | | 6.0 | 6.0 | 5.0 |
| Lead/Lag | Lead | | | Lag | Lag | | | | | Lead | Lead | Lead |
| Lead-Lag Optimize? | Yes | | | Yes | Yes | | | | | Yes | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | | | | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | Max | | Max | Max | | | | | None | None | None |
| Walk Time (s) | | 7.0 | | 7.0 | 7.0 | | | | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | | 23.0 | | 23.0 | 23.0 | | | | | 30.0 | 30.0 | |
| Pedestrian Calls (#/hr) | | 0 | | 0 | 0 | | | | | 0 | 0 | |
| Act Effct Green (s) | 78.1 | 78.1 | | 45.1 | 45.1 | | | | | 13.1 | 13.1 | 42.1 |
| Actuated g/C Ratio | 0.76 | 0.76 | | 0.44 | 0.44 | | | | | 0.13 | 0.13 | 0.41 |
| v/c Ratio | 0.84 | 0.95 | | 0.13 | 0.50 | | | | | 0.52 | 0.49 | 0.29 |
| Control Delay | 33.9 | 18.3 | | 24.1 | 21.8 | | | | | 51.1 | 49.3 | 4.9 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | | | | 0.0 | 0.0 | 0.0 |
| Total Delay | 33.9 | 18.3 | | 24.1 | 21.8 | | | | | 51.1 | 49.3 | 4.9 |
| LOS | С | В | | С | С | | | | | D | D | Α |
| Approach Delay | | 20.1 | | | 21.8 | | | | | | 27.7 | |
| Approach LOS | | С | | | С | | | | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 144 | | | | | | | | | | | | |
| Actuated Cycle Length: 10 | 2.2 | | | | | | | | | | | |
| Natural Cycle: 150 | | | | | | | | | | | | |
| Control Type: Semi Act-Ur | ncoord | | | | | | | | | | | |
| Maximum v/c Ratio: 0.95 | | | | | | | | | | | | |
| Intersection Signal Delay: | 21.0 | | | lr | ntersection | LOS: C | | | | | | |
| Intersection Capacity Utiliz | ation 120.0° | % | | 10 | CU Level | of Service | Н | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Splits and Phases: 222: | Lakeshore | Blvd & Str | achan Av | 'e | | | | | | | | |

| Splits and Phases: | 222: Lakeshore Blvd & Strachan A | Ave | |
|--------------------|----------------------------------|-------------|--------------|
| ≠ _{Ø2} | | ↓ Ø4 | #1 ø3 |
| 83 s | | 45 s | 16 s |
| ₹ Ø5 | ▼ Ø5 | | |
| 33 s | 50 s | | |

| Lane Group | Ø3 |
|-------------------------|------|
| Detector 2 Extend (s) | |
| Turn Type | |
| Protected Phases | 3 |
| Permitted Phases | |
| Detector Phase | |
| Switch Phase | |
| Minimum Initial (s) | 7.0 |
| Minimum Split (s) | 15.0 |
| Total Split (s) | 16.0 |
| Total Split (%) | 11% |
| Maximum Green (s) | 8.0 |
| Yellow Time (s) | 3.0 |
| All-Red Time (s) | 5.0 |
| Lost Time Adjust (s) | |
| Total Lost Time (s) | |
| Lead/Lag | Lag |
| Lead-Lag Optimize? | Yes |
| Vehicle Extension (s) | 3.0 |
| Recall Mode | None |
| Walk Time (s) | |
| Flash Dont Walk (s) | |
| Pedestrian Calls (#/hr) | |
| Act Effct Green (s) | |
| Actuated g/C Ratio | |
| v/c Ratio | |
| Control Delay | |
| Queue Delay | |
| Total Delay | |
| LOS | |
| Approach Delay | |
| Approach LOS | |
| I-t | |
| Intersection Summary | |

Queues

222: Lakeshore Blvd & Strachan Ave

12/18/2020

| | • | - | • | • | - | ļ | 4 | |
|------------------------|--------|--------|------|-------|-------|-------|------|--|
| Lane Group | EBL | EBT | WBL | WBT | SBL | SBT | SBR | |
| Lane Group Flow (vph) | 447 | 3570 | 9 | 1067 | 106 | 106 | 209 | |
| v/c Ratio | 0.84 | 0.95 | 0.13 | 0.50 | 0.52 | 0.49 | 0.29 | |
| Control Delay | 33.9 | 18.3 | 24.1 | 21.8 | 51.1 | 49.3 | 4.9 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 33.9 | 18.3 | 24.1 | 21.8 | 51.1 | 49.3 | 4.9 | |
| Queue Length 50th (m) | 52.2 | 181.5 | 1.0 | 53.9 | 20.9 | 20.8 | 3.5 | |
| Queue Length 95th (m) | #116.0 | #305.7 | 5.1 | 71.7 | 38.4 | 38.1 | 15.5 | |
| Internal Link Dist (m) | | 286.3 | | 172.6 | | 181.6 | | |
| Turn Bay Length (m) | 60.0 | | 60.0 | | 140.0 | | 50.0 | |
| Base Capacity (vph) | 529 | 3768 | 69 | 2153 | 605 | 644 | 716 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.84 | 0.95 | 0.13 | 0.50 | 0.18 | 0.16 | 0.29 | |
| | | | | | | | | |

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

Queue shown is maximum after two cycles.

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HCM Signalized Intersection Capacity Analysis 222: Lakeshore Blvd & Strachan Ave

12/18/2020

| ZZZ. Lakeshore bi | J | → | ` | • | + | • | • | † | <i>></i> | \ | Ţ | 4 |
|-------------------------------|-------------|----------|--------|------|------------|------------|---------|------|-------------|----------|------|-------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ሻ | ተተኈ | | ሻ | ^ | | | | | ሻ | 4 | 1 |
| Traffic Volume (vph) | 402 | 3208 | 5 | 8 | 960 | 0 | 0 | 0 | 0 | 187 | 4 | 188 |
| Future Volume (vph) | 402 | 3208 | 5 | 8 | 960 | 0 | 0 | 0 | 0 | 187 | 4 | 188 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 |
| Total Lost time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | | | | 6.0 | 6.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.91 | | 1.00 | 0.91 | | | | | 0.95 | 0.95 | 1.00 |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | | | | 1.00 | 1.00 | 0.99 |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | | | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | | 1.00 | 1.00 | | | | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | | | | 0.95 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1452 | 4931 | | 1685 | 4885 | | | | | 1585 | 1687 | 1492 |
| Flt Permitted | 0.17 | 1.00 | | 0.09 | 1.00 | | | | | 0.95 | 0.95 | 1.00 |
| Satd. Flow (perm) | 267 | 4931 | | 157 | 4885 | | | | | 1585 | 1687 | 1492 |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 447 | 3564 | 6 | 9 | 1067 | 0 | 0 | 0 | 0 | 208 | 4 | 209 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 105 |
| Lane Group Flow (vph) | 447 | 3570 | 0 | 9 | 1067 | 0 | 0 | 0 | 0 | 106 | 106 | 104 |
| Confl. Peds. (#/hr) | 5 | | 7 | 7 | | 5 | 24 | | | | | 24 |
| Heavy Vehicles (%) | 16% | 4% | 0% | 0% | 5% | 33% | 0% | 0% | 0% | 1% | 0% | 0% |
| Turn Type | pm+pt | NA | | Perm | NA | | | | | Perm | NA | pm+ov |
| Protected Phases | 5 | 2 | | | 6 | | | | | | 4 | 5 |
| Permitted Phases | 2 | | | 6 | | | | | | 4 | | 4 |
| Actuated Green, G (s) | 77.1 | 77.1 | | 44.1 | 44.1 | | | | | 12.1 | 12.1 | 39.1 |
| Effective Green, g (s) | 78.1 | 78.1 | | 45.1 | 45.1 | | | | | 13.1 | 13.1 | 41.1 |
| Actuated g/C Ratio | 0.76 | 0.76 | | 0.44 | 0.44 | | | | | 0.13 | 0.13 | 0.40 |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | | | | 7.0 | 7.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | | | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 528 | 3768 | | 69 | 2155 | | | | | 203 | 216 | 600 |
| v/s Ratio Prot | 0.23 | c0.72 | | | 0.22 | | | | | | | 0.05 |
| v/s Ratio Perm | 0.41 | | | 0.06 | | | | | | c0.07 | 0.06 | 0.02 |
| v/c Ratio | 0.85 | 0.95 | | 0.13 | 0.50 | | | | | 0.52 | 0.49 | 0.17 |
| Uniform Delay, d1 | 19.1 | 10.3 | | 16.9 | 20.4 | | | | | 41.6 | 41.4 | 19.6 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | | | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 11.9 | 6.7 | | 3.9 | 0.8 | | | | | 2.4 | 1.8 | 0.1 |
| Delay (s) | 31.0 | 17.0 | | 20.8 | 21.2 | | | | | 44.0 | 43.2 | 19.8 |
| Level of Service | С | В | | С | С | | | | | D | D | В |
| Approach Delay (s) | | 18.6 | | | 21.2 | | | 0.0 | | | 31.8 | |
| Approach LOS | | В | | | С | | | Α | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 20.1 | H | CM 2000 | Level of S | Service | | С | | | |
| HCM 2000 Volume to Capa | acity ratio | | 1.03 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 102.2 | | um of lost | | | | 24.0 | | | |
| Intersection Capacity Utiliza | ation | | 120.0% | IC | U Level o | of Service | | | Н | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

HDR Corporation

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| | • | → | • | • | + | • | • | † | ~ | / | ↓ | 4 |
|----------------------------|-------|----------|-------|-------|-------|-------|-------|----------|-------|-------|----------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 4 | | | 4 | | ሻ | fa fa | | ሻ | 1 | |
| Traffic Volume (vph) | 0 | 501 | 64 | 66 | 438 | 40 | 81 | 258 | 106 | 27 | 140 | 20 |
| Future Volume (vph) | 0 | 501 | 64 | 66 | 438 | 40 | 81 | 258 | 106 | 27 | 140 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 2150 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 0.0 | 25.0 | | 0.0 | 25.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 0 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| 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 |
| Ped Bike Factor | | 0.94 | | | 0.98 | | 0.77 | 0.97 | | 0.96 | 0.96 | |
| Frt | | 0.985 | | | 0.990 | | | 0.956 | | | 0.981 | |
| Flt Protected | | | | | 0.994 | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 0 | 1273 | 0 | 0 | 1430 | 0 | 1458 | 1486 | 0 | 1516 | 1565 | 0 |
| Flt Permitted | | | | | 0.703 | | 0.621 | | | 0.326 | | |
| Satd. Flow (perm) | 0 | 1273 | 0 | 0 | 997 | 0 | 731 | 1486 | 0 | 498 | 1565 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 12 | | | 8 | | | 29 | | | 10 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 40 | | | 40 | |
| Link Distance (m) | | 255.2 | | | 358.6 | | | 424.1 | | | 379.9 | |
| Travel Time (s) | | 18.4 | | | 25.8 | | | 38.2 | | | 34.2 | |
| Confl. Peds. (#/hr) | 41 | | 315 | 315 | | 41 | 162 | | 92 | 92 | • | 162 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles (%) | 0% | 9% | 28% | 100% | 7% | 5% | 4% | 6% | 3% | 0% | 2% | 0% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 0 | 583 | 74 | 77 | 509 | 47 | 94 | 300 | 123 | 31 | 163 | 23 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 657 | 0 | 0 | 633 | 0 | 94 | 423 | 0 | 31 | 186 | 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 | J . | | 0.0 | J . | | 3.0 | | | 3.0 | J |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.16 | 1.32 | 1.16 | 1.16 | 1.13 | 1.16 | 1.25 | 1.16 | 1.16 | 1.25 | 1.16 | 1.16 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | - | | | | | | - | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | 0.0 | 28.7 | | 0.0 | 28.7 | | 0.0 | 28.7 | | 0.0 | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |

| Existing AM 05/06/2014 | Synchro 10 Report |
|------------------------|-------------------|
| HDR Corporation | Page 7 |

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|---------------------------------|--------------|-----------|-----------|------------|-------------|------------|----------------|----------|----------|-------|------------|--------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 4 | | | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Detector Phase | 2 | 2 | | 6 | 6 | | 4 | 4 | | 8 | 8 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 21.0 | 21.0 | | 21.0 | 21.0 | |
| Minimum Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 27.0 | 27.0 | | 27.0 | 27.0 | |
| Total Split (s) | 46.0 | 46.0 | | 46.0 | 46.0 | | 34.0 | 34.0 | | 34.0 | 34.0 | |
| Total Split (%) | 57.5% | 57.5% | | 57.5% | 57.5% | | 42.5% | 42.5% | | 42.5% | 42.5% | |
| Maximum Green (s) | 40.0 | 40.0 | | 40.0 | 40.0 | | 28.0 | 28.0 | | 28.0 | 28.0 | |
| Yellow Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | -1.0 | | | -3.0 | | -1.0 | -1.0 | | -1.0 | -1.0 | |
| Total Lost Time (s) | | 5.0 | | | 3.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | | | | | | | | | | - | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | C-Max | C-Max | | C-Max | C-Max | | Max | Max | | Max | Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 13.0 | 13.0 | | 13.0 | 13.0 | | 14.0 | 14.0 | | 14.0 | 14.0 | |
| Pedestrian Calls (#/hr) | 100 | 100 | | 14 | 14 | | 31 | 31 | | 100 | 100 | |
| Act Effct Green (s) | 100 | 41.0 | | | 43.0 | | 29.0 | 29.0 | | 29.0 | 29.0 | |
| Actuated g/C Ratio | | 0.51 | | | 0.54 | | 0.36 | 0.36 | | 0.36 | 0.36 | |
| v/c Ratio | | 1.00 | | | 1.17 | | 0.36 | 0.76 | | 0.17 | 0.32 | |
| Control Delay | | 56.5 | | | 115.3 | | 23.5 | 31.5 | | 26.9 | 26.7 | |
| Queue Delay | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | | 56.5 | | | 115.3 | | 23.5 | 31.5 | | 26.9 | 26.7 | |
| LOS | | E | | | F | | C | C | | C | C | |
| Approach Delay | | 56.5 | | | 115.3 | | Ŭ | 30.1 | | - J | 26.7 | |
| Approach LOS | | E | | | F | | | C | | | C | |
| •• | | | | | • | | | | | | | |
| Intersection Summary Area Type: | CBD | | | | | | | | | | | |
| Cycle Length: 80 | CDD | | | | | | | | | | | |
| Actuated Cycle Length: 80 | ١ | | | | | | | | | | | |
| Offset: 42 (53%), Reference | | 2.ERTI a | nd 6·MRT | TI Start | of 1et Gro | on | | | | | | |
| Natural Cycle: 75 | bed to phase | Z.LDIL a | ilu U.VVD | i L, Stait | UI ISL GIE | CII | | | | | | |
| Control Type: Actuated-Co | ordinated | | | | | | | | | | | |
| Maximum v/c Ratio: 1.17 | Julullaleu | | | | | | | | | | | |
| Intersection Signal Delay: | 65.0 | | | | ntersection | 100·E | | | | | | |
| Intersection Signal Delay. | |)/ | | | CU Level | | | | | | | |
| | allon 120.7 | /0 | | 11 | 50 Level (| or Service | , п | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Splits and Phases: 538: | Strachan A | ve & King | St | | | | | | | | | |
| →ø2 (R) | | | | | | - 4 | Ø4 | | | | | |
| 46 s | | | | | | 34 s | υ τ | | | | | |
| 4 | | | | | | J-15 | | | | | | |
| Ø6 (R) | | | | | | #) | Ø8 | | | | | |
| 46 s | | | | | | 34 s | | | | | , <u> </u> | |
| HDR Corporation | | | | | | | | | | | | Page 8 |

Queues

538: Strachan Ave & King St

12/18/2020

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|------------------------|--------|--------|------|----------|------|-------|
| Lane Group | EBT | WBT | NBL | NBT | SBL | SBT |
| | | | | | | |
| Lane Group Flow (vph) | 657 | 633 | 94 | 423 | 31 | 186 |
| v/c Ratio | 1.00 | 1.17 | 0.36 | 0.76 | 0.17 | 0.32 |
| Control Delay | 56.5 | 115.3 | 23.5 | 31.5 | 26.9 | 26.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 56.5 | 115.3 | 23.5 | 31.5 | 26.9 | 26.7 |
| Queue Length 50th (m) | 92.7 | ~116.5 | 10.3 | 51.8 | 4.5 | 27.4 |
| Queue Length 95th (m) | #154.0 | #157.7 | 21.6 | #80.7 | m7.4 | m41.6 |
| Internal Link Dist (m) | 231.2 | 334.6 | | 400.1 | | 355.9 |
| Turn Bay Length (m) | | | 25.0 | | 25.0 | |
| Base Capacity (vph) | 658 | 539 | 264 | 557 | 180 | 573 |
| 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 | 1.17 | 0.36 | 0.76 | 0.17 | 0.32 |

Intersection Summary

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HCM Signalized Intersection Capacity Analysis 538: Strachan Ave & King St

v/c Ratio

Delay (s)

Uniform Delay, d1

Progression Factor

Level of Service

Approach LOS

Approach Delay (s)

Incremental Delay, d2

Movement EBL EBT WBT NBT Lane Configurations Traffic Volume (vph) 501 438 258 Future Volume (vph) 0 501 64 66 438 40 81 258 106 27 140 20 Ideal Flow (vphpl) 1900 1900 1900 1900 2150 1900 1900 1900 1900 1900 1900 1900 3.5 3.5 Lane Width 3.5 3.5 3.5 3.5 3.0 3.5 3.5 3.0 3.5 3.5 Total Lost time (s) 5.0 5.0 5.0 5.0 Lane Util. Factor 1.00 1.00 1.00 1.00 1.00 1.00 0.94 1.00 Frpb, ped/bikes 0.99 0.97 1.00 0.96 Flpb, ped/bikes 1.00 0.99 0.77 1.00 0.96 1.00 0.98 0.99 1.00 0.96 1.00 0.98 Flt Protected 1.00 0.99 0.95 1.00 0.95 1.00 Satd. Flow (prot) 1273 1409 1118 1487 1450 1566 Flt Permitted 1.00 0.70 0.62 1.00 0.33 1.00 1273 497 1566 Satd. Flow (perm) 996 731 1487 0.86 0.86 0.86 Peak-hour factor, PHF 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 583 163 Adj. Flow (vph) 509 47 94 300 123 23 31 RTOR Reduction (vph) Λ 6 n 4 0 n 18 n n 6 Lane Group Flow (vph) 651 629 180 41 315 162 162 Confl. Peds. (#/hr) 315 41 92 92 Heavy Vehicles (%) 28% 100% 4% 3% 0% 0% 5% 0% 9% 7% 6% 2% Bus Blockages (#/hr) 24 24 24 24 24 24 0 0 0 0 Turn Type NA Perm NA Perm NA Perm NA Protected Phases 2 6 4 8 Permitted Phases Actuated Green, G (s) 40.0 40.0 28.0 28.0 28.0 28.0 Effective Green, q (s) 41.0 43.0 29.0 29.0 29.0 29.0 Actuated g/C Ratio 0.51 0.54 0.36 0.36 0.36 0.36 Clearance Time (s) 6.0 6.0 6.0 6.0 6.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 652 535 264 539 180 567 v/s Ratio Prot 0.51 c0.27 0.11 v/s Ratio Perm c0.63 0.13 0.06

12/18/2020

| Intersection Summary | | | |
|-----------------------------------|--------|---------------------------|------|
| HCM 2000 Control Delay | 63.2 | HCM 2000 Level of Service | Е |
| HCM 2000 Volume to Capacity ratio | 1.03 | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 120.7% | ICU Level of Service | Н |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

1.18

18.5

0.81

96.7

111.8

111.8

0.36

18.7

1.00

3.7

22.4

0.75

22.3

1.00

9.3

31.6

С

29.9

0.17

17.3

1.37

1.6

25.4

0.32

18.4

1.43

27.4

27.1

1.2

С

1.00

19.5

1.00

34.9

54.4

D

D

54.4

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Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

^{# 95}th 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.

12/18/2020

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|----------------------------|-------|-------------------|-------|-------|----------|-------|-------|----------|-------|----------|-------|----------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 4 | | | 4 | | | 4 | | | 413 | |
| Traffic Volume (vph) | 0 | 551 | 50 | 0 | 357 | 94 | 0 | 192 | 62 | 112 | 360 | 42 |
| Future Volume (vph) | 0 | 551 | 50 | 0 | 357 | 94 | 0 | 192 | 62 | 112 | 360 | 42 |
| Ideal Flow (vphpl) | 1900 | 2150 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.98 | | | 0.98 | | | 0.98 | | | 0.98 | |
| Frt | | 0.989 | | | 0.972 | | | 0.967 | | | 0.988 | |
| Flt Protected | | | | | | | | | | | 0.989 | |
| Satd. Flow (prot) | 0 | 1691 | 0 | 0 | 1392 | 0 | 0 | 1346 | 0 | 0 | 2844 | 0 |
| Flt Permitted | | | | | | | | | | | 0.799 | |
| Satd. Flow (perm) | 0 | 1691 | 0 | 0 | 1392 | 0 | 0 | 1346 | 0 | 0 | 2271 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 8 | | | 21 | | | 25 | | | 12 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 291.1 | | | 316.7 | | | 212.5 | | | 385.1 | |
| Travel Time (s) | | 21.0 | | | 22.8 | | | 15.3 | | | 27.7 | |
| Confl. Peds. (#/hr) | 65 | | 97 | 97 | | 65 | 98 | | 42 | 42 | | 98 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles (%) | 5% | 4% | 10% | 2% | 4% | 7% | 8% | 12% | 0% | 3% | 9% | 7% |
| Bus Blockages (#/hr) | 12 | 12 | 12 | 24 | 24 | 24 | 12 | 20 | 20 | 0 | 8 | 8 |
| Adj. Flow (vph) | 0 | 641 | 58 | 0 | 415 | 109 | 0 | 223 | 72 | 130 | 419 | 49 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 699 | 0 | 0 | 524 | 0 | 0 | 295 | 0 | 0 | 598 | 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 | J . | | 0.0 | J . | | 0.0 | J - | | 0.0 | J |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.16 | 1.06 | 1.16 | 1.16 | 1.32 | 1.16 | 1.16 | 1.29 | 1.16 | 1.16 | 1.18 | 1.16 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Turn Type | | NA | | | NA | | | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | 3 | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Minimum Split (s) | 27.0 | 27.0 | | 27.0 | 27.0 | | 10.0 | 27.0 | | 27.0 | 27.0 | |
| Total Split (s) | 41.0 | 41.0 | | 41.0 | 41.0 | | 11.0 | 39.0 | | 28.0 | 28.0 | |
| Total Split (%) | 51.3% | 51.3% | | 51.3% | 51.3% | | 13.8% | 48.8% | | 35.0% | 35.0% | |
| Maximum Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 7.0 | 33.0 | | 22.0 | 22.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 2.0 | -3.0 | | 2.0 | -1.0 | | 1.0 | -1.0 | | 2.0 | -1.0 | |
| Total Lost Time (s) | | 3.0 | | | 5.0 | | | 5.0 | | | 5.0 | |
| Lead/Lag | | 0.3 | | | 0.3 | | Lead | 0.0 | | Lag | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | | | Yes | Yes | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | . 00 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | | 14.0 | | 14.0 | 14.0 | |
| Pedestrian Calls (#/hr) | 32 | 32 | | 22 | 22 | | | 33 | | 14.0 | 14.0 | |
| Act Effct Green (s) | ŲŽ. | 38.0 | | | 36.0 | | | 34.0 | | | 23.0 | |
| Actuated g/C Ratio | | 0.48 | | | 0.45 | | | 0.42 | | | 0.29 | |
| , lotation g/O I tallo | | U. T U | | | U.7J | | | U.7Z | | | 0.23 | |

Existing AM 05/06/2014 HDR Corporation Page 11 Lanes, Volumes, Timings 539: Dufferin St & King St

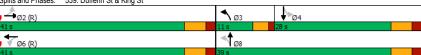
| | • | - | • | • | ← | • | 1 | Ť | | - | ţ | 4 |
|----------------------|-----|------|-----|-----|----------|-----|-----|------|-----|-----|------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| v/c Ratio | | 0.87 | | | 0.82 | | | 0.50 | | | 0.90 | |
| Control Delay | | 26.6 | | | 23.6 | | | 13.3 | | | 46.7 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 26.6 | | | 23.6 | | | 13.3 | | | 46.7 | |
| LOS | | С | | | С | | | В | | | D | |
| Approach Delay | | 26.6 | | | 23.6 | | | 13.3 | | | 46.7 | |
| Approach LOS | | С | | | С | | | В | | | D | |
| Intersection Summary | | | | | | | | | | | | |

Area Type: CBD
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 15 (19%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green

Natural Cycle: 70
Control Type: Pretimed
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 29.7
Intersection Capacity Utilization 78.6%
Analysis Period (min) 15

Intersection LOS: C
ICU Level of Service D

Splits and Phases: 539: Dufferin St & King St



539: Dufferin St & King St

12/18/2020

| | - | • | Ī | ¥ |
|------------------------|--------|--------|-------|-------|
| Lane Group | EBT | WBT | NBT | SBT |
| Lane Group Flow (vph) | 699 | 524 | 295 | 598 |
| v/c Ratio | 0.87 | 0.82 | 0.50 | 0.90 |
| Control Delay | 26.6 | 23.6 | 13.3 | 46.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 26.6 | 23.6 | 13.3 | 46.7 |
| Queue Length 50th (m) | 89.4 | 29.9 | 20.4 | 45.0 |
| Queue Length 95th (m) | #144.1 | #107.9 | m19.2 | #69.7 |
| Internal Link Dist (m) | 267.1 | 292.7 | 188.5 | 361.1 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 807 | 637 | 586 | 661 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.87 | 0.82 | 0.50 | 0.90 |

Intersection Summary

HCM Signalized Intersection Capacity Analysis 539: Dufferin St & King St

4 4 Movement EBL EBT **41**360 Lane Configurations Traffic Volume (vph) 551 357 192 Future Volume (vph) 0 551 50 0 357 94 0 192 62 112 360 42 Ideal Flow (vphpl) 1900 2150 1900 1900 1900 1900 1900 1900 1900 1900 Total Lost time (s) 3.0 5.0 5.0 5.0 Lane Util. Factor 1.00 1.00 1.00 0.95 Frpb, ped/bikes 0.98 0.98 0.98 0.99 Flpb, ped/bikes 1.00 1.00 1.00 0.99 Frt 0.99 0.97 0.97 0.99 Flt Protected 1.00 1.00 1.00 0.99 Satd. Flow (prot) 1691 1391 1346 2811 Flt Permitted 1.00 1.00 1.00 0.80 Satd. Flow (perm) 1691 1391 1346 2271 Peak-hour factor, PHF 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 Adj. Flow (vph) 0 641 415 109 223 72 130 419 RTOR Reduction (vph) 12 14 512 Lane Group Flow (vph) 281 589 0 695 n 0 0 0 0 Confl. Peds. (#/hr) 4% 4% 12% 9% Heavy Vehicles (%) 5% 10% 2% 8% 0% 3% 7% 7% Bus Blockages (#/hr) 12 12 12 24 24 24 12 20 20 Turn Type NA NA NA NA Perm Protected Phases 2 8 Permitted Phases 8 4 Actuated Green, G (s) 35.0 35.0 33.0 22.0 Effective Green, g (s) 38.0 36.0 34.0 23.0 Actuated g/C Ratio 0.48 0.45 0.42 0.29 Clearance Time (s) 6.0 6.0 6.0 6.0 803 572 Lane Grp Cap (vph) 625 652 v/s Ratio Prot c0.41 0.37 c0.21 v/s Ratio Perm c0.26 v/c Ratio 0.87 0.82 0.49 0.90 Uniform Delay, d1 18.7 19.2 16.7 27.4 Progression Factor 0.71 0.74 0.82 1.00

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| Apploacificos | U | U | ь | D |
|-----------------------------------|-------|---------------------------|------|---|
| Intersection Summary | | | | |
| HCM 2000 Control Delay | 28.7 | HCM 2000 Level of Service | С | |
| HCM 2000 Volume to Capacity ratio | 0.86 | | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 13.0 | |
| Intersection Capacity Utilization | 78.6% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |
| Analysis Period (min) | 15 | | | |

8.4

22.5

22.5

С

0.3

14.0

14.0

18.3

45.7

45.7

D

11.7

25.0

25.0

С

Incremental Delay, d2

Delay (s)

Level of Service

Approach Delay (s)

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^{# 95}th 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.

c Critical Lane Group

| | ۶ | → | • | € | + | 4 | 1 | † | ~ | / | + | 4 |
|--|-------|----------|--------|-------|-------|--------|-------|-------|--------|-------|----------|--------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ሻ | 4 | | | ની | 7 | ሻ | 4 | | ሻ | 4 | |
| Traffic Volume (vph) | 91 | 85 | 50 | 119 | 56 | 89 | 83 | 232 | 182 | 49 | 198 | 48 |
| Future Volume (vph) | 91 | 85 | 50 | 119 | 56 | 89 | 83 | 232 | 182 | 49 | 198 | 48 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| Storage Length (m) | 25.0 | | 0.0 | 0.0 | | 50.0 | 30.0 | | 0.0 | 25.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 0 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| 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 |
| Ped Bike Factor | 0.97 | 0.97 | | | 0.97 | 0.93 | 0.97 | 0.96 | | | 0.99 | |
| Frt | | 0.944 | | | | 0.850 | | 0.934 | | | 0.971 | |
| Flt Protected | 0.950 | | | | 0.967 | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1589 | 1660 | 0 | 0 | 1682 | 1436 | 1652 | 1647 | 0 | 1620 | 1721 | 0 |
| Flt Permitted | 0.592 | | | | 0.706 | | 0.581 | | | 0.429 | | |
| Satd. Flow (perm) | 960 | 1660 | 0 | 0 | 1194 | 1339 | 980 | 1647 | 0 | 731 | 1721 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 21 | | | | 152 | | 31 | | | 10 | |
| Link Speed (k/h) | | 30 | | | 50 | .02 | | 40 | | | 40 | |
| Link Distance (m) | | 143.4 | | | 229.0 | | | 205.6 | | | 241.4 | |
| Travel Time (s) | | 17.2 | | | 16.5 | | | 18.5 | | | 21.7 | |
| Confl. Peds. (#/hr) | 14 | 11.2 | 16 | 16 | 10.0 | 14 | 17 | 10.0 | 18 | 18 | 21.7 | 17 |
| 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 (%) | 6% | 5% | 2% | 0% | 25% | 5% | 2% | 5% | 0% | 4% | 5% | 2% |
| Adj. Flow (vph) | 101 | 94 | 56 | 132 | 62 | 99 | 92 | 258 | 202 | 54 | 220 | 53 |
| Shared Lane Traffic (%) | | 0. | 00 | .02 | | 00 | 02 | 200 | | ٠. | 220 | 00 |
| Lane Group Flow (vph) | 101 | 150 | 0 | 0 | 194 | 99 | 92 | 460 | 0 | 54 | 273 | 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) | Loit | 3.0 | rugiit | Loit | 3.0 | rugiit | Loit | 3.0 | rugiit | Loit | 3.0 | rugiii |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | 1.0 | | | 1.0 | | | 1.0 | | | 1.0 | |
| Headway Factor | 1.09 | 1.01 | 1.01 | 1.01 | 1.01 | 1.09 | 1.09 | 1.01 | 1.01 | 1.09 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 1.01 | 1.01 | 24 | 1.01 | 1.03 | 24 | 1.01 | 1.01 | 24 | 1.01 | 1.01 |
| Number of Detectors | 1 | 2 | 14 | 1 | 2 | 1 | 1 | 2 | 14 | 1 | 2 | 14 |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | Cl+Ex | | CI+Ex | CI+Ex | Cl+Ex | Cl+Ex | CI+Ex | | Cl+Ex | CI+Ex | |
| | CITEX | CITEX | | CITEX | CITEX | CITEX | CITEX | CITEX | | CITEX | CITEX | |
| Detector 1 Channel Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| \ / | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | | | 0.0 | | 0.0 | 0.0 | | | 0.0 | | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type Detector 2 Channel | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |

| Lane Group | Ø10 | Ø16 |
|----------------------------|-----|-----|
| Lane Configurations | | |
| Traffic Volume (vph) | | |
| Future Volume (vph) | | |
| Ideal Flow (vphpl) | | |
| Lane Width (m) | | |
| Storage Length (m) | | |
| Storage Lanes | | |
| Taper Length (m) | | |
| Lane Util. Factor | | |
| Ped Bike Factor | | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Right Turn on Red | | |
| Satd. Flow (RTOR) | | |
| Link Speed (k/h) | | |
| Link Distance (m) | | |
| Travel Time (s) | | |
| Confl. Peds. (#/hr) | | |
| Peak Hour Factor | | |
| Heavy Vehicles (%) | | |
| Adj. Flow (vph) | | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | | |
| Enter Blocked Intersection | | |
| Lane Alignment | | |
| Median Width(m) | | |
| Link Offset(m) | | |
| Crosswalk Width(m) | | |
| Two way Left Turn Lane | | |
| Headway Factor | | |
| Turning Speed (k/h) | | |
| Number of Detectors | | |
| Detector Template | | |
| Leading Detector (m) | | |
| Trailing Detector (m) | | |
| Detector 1 Position(m) | | |
| Detector 1 Size(m) | | |
| Detector 1 Type | | |
| Detector 1 Channel | | |
| Detector 1 Extend (s) | | |
| Detector 1 Queue (s) | | |
| Detector 1 Delay (s) | | |
| Detector 2 Position(m) | | |
| Detector 2 Size(m) | | |
| Detector 2 Type | | |
| Detector 2 Channel | | |
| | | |

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| | • | - | • | • | ← | • | 1 | † | - | - | ļ | 4 |
|------------------------------|--------------|-----------|-----------|----------|------------|-------------|--------------|-----------|-----|-------|-----------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 25.0 | 25.0 | | 25.0 | 25.0 | 25.0 | 40.0 | 40.0 | | 40.0 | 40.0 | |
| Minimum Split (s) | 32.0 | 32.0 | | 32.0 | 32.0 | 32.0 | 47.0 | 47.0 | | 47.0 | 47.0 | |
| Total Split (s) | 48.0 | 48.0 | | 48.0 | 48.0 | 48.0 | 59.0 | 59.0 | | 59.0 | 59.0 | |
| Total Split (%) | 33.3% | 33.3% | | 33.3% | 33.3% | 33.3% | 41.0% | 41.0% | | 41.0% | 41.0% | |
| Maximum Green (s) | 41.0 | 41.0 | | 41.0 | 41.0 | 41.0 | 52.0 | 52.0 | | 52.0 | 52.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | | 0.0 | -1.0 | -1.0 | -1.0 | -1.0 | | -1.0 | -1.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lead/Lag | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | None | Max | Max | | Max | Max | |
| | 7.0 | | | | | | | | | | | |
| Walk Time (s) | | 7.0 | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 14.0 | 14.0 | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 0 | | 14.0 | 14.0 0 | |
| Pedestrian Calls (#/hr) | | 0 | | U | | | - | - | | _ | | |
| Act Effct Green (s) | 26.8 | 26.8 | | | 26.8 | 26.8 | 53.0 0.58 | 53.0 | | 53.0 | 53.0 | |
| Actuated g/C Ratio | 0.29 | 0.29 | | | 0.29 | 0.29 | | 0.58 | | 0.58 | 0.58 | |
| v/c Ratio | 0.36 | 0.30 | | | 0.56 | 0.20 | 0.16 | 0.48 | | 0.13 | 0.27 | |
| Control Delay | 30.1 | 23.4 | | | 34.6 | 2.0 | 10.3 | 12.7 | | 10.2 | 10.4 | |
| Queue Delay | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 0.1 | | 0.0 | 0.0 | |
| Total Delay | 30.1 | 23.4 | | | 34.6 | 2.0 | 10.3 | 12.8 | | 10.2 | 10.4 | |
| LOS | С | С | | | С | Α | В | В | | В | В | |
| Approach Delay | | 26.1 | | | 23.6 | | | 12.3 | | | 10.4 | |
| Approach LOS | | С | | | С | | | В | | | В | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 144 | _ | | | | | | | | | | | |
| Actuated Cycle Length: 91 | .8 | | | | | | | | | | | |
| Natural Cycle: 100 | | | | | | | | | | | | |
| Control Type: Semi Act-Ur | ncoord | | | | | | | | | | | |
| Maximum v/c Ratio: 0.56 | | | | | | | | | | | | |
| Intersection Signal Delay: | | | | | ntersectio | | | | | | | |
| Intersection Capacity Utiliz | ation 125.6° | % | | I | CU Level | of Service | e H | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Splits and Phases: 571: | Strachan A | ve & Cana | da Blvd/l | Fleet St | | | | | | | | |
| ₫ _{@2} | | | | 001 | | <u>≯</u> 04 | | | | | | |

| 1 ø₂ | 9 ø10 | - 204 | |
|-------------|--------------|------------------|--------------|
| 59 s | 19 s | 48 s | |
| Ø6 | | Ø8 | ● ø16 |
| 59 s | | 48 s | 18 s |

Lanes, Volumes, Timings 571: Strachan Ave & Canada Blvd/Fleet St

| Lane Group | Ø10 | Ø16 |
|-------------------------|------|------|
| Detector 2 Extend (s) | | |
| Turn Type | | |
| Protected Phases | 10 | 16 |
| Permitted Phases | | |
| Detector Phase | | |
| Switch Phase | | |
| Minimum Initial (s) | 1.0 | 1.0 |
| Minimum Split (s) | 9.0 | 9.0 |
| Total Split (s) | 19.0 | 18.0 |
| Total Split (%) | 13% | 13% |
| Maximum Green (s) | 11.0 | 10.0 |
| Yellow Time (s) | 4.0 | 4.0 |
| All-Red Time (s) | 4.0 | 4.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | | |
| Lead-Lag Optimize? | | |
| Vehicle Extension (s) | 3.0 | 3.0 |
| Recall Mode | None | None |
| Walk Time (s) | | |
| Flash Dont Walk (s) | | |
| Pedestrian Calls (#/hr) | | |
| Act Effct Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |
| Control Delay | | |
| Queue Delay | | |
| Total Delay | | |
| LOS | | |
| Approach Delay | | |
| Approach LOS | | |
| Intersection Summary | | |
| intersection Summary | | |

Queues

571: Strachan Ave & Canada Blvd/Fleet St

12/18/2020

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|------------------------|------|-------|-------|------|------|----------|------|-------|--|
| Lane Group | EBL | EBT | WBT | WBR | NBL | NBT | SBL | SBT | |
| Lane Group Flow (vph) | 101 | 150 | 194 | 99 | 92 | 460 | 54 | 273 | |
| v/c Ratio | 0.36 | 0.30 | 0.56 | 0.20 | 0.16 | 0.48 | 0.13 | 0.27 | |
| Control Delay | 30.1 | 23.4 | 34.6 | 2.0 | 10.3 | 12.7 | 10.2 | 10.4 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | |
| Total Delay | 30.1 | 23.4 | 34.6 | 2.0 | 10.3 | 12.8 | 10.2 | 10.4 | |
| Queue Length 50th (m) | 14.1 | 17.4 | 28.9 | 0.0 | 6.9 | 39.7 | 4.0 | 21.0 | |
| Queue Length 95th (m) | 28.2 | 32.8 | 50.4 | 3.6 | 15.7 | 69.3 | 10.4 | 38.0 | |
| Internal Link Dist (m) | | 119.4 | 205.0 | | | 181.6 | | 217.4 | |
| Turn Bay Length (m) | 25.0 | | | 50.0 | 30.0 | | 25.0 | | |
| Base Capacity (vph) | 439 | 770 | 546 | 694 | 565 | 964 | 421 | 997 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 33 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.23 | 0.19 | 0.36 | 0.14 | 0.16 | 0.49 | 0.13 | 0.27 | |
| Intersection Summary | | | | | | | | | |

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HCM Signalized Intersection Capacity Analysis 571: Strachan Ave & Canada Blvd/Fleet St

12/18/2020

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|-------------------------------|------------|----------|---------------|------|------------|------------|---------|----------|------|-------------|------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | 7 | ĵ. | | | ર્ન | 7 | * | ĥ | | 7 | f. | |
| Traffic Volume (vph) | 91 | 85 | 50 | 119 | 56 | 89 | 83 | 232 | 182 | 49 | 198 | 48 |
| Future Volume (vph) | 91 | 85 | 50 | 119 | 56 | 89 | 83 | 232 | 182 | 49 | 198 | 48 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frpb, ped/bikes | 1.00 | 0.98 | | | 1.00 | 0.95 | 1.00 | 0.97 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 0.98 | 1.00 | | | 0.98 | 1.00 | 0.98 | 1.00 | | 0.98 | 1.00 | |
| Frt | 1.00 | 0.94 | | | 1.00 | 0.85 | 1.00 | 0.93 | | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | | 0.97 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1554 | 1673 | | | 1650 | 1364 | 1611 | 1663 | | 1592 | 1728 | |
| Flt Permitted | 0.59 | 1.00 | | | 0.71 | 1.00 | 0.58 | 1.00 | | 0.43 | 1.00 | |
| Satd. Flow (perm) | 968 | 1673 | | | 1204 | 1364 | 985 | 1663 | | 720 | 1728 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 101 | 94 | 56 | 132 | 62 | 99 | 92 | 258 | 202 | 54 | 220 | 53 |
| RTOR Reduction (vph) | 0 | 15 | 0 | 0 | 0 | 70 | 0 | 13 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 101 | 135 | 0 | 0 | 194 | 29 | 92 | 447 | 0 | 54 | 269 | 0 |
| Confl. Peds. (#/hr) | 14 | | 16 | 16 | | 14 | 17 | | 18 | 18 | | 17 |
| Heavy Vehicles (%) | 6% | 5% | 2% | 0% | 25% | 5% | 2% | 5% | 0% | 4% | 5% | 2% |
| Turn Type | Perm | NA | | Perm | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 25.8 | 25.8 | | | 25.8 | 25.8 | 52.0 | 52.0 | | 52.0 | 52.0 | |
| Effective Green, g (s) | 26.8 | 26.8 | | | 26.8 | 26.8 | 53.0 | 53.0 | | 53.0 | 53.0 | |
| Actuated g/C Ratio | 0.29 | 0.29 | | | 0.29 | 0.29 | 0.58 | 0.58 | | 0.58 | 0.58 | |
| Clearance Time (s) | 7.0 | 7.0 | | | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 282 | 488 | | | 351 | 398 | 568 | 960 | | 415 | 997 | |
| v/s Ratio Prot | | 0.08 | | | | | | c0.27 | | | 0.16 | |
| v/s Ratio Perm | 0.10 | | | | c0.16 | 0.02 | 0.09 | | | 0.08 | | |
| v/c Ratio | 0.36 | 0.28 | | | 0.55 | 0.07 | 0.16 | 0.47 | | 0.13 | 0.27 | |
| Uniform Delay, d1 | 25.7 | 25.0 | | | 27.4 | 23.5 | 9.0 | 11.2 | | 8.9 | 9.7 | |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.8 | 0.3 | | | 1.9 | 0.1 | 0.6 | 1.6 | | 0.6 | 0.7 | |
| Delay (s) | 26.5 | 25.3 | | | 29.3 | 23.6 | 9.7 | 12.8 | | 9.5 | 10.4 | |
| Level of Service | С | С | | | С | С | Α | В | | Α | В | |
| Approach Delay (s) | | 25.8 | | | 27.4 | | | 12.3 | | | 10.2 | |
| Approach LOS | | С | | | С | | | В | | | В | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 17.3 | Н | CM 2000 | Level of | Service | | В | | | |
| HCM 2000 Volume to Capa | city ratio | | 0.62 | | | | | | | | | |
| Actuated Cycle Length (s) | • | | 91.8 | S | um of lost | t time (s) | | | 28.0 | | | |
| Intersection Capacity Utiliza | ation | | 125.6% | IC | U Level | of Service | | | Н | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |
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|----------------------------|-------|----------|-------|------|----------|-------|------|----------|-------|------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | * | A | | | | 77 | | ተተኈ | | | | |
| Traffic Volume (vph) | 54 | 410 | 0 | 0 | 0 | 341 | 0 | 1125 | 14 | 0 | 0 | 0 |
| Future Volume (vph) | 54 | 410 | 0 | 0 | 0 | 341 | 0 | 1125 | 14 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 2150 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 15.0 | | 0.0 | 0.0 | | 80.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 0 | | 1 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.88 | 1.00 | 0.91 | 0.91 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | | | | | | 0.850 | | 0.998 | | | | |
| Flt Protected | 0.950 | | | | | | | | | | | |
| Satd. Flow (prot) | 1620 | 1807 | 0 | 0 | 0 | 2652 | 0 | 4968 | 0 | 0 | 0 | 0 |
| Flt Permitted | 0.950 | | | | | | | | | | | |
| Satd. Flow (perm) | 1620 | 1807 | 0 | 0 | 0 | 2652 | 0 | 4968 | 0 | 0 | 0 | 0 |
| Right Turn on Red | Yes | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | 76 | | | | | 1059 | | 1 | | | | |
| Link Speed (k/h) | | 60 | | | 30 | | | 60 | | | 60 | |
| Link Distance (m) | | 411.9 | | | 164.9 | | | 800.6 | | | 492.6 | |
| Travel Time (s) | | 24.7 | | | 19.8 | | | 48.0 | | | 29.6 | |
| Confl. Peds. (#/hr) | | | 1 | 1 | | | 15 | | | | | 15 |
| 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 (%) | 4% | 4% | 4% | 0% | 0% | 6% | 0% | 3% | 7% | 0% | 0% | 0% |
| Adj. Flow (vph) | 60 | 456 | 0 | 0 | 0 | 379 | 0 | 1250 | 16 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 60 | 456 | 0 | 0 | 0 | 379 | 0 | 1266 | 0 | 0 | 0 | 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) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | 3 |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.09 | 1.01 | 0.86 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | | | 1 | | 2 | | | | |
| Detector Template | Left | Thru | | | | Right | | Thru | | | | |
| Leading Detector (m) | 6.1 | 30.5 | | | | 6.1 | | 30.5 | | | | |
| Trailing Detector (m) | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Detector 1 Position(m) | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Detector 1 Size(m) | 6.1 | 1.8 | | | | 6.1 | | 1.8 | | | | |
| Detector 1 Type | CI+Ex | CI+Ex | | | | CI+Ex | | CI+Ex | | | | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Detector 2 Position(m) | · · · | 28.7 | | | | | | 28.7 | | | | |
| Detector 2 Size(m) | | 1.8 | | | | | | 1.8 | | | | |
| Detector 2 Type | | CI+Ex | | | | | | CI+Ex | | | | |
| Detector 2 Channel | | | | | | | | | | | | |

Lanes, Volumes, Timings 1344: Lakeshore Blvd & British Colombia Rd

| 12/18/2020 |
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|----------------------------|---------------|-------------|-------------|---------|------------|------------|-----|-----------|-------------|-------------|----------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Detector 2 Extend (s) | | 0.0 | | | | | | 0.0 | | | | |
| Turn Type | Perm | NA | | | | Perm | | NA | | | | |
| Protected Phases | | 4 | | | | | | 2 | | | | |
| Permitted Phases | 4 | | | | | 9 | | | | | | |
| Detector Phase | 4 | 4 | | | | 9 | | 2 | | | | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | | | 10.0 | | 10.0 | | | | |
| Minimum Split (s) | 27.0 | 27.0 | | | | 31.0 | | 29.0 | | | | |
| Total Split (s) | 61.0 | 61.0 | | | | 49.0 | | 34.0 | | | | |
| Total Split (%) | 42.4% | 42.4% | | | | 34.0% | | 23.6% | | | | |
| Maximum Green (s) | 55.0 | 55.0 | | | | 43.0 | | 27.0 | | | | |
| Yellow Time (s) | 4.0 | 4.0 | | | | 4.0 | | 4.0 | | | | |
| All-Red Time (s) | 2.0 | 2.0 | | | | 2.0 | | 3.0 | | | | |
| Lost Time Adjust (s) | -1.0 | -1.0 | | | | -1.0 | | -1.0 | | | | |
| Total Lost Time (s) | 5.0 | 5.0 | | | | 5.0 | | 6.0 | | | | |
| Lead/Lag | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | 3.0 | | 3.0 | | | | |
| Recall Mode | Max | Max | | | | None | | Max | | | | |
| Walk Time (s) | 0.0 | 0.0 | | | | 140110 | | 7.0 | | | | |
| Flash Dont Walk (s) | 0.0 | 0.0 | | | | | | 15.0 | | | | |
| Pedestrian Calls (#/hr) | 0.0 | 0.0 | | | | | | 0 | | | | |
| Act Effct Green (s) | 56.0 | 56.0 | | | | 11.0 | | 28.0 | | | | |
| Actuated g/C Ratio | 0.50 | 0.50 | | | | 0.10 | | 0.25 | | | | |
| v/c Ratio | 0.07 | 0.50 | | | | 0.10 | | 1.01 | | | | |
| Control Delay | 2.4 | 20.6 | | | | 0.51 | | 69.6 | | | | |
| Queue Delay | 0.0 | 0.0 | | | | 0.7 | | 0.0 | | | | |
| Total Delay | 2.4 | 20.6 | | | | 0.0 | | 69.6 | | | | |
| LOS | 2.4 A | 20.0 C | | | | Ο.7 | | 09.0 E | | | | |
| Approach Delay | А | 18.5 | | | 0.7 | А | | 69.6 | | | | |
| | | 10.5 B | | | 0.7 A | | | 09.0 F | | | | |
| Approach LOS | | D | | | А | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 144 | | | | | | | | | | | | |
| Actuated Cycle Length: 1 | 111 | | | | | | | | | | | |
| Natural Cycle: 90 | | | | | | | | | | | | |
| Control Type: Semi Act-L | | | | | | | | | | | | |
| Maximum v/c Ratio: 1.01 | | | | | | | | | | | | |
| Intersection Signal Delay | | | | | tersection | | | | | | | |
| Intersection Capacity Util | | | | IC | U Level | of Service | В | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Splits and Phases: 134 | 44: Lakeshore | Blvd & Bi | ritish Colo | mbia Rd | | | | | | | | |
| ↑ Ø2 | | 1 04 | | | | | | Ø9 | | | | |
| 34 s | 61.0 | דע | | | | | 40 | | | | | |
| 010 | 018 | | | | | | | - | | | | |

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| Lane Group | EBL | EBT | WBR | NBT |
| Lane Group Flow (vph) | 60 | 456 | 379 | 1266 |
| v/c Ratio | 0.07 | 0.50 | 0.31 | 1.01 |
| Control Delay | 2.4 | 20.6 | 0.7 | 69.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 2.4 | 20.6 | 0.7 | 69.6 |
| Queue Length 50th (m) | 0.0 | 63.1 | 0.0 | ~102.5 |
| Queue Length 95th (m) | 4.7 | 90.6 | 0.0 | #134.9 |
| Internal Link Dist (m) | | 387.9 | | 776.6 |
| Turn Bay Length (m) | 15.0 | | 80.0 | |
| Base Capacity (vph) | 854 | 911 | 1690 | 1253 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.07 | 0.50 | 0.22 | 1.01 |

| HCM Signalized 1344: Lakeshore | | . , , |
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|---|------------|----------|-------|------|------------|----------|---------|-----------------|------|------|----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | * | ^ | | | | 77 | | ተተ _ጉ | | | | |
| Traffic Volume (vph) | 54 | 410 | 0 | 0 | 0 | 341 | 0 | 1125 | 14 | 0 | 0 | 0 |
| Future Volume (vph) | 54 | 410 | 0 | 0 | 0 | 341 | 0 | 1125 | 14 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 2150 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 5.0 | 5.0 | | | | 5.0 | | 6.0 | | | | |
| Lane Util. Factor | 1.00 | 1.00 | | | | 0.88 | | 0.91 | | | | |
| Frpb, ped/bikes | 1.00 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Flpb, ped/bikes | 1.00 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Frt | 1.00 | 1.00 | | | | 0.85 | | 1.00 | | | | |
| Flt Protected | 0.95 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Satd. Flow (prot) | 1620 | 1807 | | | | 2652 | | 4968 | | | | |
| Flt Permitted | 0.95 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Satd. Flow (perm) | 1620 | 1807 | | | | 2652 | | 4968 | | | | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 60 | 456 | 0.30 | 0.30 | 0.30 | 379 | 0.30 | 1250 | 16 | 0.30 | 0.30 | 0.50 |
| RTOR Reduction (vph) | 30 | 450 | 0 | 0 | 0 | 341 | 0 | 1230 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 30 | 456 | 0 | 0 | 0 | 38 | 0 | 1265 | 0 | 0 | 0 | 0 |
| | 30 | 400 | 1 | 1 | U | 30 | 15 | 1200 | U | U | U | 15 |
| Confl. Peds. (#/hr) Heavy Vehicles (%) | 4% | 4% | 4% | 0% | 0% | 6% | 0% | 3% | 7% | 0% | 0% | 0% |
| - | | NA | 470 | 0% | U% | | U70 | | 1 70 | U% | U70 | U% |
| Turn Type | Perm | NA 4 | | | | Perm | | NA 2 | | | | |
| Protected Phases | | 4 | | | | ^ | | 2 | | | | |
| Permitted Phases | 4 | FF 0 | | | | 9 | | 07.0 | | | | |
| Actuated Green, G (s) | 55.0 | 55.0 | | | | 10.0 | | 27.0 | | | | |
| Effective Green, g (s) | 56.0 | 56.0 | | | | 11.0 | | 28.0 | | | | |
| Actuated g/C Ratio | 0.50 | 0.50 | | | | 0.10 | | 0.25 | | | | |
| Clearance Time (s) | 6.0 | 6.0 | | | | 6.0 | | 7.0 | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | 3.0 | | 3.0 | | | | |
| Lane Grp Cap (vph) | 817 | 911 | | | | 262 | | 1253 | | | | |
| v/s Ratio Prot | | c0.25 | | | | | | c0.25 | | | | |
| v/s Ratio Perm | 0.02 | | | | | c0.01 | | | | | | |
| v/c Ratio | 0.04 | 0.50 | | | | 0.14 | | 1.01 | | | | |
| Uniform Delay, d1 | 13.9 | 18.2 | | | | 45.7 | | 41.5 | | | | |
| Progression Factor | 1.00 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Incremental Delay, d2 | 0.1 | 2.0 | | | | 0.3 | | 27.8 | | | | |
| Delay (s) | 14.0 | 20.2 | | | | 45.9 | | 69.3 | | | | |
| Level of Service | В | С | | | | D | | Е | | | | |
| Approach Delay (s) | | 19.5 | | | 45.9 | | | 69.3 | | | 0.0 | |
| Approach LOS | | В | | | D | | | Е | | | Α | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 53.3 | Н | CM 2000 | Level of | Service | | D | | | |
| HCM 2000 Volume to Capac | city ratio | | 0.62 | | | | | | | | | |
| Actuated Cycle Length (s) | • | | 111.0 | S | um of lost | time (s) | | | 17.0 | | | |
| Intersection Capacity Utiliza | tion | | 55.6% | | U Level o | | | | В | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |
| 2ou 20 0.0ap | | | | | | | | | | | | |

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.

Lanes, Volumes, Timings 1449: Dufferin St & Dwy/Liberty St

12/18/2020

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|----------------------------|-------|-------|-------|-------|----------|-------|-------|----------|----------|-------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 4 | | | 4 | | | 4 | | | 4 | |
| Traffic Volume (vph) | 5 | 0 | 6 | 176 | 0 | 56 | 0 | 240 | 434 | 0 | 419 | 0 |
| Future Volume (vph) | 5 | 0 | 6 | 176 | 0 | 56 | 0 | 240 | 434 | 0 | 419 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| 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 |
| Ped Bike Factor | | 0.75 | | | 0.70 | | | 0.68 | | | | |
| Frt | | 0.921 | | | 0.967 | | | 0.913 | | | | |
| Flt Protected | | 0.980 | | | 0.963 | | | | | | | |
| Satd. Flow (prot) | 0 | 1375 | 0 | 0 | 1561 | 0 | 0 | 1016 | 0 | 0 | 1571 | 0 |
| FIt Permitted | | 0.899 | | | 0.771 | | | | | | | |
| Satd. Flow (perm) | 0 | 1163 | 0 | 0 | 958 | 0 | 0 | 1016 | 0 | 0 | 1571 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 41 | | | 41 | | | 87 | | | | |
| Link Speed (k/h) | | 50 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 106.6 | | | 106.9 | | | 249.2 | | | 212.5 | |
| Travel Time (s) | | 7.7 | | | 9.6 | | | 17.9 | | | 15.3 | |
| Confl. Peds. (#/hr) | 157 | | 273 | 273 | | 157 | 260 | | 222 | 222 | | 260 |
| Confl. Bikes (#/hr) | | | 15 | | | 25 | | | 2 | | | 13 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 0% | 2% | 0% | 1% | 0% | 4% | 0% | 12% | 1% | 0% | 10% | 0% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 20 | 20 | 12 | 20 | 20 |
| Adj. Flow (vph) | 5 | 0 | 7 | 191 | 0 | 61 | 0 | 261 | 472 | 0 | 455 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 12 | 0 | 0 | 252 | 0 | 0 | 733 | 0 | 0 | 455 | 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) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.13 | 1.01 | 1.01 | 1.13 | 1.01 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | | NA | | | NA | |

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Lanes, Volumes, Timings 1449: Dufferin St & Dwy/Liberty St

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|------------------------------|--------------|------------|---------------|-----------|-------------|------------|-------|----------------|-----|-------|-----------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Minimum Split (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Total Split (s) | 28.0 | 28.0 | | 28.0 | 28.0 | | 52.0 | 52.0 | | 52.0 | 52.0 | |
| Total Split (%) | 35.0% | 35.0% | | 35.0% | 35.0% | | 65.0% | 65.0% | | 65.0% | 65.0% | |
| Maximum Green (s) | 23.0 | 23.0 | | 23.0 | 23.0 | | 46.0 | 46.0 | | 46.0 | 46.0 | |
| Yellow Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | -1.0 | | | -1.0 | | | -1.0 | | | -1.0 | |
| Total Lost Time (s) | | 4.0 | | | 4.0 | | | 5.0 | | | 5.0 | |
| Lead/Lag | | 1.0 | | | 1.0 | | | 0.0 | | | 0.0 | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 100 | 100 | | 100 | 100 | | 100 | 100 | | 100 | 100 | |
| Act Effct Green (s) | 100 | 22.5 | | 100 | 22.5 | | 100 | 48.5 | | 100 | 48.5 | |
| Actuated g/C Ratio | | 0.28 | | | 0.28 | | | 0.61 | | | 0.61 | |
| v/c Ratio | | 0.20 | | | 0.84 | | | 1.13 | | | 0.48 | |
| Control Delay | | 0.5 | | | 48.6 | | | 94.8 | | | 24.2 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 0.5 | | | 48.6 | | | 94.8 | | | 24.2 | |
| LOS | | 0.5 A | | | 40.0 D | | | 54.0 F | | | 24.2 C | |
| Approach Delay | | 0.5 | | | 48.6 | | | 94.8 | | | 24.2 | |
| Approach LOS | | 0.5 A | | | 40.0 D | | | 54.0 F | | | 24.2 C | |
| | | ^ | | | D | | | | | | U | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 80 | | | | | | | | | | | | |
| Actuated Cycle Length: 80 | | | | | | | | | | | | |
| Offset: 40 (50%), Reference | ced to phase | 2:NBTL a | and 6:SB | TL, Start | of Green | | | | | | | |
| Natural Cycle: 70 | | | | | | | | | | | | |
| Control Type: Actuated-Co | ordinated | | | | | | | | | | | |
| Maximum v/c Ratio: 1.13 | | | | | | | | | | | | |
| Intersection Signal Delay: | | | | Ir | ntersection | LOS: E | | | | | | |
| Intersection Capacity Utiliz | ation 73.5% | | | IC | CU Level of | of Service | D D | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Splits and Phases: 1449 | : Dufferin S | t & Dwy/Li | berty St | | | | | | | | | |
| 1 (22 (22) | | | | | | | - 1- | <u>∳</u> Ø4 | | | | |
| Ø2 (R) | | | | | | | 20 | -104 | | | | |
| 1 | | | | | | | 28 | 5 | | | | |
| Ø6 (R) | | | | | | | - 13 | Ø8 | | | | |
| | | | | | | | - | | | | | |

Queues

1449: Dufferin St & Dwy/Liberty St

12/18/2020

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|------------------------|------|-------|--------|-------|
| | | | | , |
| Lane Group | EBT | WBT | NBT | SBT |
| Lane Group Flow (vph) | 12 | 252 | 733 | 455 |
| v/c Ratio | 0.03 | 0.84 | 1.13 | 0.48 |
| Control Delay | 0.5 | 48.6 | 94.8 | 24.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 0.5 | 48.6 | 94.8 | 24.2 |
| Queue Length 50th (m) | 0.0 | 29.6 | ~128.6 | 58.0 |
| Queue Length 95th (m) | 0.4 | #68.3 | #193.1 | m65.9 |
| Internal Link Dist (m) | 82.6 | 82.9 | 225.2 | 188.5 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 377 | 316 | 649 | 952 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | | | 1.13 | 0.48 |

Intersection Summary

Existing AM 05/06/2014 HDR Corporation Synchro 10 Report Page 27 HCM Signalized Intersection Capacity Analysis 1449: Dufferin St & Dwy/Liberty St

12/18/2020

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|-------------------------------|------------|----------|-------|------|------------|------------|---------|----------|----------|----------|------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 4 | | | 4 | | | 4 | | | 4 | |
| Traffic Volume (vph) | 5 | 0 | 6 | 176 | 0 | 56 | 0 | 240 | 434 | 0 | 419 | 0 |
| Future Volume (vph) | 5 | 0 | 6 | 176 | 0 | 56 | 0 | 240 | 434 | 0 | 419 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 4.0 | | | 5.0 | | | 5.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | | 0.81 | | | 0.91 | | | 0.68 | | | 1.00 | |
| Flpb, ped/bikes | | 0.92 | | | 0.77 | | | 1.00 | | | 1.00 | |
| Frt | | 0.92 | | | 0.97 | | | 0.91 | | | 1.00 | |
| Flt Protected | | 0.98 | | | 0.96 | | | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | | 1269 | | | 1198 | | | 1016 | | | 1571 | |
| Flt Permitted | | 0.90 | | | 0.77 | | | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | | 1164 | | | 958 | | | 1016 | | | 1571 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 5 | 0 | 7 | 191 | 0 | 61 | 0 | 261 | 472 | 0 | 455 | 0 |
| RTOR Reduction (vph) | 0 | 9 | 0 | 0 | 29 | 0 | 0 | 34 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 3 | 0 | 0 | 223 | 0 | 0 | 699 | 0 | 0 | 455 | 0 |
| Confl. Peds. (#/hr) | 157 | | 273 | 273 | | 157 | 260 | | 222 | 222 | | 260 |
| Confl. Bikes (#/hr) | | | 15 | | | 25 | | | 2 | | | 13 |
| Heavy Vehicles (%) | 0% | 2% | 0% | 1% | 0% | 4% | 0% | 12% | 1% | 0% | 10% | 0% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 20 | 20 | 12 | 20 | 20 |
| Turn Type | Perm | NA | | Perm | NA | | | NA | | | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 21.5 | | | 21.5 | | | 47.5 | | | 47.5 | |
| Effective Green, g (s) | | 22.5 | | | 22.5 | | | 48.5 | | | 48.5 | |
| Actuated g/C Ratio | | 0.28 | | | 0.28 | | | 0.61 | | | 0.61 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | | 327 | | | 269 | | | 615 | | | 952 | |
| v/s Ratio Prot | | | | | | | | c0.69 | | | 0.29 | |
| v/s Ratio Perm | | 0.00 | | | c0.23 | | | | | | | |
| v/c Ratio | | 0.01 | | | 0.83 | | | 1.14 | | | 0.48 | |
| Uniform Delay, d1 | | 20.7 | | | 26.9 | | | 15.8 | | | 8.7 | |
| Progression Factor | | 1.00 | | | 1.00 | | | 1.00 | | | 2.47 | |
| Incremental Delay, d2 | | 0.0 | | | 18.4 | | | 80.0 | | | 0.7 | |
| Delay (s) | | 20.7 | | | 45.4 | | | 95.7 | | | 22.3 | |
| Level of Service | | С | | | D | | | F | | | С | |
| Approach Delay (s) | | 20.7 | | | 45.4 | | | 95.7 | | | 22.3 | |
| Approach LOS | | С | | | D | | | F | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 63.4 | Н | CM 2000 | Level of S | Service | | Е | | | |
| HCM 2000 Volume to Capa | city ratio | | 1.04 | | J.VI 2000 | 20101010 | | | | | | |
| Actuated Cycle Length (s) | , | | 80.0 | Si | um of lost | time (s) | | | 9.0 | | | |
| Intersection Capacity Utiliza | ation | | 73.5% | | U Level o | . , | | | D | | | |
| Analysis Period (min) | | | 15 | 10 | S 20101 C | 5011100 | | | | | | |
| c Critical Lane Group | | | - 10 | | | | | | | | | |
| our 20110 0100p | | | | | | | | | | | | |

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

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

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

12/18/2020

| Lanes, Volumes, | Timings |
|-----------------|---------|
| 1628: Shaw St & | King St |

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|--|-------|-------|---------------|-------|----------|---------|-------|----------|----------|-------------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 4 | | | 4 | | | 413 | | | 413- | |
| Traffic Volume (vph) | 0 | 542 | 17 | 0 | 459 | 60 | 63 | 226 | 19 | 45 | 87 | 116 |
| Future Volume (vph) | 0 | 542 | 17 | 0 | 459 | 60 | 63 | 226 | 19 | 45 | 87 | 116 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.99 | | | 0.99 | | | 0.94 | | | 0.82 | |
| Frt | | 0.996 | | | 0.984 | | | 0.991 | | | 0.930 | |
| Flt Protected | | | | | | | | 0.990 | | | 0.991 | |
| Satd. Flow (prot) | 0 | 1415 | 0 | 0 | 1391 | 0 | 0 | 3063 | 0 | 0 | 2249 | 0 |
| Flt Permitted | | | | | | | | 0.819 | | | 0.828 | |
| Satd. Flow (perm) | 0 | 1415 | 0 | 0 | 1391 | 0 | 0 | 2416 | 0 | 0 | 1845 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 4 | | | 15 | | | 10 | | | 133 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 40 | | | 40 | |
| Link Distance (m) | | 199.1 | | | 255.2 | | | 127.7 | | | 380.6 | |
| Travel Time (s) | | 14.3 | | | 18.4 | | | 11.5 | | | 34.3 | |
| Confl. Peds. (#/hr) | 60 | 14.0 | 239 | 239 | 10.1 | 60 | 194 | 11.0 | 93 | 93 | 01.0 | 194 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles (%) | 100% | 7% | 0% | 100% | 8% | 2% | 5% | 1% | 0% | 33% | 2% | 7% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0.0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 0 | 623 | 20 | 0 | 528 | 69 | 72 | 260 | 22 | 52 | 100 | 133 |
| Shared Lane Traffic (%) | U | 023 | 20 | U | 320 | 03 | 12 | 200 | 22 | 32 | 100 | 100 |
| Lane Group Flow (vph) | 0 | 643 | 0 | 0 | 597 | 0 | 0 | 354 | 0 | 0 | 285 | 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) | Lon | 0.0 | rtigiit | LOIL | 0.0 | rtigitt | LOIL | 0.0 | rtigiit | LOIL | 0.0 | ragnt |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | 1.0 | | | 1.0 | | | 1.0 | | | 1.0 | |
| Headway Factor | 1.16 | 1.32 | 1.16 | 1.16 | 1.32 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 |
| Turning Speed (k/h) | 24 | 1.32 | 1.10 | 24 | 1.32 | 1.10 | 24 | 1.10 | 1.10 | 24 | 1.10 | 1.10 |
| Number of Detectors | 1 | 2 | 14 | 1 | 2 | 14 | 1 | 2 | 14 | 1 | 2 | 14 |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | - | Thru | |
| | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | Left 6.1 | 30.5 | |
| Leading Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Trailing Detector (m) Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| | 6.1 | | | 6.1 | 1.8 | | | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Size(m) | | 1.8 | | | CI+Ex | | 6.1 | | | | CI+Ex | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+EX | | CI+Ex | CI+Ex | | CI+Ex | CI+EX | |
| Detector 1 Channel | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | | | | | | | | | | 0.5 | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | | NA | | | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 4 | | | 8 | |

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|------------------------------|--------------|----------|-----------|----------|-------------|------------|-------------|----------|-----|-------|-------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Detector Phase | 2 | 2 | | 6 | 6 | | 4 | 4 | | 8 | 8 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 22.0 | 22.0 | | 22.0 | 22.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Minimum Split (s) | 28.0 | 28.0 | | 28.0 | 28.0 | | 26.0 | 26.0 | | 26.0 | 26.0 | |
| Total Split (s) | 43.0 | 43.0 | | 43.0 | 43.0 | | 27.0 | 27.0 | | 27.0 | 27.0 | |
| Total Split (%) | 61.4% | 61.4% | | 61.4% | 61.4% | | 38.6% | 38.6% | | 38.6% | 38.6% | |
| Maximum Green (s) | 37.0 | 37.0 | | 37.0 | 37.0 | | 21.0 | 21.0 | | 21.0 | 21.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | -1.0 | | | -1.0 | | | -1.0 | | | -1.0 | |
| Total Lost Time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 5.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | C-Max | C-Max | | C-Max | C-Max | | None | None | | None | None | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 15.0 | 15.0 | | 15.0 | 15.0 | | 13.0 | 13.0 | | 13.0 | 13.0 | |
| Pedestrian Calls (#/hr) | 100 | 100 | | 20 | 20 | | 31 | 31 | | 100 | 100 | |
| Act Effct Green (s) | | 38.9 | | | 38.9 | | | 21.1 | | | 21.1 | |
| Actuated g/C Ratio | | 0.56 | | | 0.56 | | | 0.30 | | | 0.30 | |
| v/c Ratio | | 0.82 | | | 0.77 | | | 0.48 | | | 0.44 | |
| Control Delay | | 23.6 | | | 20.4 | | | 22.0 | | | 12.6 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 23.6 | | | 20.4 | | | 22.0 | | | 12.6 | |
| LOS | | С | | | С | | | С | | | В | |
| Approach Delay | | 23.6 | | | 20.4 | | | 22.0 | | | 12.6 | |
| Approach LOS | | С | | | С | | | С | | | В | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | CBD | | | | | | | | | | | |
| Cycle Length: 70 | | | | | | | | | | | | |
| Actuated Cycle Length: 70 | | | | | | | | | | | | |
| Offset: 1 (1%), Referenced | to phase 2 | EBTL and | I 6:WBTL, | Start of | 1st Green | | | | | | | |
| Natural Cycle: 60 | | | | | | | | | | | | |
| Control Type: Actuated-Co | ordinated | | | | | | | | | | | |
| Maximum v/c Ratio: 0.82 | | | | | | | | | | | | |
| Intersection Signal Delay: | | | | | ntersection | | | | | | | |
| Intersection Capacity Utiliz | ation 78.9% | | | 10 | CU Level o | of Service | D D | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Splits and Phases: 1628 | 3: Shaw St 8 | King St | | | | | | | | | | |
| ø2 (R) | | | | | | | ₹ ø4 | | | | | |
| 43 s | | | | | | | 27 s | | | | | |
| ₩ Ø6 (R) | | | | | | | ↓ øs | | | | | |
| " № (K) | | | | | | | ¥ 100 | | | | | |

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Queues 1628: Shaw St & King St

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|------------------------|--------|----------|----------|----------|
| Lane Group | EBT | WBT | NBT | SBT |
| Lane Group Flow (vph) | 643 | 597 | 354 | 285 |
| v/c Ratio | 0.82 | 0.77 | 0.48 | 0.44 |
| Control Delay | 23.6 | 20.4 | 22.0 | 12.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 23.6 | 20.4 | 22.0 | 12.6 |
| Queue Length 50th (m) | 61.9 | 53.5 | 19.2 | 7.8 |
| Queue Length 95th (m) | #120.3 | #91.1 | 29.1 | 16.4 |
| Internal Link Dist (m) | 175.1 | 231.2 | 103.7 | 356.6 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 788 | 779 | 766 | 671 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.82 | 0.77 | 0.46 | 0.42 |
| Intersection Summary | | | | |

12/18/2020

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

Queue shown is maximum after two cycles.

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HCM Signalized Intersection Capacity Analysis 1628: Shaw St & King St

12/18/2020

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|----------------------------------|---------|-----------|-------|------|------------|------------|---------|-----------|------|---------|-----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 4 | | | 4 | | | 414 | | | 414 | |
| Traffic Volume (vph) | 0 | 542 | 17 | 0 | 459 | 60 | 63 | 226 | 19 | 45 | 87 | 116 |
| Future Volume (vph) | 0 | 542 | 17 | 0 | 459 | 60 | 63 | 226 | 19 | 45 | 87 | 116 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 5.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | | 0.99 | | | 0.99 | | | 0.99 | | | 0.84 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | | 0.95 | | | 0.98 | |
| Frt | | 1.00 | | | 0.98 | | | 0.99 | | | 0.93 | |
| Flt Protected | | 1.00 | | | 1.00 | | | 0.99 | | | 0.99 | |
| Satd. Flow (prot) | | 1415 | | | 1391 | | | 2920 | | | 2209 | |
| Flt Permitted | | 1.00 | | | 1.00 | | | 0.82 | | | 0.83 | |
| Satd. Flow (perm) | | 1415 | | | 1391 | | | 2417 | | | 1846 | |
| Peak-hour factor, PHF | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Adj. Flow (vph) | 0 | 623 | 20 | 0 | 528 | 69 | 72 | 260 | 22 | 52 | 100 | 133 |
| RTOR Reduction (vph) | 0 | 2 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 93 | 0 |
| Lane Group Flow (vph) | 0 | 641 | 0 | 0 | 590 | 0 | 0 | 347 | 0 | 0 | 192 | 0 |
| Confl. Peds. (#/hr) | 60 | 0 | 239 | 239 | 000 | 60 | 194 | 0 | 93 | 93 | .02 | 194 |
| Heavy Vehicles (%) | 100% | 7% | 0% | 100% | 8% | 2% | 5% | 1% | 0% | 33% | 2% | 7% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Turn Type | | NA. | 21 | | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | 1 Cilli | 4 | | 1 Cilli | 8 | |
| Permitted Phases | 2 | 2 | | 6 | U | | 4 | - | | 8 | U | |
| Actuated Green, G (s) | | 37.9 | | | 37.9 | | | 20.1 | | | 20.1 | |
| Effective Green, g (s) | | 38.9 | | | 38.9 | | | 21.1 | | | 21.1 | |
| Actuated g/C Ratio | | 0.56 | | | 0.56 | | | 0.30 | | | 0.30 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | | 786 | | | 772 | | | 728 | | | 556 | |
| v/s Ratio Prot | | | | | 0.42 | | | 120 | | | 556 | |
| | | c0.45 | | | 0.42 | | | -0.44 | | | 0.10 | |
| v/s Ratio Perm | | 0.00 | | | 0.70 | | | c0.14 | | | | |
| v/c Ratio | | 0.82 | | | 0.76 | | | 0.48 | | | 0.35 | |
| Uniform Delay, d1 | | 12.6 | | | 12.0 | | | 19.9 | | | 19.1 | |
| Progression Factor | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | | 9.1 | | | 7.1 | | | 0.5 | | | 0.4 | |
| Delay (s) | | 21.8 | | | 19.1 | | | 20.4 | | | 19.4 | |
| Level of Service | | C 21.8 | | | B 19.1 | | | C | | | B 19.4 | |
| Approach Delay (s) Approach LOS | | 21.8 C | | | 19.1 B | | | 20.4 C | | | 19.4 B | |
| •• | | | | | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 20.3 | H | CM 2000 | Level of | Service | | С | | | |
| HCM 2000 Volume to Capacity | / ratio | | 0.70 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 70.0 | | um of lost | | | | 10.0 | | | |
| Intersection Capacity Utilizatio | n | | 78.9% | IC | U Level o | of Service | | | D | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

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|----------------------------|-------|-------|-------|-------|----------|-------|-------|----------|-------|----------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 4 | | | 4 | | | 4 | | | 4 | |
| Traffic Volume (vph) | 0 | 644 | 5 | 0 | 534 | 105 | 0 | 5 | 0 | 154 | 0 | 96 |
| Future Volume (vph) | 0 | 644 | 5 | 0 | 534 | 105 | 0 | 5 | 0 | 154 | 0 | 96 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| 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 |
| Ped Bike Factor | | 1.00 | | | 0.99 | | | | | | 0.87 | |
| Frt | | 0.999 | | | 0.978 | | | | | | 0.948 | |
| Flt Protected | | | | | | | | | | | 0.970 | |
| Satd. Flow (prot) | 0 | 1293 | 0 | 0 | 1334 | 0 | 0 | 1409 | 0 | 0 | 1314 | 0 |
| Flt Permitted | | | | | | | | | | | 0.809 | |
| Satd. Flow (perm) | 0 | 1293 | 0 | 0 | 1334 | 0 | 0 | 1409 | 0 | 0 | 1054 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 1 | | | 22 | | | | | | 41 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 318.4 | | | 199.1 | | | 158.6 | | | 196.7 | |
| Travel Time (s) | | 22.9 | | | 14.3 | | | 11.4 | | | 14.2 | |
| Confl. Peds. (#/hr) | 41 | | 148 | 148 | | 41 | 117 | | 33 | 33 | | 117 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 0% | 18% | 0% | 0% | 11% | 8% | 0% | 20% | 0% | 6% | 0% | 10% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 0 | 732 | 6 | 0 | 607 | 119 | 0 | 6 | 0 | 175 | 0 | 109 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 738 | 0 | 0 | 726 | 0 | 0 | 6 | 0 | 0 | 284 | 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 | J . | | 0.0 | , | | 0.0 | J - | | 0.0 | J . |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.16 | 1.32 | 1.16 | 1.16 | 1.32 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | 0.0 | 28.7 | | 0.0 | 28.7 | | 0.0 | 28.7 | | 0.0 | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | J X | | | J X | | | J X | | | 3 ZX | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | | NA | | | NA | | | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 8 | | i Giiii | 4 | |
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|------------------------------|---------------|-----------|--------|-------------|-------------|------------|-------|-------------------|-----|-------|-------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBI |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Detector Phase | 2 | 2 | | 6 | 6 | | 8 | 8 | | 4 | 4 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 21.0 | 21.0 | | 21.0 | 21.0 | |
| Minimum Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 26.0 | 26.0 | | 26.0 | 26.0 | |
| Total Split (s) | 53.0 | 53.0 | | 53.0 | 53.0 | | 27.0 | 27.0 | | 27.0 | 27.0 | |
| Total Split (%) | 66.3% | 66.3% | | 66.3% | 66.3% | | 33.8% | 33.8% | | 33.8% | 33.8% | |
| Maximum Green (s) | 47.0 | 47.0 | | 47.0 | 47.0 | | 22.0 | 22.0 | | 22.0 | 22.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | -1.0 | | | -1.0 | | | -1.0 | | | -1.0 | |
| Total Lost Time (s) | | 5.0 | | | 5.0 | | | 4.0 | | | 4.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | C-Max | C-Max | | C-Max | C-Max | | None | None | | None | None | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 17.0 | 17.0 | | 17.0 | 17.0 | | 14.0 | 14.0 | | 14.0 | 14.0 | |
| Pedestrian Calls (#/hr) | 100 | 100 | | 14 | 14 | | 100 | 100 | | 11 | 11 | |
| Act Effct Green (s) | | 48.2 | | | 48.2 | | | 22.8 | | | 22.8 | |
| Actuated g/C Ratio | | 0.60 | | | 0.60 | | | 0.28 | | | 0.28 | |
| v/c Ratio | | 0.95 | | | 0.89 | | | 0.01 | | | 0.86 | |
| Control Delay | | 39.0 | | | 29.8 | | | 20.6 | | | 50.1 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 39.0 | | | 29.8 | | | 20.6 | | | 50.1 | |
| LOS | | D | | | С | | | С | | | D | |
| Approach Delay | | 39.0 | | | 29.8 | | | 20.6 | | | 50.1 | |
| Approach LOS | | D | | | С | | | С | | | D | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | CBD | | | | | | | | | | | |
| Cycle Length: 80 | | | | | | | | | | | | |
| Actuated Cycle Length: 80 | | | | | | | | | | | | |
| Offset: 1 (1%), Reference | d to phase 2: | EBTL and | 6:WBTL | ., Start of | 1st Green | 1 | | | | | | |
| Natural Cycle: 80 | | | | | | | | | | | | |
| Control Type: Actuated-Co | oordinated | | | | | | | | | | | |
| Maximum v/c Ratio: 0.95 | | | | | | | | | | | | |
| Intersection Signal Delay: | | | | | ntersection | | | | | | | |
| Intersection Capacity Utiliz | zation 71.5% | | | 10 | CU Level | of Service | e C | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Splits and Phases: 185 | 1: King St & | Sudbury S | St | | | | | | | | | |
| ø2 (R) | | | | | | | | Ø4 | | | | |
| 53 s | | | | | | | 2 | 7 s | | | | |
| ▼ Ø6 (R) | | | | | | | | ¶ [†] ø8 | | | | |
| 53 s | | | | | | | 2 | 7 s | | | | |
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1851: King St & Sudbury St

12/18/2020

| | - | ← | † | ↓ |
|------------------------|--------|----------|----------|----------|
| Lane Group | EBT | WBT | NBT | SBT |
| Lane Group Flow (vph) | 738 | 726 | 6 | 284 |
| v/c Ratio | 0.95 | 0.89 | 0.01 | 0.86 |
| Control Delay | 39.0 | 29.8 | 20.6 | 50.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 39.0 | 29.8 | 20.6 | 50.1 |
| Queue Length 50th (m) | 94.3 | 84.3 | 0.7 | 35.1 |
| Queue Length 95th (m) | #169.6 | #158.4 | 3.2 | #75.4 |
| Internal Link Dist (m) | 294.4 | 175.1 | 134.6 | 172.7 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 779 | 812 | 405 | 332 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.95 | 0.89 | 0.01 | 0.86 |
| Intersection Summany | | | | |

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

Queue shown is maximum after two cycles.

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HCM Signalized Intersection Capacity Analysis 1851: King St & Sudbury St

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|-----------------------------------|-------|-------|-------|------|------------|------------|---------|----------|------|-------------|---------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 4 | | | 4 | | | 4 | | | 4 | |
| Traffic Volume (vph) | 0 | 644 | 5 | 0 | 534 | 105 | 0 | 5 | 0 | 154 | 0 | 96 |
| Future Volume (vph) | 0 | 644 | 5 | 0 | 534 | 105 | 0 | 5 | 0 | 154 | 0 | 96 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | | 4.0 | | | 4.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | | 1.00 | | | 0.99 | | | 1.00 | | | 0.91 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | | 1.00 | | | 0.96 | |
| Frt | | 1.00 | | | 0.98 | | | 1.00 | | | 0.95 | |
| Flt Protected | | 1.00 | | | 1.00 | | | 1.00 | | | 0.97 | |
| Satd. Flow (prot) | | 1293 | | | 1333 | | | 1409 | | | 1264 | |
| Flt Permitted | | 1.00 | | | 1.00 | | | 1.00 | | | 0.81 | |
| Satd. Flow (perm) | | 1293 | | | 1333 | | | 1409 | | | 1053 | |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 0 | 732 | 6 | 0 | 607 | 119 | 0 | 6 | 0 | 175 | 0 | 109 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 29 | 0 |
| Lane Group Flow (vph) | 0 | 738 | 0 | 0 | 717 | 0 | 0 | 6 | 0 | 0 | 255 | 0 |
| Confl. Peds. (#/hr) | 41 | | 148 | 148 | | 41 | 117 | | 33 | 33 | | 117 |
| Heavy Vehicles (%) | 0% | 18% | 0% | 0% | 11% | 8% | 0% | 20% | 0% | 6% | 0% | 10% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Turn Type | | NA | | | NA | | | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 47.2 | | | 47.2 | | | 21.8 | | | 21.8 | |
| Effective Green, g (s) | | 48.2 | | | 48.2 | | | 22.8 | | | 22.8 | |
| Actuated g/C Ratio | | 0.60 | | | 0.60 | | | 0.29 | | | 0.29 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | | 5.0 | | | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | | 779 | | | 803 | | | 401 | | | 300 | |
| v/s Ratio Prot | | c0.57 | | | 0.54 | | | 0.00 | | | 000 | |
| v/s Ratio Perm | | 00.01 | | | 0.01 | | | 0.00 | | | c0.24 | |
| v/c Ratio | | 0.95 | | | 0.89 | | | 0.01 | | | 0.85 | |
| Uniform Delay, d1 | | 14.7 | | | 13.7 | | | 20.5 | | | 27.0 | |
| Progression Factor | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | | 21.6 | | | 14.4 | | | 0.0 | | | 19.5 | |
| Delay (s) | | 36.3 | | | 28.1 | | | 20.6 | | | 46.5 | |
| Level of Service | | D | | | C | | | C | | | D | |
| Approach Delay (s) | | 36.3 | | | 28.1 | | | 20.6 | | | 46.5 | |
| Approach LOS | | D | | | С | | | С | | | D | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 34.5 | Н | CM 2000 | Level of S | Service | | С | | | |
| HCM 2000 Volume to Capacity | ratio | | 0.92 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 80.0 | S | um of lost | time (s) | | | 9.0 | | | |
| Intersection Capacity Utilization | | | 71.5% | | | of Service | | | С | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

12/18/2020

Lanes, Volumes, Timings 1912: Atlantic Ave & King St

| Lanes, volumes, limings | |
|---------------------------|----|
| 1912: Atlantic Ave & King | St |

HDR Corporation

12/18/2020

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| | - | • | • | ← | 1 | 1 |
|----------------------------|-------|-------|-------|--------|-------|-------|
| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations | 1> | | | 4 | ኘ | 7 |
| Traffic Volume (vph) | 558 | 64 | 0 | 626 | 239 | 152 |
| Future Volume (vph) | 558 | 64 | 0 | 626 | 239 | 152 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.0 |
| Storage Length (m) | 0.0 | 0.0 | 0.0 | 0.0 | 30.0 | 0.0 |
| Storage Lanes | | 0.0 | 0.0 | | 1 | 1 |
| Taper Length (m) | | , | 2.5 | | 2.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 0.95 | 1.00 | 1.00 | 1.00 | 0.96 | 0.96 |
| Frt | 0.986 | | | | 0.00 | 0.850 |
| FIt Protected | 0.000 | | | | 0.950 | 0.000 |
| Satd. Flow (prot) | 1298 | 0 | 0 | 1390 | 1458 | 1159 |
| Flt Permitted | 1250 | 0 | J | 1000 | 0.950 | 1100 |
| Satd. Flow (perm) | 1298 | 0 | 0 | 1390 | 1399 | 1114 |
| Right Turn on Red | 1230 | Yes | U | 1350 | 1333 | Yes |
| Satd. Flow (RTOR) | 12 | 168 | | | | 49 |
| Link Speed (k/h) | 50 | | | 50 | 30 | 49 |
| Link Distance (m) | 191.3 | | | 318.4 | 198.0 | |
| Travel Time (s) | 13.8 | | | 22.9 | 23.8 | |
| Confl. Peds. (#/hr) | 13.8 | 279 | 279 | 22.9 | 23.8 | 11 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| | 11% | 6% | 100% | 10% | 4% | 17% |
| Heavy Vehicles (%) | 24 | 24 | 100% | 24 | 4% | 17% |
| Bus Blockages (#/hr) | | =: | | | - | - |
| Adj. Flow (vph) | 649 | 74 | 0 | 728 | 278 | 177 |
| Shared Lane Traffic (%) | 700 | | _ | 700 | 070 | 477 |
| Lane Group Flow (vph) | 723 | 0 | 0 | 728 | 278 | 177 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 0.0 | | | 0.0 | 3.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.32 | 1.16 | 1.16 | 1.32 | 1.25 | 1.25 |
| Turning Speed (k/h) | | 14 | 24 | | 24 | 14 |
| Number of Detectors | 2 | | 1 | 2 | 1 | 1 |
| Detector Template | Thru | | Left | Thru | Left | Right |
| Leading Detector (m) | 30.5 | | 6.1 | 30.5 | 6.1 | 6.1 |
| Trailing Detector (m) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 1.8 | | 6.1 | 1.8 | 6.1 | 6.1 |
| Detector 1 Type | CI+Ex | | CI+Ex | CI+Ex | CI+Ex | CI+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | 28.7 | | | 28.7 | | |
| Detector 2 Size(m) | 1.8 | | | 1.8 | | |
| Detector 2 Type | Cl+Ex | | | CI+Ex | | |
| DOGOGOT Z TYPE | OITEX | | | OI LLX | | |

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| | - | • | • | • | 1 | ~ |
|-----------------------------|-----------------|----------|---------|------------|-------------|------------|
| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | 0.0 | | | 0.0 | | |
| Turn Type | NA | | | NA | Perm | Perm |
| Protected Phases | 2 | | | 6 | | |
| Permitted Phases | | | 6 | | 8 | 8 |
| Detector Phase | 2 | | 6 | 6 | 8 | 8 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 21.0 | | 21.0 | 21.0 | 20.0 | 20.0 |
| Minimum Split (s) | 28.0 | | 28.0 | 28.0 | 26.0 | 26.0 |
| Total Split (s) | 43.0 | | 43.0 | 43.0 | 27.0 | 27.0 |
| Total Split (%) | 61.4% | | 61.4% | 61.4% | 38.6% | 38.6% |
| Maximum Green (s) | 36.0 | | 36.0 | 36.0 | 21.0 | 21.0 |
| Yellow Time (s) | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 3.0 | | 3.0 | 3.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | -1.0 | | 5.0 | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 6.0 | | | 6.0 | 5.0 | 5.0 |
| Lead/Lag | 0.0 | | | 0.0 | 5.0 | 3.0 |
| Lead-Lag Optimize? | | | | | | |
| | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Vehicle Extension (s) | | | | | | |
| Recall Mode | C-Max | | C-Max | C-Max | None | None |
| Walk Time (s) | 7.0 | | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Dont Walk (s) | 14.0 | | 14.0 | 14.0 | 13.0 | 13.0 |
| Pedestrian Calls (#/hr) | 100 | | 0 | 0 | 8 | 8 |
| Act Effct Green (s) | 37.6 | | | 37.6 | 21.4 | 21.4 |
| Actuated g/C Ratio | 0.54 | | | 0.54 | 0.31 | 0.31 |
| v/c Ratio | 1.03 | | | 0.98 | 0.65 | 0.47 |
| Control Delay | 61.2 | | | 46.6 | 29.3 | 18.8 |
| Queue Delay | 0.0 | | | 0.0 | 0.0 | 0.0 |
| Total Delay | 61.2 | | | 46.6 | 29.3 | 18.8 |
| LOS | E | | | D | С | В |
| Approach Delay | 61.2 | | | 46.6 | 25.2 | |
| Approach LOS | Е | | | D | С | |
| Intersection Summary | | | | | | |
| Area Type: | CBD | | | | | |
| Cycle Length: 70 | ODD | | | | | |
| Actuated Cycle Length: 70 | 0 | | | | | |
| Offset: 6 (9%), Reference | | ERT and | 6-WRTI | Start of 1 | et Groon | |
| Natural Cycle: 80 | u to priase 2.i | _DI allu | U.WDIL, | Start Of 1 | St Oleen | |
| | | | | | | |
| Control Type: Actuated-C | | | | | | |
| Maximum v/c Ratio: 1.03 | | | | | | 100 0 |
| Intersection Signal Delay: | | | | | ntersection | |
| Intersection Capacity Utili | zation 63.7% | | | IC | JU Level | of Service |
| Analysis Period (min) 15 | | | | | | |
| Splits and Phases: 191 | 2: Atlantic Ave | e & King | St | | | |
| , →ø2 (R) | | | | | | |
| - 62 (R) | | | | | | _ |

| | | - | | |
|------------------------|--------|--------|-------|------|
| | - | - | 1 | |
| Lane Group | EBT | WBT | NBL | NBR |
| Lane Group Flow (vph) | 723 | 728 | 278 | 177 |
| v/c Ratio | 1.03 | 0.98 | 0.65 | 0.47 |
| Control Delay | 61.2 | 46.6 | 29.3 | 18.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 61.2 | 46.6 | 29.3 | 18.8 |
| Queue Length 50th (m) | ~92.3 | 84.0 | 31.5 | 13.1 |
| Queue Length 95th (m) | #153.7 | #148.6 | 51.3 | 27.6 |
| Internal Link Dist (m) | 167.3 | 294.4 | 174.0 | |
| Turn Bay Length (m) | | | 30.0 | |
| Base Capacity (vph) | 702 | 746 | 439 | 383 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.03 | 0.98 | 0.63 | 0.46 |

Intersection Summar

Queue shown is maximum after two cycles.

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WBT Movement EBT NBR Lane Configurations Traffic Volume (vph) 558 626 239 Future Volume (vph) 558 64 0 626 239 152 Ideal Flow (vphpl) 1900 1900 1900 1900 1900 1900 Lane Width 3.5 3.5 3.5 3.5 3.0 3.0 Total Lost time (s) 6.0 5.0 5.0 Lane Util. Factor 1.00 1.00 1.00 1.00 Frpb, ped/bikes 0.95 1.00 1.00 0.96 Flpb, ped/bikes 1.00 1.00 0.96 1.00 0.99 1.00 1.00 0.85 Flt Protected 1.00 1.00 0.95 1.00 Satd. Flow (prot) 1298 1390 1399 1114 Flt Permitted 1.00 1.00 0.95 1.00 Satd. Flow (perm) 1298 1390 1399 1114 Peak-hour factor, PHF 0.86 0.86 0.86 0.86 0.86 0.86 Adj. Flow (vph) 649 177 74 728 278 RTOR Reduction (vph) 34 6 0 n 0 0 Lane Group Flow (vph) 717 728 278 143 279 279 Confl. Peds. (#/hr) 23 11 Heavy Vehicles (%) 6% 100% 4% 11% 10% 17% Bus Blockages (#/hr) 24 24 24 24 0 Turn Type NA NA Perm Perm Protected Phases 2 Permitted Phases Actuated Green, G (s) 36.6 36.6 20.4 20.4 Effective Green, g (s) 37.6 37.6 21.4 21.4 Actuated g/C Ratio 0.54 0.54 0.31 0.31 Clearance Time (s) 7.0 7.0 6.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 697 746 427 340 v/s Ratio Prot c0.55 0.52 v/s Ratio Perm c0.20 0.13 v/c Ratio 1.03 0.98 0.65 0.42 Uniform Delay, d1 16.2 15.8 21.1 19.4 Progression Factor 1.00 1.00 1.00 1.00 Incremental Delay, d2 41.8 27.6 3.5 8.0

HCM Signalized Intersection Capacity Analysis

58.0

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58.0

1912: Atlantic Ave & King St

Delay (s)

Level of Service

Approach LOS

Approach Delay (s)

| Intersection Summary | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 44.0 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.91 | | |
| Actuated Cycle Length (s) | 70.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 63.7% | ICU Level of Service | В |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

43.3

D C

43.3 22.9

D

24.6

С

20.2

С

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Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

| | • | - | ← | • | - | 4 |
|----------------------------|-------|-------|----------|-------|-------|-------|
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | | 4 | 1 | | W | -05.1 |
| Traffic Volume (vph) | 0 | 676 | 490 | 79 | 144 | 42 |
| Future Volume (vph) | 0 | 676 | 490 | 79 | 144 | 42 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | 0.981 | | 0.969 | |
| Flt Protected | | | 0.001 | | 0.963 | |
| Satd. Flow (prot) | 0 | 1429 | 1398 | 0 | 1474 | 0 |
| Flt Permitted | - 0 | 1123 | 1000 | | 0.963 | - 3 |
| Satd. Flow (perm) | 0 | 1429 | 1398 | 0 | 1474 | 0 |
| Right Turn on Red | U | 1723 | 1000 | Yes | 1717 | Yes |
| Satd. Flow (RTOR) | | | 20 | 165 | 18 | 163 |
| Link Speed (k/h) | | 50 | 50 | | 50 | |
| Link Distance (m) | | 316.7 | 191.3 | | 100.8 | |
| | | 22.8 | 13.8 | | 7.3 | |
| Travel Time (s) | 0.88 | | 0.88 | 0.88 | 0.88 | 0.88 |
| Peak Hour Factor | | 0.88 | | | 0.88 | |
| Heavy Vehicles (%) | 0% | 7% | 8% | 3% | | 21% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 0 | 0 |
| Adj. Flow (vph) | 0 | 768 | 557 | 90 | 164 | 48 |
| Shared Lane Traffic (%) | | =00 | 0.45 | | 0.15 | |
| Lane Group Flow (vph) | 0 | 768 | 647 | 0 | 212 | 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 | | 3.5 | |
| Link Offset(m) | | 0.0 | 0.0 | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | 1.6 | | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.16 | 1.32 | 1.32 | 1.16 | 1.16 | 1.16 |
| Turning Speed (k/h) | 24 | | | 14 | 24 | 14 |
| Number of Detectors | 1 | 2 | 2 | | 1 | |
| Detector Template | Left | Thru | Thru | | Left | |
| Leading Detector (m) | 6.1 | 30.5 | 30.5 | | 6.1 | |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | 1.8 | | 6.1 | |
| Detector 1 Type | CI+Ex | CI+Ex | CI+Ex | | CI+Ex | |
| Detector 1 Channel | OITEX | OITLX | OITLX | | OITLX | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Queue (s) | | | | | | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 2 Position(m) | | 28.7 | 28.7 | | | |
| Detector 2 Size(m) | | 1.8 | 1.8 | | | |
| Detector 2 Type | | CI+Ex | CI+Ex | | | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | 0.0 | 0.0 | | | |
| Turn Type | | NA | NA | | Perm | |
| Protected Phases | | 2 | 6 | | | |
| Permitted Phases | 2 | | | | 8 | |
| Detector Phase | 2 | 2 | 6 | | 8 | |

Existing AM 05/06/2014 HDR Corporation Synchro 10 Report Page 41 Lanes, Volumes, Timings 2081: King St & Joe Shuster Way

| | • | - | ← | • | - | ✓ | |
|------------------------------|-------------|-----------|------------|-----|-------------|--------------|--|
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR | |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 20.0 | 20.0 | 20.0 | | 18.0 | | |
| Minimum Split (s) | 26.0 | 26.0 | 26.0 | | 23.0 | | |
| Total Split (s) | 56.0 | 56.0 | 56.0 | | 24.0 | | |
| Total Split (%) | 70.0% | 70.0% | 70.0% | | 30.0% | | |
| Maximum Green (s) | 50.0 | 50.0 | 50.0 | | 19.0 | | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | | 3.0 | | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | 2.0 | | |
| Lost Time Adjust (s) | | -1.0 | -1.0 | | -1.0 | | |
| Total Lost Time (s) | | 5.0 | 5.0 | | 4.0 | | |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | | |
| Recall Mode | C-Max | C-Max | None | | None | | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | | 7.0 | | |
| Flash Dont Walk (s) | 13.0 | 13.0 | 13.0 | | 11.0 | | |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | 0 | | |
| Act Effct Green (s) | | 51.7 | 51.7 | | 19.3 | | |
| Actuated g/C Ratio | | 0.65 | 0.65 | | 0.24 | | |
| v/c Ratio | | 0.83 | 0.71 | | 0.58 | | |
| Control Delay | | 19.5 | 14.5 | | 31.4 | | |
| Queue Delay | | 0.0 | 0.0 | | 0.0 | | |
| Total Delay | | 19.5 | 14.5 | | 31.4 | | |
| LOS | | В | В | | С | | |
| Approach Delay | | 19.5 | 14.5 | | 31.4 | | |
| Approach LOS | | В | В | | С | | |
| Intersection Summary | | | | | | | |
| Area Type: | CBD | | | | | | |
| Cycle Length: 80 | | | | | | | |
| Actuated Cycle Length: 80 | | | | | | | |
| Offset: 1 (1%), Referenced | to phase 2: | EBTL, Sta | art of Gre | en | | | |
| Natural Cycle: 70 | | | | | | | |
| Control Type: Actuated-Co | ordinated | | | | | | |
| Maximum v/c Ratio: 0.83 | | | | | | | |
| Intersection Signal Delay: | | | | | ntersection | | |
| Intersection Capacity Utiliz | ation 62.0% | | | IC | CU Level of | of Service B | |
| Analysis Period (min) 15 | | | | | | | |
| 0.111 | | | | | | | |
| Splits and Phases: 2081 | : King St & | Joe Shust | ter Way | | | | |
| → Ø2 (R) | | | | | | | |
| · 22 (N) | | | | | | _ | |

| | - | ← | - | | | | | | |
|---|--------|----------|------|--|--|--|--|--|--|
| Lane Group | EBT | WBT | SBL | | | | | | |
| Lane Group Flow (vph) | 768 | 647 | 212 | | | | | | |
| v/c Ratio | 0.83 | 0.71 | 0.58 | | | | | | |
| Control Delay | 19.5 | 14.5 | 31.4 | | | | | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | | | | | | |
| Total Delay | 19.5 | 14.5 | 31.4 | | | | | | |
| Queue Length 50th (m) | 72.0 | 53.8 | 26.0 | | | | | | |
| Queue Length 95th (m) | m102.2 | 92.7 | 45.2 | | | | | | |
| Internal Link Dist (m) | 292.7 | 167.3 | 76.8 | | | | | | |
| Turn Bay Length (m) | | | | | | | | | |
| Base Capacity (vph) | 923 | 910 | 382 | | | | | | |
| Starvation Cap Reductn | 0 | 0 | 0 | | | | | | |
| Spillback Cap Reductn | 0 | 0 | 0 | | | | | | |
| Storage Cap Reductn | 0 | 0 | 0 | | | | | | |
| Reduced v/c Ratio | 0.83 | 0.71 | 0.55 | | | | | | |
| Intersection Summary | | | | | | | | | |
| m Volume for 95th percentile queue is metered by upstream signal. | | | | | | | | | |

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|----------------------------------|-------|-------|----------|------|------------|------------------|---|------|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR | | |
| Lane Configurations | | 4 | 1 | | W | | | |
| Traffic Volume (vph) | 0 | 676 | 490 | 79 | 144 | 42 | | |
| uture Volume (vph) | 0 | 676 | 490 | 79 | 144 | 42 | | |
| deal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | | |
| Total Lost time (s) | | 5.0 | 5.0 | | 4.0 | | | |
| ane Util. Factor | | 1.00 | 1.00 | | 1.00 | | | |
| -rt | | 1.00 | 0.98 | | 0.97 | | | |
| It Protected | | 1.00 | 1.00 | | 0.96 | | | |
| Satd. Flow (prot) | | 1429 | 1398 | | 1474 | | | |
| Flt Permitted | | 1.00 | 1.00 | | 0.96 | | | |
| Satd. Flow (perm) | | 1429 | 1398 | | 1474 | | | |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | | |
| Adj. Flow (vph) | 0 | 768 | 557 | 90 | 164 | 48 | | |
| RTOR Reduction (vph) | 0 | 0 | 7 | 0 | 14 | 0 | | |
| ane Group Flow (vph) | 0 | 768 | 640 | 0 | 198 | 0 | | |
| Heavy Vehicles (%) | 0% | 7% | 8% | 3% | 3% | 21% | | |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 0 | 0 | | |
| urn Type | | NA | NA | | Perm | | | |
| rotected Phases | | 2 | 6 | | | | | |
| ermitted Phases | 2 | | | | 8 | | | |
| Actuated Green, G (s) | | 50.7 | 50.7 | | 18.3 | | | |
| Effective Green, g (s) | | 51.7 | 51.7 | | 19.3 | | | |
| Actuated g/C Ratio | | 0.65 | 0.65 | | 0.24 | | | |
| Clearance Time (s) | | 6.0 | 6.0 | | 5.0 | | | |
| /ehicle Extension (s) | | 3.0 | 3.0 | | 3.0 | | | |
| ane Grp Cap (vph) | | 923 | 903 | | 355 | | | |
| /s Ratio Prot | | c0.54 | 0.46 | | | | | |
| /s Ratio Perm | | | | | c0.13 | | | |
| /c Ratio | | 0.83 | 0.71 | | 0.56 | | | |
| Jniform Delay, d1 | | 10.8 | 9.2 | | 26.6 | | | |
| Progression Factor | | 1.20 | 1.00 | | 1.00 | | | |
| ncremental Delay, d2 | | 4.7 | 2.6 | | 1.9 | | | |
| Delay (s) | | 17.6 | 11.8 | | 28.5 | | | |
| evel of Service | | В | В | | С | | | |
| Approach Delay (s) | | 17.6 | 11.8 | | 28.5 | | | |
| Approach LOS | | В | В | | С | | | |
| ntersection Summary | | | | | | | | |
| HCM 2000 Control Delay | | | 16.7 | Н | CM 2000 | Level of Service | e | В |
| HCM 2000 Volume to Capacity | ratio | | 0.77 | | | 2. 2. 23. 110 | | _ |
| Actuated Cycle Length (s) | | | 80.0 | S | um of lost | time (s) | | 10.0 |
| ntersection Capacity Utilization | | | 62.0% | | CU Level | | | В |
| Analysis Period (min) | | | 15 | | | | | |
| c Critical Lane Group | | | | | | | | |

HCM Signalized Intersection Capacity Analysis

2081: King St & Joe Shuster Way

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c Critical Lane Group

Lanes, Volumes, Timings 2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

12/18/2020

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|----------------------------|-------|-------|----------|-------------|----------|----------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | * | 7 | <u> </u> | 7 | * | <u> </u> |
| Traffic Volume (vph) | 13 | 61 | 295 | 30 | 71 | 483 |
| Future Volume (vph) | 13 | 61 | 295 | 30 | 71 | 483 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.0 | 3.5 | 3.0 | 3.0 | 3.5 |
| Storage Length (m) | 30.0 | 0.0 | 0.0 | 15.0 | 30.0 | 0.0 |
| Storage Lanes | 1 | 1 | | 13.0 | 1 | |
| Taper Length (m) | 2.5 | | | | 2.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 1.00 | 1.00 | 1.00 | 0.97 | 0.99 | 1.00 |
| Frt | | 0.850 | | 0.850 | 0.03 | |
| Flt Protected | 0.950 | 0.000 | | 0.000 | 0.950 | |
| Satd. Flow (prot) | 1560 | 1122 | 1807 | 1370 | 1276 | 1807 |
| Flt Permitted | 0.950 | 1122 | 1007 | 13/0 | 0.521 | 1007 |
| | 1560 | 1122 | 1807 | 1329 | 696 | 1807 |
| Satd. Flow (perm) | 1000 | | 1807 | | 996 | 1807 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | 22 | 73 | 20 | 24 | | 20 |
| Link Speed (k/h) | 30 | | 30 | | | 30 |
| Link Distance (m) | 148.7 | | 265.9 | | | 191.3 |
| Travel Time (s) | 17.8 | | 31.9 | | | 23.0 |
| Confl. Peds. (#/hr) | | | | 7 | 7 | |
| Peak Hour Factor | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 |
| Heavy Vehicles (%) | 8% | 30% | 4% | 10% | 32% | 4% |
| Bus Blockages (#/hr) | 0 | 8 | 0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 15 | 73 | 351 | 36 | 85 | 575 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 15 | 73 | 351 | 36 | 85 | 575 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.0 | | 3.0 | | | 3.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | 1.0 | | 1.0 | | | 1.0 |
| Headway Factor | 1.09 | 1.14 | 1.01 | 1.09 | 1.09 | 1.01 |
| | 1.09 | 1.14 | 1.01 | 1.09 | 24 | 1.01 |
| Turning Speed (k/h) | | | 0 | | | 0 |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | _ 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| Detector 1 Type | CI+Ex | CI+Ex | CI+Ex | CI+Ex | CI+Ex | CI+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 2.0 | 28.7 | 2.0 | 2.0 | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | CI+Ex | | | CI+Ex |
| Detector 2 Type | | | OITLX | | | OITLX |

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HDR Corporation

Lanes, Volumes, Timings 2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

12/18/2020

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|------------------------------|---------------|-----------|-------------|-------------|-------------|--------------|---|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT | |
| Detector 2 Channel | | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | pm+ov | NA | Perm | pm+pt | NA | |
| Protected Phases | . 0.111 | 1 | 2 | | 1 | 6 | |
| Permitted Phases | 8 | 8 | | 2 | 6 | | |
| Detector Phase | 8 | 1 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | _ | | | |
| Minimum Initial (s) | 21.0 | 6.0 | 27.0 | 27.0 | 6.0 | 27.0 | |
| Minimum Split (s) | 26.0 | 10.0 | 34.0 | 34.0 | 10.0 | 34.0 | |
| Total Split (s) | 29.0 | 11.0 | 40.0 | 40.0 | 11.0 | 51.0 | |
| Total Split (%) | 36.3% | 13.8% | 50.0% | 50.0% | 13.8% | 63.8% | |
| Maximum Green (s) | 24.0 | 7.0 | 33.0 | 33.0 | 7.0 | 44.0 | |
| Yellow Time (s) | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 44.0 | |
| All-Red Time (s) | 2.0 | 1.0 | 3.0 | 3.0 | 1.0 | 3.0 | |
| | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | |
| Lost Time Adjust (s) | -1.0 4.0 | -1.0 | -1.0 6.0 | -1.0 6.0 | -1.0 3.0 | -1.0 6.0 | |
| Total Lost Time (s) | 4.0 | | | | | 0.0 | |
| Lead/Lag | | Lead | Lag | Lag | Lead | | |
| Lead-Lag Optimize? | 2.0 | 2.2 | 2.2 | 2.2 | 2.0 | 2.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | None | C-Max | C-Max | None | C-Max | |
| Walk Time (s) | 7.0 | | 7.0 | 7.0 | | 0.0 | |
| Flash Dont Walk (s) | 14.0 | | 20.0 | 20.0 | | 0.0 | |
| Pedestrian Calls (#/hr) | 0 | | 2 | 2 | | 0 | |
| Act Effct Green (s) | 22.0 | 13.3 | 60.9 | 60.9 | 71.8 | 73.6 | |
| Actuated g/C Ratio | 0.28 | 0.17 | 0.76 | 0.76 | 0.90 | 0.92 | |
| v/c Ratio | 0.03 | 0.30 | 0.26 | 0.04 | 0.12 | 0.35 | |
| Control Delay | 21.7 | 8.2 | 7.1 | 5.0 | 2.7 | 3.6 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 21.7 | 8.2 | 7.1 | 5.0 | 2.7 | 3.6 | |
| LOS | С | Α | Α | Α | Α | Α | |
| Approach Delay | 10.5 | | 6.9 | | | 3.5 | |
| Approach LOS | В | | Α | | | Α | |
| Internation Comme | | _ | _ | _ | | | |
| Intersection Summary | | | | | | | |
| Area Type: | Other | | | | | | |
| Cycle Length: 80 | | | | | | | |
| Actuated Cycle Length: 80 | | 0.1.DT | | | | | |
| Offset: 15 (19%), Reference | ed to phase | 2:NBT a | nd 6:SBT | L, Start o | 1st Gree | n | |
| Natural Cycle: 70 | | | | | | | |
| Control Type: Actuated-Co | ordinated | | | | | | |
| Maximum v/c Ratio: 0.35 | | | | | | | |
| Intersection Signal Delay: | | | | Ir | ntersectio | n LOS: A | |
| Intersection Capacity Utiliz | ation 56.7% |) | | I | CU Level | of Service I | 3 |
| Analysis Period (min) 15 | | | | | | | |
| | : British Col | lombia Ro | l/Dufferin | St & Sasl | katchewa | n Rd | |
| \ | | | | | | | |
| Ø1 Ø | i2 (R) | | | | | | |
| 11 s 40 s | | | | | | | |
| Ø6 (R) | | | | | | | |
| F1 c (K) | | | | | | | i |

Queues

Existing AM 05/06/2014 HDR Corporation

2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

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|------------------------|-------|------|----------|------|------|-------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Group Flow (vph) | 15 | 73 | 351 | 36 | 85 | 575 |
| v/c Ratio | 0.03 | 0.30 | 0.26 | 0.04 | 0.12 | 0.35 |
| Control Delay | 21.7 | 8.2 | 7.1 | 5.0 | 2.7 | 3.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 21.7 | 8.2 | 7.1 | 5.0 | 2.7 | 3.6 |
| Queue Length 50th (m) | 1.7 | 0.0 | 9.2 | 0.3 | 0.0 | 0.0 |
| Queue Length 95th (m) | 5.6 | 5.6 | 53.1 | 5.5 | 8.7 | 63.7 |
| Internal Link Dist (m) | 124.7 | | 241.9 | | | 167.3 |
| Turn Bay Length (m) | 30.0 | | | 15.0 | 30.0 | |
| Base Capacity (vph) | 487 | 254 | 1376 | 1018 | 687 | 1662 |
| 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 | 0.03 | 0.29 | 0.26 | 0.04 | 0.12 | 0.35 |
| Intersection Summary | | | | | | |

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HCM Signalized Intersection Capacity Analysis 2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

12/18/2020

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|---|---------|------------|----------|---------|-------------|---------------|------|
| ovement | WBL | WBR | NBT | NBR | SBL | SBT | |
| ane Configurations | * | 7 | ^ | 7 | ሻ | ^ | |
| affic Volume (vph) | 13 | 61 | 295 | 30 | 71 | 483 | |
| uture Volume (vph) | 13 | 61 | 295 | 30 | 71 | 483 | |
| eal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| ane Width | 3.0 | 3.0 | 3.5 | 3.0 | 3.0 | 3.5 | |
| otal Lost time (s) | 4.0 | 3.0 | 6.0 | 6.0 | 3.0 | 6.0 | |
| ane Util, Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| pb, ped/bikes | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | |
| pb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| t | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 | |
| t Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | |
| atd. Flow (prot) | 1560 | 1122 | 1807 | 1329 | 1272 | 1807 | |
| t Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.52 | 1.00 | |
| atd. Flow (perm) | 1560 | 1122 | 1807 | 1329 | 698 | 1807 | |
| eak-hour factor, PHF | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | |
| dj. Flow (vph) | 15 | 73 | 351 | 36 | 85 | 575 | |
| TOR Reduction (vph) | 0 | 62 | 0 | 8 | 0 | 0 | |
| ane Group Flow (vph) | 15 | 11 | 351 | 28 | 85 | 575 | |
| onfl. Peds. (#/hr) | 10 | - 11 | 001 | 7 | 7 | 010 | |
| eavy Vehicles (%) | 8% | 30% | 4% | 10% | 32% | 4% | |
| us Blockages (#/hr) | 0 /0 | 8 | 4 /0 | 0 | 0 | 0 | |
| um Type | Perm | pm+ov | NA | Perm | pm+pt | NA NA | |
| rotected Phases | i.eiiii | pm+ov 1 | NA 2 | Fellill | риі+рі 1 | 6 | |
| ermitted Phases | 8 | 8 | 2 | 2 | 6 | 0 | |
| ermitted Phases ctuated Green, G (s) | 4.2 | 10.1 | 53.9 | 53.9 | 63.8 | 63.8 | |
| | 5.2 | 12.1 | 54.9 | 54.9 | 64.8 | 64.8 | |
| ffective Green, g (s) | 0.07 | 0.15 | 0.69 | 0.69 | 0.81 | 0.81 | |
| ctuated g/C Ratio | | | | | | | |
| learance Time (s) | 5.0 | 4.0 | 7.0 | 7.0 | 4.0 | 7.0 | |
| ehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| ane Grp Cap (vph) | 101 | 169 | 1240 | 912 | 614 | 1463 | |
| s Ratio Prot | | 0.01 | 0.19 | | 0.01 | c0.32 | |
| s Ratio Perm | c0.01 | 0.00 | | 0.02 | 0.10 | | |
| c Ratio | 0.15 | 0.07 | 0.28 | 0.03 | 0.14 | 0.39 | |
| niform Delay, d1 | 35.3 | 29.1 | 4.9 | 4.0 | 1.6 | 2.1 | |
| rogression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| cremental Delay, d2 | 0.7 | 0.2 | 0.6 | 0.1 | 0.1 | 0.8 | |
| elay (s) | 36.0 | 29.3 | 5.5 | 4.1 | 1.7 | 2.9 | |
| evel of Service | D | С | Α | Α | Α | Α | |
| oproach Delay (s) | 30.4 | | 5.3 | | | 2.8 | |
| oproach LOS | С | | Α | | | Α | |
| ersection Summary | | | | | | | |
| CM 2000 Control Delay | | | 5.8 | Н | CM 2000 | Level of Serv | /ice |
| CM 2000 Volume to Capacity | ratio | | 0.40 | | 2.11 2000 | | |
| ctuated Cycle Length (s) | | | 80.0 | S | um of lost | time (s) | 14. |
| tersection Capacity Utilization | 1 | | 56.7% | | CU Level | . , | 1-1. |
| | | | 15 | | | | |
| nalysis Period (min) | | | | | | | |

Lanes, Volumes, Timings 97: Yukon Place & British Colombia Rd

05/20/2021

| Lane Configurations | 000 |
|---|-------|
| Traffic Volume (vph) 1 423 0 1 308 1 7 1 0 0 0 Future Volume (vph) 1 423 0 1 308 1 7 1 0 1 0 1 0< | SBR |
| Traffic Volume (vph) 1 423 0 1 308 1 7 1 0 0 0 Future Volume (vph) 1 423 0 1 308 1 7 1 0 1 0 1 0< | |
| Ideal Flow (vphpl) | 26 |
| Lane Width (m) 3.0 3.5 3.5 3.0 3.5 3.5 3.5 3.5 3.5 3.5 Storage Length (m) 30.0 0.0 20.0 20.0 0.0 0.0 0.0 0.0 Storage Lanes 1 0 1 1 0 0 0 Taper Length (m) 2.5 2.5 2.5 2.5 | 26 |
| Storage Length (m) 30.0 0.0 20.0 20.0 0.0 0.0 0.0 Storage Lanes 1 0 1 1 0 0 0 Taper Length (m) 2.5 2.5 2.5 2.5 | 1900 |
| Storage Lanes 1 0 1 1 0 0 Taper Length (m) 2.5 2.5 2.5 2.5 | 3.5 |
| Storage Lanes 1 0 1 1 0 0 Taper Length (m) 2.5 2.5 2.5 2.5 | 0.0 |
| Taper Length (m) 2.5 2.5 2.5 2.5 | 0 |
| Lane Util. Factor 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0 | |
| | 1.00 |
| Ped Bike Factor 1.00 0.99 0.97 | |
| Frt 0.850 0.865 | |
| Fit Protected 0.950 0.950 0.957 | |
| Satd. Flow (prot) 1685 1824 0 1685 1756 1507 0 1798 0 0 1574 | 0 |
| Fit Permitted 0.555 0.494 | |
| Satd. Flow (perm) 984 1824 0 874 1756 1507 0 1860 0 0 1574 | 0 |
| | Yes |
| Satd. Flow (RTOR) 45 523 | |
| Link Speed (k/h) 30 30 30 30 | |
| Link Distance (m) 164.9 265.9 92.0 121.3 | |
| Travel Time (s) 19.8 31.9 11.0 14.6 | |
| Confl. Peds. (#/hr) 2 2 6 | 6 |
| Confl. Bikes (#/hr) 1 | |
| | 0.90 |
| | 0% |
| Adj. Flow (vph) 1 470 0 1 342 1 8 1 0 0 0 | 29 |
| Shared Lane Traffic (%) | |
| Lane Group Flow (voh) 1 470 0 1 342 1 0 9 0 0 29 | 0 |
| | No |
| | Right |
| Median Width(m) 3.0 3.0 0.0 0.0 | |
| Link Offset(m) 0.0 0.0 0.0 0.0 | |
| Crosswalk Width(m) 1.6 1.6 1.6 1.6 | |
| Two way Left Turn Lane | |
| | 1.01 |
| Turning Speed (k/h) 24 14 24 14 24 14 24 | 14 |
| Number of Detectors 1 2 1 2 1 1 2 1 2 | |
| Detector Template Left Thru Left Thru Right Left Thru Left Thru | |
| Leading Detector (m) 6.1 30.5 6.1 30.5 6.1 30.5 6.1 30.5 | |
| Trailing Detector (m) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0. | |
| Detector 1 Position(m) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0. | |
| Detector 1 Size(m) 6.1 1.8 6.1 1.8 6.1 1.8 6.1 1.8 | |
| Detector 1 Type CI+Ex CI+Ex CI+Ex CI+Ex CI+Ex CI+Ex CI+Ex CI+Ex | |
| Detector 1 Channel | |
| Detector 1 Extend (s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0. | |
| Detector 1 Queue (s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0. | |
| Detector 1 Delay (s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0. | |
| Detector 2 Position(m) 28.7 28.7 28.7 28.7 | |
| Detector 2 Size(m) 1.8 1.8 1.8 | |
| Detector 2 Type CI+Ex CI+Ex CI+Ex CI+Ex | |

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Lanes, Volumes, Timings 97: Yukon Place & British Colombia Rd

05/20/2021

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|-------------------------|-------|-------|---------------|-------|----------|-------|-------|----------|-----|-------------|-------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | Perm | Perm | NA | | | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 33.0 | 33.0 | | 33.0 | 33.0 | 33.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Minimum Split (s) | 39.0 | 39.0 | | 39.0 | 39.0 | 39.0 | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Total Split (s) | 48.0 | 48.0 | | 48.0 | 48.0 | 48.0 | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Total Split (%) | 66.7% | 66.7% | | 66.7% | 66.7% | 66.7% | 33.3% | 33.3% | | 33.3% | 33.3% | |
| Maximum Green (s) | 42.0 | 42.0 | | 42.0 | 42.0 | 42.0 | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | | -1.0 | -1.0 | -1.0 | | -1.0 | | | -1.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | Max | Max | | Max | Max | Max | None | None | | None | None | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 9.0 | 9.0 | | 9.0 | 9.0 | 9.0 | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 59.5 | 59.5 | | 59.5 | 59.5 | 59.5 | | 8.0 | | | 8.0 | |
| Actuated g/C Ratio | 0.90 | 0.90 | | 0.90 | 0.90 | 0.90 | | 0.12 | | | 0.12 | |
| v/c Ratio | 0.00 | 0.29 | | 0.00 | 0.22 | 0.00 | | 0.04 | | | 0.04 | |
| Control Delay | 2.0 | 2.3 | | 2.0 | 2.0 | 0.0 | | 27.5 | | | 0.1 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | | | 0.0 | |
| Total Delay | 2.0 | 2.3 | | 2.0 | 2.0 | 0.0 | | 27.5 | | | 0.1 | |
| LOS | Α | Α | | Α | Α | Α | | С | | | Α | |
| Approach Delay | | 2.3 | | | 2.0 | | | 27.5 | | | 0.1 | |
| Approach LOS | | Α | | | Α | | | С | | | Α | |
| Intersection Summary | | | | | | | | | | | | |

| Intersection Summary | | | | | | | | | |
|--------------------------------|-------------------------|------------------------|--|--|--|--|--|--|--|
| Area Type: | Other | | | | | | | | |
| Cycle Length: 72 | | | | | | | | | |
| Actuated Cycle Length: 66.2 | | | | | | | | | |
| Natural Cycle: 65 | | | | | | | | | |
| Control Type: Semi Act-Uncoord | | | | | | | | | |
| Maximum v/c Ratio: 0 | Maximum v/c Ratio: 0.29 | | | | | | | | |
| Intersection Signal De | elay: 2.4 | Intersection LOS: A | | | | | | | |
| Intersection Capacity | Utilization 73.3% | ICU Level of Service D | | | | | | | |
| Analysis Period (min) | 15 | | | | | | | | |

Splits and Phases: 97: Yukon Place & British Colombia Rd



Existing PM 05/06/2014 HDR Corporation

Queues

97: Yukon Place & British Colombia Rd

05/20/2021

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|------------------------|------|-------|------|----------|------|----------|------|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBT | SBT |
| Lane Group Flow (vph) | 1 | 470 | 1 | 342 | 1 | 9 | 29 |
| v/c Ratio | 0.00 | 0.29 | 0.00 | 0.22 | 0.00 | 0.04 | 0.04 |
| Control Delay | 2.0 | 2.3 | 2.0 | 2.0 | 0.0 | 27.5 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 2.0 | 2.3 | 2.0 | 2.0 | 0.0 | 27.5 | 0.1 |
| Queue Length 50th (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 0.0 |
| Queue Length 95th (m) | 0.3 | 26.3 | 0.3 | 18.3 | 0.0 | 4.6 | 0.0 |
| Internal Link Dist (m) | | 140.9 | | 241.9 | | 68.0 | 97.3 |
| Turn Bay Length (m) | 30.0 | | 20.0 | | 20.0 | | |
| Base Capacity (vph) | 883 | 1638 | 785 | 1577 | 1358 | 536 | 825 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.00 | 0.29 | 0.00 | 0.22 | 0.00 | 0.02 | 0.04 |
| Intersection Summary | | | | | | | |

HCM Signalized Intersection Capacity Analysis 97: Yukon Place & British Colombia Rd

05/20/2021

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|-------------------------------|------------|----------|-------|------|------------|------------|---------|----------|------|------|------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | * | ₽ | | ሻ | † | 7 | | 4 | | | 4 | |
| Traffic Volume (vph) | 1 | 423 | 0 | 1 | 308 | 1 | 7 | 1 | 0 | 0 | 0 | 26 |
| Future Volume (vph) | 1 | 423 | 0 | 1 | 308 | 1 | 7 | 1 | 0 | 0 | 0 | 26 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | | | 0.97 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 0.99 | | | 1.00 | |
| Frt | 1.00 | 1.00 | | 1.00 | 1.00 | 0.85 | | 1.00 | | | 0.86 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | | 0.96 | | | 1.00 | |
| Satd. Flow (prot) | 1685 | 1824 | | 1681 | 1756 | 1507 | | 1781 | | | 1574 | |
| Flt Permitted | 0.56 | 1.00 | | 0.49 | 1.00 | 1.00 | | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | 985 | 1824 | | 873 | 1756 | 1507 | | 1860 | | | 1574 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 1 | 470 | 0 | 1 | 342 | 1 | 8 | 1 | 0 | 0 | 0 | 29 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 0 |
| Lane Group Flow (vph) | 1 | 470 | 0 | 1 | 342 | 1 | 0 | 9 | 0 | 0 | 1 | 0 |
| Confl. Peds. (#/hr) | | | 2 | 2 | | | 6 | | | | | 6 |
| Confl. Bikes (#/hr) | | | | | | | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 3% | 0% | 0% | 7% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Turn Type | Perm | NA | | Perm | NA | Perm | Perm | NA | | | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 55.3 | 55.3 | | 55.3 | 55.3 | 55.3 | | 2.6 | | | 2.6 | |
| Effective Green, g (s) | 56.3 | 56.3 | | 56.3 | 56.3 | 56.3 | | 3.6 | | | 3.6 | |
| Actuated g/C Ratio | 0.81 | 0.81 | | 0.81 | 0.81 | 0.81 | | 0.05 | | | 0.05 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 793 | 1469 | | 703 | 1414 | 1213 | | 95 | | | 81 | |
| v/s Ratio Prot | | c0.26 | | | 0.19 | | | | | | 0.00 | |
| v/s Ratio Perm | 0.00 | | | 0.00 | | 0.00 | | c0.00 | | | | |
| v/c Ratio | 0.00 | 0.32 | | 0.00 | 0.24 | 0.00 | | 0.09 | | | 0.02 | |
| Uniform Delay, d1 | 1.3 | 1.8 | | 1.3 | 1.6 | 1.3 | | 31.6 | | | 31.5 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 0.0 | 0.6 | | 0.0 | 0.4 | 0.0 | | 0.4 | | | 0.1 | |
| Delay (s) | 1.3 | 2.4 | | 1.3 | 2.0 | 1.3 | | 32.0 | | | 31.6 | |
| Level of Service | Α | Α | | Α | Α | Α | | С | | | С | |
| Approach Delay (s) | | 2.4 | | | 2.0 | | | 32.0 | | | 31.6 | |
| Approach LOS | | Α | | | Α | | | С | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 3.5 | H | CM 2000 | Level of | Service | | Α | | | |
| HCM 2000 Volume to Capa | city ratio | | 0.31 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 69.9 | Sı | um of lost | time (s) | | | 10.0 | | | |
| Intersection Capacity Utiliza | tion | | 73.3% | IC | U Level o | of Service | : | | D | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

Existing PM 05/06/2014 HDR Corporation

Lanes, Volumes, Timings 222: Lakeshore Blvd & Strachan Ave

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|----------------------------|-------|-----------------|-------|-------|----------|-------|-------|----------|----------|-------------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ሻ | ተተ _ጉ | | ሻ | ተተተ | | | 4 | | 7 | ની | 7 |
| Traffic Volume (vph) | 420 | 1302 | 3 | 12 | 1991 | 0 | 0 | 0 | 0 | 405 | 11 | 324 |
| Future Volume (vph) | 420 | 1302 | 3 | 12 | 1991 | 0 | 0 | 0 | 0 | 405 | 11 | 324 |
| Ideal Flow (vphpl) | 2150 | 1900 | 1900 | 1900 | 2150 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 |
| Storage Length (m) | 60.0 | | 0.0 | 60.0 | | 50.0 | 0.0 | | 0.0 | 140.0 | | 50.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 0 | | 0 | 1 | | 1 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 0.91 | 0.91 | 1.00 | *0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Ped Bike Factor | | 1.00 | | 1.00 | | | | | | | | 0.94 |
| Frt | | | | | | | | | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | | | | 0.950 | 0.955 | |
| Satd. Flow (prot) | 1816 | 4794 | 0 | 1685 | 5883 | 0 | 0 | 1879 | 0 | 1585 | 1689 | 1507 |
| Flt Permitted | 0.079 | | | 0.185 | | | | | | 0.950 | 0.950 | |
| Satd. Flow (perm) | 151 | 4794 | 0 | 327 | 5883 | 0 | 0 | 1879 | 0 | 1585 | 1680 | 1415 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | | | | | | | | 247 |
| Link Speed (k/h) | | 60 | | | 60 | | | 40 | | | 40 | |
| Link Distance (m) | | 310.3 | | | 196.6 | | | 116.5 | | | 205.6 | |
| Travel Time (s) | | 18.6 | | | 11.8 | | | 10.5 | | | 18.5 | |
| Confl. Peds. (#/hr) | 4 | | 7 | 7 | | 4 | 43 | | | | | 43 |
| Confl. Bikes (#/hr) | | | | | | | | | 1 | | | |
| Peak Hour Factor | 0.90 | 0.95 | 0.95 | 0.90 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Heavy Vehicles (%) | 5% | 7% | 0% | 0% | 3% | 0% | 0% | 0% | 0% | 1% | 0% | 0% |
| Adj. Flow (vph) | 467 | 1371 | 3 | 13 | 2096 | 0 | 0 | 0 | 0 | 426 | 12 | 341 |
| Shared Lane Traffic (%) | | | | | | | | | | 49% | | |
| Lane Group Flow (vph) | 467 | 1374 | 0 | 13 | 2096 | 0 | 0 | 0 | 0 | 217 | 221 | 341 |
| 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) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 0.93 | 1.01 | 1.01 | 1.09 | 0.86 | 1.09 | 1.01 | 1.01 | 1.01 | 1.09 | 1.01 | 1.09 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | 1 |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | Right |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | CI+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |

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Lanes, Volumes, Timings 222: Lakeshore Blvd & Strachan Ave

05/20/2021

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|--|-------------|-------|-----|-------|-------------|------------|-------|----------|-----|-------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | pm+pt | NA | | pm+pt | NA | | | | | Perm | NA | pm+ov |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 3 | | | 4 | 5 |
| Permitted Phases | 2 | | | 6 | | | 3 | | | 4 | | 4 |
| Detector Phase | 5 | 2 | | 1 | 6 | | 3 | 3 | | 4 | 4 | 5 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 29.0 | | 6.0 | 30.0 | | 12.0 | 12.0 | | 10.0 | 10.0 | 6.0 |
| Minimum Split (s) | 12.0 | 35.0 | | 12.0 | 36.0 | | 21.0 | 21.0 | | 45.0 | 45.0 | 12.0 |
| Total Split (s) | 31.0 | 62.0 | | 16.0 | 47.0 | | 21.0 | 21.0 | | 45.0 | 45.0 | 31.0 |
| Total Split (%) | 21.5% | 43.1% | | 11.1% | 32.6% | | 14.6% | 14.6% | | 31.3% | 31.3% | 21.5% |
| Maximum Green (s) | 25.0 | 56.0 | | 10.0 | 41.0 | | 12.0 | 12.0 | | 37.0 | 37.0 | 25.0 |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| All-Red Time (s) | 3.0 | 2.0 | | 3.0 | 2.0 | | 6.0 | 6.0 | | 5.0 | 5.0 | 3.0 |
| Lost Time Adjust (s) | -3.0 | -1.0 | | -1.0 | -3.0 | | | -1.0 | | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 3.0 | 5.0 | | 5.0 | 3.0 | | | 8.0 | | 7.0 | 7.0 | 5.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lag | Lag | | Lead | Lead | Lead |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | Max | | None | Max | | None | None | | None | None | None |
| Walk Time (s) | | 7.0 | | | 7.0 | | | | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | | 22.0 | | | 22.0 | | | | | 30.0 | 30.0 | |
| Pedestrian Calls (#/hr) | | 2 | | | 1 | | | | | 0 | 0 | |
| Act Effct Green (s) | 75.0 | 68.1 | | 49.1 | 44.0 | | | | | 38.0 | 38.0 | 66.0 |
| Actuated g/C Ratio | 0.61 | 0.55 | | 0.40 | 0.36 | | | | | 0.31 | 0.31 | 0.54 |
| v/c Ratio | 0.99 | 0.52 | | 0.06 | 1.00 | | | | | 0.44 | 0.43 | 0.38 |
| Control Delay | 76.6 | 18.9 | | 13.4 | 58.3 | | | | | 37.6 | 37.0 | 5.1 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 17.3 | | | | | 0.0 | 0.0 | 0.0 |
| Total Delay | 76.6 | 18.9 | | 13.4 | 75.6 | | | | | 37.6 | 37.0 | 5.1 |
| LOS | Е | В | | В | Е | | | | | D | D | Α |
| Approach Delay | | 33.5 | | | 75.2 | | | | | | 23.2 | |
| Approach LOS | | С | | | Е | | | | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 144 | | | | | | | | | | | | |
| Actuated Cycle Length: 12 | 3 | | | | | | | | | | | |
| Natural Cycle: 115 | | | | | | | | | | | | |
| Control Type: Semi Act-Ur | ncoord | | | | | | | | | | | |
| Maximum v/c Ratio: 1.00 | | | | | | | | | | | | |
| Intersection Signal Delay: | | | | | ntersection | | | | | | | |
| Intersection Capacity Utiliz | ation 93.3% | | | IC | CU Level of | of Service | F | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| User Entered Value | | | | | | | | | | | | |



HDR Corporation Page 6

Queues

222: Lakeshore Blvd & Strachan Ave

05/20/2021

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|------------------------|--------|-------|------|--------|----------|-------|------|
| Lane Group | EBL | EBT | WBL | WBT | SBL | SBT | SBR |
| Lane Group Flow (vph) | 467 | 1374 | 13 | 2096 | 217 | 221 | 341 |
| v/c Ratio | 0.99 | 0.52 | 0.06 | 1.00 | 0.44 | 0.43 | 0.38 |
| Control Delay | 76.6 | 18.9 | 13.4 | 58.3 | 37.6 | 37.0 | 5.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 17.3 | 0.0 | 0.0 | 0.0 |
| Total Delay | 76.6 | 18.9 | 13.4 | 75.6 | 37.6 | 37.0 | 5.1 |
| Queue Length 50th (m) | 98.0 | 65.4 | 1.2 | 176.1 | 44.2 | 44.6 | 9.7 |
| Queue Length 95th (m) | #165.7 | 98.6 | 3.9 | #211.7 | 68.5 | 68.8 | 24.5 |
| Internal Link Dist (m) | | 286.3 | | 172.6 | | 181.6 | |
| Turn Bay Length (m) | 60.0 | | 60.0 | | 140.0 | | 50.0 |
| Base Capacity (vph) | 471 | 2653 | 262 | 2104 | 489 | 519 | 893 |
| Starvation Cap Reductn | 0 | 0 | 0 | 108 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.99 | 0.52 | 0.05 | 1.05 | 0.44 | 0.43 | 0.38 |

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

Queue shown is maximum after two cycles.

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HCM Signalized Intersection Capacity Analysis 222: Lakeshore Blvd & Strachan Ave

05/20/2021

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|-------------------------------|------------|------|---------------|-------|------------|-------------|--------|----------|-----------|-------|------|-------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | * | ተተኈ | | 7 | ተተተ | | | 4 | | 7 | ર્ન | 7 |
| Traffic Volume (vph) | 420 | 1302 | 3 | 12 | 1991 | 0 | 0 | 0 | 0 | 405 | 11 | 324 |
| Future Volume (vph) | 420 | 1302 | 3 | 12 | 1991 | 0 | 0 | 0 | 0 | 405 | 11 | 324 |
| Ideal Flow (vphpl) | 2150 | 1900 | 1900 | 1900 | 2150 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 |
| Total Lost time (s) | 3.0 | 5.0 | | 5.0 | 3.0 | | | | | 7.0 | 7.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.91 | | 1.00 | *0.95 | | | | | 0.95 | 0.95 | 1.00 |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | | | | 1.00 | 1.00 | 0.97 |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | | | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | | 1.00 | 1.00 | | | | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | | | | 0.95 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1816 | 4793 | | 1684 | 5883 | | | | | 1585 | 1688 | 1458 |
| Flt Permitted | 0.08 | 1.00 | | 0.19 | 1.00 | | | | | 0.95 | 0.95 | 1.00 |
| Satd. Flow (perm) | 151 | 4793 | | 329 | 5883 | | | | | 1585 | 1680 | 1458 |
| Peak-hour factor, PHF | 0.90 | 0.95 | 0.95 | 0.90 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 467 | 1371 | 3 | 13 | 2096 | 0 | 0 | 0 | 0 | 426 | 12 | 341 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 122 |
| Lane Group Flow (vph) | 467 | 1374 | 0 | 13 | 2096 | 0 | 0 | 0 | 0 | 217 | 221 | 219 |
| Confl. Peds. (#/hr) | 4 | | 7 | 7 | | 4 | 43 | | | | | 43 |
| Confl. Bikes (#/hr) | | | | | | | | | 1 | | | |
| Heavy Vehicles (%) | 5% | 7% | 0% | 0% | 3% | 0% | 0% | 0% | 0% | 1% | 0% | 0% |
| Turn Type | pm+pt | NA | | pm+pt | NA | | | | | Perm | NA | pm+ov |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 3 | | | 4 | 5 |
| Permitted Phases | 2 | | | 6 | | | 3 | | | 4 | | 4 |
| Actuated Green, G (s) | 75.6 | 67.1 | | 47.1 | 44.6 | | | | | 37.0 | 37.0 | 62.0 |
| Effective Green, q (s) | 78.6 | 68.1 | | 49.1 | 47.6 | | | | | 38.0 | 38.0 | 64.0 |
| Actuated g/C Ratio | 0.62 | 0.54 | | 0.39 | 0.38 | | | | | 0.30 | 0.30 | 0.51 |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | | | | 8.0 | 8.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | | | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 461 | 2578 | | 165 | 2211 | | | | | 475 | 504 | 737 |
| v/s Ratio Prot | c0.22 | 0.29 | | 0.00 | 0.36 | | | | | | 001 | 0.06 |
| v/s Ratio Perm | c0.40 | 0.20 | | 0.03 | 0.00 | | | | | c0.14 | 0.13 | 0.09 |
| v/c Ratio | 1.01 | 0.53 | | 0.08 | 0.95 | | | | | 0.46 | 0.44 | 0.30 |
| Uniform Delay, d1 | 40.9 | 18.9 | | 23.9 | 38.3 | | | | | 35.9 | 35.7 | 18.2 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | | | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 45.2 | 0.8 | | 0.2 | 10.3 | | | | | 0.7 | 0.6 | 0.2 |
| Delay (s) | 86.1 | 19.7 | | 24.1 | 48.6 | | | | | 36.6 | 36.3 | 18.4 |
| Level of Service | F | В | | C | D | | | | | D | D | В |
| Approach Delay (s) | • | 36.6 | | U | 48.5 | | | 0.0 | | | 28.6 | |
| Approach LOS | | D | | | D | | | Α | | | C | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 40.6 | Н | CM 2000 | Level of S | ervice | | D | | | |
| HCM 2000 Volume to Capa | city ratio | | 0.95 | | J.71 2000 | 20701010 | 0.4100 | | | | | |
| Actuated Cycle Length (s) | iony radio | | 126.6 | Si | um of lost | time (s) | | | 25.0 | | | |
| Intersection Capacity Utiliza | ation | | 93.3% | | | of Service | | | 20.0 F | | | |
| Analysis Period (min) | 20011 | | 15 | ic | C LOVEI (| JI JUI VIUE | | | | | | |
| c Critical Lane Group | | | 10 | | | | | | | | | |

Lanes, Volumes, Timings 538: Strachan Ave & King St

05/20/2021

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|----------------------------|-------|-------|-------|-------|----------|-------|-------|----------|-------|----------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 413 | | | 413 | | * | ĵ. | | 7 | ĥ | |
| Traffic Volume (vph) | 0 | 378 | 77 | 4 | 673 | 68 | 133 | 268 | 84 | 27 | 172 | 27 |
| Future Volume (vph) | 0 | 378 | 77 | 4 | 673 | 68 | 133 | 268 | 84 | 27 | 172 | 27 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 0.0 | 25.0 | | 0.0 | 25.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 0 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | 0.91 | | | 0.98 | | 0.89 | 0.97 | | 0.95 | 0.98 | |
| Frt | | 0.975 | | | 0.986 | | | 0.964 | | | 0.979 | |
| Flt Protected | | | | | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 0 | 2539 | 0 | 0 | 2879 | 0 | 1486 | 1572 | 0 | 1516 | 1604 | 0 |
| Flt Permitted | | | | | 0.953 | | 0.586 | | | 0.383 | | |
| Satd. Flow (perm) | 0 | 2539 | 0 | 0 | 2740 | 0 | 813 | 1572 | 0 | 579 | 1604 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 44 | | | 19 | | | 22 | | | 11 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 40 | | | 40 | |
| Link Distance (m) | | 255.2 | | | 358.6 | | | 424.1 | | | 379.9 | |
| Travel Time (s) | | 18.4 | | | 25.8 | | | 38.2 | | | 34.2 | |
| Confl. Peds. (#/hr) | 71 | | 292 | 292 | | 71 | 139 | | 96 | 96 | | 139 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles (%) | 0% | 6% | 17% | 100% | 4% | 0% | 2% | 1% | 0% | 0% | 1% | 0% |
| Bus Blockages (#/hr) | 20 | 20 | 20 | 20 | 20 | 20 | 0 | 0 | 0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 0 | 402 | 82 | 4 | 716 | 72 | 141 | 285 | 89 | 29 | 183 | 29 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 484 | 0 | 0 | 792 | 0 | 141 | 374 | 0 | 29 | 212 | 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 | | | 3.0 | | | 3.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.16 | 1.22 | 1.16 | 1.16 | 1.22 | 1.16 | 1.25 | 1.16 | 1.16 | 1.25 | 1.16 | 1.16 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |

Existing PM 05/06/2014 Synchro 10 Report HDR Corporation Page 9 Lanes, Volumes, Timings

HDR Corporation

538: Strachan Ave & King St 05/20/2021 Lane Group EBL EBT WBT WBR NBT Detector 2 Channel Detector 2 Extend (s) 0.0 0.0 0.0 0.0 Turn Type NA NA Perm NA Perm NA Protected Phases 2 6 4 8 Permitted Phases Detector Phase 2 6 4 8 Switch Phase 20.0 20.0 20.0 20.0 21.0 21.0 21.0 21.0 Minimum Initial (s) Minimum Split (s) 26.0 26.0 26.0 26.0 27.0 27.0 27.0 27.0 Total Split (s) 46.0 46.0 46.0 46.0 34.0 34.0 34.0 34.0 Total Split (%) 57.5% 57.5% 57.5% 57.5% 42.5% 42.5% 42.5% 42.5% Maximum Green (s) 40.0 40.0 40.0 40.0 28.0 28.0 28.0 28.0 Yellow Time (s) 3.0 3.0 3.0 3.0 4.0 4.0 4.0 4.0 3.0 All-Red Time (s) 3.0 3.0 3.0 2.0 2.0 2.0 2.0 Lost Time Adjust (s) -1.0 -1.0 -1.0 -1.0 -1.0 -1.0 Total Lost Time (s) 5.0 5.0 5.0 5.0 5.0 5.0 Lead/Lag Lead-Lag Optimize? Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 Recall Mode C-Max C-Max C-Max C-Max Max Max Max Max 7.0 7.0 7.0 7.0 7.0 7.0 7.0 Walk Time (s) 7.0 Flash Dont Walk (s) 13.0 13.0 13.0 13.0 14.0 14.0 14.0 14.0 Pedestrian Calls (#/hr) 100 100 24 24 32 32 100 100 Act Effct Green (s) 41.0 41.0 29.0 29.0 29.0 29.0 Actuated g/C Ratio 0.51 0.36 0.36 0.36 0.36 0.51 v/c Ratio 0.37 0.56 0.48 0.64 0.14 0.36 Control Delay 11.5 5.5 25.7 24.5 31.0 32.1 0.0 0.0 0.0 0.0 Queue Delay 0.0 0.0 Total Delay 11.5 25.7 24.5 31.0 32.1 5.5 LOS В Α С С С С Approach Delay 11.5 32.0 Approach LOS В Α С С Intersection Summary Area Type: CBD Cycle Length: 80 Actuated Cycle Length: 80 Offset: 50 (63%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green Natural Cycle: 55 Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.64 Intersection Signal Delay: 15.0 Intersection LOS: B Intersection Capacity Utilization 79.4% ICU Level of Service D Analysis Period (min) 15 Splits and Phases: 538: Strachan Ave & King St **↑**†ø4 ²Ø2 (R) ₹ø6 (R) ₩ Ø8

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538: Strachan Ave & King St

05/20/2021

| | - | - | 1 | † | - | ţ |
|------------------------|-------|-------|-------|----------|------|-------|
| Lane Group | EBT | WBT | NBL | NBT | SBL | SBT |
| Lane Group Flow (vph) | 484 | 792 | 141 | 374 | 29 | 212 |
| v/c Ratio | 0.37 | 0.56 | 0.48 | 0.64 | 0.14 | 0.36 |
| Control Delay | 11.5 | 5.5 | 25.7 | 24.5 | 31.0 | 32.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 11.5 | 5.5 | 25.7 | 24.5 | 31.0 | 32.1 |
| Queue Length 50th (m) | 19.5 | 8.3 | 17.7 | 44.6 | 4.3 | 31.5 |
| Queue Length 95th (m) | 29.8 | 16.3 | m24.6 | m62.8 | m7.8 | m47.9 |
| Internal Link Dist (m) | 231.2 | 334.6 | | 400.1 | | 355.9 |
| Turn Bay Length (m) | | | 25.0 | | 25.0 | |
| Base Capacity (vph) | 1322 | 1413 | 294 | 583 | 209 | 588 |
| 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 | 0.56 | 0.48 | 0.64 | 0.14 | 0.36 |
| | | | | | | |

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

HCM Signalized Intersection Capacity Analysis 538: Strachan Ave & King St

| | | | | | | , | | , | - | • | • |
|-------|------------------------------|--|--|---|---|---|---|---|--|--|--|
| EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| | 414 | | | 414 | | | 1 | | 7 | 1 2 | |
| 0 | 378 | 77 | 4 | 673 | 68 | 133 | 268 | 84 | 27 | 172 | 27 |
| 0 | 378 | 77 | 4 | 673 | 68 | 133 | 268 | 84 | 27 | 172 | 27 |
| 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| | 0.95 | | | 0.95 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| | 0.91 | | | 0.99 | | 1.00 | 0.97 | | 1.00 | 0.98 | |
| | 1.00 | | | 1.00 | | 0.89 | 1.00 | | 0.95 | 1.00 | |
| | 0.97 | | | 0.99 | | 1.00 | 0.96 | | 1.00 | 0.98 | |
| | 1.00 | | | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| | 2538 | | | 2875 | | 1318 | 1572 | | 1437 | 1604 | |
| | | | | | | | 1.00 | | | | |
| | 2538 | | | 2741 | | 814 | 1572 | | 580 | 1604 | |
| 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| 0 | 402 | | | | 72 | 141 | 285 | 89 | 29 | 183 | 29 |
| - | | - | _ | - | - | - | | | - | 7 | 0 |
| | 463 | | | 783 | | | 360 | _ | | 205 | 0 |
| | | | | | | | | | | | 139 |
| | | | | | | | | | | | 0% |
| 20 | | 20 | | | 20 | | | 0 | | | 0 |
| | | | Perm | | | Perm | | | Perm | | |
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| | В | | | А | | | C | | | C | |
| | | | | | | | | | | | |
| | | 15.2 | H | CM 2000 | Level of S | Service | | В | | | |
| ratio | | 0.59 | | | | | | | | | |
| | | 80.0 | | | . , | | | 10.0 | | | |
| | | 79.4% | IC | U Level o | of Service | | | D | | | |
| | | 15 | | | | | | | | | |
| | 0.94 0 0 0 0 0 0 0 20 2 2 | 0 378 0 378 1900 1900 3.5 3.5 5.0 0.95 0.91 1.00 2538 1.00 2538 1.00 2538 1.00 2538 1.00 2538 20 40.2 0 463 71 0 463 71 0 463 72 2 2 40.0 41.0 0.51 6.0 3.0 1300 0.18 0.36 11.6 1.00 0.8 12.4 B 12.4 B | 0 378 77 0 378 77 1900 1900 1900 3.5 3.5 3.5 5.0 0.95 0.91 1.00 0.97 1.00 2538 1.00 2538 1.00 2538 0.94 0.94 0.94 0 402 82 0 21 0 0 463 0 71 292 0% 6% 17% 20 20 20 NA 2 2 40.0 41.0 0.51 6.0 3.0 1300 0.18 0.36 11.6 1.00 0.8 12.4 B 12.4 B 12.4 B 12.4 B 12.4 B 88.0 0 79.4% | 0 378 77 4 0 378 77 4 1900 1900 1900 1900 3.5 3.5 3.5 3.5 5.0 0.95 0.91 1.00 0.97 1.00 2558 1.00 2558 1.00 2538 0.94 0.94 0.94 0.94 0 402 82 4 0 21 0 0 0 0 463 0 0 0 463 0 0 71 292 292 0% 6% 17% 100% 20 20 20 20 0% 6% 17% 100% 20 20 6 40.0 41.0 0.51 6.0 3.0 1300 0.18 0.36 11.6 1.00 0.8 12.4 B 15.2 He | 0 378 77 4 673 0 378 77 4 673 1900 1900 1900 1900 1900 3.5 3.5 3.5 3.5 3.5 3.5 5.0 0.95 0.95 0.91 0.99 1.00 1.00 0.97 0.99 1.00 0.95 2538 2875 1.00 0.95 2538 2741 0.94 0.94 0.94 0.94 0.402 82 4 716 0 21 0 0 9 0 463 0 0 783 71 292 292 0% 6% 17% 100% 4% 20 20 20 20 20 0% 6% 17% 100% 4% 2 6 2 6 2 6 40.0 40.0 40.0 41.0 41.0 0.51 6.0 6.0 6.0 3.0 3.0 3.0 1300 1404 0.18 0.29 0.36 0.56 11.6 13.3 1.00 0.30 0.8 1.5 12.4 5.5 B A 12.4 6 12.4 | 0 378 77 4 673 68 0 378 77 4 673 68 1900 1900 1900 1900 1900 1900 3.5 3.5 3.5 3.5 3.5 3.5 3.5 5.0 0.95 0.95 0.91 0.99 1.00 1.00 0.97 0.99 1.00 1.00 25538 2875 1.00 0.95 2538 2741 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.96 82 4 716 72 0 21 0 0 9 0 0 463 0 0 783 0 71 292 292 71 0% 6% 17% 100% 4% 0% 20 20 20 20 20 20 20 0 463 0 0 783 0 0 783 0 0 783 0 0 402 82 4 716 72 0 21 0 0 9 0 0 463 0 0 783 0 0 0 463 0 0 783 0 0 0 463 0 0 783 0 0 0 463 0 0 783 0 0 0 463 0 0 783 0 0 0 463 0 0 783 0 0 0 463 0 0 783 0 0 0 463 0 0 783 0 0 0 100 463 0 0 783 0 0 0 100 463 0 0 0 0 0 0 100 463 0 0 0 0 0 0 0 100 463 0 0 0 0 0 0 0 100 100 100 100 100 100 1 | 0 378 77 4 673 68 133 1900 100 0.50 5.0 5.0 5.0 0.95 5.0 0.95 1.00 0.99 1.00 0.99 1.00 0.95 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.05 1.05 1.05 1.05 1.05 1.05 1.05 1.05 1.05 1.05 1.05 1.05 1.05 1.05 1.05 1.08 1.00 1.07 1.00 1.09 9.0 1.00 1.00 1.00 <td< td=""><td>0 378 77 4 673 68 133 268 0 378 77 4 673 68 133 268 1900 1900 1900 1900 1900 1900 1900 3.5 3.5 3.5 3.5 3.5 3.5 3.0 3.5 5.0 0.95 0.95 1.00 1.00 0.97 1.00 0.97 1.00 0.99 1.00 0.95 1.00 0.97 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 1.00 0.95 1.00 1.00 0.95 1.00</td><td>0 378 77 4 673 68 133 268 84 1900 3.5 <</td><td>0 378 77 4 673 68 133 268 84 27 1900 <t< td=""><td>0 378 77 4 673 68 133 268 84 27 172 0 378 77 4 673 68 133 268 84 27 172 1900 1900 1900 1900 1900 1900 1900 190</td></t<></td></td<> | 0 378 77 4 673 68 133 268 0 378 77 4 673 68 133 268 1900 1900 1900 1900 1900 1900 1900 3.5 3.5 3.5 3.5 3.5 3.5 3.0 3.5 5.0 0.95 0.95 1.00 1.00 0.97 1.00 0.97 1.00 0.99 1.00 0.95 1.00 0.97 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 0.95 1.00 1.00 0.95 1.00 1.00 0.95 1.00 | 0 378 77 4 673 68 133 268 84 1900 3.5 < | 0 378 77 4 673 68 133 268 84 27 1900 <t< td=""><td>0 378 77 4 673 68 133 268 84 27 172 0 378 77 4 673 68 133 268 84 27 172 1900 1900 1900 1900 1900 1900 1900 190</td></t<> | 0 378 77 4 673 68 133 268 84 27 172 0 378 77 4 673 68 133 268 84 27 172 1900 1900 1900 1900 1900 1900 1900 190 |

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|----------------------------|---------|-------|---------------|---------|----------|--------|-------|----------|----------|---------|------------|--------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 413 | | | 414 | | | 414 | | | 414 | |
| Traffic Volume (vph) | 81 | 359 | 53 | 55 | 574 | 92 | 45 | 387 | 46 | 113 | 235 | 74 |
| Future Volume (vph) | 81 | 359 | 53 | 55 | 574 | 92 | 45 | 387 | 46 | 113 | 235 | 74 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.96 | | | 0.96 | | | 0.97 | | | 0.93 | |
| Frt | | 0.984 | | | 0.981 | | | 0.986 | | | 0.974 | |
| Flt Protected | | 0.992 | | | 0.996 | | | 0.995 | | | 0.987 | |
| Satd. Flow (prot) | 0 | 2879 | 0 | 0 | 2849 | 0 | 0 | 2707 | 0 | 0 | 2611 | 0 |
| Flt Permitted | | 0.654 | | | 0.859 | | | 0.871 | | | 0.693 | |
| Satd. Flow (perm) | 0 | 1880 | 0 | 0 | 2437 | 0 | 0 | 2345 | 0 | 0 | 1791 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 21 | | | 26 | | | 18 | | | 33 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 291.1 | | | 316.7 | | | 212.5 | | | 385.1 | |
| Travel Time (s) | | 21.0 | | | 22.8 | | | 15.3 | | | 27.7 | |
| Confl. Peds. (#/hr) | 190 | 21.0 | 200 | 200 | | 190 | 235 | 10.0 | 160 | 160 | | 235 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles (%) | 6% | 3% | 4% | 2% | 2% | 4% | 7% | 9% | 9% | 5% | 13% | 5% |
| Bus Blockages (#/hr) | 10 | 10 | 10 | 20 | 20 | 20 | 10 | 24 | 24 | 0 | 14 | 14 |
| Adj. Flow (vph) | 93 | 413 | 61 | 63 | 660 | 106 | 52 | 445 | 53 | 130 | 270 | 85 |
| Shared Lane Traffic (%) | 00 | 110 | 01 | | 000 | 100 | 02 | 110 | | 100 | 210 | 00 |
| Lane Group Flow (vph) | 0 | 567 | 0 | 0 | 829 | 0 | 0 | 550 | 0 | 0 | 485 | 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) | Loit | 0.0 | rugiit | Loit | 0.0 | rugiit | Loit | 0.0 | rugiit | Loit | 0.0 | rugiit |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | 1.0 | | | 1.0 | | | 1.0 | | | 1.0 | |
| Headway Factor | 1.16 | 1.19 | 1.16 | 1.16 | 1.22 | 1.16 | 1.16 | 1.23 | 1.16 | 1.16 | 1.20 | 1.16 |
| Turning Speed (k/h) | 24 | 1.13 | 14 | 24 | 1.22 | 1.10 | 24 | 1.20 | 1.10 | 24 | 1.20 | 14 |
| Turn Type | Perm | NA | | Perm | NA | 17 | pm+pt | NA | 17 | Perm | NA | 17 |
| Protected Phases | 1 Cilli | 2 | | 1 Cilli | 6 | | 3 | 8 | | 1 Cilli | 4 | |
| Permitted Phases | 2 | | | 6 | U | | 8 | 0 | | 4 | - | |
| Minimum Split (s) | 27.0 | 27.0 | | 27.0 | 27.0 | | 10.0 | 27.0 | | 27.0 | 27.0 | |
| Total Split (s) | 40.0 | 40.0 | | 40.0 | 40.0 | | 10.0 | 40.0 | | 30.0 | 30.0 | |
| Total Split (%) | 50.0% | 50.0% | | 50.0% | 50.0% | | 12.5% | 50.0% | | 37.5% | 37.5% | |
| Maximum Green (s) | 34.0 | 34.0 | | 34.0 | 34.0 | | 6.0 | 34.0 | | 24.0 | 24.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 2.0 | -1.0 | | 2.0 | -1.0 | | 1.0 | -1.0 | | 2.0 | -2.0 | |
| Total Lost Time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 4.0 | |
| | | 5.0 | | | 5.0 | | Lead | 5.0 | | Lon | | |
| Lead/Lag | | | | | | | | | | Lag | Lag | |
| Lead-Lag Optimize? | 7.0 | 7.0 | | 7.0 | 7.0 | | Yes | 7.0 | | Yes | Yes 7.0 | |
| Walk Time (s) | | | | | | | | | | 7.0 | | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | | 14.0 | | 14.0 | 14.0 | |
| Pedestrian Calls (#/hr) | 100 | 100 | | 100 | 100 | | | 100 | | 100 | 100 | |
| Act Effct Green (s) | | 35.0 | | | 35.0 | | | 35.0 | | | 26.0 | |
| Actuated g/C Ratio | | 0.44 | | | 0.44 | | | 0.44 | | | 0.32 | |

Existing PM 05/06/2014 Synchro 10 Report HDR Corporation Page 13 Lanes, Volumes, Timings 539: Dufferin St & King St

EBL EBT WBT NBT Lane Group v/c Ratio 0.68 0.77 0.52 0.80 Control Delay 21.8 23.5 19.8 35.1 Queue Delay 0.0 0.0 0.0 0.0 Total Delay 21.8 23.5 19.8 35.1 LOS D Approach Delay Approach LOS 21.8 23.5 19.8 35.1 С

05/20/2021

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Intersection Summary Area Type:

Cycle Length: 80
Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green

CBD

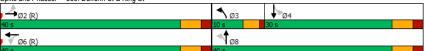
Natural Cycle: 65 Control Type: Pretimed Maximum v/c Ratio: 0.80

Intersection Signal Delay: 24.6
Intersection Capacity Utilization 92.0% Intersection LOS: C
ICU Level of Service F

Analysis Period (min) 15

HDR Corporation

Splits and Phases: 539: Dufferin St & King St



Existing PM 05/06/2014 Synchro 10 Report 539: Dufferin St & King St

05/20/2021

| - | ← | - ↑ | . ↓ |
|-------|--|--|---|
| | | | * |
| EBT | WBT | NBT | SBT |
| 567 | 829 | 550 | 485 |
| 0.68 | 0.77 | 0.52 | 0.80 |
| 21.8 | 23.5 | 19.8 | 35.1 |
| 0.0 | 0.0 | 0.0 | 0.0 |
| 21.8 | 23.5 | 19.8 | 35.1 |
| 21.3 | 38.4 | 29.7 | 32.7 |
| 33.5 | 55.8 | m47.1 | #54.0 |
| 267.1 | 292.7 | 188.5 | 361.1 |
| | | | |
| 834 | 1080 | 1058 | 604 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0.68 | 0.77 | 0.52 | 0.80 |
| | 0.68 21.8 0.0 21.8 21.3 33.5 267.1 834 0 | 567 829 0.68 0.77 21.8 23.5 0.0 0.0 21.8 23.5 21.3 38.4 33.5 55.8 267.1 292.7 834 1080 0 0 0 0 | 567 829 550 0.68 0.77 0.52 21.8 23.5 19.8 0.0 0.0 0.0 21.8 23.5 19.8 21.3 38.4 29.7 33.5 55.8 m47.1 267.1 292.7 188.5 834 1080 1058 0 0 0 0 0 0 |

Intersection Summary

HCM Signalized Intersection Capacity Analysis 539: Dufferin St & King St

05/20/2021

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|---------------------------------|-----------|----------|-------|------|------------|------------|---------|----------|------|-------------|-------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 414 | | | 414 | | | 414 | | | 414 | |
| Traffic Volume (vph) | 81 | 359 | 53 | 55 | 574 | 92 | 45 | 387 | 46 | 113 | 235 | 74 |
| Future Volume (vph) | 81 | 359 | 53 | 55 | 574 | 92 | 45 | 387 | 46 | 113 | 235 | 74 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 4.0 | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | | 0.97 | | | 0.97 | | | 0.98 | | | 0.95 | |
| Flpb, ped/bikes | | 0.99 | | | 0.99 | | | 0.99 | | | 0.98 | |
| Frt | | 0.98 | | | 0.98 | | | 0.99 | | | 0.97 | |
| Flt Protected | | 0.99 | | | 1.00 | | | 1.00 | | | 0.99 | |
| Satd. Flow (prot) | | 2851 | | | 2826 | | | 2682 | | | 2550 | |
| Flt Permitted | | 0.65 | | | 0.86 | | | 0.87 | | | 0.69 | |
| Satd. Flow (perm) | | 1880 | | | 2436 | | | 2347 | | | 1790 | |
| Peak-hour factor, PHF | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Adj. Flow (vph) | 93 | 413 | 61 | 63 | 660 | 106 | 52 | 445 | 53 | 130 | 270 | 85 |
| RTOR Reduction (vph) | 0 | 12 | 0 | 0 | 15 | 0 | 0 | 10 | 0 | 0 | 22 | 0 |
| Lane Group Flow (vph) | 0 | 555 | 0 | 0 | 814 | 0 | 0 | 540 | 0 | 0 | 463 | 0 |
| Confl. Peds. (#/hr) | 190 | | 200 | 200 | | 190 | 235 | | 160 | 160 | | 235 |
| Heavy Vehicles (%) | 6% | 3% | 4% | 2% | 2% | 4% | 7% | 9% | 9% | 5% | 13% | 5% |
| Bus Blockages (#/hr) | 10 | 10 | 10 | 20 | 20 | 20 | 10 | 24 | 24 | 0 | 14 | 14 |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | 3 | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 34.0 | | | 34.0 | | | 34.0 | | | 24.0 | |
| Effective Green, g (s) | | 35.0 | | | 35.0 | | | 35.0 | | | 26.0 | |
| Actuated g/C Ratio | | 0.44 | | | 0.44 | | | 0.44 | | | 0.32 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | |
| Lane Grp Cap (vph) | | 822 | | | 1065 | | | 1056 | | | 581 | |
| v/s Ratio Prot | | | | | | | | c0.04 | | | | |
| v/s Ratio Perm | | 0.30 | | | c0.33 | | | 0.18 | | | c0.26 | |
| v/c Ratio | | 0.68 | | | 0.76 | | | 0.51 | | | 0.80 | |
| Uniform Delay, d1 | | 18.0 | | | 19.0 | | | 16.3 | | | 24.6 | |
| Progression Factor | | 0.98 | | | 0.99 | | | 1.16 | | | 1.00 | |
| Incremental Delay, d2 | | 4.3 | | | 4.8 | | | 1.4 | | | 10.8 | |
| Delay (s) | | 21.8 | | | 23.6 | | | 20.3 | | | 35.4 | |
| Level of Service | | С | | | С | | | С | | | D | |
| Approach Delay (s) | | 21.8 | | | 23.6 | | | 20.3 | | | 35.4 | |
| Approach LOS | | С | | | С | | | С | | | D | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 24.8 | Н | CM 2000 | Level of | Service | | С | | | |
| HCM 2000 Volume to Capaci | ity ratio | | 0.75 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 80.0 | Sı | um of lost | time (s) | | | 12.0 | | | |
| Intersection Capacity Utilizati | ion | | 92.0% | IC | U Level o | of Service | 9 | | F | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |

c Critical Lane Group

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

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|----------------------------|-------|----------|-------|-------|----------|-------|-------|-------|-------|-------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | , j | ĵ. | | | ની | 7 | 7 | £ | | Ť | ĵ. | |
| Traffic Volume (vph) | 139 | 4 | 208 | 77 | 88 | 60 | 125 | 347 | 87 | 87 | 555 | 65 |
| Future Volume (vph) | 139 | 4 | 208 | 77 | 88 | 60 | 125 | 347 | 87 | 87 | 555 | 65 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| Storage Length (m) | 25.0 | | 0.0 | 0.0 | | 50.0 | 30.0 | | 0.0 | 25.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 0 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| 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 |
| Ped Bike Factor | 0.91 | 0.87 | | | 0.97 | 0.83 | | 0.98 | | 0.98 | 0.99 | |
| Frt | | 0.853 | | | | 0.850 | | 0.970 | | | 0.984 | |
| Flt Protected | 0.950 | | | | 0.977 | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1589 | 1307 | 0 | 0 | 1605 | 1507 | 1652 | 1667 | 0 | 1574 | 1705 | 0 |
| Flt Permitted | 0.584 | | | | 0.623 | | 0.172 | | | 0.346 | | |
| Satd. Flow (perm) | 889 | 1307 | 0 | 0 | 988 | 1246 | 299 | 1667 | 0 | 561 | 1705 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 219 | | | | 152 | | 10 | | | 5 | |
| Link Speed (k/h) | | 30 | | | 50 | | | 40 | | | 40 | |
| Link Distance (m) | | 143.4 | | | 229.0 | | | 205.6 | | | 241.4 | |
| Travel Time (s) | | 17.2 | | | 16.5 | | | 18.5 | | | 21.7 | |
| Confl. Peds. (#/hr) | 56 | | 53 | 53 | | 56 | 33 | | 29 | 29 | | 33 |
| Confl. Bikes (#/hr) | | | | | | 22 | | | 26 | | | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Heavy Vehicles (%) | 6% | 12% | 6% | 1% | 26% | 0% | 2% | 8% | 2% | 7% | 8% | 1% |
| Adj. Flow (vph) | 146 | 4 | 219 | 81 | 93 | 63 | 132 | 365 | 92 | 92 | 584 | 68 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 146 | 223 | 0 | 0 | 174 | 63 | 132 | 457 | 0 | 92 | 652 | 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) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.09 | 1.01 | 1.01 | 1.01 | 1.01 | 1.09 | 1.09 | 1.01 | 1.01 | 1.09 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | 2.0 | 2.0 | 30.5 | | 2.0 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | 2.0 | 2.0 | 1.8 | | 2.0 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | CI+Ex | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | 2.0 | 28.7 | | 2.0 | 28.7 | | | 28.7 | | 2.0 | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | Cl+Ex | | | CI+Ex | | | CI+Ex | |
| | | J A | | | J / | | | J A | | | J A | |

Existing PM 05/06/2014 HDR Corporation Synchro 10 Report Page 17 Lanes, Volumes, Timings 571: Strachan Ave & Canada Blvd/Fleet St

| Lane Group | Ø10 | Ø12 | Ø14 | Ø16 | |
|----------------------------|-----|-----|-----|-----|--|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | | | | | |
| Future Volume (vph) | | | | | |
| Ideal Flow (vphpl) | | | | | |
| Lane Width (m) | | | | | |
| Storage Length (m) | | | | | |
| Storage Lanes | | | | | |
| Taper Length (m) | | | | | |
| Lane Util. Factor | | | | | |
| Ped Bike Factor | | | | | |
| Frt | | | | | |
| Flt Protected | | | | | |
| Satd. Flow (prot) | | | | | |
| Flt Permitted | | | | | |
| Satd. Flow (perm) | | | | | |
| Right Turn on Red | | | | | |
| Satd. Flow (RTOR) | | | | | |
| Link Speed (k/h) | | | | | |
| Link Distance (m) | | | | | |
| Travel Time (s) | | | | | |
| Confl. Peds. (#/hr) | | | | | |
| Confl. Bikes (#/hr) | | | | | |
| Peak Hour Factor | | | | | |
| Heavy Vehicles (%) | | | | | |
| Adj. Flow (vph) | | | | | |
| Shared Lane Traffic (%) | | | | | |
| Lane Group Flow (vph) | | | | | |
| Enter Blocked Intersection | | | | | |
| Lane Alignment | | | | | |
| Median Width(m) | | | | | |
| Link Offset(m) | | | | | |
| Crosswalk Width(m) | | | | | |
| Two way Left Turn Lane | | | | | |
| Headway Factor | | | | | |
| Turning Speed (k/h) | | | | | |
| Number of Detectors | | | | | |
| Detector Template | | | | | |
| Leading Detector (m) | | | | | |
| | | | | | |
| Trailing Detector (m) | | | | | |
| Detector 1 Position(m) | | | | | |
| Detector 1 Size(m) | | | | | |
| Detector 1 Type | | | | | |
| Detector 1 Channel | | | | | |
| Detector 1 Extend (s) | | | | | |
| Detector 1 Queue (s) | | | | | |
| Detector 1 Delay (s) | | | | | |
| Detector 2 Position(m) | | | | | |
| Detector 2 Size(m) | | | | | |
| Detector 2 Type | | | | | |

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| Lane Group EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT | <i>~</i> = < < + <i>></i> + <i>+</i> | • | - | • | • | - | • | |
|--|---|------------|----------|---------|-----------|------------|---------------|--------------------------|
| Detector 2 Extend (s) | BL WBT WBR NBL NBT NBR SBL SBT | WBR | WBT | WBL | EBR | EBT | EBL | Lane Group |
| Tum Type | | | | | | | | Detector 2 Channel |
| Tum Type | 0.0 0.0 0.0 | | 0.0 | | | 0.0 | | Detector 2 Extend (s) |
| Protected Phases | erm NA Perm Perm NA Perm NA | Perm | NA | Perm | | NA | Perm | |
| Detector Phase | 8 2 6 | | 8 | | | 4 | | |
| Switch Phase Swit | 8 8 2 6 | 8 | | 8 | | | 4 | Permitted Phases |
| Minimum Initial (s) 32.0 32.0 32.0 32.0 32.0 32.0 29.0 29.0 29.0 29.0 39.0 36.0 | 8 8 8 2 2 6 6 | 8 | 8 | 8 | | 4 | 4 | Detector Phase |
| Minimum Initial (s) 32.0 32.0 32.0 32.0 32.0 32.0 29.0 29.0 29.0 29.0 39.0 36.0 | | | | | | | | Switch Phase |
| Minimum Split (s) 39.0 39.0 39.0 39.0 39.0 36.0 3 | 2.0 32.0 32.0 29.0 29.0 29.0 29.0 | 32.0 | 32.0 | 32.0 | | 32.0 | 32.0 | |
| Total Split (s) | | | | | | | | |
| Total Split (%) 27.8% 27.8% 27.8% 27.8% 27.8% 27.8% 41.7% 41 | | 40.0 | | 40.0 | | 40.0 | 40.0 | |
| Maximum Green (s) 33.0 33.0 33.0 33.0 33.0 53.0 53.0 53.0 | | 27.8% | 27.8% | 27.8% | | | | |
| Yellow Time (s) | | | | | | | | |
| All-Red Time (s) 3.0 3.0 3.0 3.0 3.0 4.0 4.0 4.0 4.0 4.0 Lost Time Adjust (s) -1.0 -1.0 -1.0 -1.0 -1.0 -1.0 -1.0 -1.0 | | | | | | | | |
| Lost Time Adjust (s) | | | | | | | | |
| Total Lost Time (s) | | | | 0.0 | | | | |
| Lead-Lag Optimizer Vehicle Extension (s) 3.0 3 | | | | | | | | |
| Lead-Lag Optimize? Vehicle Extension (s) 3.0 | 0.0 0.0 0.0 0.0 | 0.0 | 0.0 | | | 0.0 | 0.0 | |
| Vehicle Extension (s) 3.0 7.0 | | | | | | | | |
| Recall Mode | 30 30 30 30 30 30 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Walk Time (s) 7.0 < | | | | | | | | (/ |
| Flash Dont Walk (s) | | | | | | | | |
| Pedestrian Calls (#/hr) | | | | | | | | |
| Act Effct Green (s) 34.6 34.6 34.6 34.6 54.9 54.9 54.9 54.9 Actuated g/C Ratio 0.31 0.31 0.31 0.31 0.31 0.49 0.49 0.49 0.49 0.40 v/c Ratio 0.53 0.40 0.57 0.13 0.90 0.56 0.34 0.78 0.00 0.50 0.53 0.40 0.57 0.13 0.90 0.56 0.34 0.78 0.00 0.00 0.00 0.00 0.00 0.00 0.00 | | | | | | | | |
| Actuated g/C Ratio 0.31 0.31 0.31 0.31 0.49 0.49 0.49 0.49 v/c Ratio 0.53 0.40 0.57 0.13 0.90 0.56 0.34 0.78 Control Delay 44.4 7.5 44.9 0.6 85.5 25.7 26.2 34.2 Queue Delay 0.0 0.0 0.0 0.0 0.0 0.0 0.2 0.0 0.0 Total Delay 44.4 7.5 44.9 0.6 85.5 25.9 26.2 34.2 LOS 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0. | | | | 13 | | | | \ / |
| v/c Ratio 0.53 0.40 0.57 0.13 0.90 0.56 0.34 0.78 Control Delay 44.4 7.5 44.9 0.6 85.5 25.7 26.2 34.2 Queue Delay 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 Total Delay 44.4 7.5 44.9 0.6 85.5 25.9 26.2 34.2 LOS D A D A F C C C Approach Delay 22.1 33.1 39.2 33.2 Approach LOS C C C D C Intersection Summary Area Type: Other Cycle Length: 144 Actuated Cycle Length: 112 Natural Cycle: 135 Control Type: Semi Act-Uncoord Maximum v/c Ratio: 0.90 Intersection LOS: C Intersection Capacity Utilization 131.0% ICU Level of Service H Analysis Period (min) 15 Splits and Phases: 571: Strachan Ave & Canada Blvd/Fleet St | | | | | | | | |
| Control Delay 44.4 7.5 44.9 0.6 85.5 25.7 26.2 34.2 Queue Delay 0.0 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> | | | | | | | | |
| Queue Delay | | | | | | | | |
| Total Delay | | | | | | | | |
| LOS D A D A F C C C Approach Delay 22.1 33.1 39.2 33.2 Approach LOS C C C C D D C C Intersection Summary Area Type: Other Cycle Length: 144 Actuated Cycle Length: 112 Natural Cycle: 135 Control Type: Semi Act-Uncoord Maximum v/c Ratio: 0.90 Intersection Signal Delay: 32.9 Intersection LOS: C Intersection Capacity Utilization 131.0% ICU Level of Service H Analysis Period (min) 15 Splits and Phases: 571: Strachan Ave & Canada Blvd/Fleet St | | | | | | | | |
| Approach Delay 22.1 33.1 39.2 33.2 Approach LOS C C C D C C D C C Intersection Summary Area Type: Other Cycle Length: 144 Actuated Cycle Length: 112 Natural Cycle: 135 Control Type: Semi Act-Uncoord Maximum v/c Ratio: 0.90 Intersection Signal Delay: 32.9 Intersection LOS: C Intersection Capacity Utilization 131.0% ICU Level of Service H Analysis Period (min) 15 Splits and Phases: 571: Strachan Ave & Canada Blvd/Fleet St | | | | | | | | |
| Approach LOS C C C D C Intersection Summary Area Type: Other Cycle Length: 144 Actuated Cycle Length: 112 Natural Cycle: 135 Control Type: Semi Act-Uncoord Maximum v/c Ratio: 0.90 Intersection Signal Delay: 32.9 Intersection LOS: C Intersection Capacity Utilization 131.0% ICU Level of Service H Analysis Period (min) 15 Splits and Phases: 571: Strachan Ave & Canada Blvd/Fleet St | | | | | | | | |
| Intersection Summary Area Type: Other Cycle Length: 144 Actuated Cycle Length: 112 Natural Cycle: 135 Control Type: Semi Act-Uncoord Maximum v/c Ratio: 0.90 Intersection Signal Delay: 32.9 Intersection LOS: C Intersection Capacity Utilization 131.0% ICU Level of Service H Analysis Period (min) 15 Splits and Phases: 571: Strachan Ave & Canada Blvd/Fleet St | **** | | | | | | | |
| Area Type: Other Cycle Length: 144 Actuated Cycle Length: 112 Natural Cycle: 135 Control Type: Semi Act-Uncoord Maximum v/c Ratio: 0.90 Intersection Signal Delay: 32.9 Intersection LOS: C Intersection Capacity Utilization 131.0% ICU Level of Service H Analysis Period (min) 15 Splits and Phases: 571: Strachan Ave & Canada Blvd/Fleet St | 0 5 | | | | | | | •• |
| Cycle Length: 144 Actuated Cycle Length: 112 Natural Cycle: 135 Control Type: Semi Act-Uncoord Maximum v/c Ratio: 0.90 Intersection Signal Delay: 32.9 Intersection LOS: C Intersection Capacity Utilization 131.0% ICU Level of Service H Analysis Period (min) 15 Splits and Phases: 571: Strachan Ave & Canada Blvd/Fleet St | | | | | | | 0.11 | |
| Actuated Cycle Length: 112 Natural Cycle: 135 Control Type: Semi Act-Uncoord Maximum v/c Ratio: 0.90 Intersection Signal Delay: 32.9 Intersection LOS: C Intersection Capacity Utilization 131.0% ICU Level of Service H Analysis Period (min) 15 Splits and Phases: 571: Strachan Ave & Canada Blvd/Fleet St | | | | | | | Otner | |
| Natural Cycle: 135 Control Type: Semi Act-Uncoord Maximum v/c Ratio: 0.90 Intersection Signal Delay: 32.9 Intersection LOS: C Intersection Capacity Utilization 131.0% ICU Level of Service H Analysis Period (min) 15 Splits and Phases: 571: Strachan Ave & Canada Blvd/Fleet St | | | | | | | | |
| Control Type: Semi Act-Uncoord Maximum v/c Ratio: 0.90 Intersection Signal Delay: 32.9 Intersection Capacity Utilization 131.0% ICU Level of Service H Analysis Period (min) 15 Splits and Phases: 571: Strachan Ave & Canada Blvd/Fleet St | | | | | | | 12 | |
| Maximum v/c Ratio: 0.90 Intersection Signal Delay: 32.9 Intersection LOS: C Intersection Capacity Utilization 131.0% ICU Level of Service H Analysis Period (min) 15 Splits and Phases: 571: Strachan Ave & Canada Blvd/Fleet St | | | | | | | | |
| Intersection Signal Delay: 32.9 Intersection LOS: C Intersection Capacity Utilization 131.0% ICU Level of Service H Analysis Period (min) 15 Splits and Phases: 571: Strachan Ave & Canada Blvd/Fleet St | | | | | | | ncoord | |
| Intersection Capacity Utilization 131.0% ICU Level of Service H Analysis Period (min) 15 Splits and Phases: 571: Strachan Ave & Canada Blvd/Fleet St | | | | | | | | |
| Analysis Period (min) 15 Splits and Phases: 571: Strachan Ave & Canada Blvd/Fleet St | | | | | | ., | | |
| Splits and Phases: 571: Strachan Ave & Canada Blvd/Fleet St | ICU Level of Service H | if Service | CU Level | 10 | | / o | zation 131.0° | |
| | | | | | | | | Analysis Period (min) 15 |
| | St | | | leet St | da Blvd/F | ve & Cana | : Strachan A | Splits and Phases: 571: |
| ↑ø2 * \$ø10 • ø4 | • | 1 | 10 | | | | | 4 |

| Lane Group | Ø10 | Ø12 | Ø14 | Ø16 | |
|-------------------------|------|------|------|------|--|
| Detector 2 Channel | | | | | |
| Detector 2 Extend (s) | | | | | |
| Turn Type | | | | | |
| Protected Phases | 10 | 12 | 14 | 16 | |
| Permitted Phases | | | | | |
| Detector Phase | | | | | |
| Switch Phase | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | 7.0 | |
| Minimum Split (s) | 15.0 | 15.0 | 15.0 | 15.0 | |
| Total Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | |
| Total Split (%) | 15% | 15% | 15% | 15% | |
| Maximum Green (s) | 14.0 | 14.0 | 14.0 | 14.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | |
| All-Red Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | |
| Lost Time Adjust (s) | | | | | |
| Total Lost Time (s) | | | | | |
| Lead/Lag | | | | | |
| Lead-Lag Optimize? | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | |
| Walk Time (s) | 0.0 | 0.0 | 0.0 | 0.0 | |
| Flash Dont Walk (s) | 0.0 | 0.0 | 0.0 | 0.0 | |
| Pedestrian Calls (#/hr) | 16 | 16 | 16 | 16 | |
| Act Effct Green (s) | | | | | |
| Actuated g/C Ratio | | | | | |
| v/c Ratio | | | | | |
| Control Delay | | | | | |
| Queue Delay | | | | | |
| Total Delay | | | | | |
| LOS | | | | | |
| Approach Delay | | | | | |
| Approach LOS | | | | | |
| Intersection Summary | | | | | |
| intersection Summary | | | | | |

Lanes, Volumes, Timings 571: Strachan Ave & Canada Blvd/Fleet St

| | • | - | ← | • | 4 | † | - | ļ | |
|------------------------|------|-------|----------|------|-------|----------|------|--------|--|
| Lane Group | EBL | EBT | WBT | WBR | NBL | NBT | SBL | SBT | |
| Lane Group Flow (vph) | 146 | 223 | 174 | 63 | 132 | 457 | 92 | 652 | |
| v/c Ratio | 0.53 | 0.40 | 0.57 | 0.13 | 0.90 | 0.56 | 0.34 | 0.78 | |
| Control Delay | 44.4 | 7.5 | 44.9 | 0.6 | 85.5 | 25.7 | 26.2 | 34.2 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | |
| Total Delay | 44.4 | 7.5 | 44.9 | 0.6 | 85.5 | 25.9 | 26.2 | 34.2 | |
| Queue Length 50th (m) | 22.1 | 0.5 | 26.8 | 0.0 | 20.0 | 51.9 | 9.3 | 88.4 | |
| Queue Length 95th (m) | 57.6 | 21.0 | #67.0 | 0.0 | #77.7 | 128.4 | 32.5 | #228.9 | |
| Internal Link Dist (m) | | 119.4 | 205.0 | | | 181.6 | | 217.4 | |
| Turn Bay Length (m) | 25.0 | | | 50.0 | 30.0 | | 25.0 | | |
| Base Capacity (vph) | 274 | 554 | 304 | 489 | 146 | 822 | 274 | 838 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 46 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.53 | 0.40 | 0.57 | 0.13 | 0.90 | 0.59 | 0.34 | 0.78 | |
| Intono etian Communica | | | | | | | | | |

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

Queue shown is maximum after two cycles.

| | ۶ | - | • | • | ← | • | 1 | † | / | - | ↓ | 4 |
|---------------------------------|------------|-----------|--------|---------|-----------|------------|---------|-----------|------|---------|-----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBI |
| Lane Configurations | 7 | ĵ» | | | ર્ન | 7 | ň | ĵ» | | 7 | ĥ | |
| Traffic Volume (vph) | 139 | 4 | 208 | 77 | 88 | 60 | 125 | 347 | 87 | 87 | 555 | 6 |
| Future Volume (vph) | 139 | 4 | 208 | 77 | 88 | 60 | 125 | 347 | 87 | 87 | 555 | 6 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 190 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3. |
| Total Lost time (s) | 6.0 | 6.0 | | | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frpb, ped/bikes | 1.00 | 0.88 | | | 1.00 | 0.85 | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 0.92 | 1.00 | | | 0.97 | 1.00 | 1.00 | 1.00 | | 0.98 | 1.00 | |
| Frt | 1.00 | 0.85 | | | 1.00 | 0.85 | 1.00 | 0.97 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | | 0.98 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1463 | 1333 | | | 1556 | 1280 | 1652 | 1672 | | 1538 | 1708 | |
| Flt Permitted | 0.58 | 1.00 | | | 0.62 | 1.00 | 0.17 | 1.00 | | 0.35 | 1.00 | |
| Satd. Flow (perm) | 899 | 1333 | | | 992 | 1280 | 300 | 1672 | | 560 | 1708 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.9 |
| Adj. Flow (vph) | 146 | 4 | 219 | 81 | 93 | 63 | 132 | 365 | 92 | 92 | 584 | 6 |
| RTOR Reduction (vph) | 0 | 157 | 0 | 0 | 0 | 45 | 0 | 6 | 0 | 0 | 3 | |
| Lane Group Flow (vph) | 146 | 66 | 0 | 0 | 174 | 18 | 132 | 451 | 0 | 92 | 649 | |
| Confl. Peds. (#/hr) | 56 | 00 | 53 | 53 | | 56 | 33 | | 29 | 29 | 0.10 | 3 |
| Confl. Bikes (#/hr) | | | | | | 22 | | | 26 | | | |
| Heavy Vehicles (%) | 6% | 12% | 6% | 1% | 26% | 0% | 2% | 8% | 2% | 7% | 8% | 19 |
| Turn Type | Perm | NA | 070 | Perm | NA | Perm | Perm | NA | 270 | Perm | NA | - 17 |
| Protected Phases | 1 Cilli | 4 | | 1 Cilli | 8 | I CIIII | 1 Cilli | 2 | | I CIIII | 6 | |
| Permitted Phases | 4 | | | 8 | · | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 33.5 | 33.5 | | U | 33.5 | 33.5 | 53.9 | 53.9 | | 53.9 | 53.9 | |
| Effective Green, q (s) | 34.5 | 34.5 | | | 34.5 | 34.5 | 54.9 | 54.9 | | 54.9 | 54.9 | |
| Actuated g/C Ratio | 0.28 | 0.28 | | | 0.28 | 0.28 | 0.45 | 0.45 | | 0.45 | 0.45 | |
| Clearance Time (s) | 7.0 | 7.0 | | | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 253 | 376 | | | 280 | 361 | 134 | 751 | | 251 | 767 | |
| v/s Ratio Prot | 200 | 0.05 | | | 200 | 301 | 134 | 0.27 | | 201 | 0.38 | |
| v/s Ratio Perm | 0.16 | 0.05 | | | c0.18 | 0.01 | c0.44 | 0.27 | | 0.16 | 0.30 | |
| v/c Ratio | 0.16 | 0.18 | | | 0.62 | 0.01 | 0.99 | 0.60 | | 0.16 | 0.85 | |
| Uniform Delay, d1 | 37.6 | 33.1 | | | 38.2 | 31.9 | 33.2 | 25.4 | | 22.2 | 29.9 | |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| | 9.3 | 1.00 | | | 10.0 | 0.3 | 73.9 | 3.5 | | 4.1 | 11.1 | |
| Incremental Delay, d2 | 46.9 | 34.1 | | | 48.1 | 32.2 | 107.1 | 28.9 | | 26.3 | 41.0 | |
| Delay (s) | 40.9 D | 34.1 C | | | 40.1 D | | | 20.9 C | | | 41.0 D | |
| Level of Service | U | | | | | С | F | | | С | | |
| Approach Delay (s) Approach LOS | | 39.2 D | | | 43.9 D | | | 46.5 D | | | 39.2 D | |
| Intersection Summary | | | | | | | | | | | | |
| | | | 42.0 | 11 | OM 2000 | Level of | Comina | | D | | | |
| HCM 2000 Control Delay | oite rotio | | | Н | UN 2000 | Level of | Service | | ט | | | |
| HCM 2000 Volume to Capa | city ratio | | 0.80 | ^ | 61 | / \ | | | 00.0 | | | |
| Actuated Cycle Length (s) | | | 122.2 | | um of los | . , | | | 28.0 | | | |
| Intersection Capacity Utiliza | tion | | 131.0% | IC | U Level | of Service | | | Н | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |

Lanes, Volumes, Timings 1344: Lakeshore Blvd & British Colombia Rd

05/20/2021

| Lane Group EBL EBT EBR WBL WBT WBT NBL NBT NBR SBL SBT SBR | | ᄼ | → | • | • | — | • | • | † | ~ | / | ļ | 4 |
|--|-----------------------|-------|----------|-------|------|----------|-------|------|-----------------|----------|----------|-------|-------|
| Traffic Volume (vph) | Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Future Volume (vph) | Lane Configurations | 7 | ^ | | | | 77 | | ተተ _ጉ | | | | |
| Ideal Flow (vphpt) | Traffic Volume (vph) | 54 | 386 | 0 | 0 | 0 | 567 | 0 | 2322 | 4 | 0 | 0 | 0 |
| Lane Width (m) | Future Volume (vph) | 54 | 386 | 0 | 0 | 0 | 567 | 0 | 2322 | 4 | 0 | 0 | 0 |
| Storage Length (m) | Ideal Flow (vphpl) | 1900 | 2000 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Lanes | Lane Width (m) | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Taper Length (m) | Storage Length (m) | 15.0 | | 0.0 | 0.0 | | 80.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Lane Util. Factor | Storage Lanes | 1 | | 0 | 0 | | 1 | 0 | | 0 | 0 | | 0 |
| Fit Protected | Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Fit Protected 0.950 Satd. Flow (prot) 1652 1939 0 0 0 0 2756 0 5029 0 0 0 0 0 0 0 0 0 | Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.88 | 1.00 | 0.91 | 0.91 | 1.00 | 1.00 | 1.00 |
| Satd. Flow (prot) 1652 1939 0 0 0 2756 0 5029 0 0 0 0 0 | Frt | | | | | | 0.850 | | | | | | |
| Fit Permitted | Flt Protected | 0.950 | | | | | | | | | | | |
| Satd. Flow (perm) 1652 1939 0 0 0 2756 0 5029 0 0 0 0 0 | Satd. Flow (prot) | 1652 | 1939 | 0 | 0 | 0 | 2756 | 0 | 5029 | 0 | 0 | 0 | 0 |
| Right Turn on Red | Flt Permitted | 0.950 | | | | | | | | | | | |
| Satd. Flow (RTOR) 76 | Satd. Flow (perm) | 1652 | 1939 | 0 | 0 | 0 | 2756 | 0 | 5029 | 0 | 0 | 0 | 0 |
| Link Speed (k/h) 60 30 60 60 Link Distance (m) 411.9 164.9 800.6 492.6 Travel Time (s) 24.7 19.8 48.0 29.6 Peak Hour Factor 0.95 0.0 0.0 0.0 0.0 0.0 | Right Turn on Red | Yes | | Yes | | | Yes | | | Yes | | | Yes |
| Link Distance (m) 411.9 164.9 800.6 492.6 Travel Time (s) 24.7 19.8 48.0 29.6 Peak Hour Factor 0.95 | Satd. Flow (RTOR) | 76 | | | | | 293 | | | | | | |
| Link Distance (m) 411.9 164.9 800.6 492.6 Travel Time (s) 24.7 19.8 48.0 29.6 Peak Hour Factor 0.95 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0< | Link Speed (k/h) | | 60 | | | 30 | | | 60 | | | 60 | |
| Travel Time (s) 24.7 19.8 48.0 29.6 Peak Hour Factor 0.95 0 | | | 411.9 | | | 164.9 | | | 800.6 | | | 492.6 | |
| Peak Hour Factor 0.95 0. | | | 24.7 | | | 19.8 | | | 48.0 | | | 29.6 | |
| Adj. Flow (vph) 57 406 0 0 597 0 2444 4 0 0 0 Shared Lane Traffic (%) Shared Lane Traffic (%) Shared Lane Group Flow (vph) 57 406 0 0 0 597 0 2448 0 </td <td></td> <td>0.95</td> <td>0.95</td> <td>0.95</td> <td>0.95</td> <td>0.95</td> <td>0.95</td> <td>0.95</td> <td></td> <td>0.95</td> <td>0.95</td> <td>0.95</td> <td>0.95</td> | | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | | 0.95 | 0.95 | 0.95 | 0.95 |
| Shared Lane Traffic (%) Lane Group Flow (vph) 57 406 0 0 0 597 0 2448 0 0 0 0 0 | | | | | | | | | | | | | |
| Lane Group Flow (vph) 57 406 0 0 597 0 2448 0 0 0 0 Enter Blocked Intersection No 3.0 3.0 3.0 3 | | | | | | | | | | | | | |
| Enter Blocked Intersection No No No No No No No | | 57 | 406 | 0 | 0 | 0 | 597 | 0 | 2448 | 0 | 0 | 0 | 0 |
| Lane Alignment | | | | No | No | No | | No | | No | No | No | |
| Median Width(m) 3.0 3.0 3.0 3.0 Link Offset(m) 0.0 0.0 0.0 0.0 Crosswalk Width(m) 1.6 1.6 1.6 1.6 Two way Left Turn Lane 1.09 0.95 1.01 | | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Link Offset(m) 0.0 0.0 0.0 0.0 Crosswalk Width(m) 1.6 1.6 1.6 1.6 Two way Left Turn Lane Headway Factor 1.09 0.95 1.01< | | | | J - | | | J . | | | <u> </u> | | | J |
| Crosswalk Width(m) 1.6 1.0 1.01 | | | | | | | | | | | | | |
| Two way Left Turn Lane Headway Factor 1.09 0.95 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.0 | , | | | | | | | | | | | | |
| Headway Factor 1.09 0.95 1.01 | | | | | | | | | | | | | |
| Turning Speed (k/h) 24 14 <td></td> <td>1.09</td> <td>0.95</td> <td>1.01</td> | | 1.09 | 0.95 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Number of Detectors 1 2 1 2 Detector Template Left Thru Right Thru Leading Detector (m) 6.1 30.5 6.1 30.5 Trailing Detector (m) 0.0 0.0 0.0 0.0 Detector 1 Position(m) 0.0 0.0 0.0 0.0 Detector 1 Size(m) 6.1 1.8 6.1 1.8 Detector 1 Type CI+Ex CI+Ex CI+Ex Detector 1 Channel CI+Ex CI+Ex CI+Ex | | | | | | | | | | | | | |
| Leading Detector (m) 6.1 30.5 6.1 30.5 Trailing Detector (m) 0.0 0.0 0.0 Detector 1 Position(m) 0.0 0.0 0.0 Detector 1 Size(m) 6.1 1.8 6.1 1.8 Detector 1 Type CI+Ex CI+Ex CI+Ex CI+Ex Detector 1 Channel CI+Ex CI+Ex CI+Ex | | | 2 | | | | 1 | | 2 | | | | |
| Leading Detector (m) 6.1 30.5 6.1 30.5 Trailing Detector (m) 0.0 0.0 0.0 Detector 1 Position(m) 0.0 0.0 0.0 Detector 1 Size(m) 6.1 1.8 6.1 1.8 Detector 1 Type CI+Ex CI+Ex CI+Ex CI+Ex Detector 1 Channel CI+Ex CI+Ex CI+Ex | | | | | | | Right | | | | | | |
| Trailing Detector (m) 0.0 0.0 0.0 0.0 Detector 1 Position(m) 0.0 0.0 0.0 0.0 Detector 1 Size(m) 6.1 1.8 6.1 1.8 Detector 1 Type CI+Ex CI+Ex CI+Ex CI+Ex Detector 1 Channel CI+Ex CI+Ex CI+Ex | | | | | | | | | | | | | |
| Detector 1 Position(m) 0.0 0.0 0.0 0.0 Detector 1 Size(m) 6.1 1.8 6.1 1.8 Detector 1 Type CI+Ex CI+Ex CI+Ex CI+Ex Detector 1 Channel CI+Ex CI+Ex CI+Ex | | | | | | | | | | | | | |
| Detector 1 Size(m) 6.1 1.8 6.1 1.8 Detector 1 Type CI+Ex CI+Ex CI+Ex CI+Ex Detector 1 Channel CI+Ex CI+Ex CI+Ex CI+Ex | | | | | | | | | | | | | |
| Detector 1 Type CI+Ex CI+Ex CI+Ex CI+Ex Detector 1 Channel CI+Ex CI+Ex CI+Ex | | | | | | | | | | | | | |
| Detector 1 Channel | | | | | | | | | | | | | |
| | | | · · | | | | | | | | | | |
| Detector 1 Extend (s) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | Detector 1 Extend (s) | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Detector 1 Queue (s) 0.0 0.0 0.0 0.0 | | | | | | | | | | | | | |
| Detector 1 Delay (s) 0.0 0.0 0.0 0.0 | | | | | | | 0.0 | | 0.0 | | | | |
| Detector 2 Position(m) 28.7 28.7 | | 0.0 | | | | | 0.0 | | | | | | |
| Detector 2 Size(m) 1.8 1.8 | | | | | | | | | | | | | |
| Detector 2 Type CI+Ex CI+Ex | | | | | | | | | | | | | |
| Detector 2 Channel | | | 3. LX | | | | | | J X | | | | |
| Detector 2 Extend (s) 0.0 0.0 | | | 0.0 | | | | | | 0.0 | | | | |
| Tum Type Perm NA Perm NA | | Perm | | | | | Perm | | | | | | |
| Protected Phases 4 2 | | | | | | | | | | | | | |

Existing PM 05/06/2014 HDR Corporation Synchro 10 Report Page 23 Lanes, Volumes, Timings

1344: Lakeshore Blvd & British Colombia Rd

05/20/2021

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|------------------------------|--------------|-------|-----|-----|------------|------------|-----|----------|-----|-----|-----|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Permitted Phases | 4 | | | | | 9 | | | | | | |
| Detector Phase | 4 | 4 | | | | 9 | | 2 | | | | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | | | | 7.0 | | 22.0 | | | | |
| Minimum Split (s) | 13.0 | 13.0 | | | | 30.0 | | 29.0 | | | | |
| Total Split (s) | 29.0 | 29.0 | | | | 33.0 | | 82.0 | | | | |
| Total Split (%) | 20.1% | 20.1% | | | | 22.9% | | 56.9% | | | | |
| Maximum Green (s) | 23.0 | 23.0 | | | | 27.0 | | 75.0 | | | | |
| Yellow Time (s) | 4.0 | 4.0 | | | | 4.0 | | 4.0 | | | | |
| All-Red Time (s) | 2.0 | 2.0 | | | | 2.0 | | 3.0 | | | | |
| Lost Time Adjust (s) | -1.0 | -3.0 | | | | -1.0 | | -1.0 | | | | |
| Total Lost Time (s) | 5.0 | 3.0 | | | | 5.0 | | 6.0 | | | | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | 3.0 | | 3.0 | | | | |
| Recall Mode | None | None | | | | None | | None | | | | |
| Walk Time (s) | 0.0 | 0.0 | | | | | | 7.0 | | | | |
| Flash Dont Walk (s) | 0.0 | 0.0 | | | | | | 15.0 | | | | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | | | | 0 | | | | |
| Act Effct Green (s) | 24.0 | 26.0 | | | | 22.2 | | 75.7 | | | | |
| Actuated g/C Ratio | 0.17 | 0.19 | | | | 0.16 | | 0.55 | | | | |
| v/c Ratio | 0.16 | 1.11 | | | | 0.87 | | 0.89 | | | | |
| Control Delay | 6.4 | 131.2 | | | | 42.0 | | 33.1 | | | | |
| Queue Delay | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Total Delay | 6.4 | 131.2 | | | | 42.0 | | 33.1 | | | | |
| LOS | Α | F | | | | D | | С | | | | |
| Approach Delay | | 115.8 | | | 42.0 | | | 33.1 | | | | |
| Approach LOS | | F | | | D | | | С | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 144 | | | | | | | | | | | | |
| Actuated Cycle Length: 13 | 88 | | | | | | | | | | | |
| Natural Cycle: 120 | | | | | | | | | | | | |
| Control Type: Semi Act-Ur | ncoord | | | | | | | | | | | |
| Maximum v/c Ratio: 1.11 | | | | | | | | | | | | |
| Intersection Signal Delay: | | | | | tersection | | | | | | | |
| Intersection Capacity Utiliz | zation 84.0% | | | IC | U Level | of Service | E | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |

Splits and Phases: 1344: Lakeshore Blvd & British Colombia Rd Ø9

1344: Lakeshore Blvd & British Colombia Rd

05/20/2021

| | • | - | • | † |
|------------------------|------|--------|------|----------|
| | | _ | | |
| Lane Group | EBL | EBT | WBR | NBT |
| Lane Group Flow (vph) | 57 | 406 | 597 | 2448 |
| v/c Ratio | 0.16 | 1.11 | 0.87 | 0.89 |
| Control Delay | 6.4 | 131.2 | 42.0 | 33.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 6.4 | 131.2 | 42.0 | 33.1 |
| Queue Length 50th (m) | 0.0 | ~128.6 | 48.5 | 211.5 |
| Queue Length 95th (m) | 7.6 | #201.0 | 72.9 | 252.0 |
| Internal Link Dist (m) | | 387.9 | | 776.6 |
| Turn Bay Length (m) | 15.0 | | 80.0 | |
| Base Capacity (vph) | 350 | 365 | 793 | 2773 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | | | | |

HCM Signalized Intersection Capacity Analysis 1344: Lakeshore Blvd & British Colombia Rd

05/20/2021

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|-------------------------------|-------------|------------|-------|------|------------|------------|---------|-----------|------|-------------|----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ሻ | ^ | | | | 77 | | ተተኈ | | | | |
| Traffic Volume (vph) | 54 | 386 | 0 | 0 | 0 | 567 | 0 | 2322 | 4 | 0 | 0 | 0 |
| Future Volume (vph) | 54 | 386 | 0 | 0 | 0 | 567 | 0 | 2322 | 4 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 2000 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 5.0 | 3.0 | | | | 5.0 | | 6.0 | | | | |
| Lane Util. Factor | 1.00 | 1.00 | | | | 0.88 | | 0.91 | | | | |
| Frt | 1.00 | 1.00 | | | | 0.85 | | 1.00 | | | | |
| Flt Protected | 0.95 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Satd. Flow (prot) | 1652 | 1939 | | | | 2756 | | 5028 | | | | |
| Flt Permitted | 0.95 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Satd. Flow (perm) | 1652 | 1939 | | | | 2756 | | 5028 | | | | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 57 | 406 | 0 | 0 | 0 | 597 | 0 | 2444 | 4 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 47 | 0 | 0 | 0 | 0 | 246 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 10 | 406 | 0 | 0 | 0 | 351 | 0 | 2448 | 0 | 0 | 0 | 0 |
| Turn Type | Perm | NA | • | | | Perm | | NA | | | | |
| Protected Phases | 1 01111 | 4 | | | | 1 01111 | | 2 | | | | |
| Permitted Phases | 4 | - | | | | 9 | | _ | | | | |
| Actuated Green, G (s) | 23.0 | 23.0 | | | | 21.2 | | 74.7 | | | | |
| Effective Green, q (s) | 24.0 | 26.0 | | | | 22.2 | | 75.7 | | | | |
| Actuated g/C Ratio | 0.17 | 0.19 | | | | 0.16 | | 0.55 | | | | |
| Clearance Time (s) | 6.0 | 6.0 | | | | 6.0 | | 7.0 | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | 3.0 | | 3.0 | | | | |
| Lane Grp Cap (vph) | 287 | 365 | | | | 443 | | 2760 | | | | |
| v/s Ratio Prot | 201 | c0.21 | | | | 770 | | c0.49 | | | | |
| v/s Ratio Perm | 0.01 | CU.Z I | | | | c0.13 | | 60.43 | | | | |
| v/c Ratio | 0.01 | 1.11 | | | | 0.79 | | 0.89 | | | | |
| Uniform Delay, d1 | 47.3 | 56.0 | | | | 55.6 | | 27.3 | | | | |
| Progression Factor | 1.00 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Incremental Delay, d2 | 0.0 | 81.0 | | | | 9.4 | | 3.8 | | | | |
| | 47.4 | 137.0 | | | | 65.0 | | 31.2 | | | | |
| Delay (s) Level of Service | 47.4 D | 137.0 F | | | | 00.0 E | | 31.2 C | | | | |
| Approach Delay (s) | U | 125.9 | | | 65.0 | | | 31.2 | | | 0.0 | |
| Approach LOS | | 125.9 F | | | 00.U E | | | 31.2 C | | | 0.0 A | |
| | | F | | | E | | | C | | | А | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 49.5 | H | CM 2000 | Level of | Service | | D | | | |
| HCM 2000 Volume to Capa | acity ratio | | 0.92 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 137.9 | | um of lost | | | | 15.0 | | | |
| Intersection Capacity Utiliza | ation | | 84.0% | IC | U Level o | of Service | | | Е | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| o Critical Lana Croup | | | | | | | | | | | | |

| HCM 2000 Control Delay 49.5 HCM 2000 Level of Service D HCM 2000 Volume to Capacity ratio 0.92 | Intersection Summary | | | | |
|--|-----------------------------------|-------|---------------------------|------|--|
| | HCM 2000 Control Delay | 49.5 | HCM 2000 Level of Service | D | |
| | HCM 2000 Volume to Capacity ratio | 0.92 | | | |
| Actuated Cycle Length (s) 137.9 Sum of lost time (s) 15.0 | Actuated Cycle Length (s) | 137.9 | Sum of lost time (s) | 15.0 | |
| Intersection Capacity Utilization 84.0% ICU Level of Service E | Intersection Capacity Utilization | 84.0% | ICU Level of Service | E | |
| Analysis Period (min) 15 | Analysis Period (min) | 15 | | | |
| c Critical Lane Group | c Critical Lane Group | | | | |

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

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

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings 1449: Dufferin St & Dwy/Liberty St

05/20/2021

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|----------------------------|-------|----------|-------|-------|----------|-------|-------|----------|-------|----------|----------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 4 | | | 4 | | | 413- | | | 414 | |
| Traffic Volume (vph) | 5 | 4 | 2 | 376 | 0 | 151 | 0 | 379 | 159 | 58 | 350 | 0 |
| Future Volume (vph) | 5 | 4 | 2 | 376 | 0 | 151 | 0 | 379 | 159 | 58 | 350 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.97 | | | 0.90 | | | 0.87 | | | 0.98 | |
| Frt | | 0.979 | | | 0.961 | | | 0.956 | | | | |
| Flt Protected | | 0.977 | | | 0.966 | | | | | | 0.993 | |
| Satd. Flow (prot) | 0 | 1763 | 0 | 0 | 1672 | 0 | 0 | 2784 | 0 | 0 | 3346 | 0 |
| FIt Permitted | | 0.856 | | | 0.781 | | | | | | 0.794 | |
| Satd. Flow (perm) | 0 | 1530 | 0 | 0 | 1252 | 0 | 0 | 2784 | 0 | 0 | 2620 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 2 | | | 41 | | | 103 | | | | |
| Link Speed (k/h) | | 50 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 106.6 | | | 106.9 | | | 249.2 | | | 212.5 | |
| Travel Time (s) | | 7.7 | | | 9.6 | | | 17.9 | | | 15.3 | |
| Confl. Peds. (#/hr) | 64 | | 79 | 79 | | 64 | 107 | | 178 | 178 | | 107 |
| Confl. Bikes (#/hr) | | | 18 | | | 16 | | | 36 | | | |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 1% | 0% | 2% | 0% | 2% | 2% | 0% | 1% | 0% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 24 | 24 | 10 | 24 | 24 |
| Adj. Flow (vph) | 6 | 5 | 2 | 427 | 0 | 172 | 0 | 431 | 181 | 66 | 398 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 13 | 0 | 0 | 599 | 0 | 0 | 612 | 0 | 0 | 464 | 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) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.08 | 1.01 | 1.01 | 1.08 | 1.01 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | | NA | | Perm | NA | |

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Lanes, Volumes, Timings 1449: Dufferin St & Dwy/Liberty St

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|--|-----------------|-----------|----------|-----------|------------|------------|-------|----------|-----|-------------|-------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Minimum Split (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Total Split (s) | 40.0 | 40.0 | | 40.0 | 40.0 | | 40.0 | 40.0 | | 40.0 | 40.0 | |
| Total Split (%) | 50.0% | 50.0% | | 50.0% | 50.0% | | 50.0% | 50.0% | | 50.0% | 50.0% | |
| Maximum Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 34.0 | 34.0 | | 34.0 | 34.0 | |
| Yellow Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | -1.0 | | | -2.0 | | | -1.0 | | | -1.0 | |
| Total Lost Time (s) | | 4.0 | | | 3.0 | | | 5.0 | | | 5.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 26 | 26 | | 21 | 21 | | 100 | 100 | | 100 | 100 | |
| Act Effct Green (s) | | 36.0 | | | 37.0 | | | 35.0 | | | 35.0 | |
| Actuated g/C Ratio | | 0.45 | | | 0.46 | | | 0.44 | | | 0.44 | |
| v/c Ratio | | 0.02 | | | 1.00 | | | 0.48 | | | 0.40 | |
| Control Delay | | 11.5 | | | 58.6 | | | 15.7 | | | 13.4 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 11.5 | | | 58.6 | | | 15.7 | | | 13.4 | |
| LOS | | В | | | E | | | В | | | В | |
| Approach Delay | | 11.5 | | | 58.6 | | | 15.7 | | | 13.4 | |
| Approach LOS | | В | | | Е | | | В | | | В | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 80 | | | | | | | | | | | | |
| Actuated Cycle Length: 8 | | | | | | | | | | | | |
| Offset: 79 (99%), Referen | nced to phase | 2:NBTL a | and 6:SB | TL, Start | of Green | | | | | | | |
| Natural Cycle: 60 | | | | | | | | | | | | |
| Control Type: Actuated-C | | | | | | | | | | | | |
| Maximum v/c Ratio: 1.00 | | | | | | 100.0 | | | | | | |
| Intersection Signal Delay | | | | | tersection | | _ | | | | | |
| Intersection Capacity Util Analysis Period (min) 15 | ization 82.5% | | | IC | CU Level o | of Service | E | | | | | |
| , , | 10. Dufferin C | . 0 D/I : | harti Ct | | | | | | | | | |
| 4 ♠ | 19: Dufferin St | ια DWy/LI | Derly St | | 1. | | | | | | | |
| Ø2 (R) | | | | | | 04 | | | | | _ | |
| 40 s | | | | | 40 s | | | | | | | |

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05/20/2021

Queues

1449: Dufferin St & Dwy/Liberty St

05/20/2021

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|------------------------|------|--------|----------|-------|
| | | | | * |
| Lane Group | EBT | WBT | NBT | SBT |
| Lane Group Flow (vph) | 13 | 599 | 612 | 464 |
| v/c Ratio | 0.02 | 1.00 | 0.48 | 0.40 |
| Control Delay | 11.5 | 58.6 | 15.7 | 13.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 11.5 | 58.6 | 15.7 | 13.4 |
| Queue Length 50th (m) | 0.9 | 82.7 | 35.7 | 30.2 |
| Queue Length 95th (m) | 3.7 | #146.8 | m46.0 | m34.3 |
| Internal Link Dist (m) | 82.6 | 82.9 | 225.2 | 188.5 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 689 | 601 | 1275 | 1146 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.02 | 1.00 | 0.48 | 0.40 |

Intersection Summary

HCM Signalized Intersection Capacity Analysis 1449: Dufferin St & Dwy/Liberty St

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|----|----|------|----|
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|---------------------------------|-----------|----------|-------|------|------------|------------|-------------|----------|------|-------------|----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 4 | | | 4 | | | 413 | | | 414 | |
| Traffic Volume (vph) | 5 | 4 | 2 | 376 | 0 | 151 | 0 | 379 | 159 | 58 | 350 | 0 |
| Future Volume (vph) | 5 | 4 | 2 | 376 | 0 | 151 | 0 | 379 | 159 | 58 | 350 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 3.0 | | | 5.0 | | | 5.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | | 0.98 | | | 0.97 | | | 0.87 | | | 1.00 | |
| Flpb, ped/bikes | | 0.99 | | | 0.93 | | | 1.00 | | | 0.98 | |
| Frt | | 0.98 | | | 0.96 | | | 0.96 | | | 1.00 | |
| Flt Protected | | 0.98 | | | 0.97 | | | 1.00 | | | 0.99 | |
| Satd. Flow (prot) | | 1747 | | | 1548 | | | 2783 | | | 3276 | |
| Flt Permitted | | 0.86 | | | 0.78 | | | 1.00 | | | 0.79 | |
| Satd. Flow (perm) | | 1530 | | | 1251 | | | 2783 | | | 2618 | |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 6 | 5 | 2 | 427 | 0 | 172 | 0 | 431 | 181 | 66 | 398 | 0 |
| RTOR Reduction (vph) | 0 | 1 | 0 | 0 | 22 | 0 | 0 | 58 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 12 | 0 | 0 | 577 | 0 | 0 | 554 | 0 | 0 | 464 | 0 |
| Confl. Peds. (#/hr) | 64 | | 79 | 79 | | 64 | 107 | | 178 | 178 | | 107 |
| Confl. Bikes (#/hr) | | | 18 | | | 16 | | | 36 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 1% | 0% | 2% | 0% | 2% | 2% | 0% | 1% | 0% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 24 | 24 | 10 | 24 | 24 |
| Turn Type | Perm | NA | | Perm | NA | | | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 35.0 | | | 35.0 | | | 34.0 | | | 34.0 | |
| Effective Green, g (s) | | 36.0 | | | 37.0 | | | 35.0 | | | 35.0 | |
| Actuated g/C Ratio | | 0.45 | | | 0.46 | | | 0.44 | | | 0.44 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | | 688 | | | 578 | | | 1217 | | | 1145 | |
| v/s Ratio Prot | | | | | | | | c0.20 | | | | |
| v/s Ratio Perm | | 0.01 | | | c0.46 | | | | | | 0.18 | |
| v/c Ratio | | 0.02 | | | 1.00 | | | 0.46 | | | 0.41 | |
| Uniform Delay, d1 | | 12.2 | | | 21.5 | | | 15.8 | | | 15.4 | |
| Progression Factor | | 1.00 | | | 1.00 | | | 1.13 | | | 0.80 | |
| Incremental Delay, d2 | | 0.0 | | | 36.7 | | | 0.6 | | | 0.8 | |
| Delay (s) | | 12.2 | | | 58.2 | | | 18.5 | | | 13.1 | |
| Level of Service | | В | | | Е | | | В | | | В | |
| Approach Delay (s) | | 12.2 | | | 58.2 | | | 18.5 | | | 13.1 | |
| Approach LOS | | В | | | Е | | | В | | | В | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 31.0 | Н | CM 2000 | Level of S | Service | | С | | | |
| HCM 2000 Volume to Capaci | ity ratio | | 0.74 | | 2.31 2000 | _3.0.01 | 1 1 1 1 0 0 | | | | | |
| Actuated Cycle Length (s) | , | | 80.0 | S | um of lost | time (s) | | | 9.0 | | | |
| Intersection Capacity Utilizati | on | | 82.5% | | U Level o | | | | E | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | ., | | | | | | | | | |

| HCM 2000 Control Delay | 31.0 | HCM 2000 Level of Service | С | |
|-----------------------------------|-------|---------------------------|-----|--|
| HCM 2000 Volume to Capacity ratio | 0.74 | | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 9.0 | |
| Intersection Capacity Utilization | 82.5% | ICU Level of Service | E | |
| Analysis Period (min) | 15 | | | |
| c Critical Lane Group | | | | |

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

Lanes, Volumes, Timings 1628: Shaw St & King St

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|----------------------------|-------|-------|---------------|-------|-------|-------|-------|----------|-------|-------|----------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 414 | | | 414 | | | 414 | | | 414 | |
| Traffic Volume (vph) | 15 | 420 | 34 | 0 | 710 | 80 | 84 | 251 | 7 | 57 | 164 | 111 |
| Future Volume (vph) | 15 | 420 | 34 | 0 | 710 | 80 | 84 | 251 | 7 | 57 | 164 | 111 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.99 | | | 0.99 | | | 0.99 | | | 0.96 | |
| Frt | | 0.989 | | | 0.985 | | | 0.997 | | | 0.950 | |
| Flt Protected | | 0.998 | | | | | | 0.988 | | | 0.992 | |
| Satd. Flow (prot) | 0 | 2784 | 0 | 0 | 2902 | 0 | 0 | 3134 | 0 | 0 | 2745 | 0 |
| Flt Permitted | | 0.914 | | | | | | 0.732 | | | 0.811 | |
| Satd. Flow (perm) | 0 | 2548 | 0 | 0 | 2902 | 0 | 0 | 2297 | 0 | 0 | 2220 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 18 | | | 27 | | | 3 | | | 86 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 40 | | | 40 | |
| Link Distance (m) | | 199.1 | | | 255.2 | | | 127.7 | | | 380.6 | |
| Travel Time (s) | | 14.3 | | | 18.4 | | | 11.5 | | | 34.3 | |
| Confl. Peds. (#/hr) | 99 | | 83 | 83 | | 99 | 73 | | 109 | 109 | | 73 |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Heavy Vehicles (%) | 100% | 6% | 0% | 100% | 4% | 0% | 0% | 1% | 0% | 19% | 3% | 7% |
| Bus Blockages (#/hr) | 20 | 20 | 20 | 20 | 20 | 20 | 0 | 0 | 0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 18 | 494 | 40 | 0 | 835 | 94 | 99 | 295 | 8 | 67 | 193 | 131 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 552 | 0 | 0 | 929 | 0 | 0 | 402 | 0 | 0 | 391 | 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 | J . | | 0.0 | J . | | 0.0 | | | 0.0 | J . |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.16 | 1.22 | 1.16 | 1.16 | 1.22 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 4 | | | 8 | |

Existing PM 05/06/2014 Synchro 10 Report HDR Corporation Page 31 Lanes, Volumes, Timings 1628: Shaw St & King St

EBL EBT WBT WBR Lane Group EBR WBL NBL NBT Permitted Phases Detector Phase 2 2 6 4 4 8 8 Switch Phase Minimum Initial (s) 22.0 22.0 22.0 22.0 20.0 20.0 20.0 20.0 Minimum Split (s) 28.0 28.0 28.0 28.0 26.0 26.0 26.0 26.0 Total Split (s) 43.0 43.0 43.0 43.0 27.0 27.0 27.0 27.0 Total Split (%) 61.4% 61.4% 61.4% 61.4% 38.6% 38.6% 38.6% 38.6% Maximum Green (s) 37.0 37.0 37.0 37.0 21.0 21.0 21.0 21.0 Yellow Time (s) 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 All-Red Time (s) 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 Lost Time Adjust (s) -1.0 -1.0 -1.0 -1.0 Total Lost Time (s) 5.0 5.0 5.0 5.0 Lead/Lag Lead-Lag Optimize? Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 Recall Mode C-Max C-Max C-Max C-Max None None None None 7.0 7.0 7.0 7.0 7.0 Walk Time (s) 7.0 7.0 7.0 Flash Dont Walk (s) 15.0 15.0 15.0 15.0 13.0 13.0 13.0 13.0 Pedestrian Calls (#/hr) 28 33 100 24 Act Effct Green (s) 38.8 38.8 21.2 21.2 Actuated g/C Ratio 0.55 0.55 0.30 0.30 v/c Ratio 0.39 0.57 0.58 0.53 Control Delay 9.6 11.7 24.3 18.7 Queue Delay 0.0 0.0 0.0 0.0 Total Delay 9.6 11.7 24.3 18.7 LOS С В Α В Approach Delay 24.3 Approach LOS Α В Intersection Summary CBD Area Type: Cycle Length: 70 Actuated Cycle Length: 70 Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green Natural Cycle: 55 Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.58 Intersection Signal Delay: 14.6 Intersection LOS: B Intersection Capacity Utilization 72.5% ICU Level of Service C Analysis Period (min) 15 Splits and Phases: 1628: Shaw St & King St **↑**†_{Ø4} Ø2 (R) ₩ Ø6 (R)

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Queues 1628: Shaw St & King St

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|------------------------|-------|-------|-------|-------|
| Lane Group | EBT | WBT | NBT | SBT |
| Lane Group Flow (vph) | 552 | 929 | 402 | 391 |
| v/c Ratio | 0.39 | 0.57 | 0.58 | 0.53 |
| Control Delay | 9.6 | 11.7 | 24.3 | 18.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 9.6 | 11.7 | 24.3 | 18.7 |
| Queue Length 50th (m) | 18.7 | 36.5 | 23.1 | 17.0 |
| Queue Length 95th (m) | 27.3 | 49.4 | 33.0 | 26.4 |
| Internal Link Dist (m) | 175.1 | 231.2 | 103.7 | 356.6 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1420 | 1620 | 723 | 756 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.39 | 0.57 | 0.56 | 0.52 |
| Intersection Summary | | | | |

HCM Signalized Intersection Capacity Analysis 1628: Shaw St & King St

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|-------------------------------|------------|------|-------|------|------------|------------|----------|----------|------|------|------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 414 | | | 414 | | | 414 | | | 414 | |
| Traffic Volume (vph) | 15 | 420 | 34 | 0 | 710 | 80 | 84 | 251 | 7 | 57 | 164 | 111 |
| Future Volume (vph) | 15 | 420 | 34 | 0 | 710 | 80 | 84 | 251 | 7 | 57 | 164 | 111 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 5.0 | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | | 0.99 | | | 0.99 | | | 1.00 | | | 0.97 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | | 0.99 | | | 0.99 | |
| Frt | | 0.99 | | | 0.98 | | | 1.00 | | | 0.95 | |
| Flt Protected | | 1.00 | | | 1.00 | | | 0.99 | | | 0.99 | |
| Satd. Flow (prot) | | 2784 | | | 2901 | | | 3100 | | | 2713 | |
| Flt Permitted | | 0.91 | | | 1.00 | | | 0.73 | | | 0.81 | |
| Satd. Flow (perm) | | 2549 | | | 2901 | | | 2298 | | | 2220 | |
| Peak-hour factor, PHF | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Adj. Flow (vph) | 18 | 494 | 40 | 0 | 835 | 94 | 99 | 295 | 8 | 67 | 193 | 131 |
| RTOR Reduction (vph) | 0 | 8 | 0 | 0 | 12 | 0 | 0 | 2 | 0 | 0 | 60 | C |
| Lane Group Flow (vph) | 0 | 544 | 0 | 0 | 917 | 0 | 0 | 400 | 0 | 0 | 331 | C |
| Confl. Peds. (#/hr) | 99 | | 83 | 83 | | 99 | 73 | | 109 | 109 | | 73 |
| Heavy Vehicles (%) | 100% | 6% | 0% | 100% | 4% | 0% | 0% | 1% | 0% | 19% | 3% | 7% |
| Bus Blockages (#/hr) | 20 | 20 | 20 | 20 | 20 | 20 | 0 | 0 | 0 | 0 | 0 | C |
| Turn Type | Perm | NA | | | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 4 | | | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | | 37.8 | | | 37.8 | | | 20.2 | | | 20.2 | |
| Effective Green, g (s) | | 38.8 | | | 38.8 | | | 21.2 | | | 21.2 | |
| Actuated g/C Ratio | | 0.55 | | | 0.55 | | | 0.30 | | | 0.30 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | | 1412 | | | 1607 | | | 695 | | | 672 | |
| v/s Ratio Prot | | | | | c0.32 | | | | | | | |
| v/s Ratio Perm | | 0.21 | | | | | | c0.17 | | | 0.15 | |
| v/c Ratio | | 0.39 | | | 0.57 | | | 0.58 | | | 0.49 | |
| Uniform Delay, d1 | | 8.8 | | | 10.2 | | | 20.6 | | | 20.0 | |
| Progression Factor | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | | 0.8 | | | 1.5 | | | 1.2 | | | 0.6 | |
| Delay (s) | | 9.6 | | | 11.6 | | | 21.8 | | | 20.6 | |
| Level of Service | | Α | | | В | | | С | | | С | |
| Approach Delay (s) | | 9.6 | | | 11.6 | | | 21.8 | | | 20.6 | |
| Approach LOS | | Α | | | В | | | С | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 14.5 | Н | CM 2000 | Level of S | Service | | В | | | |
| HCM 2000 Volume to Capa | city ratio | | 0.57 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 70.0 | Sı | um of lost | time (s) | | | 10.0 | | | |
| Intersection Capacity Utiliza | ation | | 72.5% | IC | U Level | of Service | | | С | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |
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|----------------------------|-------|-------|-------|-------|----------|-------|-------|----------|-------|----------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 413 | | | 414 | | | 4 | | | 4 | |
| Traffic Volume (vph) | 0 | 583 | 0 | 0 | 610 | 106 | 0 | 0 | 0 | 89 | 0 | 75 |
| Future Volume (vph) | 0 | 583 | 0 | 0 | 610 | 106 | 0 | 0 | 0 | 89 | 0 | 75 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | 0.98 | | | | | | 0.94 | |
| Frt | | | | | 0.978 | | | | | | 0.938 | |
| Flt Protected | | | | | | | | | | | 0.974 | |
| Satd. Flow (prot) | 0 | 2730 | 0 | 0 | 2611 | 0 | 0 | 1691 | 0 | 0 | 1273 | 0 |
| Flt Permitted | | | | | | | | | | | 0.841 | |
| Satd. Flow (perm) | 0 | 2730 | 0 | 0 | 2611 | 0 | 0 | 1691 | 0 | 0 | 1076 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | 44 | | | | | | 53 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 318.4 | | | 199.1 | | | 158.6 | | | 196.7 | |
| Travel Time (s) | | 22.9 | | | 14.3 | | | 11.4 | | | 14.2 | |
| Confl. Peds. (#/hr) | 54 | | 106 | 106 | | 54 | 67 | | 34 | 34 | | 67 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Heavy Vehicles (%) | 0% | 13% | 0% | 0% | 14% | 12% | 0% | 0% | 0% | 17% | 0% | 16% |
| Bus Blockages (#/hr) | 20 | 20 | 20 | 20 | 20 | 20 | 0 | 0 | 0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 0 | 601 | 0 | 0 | 629 | 109 | 0 | 0 | 0 | 92 | 0 | 77 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 601 | 0 | 0 | 738 | 0 | 0 | 0 | 0 | 0 | 169 | 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) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.16 | 1.22 | 1.16 | 1.16 | 1.22 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | 0.0 | 28.7 | | 0.0 | 28.7 | | 0.0 | 28.7 | | 0.0 | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | J X | | | J X | | | J LX | | | J X | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | | NA | | | NA | | | 0.0 | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 8 | | 1 CHIII | 4 | |
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Lanes, Volumes, Timings 1851: King St & Sudbury St

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|-----------------------------|--------------|-----------|---------------|-------------|-------------|------------|-------|----------|-------------|-------|-------|----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SB |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Detector Phase | 2 | 2 | | 6 | 6 | | 8 | 8 | | 4 | 4 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 21.0 | 21.0 | | 21.0 | 21.0 | |
| Minimum Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 26.0 | 26.0 | | 26.0 | 26.0 | |
| Total Split (s) | 53.0 | 53.0 | | 53.0 | 53.0 | | 27.0 | 27.0 | | 27.0 | 27.0 | |
| Total Split (%) | 66.3% | 66.3% | | 66.3% | 66.3% | | 33.8% | 33.8% | | 33.8% | 33.8% | |
| Maximum Green (s) | 47.0 | 47.0 | | 47.0 | 47.0 | | 22.0 | 22.0 | | 22.0 | 22.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | -1.0 | | | -1.0 | | | -1.0 | | | -1.0 | |
| Total Lost Time (s) | | 5.0 | | | 5.0 | | | 4.0 | | | 4.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | C-Max | C-Max | | C-Max | C-Max | | None | None | | None | None | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 17.0 | 17.0 | | 17.0 | 17.0 | | 14.0 | 14.0 | | 14.0 | 14.0 | |
| Pedestrian Calls (#/hr) | 100 | 100 | | 18 | 18 | | 22 | 22 | | 11 | 11 | |
| Act Effct Green (s) | | 48.8 | | | 48.8 | | | | | | 22.2 | |
| Actuated g/C Ratio | | 0.61 | | | 0.61 | | | | | | 0.28 | |
| v/c Ratio | | 0.36 | | | 0.46 | | | | | | 0.50 | |
| Control Delay | | 8.6 | | | 9.0 | | | | | | 22.3 | |
| Queue Delay | | 0.0 | | | 0.0 | | | | | | 0.0 | |
| Total Delay | | 8.6 | | | 9.0 | | | | | | 22.3 | |
| LOS | | Α | | | Α | | | | | | С | |
| Approach Delay | | 8.6 | | | 9.0 | | | | | | 22.3 | |
| Approach LOS | | Α | | | Α | | | | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | CBD | | | | | | | | | | | |
| Cycle Length: 80 | | | | | | | | | | | | |
| Actuated Cycle Length: 80 | | | | | | | | | | | | |
| Offset: 1 (1%), Reference | d to phase 2 | EBTL and | I 6:WBTL | ., Start of | 1st Green | 1 | | | | | | |
| Natural Cycle: 60 | | | | | | | | | | | | |
| Control Type: Actuated-C | oordinated | | | | | | | | | | | |
| Maximum v/c Ratio: 0.50 | | | | | | | | | | | | |
| Intersection Signal Delay: | | | | | ntersection | | | | | | | |
| Intersection Capacity Utili | zation 48.1% | | | 10 | CU Level of | of Service | Α | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Splits and Phases: 185 | 1: King St & | Sudbury S | it | | | | | | | | | |
| Ø2 (R) | <u> </u> | , | | | | | | Ø4 | | | | |
| - WZ (K) | | | | | | | | ▼ 104 | | | | |

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05/20/2021

Queues 1851: King St & Sudbury St

05/20/2021

| | - | • | ¥ |
|------------------------|-------|-------|-------|
| Lane Group | EBT | WBT | SBT |
| Lane Group Flow (vph) | 601 | 738 | 169 |
| v/c Ratio | 0.36 | 0.46 | 0.50 |
| Control Delay | 8.6 | 9.0 | 22.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 |
| Total Delay | 8.6 | 9.0 | 22.3 |
| Queue Length 50th (m) | 21.4 | 26.4 | 14.3 |
| Queue Length 95th (m) | 31.8 | 39.5 | 32.3 |
| Internal Link Dist (m) | 294.4 | 175.1 | 172.7 |
| Turn Bay Length (m) | | | |
| Base Capacity (vph) | 1665 | 1610 | 347 |
| Starvation Cap Reductn | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.36 | 0.46 | 0.49 |
| Intersection Summary | | | |

HCM Signalized Intersection Capacity Analysis 1851: King St & Sudbury St

05/20/2021

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|-----------------------------------|----------|------|-------|------|------------|------------|---------|----------|----------|------|-------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 413 | | | 413 | | | 4 | | | 4 | |
| Traffic Volume (vph) | 0 | 583 | 0 | 0 | 610 | 106 | 0 | 0 | 0 | 89 | 0 | 75 |
| Future Volume (vph) | 0 | 583 | 0 | 0 | 610 | 106 | 0 | 0 | 0 | 89 | 0 | 75 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | | | | | 4.0 | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | | | | | 1.00 | |
| Frpb, ped/bikes | | 1.00 | | | 0.98 | | | | | | 0.96 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | | | | | 0.98 | |
| Frt | | 1.00 | | | 0.98 | | | | | | 0.94 | |
| Flt Protected | | 1.00 | | | 1.00 | | | | | | 0.97 | |
| Satd. Flow (prot) | | 2730 | | | 2610 | | | | | | 1246 | |
| Flt Permitted | | 1.00 | | | 1.00 | | | | | | 0.84 | |
| Satd. Flow (perm) | | 2730 | | | 2610 | | | | | | 1077 | |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 0 | 601 | 0 | 0 | 629 | 109 | 0 | 0 | 0 | 92 | 0 | 77 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 38 | 0 |
| Lane Group Flow (vph) | 0 | 601 | 0 | 0 | 721 | 0 | 0 | 0 | 0 | 0 | 131 | 0 |
| Confl. Peds. (#/hr) | 54 | | 106 | 106 | | 54 | 67 | | 34 | 34 | | 67 |
| Heavy Vehicles (%) | 0% | 13% | 0% | 0% | 14% | 12% | 0% | 0% | 0% | 17% | 0% | 16% |
| Bus Blockages (#/hr) | 20 | 20 | 20 | 20 | 20 | 20 | 0 | 0 | 0 | 0 | 0 | 0 |
| Turn Type | | NA | | | NA | | | | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 47.8 | | | 47.8 | | | | | | 21.2 | |
| Effective Green, g (s) | | 48.8 | | | 48.8 | | | | | | 22.2 | |
| Actuated g/C Ratio | | 0.61 | | | 0.61 | | | | | | 0.28 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | | | | | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | | | | 3.0 | |
| Lane Grp Cap (vph) | | 1665 | | | 1592 | | | | | | 298 | |
| v/s Ratio Prot | | 0.22 | | | c0.28 | | | | | | | |
| v/s Ratio Perm | | | | | | | | | | | c0.12 | |
| v/c Ratio | | 0.36 | | | 0.45 | | | | | | 0.44 | |
| Uniform Delay, d1 | | 7.8 | | | 8.4 | | | | | | 23.8 | |
| Progression Factor | | 1.00 | | | 1.00 | | | | | | 1.00 | |
| Incremental Delay, d2 | | 0.6 | | | 0.9 | | | | | | 1.0 | |
| Delay (s) | | 8.4 | | | 9.3 | | | | | | 24.8 | |
| Level of Service | | Α | | | Α | | | | | | С | |
| Approach Delay (s) | | 8.4 | | | 9.3 | | | 0.0 | | | 24.8 | |
| Approach LOS | | Α | | | Α | | | Α | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 10.7 | Н | CM 2000 | Level of S | Service | | В | | | |
| HCM 2000 Volume to Capaci | tv ratio | | 0.45 | | | | | | | | | |
| Actuated Cycle Length (s) | , | | 80.0 | S | um of lost | time (s) | | | 9.0 | | | |
| Intersection Capacity Utilization | on | | 48.1% | | | of Service | | | A | | | |
| Analysis Period (min) | | | 15 | | | 2200 | | | | | | |
| Critical Lana Craun | | | | | | | | | | | | |

| Intersection Summary | | | | |
|-----------------------------------|-------|---------------------------|-----|--|
| HCM 2000 Control Delay | 10.7 | HCM 2000 Level of Service | В | |
| HCM 2000 Volume to Capacity ratio | 0.45 | | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 9.0 | |
| Intersection Capacity Utilization | 48.1% | ICU Level of Service | Α | |
| Analysis Period (min) | 15 | | | |
| c Critical Lane Group | | | | |

| | → | • | • | ← | 4 | / |
|----------------------------|-------------|-------|-------|----------|-------|---------|
| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations | † 1> | | ., | 414 | ሻ | 7 |
| Traffic Volume (vph) | 373 | 276 | 2 | 624 | 206 | 223 |
| Future Volume (vph) | 373 | 276 | 2 | 624 | 206 | 223 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.0 |
| Storage Length (m) | 0.0 | 0.0 | 0.0 | 0.0 | 30.0 | 0.0 |
| Storage Lanes | | 0.0 | 0.0 | | 1 | 1 |
| Taper Length (m) | | J | 2.5 | | 2.5 | |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 |
| Ped Bike Factor | 0.81 | 0.33 | 0.55 | 1.00 | 0.95 | 0.96 |
| Frt | 0.936 | | | 1.00 | 0.33 | 0.850 |
| Fit Protected | 0.930 | | | | 0.950 | 0.000 |
| | 0004 | 0 | _ | 0700 | | 4000 |
| Satd. Flow (prot) | 2234 | 0 | 0 | 2798 | 1486 | 1233 |
| Flt Permitted | | | | 0.953 | 0.950 | 4400 |
| Satd. Flow (perm) | 2234 | 0 | 0 | 2665 | 1416 | 1183 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | 317 | | | | | 97 |
| Link Speed (k/h) | 50 | | | 50 | 30 | |
| Link Distance (m) | 191.3 | | | 318.4 | 198.0 | |
| Travel Time (s) | 13.8 | | | 22.9 | 23.8 | |
| Confl. Peds. (#/hr) | | 261 | 261 | | 45 | 28 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles (%) | 6% | 3% | 100% | 10% | 2% | 10% |
| Bus Blockages (#/hr) | 20 | 20 | 20 | 20 | 0 | 0 |
| Adj. Flow (vph) | 429 | 317 | 2 | 717 | 237 | 256 |
| Shared Lane Traffic (%) | 120 | 017 | | | 201 | 200 |
| Lane Group Flow (vph) | 746 | 0 | 0 | 719 | 237 | 256 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | | Left | Left | Left | |
| | Leπ 0.0 | Right | Left | 0.0 | 3.0 | Right |
| Median Width(m) | | | | | | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.22 | 1.16 | 1.16 | 1.22 | 1.25 | 1.25 |
| Turning Speed (k/h) | | 14 | 24 | | 24 | 14 |
| Number of Detectors | 2 | | 1 | 2 | 1 | 1 |
| Detector Template | Thru | | Left | Thru | Left | Right |
| Leading Detector (m) | 30.5 | | 6.1 | 30.5 | 6.1 | 6.1 |
| Trailing Detector (m) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 1.8 | | 6.1 | 1.8 | 6.1 | 6.1 |
| Detector 1 Type | CI+Ex | | CI+Ex | CI+Ex | CI+Ex | CI+Ex |
| Detector 1 Channel | OILLX | | OITEX | OITEX | OI LX | OI · LX |
| Detector 1 Extend (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | | | 0.0 | | 0.0 | 0.0 |
| Detector 2 Position(m) | 28.7 | | | 28.7 | | |
| Detector 2 Size(m) | 1.8 | | | 1.8 | | |
| Detector 2 Type | CI+Ex | | | CI+Ex | | |

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|------------------------|------------------|
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| | - | • | 1 | • | 1 | 1 | |
|--|-----------------|-----------|------------|------------|---------------------------|---------|--------------|
| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR | |
| Detector 2 Channel | | | | | | | |
| Detector 2 Extend (s) | 0.0 | | | 0.0 | | | |
| Turn Type | NA | | Perm | NA | Perm | Perm | |
| Protected Phases | 2 | | | 6 | | | |
| Permitted Phases | | | 6 | | 8 | 8 | |
| Detector Phase | 2 | | 6 | 6 | 8 | 8 | |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 21.0 | | 21.0 | 21.0 | 20.0 | 20.0 | |
| Minimum Split (s) | 28.0 | | 28.0 | 28.0 | 26.0 | 26.0 | |
| Total Split (s) | 43.0 | | 43.0 | 43.0 | 27.0 | 27.0 | |
| Total Split (%) | 61.4% | | 61.4% | 61.4% | 38.6% | 38.6% | |
| Maximum Green (s) | 36.0 | | 36.0 | 36.0 | 21.0 | 21.0 | |
| Yellow Time (s) | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | |
| All-Red Time (s) | 3.0 | | 3.0 | 3.0 | 2.0 | 2.0 | |
| Lost Time Adjust (s) | -1.0 | | | -1.0 | -1.0 | -1.0 | |
| Total Lost Time (s) | 6.0 | | | 6.0 | 5.0 | 5.0 | |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | C-Max | | C-Max | C-Max | None | None | |
| Walk Time (s) | 7.0 | | 7.0 | 7.0 | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 14.0 | | 14.0 | 14.0 | 13.0 | 13.0 | |
| Pedestrian Calls (#/hr) | 100 | | 0 | 0 | 15 | 15 | |
| Act Effct Green (s) | 37.8 | | | 37.8 | 21.2 | 21.2 | |
| Actuated g/C Ratio | 0.54 | | | 0.54 | 0.30 | 0.30 | |
| v/c Ratio | 0.55 | | | 0.50 | 0.55 | 0.60 | |
| Control Delay | 7.5 | | | 11.7 | 26.2 | 19.5 | |
| Queue Delay | 0.0 | | | 0.0 | 0.0 | 0.0 | |
| Total Delay | 7.5 | | | 11.7 | 26.2 | 19.5 | |
| LOS | Α | | | В | С | В | |
| Approach Delay | 7.5 | | | 11.7 | 22.7 | | |
| Approach LOS | Α | | | В | С | | |
| Intersection Summary | | | | | | | |
| | CBD | | | | | | |
| Area Type: | CDD | | | | | | |
| Cycle Length: 70 | 0 | | | | | | |
| Actuated Cycle Length: 70 Offset: 6 (9%), Reference | | RT and 6 | S-M/RTI | Start of 1 | et Groon | | |
| Offset: 6 (9%), Reference Natural Cycle: 55 | u to phase 2:E | י מוומ ום | J.VVD I L, | SIGIT OF I | st Green | | |
| Natural Cycle: 55 Control Type: Actuated-C | oordinated | | | | | | |
| Control Type: Actuated-C Maximum v/c Ratio: 0.60 | oordinated | | | | | | |
| | 120 | | | 1 | tersection | 100.0 | |
| Intersection Signal Delay: Intersection Capacity Utili | | | | | itersection CU Level o | | ٨ |
| | ZaliUII 31.9% | | | IC | O Level (| oetvice | Α |
| | | | | | | | |
| | | | | | | | |
| Analysis Period (min) 15 | 2. Atlantia A | 0 Kina (| 24 | | | | |
| Analysis Period (min) 15 | 2: Atlantic Ave | & King S | St | | | | |
| Analysis Period (min) 15 Splits and Phases: 191 | 2: Atlantic Ave | & King S | St | | | | |
| Analysis Period (min) 15 | 2: Atlantic Ave | & King S | St | | | | |
| Analysis Period (min) 15 Splits and Phases: 191 9 92 (R) 43 s | 2: Atlantic Ave | & King S | St | | | | 4. |
| Analysis Period (min) 15 Splits and Phases: 191 | 2: Atlantic Ave | & King S | St | | | | ₹ /Ø8 |

Queues 1912: Atlantic Ave & King St

05/20/2021

| | - | • | | |
|------------------------|-------|-------|-------|------|
| Lane Group | EBT | WBT | NBL | NBR |
| Lane Group Flow (vph) | 746 | 719 | 237 | 256 |
| v/c Ratio | 0.55 | 0.50 | 0.55 | 0.60 |
| Control Delay | 7.5 | 11.7 | 26.2 | 19.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 7.5 | 11.7 | 26.2 | 19.5 |
| Queue Length 50th (m) | 15.4 | 28.4 | 25.9 | 16.9 |
| Queue Length 95th (m) | 27.8 | 40.8 | 43.7 | 36.4 |
| Internal Link Dist (m) | 167.3 | 294.4 | 174.0 | |
| Turn Bay Length (m) | | | 30.0 | |
| Base Capacity (vph) | 1352 | 1438 | 445 | 438 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.55 | 0.50 | 0.53 | 0.58 |
| Intersection Summary | | | | |

HCM Signalized Intersection Capacity Analysis 1912: Atlantic Ave & King St

05/20/2021

| | - | \rightarrow | • | • | 4 | <i>></i> | | |
|------------------------------|-------------|---------------|-------|-------|------------|-----------------|---|------|
| Movement | EBT | EBR | WBL | WBT | NBL | NBR | | |
| Lane Configurations | † 1> | | | 414 | * | # | | |
| raffic Volume (vph) | 373 | 276 | 2 | 624 | 206 | 223 | | |
| Future Volume (vph) | 373 | 276 | 2 | 624 | 206 | 223 | | |
| deal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | | |
| ane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.0 | | |
| Total Lost time (s) | 6.0 | | | 6.0 | 5.0 | 5.0 | | |
| Lane Util. Factor | 0.95 | | | 0.95 | 1.00 | 1.00 | | |
| Frpb, ped/bikes | 0.81 | | | 1.00 | 1.00 | 0.96 | | |
| Flpb, ped/bikes | 1.00 | | | 1.00 | 0.95 | 1.00 | | |
| Frt | 0.94 | | | 1.00 | 1.00 | 0.85 | | |
| Flt Protected | 1.00 | | | 1.00 | 0.95 | 1.00 | | |
| Satd. Flow (prot) | 2235 | | | 2796 | 1416 | 1183 | | |
| Flt Permitted | 1.00 | | | 0.95 | 0.95 | 1.00 | | |
| Satd. Flow (perm) | 2235 | | | 2666 | 1416 | 1183 | | |
| Peak-hour factor, PHF | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | | |
| Adj. Flow (vph) | 429 | 317 | 2 | 717 | 237 | 256 | | |
| RTOR Reduction (vph) | 146 | 0 | 0 | 0 | 0 | 68 | | |
| Lane Group Flow (vph) | 600 | 0 | 0 | 719 | 237 | 188 | | |
| Confl. Peds. (#/hr) | | 261 | 261 | | 45 | 28 | | |
| Heavy Vehicles (%) | 6% | 3% | 100% | 10% | 2% | 10% | | |
| Bus Blockages (#/hr) | 20 | 20 | 20 | 20 | 0 | 0 | | |
| Turn Type | NA | | Perm | NA | Perm | Perm | | |
| Protected Phases | 2 | | | 6 | | | | |
| Permitted Phases | | | 6 | | 8 | 8 | | |
| Actuated Green, G (s) | 36.8 | | | 36.8 | 20.2 | 20.2 | | |
| Effective Green, g (s) | 37.8 | | | 37.8 | 21.2 | 21.2 | | |
| Actuated g/C Ratio | 0.54 | | | 0.54 | 0.30 | 0.30 | | |
| Clearance Time (s) | 7.0 | | | 7.0 | 6.0 | 6.0 | | |
| Vehicle Extension (s) | 3.0 | | | 3.0 | 3.0 | 3.0 | | |
| Lane Grp Cap (vph) | 1206 | | | 1439 | 428 | 358 | | |
| v/s Ratio Prot | 0.27 | | | | | | | |
| v/s Ratio Perm | | | | c0.27 | c0.17 | 0.16 | | |
| v/c Ratio | 0.50 | | | 0.50 | 0.55 | 0.53 | | |
| Uniform Delay, d1 | 10.1 | | | 10.1 | 20.4 | 20.2 | | |
| Progression Factor | 1.00 | | | 1.00 | 1.00 | 1.00 | | |
| Incremental Delay, d2 | 1.5 | | | 1.2 | 1.6 | 1.4 | | |
| Delay (s) | 11.6 | | | 11.4 | 22.0 | 21.6 | | |
| Level of Service | В | | | В | С | С | | |
| Approach Delay (s) | 11.6 | | | 11.4 | 21.8 | | | |
| Approach LOS | В | | | В | С | | | |
| ntersection Summary | | | | | | | | |
| HCM 2000 Control Delay | | | 14.1 | Н | CM 2000 | Level of Servic | е | В |
| HCM 2000 Volume to Cap | acity ratio | | 0.53 | | | | | |
| Actuated Cycle Length (s) | | | 70.0 | Sı | um of lost | time (s) | | 12.0 |
| Intersection Capacity Utiliz | ation | | 51.9% | | U Level o | | | Α |
| Analysis Period (min) | | | 15 | | | | | |
| c Critical Lane Group | | | | | | | | |

Existing PM 05/06/2014 HDR Corporation

Lane Group

Lane Configurations

Traffic Volume (vph)

Future Volume (vph)

Ideal Flow (vphpl)

Lane Util. Factor

Satd. Flow (prot)

Satd. Flow (perm)

Right Turn on Red

Satd. Flow (RTOR)

Link Speed (k/h)

Link Distance (m)

Peak Hour Factor Heavy Vehicles (%)

Bus Blockages (#/hr)

Shared Lane Traffic (%)

Lane Group Flow (vph)

Enter Blocked Intersection

Travel Time (s)

Adj. Flow (vph)

Lane Alignment

Link Offset(m)

Median Width(m)

Crosswalk Width(m)

Headway Factor Turning Speed (k/h)

Number of Detectors Detector Template

Leading Detector (m)

Trailing Detector (m)

Detector 1 Position(m

Detector 1 Size(m)

Detector 1 Channel Detector 1 Extend (s)

Detector 1 Queue (s)

Detector 1 Delay (s)

Detector 2 Size(m)

Detector 2 Channel

Protected Phases

Permitted Phases Detector Phase

Detector 2 Extend (s)

Detector 2 Type

Turn Type

Detector 2 Position(m)

Detector 1 Type

Two way Left Turn Lane

Flt Protected

Flt Permitted

Frt

EBL

0 539

0.95

0%

20 20

0

0 606

No

Left

1.16

24

Left

6.1

0.0

0.0

6.1

0.0

0.0

2

1900 1900

EBT

0.95

0 2966 2915

50

316.7

22.8

0.89

4%

606

No

0.0

1.6 1.6

1.22

Thru

30.5

0.0

0.0

1.8

0.0

0.0

0.0

28.7

1.8

0.0

NA

2

2

CI+Ex CI+Ex

CI+Ex CI+Ex CI+Ex

Left

0 2966

ħβ

728

728

1900

0.95

0.977

2915

51

50

13.8

0.89

4%

20

818

965

No

Left Right

0.0

0.0

Thru

30.5

0.0

0.0

1.8

0.0

0.0

0.0

28.7

1.8

0.0

NA

6

6

→ ← < √ √

131

1900

0.95 1.00

Yes

0%

20

147

0

No

14 24

SBL

93

1900

0.973

0.962

1468

0.962

1468

50

100.8

7.3

0.89

0% 39%

104

130

No

Left Right

3.5

0.0

1.6

Left

6.1

0.0

0.0

6.1

0.0

0.0

0.0

Perm

8

CI+Ex

23

23

1900

1.00

Yes

0.89

26

0

No

14

| | • | - | ← | • | - | 4 | | |
|------------------------------|---------------|-----------|------------|-----|-------------|--------------|------|--|
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR | | |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 20.0 | 20.0 | 20.0 | | 18.0 | | | |
| Minimum Split (s) | 26.0 | 26.0 | 26.0 | | 23.0 | | | |
| Total Split (s) | 56.0 | 56.0 | 56.0 | | 24.0 | | | |
| Total Split (%) | 70.0% | 70.0% | 70.0% | | 30.0% | | | |
| Maximum Green (s) | 50.0 | 50.0 | 50.0 | | 19.0 | | | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | | 3.0 | | | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | 2.0 | | | |
| Lost Time Adjust (s) | | -1.0 | -1.0 | | -1.0 | | | |
| Total Lost Time (s) | | 5.0 | 5.0 | | 4.0 | | | |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | | | |
| Recall Mode | C-Max | C-Max | None | | None | | | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | | 7.0 | | | |
| Flash Dont Walk (s) | 13.0 | 13.0 | 13.0 | | 11.0 | | | |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | 0 | | | |
| Act Effct Green (s) | | 57.6 | 57.6 | | 19.0 | | | |
| Actuated g/C Ratio | | 0.72 | 0.72 | | 0.24 | | | |
| v/c Ratio | | 0.28 | 0.46 | | 0.36 | | | |
| Control Delay | | 4.5 | 6.9 | | 25.8 | | | |
| Queue Delay | | 0.0 | 0.0 | | 0.0 | | | |
| Total Delay | | 4.5 | 6.9 | | 25.8 | | | |
| LOS | | Α | Α | | С | | | |
| Approach Delay | | 4.5 | 6.9 | | 25.8 | | | |
| Approach LOS | | Α | Α | | С | | | |
| Intersection Summary | | | | | | | | |
| Area Type: | CBD | | | | | | | |
| Cycle Length: 80 | | | | | | | | |
| Actuated Cycle Length: 80 | | | | | | | | |
| Offset: 1 (1%), Referenced | to phase 2 | EBTL, St | art of Gre | en | | | | |
| Natural Cycle: 50 | | | | | | | | |
| Control Type: Actuated-Co | ordinated | | | | | | | |
| Maximum v/c Ratio: 0.46 | | | | | | | | |
| Intersection Signal Delay: | | | | | ntersection | | | |
| Intersection Capacity Utiliz | ation 49.5% | | | IC | CU Level o | of Service A | | |
| Analysis Period (min) 15 | | | | | | | | |
| Splits and Phases: 2081 | I: King St & | loo Chuci | tor Mov | | | | | |
| Spiils and Friases. 2001 | i. Killy St & | JUE SHUS | lei vvay | | | | 1 | |
| - → Ø2 (R) | | | | | | | | |
| 56 s | | | | | | | | |
| ← | | | | | | | | |
| Ø6 | | | | | | _ | ™Ø8 | |
| 56 s | | | | | | | 24 s | |

Existing PM 05/06/2014 Synchro 10 Report HDR Corporation Page 43

Existing PM 05/06/2014 HDR Corporation Synchro 10 Report Page 44 2081: King St & Joe Shuster Way

05/20/2021

| | - | ← | - |
|------------------------|-------|-------|------|
| Lane Group | EBT | WBT | SBL |
| Lane Group Flow (vph) | 606 | 965 | 130 |
| v/c Ratio | 0.28 | 0.46 | 0.36 |
| Control Delay | 4.5 | 6.9 | 25.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 |
| Total Delay | 4.5 | 6.9 | 25.8 |
| Queue Length 50th (m) | 15.4 | 33.0 | 14.5 |
| Queue Length 95th (m) | m16.6 | 44.7 | 29.1 |
| Internal Link Dist (m) | 292.7 | 167.3 | 76.8 |
| Turn Bay Length (m) | | | |
| Base Capacity (vph) | 2135 | 2113 | 378 |
| Starvation Cap Reductn | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.28 | 0.46 | 0.34 |

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

HCM Signalized Intersection Capacity Analysis 2081: King St & Joe Shuster Way

05/20/2021

| | • | → | — | • | - | 4 | | |
|-------------------------------|------------|----------|------------|------|------------|------------------|----|-----|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR | | |
| Lane Configurations | | 414 | ∱ ⊅ | | W | | | |
| Traffic Volume (vph) | 0 | 539 | 728 | 131 | 93 | 23 | | |
| Future Volume (vph) | 0 | 539 | 728 | 131 | 93 | 23 | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | | |
| Total Lost time (s) | | 5.0 | 5.0 | | 4.0 | | | |
| Lane Util. Factor | | 0.95 | 0.95 | | 1.00 | | | |
| Frt | | 1.00 | 0.98 | | 0.97 | | | |
| Flt Protected | | 1.00 | 1.00 | | 0.96 | | | |
| Satd. Flow (prot) | | 2966 | 2915 | | 1468 | | | |
| Flt Permitted | | 1.00 | 1.00 | | 0.96 | | | |
| Satd. Flow (perm) | | 2966 | 2915 | | 1468 | | | |
| Peak-hour factor, PHF | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | | |
| Adj. Flow (vph) | 0 | 606 | 818 | 147 | 104 | 26 | | |
| RTOR Reduction (vph) | 0 | 0 | 16 | 0 | 12 | 0 | | |
| Lane Group Flow (vph) | 0 | 606 | 949 | 0 | 118 | 0 | | |
| Heavy Vehicles (%) | 0% | 4% | 4% | 0% | 0% | 39% | | |
| Bus Blockages (#/hr) | 20 | 20 | 20 | 20 | 0 | 0 | | |
| Turn Type | | NA | NA | | Perm | | | |
| Protected Phases | | 2 | 6 | | | | | |
| Permitted Phases | 2 | | | | 8 | | | |
| Actuated Green, G (s) | | 54.6 | 54.6 | | 14.4 | | | |
| Effective Green, g (s) | | 55.6 | 55.6 | | 15.4 | | | |
| Actuated g/C Ratio | | 0.70 | 0.70 | | 0.19 | | | |
| Clearance Time (s) | | 6.0 | 6.0 | | 5.0 | | | |
| Vehicle Extension (s) | | 3.0 | 3.0 | | 3.0 | | | |
| Lane Grp Cap (vph) | | 2061 | 2025 | | 282 | | | |
| v/s Ratio Prot | | 0.20 | c0.33 | | | | | |
| v/s Ratio Perm | | | | | c0.08 | | | |
| v/c Ratio | | 0.29 | 0.47 | | 0.42 | | | |
| Uniform Delay, d1 | | 4.7 | 5.5 | | 28.4 | | | |
| Progression Factor | | 0.77 | 1.00 | | 1.00 | | | |
| Incremental Delay, d2 | | 0.3 | 0.2 | | 1.0 | | | |
| Delay (s) | | 3.9 | 5.7 | | 29.4 | | | |
| Level of Service | | Α | Α | | С | | | |
| Approach Delay (s) | | 3.9 | 5.7 | | 29.4 | | | |
| Approach LOS | | Α | Α | | С | | | |
| Intersection Summary | | | | | | | | |
| HCM 2000 Control Delay | | | 6.9 | Н | CM 2000 | Level of Service | 9 | Α |
| HCM 2000 Volume to Capac | city ratio | | 0.46 | | | | | |
| Actuated Cycle Length (s) | | | 80.0 | Sı | um of lost | time (s) | 10 | 0.0 |
| Intersection Capacity Utiliza | tion | | 49.5% | IC | U Level o | of Service | | Α |
| Analysis Period (min) | | | 15 | | | | | |
| 0 111 0 | | | | | | | | |

c Critical Lane Group

Synchro 10 Report

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Lanes, Volumes, Timings 2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

05/20/2021

| | • | • | † | <i>></i> | - | ļ |
|----------------------------|-------|-------|----------|-------------|-------|----------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | * | 7 | † | 7 | * | † |
| Traffic Volume (vph) | 52 | 110 | 483 | 20 | 83 | 661 |
| Future Volume (vph) | 52 | 110 | 483 | 20 | 83 | 661 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.0 | 3.5 | 3.0 | 3.0 | 3.5 |
| Storage Length (m) | 30.0 | 0.0 | 0.0 | 15.0 | 30.0 | 0.0 |
| Storage Lanes | 1 | 1 | | 1 | 1 | |
| Taper Length (m) | 2.5 | | | | 2.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 1.00 | 1.00 | 1.00 | 0.94 | 0.99 | 1.00 |
| Frt | | 0.850 | | 0.850 | 0.00 | |
| Flt Protected | 0.950 | 0.000 | | 0.000 | 0.950 | |
| Satd. Flow (prot) | 1685 | 1315 | 1842 | 1507 | 1478 | 1842 |
| Flt Permitted | 0.950 | 1010 | 1042 | 1307 | 0.345 | 1042 |
| | 1685 | 1315 | 1842 | 1416 | 529 | 1842 |
| Satd. Flow (perm) | 1005 | Yes | 1842 | 1416 Yes | 529 | 1842 |
| Right Turn on Red | | | | | | |
| Satd. Flow (RTOR) | 20 | 124 | 20 | 9 | | 20 |
| Link Speed (k/h) | 30 | | 30 | | | 30 |
| Link Distance (m) | 148.7 | | 265.9 | | | 191.3 |
| Travel Time (s) | 17.8 | | 31.9 | 0.5 | - | 23.0 |
| Confl. Peds. (#/hr) | | | | 28 | 28 | |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Heavy Vehicles (%) | 0% | 11% | 2% | 0% | 14% | 2% |
| Bus Blockages (#/hr) | 0 | 8 | 0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 58 | 124 | 543 | 22 | 93 | 743 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 58 | 124 | 543 | 22 | 93 | 743 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.0 | | 3.0 | | | 3.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.09 | 1.14 | 1.01 | 1.09 | 1.09 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| Detector 1 Type | CI+Ex | CI+Ex | CI+Ex | CI+Ex | CI+Ex | CI+Ex |
| | CITEX | CITEX | CITEX | CITEX | CITEX | CITEX |
| Detector 1 Channel | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Extend (s) | | | | | | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | CI+Ex | | | CI+Ex |

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HDR Corporation

Lanes, Volumes, Timings 2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

05/20/2021

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| | • | • | † | <i>></i> | - | ↓ |
|------------------------------|----------------|------------|------------|-------------|-----------|--------------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Perm | pm+ov | NA | Perm | pm+pt | NA |
| Protected Phases | | 1 | 2 | | 1 | 6 |
| Permitted Phases | 8 | 8 | | 2 | 6 | |
| Detector Phase | 8 | 1 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 21.0 | 6.0 | 27.0 | 27.0 | 6.0 | 27.0 |
| Minimum Split (s) | 26.0 | 10.0 | 34.0 | 34.0 | 10.0 | 34.0 |
| Total Split (s) | 29.0 | 11.0 | 40.0 | 40.0 | 11.0 | 51.0 |
| Total Split (%) | 36.3% | 13.8% | 50.0% | 50.0% | 13.8% | 63.8% |
| Maximum Green (s) | 24.0 | 7.0 | 33.0 | 33.0 | 7.0 | 44.0 |
| Yellow Time (s) | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 |
| All-Red Time (s) | 2.0 | 1.0 | 3.0 | 3.0 | 1.0 | 3.0 |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 4.0 | 3.0 | 6.0 | 6.0 | 3.0 | 6.0 |
| Lead/Lag | | Lead | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | C-Max | C-Max | None | C-Max |
| Walk Time (s) | 7.0 | | 7.0 | 7.0 | | 0.0 |
| Flash Dont Walk (s) | 14.0 | | 20.0 | 20.0 | | 0.0 |
| Pedestrian Calls (#/hr) | 0 | | 9 | 9 | | 0 |
| Act Effct Green (s) | 22.0 | 24.0 | 47.0 | 47.0 | 61.4 | 60.8 |
| Actuated g/C Ratio | 0.28 | 0.30 | 0.59 | 0.59 | 0.77 | 0.76 |
| v/c Ratio | 0.13 | 0.26 | 0.50 | 0.03 | 0.18 | 0.53 |
| Control Delay | 22.8 | 4.1 | 15.8 | 9.7 | 1.3 | 8.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 22.8 | 4.1 | 15.8 | 9.7 | 1.3 | 8.0 |
| LOS | С | Α | В | Α | Α | Α |
| Approach Delay | 10.0 | | 15.5 | | | 7.2 |
| Approach LOS | В | | В | | | Α |
| Intersection Summary | | | | | | |
| Area Type: | Other | | | | | |
| Cycle Length: 80 | | | | | | |
| Actuated Cycle Length: 80 | | | | | | |
| Offset: 31 (39%), Reference | ed to phase | 2:NBT a | nd 6:SBT | L, Start of | 1st Gree | n |
| Natural Cycle: 70 | | | | | | |
| Control Type: Actuated-Co | ordinated | | | | | |
| Maximum v/c Ratio: 0.53 | | | | | | |
| Intersection Signal Delay: | | | | | tersectio | |
| Intersection Capacity Utiliz | ation 60.6% | | | IC | CU Level | of Service I |
| Analysis Period (min) 15 | | | | | | |
| Splits and Phases: 2134 | : British Col | ombio Do | I/Dufforin | Ct 9 Cool | ratahawa | n Dd |
| Spiils and Friases. 2134 | . DIILISII CUI | UIIIDIA NO | /Dullellii | ol & oasi | Adultewa | i Nu |
| ø ₁ Tø | 2 (R) | | | | | |
| 11 s 40 s | - (-) | | | | | |
| A | | | | | | |
| ♥ Ø6 (R) | | | | | | |
| 1.0 | | | | | | |

2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

05/20/2021

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|------------------------|-------|------|----------|------|------|-------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Group Flow (vph) | 58 | 124 | 543 | 22 | 93 | 743 |
| v/c Ratio | 0.13 | 0.26 | 0.50 | 0.03 | 0.18 | 0.53 |
| Control Delay | 22.8 | 4.1 | 15.8 | 9.7 | 1.3 | 8.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 22.8 | 4.1 | 15.8 | 9.7 | 1.3 | 8.0 |
| Queue Length 50th (m) | 6.6 | 0.0 | 60.8 | 1.0 | 0.5 | 77.5 |
| Queue Length 95th (m) | 14.9 | 8.3 | 96.7 | 4.9 | m0.5 | m73.7 |
| Internal Link Dist (m) | 124.7 | | 241.9 | | | 167.3 |
| Turn Bay Length (m) | 30.0 | | | 15.0 | 30.0 | |
| Base Capacity (vph) | 526 | 487 | 1082 | 835 | 510 | 1400 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 12 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.11 | 0.25 | 0.50 | 0.03 | 0.18 | 0.54 |
| | | | | | | |

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

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HCM Signalized Intersection Capacity Analysis 2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

05/20/2021

| | • | • | † | / | \ | ↓ | |
|----------------------------------|---------|-------|----------|------|------------|------------------|------|
| Movement | WBL | WBR | NBT | NBR | SBL | SBT | |
| Lane Configurations | * | 7 | | 7 | * | † | |
| Traffic Volume (vph) | 52 | 110 | 483 | 20 | 83 | 661 | |
| Future Volume (vph) | 52 | 110 | 483 | 20 | 83 | 661 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Lane Width | 3.0 | 3.0 | 3.5 | 3.0 | 3.0 | 3.5 | |
| Total Lost time (s) | 4.0 | 3.0 | 6.0 | 6.0 | 3.0 | 6.0 | |
| Lane Util, Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 0.94 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1685 | 1315 | 1842 | 1416 | 1471 | 1842 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.34 | 1.00 | |
| Satd. Flow (perm) | 1685 | 1315 | 1842 | 1416 | 534 | 1842 | |
| Peak-hour factor, PHF | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | |
| Adj. Flow (vph) | 58 | 124 | 543 | 22 | 93 | 743 | |
| RTOR Reduction (vph) | 0 | 90 | 0 | 4 | 0 | 0 | |
| Lane Group Flow (vph) | 58 | 34 | 543 | 18 | 93 | 743 | |
| Confl. Peds. (#/hr) | | | | 28 | 28 | | |
| Heavy Vehicles (%) | 0% | 11% | 2% | 0% | 14% | 2% | |
| Bus Blockages (#/hr) | 0 | 8 | 0 | 0 | 0 | 0 | |
| Turn Type | Perm | pm+ov | NA | Perm | pm+pt | NA | |
| Protected Phases | | 1 | 2 | | 1 | 6 | |
| Permitted Phases | 8 | 8 | | 2 | 6 | | |
| Actuated Green, G (s) | 12.6 | 20.0 | 44.0 | 44.0 | 55.4 | 55.4 | |
| Effective Green, g (s) | 13.6 | 22.0 | 45.0 | 45.0 | 56.4 | 56.4 | |
| Actuated g/C Ratio | 0.17 | 0.28 | 0.56 | 0.56 | 0.70 | 0.70 | |
| Clearance Time (s) | 5.0 | 4.0 | 7.0 | 7.0 | 4.0 | 7.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 286 | 361 | 1036 | 796 | 474 | 1298 | |
| v/s Ratio Prot | | 0.01 | 0.29 | | 0.02 | c0.40 | |
| v/s Ratio Perm | c0.03 | 0.02 | | 0.01 | 0.12 | | |
| v/c Ratio | 0.20 | 0.09 | 0.52 | 0.02 | 0.20 | 0.57 | |
| Uniform Delay, d1 | 28.5 | 21.6 | 10.9 | 7.8 | 4.8 | 5.8 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 0.24 | 0.94 | |
| Incremental Delay, d2 | 0.4 | 0.1 | 1.9 | 0.1 | 0.0 | 0.2 | |
| Delay (s) | 28.9 | 21.7 | 12.8 | 7.8 | 1.2 | 5.6 | |
| Level of Service | С | С | В | Α | Α | A | |
| Approach Delay (s) | 24.0 | | 12.6 | | | 5.1 | |
| Approach LOS | С | | В | | | Α | |
| ntersection Summary | | | | | | | |
| HCM 2000 Control Delay | | | 10.0 | Н | CM 2000 | Level of Service | ce A |
| HCM 2000 Volume to Capacity | y ratio | | 0.53 | | | | |
| Actuated Cycle Length (s) | | | 80.0 | S | um of lost | time (s) | 14.0 |
| Intersection Capacity Utilizatio | n | | 60.6% | | CU Level o | () | В |
| Analysis Period (min) | | | 15 | | | | |
| c Critical Lane Group | | | | | | | |

Lanes, Volumes, Timings

97: Yukon Place & British Colombia Rd

09/30/2021

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|----------------------------|-------|-------|---------------|-------|----------|-------|-------|----------|-------------|-------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ሻ | £ | | ሻ | † | 7 | | 4 | | | 4 | |
| Traffic Volume (vph) | 1 | 423 | 0 | 1 | 308 | 1 | 7 | 1 | 0 | 0 | 0 | 26 |
| Future Volume (vph) | 1 | 423 | 0 | 1 | 308 | 1 | 7 | 1 | 0 | 0 | 0 | 26 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 20.0 | | 20.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| 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 |
| Ped Bike Factor | | | | 1.00 | | | | 0.99 | | | 0.97 | |
| Frt | | | | | | 0.850 | | | | | 0.865 | |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.957 | | | | |
| Satd. Flow (prot) | 1685 | 1824 | 0 | 1685 | 1756 | 1507 | 0 | 1798 | 0 | 0 | 1574 | 0 |
| Flt Permitted | 0.555 | | | 0.494 | | | | | | | | |
| Satd. Flow (perm) | 984 | 1824 | 0 | 874 | 1756 | 1507 | 0 | 1860 | 0 | 0 | 1574 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | | 45 | | | | | 514 | |
| Link Speed (k/h) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (m) | | 164.9 | | | 265.9 | | | 92.0 | | | 121.3 | |
| Travel Time (s) | | 19.8 | | | 31.9 | | | 11.0 | | | 14.6 | |
| Confl. Peds. (#/hr) | | | 2 | 2 | | | 6 | | | | | 6 |
| Confl. Bikes (#/hr) | | | | | | | | | 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 (%) | 0% | 3% | 0% | 0% | 7% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Adj. Flow (vph) | 1 | 470 | 0 | 1 | 342 | 1 | 8 | 1 | 0 | 0 | 0 | 29 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 1 | 470 | 0 | 1 | 342 | 1 | 0 | 9 | 0 | 0 | 29 | 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) | | 3.0 | | | 3.0 | Ť | | 0.0 | Ť | | 0.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.09 | 1.01 | 1.01 | 1.09 | 1.01 | 1.09 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | CI+Ex | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 1 Lanes, Volumes, Timings

| 97: Yukon Place & British Color | nbia | Rd |
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09/30/2021

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|-------------------------|-------|-------|-----|-------|-------|-------|-------|-------|-----|-------|-------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | Perm | Perm | NA | | | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 33.0 | 33.0 | | 33.0 | 33.0 | 33.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Minimum Split (s) | 39.0 | 39.0 | | 39.0 | 39.0 | 39.0 | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Total Split (s) | 47.0 | 47.0 | | 47.0 | 47.0 | 47.0 | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Total Split (%) | 65.3% | 65.3% | | 65.3% | 65.3% | 65.3% | 34.7% | 34.7% | | 34.7% | 34.7% | |
| Maximum Green (s) | 41.0 | 41.0 | | 41.0 | 41.0 | 41.0 | 19.0 | 19.0 | | 19.0 | 19.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | | -1.0 | -1.0 | -1.0 | | -1.0 | | | -1.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | Max | Max | | Max | Max | Max | None | None | | None | None | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 9.0 | 9.0 | | 9.0 | 9.0 | 9.0 | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 58.5 | 58.5 | | 58.5 | 58.5 | 58.5 | | 8.0 | | | 8.0 | |
| Actuated g/C Ratio | 0.90 | 0.90 | | 0.90 | 0.90 | 0.90 | | 0.12 | | | 0.12 | |
| v/c Ratio | 0.00 | 0.29 | | 0.00 | 0.22 | 0.00 | | 0.04 | | | 0.05 | |
| Control Delay | 2.0 | 2.3 | | 2.0 | 2.1 | 0.0 | | 27.0 | | | 0.1 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | | | 0.0 | |
| Total Delay | 2.0 | 2.3 | | 2.0 | 2.1 | 0.0 | | 27.0 | | | 0.1 | |
| LOS | Α | Α | | Α | Α | Α | | С | | | Α | |
| Approach Delay | | 2.3 | | | 2.1 | | | 27.0 | | | 0.1 | |
| Approach LOS | | Α | | | Α | | | С | | | Α | |
| Intersection Summary | | | | | | | | | | | | |

| Intersection Summary | 1 | | | | | | | |
|--|--------------------------------|---------------------|--|--|--|--|--|--|
| Area Type: | Other | | | | | | | |
| Cycle Length: 72 | | | | | | | | |
| Actuated Cycle Lengtl | h: 65.2 | | | | | | | |
| Natural Cycle: 65 | | | | | | | | |
| Control Type: Semi A | Control Type: Semi Act-Uncoord | | | | | | | |
| Maximum v/c Ratio: 0 | .29 | | | | | | | |
| Intersection Signal De | elay: 2.4 | Intersection LOS: A | | | | | | |
| Intersection Capacity Utilization 73.3% ICU Level of Service D | | | | | | | | |
| Analysis Period (min) | 15 | | | | | | | |

Splits and Phases: 97: Yukon Place & British Colombia Rd



Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 2

Synchro 11 Report

Page 3

HCM Signalized Intersection Capacity Analysis 97: Yukon Place & British Colombia Rd

09/30/2021

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|--------------------------------|-----------|----------|-------|------|------------|------------|---------|----------|------|----------|------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | 7 | 1 | | ሻ | * | 7 | | 4 | | | 4 | |
| Traffic Volume (vph) | 1 | 423 | 0 | 1 | 308 | 1 | 7 | 1 | 0 | 0 | 0 | 26 |
| Future Volume (vph) | 1 | 423 | 0 | 1 | 308 | 1 | 7 | 1 | 0 | 0 | 0 | 26 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | | | 0.97 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 0.99 | | | 1.00 | |
| Frt | 1.00 | 1.00 | | 1.00 | 1.00 | 0.85 | | 1.00 | | | 0.86 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | | 0.96 | | | 1.00 | |
| Satd. Flow (prot) | 1685 | 1824 | | 1681 | 1756 | 1507 | | 1781 | | | 1574 | |
| Flt Permitted | 0.56 | 1.00 | | 0.49 | 1.00 | 1.00 | | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | 985 | 1824 | | 873 | 1756 | 1507 | | 1860 | | | 1574 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 1 | 470 | 0 | 1 | 342 | 1 | 8 | 1 | 0 | 0 | 0 | 29 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 0 |
| Lane Group Flow (vph) | 1 | 470 | 0 | 1 | 342 | 1 | 0 | 9 | 0 | 0 | 2 | 0 |
| Confl. Peds. (#/hr) | | | 2 | 2 | | | 6 | | | | | 6 |
| Confl. Bikes (#/hr) | | | | | | | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 3% | 0% | 0% | 7% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Turn Type | Perm | NA | | Perm | NA | Perm | Perm | NA | | | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 54.3 | 54.3 | | 54.3 | 54.3 | 54.3 | | 2.6 | | | 2.6 | |
| Effective Green, g (s) | 55.3 | 55.3 | | 55.3 | 55.3 | 55.3 | | 3.6 | | | 3.6 | |
| Actuated g/C Ratio | 0.80 | 0.80 | | 0.80 | 0.80 | 0.80 | | 0.05 | | | 0.05 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 790 | 1463 | | 700 | 1409 | 1209 | | 97 | | | 82 | |
| v/s Ratio Prot | | c0.26 | | | 0.19 | | | | | | 0.00 | |
| v/s Ratio Perm | 0.00 | | | 0.00 | | 0.00 | | c0.00 | | | | |
| v/c Ratio | 0.00 | 0.32 | | 0.00 | 0.24 | 0.00 | | 0.09 | | | 0.02 | |
| Uniform Delay, d1 | 1.3 | 1.8 | | 1.3 | 1.7 | 1.3 | | 31.1 | | | 31.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 0.0 | 0.6 | | 0.0 | 0.4 | 0.0 | | 0.4 | | | 0.1 | |
| Delay (s) | 1.3 | 2.4 | | 1.3 | 2.1 | 1.3 | | 31.5 | | | 31.1 | |
| Level of Service | Α | Α | | Α | Α | Α | | С | | | С | |
| Approach Delay (s) | | 2.4 | | | 2.1 | | | 31.5 | | | 31.1 | |
| Approach LOS | | Α | | | Α | | | С | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 3.5 | Н | CM 2000 | Level of S | Service | | A | | | |
| HCM 2000 Volume to Capac | ity ratio | | 0.31 | | J.71 2000 | 23101010 | 3014100 | | - 11 | | | |
| Actuated Cycle Length (s) | , | | 68.9 | Si | um of lost | time (s) | | | 10.0 | | | |
| Intersection Capacity Utilizat | ion | | 73.3% | | | of Service | | | D | | | |
| Analysis Period (min) | | | 15 | 10 | | | | | | | | |
| c Critical Lane Group | | | ., | | | | | | | | | |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements

Lanes, Volumes, Timings 222: Strachan Ave & Lakeshore Blvd

09/30/2021

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|----------------------------|-------|-----------------|-------|-------|----------|-------|-------|----------|-------------|-------------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ሻ | ተተ _ጉ | | ሻ | ተተተ | | | 4 | | ሻ | ની | 7 |
| Traffic Volume (vph) | 502 | 3996 | 5 | 8 | 1196 | 0 | 0 | 39 | 0 | 287 | 17 | 235 |
| Future Volume (vph) | 502 | 3996 | 5 | 8 | 1196 | 0 | 0 | 39 | 0 | 287 | 17 | 235 |
| Ideal Flow (vphpl) | 2150 | 2100 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 |
| Storage Length (m) | 60.0 | | 0.0 | 60.0 | | 50.0 | 0.0 | | 0.0 | 140.0 | | 50.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 0 | | 0 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | *1.00 | 0.91 | 1.00 | 0.91 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Ped Bike Factor | | 1.00 | | | | | | | | | | 0.93 |
| Frt | | | | | | | | | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | | | | 0.950 | 0.957 | |
| Satd. Flow (prot) | 1643 | 5990 | 0 | 1685 | 4885 | 0 | 0 | 1879 | 0 | 1585 | 1693 | 1507 |
| Flt Permitted | 0.087 | | | 0.098 | | | | | | 0.729 | 0.718 | |
| Satd. Flow (perm) | 151 | 5990 | 0 | 174 | 4885 | 0 | 0 | 1879 | 0 | 1216 | 1270 | 1396 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | | | | | | | | 261 |
| Link Speed (k/h) | | 60 | | | 60 | | | 40 | | | 40 | |
| Link Distance (m) | | 310.3 | | | 196.6 | | | 116.5 | | | 205.6 | |
| Travel Time (s) | | 18.6 | | | 11.8 | | | 10.5 | | | 18.5 | |
| Confl. Peds. (#/hr) | 6 | | 8 | 8 | | 6 | 49 | | | | | 49 |
| Confl. Bikes (#/hr) | | | | | | | | | 39 | | | 13 |
| 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 (%) | 16% | 4% | 0% | 0% | 5% | 33% | 0% | 0% | 0% | 1% | 0% | 0% |
| Adj. Flow (vph) | 558 | 4440 | 6 | 9 | 1329 | 0 | 0 | 43 | 0 | 319 | 19 | 261 |
| Shared Lane Traffic (%) | | | | | | | | | | 49% | | |
| Lane Group Flow (vph) | 558 | 4446 | 0 | 9 | 1329 | 0 | 0 | 43 | 0 | 163 | 175 | 261 |
| 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) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 0.93 | 0.89 | 1.01 | 1.09 | 1.01 | 1.09 | 1.01 | 1.01 | 1.01 | 1.09 | 1.01 | 1.09 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | 1 |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | Right |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | Cl+Ex | CI+Ex | | CI+Ex | CI+Ex | CI+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 5

Lanes, Volumes, Timings 222: Strachan Ave & Lakeshore Blvd

09/30/2021

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|-----------------------------|----------------|------------|-------------|-------|-------------|------------|-------|----------|----------|-------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | pm+pt | NA | | Perm | NA | | | NA | | Perm | NA | pm+ov |
| Protected Phases | 5 | 2 | | | 6 | | | 3 | | | 4 | 5 |
| Permitted Phases | 2 | | | 6 | | | 3 | | | 4 | | 4 |
| Detector Phase | 5 | 2 | | 6 | 6 | | 3 | 3 | | 4 | 4 | 5 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 29.0 | | 30.0 | 30.0 | | 12.0 | 12.0 | | 10.0 | 10.0 | 6.0 |
| Minimum Split (s) | 12.0 | 35.0 | | 36.0 | 36.0 | | 21.0 | 21.0 | | 45.0 | 45.0 | 12.0 |
| Total Split (s) | 31.0 | 76.0 | | 45.0 | 45.0 | | 22.0 | 22.0 | | 46.0 | 46.0 | 31.0 |
| Total Split (%) | 21.5% | 52.8% | | 31.3% | 31.3% | | 15.3% | 15.3% | | 31.9% | 31.9% | 21.5% |
| Maximum Green (s) | 25.0 | 70.0 | | 39.0 | 39.0 | | 13.0 | 13.0 | | 38.0 | 38.0 | 25.0 |
| Yellow Time (s) | 3.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| All-Red Time (s) | 3.0 | 2.0 | | 2.0 | 2.0 | | 6.0 | 6.0 | | 5.0 | 5.0 | 3.0 |
| Lost Time Adjust (s) | -3.0 | -3.0 | | -1.0 | -1.0 | | | -1.0 | | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 3.0 | 3.0 | | 5.0 | 5.0 | | | 8.0 | | 7.0 | 7.0 | 5.0 |
| Lead/Lag | Lead | | | Lag | Lag | | Lead | Lead | | Lag | Lag | Lead |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | Max | | Max | Max | | None | None | | None | None | None |
| Walk Time (s) | | 7.0 | | 7.0 | 7.0 | | | | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | | 22.0 | | 22.0 | 22.0 | | | | | 30.0 | 30.0 | |
| Pedestrian Calls (#/hr) | | 3 | | 2 | 2 | | | | | 0 | 0 | |
| Act Effct Green (s) | 74.2 | 74.2 | | 40.7 | 40.7 | | | 13.2 | | 23.3 | 23.3 | 51.8 |
| Actuated g/C Ratio | 0.60 | 0.60 | | 0.33 | 0.33 | | | 0.11 | | 0.19 | 0.19 | 0.42 |
| v/c Ratio | 1.29 | 1.24 | | 0.16 | 0.83 | | | 0.21 | | 0.71 | 0.73 | 0.34 |
| Control Delay | 178.6 | 134.8 | | 44.1 | 45.5 | | | 58.5 | | 65.2 | 66.1 | 3.6 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Delay | 178.6 | 134.8 | | 44.1 | 45.5 | | | 58.5 | | 65.2 | 66.1 | 3.6 |
| LOS | F | F | | D | D | | | E | | E | E | Α |
| Approach Delay | | 139.7 | | | 45.5 | | | 58.5 | | | 38.6 | |
| Approach LOS | | F | | | D | | | Е | | | D | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 144 | | | | | | | | | | | | |
| Actuated Cycle Length: 1 | 23.6 | | | | | | | | | | | |
| Natural Cycle: 145 | | | | | | | | | | | | |
| Control Type: Semi Act-U | Incoord | | | | | | | | | | | |
| Maximum v/c Ratio: 1.29 | | | | | | | | | | | | |
| Intersection Signal Delay | | ., | | | tersection | | | | | | | |
| Intersection Capacity Utili | ization 136.0° | / o | | 10 | CU Level of | of Service | Н | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| * User Entered Value | | | | | | | | | | | | |
| Splits and Phases: 222 | 2: Strachan A | a & Lako | shore Plu | d | | | | | | | | |
| Dpino anu i nascs. ZZZ | Guadian A | vo a Lake | 31101 C DIV | u | | | | | | | | |



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|------------------------|--------|--------|------|--------|----------|-------|----------|------|--|
| Lane Group | EBL | EBT | WBL | WBT | NBT | SBL | SBT | SBR | |
| Lane Group Flow (vph) | 558 | 4446 | 9 | 1329 | 43 | 163 | 175 | 261 | |
| v/c Ratio | 1.29 | 1.24 | 0.16 | 0.83 | 0.21 | 0.71 | 0.73 | 0.34 | |
| Control Delay | 178.6 | 134.8 | 44.1 | 45.5 | 58.5 | 65.2 | 66.1 | 3.6 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 178.6 | 134.8 | 44.1 | 45.5 | 58.5 | 65.2 | 66.1 | 3.6 | |
| Queue Length 50th (m) | ~170.2 | ~475.5 | 1.6 | 115.2 | 10.1 | 41.0 | 44.2 | 0.0 | |
| Queue Length 95th (m) | #267.9 | #557.7 | 7.4 | #160.6 | 23.4 | 66.1 | 70.2 | 13.9 | |
| Internal Link Dist (m) | | 286.3 | | 172.6 | 92.5 | | 181.6 | | |
| Turn Bay Length (m) | 60.0 | | 60.0 | | | 140.0 | | 50.0 | |
| Base Capacity (vph) | 433 | 3595 | 57 | 1606 | 216 | 390 | 407 | 759 | |
| Starvation Cap Reductn | 0 | 67 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 1.29 | 1.26 | 0.16 | 0.83 | 0.20 | 0.42 | 0.43 | 0.34 | |

| HCM Signalized Intersection Capacity Analysis |
|---|
| 222: Strachan Ave & Lakeshore Blvd |
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|-----------------------------------|------------|-----------------|---------------|------|------------|------------|---------|----------|------|------|-------|-------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | N. | ተተ _ጮ | | 7 | ተተተ | | | 4 | | Ţ | ર્ન | 7 |
| Traffic Volume (vph) | 502 | 3996 | 5 | 8 | 1196 | 0 | 0 | 39 | 0 | 287 | 17 | 235 |
| Future Volume (vph) | 502 | 3996 | 5 | 8 | 1196 | 0 | 0 | 39 | 0 | 287 | 17 | 235 |
| Ideal Flow (vphpl) | 2150 | 2100 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 |
| Total Lost time (s) | 3.0 | 3.0 | | 5.0 | 5.0 | | | 8.0 | | 7.0 | 7.0 | 5.0 |
| Lane Util. Factor | 1.00 | *1.00 | | 1.00 | 0.91 | | | 1.00 | | 0.95 | 0.95 | 1.00 |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.97 |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | | 1.00 | | 0.95 | 0.96 | 1.00 |
| Satd. Flow (prot) | 1643 | 5989 | | 1685 | 4885 | | | 1879 | | 1585 | 1694 | 1460 |
| Flt Permitted | 0.09 | 1.00 | | 0.10 | 1.00 | | | 1.00 | | 0.73 | 0.72 | 1.00 |
| Satd. Flow (perm) | 151 | 5989 | | 174 | 4885 | | | 1879 | | 1216 | 1271 | 1460 |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 558 | 4440 | 6 | 9 | 1329 | 0 | 0 | 43 | 0 | 319 | 19 | 261 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 158 |
| Lane Group Flow (vph) | 558 | 4446 | 0 | 9 | 1329 | 0 | 0 | 43 | 0 | 163 | 175 | 103 |
| Confl. Peds. (#/hr) | 6 | | 8 | 8 | | 6 | 49 | | | | | 49 |
| Confl. Bikes (#/hr) | | | | | | | | | 39 | | | 13 |
| Heavy Vehicles (%) | 16% | 4% | 0% | 0% | 5% | 33% | 0% | 0% | 0% | 1% | 0% | 0% |
| Turn Type | pm+pt | NA | | Perm | NA | | | NA | | Perm | NA | pm+ov |
| Protected Phases | 5 | 2 | | | 6 | | | 3 | | | 4 | 5 |
| Permitted Phases | 2 | | | 6 | | | 3 | | | 4 | | 4 |
| Actuated Green, G (s) | 71.2 | 71.2 | | 39.8 | 39.8 | | | 9.1 | | 22.3 | 22.3 | 47.7 |
| Effective Green, g (s) | 74.2 | 74.2 | | 40.8 | 40.8 | | | 10.1 | | 23.3 | 23.3 | 49.7 |
| Actuated g/C Ratio | 0.59 | 0.59 | | 0.32 | 0.32 | | | 0.08 | | 0.19 | 0.19 | 0.40 |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | | 9.0 | | 8.0 | 8.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 426 | 3538 | | 56 | 1586 | | | 151 | | 225 | 235 | 577 |
| v/s Ratio Prot | c0.30 | 0.74 | | | 0.27 | | | c0.02 | | | | 0.04 |
| v/s Ratio Perm | c0.48 | | | 0.05 | | | | | | 0.13 | c0.14 | 0.03 |
| v/c Ratio | 1.31 | 1.26 | | 0.16 | 0.84 | | | 0.28 | | 0.72 | 0.74 | 0.18 |
| Uniform Delay, d1 | 39.0 | 25.7 | | 30.2 | 39.3 | | | 54.4 | | 48.1 | 48.3 | 24.7 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 155.5 | 117.9 | | 6.1 | 5.5 | | | 1.0 | | 11.0 | 12.1 | 0.1 |
| Delay (s) | 194.5 | 143.6 | | 36.3 | 44.8 | | | 55.4 | | 59.1 | 60.4 | 24.8 |
| Level of Service | F | F | | D | D | | | Е | | Е | Е | С |
| Approach Delay (s) | | 149.3 | | | 44.7 | | | 55.4 | | | 44.5 | |
| Approach LOS | | F | | | D | | | Е | | | D | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 119.7 | Н | CM 2000 | Level of S | Service | | F | | | |
| HCM 2000 Volume to Capa | city ratio | | 1.16 | | | | | | | | | |
| Actuated Cycle Length (s) | , | | 125.6 | Si | um of lost | time (s) | | | 25.0 | | | |
| Intersection Capacity Utilization | | | 136.0% | | | of Service | | | Н | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings 538: Strachan Ave & King St

09/30/2021

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|----------------------------|-------|-------|---------------|-------|----------|-------|-------|----------|----------|-------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 414 | | | 414 | | , N | f) | | 7 | ĵ. | |
| Traffic Volume (vph) | 0 | 627 | 122 | 66 | 560 | 40 | 113 | 335 | 116 | 27 | 199 | 20 |
| Future Volume (vph) | 0 | 627 | 122 | 66 | 560 | 40 | 113 | 335 | 116 | 27 | 199 | 20 |
| Ideal Flow (vphpl) | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 0.0 | 25.0 | | 0.0 | 25.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 0 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | 0.91 | | | 0.98 | | 0.85 | 0.96 | | 0.96 | 0.98 | |
| Frt | | 0.976 | | | 0.991 | | | 0.961 | | | 0.986 | |
| Flt Protected | | | | | 0.995 | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 0 | 1599 | 0 | 0 | 1696 | 0 | 1458 | 1486 | 0 | 1516 | 1601 | 0 |
| Flt Permitted | | | | | 0.776 | | 0.505 | | | 0.160 | | |
| Satd. Flow (perm) | 0 | 1599 | 0 | 0 | 1306 | 0 | 660 | 1486 | 0 | 246 | 1601 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 46 | | | 13 | | | 23 | | | 7 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 40 | | | 40 | |
| Link Distance (m) | | 255.2 | | | 358.6 | | | 424.1 | | | 379.9 | |
| Travel Time (s) | | 18.4 | | | 25.8 | | | 38.2 | | | 34.2 | |
| Confl. Peds. (#/hr) | 48 | | 285 | 285 | | 48 | 205 | | 116 | 116 | • | 205 |
| Confl. Bikes (#/hr) | | | 37 | | | 15 | | | 9 | | | 11 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles (%) | 0% | 9% | 28% | 100% | 7% | 5% | 4% | 6% | 3% | 0% | 2% | 0% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 0 | 729 | 142 | 77 | 651 | 47 | 131 | 390 | 135 | 31 | 231 | 23 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 871 | 0 | 0 | 775 | 0 | 131 | 525 | 0 | 31 | 254 | 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 | | | 3.0 | | | 3.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.92 | 2.03 | 1.92 | 1.92 | 2.03 | 1.92 | 1.25 | 1.16 | 1.16 | 1.25 | 1.16 | 1.16 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 9 Lanes, Volumes, Timings 538: Strachan Ave & King St

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09/30/2021

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|--|---------------|------------|-----------|----------|------------|-----------|-----------|-----------|----------|-----------|-----------|----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SI |
| Detector 2 Type | | Cl+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 4 | | | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Detector Phase | 2 | 2 | | 6 | 6 | | 4 | 4 | | 8 | 8 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 21.0 | 21.0 | | 21.0 | 21.0 | |
| Minimum Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 27.0 | 27.0 | | 27.0 | 27.0 | |
| Total Split (s) | 50.0 | 50.0 | | 50.0 | 50.0 | | 30.0 | 30.0 | | 30.0 | 30.0 | |
| Total Split (%) | 62.5% | 62.5% | | 62.5% | 62.5% | | 37.5% | 37.5% | | 37.5% | 37.5% | |
| Maximum Green (s) | 44.0 | 44.0 | | 44.0 | 44.0 | | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Yellow Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 5.0 | -1.0 | | | -1.0 | | -1.0 | -1.0 | | -1.0 | -1.0 | |
| Total Lost Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | C-Max | C-Max | (| C-Max | C-Max | | Max | Max | | Max | Max | |
| Walk Time (s) | 7.0 | 7.0 | , | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 13.0 | 13.0 | | 13.0 | 13.0 | | 14.0 | 14.0 | | 14.0 | 14.0 | |
| Pedestrian Calls (#/hr) | 100 | 100 | | 16 | 16 | | 100 | 100 | | 100 | 100 | |
| Act Effct Green (s) | 100 | 45.0 | | | 45.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Actuated g/C Ratio | | 0.56 | | | 0.56 | | 0.31 | 0.31 | | 0.31 | 0.31 | |
| v/c Ratio | | 0.95 | | | 1.05 | | 0.64 | 1.09 | | 0.41 | 0.50 | |
| Control Delay | | 37.1 | | | 61.3 | | 40.2 | 97.1 | | 46.0 | 32.4 | |
| Queue Delay | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | | 37.1 | | | 61.3 | | 40.2 | 97.1 | | 46.0 | 32.4 | |
| LOS | | D D | | | 01.5 E | | 40.2 D | 51.1 F | | 40.0 D | 02.4 C | |
| Approach Delay | | 37.1 | | | 61.3 | | D | 85.8 | | D | 33.9 | |
| Approach LOS | | 37.1 | | | 01.5 E | | | 03.0 F | | | 33.3 C | |
| | | U | | | | | | Г | | | C | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | CBD | | | | | | | | | | | |
| Cycle Length: 80 | | | | | | | | | | | | |
| Actuated Cycle Length: 80 | | 0.5551 | LOWDT | | (4.10 | | | | | | | |
| Offset: 42 (53%), Reference | ced to phase | e z:EBIL a | na 6:WB11 | L, Start | or 1st Gre | en | | | | | | |
| Natural Cycle: 80 | oordinated | | | | | | | | | | | |
| Control Type: Actuated-Co | oordinated | | | | | | | | | | | |
| Maximum v/c Ratio: 1.09 | EC 2 | | | | toroodi | 100.5 | | | | | | |
| Intersection Signal Delay: | | 2/ | | | tersection | | . LI | | | | | |
| Intersection Capacity Utiliz Analysis Period (min) 15 | zation 132.2° | 70 | | 10 | CU Level o | i Service | п | | | | | |
| , , , | Strachan A | ve & Kina | St St | | | | | | | | | |
| * | . Guacilail A | ve a ruily | Οι | | | | | | | | | |
| Ø2 (R) | | | | | | | ^√0 | 14 | | | | |
| 50 s | | | | | | | 30 s | | | | | |

538: Strachan Ave & King St

09/30/2021

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|------------------------|-------|-------|-------|----------|------|-------|
| Lane Group | EBT | WBT | NBL | NBT | SBL | SBT |
| Lane Group Flow (vph) | 871 | 775 | 131 | 525 | 31 | 254 |
| v/c Ratio | 0.95 | 1.05 | 0.64 | 1.09 | 0.41 | 0.50 |
| Control Delay | 37.1 | 61.3 | 40.2 | 97.1 | 46.0 | 32.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 37.1 | 61.3 | 40.2 | 97.1 | 46.0 | 32.4 |
| Queue Length 50th (m) | 57.7 | ~52.2 | 16.9 | ~89.2 | 4.8 | 38.6 |
| Queue Length 95th (m) | #94.8 | #93.3 | #37.9 | #136.6 | m9.1 | m54.4 |
| Internal Link Dist (m) | 231.2 | 334.6 | | 400.1 | | 355.9 |
| Turn Bay Length (m) | | | 25.0 | | 25.0 | |
| Base Capacity (vph) | 919 | 740 | 206 | 480 | 76 | 505 |
| 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 | 1.05 | 0.64 | 1.09 | 0.41 | 0.50 |

Intersection Summar

HCM Signalized Intersection Capacity Analysis

538: Strachan Ave & King St

09/30/2021

| Movement EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT | | ۶ | → | • | • | ← | • | 4 | † | / | > | ↓ | 4 |
|--|-----------------------|-----------|----------|---------|---------|------------|--------------|---------|----------|------|-------------|----------|------|
| Traffic Volume (vph) | Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Future Volume ("phi) | Lane Configurations | | 413- | | | 413 | | 7 | ĵ, | | 7 | f. | |
| Ideal Flow (vphpl) 1250 | Traffic Volume (vph) | 0 | 627 | 122 | 66 | 560 | 40 | 113 | 335 | 116 | 27 | 199 | 20 |
| Lane Width | Future Volume (vph) | 0 | 627 | 122 | 66 | 560 | 40 | 113 | 335 | 116 | 27 | 199 | 20 |
| Total Lost time (s) | Ideal Flow (vphpl) | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor 0.95 0.95 1.00 1.00 1.00 1.00 1.00 1.00 Frph, pedbikes 0.91 0.99 0.98 1.00 0.96 1.00 0.98 1.00 0.96 1.00 0.98 1.00 0.96 1.00 0.98 1.00 0.99 0.85 1.00 0.96 1.00 0.98 1.00 0.99 0.85 1.00 0.96 1.00 0.99 1.00 0.96 1.00 0.99 1.00 0.96 1.00 0.99 1.00 0.96 1.00 0.99 1.00 0.96 1.00 0.99 1.00 0.96 1.00 0.99 1.00 0.16 1.00 0.78 0.50 1.00 0.16 1.00 0.78 0.50 1.00 0.16 1.00 0.78 0.50 1.00 0.16 1.00 0.78 0.50 1.00 0.16 1.00 0.78 0.50 1.00 0.16 1.00 0.79 0.79 1.00 0.79 1.00 0.16 1.00 0.79 1.00 0.79 1.00 0.79 1.00 0.79 1.00 0.79 1.00 0.79 1.00 0.79 1.00 0.79 1.00 0.70 1.00 0.16 1.00 0.70 0.7 | Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| Frpb, pedrbikes | Total Lost time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Fipb, ped/bikes | Lane Util. Factor | | 0.95 | | | 0.95 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Fit 0.98 | Frpb, ped/bikes | | 0.91 | | | 0.99 | | 1.00 | 0.96 | | 1.00 | 0.98 | |
| Fit Protected | Flpb, ped/bikes | | 1.00 | | | 0.99 | | 0.85 | 1.00 | | 0.96 | 1.00 | |
| Satd. Flow (prot) 1598 1675 1241 1487 1460 1602 | Frt | | 0.98 | | | 0.99 | | 1.00 | 0.96 | | 1.00 | 0.99 | |
| Fit Permitted 1.00 0.78 0.50 1.00 0.16 1.00 Satd. Flow (perm) 1598 1307 659 1487 246 1602 Peak-hour factor, PHF 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 | Flt Protected | | 1.00 | | | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satid. Flow (perm) 1598 1307 659 1487 246 1602 | Satd. Flow (prot) | | 1598 | | | 1675 | | 1241 | 1487 | | 1460 | 1602 | |
| Peak-hour factor, PHF 0.86 0.80 | Flt Permitted | | 1.00 | | | 0.78 | | 0.50 | 1.00 | | 0.16 | 1.00 | |
| Peak-hour factor, PHF 0.86 0.80 | Satd, Flow (perm) | | 1598 | | | 1307 | | 659 | 1487 | | 246 | 1602 | |
| Adj. Flow (vph) 0 729 142 77 651 47 131 390 135 31 231 RTOR Reduction (vph) 0 20 0 0 6 0 0 16 0 0 5 Lane Group Flow (vph) 0 851 0 0 769 0 131 509 0 31 249 Confl. Peds. (#hr) 48 285 285 48 205 116 | | 0.86 | | 0.86 | 0.86 | | 0.86 | | | 0.86 | 0.86 | | 0.86 |
| RTOR Reduction (vph) 0 20 0 6 0 0 16 0 0 5 Lane Group Flow (vph) 0 851 0 0 769 0 131 509 0 31 249 Confl. Bikes (#hr) 48 285 285 48 205 116 116 116 Confl. Bikes (#hr) 37 15 9 15 9 15 9 15 15 9 15 15 9 15 15 9 15 15 9 15 15 9 15 15 9 15 15 9 15 15 9 15 15 9 15 15 9 15 15 9 15 15 9 15 15 9 15 15 15 9 15 15 15 15 15 15 15 15 15 15 15 15 15 16 | | | | | | | | | | | | | 23 |
| Lane Group Flow (vph) 0 851 0 0 769 0 131 509 0 31 249 Confl. Peds. (#/hr) 48 285 285 48 205 116 116 Confl. Bikes (#/hr) 37 15 9 16 17 15 9 Heavy Vehicles (%) 0% 9% 28% 100% 7% 5% 4% 6% 3% 0% 2% Bus Blockages (#/hr) 24 24 24 24 24 24 0< | | 0 | | 0 | 0 | 6 | 0 | 0 | 16 | 0 | 0 | | 0 |
| Confl. Peds. (#/hr) 48 285 285 48 205 116 116 Confl. Bikes (#/hr) 37 15 9 9 Heavy Vehicles (%) 0% 9% 28% 100% 7% 5% 4% 6% 3% 0% 2% Bus Blockages (#/hr) 24 24 24 24 24 0 <td< td=""><td></td><td></td><td></td><td>0</td><td>0</td><td></td><td></td><td>131</td><td></td><td>0</td><td></td><td></td><td>0</td></td<> | | | | 0 | 0 | | | 131 | | 0 | | | 0 |
| Confi. Bikes (#/hr) | | | | 285 | | | | | | | | | 205 |
| Heavy Vehicles (%) | | | | | | | | | | | | | 11 |
| Bus Blockages (#hr) | | 0% | 9% | | 100% | 7% | | 4% | 6% | - | 0% | 2% | 0% |
| Turn Type | | | | | | | | | | | | | 0 |
| Protected Phases 2 6 6 4 8 8 Permitted Phases 2 6 6 4 4 8 Actuated Green, G (s) 44.0 44.0 24.0 24.0 24.0 24.0 25.0 Actuated Green, g (s) 45.0 45.0 25.0 25.0 25.0 25.0 Actuated g/C Ratio 0.56 0.56 0.31 0.31 0.31 0.31 0.31 Clearance Time (s) 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4 | | | | | | | | | | • | | | |
| Permitted Phases 2 6 4 8 Actuated Green, G (s) 44.0 44.0 26.0 25.0 25.0 26.0 26.0 26.0 26.0 26.0 26.0 26.0 26.0 <td></td> <td></td> <td></td> <td></td> <td>1 01111</td> <td></td> <td></td> <td>1 01111</td> <td></td> <td></td> <td>1 01111</td> <td></td> <td></td> | | | | | 1 01111 | | | 1 01111 | | | 1 01111 | | |
| Actuated Green, G (s) | | 2 | - | | 6 | | | 4 | • | | 8 | · | |
| Effective Green, g (s) 45.0 45.0 26.0 0.31 0.31 0.31 0.31 0.31 0.31 0.31 0.31 0.30 3.0 | | | 44 0 | | | 44 0 | | | 24 0 | | | 24 0 | |
| Actuated g/C Ratio 0.56 0.56 0.31 0.30 3.0 <td></td> | | | | | | | | | | | | | |
| Clearance Time (s) | | | | | | | | | | | | | |
| Vehicle Extension (s) 3.0 5.0 4 4.0 5.0 4.0 4.0 1.0 | | | | | | | | | | | | | |
| Lane Grp Cap (vph) 898 735 205 464 76 500 v/s Ratio Prot 0.53 c0.34 0.16 v/s Ratio Perm c0.59 0.20 0.13 v/c Ratio 0.95 1.05 0.64 1.10 0.41 0.50 Uniform Delay, d1 16.4 17.5 23.6 27.5 21.7 22.4 Progression Factor 1.00 0.68 1.00 1.00 1.28 1.30 Incremental Delay, d2 19.7 45.4 14.3 70.9 13.9 3.2 Delay (s) 36.1 57.3 37.9 98.4 41.7 32.4 Level of Service D E D F D C Approach Delay (s) 36.1 57.3 37.9 98.4 41.7 32.4 Approach LOS D E D F D C Intersection Summary E F C C HCM 2000 Cohrrol Delay <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<> | | | | | | | | | | | | | |
| v/s Ratio Prot 0.53 c0.34 0.16 v/s Ratio Perm c0.59 0.20 0.13 v/c Ratio 0.95 1.05 0.64 1.10 0.41 0.50 Uniform Delay, d1 16.4 17.5 23.6 27.5 21.7 22.4 Progression Factor 1.00 0.68 1.00 1.00 1.28 1.30 Incremental Delay, d2 19.7 45.4 14.3 70.9 13.9 3.2 Delay (s) 36.1 57.3 37.9 98.4 41.7 32.4 Level of Service D E D F D C Approach Delay (s) 36.1 57.3 86.3 33.4 Approach LOS D E F C Intersection Summary F C C Intersection Summary HCM 2000 Level of Service D H HCM 2000 Volume to Capacity ation 1.06 Actuated Cycle Length (s) 80.0 Sum of lost time (s) 10.0 Int | | | | | | | | | | | | | |
| v/s Ratio Perm c0.59 0.20 0.13 v/c Ratio 0.95 1.05 0.64 1.10 0.41 0.50 Uniform Delay, d1 16.4 17.5 23.6 27.5 21.7 22.4 Progression Factor 1.00 0.68 1.00 1.00 1.28 1.30 Incremental Delay, d2 19.7 45.4 14.3 70.9 13.9 3.2 Delay (s) 36.1 57.3 37.9 98.4 41.7 32.4 Level of Service D E D F D C Approach Delay (s) 36.1 57.3 37.9 98.4 41.7 32.4 Approach LOS D E D F D C Intersection Summary HCM 2000 Control Delay 54.9 HCM 2000 Level of Service D HCM 2000 Volume to Capacity traito 1.06 Actuated Cycle Length (s) 80.0 Sum of lost time (s) 10.0 Intersection Capacity | | | | | | 700 | | 200 | | | 70 | | |
| v/c Ratio 0.95 1.05 0.64 1.10 0.41 0.50 Uniform Delay, d1 16.4 17.5 23.6 27.5 21.7 22.4 Progression Factor 1.00 0.68 1.00 1.00 1.28 1.30 Incremental Delay, d2 19.7 45.4 14.3 70.9 13.9 3.2 Delay (s) 36.1 57.3 37.9 98.4 41.7 32.4 Level of Service D E D F D C Approach LOS 36.1 57.3 86.3 33.4 33.4 Approach LOS E F C Intersection Summary HCM 2000 Control Delay 54.9 HCM 2000 Level of Service D D HCM 2000 Volume to Capacity atlo Actuated Cycle Length (s) 80.0 Sum of lost time (s) 10.0 Intersection Capacity Utilization 132.2% ICU Level of Service H H H | | | 0.55 | | | c0 50 | | 0.20 | 60.04 | | 0.13 | 0.10 | |
| Uniform Delay, d1 16.4 17.5 23.6 27.5 21.7 22.4 Progression Factor 1.00 0.68 1.00 1.00 1.28 1.30 Incremental Delay, d2 19.7 45.4 14.3 70.9 13.9 3.2 Delay (s) 36.1 57.3 37.9 98.4 41.7 32.4 Level of Service D E D F D C Approach Delay (s) 36.1 57.3 86.3 33.4 Approach LOS D E F C C Intersection Summary HCM 2000 Control Delay 54.9 HCM 2000 Level of Service D H H H H Level of Service H Level of Service < | | | 0.05 | | | | | | 1 10 | | | 0.50 | |
| Progression Factor 1.00 0.68 1.00 1.00 1.28 1.30 Incremental Delay, d2 19.7 45.4 14.3 70.9 13.9 3.2 Delay (s) 36.1 57.3 37.9 98.4 41.7 32.4 Level of Service D E D F D C Approach Delay (s) 36.1 57.3 86.3 33.4 Approach LOS D E F C Intersection Summary HCM 2000 Control Delay 54.9 HCM 2000 Level of Service D HCM 2000 Volume to Capacity ratio 1.06 Actuated Cycle Length (s) 80.0 Sum of lost time (s) 10.0 Intersection Capacity Utilization 132.2% ICU Level of Service H | | | | | | | | | | | | | |
| Incremental Delay, d2 | | | | | | | | | | | | | |
| Delay (s) 36.1 57.3 37.9 98.4 41.7 32.4 Level of Service D E D F D C Approach Delay (s) 36.1 57.3 86.3 33.4 Approach LOS D E F C Intersection Summary HCM 2000 Control Delay 54.9 HCM 2000 Level of Service D HCM 2000 Volume to Capacity ratio 1.06 Actuated Cycle Length (s) 80.0 Sum of lost time (s) 10.0 Intersection Capacity Utilization 132.2% ICU Level of Service H | | | | | | | | | | | | | |
| Level of Service D E D F D C Approach Delay (s) 36.1 57.3 86.3 33.4 Approach LOS D E F C Intersection Summary HCM 2000 Control Delay 54.9 HCM 2000 Level of Service D HCM 2000 Volume to Capacity ratio 1.06 Actuated Cycle Length (s) 80.0 Sum of lost time (s) 10.0 Intersection Capacity Utilization 132.2% ICU Level of Service H | | | | | | | | | | | | | |
| Approach Delay (s) 36.1 57.3 86.3 33.4 Approach LOS D E F C Intersection Summary HCM 2000 Control Delay 54.9 HCM 2000 Level of Service D HCM 2000 Volume to Capacity ratio 1.06 D Actuated Cycle Length (s) 80.0 Sum of lost time (s) 10.0 Intersection Capacity Utilization 132.2% ICU Level of Service H | | | | | | | | | | | | | |
| Approach LOS D E F C Intersection Summary Intersection Summary 54.9 HCM 2000 Level of Service D HCM 2000 Volume to Capacity ratio 1.06 Sum of lost time (s) 10.0 Actuated Cycle Length (s) 80.0 Sum of lost time (s) 10.0 Intersection Capacity Utilization 132.2% ICU Level of Service H | | | | | | | | U | | | U | | |
| HCM 2000 Control Delay 54.9 HCM 2000 Level of Service D HCM 2000 Volume to Capacity ratio 1.06 Actuated Cycle Length (s) 80.0 Sum of lost time (s) 10.0 Intersection Capacity Utilization 132.2% ICU Level of Service H | | | | | | | | | | | | | |
| HCM 2000 Control Delay 54.9 HCM 2000 Level of Service D HCM 2000 Volume to Capacity ratio 1.06 Actuated Cycle Length (s) 80.0 Sum of lost time (s) 10.0 Intersection Capacity Utilization 132.2% ICU Level of Service H | •• | | | | | | | | | | | | |
| HCM 2000 Volume to Capacity ratio 1.06 Actuated Cycle Length (s) 80.0 Sum of lost time (s) 10.0 Intersection Capacity Utilization 132.2% ICU Level of Service H | | | | 54.9 | Н | CM 2000 | Level of S | Service | | D | | | |
| Actuated Cycle Length (s) 80.0 Sum of lost time (s) 10.0 Intersection Capacity Utilization 132.2% ICU Level of Service H | | ity ratio | | | - 11 | 2.71 2000 | 23101010 | 2017100 | | | | | |
| Intersection Capacity Utilization 132.2% ICU Level of Service H | | ity rullo | | | Q | ım of lost | time (s) | | | 10.0 | | | |
| | | ion | | | | | | | | | | | |
| Analysis Period (min) 15 | Analysis Period (min) | 011 | | 152.276 | ic | C LOVEI (| JI JUI VILLE | | | - " | | | |
| c Critical Lane Group | | | | 10 | | | | | | | | | |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

^{# 95}th 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.

09/30/2021

| | | ᄼ | - | • | • | ← | • | 4 | † | ~ | / | ţ | 1 |
|--|----------------------|-------|-------|------------|-------|----------|------------|-------|----------|----------|----------|-------|----------|
| Traffic Volume (γph) 56 737 86 42 456 106 34 258 44 112 592 42 42 426 106 34 258 44 112 592 42 42 426 106 34 258 44 112 592 42 42 42 426 106 34 258 44 112 592 42 42 42 42 42 42 42 | Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Traffic Volume (γph) 56 737 86 42 456 106 34 258 44 112 592 42 42 426 106 34 258 44 112 592 42 42 426 106 34 258 44 112 592 42 42 42 426 106 34 258 44 112 592 42 42 42 42 42 42 42 | Lane Configurations | | 4134 | | | 4134 | | | 413 | | | 4134 | |
| | Traffic Volume (vph) | 56 | | 86 | 42 | | 106 | 34 | | 44 | 112 | | 42 |
| Lane Util. Factor | Future Volume (vph) | 56 | 737 | 86 | 42 | 456 | 106 | 34 | 258 | 44 | 112 | 592 | 42 |
| Ped Bike Factor | Ideal Flow (vphpl) | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1900 | 1900 | 1900 |
| Firth | Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Filt Producted | Ped Bike Factor | | 0.97 | | | 0.97 | | | 0.98 | | | 0.97 | |
| Satd. Flow (prot) | Frt | | 0.985 | | | 0.974 | | | 0.980 | | | 0.992 | |
| Fit Permitted | Flt Protected | | 0.997 | | | 0.997 | | | 0.995 | | | 0.993 | |
| Satd. Flow (perm) 0 | Satd. Flow (prot) | 0 | 1880 | 0 | 0 | 1813 | 0 | 0 | 1727 | 0 | 0 | 2781 | 0 |
| Right Turn on Red Satul. Flow (RTOR) | Flt Permitted | | 0.855 | | | 0.761 | | | 0.746 | | | 0.807 | |
| Satid. Flow (RTOR) | Satd. Flow (perm) | 0 | 1607 | 0 | 0 | 1380 | 0 | 0 | 1289 | 0 | 0 | 2233 | 0 |
| Link Speed (k/h) | Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Link Speed (k/h) | Satd. Flow (RTOR) | | 19 | | | 41 | | | 25 | | | 8 | |
| Travel Time (s) | | | 50 | | | 50 | | | 50 | | | 50 | |
| Travel Time (s) | -1(-) | | | | | 316.7 | | | | | | | |
| Confi. Peds. (#/hr) | | | 21.0 | | | 22.8 | | | 15.3 | | | | |
| Confi. Bikes (#/hr) | | 129 | | 203 | 203 | | 129 | 189 | | 121 | 121 | | 189 |
| Peak Hour Factor 0.86 0. | | | | 73 | | | 2 | | | 5 | | | 118 |
| Heavy Vehicles (%) | | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Bus Blockages (#/hr) | | | | | | | | | | | | | |
| Adj. Flow (viph) | | | | | | | | | | | | | |
| Shared Lane Traffic (%) Lane Group Flow (vph) 0 1022 0 0 702 0 0 391 0 0 867 0 0 0 0 0 0 0 0 0 | | | | | | | | | | | 130 | | |
| Lane Group Flow (vph) | | | | | | | | | | | | | |
| Enter Blocked Intersection | | 0 | 1022 | 0 | 0 | 702 | 0 | 0 | 391 | 0 | 0 | 867 | 0 |
| Median Width(m) | | No | No | No | No | No | No | No | No | No | No | No | No |
| Median Width(m) | Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Link Offset(m) 0.0 0.0 0.0 0.0 Crosswalk Width(m) 4.8 4.8 4.8 4.8 Two way Left Turn Lane Headway Factor 1.92 1.97 1.92 1.92 2.03 1.92 1.92 2.06 1.92 1.16 1.22 1.16 Turning Speed (k/h) 24 14 < | | | | J . | | 0.0 | J . | | 0.0 | J | | 0.0 | J |
| Crosswalk Width(m) 4.8 4.8 4.8 4.8 4.8 4.8 4.8 4.8 4.8 4.8 4.8 4.8 4.8 4.8 4.8 4.8 4.8 Two way Left Turn Lane 1.92 1.92 1.92 2.03 1.92 1.92 2.06 1.92 1.16 1.22 1.16 1.22 1.16 1.22 1.16 1.22 1.16 1.22 1.16 1.22 1.16 1.22 1.16 1.22 1.16 1.22 1.16 1.22 1.16 1.22 1.16 1.22 1.16 1.22 1.16 1.22 1.16 1.22 1.16 1.22 1.16 1.22 1.16 1.10 1.16 1.22 1.16 1.16 1.22 1.16 1.16 1.22 1.16 1.16 1.22 1.16 1.16 1.22 1.16 1.16 1.22 1.16 1.22 1.16 1.4 1.4 24 1.4 24 1.4 24 1.4 24 < | | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Two way Left Turn Lane Headway Factor 1.92 1.97 1.92 1.92 2.03 1.92 2.06 1.92 1.16 1.22 1.16 1.21 1.16 1.22 1.16 1.10 | | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Turning Speed (k/h) 24 14 24 14 24 14 24 14 24 14 24 14 24 14 24 14 24 14 24 14 74 14 <td></td> | | | | | | | | | | | | | |
| Turning Speed (k/h) 24 14 24 14 24 14 24 14 24 14 24 14 24 14 24 14 24 14 24 14 7 14 | | 1.92 | 1.97 | 1.92 | 1.92 | 2.03 | 1.92 | 1.92 | 2.06 | 1.92 | 1.16 | 1.22 | 1.16 |
| Protected Phases 2 | | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Protected Phases 2 | Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Permitted Phases 2 | | | | | | 6 | | | 8 | | | 4 | |
| Total Split (s) 41.0 41.0 41.0 41.0 10.0 39.0 29.0 29.0 Total Split (%) 51.3% 51.3% 51.3% 12.5% 48.8% 36.3% 36.3% Maximum Green (s) 35.0 35.0 35.0 35.0 35.0 23.0 23.0 Yellow Time (s) 4.0 4.0 4.0 3.0 4.0 4.0 4.0 All-Red Time (s) 2.0 2.0 2.0 2.0 1.0 2.0 2.0 2.0 Lost Time Adjust (s) -2.0 -1.0 -1.0 -1.0 -1.0 -1.0 Total Lost Time (s) 4.0 5.0 5.0 5.0 5.0 Lead/Lag Lead Lag Lag Lag Lead-Lag Optimize? Yes Yes Yes Walk Time (s) 7.0 7.0 7.0 7.0 7.0 Flash Dort Walk (s) 11.0 11.0 11.0 14.0 14.0 14.0 Pedestrian Ca | | 2 | | | 6 | | | 8 | | | 4 | | |
| Total Split (s) 41.0 41.0 41.0 41.0 10.0 39.0 29.0 29.0 Total Split (%) 51.3% 51.3% 51.3% 12.5% 48.8% 36.3% 36.3% Maximum Green (s) 35.0 35.0 35.0 35.0 35.0 35.0 23.0 23.0 Yellow Time (s) 4.0 4.0 4.0 3.0 4.0 4.0 4.0 All-Red Time (s) 2.0 2.0 2.0 2.0 1.0 2.0 2.0 2.0 Lost Time Adjust (s) -2.0 -2.0 -1.0 | Minimum Split (s) | 27.0 | 27.0 | | 27.0 | 27.0 | | 10.0 | 27.0 | | 27.0 | 27.0 | |
| Total Split (%) 51.3% 51.3% 51.3% 51.3% 51.3% 48.8% 36.3% 36.3% Maximum Green (s) 35.0 35.0 35.0 35.0 6.0 33.0 23.0 23.0 Yellow Time (s) 4.0 4.0 4.0 3.0 4.0 4.0 4.0 All-Red Time (s) 2.0 2. | | | | | 41.0 | 41.0 | | | 39.0 | | 29.0 | 29.0 | |
| Maximum Green (s) 35.0 35.0 35.0 35.0 35.0 36.0 33.0 23.0 23.0 Yellow Time (s) 4.0 4.0 4.0 3.0 4.0 4.0 4.0 All-Red Time (s) 2.0 2.0 2.0 1.0 2.0 2.0 2.0 Lost Time Adjust (s) -2.0 -1.0 -1.0 -1.0 -1.0 -1.0 Total Lost Time (s) 4.0 5.0 5.0 5.0 5.0 5.0 Lead/Lag Lead Lag Optimize? Yes Yes Yes Yes Walk Time (s) 7.0 <td></td> <td>51.3%</td> <td>51.3%</td> <td></td> <td>51.3%</td> <td>51.3%</td> <td></td> <td></td> <td>48.8%</td> <td></td> <td>36.3%</td> <td>36.3%</td> <td></td> | | 51.3% | 51.3% | | 51.3% | 51.3% | | | 48.8% | | 36.3% | 36.3% | |
| Yellow Time (s) 4.0 4.0 4.0 4.0 3.0 4.0 4.0 4.0 All-Red Time (s) 2.0 2.0 2.0 1.0 2.0 2.0 2.0 Lost Time (s) 2.0 -1.0 -1.0 -1.0 -1.0 -1.0 Total Lost Time (s) 4.0 5.0 5.0 5.0 5.0 Lead/Lag Lead Lag 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 14.0 14.0 14.0 Pedestrian Calls (#/hr) 100 100 100 100 100 100 100 | | | 35.0 | | 35.0 | | | | 33.0 | | 23.0 | 23.0 | |
| All-Red Time (s) 2.0 2.0 2.0 2.0 1.0 2.0 2.0 2.0 2.0 Lost Time Adjust (s) -2.0 -1.0 -1.0 -1.0 -1.0 Total Lost Time (s) 4.0 5.0 5.0 5.0 5.0 Lead/Lag Lag Lag Lag-Lag-Lag-Dtimize? Yes Yes Yes Walk Time (s) 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 Flash Dont Walk (s) 11.0 11.0 11.0 11.0 14.0 14.0 Pedestrian Calls (#/hr) 100 100 100 100 100 100 100 | | | | | | | | | | | | | |
| Lost Time Adjust (s) -2.0 -1.0 -1.0 -1.0 Total Lost Time (s) 4.0 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 7.0 Flash Dont Walk (s) 11.0 11.0 11.0 14.0 14.0 14.0 Pedestrian Calls (#/hr) 100 100 100 100 100 100 | () | | | | | | | | | | | | |
| Total Lost Time (s) 4.0 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 14.0 14.0 14.0 Pedestrian Calls (#/hr) 100 100 100 100 100 100 100 | | | | | 2.0 | | | 1.0 | | | 2.0 | | |
| Lead/Lag Lead Lag Lag Lead-Lag Optimize? Yes Yes Yes Walk Time (s) 7.0 7 | | | | | | | | | | | | | |
| Lead-Lag Optimize? Yes Yes Yes Yes Walk Time (s) 7.0 7.0 7.0 7.0 7.0 7.0 Flash Dont Walk (s) 11.0 11.0 11.0 11.0 14.0 14.0 14.0 Pedestrian Calls (#/hr) 100 100 100 100 100 100 100 | | | | | | | | Lead | | | Lag | | |
| Walk Time (s) 7.0 7.0 7.0 7.0 7.0 7.0 7.0 Flash Dont Walk (s) 11.0 11.0 11.0 14.0 14.0 14.0 14.0 14.0 14.0 10.0 <td></td> | | | | | | | | | | | | | |
| Flash Dont Walk (s) 11.0 11.0 11.0 11.0 14.0 14.0 14.0 Pedestrian Calls (#/hr) 100 100 100 100 100 100 100 | 0 1 | 7.0 | 7.0 | | 7.0 | 7.0 | | | 7.0 | | | | |
| Pedestrian Calls (#/hr) 100 100 100 100 100 100 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | Act Effct Green (s) | | 37.0 | | | 36.0 | | | 34.0 | | | 24.0 | |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 13

Lanes, Volumes, Timings 539: Dufferin St & King St

| 539: Dufferin St 8 | | | | | | | | | | | 09/3 | 30/2021 |
|-----------------------------|------------------|----------|---------|-----------|------------|-----------|------|------|-------------|----------|----------|---------|
| | • | → | • | √ | ← | 4 | • | † | <i>></i> | / | + | 4 |
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Actuated g/C Ratio | | 0.46 | | | 0.45 | | | 0.42 | | | 0.30 | |
| v/c Ratio | | 1.36 | | | 1.09 | | | 0.66 | | | 1.28 | |
| Control Delay | | 190.3 | | | 76.9 | | | 16.9 | | | 166.4 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 190.3 | | | 76.9 | | | 16.9 | | | 166.4 | |
| LOS | | F | | | Е | | | В | | | F | |
| Approach Delay | | 190.3 | | | 76.9 | | | 16.9 | | | 166.4 | |
| Approach LOS | | F | | | Е | | | В | | | F | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | CBD | | | | | | | | | | | |
| Cycle Length: 80 | | | | | | | | | | | | |
| Actuated Cycle Length: 8 | | | | | | | | | | | | |
| Offset: 15 (19%), Referen | nced to phase 2 | ::EBTL a | nd 6:WB | TL, Start | of 1st Gre | en | | | | | | |
| Natural Cycle: 140 | | | | | | | | | | | | |
| Control Type: Pretimed | | | | | | | | | | | | |
| Maximum v/c Ratio: 1.36 | | | | | | | | | | | | |
| Intersection Signal Delay: | : 133.9 | | | In | tersection | LOS: F | | | | | | |
| Intersection Capacity Utili | zation 129.8% | | | IC | U Level o | f Service | Н | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Splits and Phases: 539 | : Dufferin St & | Vina Ct | | | | | | | | | | |
| A Spills and Friases. 333 | . Dullellii St & | King St | | | 14 | | - L | | | | | |
| →ø2 (R) | | | | | | Ø3 | - ₩ | Ø4 | | | | |
| 41 s | | | | | 10 s | | 29 s | | | | | |
| ▼ Ø6 (R) | | | | | - -< | Ø8 | | | | | | |
| * 20 (K) | | | | | | 100 | | | | | | |

539: Dufferin St & King St

09/30/2021

| | - | • | Ť | ¥ |
|------------------------|--------|-------|-------|--------|
| Lane Group | EBT | WBT | NBT | SBT |
| Lane Group Flow (vph) | 1022 | 702 | 391 | 867 |
| v/c Ratio | 1.36 | 1.09 | 0.66 | 1.28 |
| Control Delay | 190.3 | 76.9 | 16.9 | 166.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 190.3 | 76.9 | 16.9 | 166.4 |
| Queue Length 50th (m) | ~109.3 | ~62.8 | 16.1 | ~89.7 |
| Queue Length 95th (m) | #137.4 | #87.6 | m18.5 | #117.2 |
| Internal Link Dist (m) | 267.1 | 292.7 | 188.5 | 361.1 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 753 | 643 | 589 | 675 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.36 | 1.09 | 0.66 | 1.28 |

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

HCM Signalized Intersection Capacity Analysis 539: Dufferin St & King St

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|-------------------------------|------------|----------|--------|------|-----------|------------|---------|----------|------|----------|---------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Lane Configurations | | 414 | | | 414 | | | 413 | | | 413 | |
| Traffic Volume (vph) | 56 | 737 | 86 | 42 | 456 | 106 | 34 | 258 | 44 | 112 | 592 | 42 |
| Future Volume (vph) | 56 | 737 | 86 | 42 | 456 | 106 | 34 | 258 | 44 | 112 | 592 | 42 |
| Ideal Flow (vphpl) | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 5.0 | | | 5.0 | | | 5.0 | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | | 0.97 | | | 0.97 | | | 0.98 | | | 0.98 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | | 1.00 | | | 0.99 | |
| Frt | | 0.99 | | | 0.97 | | | 0.98 | | | 0.99 | |
| Flt Protected | | 1.00 | | | 1.00 | | | 0.99 | | | 0.99 | |
| Satd. Flow (prot) | | 1874 | | | 1806 | | | 1722 | | | 2745 | |
| Flt Permitted | | 0.86 | | | 0.76 | | | 0.75 | | | 0.81 | |
| Satd. Flow (perm) | | 1607 | | | 1380 | | | 1292 | | | 2232 | |
| Peak-hour factor, PHF | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Adj. Flow (vph) | 65 | 857 | 100 | 49 | 530 | 123 | 40 | 300 | 51 | 130 | 688 | 49 |
| RTOR Reduction (vph) | 0 | 10 | 0 | 0 | 23 | 0 | 0 | 14 | 0 | 0 | 6 | (|
| Lane Group Flow (vph) | 0 | 1012 | 0 | 0 | 679 | 0 | 0 | 377 | 0 | 0 | 861 | (|
| Confl. Peds. (#/hr) | 129 | | 203 | 203 | | 129 | 189 | | 121 | 121 | | 189 |
| Confl. Bikes (#/hr) | | | 73 | | | 2 | | | 5 | | | 118 |
| Heavy Vehicles (%) | 5% | 4% | 10% | 2% | 4% | 7% | 8% | 12% | 0% | 3% | 9% | 7% |
| Bus Blockages (#/hr) | 12 | 12 | 12 | 24 | 24 | 24 | 12 | 30 | 30 | 0 | 18 | 18 |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | 3 | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 35.0 | | | 35.0 | | | 33.0 | | | 23.0 | |
| Effective Green, g (s) | | 37.0 | | | 36.0 | | | 34.0 | | | 24.0 | |
| Actuated g/C Ratio | | 0.46 | | | 0.45 | | | 0.42 | | | 0.30 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | |
| Lane Grp Cap (vph) | | 743 | | | 621 | | | 586 | | | 669 | |
| v/s Ratio Prot | | | | | | | | c0.06 | | | | |
| v/s Ratio Perm | | c0.63 | | | 0.49 | | | 0.22 | | | c0.39 | |
| v/c Ratio | | 1.36 | | | 1.09 | | | 0.64 | | | 1.29 | |
| Uniform Delay, d1 | | 21.5 | | | 22.0 | | | 18.2 | | | 28.0 | |
| Progression Factor | | 0.83 | | | 0.68 | | | 0.85 | | | 1.00 | |
| Incremental Delay, d2 | | 171.3 | | | 59.9 | | | 2.0 | | | 140.5 | |
| Delay (s) | | 189.1 | | | 74.8 | | | 17.5 | | | 168.5 | |
| Level of Service | | F | | | Е | | | В | | | F | |
| Approach Delay (s) | | 189.1 | | | 74.8 | | | 17.5 | | | 168.5 | |
| Approach LOS | | F | | | Е | | | В | | | F | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 133.7 | Н | CM 2000 | Level of | Service | | F | | | |
| HCM 2000 Volume to Capac | city ratio | | 1.28 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 80.0 | | um of los | | | | 13.0 | | | |
| Intersection Capacity Utiliza | tion | | 129.8% | IC | CU Level | of Service |) | | Н | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

| Intersection Summary | | | | |
|-----------------------------------|--------|---------------------------|------|--|
| HCM 2000 Control Delay | 133.7 | HCM 2000 Level of Service | F | |
| HCM 2000 Volume to Capacity ratio | 1.28 | | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 13.0 | |
| Intersection Capacity Utilization | 129.8% | ICU Level of Service | Н | |
| Analysis Period (min) | 15 | | | |
| c Critical Lane Group | | | | |

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|----------------------------|-------|----------|-------|-------|----------|----------|-------|----------|-------|----------|----------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | * | 1 | | | ની | 7 | ሻ | fa fa | | ሻ | 1 | |
| Traffic Volume (vph) | 91 | 86 | 50 | 119 | 56 | 89 | 83 | 327 | 182 | 50 | 301 | 80 |
| Future Volume (vph) | 91 | 86 | 50 | 119 | 56 | 89 | 83 | 327 | 182 | 50 | 301 | 80 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| Storage Length (m) | 25.0 | | 0.0 | 0.0 | | 50.0 | 30.0 | | 0.0 | 25.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 0 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| 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 |
| Ped Bike Factor | 0.87 | 0.97 | | | 0.97 | 0.79 | 0.98 | 0.97 | | | 0.98 | |
| Frt | | 0.945 | | | | 0.850 | | 0.946 | | | 0.968 | |
| Flt Protected | 0.950 | | | | 0.967 | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1589 | 1655 | 0 | 0 | 1682 | 1436 | 1652 | 1678 | 0 | 1620 | 1708 | 0 |
| Flt Permitted | 0.546 | | | | 0.659 | | 0.383 | | | 0.255 | | |
| Satd. Flow (perm) | 794 | 1655 | 0 | 0 | 1108 | 1135 | 655 | 1678 | 0 | 435 | 1708 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 19 | | | | 152 | | 23 | | | 11 | |
| Link Speed (k/h) | | 30 | | | 50 | | | 40 | | | 40 | |
| Link Distance (m) | | 143.4 | | | 229.0 | | | 205.6 | | | 241.4 | |
| Travel Time (s) | | 17.2 | | | 16.5 | | | 18.5 | | | 21.7 | |
| Confl. Peds. (#/hr) | 86 | | 29 | 29 | | 86 | 19 | | 21 | 21 | | 19 |
| Confl. Bikes (#/hr) | | | 1 | | | | | | | | | 32 |
| 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 (%) | 6% | 5% | 2% | 0% | 25% | 5% | 2% | 5% | 0% | 4% | 5% | 2% |
| Adj. Flow (vph) | 101 | 96 | 56 | 132 | 62 | 99 | 92 | 363 | 202 | 56 | 334 | 89 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 101 | 152 | 0 | 0 | 194 | 99 | 92 | 565 | 0 | 56 | 423 | 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) | | 3.0 | J . | | 3.0 | <u> </u> | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.09 | 1.01 | 1.01 | 1.01 | 1.01 | 1.09 | 1.09 | 1.01 | 1.01 | 1.09 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | 2.0 | 2.0 | 30.5 | | 2.0 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | 2.0 | 2.0 | 1.8 | | 2.0 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | CI+Ex | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | · · | | | | | · · | · · | | | · · | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | 0.0 | 28.7 | | 0.0 | 28.7 | 0.0 | 0.0 | 28.7 | | 0.0 | 28.7 | |
| Detector 2 Fosition(III) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Type | | OITLX | | | OITLX | | | OITLX | | | OITLX | |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 17 Lane Group Ø10 Ø12 Ø14 Ø:
Lane Configurations
Traffic Volume (vph)

571: Strachan Ave & Canada Blvd/Fleet St

Ideal Flow (vphpl) Lane Width (m) Storage Length (m)

Future Volume (vph)

Lanes, Volumes, Timings

Storage Lanes
Taper Length (m)

Lane Util. Factor Ped Bike Factor

Frt

Flt Protected

Satd. Flow (prot) Flt Permitted

Satd. Flow (perm)

Right Turn on Red Satd. Flow (RTOR)

Link Speed (k/h) Link Distance (m)

Travel Time (s)

Confl. Peds. (#/hr) Confl. Bikes (#/hr)

Peak Hour Factor Heavy Vehicles (%)

Adj. Flow (vph) Shared Lane Traffic (%)

Lane Group Flow (vph)
Enter Blocked Intersection

Enter Blocked Interse Lane Alignment

Median Width(m) Link Offset(m)

Crosswalk Width(m)
Two way Left Turn Lane

Headway Factor

Turning Speed (k/h)
Number of Detectors

Detector Template

Leading Detector (m)
Trailing Detector (m)

Detector 1 Position(m)
Detector 1 Size(m)

Detector 1 Type

Detector 1 Channel

Detector 1 Extend (s) Detector 1 Queue (s)

Detector 1 Queue (s)
Detector 1 Delay (s)

Detector 2 Position(m)
Detector 2 Size(m)

Detector 2 Type

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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HDR Corporation

Synchro 11 Report

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|-------------------------------|--------------|-----------|---------------|--------------|------------|------------|-----------|-----------|-----|-----------|-----------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 32.0 | 32.0 | | 32.0 | 32.0 | 32.0 | 29.0 | 29.0 | | 29.0 | 29.0 | |
| Minimum Split (s) | 39.0 | 39.0 | | 39.0 | 39.0 | 39.0 | 36.0 | 36.0 | | 36.0 | 36.0 | |
| Total Split (s) | 39.0 | 39.0 | | 39.0 | 39.0 | 39.0 | 61.0 | 61.0 | | 61.0 | 61.0 | |
| Total Split (%) | 27.1% | 27.1% | | 27.1% | 27.1% | 27.1% | 42.4% | 42.4% | | 42.4% | 42.4% | |
| Maximum Green (s) | 32.0 | 32.0 | | 32.0 | 32.0 | 32.0 | 54.0 | 54.0 | | 54.0 | 54.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | | 0.0 | -1.0 | -1.0 | -1.0 | -1.0 | | -1.0 | -1.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lead/Lag | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | Max | Max | | Max | Max | Max | Max | Max | | Max | Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 25.0 | 25.0 | | 25.0 | 25.0 | 25.0 | 22.0 | 22.0 | | 22.0 | 22.0 | |
| Pedestrian Calls (#/hr) | 10 | 10 | | 28 | 28 | 28 | 7 | 7 | | 6 | 6 | |
| Act Effct Green (s) | 33.5 | 33.5 | | 20 | 33.5 | 33.5 | 55.9 | 55.9 | | 55.9 | 55.9 | |
| Actuated g/C Ratio | 0.30 | 0.30 | | | 0.30 | 0.30 | 0.50 | 0.50 | | 0.50 | 0.50 | |
| v/c Ratio | 0.30 | 0.30 | | | 0.59 | 0.30 | 0.30 | 0.50 | | 0.30 | 0.30 | |
| Control Delay | 42.5 | 31.2 | | | 45.2 | 2.2 | 23.5 | 27.9 | | 25.2 | 23.4 | |
| Queue Delay | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 0.4 | | 0.0 | 0.0 | |
| Total Delay | 42.5 | 31.2 | | | 45.2 | 2.2 | 23.5 | 28.3 | | 25.2 | 23.4 | |
| LOS | 42.5 D | 31.2 C | | | 45.2 D | Z.Z A | 23.5 C | 20.3 C | | 25.2 C | 23.4 C | |
| | U | 35.7 | | | 30.7 | А | U | 27.6 | | C | 23.6 | |
| Approach Delay | | | | | 30.7 C | | | | | | | |
| Approach LOS | | D | | | C | | | С | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 144 | | | | | | | | | | | | |
| Actuated Cycle Length: 112 | 2 | | | | | | | | | | | |
| Natural Cycle: 130 | | | | | | | | | | | | |
| Control Type: Semi Act-Un | coord | | | | | | | | | | | |
| Maximum v/c Ratio: 0.67 | | | | | | | | | | | | |
| Intersection Signal Delay: 2 | 28.2 | | | lr | ntersectio | n LOS: C | | | | | | |
| Intersection Capacity Utiliza | ation 126.59 | 6 | | IC | CU Level | of Service | e H | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Splits and Phases: 571: | Strachan Av | /e & Cana | da Blvd/F | leet St | | | | | | | | |
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Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements

| iviinimum initiai (s) | 7.0 | 7.0 | 7.0 | 7.0 |
|-------------------------|------|------|------|------|
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 |
| Total Split (s) | 22.0 | 22.0 | 22.0 | 22.0 |
| Total Split (%) | 15% | 15% | 15% | 15% |
| Maximum Green (s) | 14.0 | 14.0 | 14.0 | 14.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 4.0 | 4.0 | 4.0 | 4.0 |
| Lost Time Adjust (s) | | | | |
| Total Lost Time (s) | | | | |
| Lead/Lag | | | | |
| Lead-Lag Optimize? | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None |
| Walk Time (s) | 0.0 | 0.0 | 0.0 | 0.0 |
| Flash Dont Walk (s) | 0.0 | 0.0 | 0.0 | 0.0 |
| Pedestrian Calls (#/hr) | 19 | 19 | 19 | 19 |
| Act Effct Green (s) | | | | |
| Actuated g/C Ratio | | | | |
| v/c Ratio | | | | |
| Control Delay | | | | |
| Queue Delay | | | | |
| Total Delay | | | | |
| LOS | | | | |
| Approach Delay | | | | |
| Approach LOS | | | | |
| Intersection Summary | | | | |
| intersection Summary | | | | |
| | | | | |
| | | | | |

Lanes, Volumes, Timings

Lane Group
Detector 2 Channel
Detector 2 Extend (s)
Turn Type
Protected Phases

Permitted Phases Detector Phase Switch Phase Minimum Initial (s)

571: Strachan Ave & Canada Blvd/Fleet St

Ø10 Ø12 Ø14 Ø16

10 12 14 16

7.0 7.0

7.0 7.0

| | • | - | • | • | 4 | † | - | ļ | |
|------------------------|------|-------|-------|------|------|----------|------|-------|--|
| Lane Group | EBL | EBT | WBT | WBR | NBL | NBT | SBL | SBT | |
| Lane Group Flow (vph) | 101 | 152 | 194 | 99 | 92 | 565 | 56 | 423 | |
| v/c Ratio | 0.42 | 0.30 | 0.59 | 0.22 | 0.28 | 0.67 | 0.26 | 0.49 | |
| Control Delay | 42.5 | 31.2 | 45.2 | 2.2 | 23.5 | 27.9 | 25.2 | 23.4 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | |
| Total Delay | 42.5 | 31.2 | 45.2 | 2.2 | 23.5 | 28.3 | 25.2 | 23.4 | |
| Queue Length 50th (m) | 14.9 | 18.6 | 30.3 | 0.0 | 8.8 | 66.9 | 5.3 | 44.9 | |
| Queue Length 95th (m) | 41.3 | 47.6 | #74.4 | 2.9 | 30.3 | 166.2 | 21.2 | 112.9 | |
| Internal Link Dist (m) | | 119.4 | 205.0 | | | 181.6 | | 217.4 | |
| Turn Bay Length (m) | 25.0 | | | 50.0 | 30.0 | | 25.0 | | |
| Base Capacity (vph) | 238 | 508 | 331 | 446 | 327 | 849 | 217 | 858 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.42 | 0.30 | 0.59 | 0.22 | 0.28 | 0.71 | 0.26 | 0.49 | |
| | | | | | | | | | |

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

Queue shown is maximum after two cycles.

| or i. Strachan Ave t | x Odila | aa Div | u/i icc | · Ot | | | | | | | | |
|---------------------------------|-----------|----------|---------------|----------------|------------|-------------|----------|----------|-----------|-------------|------|------|
| | • | → | \rightarrow | • | ← | • | 4 | † | 1 | > | ļ | 4 |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | 7 | ĵ» | | | ર્ન | 7 | | ĵ» | | 7 | ĵ» | |
| Traffic Volume (vph) | 91 | 86 | 50 | 119 | 56 | 89 | 83 | 327 | 182 | 50 | 301 | 80 |
| Future Volume (vph) | 91 | 86 | 50 | 119 | 56 | 89 | 83 | 327 | 182 | 50 | 301 | 80 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frpb, ped/bikes | 1.00 | 0.97 | | | 1.00 | 0.82 | 1.00 | 0.98 | | 1.00 | 0.98 | |
| Flpb, ped/bikes | 0.88 | 1.00 | | | 0.97 | 1.00 | 0.98 | 1.00 | | 0.99 | 1.00 | |
| Frt | 1.00 | 0.94 | | | 1.00 | 0.85 | 1.00 | 0.95 | | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | | 0.97 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1405 | 1661 | | | 1633 | 1176 | 1624 | 1684 | | 1601 | 1713 | |
| Flt Permitted | 0.55 | 1.00 | | | 0.66 | 1.00 | 0.38 | 1.00 | | 0.26 | 1.00 | |
| Satd. Flow (perm) | 808 | 1661 | | | 1113 | 1176 | 655 | 1684 | | 430 | 1713 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 101 | 96 | 56 | 132 | 62 | 99 | 92 | 363 | 202 | 56 | 334 | 89 |
| RTOR Reduction (vph) | 0 | 14 | 0 | 0 | 0 | 72 | 0 | 12 | 0 | 0 | 6 | 0 |
| Lane Group Flow (vph) | 101 | 138 | 0 | 0 | 194 | 27 | 92 | 553 | 0 | 56 | 417 | 0 |
| Confl. Peds. (#/hr) | 86 | | 29 | 29 | | 86 | 19 | | 21 | 21 | | 19 |
| Confl. Bikes (#/hr) | | | 1 | | | | | | | | | 32 |
| Heavy Vehicles (%) | 6% | 5% | 2% | 0% | 25% | 5% | 2% | 5% | 0% | 4% | 5% | 2% |
| Turn Type | Perm | NA | | Perm | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 32.5 | 32.5 | | | 32.5 | 32.5 | 54.9 | 54.9 | | 54.9 | 54.9 | |
| Effective Green, g (s) | 33.5 | 33.5 | | | 33.5 | 33.5 | 55.9 | 55.9 | | 55.9 | 55.9 | |
| Actuated g/C Ratio | 0.27 | 0.27 | | | 0.27 | 0.27 | 0.46 | 0.46 | | 0.46 | 0.46 | |
| Clearance Time (s) | 7.0 | 7.0 | | | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 221 | 455 | | | 305 | 322 | 299 | 770 | | 196 | 783 | |
| v/s Ratio Prot | | 0.08 | | | | | | c0.33 | | | 0.24 | |
| v/s Ratio Perm | 0.13 | | | | c0.17 | 0.02 | 0.14 | | | 0.13 | | |
| v/c Ratio | 0.46 | 0.30 | | | 0.64 | 0.08 | 0.31 | 0.72 | | 0.29 | 0.53 | |
| Uniform Delay, d1 | 36.8 | 35.1 | | | 39.0 | 33.0 | 20.9 | 26.8 | | 20.7 | 23.8 | |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 6.7 | 1.7 | | | 9.7 | 0.5 | 2.7 | 5.7 | | 3.6 | 2.6 | |
| Delay (s) | 43.5 | 36.8 | | | 48.7 | 33.5 | 23.6 | 32.5 | | 24.3 | 26.4 | |
| Level of Service | D | D | | | D | С | С | С | | С | С | |
| Approach Delay (s) | | 39.5 | | | 43.6 | | | 31.2 | | | 26.1 | |
| Approach LOS | | D | | | D | | | С | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 33.2 | Н | CM 2000 | Level of S | Service | | С | | | |
| HCM 2000 Volume to Capaci | ity ratio | | 0.65 | - 11 | OW 2000 | LCVCIOI | JCI VICC | | U | | | |
| Actuated Cycle Length (s) | ity ratio | | 122.2 | Q ₁ | um of lost | time (s) | | | 28.0 | | | |
| Intersection Capacity Utilizati | on | | 126.5% | | | of Service | | | 20.0 H | | | |
| Analysis Period (min) | U11 | | 15 | ic | C LOVEI (| J. 361 VICE | | | - 11 | | | |
| c Critical Lane Group | | | | | | | | | | | | |

c Critical Lane Group

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|----------------------------|-------|----------|---------------|------|----------|-------|------|-----------------|-------|------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ሻ | 1 | | | | 77 | | ተተ _ጮ | | | | |
| Traffic Volume (vph) | 54 | 486 | 0 | 0 | 0 | 418 | 0 | 1402 | 14 | 0 | 0 | 0 |
| Future Volume (vph) | 54 | 486 | 0 | 0 | 0 | 418 | 0 | 1402 | 14 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 15.0 | | 0.0 | 0.0 | | 80.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 0 | | 1 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.88 | 1.00 | 0.91 | 0.91 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | 0.99 | | | | | | |
| Frt | | | | | | 0.850 | | 0.998 | | | | |
| Flt Protected | 0.950 | | | | | | | | | | | |
| Satd. Flow (prot) | 1620 | 1807 | 0 | 0 | 0 | 2652 | 0 | 4968 | 0 | 0 | 0 | 0 |
| Flt Permitted | 0.950 | | | | | | | | | | | |
| Satd. Flow (perm) | 1620 | 1807 | 0 | 0 | 0 | 2617 | 0 | 4968 | 0 | 0 | 0 | 0 |
| Right Turn on Red | Yes | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | 99 | | | | | 740 | | 1 | | | | |
| Link Speed (k/h) | | 60 | | | 30 | | | 60 | | | 60 | |
| Link Distance (m) | | 411.9 | | | 164.9 | | | 800.6 | | | 492.6 | |
| Travel Time (s) | | 24.7 | | | 19.8 | | | 48.0 | | | 29.6 | |
| Confl. Peds. (#/hr) | | | | | | | 17 | | | | | 17 |
| Confl. Bikes (#/hr) | | | | | | 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 (%) | 4% | 4% | 4% | 0% | 0% | 6% | 0% | 3% | 7% | 0% | 0% | 0% |
| Adj. Flow (vph) | 60 | 540 | 0 | 0 | 0 | 464 | 0 | 1558 | 16 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 60 | 540 | 0 | 0 | 0 | 464 | 0 | 1574 | 0 | 0 | 0 | 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) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.09 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | | | 1 | | 2 | | | | |
| Detector Template | Left | Thru | | | | Right | | Thru | | | | |
| Leading Detector (m) | 6.1 | 30.5 | | | | 6.1 | | 30.5 | | | | |
| Trailing Detector (m) | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Detector 1 Position(m) | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Detector 1 Size(m) | 6.1 | 1.8 | | | | 6.1 | | 1.8 | | | | |
| Detector 1 Type | CI+Ex | CI+Ex | | | | CI+Ex | | CI+Ex | | | | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Detector 2 Position(m) | | 28.7 | | | | | | 28.7 | | | | |
| Detector 2 Size(m) | | 1.8 | | | | | | 1.8 | | | | |
| Detector 2 Type | | Cl+Ex | | | | | | CI+Ex | | | | |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 23 Lanes, Volumes, Timings

1344: Lakeshore Blvd & British Colombia Rd

09/30/2021

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|-----------------------------|--------------|-----------|---------------|---------|------------|------------|----------|----------|-------------|-------------|-----|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | | | | 0.0 | | | | |
| Turn Type | Perm | NA | | | | Perm | | NA | | | | |
| Protected Phases | | 4 | | | | | | 2 | | | | |
| Permitted Phases | 4 | | | | | 9 | | | | | | |
| Detector Phase | 4 | 4 | | | | 9 | | 2 | | | | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | | | | 7.0 | | 22.0 | | | | |
| Minimum Split (s) | 13.0 | 13.0 | | | | 30.0 | | 29.0 | | | | |
| Total Split (s) | 39.0 | 39.0 | | | | 30.0 | | 41.0 | | | | |
| Total Split (%) | 35.5% | 35.5% | | | | 27.3% | | 37.3% | | | | |
| Maximum Green (s) | 33.0 | 33.0 | | | | 24.0 | | 34.0 | | | | |
| Yellow Time (s) | 4.0 | 4.0 | | | | 4.0 | | 4.0 | | | | |
| All-Red Time (s) | 2.0 | 2.0 | | | | 2.0 | | 3.0 | | | | |
| Lost Time Adjust (s) | -1.0 | -1.0 | | | | -1.0 | | -1.0 | | | | |
| Total Lost Time (s) | 5.0 | 5.0 | | | | 5.0 | | 6.0 | | | | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | 3.0 | | 3.0 | | | | |
| Recall Mode | None | None | | | | None | | None | | | | |
| Walk Time (s) | 0.0 | 0.0 | | | | | | 7.0 | | | | |
| Flash Dont Walk (s) | 0.0 | 0.0 | | | | | | 15.0 | | | | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | | | | 0 | | | | |
| Act Effct Green (s) | 33.2 | 33.2 | | | | 8.0 | | 35.0 | | | | |
| Actuated g/C Ratio | 0.36 | 0.36 | | | | 0.09 | | 0.38 | | | | |
| v/c Ratio | 0.09 | 0.83 | | | | 0.51 | | 0.83 | | | | |
| Control Delay | 1.7 | 39.8 | | | | 2.1 | | 31.0 | | | | |
| Queue Delay | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Total Delay | 1.7 | 39.8 | | | | 2.1 | | 31.0 | | | | |
| LOS | Α | D | | | | Α | | С | | | | |
| Approach Delay | | 36.0 | | | 2.1 | | | 31.0 | | | | |
| Approach LOS | | D | | | Α | | | С | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 110 | | | | | | | | | | | | |
| Actuated Cycle Length: 92 | 2.2 | | | | | | | | | | | |
| Natural Cycle: 100 | | | | | | | | | | | | |
| Control Type: Semi Act-U | ncoord | | | | | | | | | | | |
| Maximum v/c Ratio: 0.83 | | | | | | | | | | | | |
| Intersection Signal Delay: | 27.0 | | | In | tersection | LOS: C | | | | | | |
| Intersection Capacity Utili | zation 62.1% | | | IC | U Level | of Service | В | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Splits and Phases: 134 | 4: Lakeshore | Blvd & Br | itish Colo | mbia Rd | | | | | | | | |
| A | | | | 1014 | | | | | Ø9 | | | |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

1344: Lakeshore Blvd & British Colombia Rd

09/30/2021

| | • | - | • | Ť |
|------------------------|------|--------|------|-------|
| Lane Group | EBL | EBT | WBR | NBT |
| Lane Group Flow (vph) | 60 | 540 | 464 | 1574 |
| v/c Ratio | 0.09 | 0.83 | 0.51 | 0.83 |
| Control Delay | 1.7 | 39.8 | 2.1 | 31.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 1.7 | 39.8 | 2.1 | 31.0 |
| Queue Length 50th (m) | 0.0 | 86.2 | 0.0 | 92.6 |
| Queue Length 95th (m) | 3.0 | #139.0 | 0.0 | 111.7 |
| Internal Link Dist (m) | | 387.9 | | 776.6 |
| Turn Bay Length (m) | 15.0 | | 80.0 | |
| Base Capacity (vph) | 660 | 666 | 1249 | 1887 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.09 | 0.81 | 0.37 | 0.83 |

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 1344: Lakeshore Blvd & British Colombia Rd

09/30/2021

| | • | → | • | • | + | • | 1 | 1 | <i>></i> | / | + | 4 |
|--|------------|----------|-------|---|------------|------------|----------|-----------------|-------------|----------|----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | 7 | <u></u> | | | | 77 | | ተ ተጉ | | | | |
| Traffic Volume (vph) | 54 | 486 | 0 | 0 | 0 | 418 | 0 | 1402 | 14 | 0 | 0 | 0 |
| Future Volume (vph) | 54 | 486 | 0 | 0 | 0 | 418 | 0 | 1402 | 14 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 5.0 | 5.0 | | | | 5.0 | | 6.0 | | | | |
| Lane Util. Factor | 1.00 | 1.00 | | | | 0.88 | | 0.91 | | | | |
| Frpb, ped/bikes | 1.00 | 1.00 | | | | 0.99 | | 1.00 | | | | |
| Flpb, ped/bikes | 1.00 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Frt | 1.00 | 1.00 | | | | 0.85 | | 1.00 | | | | |
| Flt Protected | 0.95 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Satd. Flow (prot) | 1620 | 1807 | | | | 2613 | | 4970 | | | | |
| Flt Permitted | 0.95 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Satd. Flow (perm) | 1620 | 1807 | | | | 2613 | | 4970 | | | | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 60 | 540 | 0 | 0 | 0 | 464 | 0 | 1558 | 16 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 38 | 0 | 0 | 0 | 0 | 424 | 0 | 1 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 22 | 540 | 0 | 0 | 0 | 40 | 0 | 1573 | 0 | 0 | 0 | 0 |
| Confl. Peds. (#/hr) | | | - | - | - | | 17 | | - | - | - | 17 |
| Confl. Bikes (#/hr) | | | | | | 1 | | | | | | |
| Heavy Vehicles (%) | 4% | 4% | 4% | 0% | 0% | 6% | 0% | 3% | 7% | 0% | 0% | 0% |
| Turn Type | Perm | NA | | • | | Perm | | NA | | | | |
| Protected Phases | | 4 | | | | | | 2 | | | | |
| Permitted Phases | 4 | | | | | 9 | | | | | | |
| Actuated Green, G (s) | 32.2 | 32.2 | | | | 7.0 | | 34.0 | | | | |
| Effective Green, g (s) | 33.2 | 33.2 | | | | 8.0 | | 35.0 | | | | |
| Actuated g/C Ratio | 0.36 | 0.36 | | | | 0.09 | | 0.38 | | | | |
| Clearance Time (s) | 6.0 | 6.0 | | | | 6.0 | | 7.0 | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | 3.0 | | 3.0 | | | | |
| Lane Grp Cap (vph) | 583 | 650 | | | | 226 | | 1886 | | | | |
| v/s Ratio Prot | 500 | c0.30 | | | | 220 | | c0.32 | | | | |
| v/s Ratio Perm | 0.01 | 00.00 | | | | c0.02 | | 00.02 | | | | |
| v/c Ratio | 0.04 | 0.83 | | | | 0.18 | | 0.83 | | | | |
| Uniform Delay, d1 | 19.1 | 26.9 | | | | 39.1 | | 26.0 | | | | |
| Progression Factor | 1.00 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Incremental Delay, d2 | 0.0 | 8.9 | | | | 0.4 | | 3.3 | | | | |
| Delay (s) | 19.2 | 35.8 | | | | 39.4 | | 29.3 | | | | |
| Level of Service | В | D | | | | D D | | 23.5 C | | | | |
| Approach Delay (s) | ь | 34.1 | | | 39.4 | D | | 29.3 | | | 0.0 | |
| Approach LOS | | C C | | | D D | | | 23.3 C | | | Α | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 32.2 | Н | CM 2000 | Level of S | Service | | С | | | |
| HCM 2000 Control Delay HCM 2000 Volume to Capa | city ratio | | 0.77 | - 11 | OM 2000 | LOVOI OI C | JOI VICO | | 0 | | | |
| Actuated Cycle Length (s) | only ratio | | 92.2 | Q | um of lost | time (s) | | | 17.0 | | | |
| Intersection Capacity Utiliza | tion | | 62.1% | | CU Level o | | | | 17.0 B | | | |
| Analysis Period (min) | uon | | 15 | IC | O LEVEL | , oeivice | | | U | | | |
| c Critical Lane Group | | | 10 | | | | | | | | | |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Lanes, Volumes, Timings 1449: Dufferin St & Dwy/Liberty St

09/30/2021

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|----------------------------|-------|-------|-------|-------|----------|-------|-------|-------|-------|----------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 4 | | | 4 | | | 413 | | | 414 | |
| Traffic Volume (vph) | 5 | 0 | 6 | 129 | 0 | 71 | 2 | 307 | 518 | 130 | 674 | 0 |
| Future Volume (vph) | 5 | 0 | 6 | 129 | 0 | 71 | 2 | 307 | 518 | 130 | 674 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1250 | 1400 | 1250 | 1250 | 1250 | 1250 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.76 | | | 0.72 | | | 0.67 | | | 0.98 | |
| Frt | | 0.921 | | | 0.952 | | | 0.906 | | | | |
| Flt Protected | | 0.980 | | | 0.969 | | | | | | 0.992 | |
| Satd. Flow (prot) | 0 | 1364 | 0 | 0 | 1549 | 0 | 0 | 1433 | 0 | 0 | 2021 | 0 |
| Flt Permitted | | 0.898 | | | 0.798 | | | 0.954 | | | 0.645 | |
| Satd. Flow (perm) | 0 | 1178 | 0 | 0 | 1009 | 0 | 0 | 1367 | 0 | 0 | 1288 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 41 | | | 41 | | | 23 | | | | |
| Link Speed (k/h) | | 50 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 106.6 | | | 106.9 | | | 249.2 | | | 212.5 | |
| Travel Time (s) | | 7.7 | | | 9.6 | | | 17.9 | | | 15.3 | |
| Confl. Peds. (#/hr) | 180 | | 338 | 338 | | 180 | 356 | | 252 | 252 | | 356 |
| Confl. Bikes (#/hr) | | | | | | | | | 5 | | | 153 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 0% | 2% | 0% | 1% | 0% | 4% | 0% | 12% | 1% | 0% | 10% | 0% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 30 | 30 | 12 | 30 | 30 |
| Adj. Flow (vph) | 5 | 0 | 7 | 140 | 0 | 77 | 2 | 334 | 563 | 141 | 733 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 12 | 0 | 0 | 217 | 0 | 0 | 899 | 0 | 0 | 874 | 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) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.70 | 1.60 | 1.70 | 1.70 | 1.83 | 1.70 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 27

Lanes, Volumes, Timings 1449: Dufferin St & Dwy/Liberty St

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|---------------------------------|-------------|------------|----------|------------|-------------|------------|-------|----------------------|------------|----------|-------|----------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Minimum Split (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Total Split (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 56.0 | 56.0 | | 56.0 | 56.0 | |
| Total Split (%) | 30.0% | 30.0% | | 30.0% | 30.0% | | 70.0% | 70.0% | | 70.0% | 70.0% | |
| Maximum Green (s) | 19.0 | 19.0 | | 19.0 | 19.0 | | 50.0 | 50.0 | | 50.0 | 50.0 | |
| Yellow Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | -1.0 | | | -1.0 | | | -3.0 | | | -1.0 | |
| Total Lost Time (s) | | 4.0 | | | 4.0 | | | 3.0 | | | 5.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 100 | 100 | | 100 | 100 | | 100 | 100 | | 100 | 100 | |
| Act Effct Green (s) | | 19.6 | | | 19.6 | | | 53.4 | | | 51.4 | |
| Actuated g/C Ratio | | 0.24 | | | 0.24 | | | 0.67 | | | 0.64 | |
| v/c Ratio | | 0.04 | | | 0.78 | | | 1.19dr | | | 1.06 | |
| Control Delay | | 0.5 | | | 44.2 | | | 42.3 | | | 58.5 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 0.5 | | | 44.2 | | | 42.3 | | | 58.5 | |
| LOS | | Α | | | D | | | D | | | E | |
| Approach Delay | | 0.5 | | | 44.2 | | | 42.3 | | | 58.5 | |
| Approach LOS | | Α | | | D | | | D | | | Е | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: (| Other | | | | | | | | | | | |
| Cycle Length: 80 | | | | | | | | | | | | |
| Actuated Cycle Length: 80 | | | | | | | | | | | | |
| Offset: 40 (50%), Referenced | d to phase | 2:NBTL a | ind 6:SB | TL, Start | of Green | | | | | | | |
| Natural Cycle: 90 | | | | | | | | | | | | |
| Control Type: Actuated-Coor | dinated | | | | | | | | | | | |
| Maximum v/c Ratio: 1.06 | | | | | | | | | | | | |
| Intersection Signal Delay: 49 | | | | | ntersection | | | | | | | |
| Intersection Capacity Utilizati | ion 104.09 | % | | IC | CU Level of | of Service | G | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| dr Defacto Right Lane. Re | code with | 1 though | ane as a | right lane | 9. | | | | | | | |
| Splits and Phases: 1449: [| Dufferin St | t & Dwy/Li | berty St | | | | | | | | | |
| ¶ Ø2 (R) | | | | | | | | - - - | 0 4 | | | |
| 56 s | | | | | | | | 24 s | | | | |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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1449: Dufferin St & Dwy/Liberty St

09/30/2021

Synchro 11 Report

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|------------------------|------|-------|----------|-------|
| Lane Group | EBT | WBT | NBT | SBT |
| Lane Group Flow (vph) | 12 | 217 | 899 | 874 |
| v/c Ratio | 0.04 | 0.78 | 1.19dr | 1.06 |
| Control Delay | 0.5 | 44.2 | 42.3 | 58.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 0.5 | 44.2 | 42.3 | 58.5 |
| Queue Length 50th (m) | 0.0 | 24.9 | 73.4 | ~68.4 |
| Queue Length 95th (m) | 0.5 | #59.7 | #112.4 | m48.0 |
| Internal Link Dist (m) | 82.6 | 82.9 | 225.2 | 188.5 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 325 | 283 | 920 | 827 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.04 | 0.77 | 0.98 | 1.06 |

- Volume exceeds capacity, queue is theoretically infinite.
- Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dr Defacto Right Lane. Recode with 1 though lane as a right lane.

HCM Signalized Intersection Capacity Analysis

1449: Dufferin St & Dwy/Liberty St

09/30/2021

| | 8 130 8 130 0 1250 2 0.92 3 141 0 0 | 674 674 1250 5.0 0.95 1.00 0.98 1.00 0.99 1981 0.64 1288 | |
|---|--|---|------|
| Traffic Volume (vph) 5 0 6 129 0 71 2 307 51 Future Volume (vph) 5 0 6 129 0 71 2 307 51 Ideal Flow (vphpl) 1900 1900 1900 1900 1900 1250 1400 125 Total Lost time (s) 4.0 4.0 4.0 3.0 3.0 Lane Util. Factor 1.00 1.00 0.95 Frpb, ped/bikes 0.80 0.91 0.67 Fipb, ped/bikes 0.94 0.79 1.00 51 0.67 Fit Protected 0.98 0.97 1.00 51 1.00 | 2 0.92 3 141 0 0 0 | 674 674 1250 5.0 0.95 1.00 0.98 1.00 0.99 1981 0.64 1288 | 0 |
| Traffic Volume (vph) 5 0 6 129 0 71 2 307 51 Future Volume (vph) 5 0 6 129 0 71 2 307 51 Ideal Flow (vphpl) 1900 1900 1900 1900 1900 1250 1400 125 Total Lost time (s) 4.0 4.0 4.0 3.0 3.0 Lane Uili. Factor 1.00 1.00 0.95 Frppb, ped/bikes 0.80 0.91 0.67 Fipb, ped/bikes 0.94 0.79 1.00 5 1.00 1.00 Frt 0.92 0.92 0.95 0.91 1.00 | 2 0.92 3 141 0 0 0 | 674 674 1250 5.0 0.95 1.00 0.98 1.00 0.99 1981 0.64 1288 | 0 |
| Future Volume (vph) | 0 1250 2 0.92 3 141 0 0 | 1250 5.0 0.95 1.00 0.98 1.00 0.99 1981 0.64 1288 | 0 |
| Ideal Flow (vphpl) | 0 1250 2 0.92 3 141 0 0 | 1250 5.0 0.95 1.00 0.98 1.00 0.99 1981 0.64 1288 | 1250 |
| Total Lost time (s) | 3 141 0 0 | 0.95 1.00 0.98 1.00 0.99 1981 0.64 1288 | |
| Lane Util. Factor 1.00 1.00 0.95 Frpb, ped/bikes 0.80 0.91 0.67 Frpb, ped/bikes 0.94 0.79 1.00 Frt 0.92 0.95 0.91 Fit Protected 0.98 0.97 1.00 Satd. Flow (prot) 1286 1225 1433 Fit Permitted 0.90 0.80 0.95 Satd. Flow (perm) 1178 1008 1367 Peak-hour factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 | 3 141 0 0 | 1.00 0.98 1.00 0.99 1981 0.64 1288 | |
| Frpb, ped/bikes 0.80 0.91 0.67 Flpb, ped/bikes 0.94 0.79 1.00 Flt Protected 0.98 0.97 1.00 Satd. Flow (prot) 1286 1225 1433 Flt Permitted 0.90 0.80 0.95 Satd. Flow (perm) 1178 1008 1367 Peak-hour factor, PHF 0.92 | 3 141 0 0 | 0.98 1.00 0.99 1981 0.64 1288 | |
| Fipb, ped/bikes | 3 141 0 0 | 1.00 0.99 1981 0.64 1288 | |
| Fit | 3 141 0 0 | 1.00 0.99 1981 0.64 1288 | |
| Fit Protected 0.98 0.97 1.00 Satd. Flow (prot) 1286 1225 1433 1436 | 3 141 0 0 | 0.99 1981 0.64 1288 | |
| Satd. Flow (prot) 1286 1225 1433 Fit Permitted 0.90 0.80 0.95 Satd. Flow (perm) 1178 1008 1367 Peak-hour factor, PHF 0.92 0.93 18 0.8 0.25 0.8 | 3 141 0 0 | 1981 0.64 1288 | |
| Fit Permitted 0.90 0.80 0.95 Satd. Flow (perm) 1178 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 | 3 141 0 0 | 0.64 1288 | |
| Satd. Flow (perm) 1178 1008 1367 Peak-hour factor, PHF 0.92 0.93 1.92 1.92 1.92 1.92 1.92 1.92 1.92 1.92 1.92 1.92 1.92 1.92 1.92 1.92 1.92 1.92 1.92 1.92 1.92 | 3 141 0 0 | 1288 | |
| Peak-hour factor, PHF 0.92 0.93 1.86 0.81 1.80 3.83 3.83 3.83 180 356 2.25 Confl. Bikes (#hr) 1 0 0 0 0 0 0 0 0 12% 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2< | 3 141 0 0 | | |
| Adj. Flow (vph) 5 0 7 140 0 77 2 334 56 RTOR Reduction (vph) 0 9 0 0 31 0 0 89 Lane Group Flow (vph) 0 3 0 0 186 0 0 891 Confl. Pales, (#/hr) 180 338 338 180 356 25 Confl. Bikes (#/hr) 0 0 1% 0% 4% 0% 12% 1 Bus Blockages (#/hr) 0 0 0 0 0 0 12% 1 Turn Type Perm NA SA 2 2 Actua | 3 141 0 0 | | 0.92 |
| RTOR Reduction (vph) 0 9 0 0 31 0 0 8 Lane Group Flow (vph) 0 3 0 0 186 0 0 891 Confl. Places (#hr) 180 338 338 180 356 25 Confl. Bikes (#hr) 0 0 1% 0% 4% 0% 12% 1* Bus Blockages (#/hr) 0 0 0 0 0 12 30 3 4 4 4 8 2 2 4 4 8 1 <td>0 0</td> <td></td> <td>0.32</td> | 0 0 | | 0.32 |
| Lane Group Flow (vph) 0 3 0 0 186 0 0 891 Confl. Peds. (#hr) 180 338 338 180 356 25 Confl. Bikes (#hr) 180 338 338 180 356 25 Confl. Bikes (#hr) 0 0 0 19 0% 4% 0% 12% 11 Bus Blockages (#hr) 0 0 0 0 0 0 0 12 30 3 Turn Type Perm NA Perm | | | 0 |
| Confl. Peds. (#/hr) 180 338 338 180 356 25 Confl. Bikes (#/hr) 0% 2% 0% 1% 0% 4% 0% 12% 1 Bus Blockages (#/hr) 0 0 0 0 0 0 0 12% 3 3 Turn Type Perm NA Perm NA <td>0 0</td> <td>-</td> <td>0</td> | 0 0 | - | 0 |
| Confi. Bikes (#hr) Heavy Vehicles (%) Heavy Vehicles (%) Bus Blockages (#hr) 0 0 0 0 0 0 0 12 30 3 Turn Type Perm NA Protected Phases 4 8 2 Permitted Phases 4 8 2 Actuated Green, G (s) Effective Green, g (s) 18.6 18.6 50.4 Effective Green, g (s) 19.6 19.6 53.4 Actuated g/C Ratio 0.25 0.25 0.67 Clearance Time (s) 5.0 5.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 Vehicle Extension (s) 28 246 912 v/s Ratio Prot v/s Ratio Prot v/s Ratio Derm 0.00 0.18 0.65 v/c Ratio 0.01 0.76 1.19dr Uniform Delay, d1 22.9 28.0 12.7 Progression Factor 1.00 1.00 1.25 | | | 356 |
| Heavy Vehicles (%) | 2 202 5 | | 153 |
| Bus Blockages (#lhr) 0 0 0 0 0 12 30 3 Turn Type Perm NA Perm NA Perm NA Protected Phases 4 8 2 2 Permitted Phases 4 8 2 2 Actuated Green, G (s) 18.6 18.6 50.4 50.4 Effective Green, g (s) 19.6 19.6 53.4 Actuated g/C Ratio 0.25 0.25 0.67 0.67 Clearance Time (s) 5.0 5.0 6.0 O O Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 Santa or Time (s) Vehicle Extension (s) 3.0 3.0 3.0 3.0 Santa or Time (s) Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 Santa or Time (s) Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 <td< td=""><td>-</td><td>10%</td><td>0%</td></td<> | - | 10% | 0% |
| Turn Type Perm NA Perm NA Perm NA Protected Phases 4 8 2 Permitted Phases 4 8 2 Actuated Green, G (s) 18.6 18.6 50.4 Effective Green, g (s) 19.6 19.6 53.4 Actuated g/C Ratio 0.25 0.25 0.67 Clearance Time (s) 5.0 5.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 Lane Grp Cap (vph) 288 246 912 v/s Ratio Prot v/s Ratio Prot 0.00 0.18 0.65 v/c Ratio 0.01 0.76 1.19dr Uniform Delay, d1 22.9 28.0 12.7 Progression Factor 1.00 1.00 1.25 | | | 30 |
| Protected Phases 4 8 2 Permitted Phases 4 8 2 Actuated Green, G (s) 18.6 18.6 50.4 Effective Green, g (s) 19.6 19.6 53.4 Actuated g/C Ratio 0.25 0.25 0.67 Clearance Time (s) 5.0 5.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 Uehicle Extension (s) 288 246 912 v/s Ratio Prot v/s Ratio Prot v/s Ratio Derm 0.00 0.18 0.65 v/c Ratio 0.01 0.76 1.19dr Uniform Delay, d1 22.9 28.0 12.7 Progression Factor 1.00 1.00 1.25 | Perm | | 30 |
| Permitted Phases 4 8 2 Actuated Green, G (s) 18.6 18.6 50.4 Effective Green, g (s) 19.6 19.6 53.4 Actuated g/C Ratio 0.25 0.25 0.67 Clearance Time (s) 5.0 5.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 Jane Grp Cap (vph) 288 246 912 v/s Ratio Prot v/s Ratio Perm 0.00 c0.18 0.65 v/c Ratio 0.01 0.76 1.19dr Uniform Delay, d1 22.9 28.0 12.7 Progression Factor 1.00 1.00 1.25 | Pellii | NA 6 | |
| Actuated Green, G (s) 18.6 18.6 50.4 Effective Green, g (s) 19.6 19.6 53.4 Actuated g/C Ratio 0.25 0.25 0.67 Clearance Time (s) 5.0 5.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 Lane Grp Cap (vph) 288 246 912 v/s Ratio Prot v/s Ratio Prot v/s Ratio Derm 0.00 c0.18 0.65 v/c Ratio 0.01 0.76 1.19dr Uniform Delay, d1 22.9 28.0 12.7 Progression Factor 1.00 1.00 1.25 | 6 | | |
| Effective Green, g (s) 19.6 19.6 53.4 Actuated g/C Ratio 0.25 0.25 0.67 Clearance Time (s) 5.0 5.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 Lane Grp Cap (vph) 288 246 912 v/s Ratio Prot v/s Ratio Perm 0.00 c0.18 0.65 v/c Ratio 0.01 0.76 1.19dr Uniform Delay, d1 22.9 28.0 12.7 Progression Factor 1.00 1.00 1.25 | 0 | 50.4 | |
| Actuated g/C Ratio 0.25 0.25 0.67 Clearance Time (s) 5.0 5.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 Lane Grp Cap (vph) 288 246 912 v/s Ratio Prot v/s Ratio Perm 0.00 c0.18 0.65 v/c Ratio 0.01 0.76 1.19dr Uniform Delay, d1 22.9 28.0 12.7 Progression Factor 1.00 1.00 1.25 | | 51.4 | |
| Clearance Time (s) 5.0 5.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 Lane Grp Cap (vph) 288 246 912 v/s Ratio Prot v/s Ratio Perm 0.00 c0.18 0.65 v/c Ratio 0.01 0.76 1.19dr Uniform Delay, d1 22.9 28.0 12.7 Progression Factor 1.00 1.00 1.25 | | 0.64 | |
| Vehicle Extension (s) 3.0 3.0 3.0 Lane Grp Cap (vph) 288 246 912 v/s Ratio Prot v/s Ratio Perm 0.00 c0.18 0.65 v/c Ratio 0.01 0.76 1.19dr Uniform Delay, d1 22.9 28.0 12.7 Progression Factor 1.00 1.00 1.25 | | 6.0 | |
| Lane Grp Cap (vph) 288 246 912 v/s Ratio Prot 918 918 918 v/s Ratio Perm 0.00 0.18 0.65 v/c Ratio 0.01 0.76 1.19dr Uniform Delay, d1 22.9 28.0 12.7 Progression Factor 1.00 1.00 1.25 | | 3.0 | |
| v/s Ratio Prot v/s Ratio Perm 0.00 c0.18 0.65 v/c Ratio 0.01 0.76 1.19dr u/c Inform Delay, d1 22.9 28.0 12.7 Progression Factor 1.00 1.00 1.25 | | | |
| v/s Ratio Perm 0.00 c0.18 0.65 v/c Ratio 0.01 0.76 1.19dr Uniform Delay, d1 22.9 28.0 12.7 Progression Factor 1.00 1.00 1.25 | | 827 | |
| v/c Ratio 0.01 0.76 1.19dr Uniform Delay, d1 22.9 28.0 12.7 Progression Factor 1.00 1.00 1.25 | | 0.00 | |
| Uniform Delay, d1 22.9 28.0 12.7 Progression Factor 1.00 1.00 1.25 | | c0.68 | |
| Progression Factor 1.00 1.00 1.25 | | 1.06 | |
| | | 14.3 | |
| Incremental Delay, d2 0.0 12.4 24.6 | | 2.11 | |
| | | 28.8 | |
| Delay (s) 22.9 40.4 40.5 | | 58.9 | |
| Level of Service C D D | | Е | |
| Approach Delay (s) 22.9 40.4 40.5 | | 58.9 | |
| Approach LOS C D D | | Е | |
| Intersection Summary | | | |
| HCM 2000 Control Delay 48.4 HCM 2000 Level of Service |) | | |
| HCM 2000 Volume to Capacity ratio 0.97 | | | |
| Actuated Cycle Length (s) 80.0 Sum of lost time (s) 9. | 0 | | |
| | 3 | | |
| Analysis Period (min) 15 | | | |
| dr Defacto Right Lane. Recode with 1 though lane as a right lane. | | | |
| c Critical Lane Group | | | |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements

Lanes, Volumes, Timings 1628: Shaw St & King St

09/30/2021

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|----------------------------|-------|-------|---------------|-------|----------|-------|-------|----------|-------|----------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 413 | | | 413 | | | 414 | | | 413 | |
| Traffic Volume (vph) | 21 | 673 | 17 | 0 | 593 | 86 | 63 | 226 | 19 | 107 | 87 | 116 |
| Future Volume (vph) | 21 | 673 | 17 | 0 | 593 | 86 | 63 | 226 | 19 | 107 | 87 | 116 |
| Ideal Flow (vphpl) | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.99 | | | 0.99 | | | 0.96 | | | 0.88 | |
| Frt | | 0.996 | | | 0.981 | | | 0.991 | | | 0.944 | |
| Flt Protected | | 0.999 | | | | | | 0.990 | | | 0.983 | |
| Satd. Flow (prot) | 0 | 1815 | 0 | 0 | 1817 | 0 | 0 | 3071 | 0 | 0 | 2351 | 0 |
| Flt Permitted | | 0.920 | | | | | | 0.801 | | | 0.713 | |
| Satd. Flow (perm) | 0 | 1670 | 0 | 0 | 1817 | 0 | 0 | 2408 | 0 | 0 | 1659 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 6 | | | 37 | | | 10 | | | 133 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 40 | | | 40 | |
| Link Distance (m) | | 199.1 | | | 255.2 | | | 127.7 | | | 380.6 | |
| Travel Time (s) | | 14.3 | | | 18.4 | | | 11.5 | | | 34.3 | |
| Confl. Peds. (#/hr) | 87 | | 289 | 289 | | 87 | 239 | | 126 | 126 | | 239 |
| Confl. Bikes (#/hr) | | | | | | 19 | | | | | | |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles (%) | 100% | 7% | 0% | 100% | 8% | 2% | 5% | 1% | 0% | 33% | 2% | 7% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 24 | 774 | 20 | 0 | 682 | 99 | 72 | 260 | 22 | 123 | 100 | 133 |
| Shared Lane Traffic (%) | =: | | | - | | | | | | | | |
| Lane Group Flow (vph) | 0 | 818 | 0 | 0 | 781 | 0 | 0 | 354 | 0 | 0 | 356 | 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) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.92 | 2.03 | 1.92 | 1.92 | 2.03 | 1.92 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | 01123 | O. LX | | O. LA | O. LA | | 0. Ex | 0. Lx | | 0. Lx | O. LA | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | 0.0 | 28.7 | | 0.0 | 28.7 | | 0.0 | 28.7 | | 0.0 | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | OFFER | | | OITLA | | | OITEX | | | OIYLX | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| | Perm | NA | | | NA | | Perm | NA | | Perm | NA | |
| Turn Type | reiin | INA | | | INA | | reim | INA | | reiin | INA | |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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Lanes, Volumes, Timings 1628: Shaw St & King St

| | • | - | • | • | ← | • | 4 | † | 1 | - | ↓ | 1 |
|------------------------------|--------------|----------|--------|------------|-------------|------------|-------|----------|-----|-------|----------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Protected Phases | | 2 | | | 6 | | | 4 | | | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Detector Phase | 2 | 2 | | 6 | 6 | | 4 | 4 | | 8 | 8 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 22.0 | 22.0 | | 22.0 | 22.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Minimum Split (s) | 28.0 | 28.0 | | 28.0 | 28.0 | | 26.0 | 26.0 | | 26.0 | 26.0 | |
| Total Split (s) | 44.0 | 44.0 | | 44.0 | 44.0 | | 26.0 | 26.0 | | 26.0 | 26.0 | |
| Total Split (%) | 62.9% | 62.9% | | 62.9% | 62.9% | | 37.1% | 37.1% | | 37.1% | 37.1% | |
| Maximum Green (s) | 38.0 | 38.0 | | 38.0 | 38.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | -1.0 | | | -1.0 | | | -1.0 | | | -1.0 | |
| Total Lost Time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 5.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | C-Max | C-Max | | C-Max | C-Max | | None | None | | None | None | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 15.0 | 15.0 | | 15.0 | 15.0 | | 13.0 | 13.0 | | 13.0 | 13.0 | |
| Pedestrian Calls (#/hr) | 100 | 100 | | 29 | 29 | | 100 | 100 | | 100 | 100 | |
| Act Effct Green (s) | | 39.0 | | | 39.0 | | | 21.0 | | | 21.0 | |
| Actuated g/C Ratio | | 0.56 | | | 0.56 | | | 0.30 | | | 0.30 | |
| v/c Ratio | | 0.88 | | | 0.76 | | | 0.49 | | | 0.60 | |
| Control Delay | | 26.6 | | | 17.4 | | | 22.2 | | | 17.8 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 26.6 | | | 17.4 | | | 22.2 | | | 17.8 | |
| LOS | | С | | | В | | | С | | | В | |
| Approach Delay | | 26.6 | | | 17.4 | | | 22.2 | | | 17.8 | |
| Approach LOS | | С | | | В | | | С | | | В | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | CBD | | | | | | | | | | | |
| Cycle Length: 70 | | | | | | | | | | | | |
| Actuated Cycle Length: 70 | | | | | | | | | | | | |
| Offset: 1 (1%), Referenced | | EBTL and | 6:WBTL | . Start of | 1st Green | | | | | | | |
| Natural Cycle: 65 | | | | , | | | | | | | | |
| Control Type: Actuated-Co | ordinated | | | | | | | | | | | |
| Maximum v/c Ratio: 0.88 | | | | | | | | | | | | |
| Intersection Signal Delay: | 21.5 | | | Ir | ntersection | LOS: C | | | | | | |
| Intersection Capacity Utiliz | | % | | I | CU Level o | of Service | G | | | | | |
| Analysis Period (min) 15 | | - | | - | | | | | | | | |
| Splits and Phases: 1628 | 3: Shaw St 8 | Kina St | | | | | | | | | | |
| A | 5.10.1 51 0 | 9 01 | | | | | | | | | | |
| → Ø2 (R) | | | | | | | 170 | 14 | | | | |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Ø6 (R)

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1628: Shaw St & King St

09/30/2021

| | - | - | † | Ų. |
|------------------------|-------|-------|----------|-------|
| Lane Group | EBT | WBT | NBT | SBT |
| Lane Group Flow (vph) | 818 | 781 | 354 | 356 |
| v/c Ratio | 0.88 | 0.76 | 0.49 | 0.60 |
| Control Delay | 26.6 | 17.4 | 22.2 | 17.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 26.6 | 17.4 | 22.2 | 17.8 |
| Queue Length 50th (m) | 44.2 | 35.8 | 19.2 | 12.4 |
| Queue Length 95th (m) | #79.1 | 54.8 | 29.5 | 24.2 |
| Internal Link Dist (m) | 175.1 | 231.2 | 103.7 | 356.6 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 933 | 1028 | 729 | 590 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.88 | 0.76 | 0.49 | 0.60 |
| | | | | |

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 1628: Shaw St & King St

| | • | → | \rightarrow | • | ← | • | 4 | † | / | - | ↓ | 4 |
|--------------------------------|------------|----------|---------------|------|------------|----------|---------|----------|----------|------|----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 413 | | | 414 | | | 413 | | | 414 | |
| Traffic Volume (vph) | 21 | 673 | 17 | 0 | 593 | 86 | 63 | 226 | 19 | 107 | 87 | 116 |
| Future Volume (vph) | 21 | 673 | 17 | 0 | 593 | 86 | 63 | 226 | 19 | 107 | 87 | 116 |
| Ideal Flow (vphpl) | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 5.0 | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | | 0.99 | | | 0.99 | | | 0.99 | | | 0.90 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | | 0.97 | | | 0.97 | |
| Frt | | 1.00 | | | 0.98 | | | 0.99 | | | 0.94 | |
| Flt Protected | | 1.00 | | | 1.00 | | | 0.99 | | | 0.98 | |
| Satd. Flow (prot) | | 1813 | | | 1817 | | | 2976 | | | 2287 | |
| Flt Permitted | | 0.92 | | | 1.00 | | | 0.80 | | | 0.71 | |
| Satd. Flow (perm) | | 1671 | | | 1817 | | | 2408 | | | 1659 | |
| Peak-hour factor, PHF | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Adj. Flow (vph) | 24 | 774 | 20 | 0 | 682 | 99 | 72 | 260 | 22 | 123 | 100 | 133 |
| RTOR Reduction (vph) | 0 | 3 | 0 | 0 | 16 | 0 | 0 | 7 | 0 | 0 | 93 | 0 |
| Lane Group Flow (vph) | 0 | 815 | 0 | 0 | 765 | 0 | 0 | 347 | 0 | 0 | 263 | 0 |
| Confl. Peds. (#/hr) | 87 | | 289 | 289 | | 87 | 239 | | 126 | 126 | | 239 |
| Confl. Bikes (#/hr) | | | | | | 19 | | | | | | |
| Heavy Vehicles (%) | 100% | 7% | 0% | 100% | 8% | 2% | 5% | 1% | 0% | 33% | 2% | 7% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Turn Type | Perm | NA | | | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 4 | | | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | | 38.0 | | | 38.0 | | | 20.0 | | | 20.0 | |
| Effective Green, g (s) | | 39.0 | | | 39.0 | | | 21.0 | | | 21.0 | |
| Actuated g/C Ratio | | 0.56 | | | 0.56 | | | 0.30 | | | 0.30 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | | 930 | | | 1012 | | | 722 | | | 497 | |
| v/s Ratio Prot | | | | | 0.42 | | | | | | | |
| v/s Ratio Perm | | c0.49 | | | | | | 0.14 | | | c0.16 | |
| v/c Ratio | | 0.88 | | | 0.76 | | | 0.48 | | | 0.53 | |
| Uniform Delay, d1 | | 13.4 | | | 11.9 | | | 20.0 | | | 20.4 | |
| Progression Factor | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | | 11.4 | | | 5.2 | | | 0.5 | | | 1.0 | |
| Delay (s) | | 24.8 | | | 17.1 | | | 20.5 | | | 21.4 | |
| Level of Service | | С | | | В | | | С | | | С | |
| Approach Delay (s) | | 24.8 | | | 17.1 | | | 20.5 | | | 21.4 | |
| Approach LOS | | С | | | В | | | С | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 21.0 | Н | CM 2000 | Level of | Service | | С | | | |
| HCM 2000 Volume to Capac | city ratio | | 0.75 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 70.0 | S | um of lost | time (s) | | | 10.0 | | | |
| Intersection Capacity Utilizat | ion | | 104.1% | | U Level | |) | | G | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

| Intersection Summary | | | | |
|-----------------------------------|--------|---------------------------|------|--|
| HCM 2000 Control Delay | 21.0 | HCM 2000 Level of Service | С | |
| HCM 2000 Volume to Capacity ratio | 0.75 | | | |
| Actuated Cycle Length (s) | 70.0 | Sum of lost time (s) | 10.0 | |
| Intersection Capacity Utilization | 104.1% | ICU Level of Service | G | |
| Analysis Period (min) | 15 | | | |
| O 111 O | | | | |

c Critical Lane Group

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|--|-------|-------|---------------|-------|----------|--------|-------|----------|--------|----------|-------|--------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 414 | | | 414 | | | 4 | | | 4 | |
| Traffic Volume (vph) | 0 | 791 | 5 | 0 | 680 | 112 | 0 | 5 | 0 | 163 | 0 | 96 |
| Future Volume (vph) | 0 | 791 | 5 | 0 | 680 | 112 | 0 | 5 | 0 | 163 | 0 | 96 |
| Ideal Flow (vphpl) | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | 1.00 | | | 0.98 | | | | | | 0.90 | |
| Frt | | 0.999 | | | 0.979 | | | | | | 0.950 | |
| Flt Protected | | | | | | | | | | | 0.969 | |
| Satd. Flow (prot) | 0 | 1701 | 0 | 0 | 1745 | 0 | 0 | 1409 | 0 | 0 | 1347 | 0 |
| Flt Permitted | | | | | | | | | | | 0.805 | |
| Satd. Flow (perm) | 0 | 1701 | 0 | 0 | 1745 | 0 | 0 | 1409 | 0 | 0 | 1080 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 1 | | | 41 | | | | | | 41 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 318.4 | | | 199.1 | | | 158.6 | | | 196.7 | |
| Travel Time (s) | | 22.9 | | | 14.3 | | | 11.4 | | | 14.2 | |
| Confl. Peds. (#/hr) | 73 | | 219 | 219 | | 73 | 158 | | 49 | 49 | | 158 |
| Confl. Bikes (#/hr) | | | | | | 15 | | | | | | |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 0% | 18% | 0% | 0% | 11% | 8% | 0% | 20% | 0% | 6% | 0% | 10% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 0 | 899 | 6 | 0 | 773 | 127 | 0 | 6 | 0 | 185 | 0 | 109 |
| Shared Lane Traffic (%) | 0 | 000 | U | • | 770 | 121 | • | U | U | 100 | U | 100 |
| Lane Group Flow (vph) | 0 | 905 | 0 | 0 | 900 | 0 | 0 | 6 | 0 | 0 | 294 | 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) | Loit | 0.0 | rugiit | Loit | 0.0 | rugiit | Loit | 0.0 | rugiit | Loit | 0.0 | rugiit |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | 1.0 | | | 1.0 | | | 1.0 | | | 1.0 | |
| Headway Factor | 1.92 | 2.03 | 1.92 | 1.92 | 2.03 | 1.92 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 |
| Turning Speed (k/h) | 24 | 2.00 | 14 | 24 | 2.00 | 14 | 24 | 1.10 | 14 | 24 | 1.10 | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | - 11 | 1 | 2 | 1.7 | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | CITLX | CITLX | | CITLX | CITLX | | CITLX | CITLX | | CITLX | CITLX | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | 0.0 | 28.7 | | 0.0 | 28.7 | | 0.0 | 28.7 | | 0.0 | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Type Detector 2 Channel | | CITEX | | | CITEX | | | CITEX | | | CITEX | |
| Detector 2 Channel Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| | | | | | | | | | | Dam | | |
| Turn Type | | NA | | | NA | | | NA | | Perm | NA | |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 35 Lanes, Volumes, Timings 1851: King St & Sudbury St

Lane Group Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (%) Maximum Green (s) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Vehicle Extension (s) Recall Mode Walk Time (s) Flash Dont Walk (s) Pedestrian Calls (#/hr) Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS Approach Delay Approach LOS Intersection Summary

| ۶ | → | 7 1 | + | • | 1 | † | <i>></i> | / | + | * |
|-------|----------|---------|----------|-----|-------|----------|-------------|----------|----------|----|
| EBL | EBT | EBR WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SE |
| | 2 | | 6 | | | 8 | | | 4 | |
| 2 | | 6 | | | 8 | | | 4 | | |
| 2 | 2 | 6 | 6 | | 8 | 8 | | 4 | 4 | |
| | | | | | | | | | | |
| 24.0 | 24.0 | 24.0 | | | 21.0 | 21.0 | | 21.0 | 21.0 | |
| 30.0 | 30.0 | 30.0 | 30.0 | | 26.0 | 26.0 | | 26.0 | 26.0 | |
| 53.0 | 53.0 | 53.0 | 53.0 | | 27.0 | 27.0 | | 27.0 | 27.0 | |
| 66.3% | 66.3% | 66.3% | | | 33.8% | 33.8% | | 33.8% | 33.8% | |
| 47.0 | 47.0 | 47.0 | | | 22.0 | 22.0 | | 22.0 | 22.0 | |
| 4.0 | 4.0 | 4.0 | | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| 2.0 | 2.0 | 2.0 | | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| | -1.0 | | -1.0 | | | -1.0 | | | -1.0 | |
| | 5.0 | | 5.0 | | | 4.0 | | | 4.0 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| 3.0 | 3.0 | 3.0 | | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| C-Max | C-Max | C-Max | | | None | None | | None | None | |
| 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| 17.0 | 17.0 | 17.0 | 17.0 | | 14.0 | 14.0 | | 14.0 | 14.0 | |
| 100 | 100 | 24 | | | 100 | 100 | | 16 | 16 | |
| | 48.2 | | 48.2 | | | 22.8 | | | 22.8 | |
| | 0.60 | | 0.60 | | | 0.28 | | | 0.28 | |
| | 0.88 | | 0.84 | | | 0.01 | | | 0.88 | |
| | 26.2 | | 21.8 | | | 20.6 | | | 51.5 | |
| | 0.0 | | 0.0 | | | 0.0 | | | 0.0 | |
| | 26.2 | | 21.8 | | | 20.6 | | | 51.5 | |
| | С | | С | | | С | | | D | |
| | 26.2 | | 21.8 | | | 20.6 | | | 51.5 | |
| | С | | С | | | С | | | D | |
| | | | | | | | | | | |
| | | | | | | | | | | |

CBD Area Type: Cycle Length: 80 Actuated Cycle Length: 80

Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green

Natural Cycle: 80

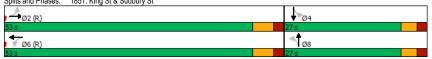
Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.88

Intersection Signal Delay: 27.8

Intersection LOS: C ICU Level of Service C Intersection Capacity Utilization 71.9%

Analysis Period (min) 15

Splits and Phases: 1851: King St & Sudbury St



Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 36

1851: King St & Sudbury St

09/30/2021

| | - | ← | - ↑ | Ţ |
|------------------------|-------|-------|-------|-------|
| | - | | ' | • |
| Lane Group | EBT | WBT | NBT | SBT |
| Lane Group Flow (vph) | 905 | 900 | 6 | 294 |
| v/c Ratio | 0.88 | 0.84 | 0.01 | 0.88 |
| Control Delay | 26.2 | 21.8 | 20.6 | 51.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 26.2 | 21.8 | 20.6 | 51.5 |
| Queue Length 50th (m) | 55.9 | 50.7 | 0.7 | 36.8 |
| Queue Length 95th (m) | #98.0 | #83.3 | 3.2 | #77.7 |
| Internal Link Dist (m) | 294.4 | 175.1 | 134.6 | 172.7 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1025 | 1067 | 405 | 339 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.88 | 0.84 | 0.01 | 0.87 |
| | | | | |

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 1851: King St & Sudbury St

| _ | 1 | 12 | ^ | 12 | ۸ | 1 |
|---|---|----|---|----|---|---|
| | | | | | | |

| | ۶ | - | • | • | ← | • | • | † | <i>></i> | > | ţ | 4 |
|-----------------------------------|-------|-------|-------|------|------------|------------|---------|----------|-------------|-------------|-------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 414 | | | 414 | | | 4 | | | 4 | |
| Traffic Volume (vph) | 0 | 791 | 5 | 0 | 680 | 112 | 0 | 5 | 0 | 163 | 0 | 96 |
| Future Volume (vph) | 0 | 791 | 5 | 0 | 680 | 112 | 0 | 5 | 0 | 163 | 0 | 96 |
| Ideal Flow (vphpl) | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | | 4.0 | | | 4.0 | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | | 1.00 | | | 0.98 | | | 1.00 | | | 0.93 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | | 1.00 | | | 0.97 | |
| Frt | | 1.00 | | | 0.98 | | | 1.00 | | | 0.95 | |
| Flt Protected | | 1.00 | | | 1.00 | | | 1.00 | | | 0.97 | |
| Satd. Flow (prot) | | 1701 | | | 1744 | | | 1409 | | | 1300 | |
| Flt Permitted | | 1.00 | | | 1.00 | | | 1.00 | | | 0.81 | |
| Satd. Flow (perm) | | 1701 | | | 1744 | | | 1409 | | | 1080 | |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 0 | 899 | 6 | 0 | 773 | 127 | 0 | 6 | 0 | 185 | 0 | 109 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 29 | 0 |
| Lane Group Flow (vph) | 0 | 905 | 0 | 0 | 884 | 0 | 0 | 6 | 0 | 0 | 265 | 0 |
| Confl. Peds. (#/hr) | 73 | | 219 | 219 | | 73 | 158 | | 49 | 49 | | 158 |
| Confl. Bikes (#/hr) | | | | | | 15 | | | | | | |
| Heavy Vehicles (%) | 0% | 18% | 0% | 0% | 11% | 8% | 0% | 20% | 0% | 6% | 0% | 10% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Turn Type | | NA | | | NA | | | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 47.2 | | | 47.2 | | | 21.8 | | | 21.8 | |
| Effective Green, g (s) | | 48.2 | | | 48.2 | | | 22.8 | | | 22.8 | |
| Actuated g/C Ratio | | 0.60 | | | 0.60 | | | 0.29 | | | 0.29 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | | 5.0 | | | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | | 1024 | | | 1050 | | | 401 | | | 307 | |
| v/s Ratio Prot | | c0.53 | | | 0.51 | | | 0.00 | | | | |
| v/s Ratio Perm | | | | | | | | | | | c0.25 | |
| v/c Ratio | | 0.88 | | | 0.84 | | | 0.01 | | | 0.86 | |
| Uniform Delay, d1 | | 13.5 | | | 12.8 | | | 20.5 | | | 27.1 | |
| Progression Factor | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | | 11.0 | | | 8.2 | | | 0.0 | | | 21.2 | |
| Delay (s) | | 24.5 | | | 21.0 | | | 20.6 | | | 48.3 | |
| Level of Service | | С | | | С | | | С | | | D | |
| Approach Delay (s) | | 24.5 | | | 21.0 | | | 20.6 | | | 48.3 | |
| Approach LOS | | С | | | С | | | С | | | D | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 26.3 | Н | CM 2000 | Level of S | Service | | С | | | |
| HCM 2000 Volume to Capacity | ratio | | 0.88 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 80.0 | S | um of lost | time (s) | | | 9.0 | | | |
| Intersection Capacity Utilization | | | 71.9% | IC | U Level | of Service | | | С | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

| Intersection Summary | | | | |
|-----------------------------------|-------|---------------------------|-----|--|
| HCM 2000 Control Delay | 26.3 | HCM 2000 Level of Service | С | |
| HCM 2000 Volume to Capacity ratio | 0.88 | | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 9.0 | |
| Intersection Capacity Utilization | 71.9% | ICU Level of Service | С | |
| Analysis Period (min) | 15 | | | |
| | | | | |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Lanes, Volumes, Timings 1912: Atlantic Ave & King St

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| | - | • | • | ← | 4 | - |
|----------------------------|------------|-------|-------|--------------|-------|-------|
| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations | † p | LDI | 1102 | 414 | ኘ | 7 |
| Traffic Volume (vph) | 697 | 73 | 4 | 779 | 295 | 180 |
| Future Volume (vph) | 697 | 73 | 4 | 779 | 295 | 180 |
| Ideal Flow (vphpl) | 1250 | 1250 | 1250 | 1250 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.0 |
| Storage Length (m) | 5.5 | 0.0 | 0.0 | 5.5 | 30.0 | 0.0 |
| Storage Length (III) | | 0.0 | 0.0 | | 30.0 | 1 |
| Taper Length (m) | | U | 7.5 | | 7.5 | - 1 |
| Lane Util. Factor | 0.95 | 0 0F | | 0 OF | 1.00 | 1.00 |
| | | 0.95 | 0.95 | 0.95 1.00 | | |
| Ped Bike Factor | 0.95 | | | 1.00 | 0.95 | 0.96 |
| Frt | 0.986 | | | | 0.050 | 0.850 |
| Fit Protected | 4700 | | | 4001 | 0.950 | 4450 |
| Satd. Flow (prot) | 1703 | 0 | 0 | 1821 | 1458 | 1159 |
| Flt Permitted | | | | 0.950 | 0.950 | |
| Satd. Flow (perm) | 1703 | 0 | 0 | 1729 | 1383 | 1110 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | 25 | | | | | 19 |
| Link Speed (k/h) | 50 | | | 50 | 30 | |
| Link Distance (m) | 191.3 | | | 318.4 | 198.0 | |
| Travel Time (s) | 13.8 | | | 22.9 | 23.8 | |
| Confl. Peds. (#/hr) | | 387 | 387 | | 49 | 30 |
| Confl. Bikes (#/hr) | | 5 | 30. | | | |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles (%) | 11% | 6% | 100% | 10% | 4% | 17% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 0 | 0 |
| Adj. Flow (vph) | 810 | 85 | 5 | 906 | 343 | 209 |
| | 010 | 00 | 0 | 900 | 343 | 209 |
| Shared Lane Traffic (%) | 005 | | • | 044 | 242 | 000 |
| Lane Group Flow (vph) | 895 | 0 | 0 | 911 | 343 | 209 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 0.0 | | | 0.0 | 3.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 4.8 | | | 4.8 | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 2.03 | 1.92 | 1.92 | 2.03 | 1.25 | 1.25 |
| Turning Speed (k/h) | | 14 | 24 | | 24 | 14 |
| Number of Detectors | 2 | | 1 | 2 | 1 | 1 |
| Detector Template | Thru | | Left | Thru | Left | Right |
| Leading Detector (m) | 30.5 | | 6.1 | 30.5 | 6.1 | 6.1 |
| | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Trailing Detector (m) | | | | | | |
| Detector 1 Position(m) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 1.8 | | 6.1 | 1.8 | 6.1 | 6.1 |
| Detector 1 Type | CI+Ex | | CI+Ex | CI+Ex | CI+Ex | CI+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | 28.7 | | | 28.7 | | |
| Detector 2 Size(m) | 1.8 | | | 1.8 | | |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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|---------------------------|------------------|------------|-------|------------|-------------|------------|
| Lane Group | EBT | EBR \ | WBL | WBT | NBL | NBR |
| Detector 2 Type | CI+Ex | | | CI+Ex | | |
| Detector 2 Channel | | | | A | | |
| Detector 2 Extend (s) | 0.0 | | | 0.0 | | |
| Turn Type | NA | F | erm | NA | Perm | Perm |
| Protected Phases | 2 | | | 6 | | |
| Permitted Phases | | | 6 | | 8 | 8 |
| Detector Phase | 2 | | 6 | 6 | 8 | 8 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 21.0 | | 21.0 | 21.0 | 20.0 | 20.0 |
| Minimum Split (s) | 28.0 | | 28.0 | 28.0 | 26.0 | 26.0 |
| Total Split (s) | 44.0 | | 44.0 | 44.0 | 26.0 | 26.0 |
| Total Split (%) | 62.9% | | 2.9% | 62.9% | 37.1% | 37.1% |
| Maximum Green (s) | 37.0 | | 37.0 | 37.0 | 20.0 | 20.0 |
| Yellow Time (s) | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 3.0 | | 3.0 | 3.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | -1.0 | | 0.0 | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 6.0 | | | 6.0 | 5.0 | 5.0 |
| Lead/Lag | 0.0 | | | 0.0 | 0.0 | 0.0 |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | C-Max | C- | -Max | C-Max | None | None |
| Walk Time (s) | 7.0 | U- | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Dont Walk (s) | 14.0 | | 14.0 | 14.0 | 13.0 | 13.0 |
| Pedestrian Calls (#/hr) | 100 | | 7 | 7 | 16 | 16 |
| Act Effct Green (s) | 38.0 | | | 38.0 | 21.0 | 21.0 |
| Actuated g/C Ratio | 0.54 | | | 0.54 | 0.30 | 0.30 |
| v/c Ratio | 0.96 | | | 0.54 | 0.83 | 0.60 |
| Control Delay | 38.1 | | | 41.3 | 42.4 | 27.6 |
| Queue Delay | 0.0 | | | 0.0 | 0.0 | 0.0 |
| Total Delay | 38.1 | | | 41.3 | 42.4 | 27.6 |
| LOS | J0.1 | | | 41.3 D | 42.4 D | 21.0 C |
| Approach Delay | 38.1 | | | 41.3 | 36.8 | U |
| Approach LOS | J0.1 | | | 41.3 D | 30.0 D | |
| Approacti LOS | U | | | U | ט | |
| Intersection Summary | | | | | | |
| Area Type: | CBD | | | | | |
| Cycle Length: 70 | | | | | | |
| Actuated Cycle Length: 7 | 70 | | | | | |
| Offset: 6 (9%), Reference | ed to phase 2:E | BT and 6:W | /BTL, | Start of 1 | st Green | |
| Natural Cycle: 90 | · | | | | | |
| Control Type: Actuated-0 | Coordinated | | | | | |
| Maximum v/c Ratio: 0.97 | | | | | | |
| Intersection Signal Delay | | | | lr | ntersection | n LOS: D |
| Intersection Capacity Uti | | | | | | of Service |
| Analysis Period (min) 15 | | | | | | |
| , | | | | | | |
| Splits and Phases: 19 | 12: Atlantic Ave | & King St | | | | |
| • | | | | | | |
| →ø2 (R) | | | | | | |

1912: Atlantic Ave & King St

09/30/2021

| | - | • | 1 | |
|------------------------|-------|-------|-------|------|
| Lane Group | EBT | WBT | NBL | NBR |
| Lane Group Flow (vph) | 895 | 911 | 343 | 209 |
| v/c Ratio | 0.96 | 0.97 | 0.83 | 0.60 |
| Control Delay | 38.1 | 41.3 | 42.4 | 27.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 38.1 | 41.3 | 42.4 | 27.6 |
| Queue Length 50th (m) | 52.6 | 55.7 | 41.5 | 21.0 |
| Queue Length 95th (m) | #88.5 | #91.1 | #76.6 | 39.3 |
| Internal Link Dist (m) | 167.3 | 294.4 | 174.0 | |
| Turn Bay Length (m) | | | 30.0 | |
| Base Capacity (vph) | 935 | 938 | 414 | 346 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.96 | 0.97 | 0.83 | 0.60 |

HCM Signalized Intersection Capacity Analysis 1912: Atlantic Ave & King St

09/30/2021

| Movement |
|--|
| Lane Configurations Traffic Volume (vph) 697 73 4 779 295 180 Future Volume (vph) 697 73 4 779 295 180 Future Volume (vph) 697 73 4 779 295 180 Future Volume (vph) 1250 1250 1250 1250 1250 1250 1900 1900 1900 Lane Width 3.5 3.5 3.5 3.5 3.5 3.0 3.0 3.0 Total Lost time (s) 6.0 6.0 6.0 5.0 5.0 Lane Util. Factor 0.95 1.00 1.00 1.00 0.96 Fipb, ped/bikes 1.00 1.00 1.00 0.95 1.00 Frt 0.99 1.00 1.00 0.95 1.00 Frt 0.99 1.00 1.00 0.95 1.00 Fit Portocted 1.00 1.00 0.95 1.00 Satd. Flow (perm) 1703 1819 1383 1110 Fit Permitted 1.00 0.95 0.95 1.00 Satd. Flow (perm) 1703 1729 1383 1110 Peak-hour factor, PHF 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 |
| Traffic Volume (vph) 697 73 4 779 295 180 Future Volume (vph) 697 73 4 779 295 180 Ideal Flow (vphph) 1250 1250 1250 1250 1900 1900 Lane Width 3.5 3.5 3.5 3.5 3.0 3.0 Total Lost time (s) 6.0 6.0 5.0 5.0 Lane Width 3.5 3.5 3.5 3.5 3.0 3.0 Total Lost time (s) 6.0 6.0 5.0 5.0 Lane Util, Factor 0.95 0.95 1.00 1.00 0.96 Fripb, ped/bikes 1.00 1.00 0.95 1.00 Frpb, ped/bikes 1.00 1.00 0.95 1.00 Frit 0.99 1.00 1.00 0.95 1.00 Fit Protected 1.00 1.00 0.95 1.00 Satd. Flow (prot) 1703 1819 1383 1110 Fit Permitted 1.00 0.95 0.95 1.00 Satd. Flow (perm) 1703 1819 1383 1110 Fit Permitted 1.00 0.95 0.95 1.00 Satd. Flow (perm) 1703 1729 1383 1110 Peak-hour factor, PHF 0.86 0.86 0.86 0.86 0.86 0.86 Adj. Flow (vph) 810 85 5 906 343 209 RTOR Reduction (vph) 884 0 0 911 343 196 Confl. Bikes (#/hr) 5 Heavy Vehicles (%) 11% 6% 100% 10% 4% 17% Bus Blockages (#/hr) 24 24 24 24 0 0 Confl. Bikes (#/hr) 24 24 24 24 0 0 Tum Type NA Perm NA Perm Perm Pertotected Phases 6 8 8 Actuated Green, G (s) 37.0 3.0 3.0 3.0 Clearance Time (s) 7.0 7.0 6.0 6.0 |
| Future Volume (vph) 697 73 4 779 295 180 |
| Ideal Flow (vphpt) |
| Lane Width 3.5 3.5 3.5 3.5 3.0 3.0 Total Lost time (s) 6.0 6.0 5.0 5.0 5.0 Lane Util. Factor 0.95 0.95 1.00 1.00 0.96 Fipb, ped/bikes 0.95 1.00 1.00 0.96 Fipb, ped/bikes 1.00 1.00 0.95 1.00 1.00 0.96 Fipb, ped/bikes 1.00 1.00 0.95 1.00 1.00 0.95 1.00 Fit 0.99 1.00 1.00 0.95 1.00 Satd. Flow (prot) 1703 1819 1383 1110 Fit Permitted 1.00 0.95 0.95 1.00 Satd. Flow (prom) 1703 1819 1383 1110 Fit Permitted 1.00 0.95 0.95 1.00 Satd. Flow (prom) 1703 1729 1383 1110 Fit Permitted 1.00 0.95 0.95 0.95 1.00 Satd. Flow (prom) 1703 1729 1383 1110 Satd. Flow (prom) 1703 Satd. Flow (prom) 1704 Satd. Satd. Flow (prom) 1704 Satd. Satd. Flow (prom) 1705 Satd. Flow (|
| Total Lost time (s) 6.0 6.0 5.0 5.0 5.0 Lane Util. Factor 0.95 0.95 1.00 1.00 0.96 Firpb, ped/bikes 0.95 1.00 1.00 0.96 Firpb, ped/bikes 1.00 1.00 0.95 1.00 Fit 0.99 1.00 1.00 0.95 1.00 Satd. Flow (prot) 1703 1819 1383 1110 Fit Permitted 1.00 0.95 0.95 1.00 Satd. Flow (prot) 1703 1879 1383 1110 Fit Permitted 1.00 0.95 0.95 1.00 Satd. Flow (perm) 1703 1729 1383 1110 Fit Permitted 1.00 0.95 0.95 1.00 Satd. Flow (perm) 1703 1729 1383 1110 Fit Peak-hour factor, PHF 0.86 0.86 0.86 0.86 0.86 0.86 0.86 Adj. Flow (vph) 810 85 5 906 343 209 RTOR Reduction (vph) 11 0 0 0 0 13 Lane Group Flow (vph) 884 0 0 911 343 196 Coordi. Peds. (#hr) 387 387 49 30 Confl. Peds. (#hr) 5 Heavy Vehicles (%) 11% 6% 100% 10% 4% 17% Bus Blockages (#hr) 24 24 24 24 0 0 DITUM Type NA Perm NA Perm Perm Perm Perm Perm Perm Perm Perm |
| Lane Util. Factor 0.95 0.95 1.00 1.00 Frpb, ped/bikes 0.95 1.00 1.00 0.96 Flpb, ped/bikes 1.00 1.00 0.95 1.00 Frt 0.99 1.00 1.00 0.85 Flt Protected 1.00 1.00 0.95 1.00 Satd. Flow (prot) 1703 1819 1383 1110 Flt Permitted 1.00 0.95 0.95 1.00 Satd. Flow (perm) 1703 1729 1383 1110 Flt Permitted 1.00 0.95 0.95 1.00 Satd. Flow (perm) 1703 1729 1383 1110 Flt Permitted 1.00 0.95 0.95 1.00 Satd. Flow (perm) 1703 1729 1383 1110 Flt Permitted 1.00 0.95 0.95 1.00 Satd. Flow (perm) 1703 1729 1383 1110 Flt Permitted 1.00 0.95 0.95 0.95 1.00 Satd. Flow (perm) 1703 1729 1383 1110 Flt Permitted 1.00 0.05 0.95 0.95 1.00 Satd. Flow (perm) 1703 1729 1383 1110 Flt Permitted 1.00 0.05 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 |
| Frpb, ped/bikes |
| Fipb, ped/bikes |
| Fit Protected 1.00 1.00 0.85 Fit Protected 1.00 1.00 0.95 1.00 Satd. Flow (prot) 1703 1819 1383 1110 Fit Permitted 1.00 0.95 0.95 1.00 Satd. Flow (perm) 1703 1729 1383 1110 Peak-hour factor, PHF 0.86 0.86 0.86 0.86 0.86 0.86 Adj. Flow (vph) 810 85 5 906 343 209 RTOR Reduction (vph) 11 0 0 0 0 0 13 Lane Group Flow (vph) 884 0 0 911 343 196 Confl. Peds. (#hr) 387 387 49 30 Confl. Bikes (#hr) 5 Heavy Vehicles (%) 11% 6% 100% 10% 4% 17% Bus Blockages (#hr) 24 24 24 24 0 0 Turn Type NA Perm NA Perm Perm Protected Phases 2 6 Permitted Phases 6 8 8 8 Actuated Green, G (s) 37.0 37.0 20.0 20.0 Effective Green, g (s) 38.0 38.0 21.0 21.0 Actuated g/C Ratio 0.54 0.54 0.30 0.30 Clearance Time (s) 7.0 7.0 6.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 924 938 414 333 v/s Ratio Perm Co.53 c0.25 0.18 v/s Ratio Perm Co.54 c0.54 0.50 D D C Intersection Summary HCM 2000 Control Delay 35.8 HCM 2000 Level of Service D |
| Fit Protected |
| Satd. Flow (prot) 1703 1819 1383 1110 |
| Fit Permitted 1.00 0.95 0.95 1.00 Satd. Flow (perm) 1703 1729 1383 1110 Peak-hour factor, PHF 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 |
| Satd. Flow (perm) 1703 1729 1383 1110 |
| Peak-hour factor, PHF 0.86 0.96 0.96 0.96 0.96 0.97 0.83 0.96 0.97 0.83 0.59 0.96 0.97 0.83 0.59 |
| Adj. Flow (vph) 810 85 5 906 343 209 RTOR Reduction (vph) 11 0 0 0 0 13 Lane Group Flow (vph) 884 0 0 9911 343 196 Confl. Peds. (#hr) 387 387 49 30 Confl. Bikes (#hr) 5 Heavy Vehicles (%) 11% 6% 100% 10% 4% 17% Bus Blockages (#hr) 24 24 24 24 0 0 0 Turn Type NA Perm NA Perm Perm Protected Phases 2 6 8 8 Actuated Green, G (s) 37,0 37,0 20,0 20,0 Effective Green, g (s) 38.0 38.0 21.0 21.0 Actuated g/C Ratio 0.54 0.54 0.30 0.30 Clearance Time (s) 7.0 7.0 6.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 924 938 414 333 v/s Ratio Prot 0.52 v/s Ratio Prot 0.52 v/s Ratio Deta 15.2 15.5 22.8 20.8 Progression Factor 1.00 1.00 1.00 Incremental Delay, d1 15.2 15.5 22.8 20.8 Progression Factor 1.00 1.00 1.00 Incremental Delay, d2 20.7 23.2 12.8 2.6 Delay (s) 35.9 38.7 35.6 23.5 Level of Service D D D C Intersection Summary HCM 2000 Control Delay HCM 2000 Control Delay HCM 2000 Level of Service D |
| RTOR Reduction (vph) |
| Lane Group Flow (vph) 884 0 0 911 343 196 Confl. Peds. (#hr) 5 Heavy Vehicles (%) 11% 6% 100% 10% 4% 17% Bus Blockages (#hr) 24 24 24 24 0 0 Turn Type NA Perm NA Perm Perm Perrected Phases 2 Fermitted Phases 6 8 8 8 Actuated Green, G (s) 37.0 37.0 20.0 20.0 Effective Green, g (s) 38.0 38.0 21.0 21.0 Actuated g/C Ratio 0.54 0.54 0.30 0.30 Clearance Time (s) 7.0 7.0 6.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 924 938 414 333 V/s Ratio Prot 0.52 V/s Ratio Perm Cation 0.96 0.97 0.83 0.59 Uniform Delay, d1 15.2 15.5 22.8 20.8 Progression Factor 1.00 1.00 1.00 Incremental Delay, d2 20.7 23.2 12.8 2.6 Delay (s) 35.9 38.7 35.6 23.5 Level of Service D D D C Interesection Summary HCM 2000 Control Delay HCM 2000 Control Delay HCM 2000 Control Delay HCM 2000 Level of Service D |
| Confl. Peds. (#/hr) |
| Confi. Bikes (#hr) Heavy Vehicles (%) Bus Blockages (#hr) 24 24 24 24 24 20 0 0 Turn Type NA Perm NA Perm NA Perm NA Perm Perm Protected Phases 2 6 Permitted Phases 6 8 8 Actuated Green, G (s) 37.0 37.0 20.0 20.0 Effective Green, g (s) 38.0 38.0 21.0 21.0 Actuated g/C Ratio 0.54 0.54 0.54 0.54 0.30 0.30 Clearance Time (s) 7.0 7.0 6.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 924 938 414 333 v/s Ratio Prot v/s Ratio Perm c0.53 c0.25 0.18 v/c Ratio 0.96 0.97 0.83 0.59 Uniform Delay, d1 15.2 15.5 22.8 20.8 Progression Factor 1.00 1.0 |
| Heavy Vehicles (%) |
| Bus Blockages (#lhr) |
| Turn Type |
| Protected Phases 2 6 8 Permitted Phases 6 8 8 Actuated Green, G (s) 37.0 37.0 20.0 20.0 Effective Green, g (s) 38.0 38.0 21.0 21.0 Actuated g/C Ratio 0.54 0.54 0.30 0.30 Clearance Time (s) 7.0 7.0 6.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 924 938 414 333 Wes Ratio Prot 0.52 Ws Ratio Perm 0.52 Vs Ratio Perm 0.96 0.97 0.83 0.59 Uniform Delay, d1 15.2 15.5 22.8 20.8 Progression Factor 1.00 1.00 1.00 Incremental Delay, d2 20.7 23.2 12.8 2.6 Delay (s) 35.9 38.7 35.6 23.5 Level of Service D D D C Approach LOS D D C Intersection Summary HCM 2000 Control Delay B 35.8 HCM 2000 Level of Service D |
| Permitted Phases 6 8 8 8 Actuated Green, G (s) 37.0 37.0 20.0 20.0 Effective Green, g (s) 38.0 38.0 21.0 21.0 Actuated g/C Ratio 0.54 0.54 0.30 0.30 Clearance Time (s) 7.0 7.0 6.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 924 938 414 333 W/s Ratio Prot 0.52 W/s Ratio Perm c0.53 c0.25 0.18 W/c Ratio 0.96 0.97 0.83 0.59 Uniform Delay, d1 15.2 15.5 22.8 20.8 Progression Factor 1.00 1.00 1.00 1.00 Incremental Delay, d2 20.7 23.2 12.8 2.6 Delay (s) 35.9 38.7 35.6 23.5 Level of Service D D D C Approach LOS D D C Intersection Summary HCM 2000 Control Delay B S B HCM 2000 Level of Service D |
| Actuated Green, G (s) 37.0 37.0 20.0 20.0 Effective Green, g (s) 38.0 38.0 21.0 21.0 Actuated g/C Ratio 0.54 0.54 0.30 0.30 Clearance Time (s) 7.0 7.0 6.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 924 938 414 333 V/S Ratio Prot 0.52 V/S Ratio Prot 0.52 V/S Ratio Prot 0.52 V/S Ratio Prot 0.96 0.97 0.83 0.59 Uniform Delay, d1 15.2 15.5 22.8 20.8 Progression Factor 1.00 1.00 1.00 1.00 Incremental Delay, d2 20.7 23.2 12.8 2.6 Delay (s) 35.9 38.7 35.6 23.5 Level of Service D D D C Approach LOS D C C Intersection Summary HCM 2000 Centrol Delay B C C Intersection Summary |
| Effective Green, g (s) 38.0 38.0 21.0 21.0 Actuated g/C Ratio 0.54 0.54 0.30 0.30 0.30 0.54 0.54 0.30 0.30 0.30 0.54 0.54 0.30 0.30 0.30 0.54 0.54 0.30 0.30 0.30 0.54 0.54 0.30 0.30 0.30 0.54 0.55 0.55 0.55 0.55 0.55 0.55 0.5 |
| Actuated g/C Ratio 0.54 0.54 0.30 0.30 Clearance Time (s) 7.0 7.0 6.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 Vehicle Extension (s) 924 938 414 333 v/s Ratio Prot 0.52 v/s Ratio Perm 0.96 0.97 0.83 0.59 Uniform Delay, d1 15.2 15.5 22.8 20.8 Progression Factor 1.00 1.00 1.00 1.00 1.00 Incremental Delay, d2 20.7 23.2 12.8 2.6 Delay (s) 35.9 38.7 35.6 23.5 Level of Service D D D C Approach LOS D D C Intersection Summary HCM 2000 Control Delay S 7.0 5.8 PCM 2000 Level of Service D Intersection Summary |
| Clearance Time (s) 7.0 7.0 6.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 924 938 414 333 v/s Ratio Prot 0.52 v/s Ratio Perm c0.53 c0.25 0.18 v/c Ratio 0.96 0.97 0.83 0.59 Uniform Delay, d1 15.2 15.5 22.8 20.8 Progression Factor 1.00 1.00 1.00 1.00 Incremental Delay, d2 20.7 23.2 12.8 2.6 Delay (s) 35.9 38.7 35.6 23.5 Level of Service D D D C Approach Delay (s) 35.9 38.7 31.0 Approach LOS D D C Intersection Summary HCM 2000 Control Delay 35.8 HCM 2000 Level of Service D |
| Vehicle Extension (s) 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 924 938 414 333 v/s Ratio Prot 0.52 v/s Ratio Perm c0.53 c0.25 0.18 v/c Ratio 0.96 0.97 0.83 0.59 Uniform Delay, d1 15.2 15.5 22.8 20.8 Progression Factor 1.00 1.00 1.00 1.00 Incremental Delay, d2 20.7 23.2 12.8 2.6 Delay (s) 35.9 38.7 35.6 23.5 Level of Service D D D C Approach LOS D D C Intersection Summary HCM 2000 Control Delay 35.8 HCM 2000 Level of Service D |
| Lane Grp Cap (vph) 924 938 414 333 w/s Ratio Prot 0.52 v/s Ratio Perm 0.52 0.53 0.25 0.18 v/c Ratio 0.96 0.97 0.83 0.59 Uniform Delay, d1 15.2 15.5 22.8 20.8 Progression Factor 1.00 1.00 1.00 1.00 Incremental Delay, d2 20.7 23.2 12.8 2.6 Delay (s) 35.9 38.7 35.6 23.5 Level of Service D D D C Approach Delay (s) 35.9 38.7 31.0 Approach LOS D D C Intersection Summary HCM 2000 Control Delay 35.8 HCM 2000 Level of Service D |
| v/s Ratio Prot 0.52 v/s Ratio Perm c0.53 c0.25 0.18 v/s Ratio Perm c0.53 c0.25 0.18 v/s Ratio 0.96 0.97 0.83 0.59 Uniform Delay, d1 15.2 15.5 22.8 20.8 Progression Factor 1.00 1.00 1.00 1.00 Incremental Delay, d2 20.7 23.2 12.8 2.6 Delay (s) 35.9 38.7 35.6 23.5 Level of Service D D D C Approach Delay (s) 35.9 38.7 31.0 Approach LOS D D C Intersection Summary HCM 2000 Control Delay 35.8 HCM 2000 Level of Service D |
| v/s Ratio Perm c0.53 c0.25 0.18 v/c Ratio 0.96 0.97 0.83 0.59 Uniform Delay, d1 15.2 15.5 22.8 20.8 Progression Factor 1.00 1.00 1.00 1.00 Incremental Delay, d2 20.7 23.2 12.8 2.6 Delay (s) 35.9 38.7 35.6 23.5 Level of Service D D C Approach Delay (s) 35.9 38.7 31.0 Approach LOS D D C Intersection Summary HCM 2000 Control Delay 35.8 HCM 2000 Level of Service D |
| v/c Ratio 0.96 0.97 0.83 0.59 Uniform Delay, d1 15.2 15.5 22.8 20.8 Progression Factor 1.00 1.00 1.00 1.00 Incremental Delay, d2 20.7 23.2 12.8 2.6 Delay (s) 35.9 38.7 35.6 23.5 Level of Service D D D C Approach Delay (s) 35.9 38.7 31.0 Approach LOS D C Intersection Summary HCM 2000 Control Delay 35.8 HCM 2000 Level of Service D |
| Uniform Delay, d1 15.2 15.5 22.8 20.8 Progression Factor 1.00 1.00 1.00 1.00 Incremental Delay, d2 20.7 23.2 12.8 2.6 Delay (s) 35.9 38.7 35.6 23.5 Level of Service D D D D C Approach Delay (s) 35.9 38.7 31.0 Approach LOS D D D C Intersection Summary HCM 2000 Control Delay 35.8 HCM 2000 Level of Service D |
| Progression Factor 1.00 1.00 1.00 1.00 Incremental Delay, d2 20.7 23.2 12.8 2.6 Delay (s) 35.9 38.7 35.6 23.5 Level of Service D D D C Approach Delay (s) 35.9 38.7 31.0 Approach LOS D C Intersection Summary HCM 2000 Control Delay 35.8 HCM 2000 Level of Service D |
| Incremental Delay, d2 20.7 23.2 12.8 2.6 Delay (s) 35.9 38.7 35.6 23.5 Level of Service |
| Delay (s) 35.9 38.7 35.6 23.5 Level of Service D D D C Approach Delay (s) 35.9 38.7 31.0 Approach LOS D D C Intersection Summary HCM 2000 Control Delay 35.8 HCM 2000 Level of Service D |
| Level of Service D D D C Approach Delay (s) 35.9 38.7 31.0 Approach LOS D D C Intersection Summary HCM 2000 Control Delay 35.8 HCM 2000 Level of Service D |
| Approach Delay (s) 35.9 38.7 31.0 Approach LOS D D C Intersection Summary HCM 2000 Control Delay 35.8 HCM 2000 Level of Service D |
| Approach LOS D D C Intersection Summary HCM 2000 Control Delay 35.8 HCM 2000 Level of Service D |
| HCM 2000 Control Delay 35.8 HCM 2000 Level of Service D |
| HCM 2000 Control Delay 35.8 HCM 2000 Level of Service D |
| |
| |
| Actuated Cycle Length (s) 70.0 Sum of lost time (s) 12.0 |
| Intersection Capacity Utilization 68.4% ICU Level of Service C |
| Analysis Period (min) 15 |
| c Critical Lane Group |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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

Queue shown is maximum after two cycles.

| | • | → | ← | • | - | 1 |
|----------------------------|-------|--------------------|----------------|--------------|-------|-------|
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | LDL | 414 | ↑ ₽ | וטוו | ₩. | ODIN |
| Traffic Volume (vph) | 0 | €1 T 852 | T → 628 | 79 | 144 | 42 |
| | 0 | 852 | 628 | 79 79 | 144 | 42 |
| Future Volume (vph) | | | | | | |
| Ideal Flow (vphpl) | 1250 | 1250 | 1250 0.95 | 1250 0.95 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | | 0.95 | 1.00 | 1.00 |
| Ped Bike Factor | | | 0.99 | | 0.99 | |
| Frt | | | 0.983 | | 0.969 | |
| Flt Protected | _ | | | | 0.963 | _ |
| Satd. Flow (prot) | 0 | 1881 | 1821 | 0 | 1460 | 0 |
| FIt Permitted | | | | | 0.963 | |
| Satd. Flow (perm) | 0 | 1881 | 1821 | 0 | 1460 | 0 |
| Right Turn on Red | | | | Yes | | Yes |
| Satd. Flow (RTOR) | | | 35 | | 17 | |
| Link Speed (k/h) | | 50 | 50 | | 50 | |
| Link Distance (m) | | 316.7 | 191.3 | | 100.8 | |
| Travel Time (s) | | 22.8 | 13.8 | | 7.3 | |
| Confl. Peds. (#/hr) | 40 | | | 40 | | 23 |
| Confl. Bikes (#/hr) | | | | 1 | | |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 0.00 | 7% | 8% | 3% | 3% | 21% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 0 | 0 |
| | 0 | | 714 | 90 | 164 | 48 |
| Adj. Flow (vph) | 0 | 968 | / 14 | 90 | 104 | 48 |
| Shared Lane Traffic (%) | ^ | 000 | 00.4 | • | 040 | • |
| Lane Group Flow (vph) | 0 | 968 | 804 | 0 | 212 | 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 | | 3.5 | |
| Link Offset(m) | | 0.0 | 0.0 | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | 4.8 | | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.92 | 2.03 | 2.03 | 1.92 | 1.16 | 1.16 |
| Turning Speed (k/h) | 24 | 2.00 | | 14 | 24 | 14 |
| Number of Detectors | 1 | 2 | 2 | 17 | 1 | |
| Detector Template | Left | Thru | Thru | | Left | |
| Leading Detector (m) | 6.1 | 30.5 | 30.5 | | 6.1 | |
| | | | 0.0 | | 0.0 | |
| Trailing Detector (m) | 0.0 | 0.0 | | | | |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | 1.8 | | 6.1 | |
| Detector 1 Type | CI+Ex | CI+Ex | CI+Ex | | CI+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 2 Position(m) | | 28.7 | 28.7 | | | |
| Detector 2 Size(m) | | 1.8 | 1.8 | | | |
| Detector 2 Type | | CI+Ex | CI+Ex | | | |
| Detector 2 Channel | | JI. LX | JI-LX | | | |
| Detector 2 Extend (s) | | 0.0 | 0.0 | | | |
| (/ | | NA | NA | | Perm | |
| Turn Type | | ΝA | INA | | Perm | |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 43 Lanes, Volumes, Timings 2081: King St & Joe Shuster Way

| Lane Group EBL EBT WBT WBR SBL SBR |
|--|
| Permitted Phases 2 8 Detector Phase 2 2 6 8 Switch Phase 8 8 8 8 Minimum Initial (s) 20.0 20.0 20.0 18.0 Minimum Split (s) 26.0 26.0 26.0 23.0 Total Split (s) 57.0 57.0 57.0 23.0 Total Split (%) 71.3% 71.3% 71.3% 28.8% Maximum Green (s) 51.0 51.0 51.0 18.0 Yellow Time (s) 4.0 4.0 4.0 3.0 All-Red Time (s) 2.0 2.0 2.0 2.0 Lost Time Adjust (s) -1.0 -1.0 -1.0 -1.0 Total Lost Time (s) 5.0 5.0 4.0 |
| Detector Phase 2 2 6 8 Switch Phase Minimum Initial (s) 20.0 20.0 20.0 18.0 Minimum Split (s) 26.0 26.0 26.0 23.0 Total Split (s) 57.0 57.0 57.0 23.0 Total Split (%) 71.3% 71.3% 28.8% Maximum Green (s) 51.0 51.0 51.0 18.0 Yellow Time (s) 4.0 4.0 3.0 All-Red Time (s) 2.0 2.0 2.0 Lost Time Adjust (s) -1.0 -1.0 -1.0 -1.0 Total Lost Time (s) 5.0 5.0 4.0 |
| Switch Phase 30.0 20.0 20.0 18.0 Minimum Initial (s) 20.0 26.0 26.0 23.0 Total Split (s) 57.0 57.0 57.0 23.0 Total Split (%) 71.3% 71.3% 71.3% 28.8% Maximum Green (s) 51.0 51.0 51.0 18.0 Yellow Time (s) 4.0 4.0 3.0 All-Red Time (s) 2.0 2.0 2.0 Lost Time Adjust (s) -1.0 -1.0 -1.0 -1.0 -1.0 Total Lost Time (s) 5.0 5.0 4.0 4.0 4.0 |
| Minimum Initial (s) 20.0 20.0 20.0 18.0 Minimum Spiti (s) 26.0 26.0 26.0 23.0 Total Spiti (s) 57.0 57.0 57.0 23.0 Total Spiti (%) 71.3% 71.3% 71.3% 28.8% Maximum Green (s) 51.0 51.0 51.0 18.0 Yellow Time (s) 4.0 4.0 4.0 3.0 All-Red Time (s) 2.0 2.0 2.0 2.0 Lost Time Adjust (s) -1.0 -1.0 -1.0 -1.0 Total Lost Time (s) 5.0 5.0 4.0 |
| Minimum Split (s) 26.0 26.0 26.0 23.0 Total Split (s) 57.0 57.0 57.0 23.0 Total Split (%) 71.3% 71.3% 71.3% 28.8% Maximum Green (s) 51.0 51.0 51.0 18.0 Yellow Time (s) 4.0 4.0 4.0 3.0 All-Red Time (s) 2.0 2.0 2.0 Lost Time Adjust (s) -1.0 -1.0 -1.0 Total Lost Time (s) 5.0 5.0 4.0 |
| Total Split (s) 57.0 57.0 57.0 23.0 Total Split (%) 71.3% 71.3% 28.8% Maximum Green (s) 51.0 51.0 51.0 Yellow Time (s) 4.0 4.0 4.0 4.1-Red Time (s) 2.0 2.0 2.0 Lost Time Adjust (s) -1.0 -1.0 -1.0 Total Lost Time (s) 5.0 5.0 4.0 |
| Total Split (%) 71.3% 71.3% 28.8% Maximum Green (s) 51.0 51.0 51.0 18.0 Yellow Time (s) 4.0 4.0 3.0 All-Red Time (s) 2.0 2.0 2.0 Lost Time Adjust (s) -1.0 -1.0 -1.0 Total Lost Time (s) 5.0 5.0 4.0 |
| Maximum Green (s) 51.0 51.0 51.0 18.0 Yellow Time (s) 4.0 4.0 4.0 3.0 All-Red Time (s) 2.0 2.0 2.0 2.0 Lost Time Adjust (s) -1.0 -1.0 -1.0 Total Lost Time (s) 5.0 5.0 4.0 |
| Yellow Time (s) 4.0 4.0 4.0 3.0 All-Red Time (s) 2.0 2.0 2.0 2.0 Lost Time Adjust (s) -1.0 -1.0 -1.0 Total Lost Time (s) 5.0 5.0 4.0 |
| All-Red Time (s) 2.0 2.0 2.0 2.0 Lost Time Adjust (s) -1.0 -1.0 -1.0 Total Lost Time (s) 5.0 5.0 4.0 |
| Lost Time Adjust (s) -1.0 -1.0 -1.0 Total Lost Time (s) 5.0 5.0 4.0 |
| Total Lost Time (s) 5.0 5.0 4.0 |
| |
| Lead/Lag |
| |
| Lead-Lag Optimize? |
| Vehicle Extension (s) 3.0 3.0 3.0 3.0 |
| Recall Mode C-Max C-Max None None |
| Walk Time (s) 7.0 7.0 7.0 7.0 |
| Flash Dont Walk (s) 13.0 13.0 11.0 |
| Pedestrian Calls (#/hr) 100 100 13 7 |
| Act Effct Green (s) 52.0 52.0 19.0 |
| Actuated g/C Ratio 0.65 0.65 0.24 |
| v/c Ratio 0.79 0.67 0.59 |
| Control Delay 16.1 11.8 32.5 |
| Queue Delay 0.0 0.0 0.0 |
| Total Delay 16.1 11.8 32.5 |
| LOS B B C |
| Approach Delay 16.1 11.8 32.5 |
| Approach LOS B B C |
| Intersection Summary |
| Area Type: CBD |
| Cycle Length: 80 |
| Actuated Cycle Length: 80 |
| Offset: 1 (1%), Referenced to phase 2:EBTL, Start of Green |
| Natural Cycle: 65 |
| Control Type: Actuated-Coordinated |
| Maximum v/c Ratio: 0.79 |
| Intersection Signal Delay: 16.1 Intersection LOS: B |
| Intersection Capacity Utilization 62.3% ICU Level of Service B |
| Analysis Period (min) 15 |



Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

2081: King St & Joe Shuster Way

09/30/2021

| | - | ← | - |
|------------------------|-------|-------|------|
| Lane Group | EBT | WBT | SBL |
| Lane Group Flow (vph) | 968 | 804 | 212 |
| v/c Ratio | 0.79 | 0.67 | 0.59 |
| Control Delay | 16.1 | 11.8 | 32.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 |
| Total Delay | 16.1 | 11.8 | 32.5 |
| Queue Length 50th (m) | 49.4 | 33.2 | 26.3 |
| Queue Length 95th (m) | m34.1 | 49.9 | 46.3 |
| Internal Link Dist (m) | 292.7 | 167.3 | 76.8 |
| Turn Bay Length (m) | | | |
| Base Capacity (vph) | 1222 | 1195 | 359 |
| Starvation Cap Reductn | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.79 | 0.67 | 0.59 |
| Into ti O | | | |

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

HCM Signalized Intersection Capacity Analysis

2081: King St & Joe Shuster Way

09/30/2021

| | ၨ | - | ← | • | - | 4 | |
|---|-------|-------|-------------|----------------|------------|------------------|------|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR | |
| Lane Configurations | | 414 | ↑ 1> | | W | | |
| Traffic Volume (vph) | 0 | 852 | 628 | 79 | 144 | 42 | |
| Future Volume (vph) | 0 | 852 | 628 | 79 | 144 | 42 | |
| Ideal Flow (vphpl) | 1250 | 1250 | 1250 | 1250 | 1900 | 1900 | |
| Total Lost time (s) | .200 | 5.0 | 5.0 | 1200 | 4.0 | 1000 | |
| Lane Util. Factor | | 0.95 | 0.95 | | 1.00 | | |
| Frpb, ped/bikes | | 1.00 | 0.99 | | 0.99 | | |
| Flpb, ped/bikes | | 1.00 | 1.00 | | 1.00 | | |
| Frt | | 1.00 | 0.98 | | 0.97 | | |
| Flt Protected | | 1.00 | 1.00 | | 0.96 | | |
| Satd. Flow (prot) | | 1881 | 1821 | | 1460 | | |
| Flt Permitted | | 1.00 | 1.00 | | 0.96 | | |
| Satd. Flow (perm) | | 1881 | 1821 | | 1460 | | |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | |
| Adj. Flow (vph) | 0.00 | 968 | 714 | 90 | 164 | 48 | |
| RTOR Reduction (vph) | 0 | 0 | 12 | 0 | 13 | 0 | |
| Lane Group Flow (vph) | 0 | 968 | 792 | 0 | 199 | 0 | |
| Confl. Peds. (#/hr) | 40 | | | 40 | | 23 | |
| Confl. Bikes (#/hr) | | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 7% | 8% | 3% | 3% | 21% | |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 0 | 0 | |
| Turn Type | | NA | NA | | Perm | | |
| Protected Phases | | 2 | 6 | | | | |
| Permitted Phases | 2 | | | | 8 | | |
| Actuated Green, G (s) | | 51.0 | 51.0 | | 18.0 | | |
| Effective Green, q (s) | | 52.0 | 52.0 | | 19.0 | | |
| Actuated g/C Ratio | | 0.65 | 0.65 | | 0.24 | | |
| Clearance Time (s) | | 6.0 | 6.0 | | 5.0 | | |
| Vehicle Extension (s) | | 3.0 | 3.0 | | 3.0 | | |
| Lane Grp Cap (vph) | | 1222 | 1183 | | 346 | | |
| v/s Ratio Prot | | c0.51 | 0.43 | | | | |
| v/s Ratio Perm | | | | | c0.14 | | |
| v/c Ratio | | 0.79 | 0.67 | | 0.58 | | |
| Uniform Delay, d1 | | 10.1 | 8.7 | | 26.9 | | |
| Progression Factor | | 1.42 | 1.00 | | 1.00 | | |
| Incremental Delay, d2 | | 0.5 | 1.5 | | 2.3 | | |
| Delay (s) | | 14.9 | 10.1 | | 29.2 | | |
| Level of Service | | В | В | | С | | |
| Approach Delay (s) | | 14.9 | 10.1 | | 29.2 | | |
| Approach LOS | | В | В | | С | | |
| Intersection Summary | | | | | | | |
| HCM 2000 Control Delay | | | 14.5 | Н | CM 2000 | Level of Service | В |
| HCM 2000 Volume to Capacity | ratio | | 0.74 | 110 | JIVI 2000 | LOTOI OF OCTVICE | |
| Actuated Cycle Length (s) | | | 80.0 | Q ₁ | um of lost | time (s) | 10.0 |
| | | | | | | | |
| | 1 | | | | | (-) | |
| Intersection Capacity Utilization Analysis Period (min) | 1 | | 62.3% | | U Level o | (-) | В |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Lanes, Volumes, Timings 2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

09/30/2021

| | • | • | † | 1 | - | Į. |
|----------------------------|-------|-------|---------|-------|-------|----------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | * | 1 | | 7 | * | † |
| Traffic Volume (vph) | 14 | 61 | 443 | 30 | 146 | 677 |
| Future Volume (vph) | 14 | 61 | 443 | 30 | 146 | 677 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.0 | 3.5 | 3.0 | 3.0 | 3.5 |
| Storage Length (m) | 30.0 | 0.0 | | 15.0 | 30.0 | |
| Storage Lanes | 1 | 1 | | 1 | 1 | |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | 0.97 | 1.00 | |
| Frt | | 0.850 | | 0.850 | 1.00 | |
| Flt Protected | 0.950 | 0.000 | | 0.000 | 0.950 | |
| Satd. Flow (prot) | 1560 | 1113 | 1807 | 1370 | 1276 | 1807 |
| Flt Permitted | 0.950 | 1110 | 1001 | 1370 | 0.403 | 1001 |
| | 1560 | 1113 | 1807 | 1329 | 540 | 1807 |
| Satd. Flow (perm) | 0001 | | 1807 | | 540 | 1807 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | 22 | 73 | 20 | 16 | | 20 |
| Link Speed (k/h) | 30 | | 30 | | | 30 |
| Link Distance (m) | 148.7 | | 265.9 | | | 191.3 |
| Travel Time (s) | 17.8 | | 31.9 | _ | _ | 23.0 |
| Confl. Peds. (#/hr) | 0.0: | | 00: | 7 | 7 | 0.01 |
| Peak Hour Factor | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 |
| Heavy Vehicles (%) | 8% | 30% | 4% | 10% | 32% | 4% |
| Bus Blockages (#/hr) | 0 | 10 | 0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 17 | 73 | 527 | 36 | 174 | 806 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 17 | 73 | 527 | 36 | 174 | 806 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.0 | | 3.0 | | | 3.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 4.8 | | 4.8 | | | 4.8 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.09 | 1.15 | 1.01 | 1.09 | 1.09 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| Detector 1 Size(m) | | | | | | |
| Detector 1 Type | CI+Ex | CI+Ex | CI+Ex | CI+Ex | CI+Ex | CI+Ex |
| Detector 1 Channel | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | CI+Ex | | | CI+Ex |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 47

HDR Corporation

Lanes, Volumes, Timings 2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

09/30/2021

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| | • | • | † | / | - | ļ | |
|-------------------------------|-------------|-------------|---|-------------|-------------|--------------|---|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT | |
| Detector 2 Channel | | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | pm+ov | NA | Perm | pm+pt | NA | |
| Protected Phases | | 1 | 2 | | 1 | 6 | |
| Permitted Phases | 8 | 8 | | 2 | 6 | | |
| Detector Phase | 8 | 1 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 21.0 | 6.0 | 27.0 | 27.0 | 6.0 | 27.0 | |
| Minimum Split (s) | 26.0 | 10.0 | 34.0 | 34.0 | 10.0 | 34.0 | |
| Total Split (s) | 26.0 | 14.0 | 40.0 | 40.0 | 14.0 | 54.0 | |
| Total Split (%) | 32.5% | 17.5% | 50.0% | 50.0% | 17.5% | 67.5% | |
| Maximum Green (s) | 21.0 | 10.0 | 33.0 | 33.0 | 10.0 | 47.0 | |
| Yellow Time (s) | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 1.0 | 3.0 | 3.0 | 1.0 | 3.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | |
| Total Lost Time (s) | 4.0 | 3.0 | 6.0 | 6.0 | 3.0 | 6.0 | |
| Lead/Lag | 1.0 | Lead | Lag | Lag | Lead | 0.0 | |
| Lead-Lag Optimize? | | Loud | Lug | Lug | Loud | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | None | C-Max | C-Max | None | C-Max | |
| Walk Time (s) | 7.0 | INOTIC | 7.0 | 7.0 | 140110 | 0.0 | |
| Flash Dont Walk (s) | 14.0 | | 20.0 | 20.0 | | 0.0 | |
| Pedestrian Calls (#/hr) | 0 | | 20.0 | 20.0 | | 0.0 | |
| Act Effct Green (s) | 22.0 | 13.3 | 57.7 | 57.7 | 71.8 | 73.6 | |
| Actuated g/C Ratio | 0.28 | 0.17 | 0.72 | 0.72 | 0.90 | 0.92 | |
| v/c Ratio | 0.20 | 0.30 | 0.40 | 0.04 | 0.31 | 0.48 | |
| Control Delay | 21.7 | 8.2 | 8.7 | 5.8 | 2.5 | 2.4 | |
| Queue Delay | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 21.7 | 8.2 | 8.7 | 5.8 | 2.5 | 2.4 | |
| LOS | 21.7 C | 0.2 A | Α. | J.0 | 2.5 A | 2.4 A | |
| Approach Delay | 10.8 | | 8.5 | | | 2.4 | |
| Approach LOS | 10.0 B | | 0.5 A | | | 2.4 A | |
| Apploach Loo | D | | ^ | | | ^ | |
| Intersection Summary | | | | | | | |
| | Other | | | | | | |
| Cycle Length: 80 | | | | | | | |
| Actuated Cycle Length: 80 | | | | | | | |
| Offset: 15 (19%), Reference | ed to phase | 2:NBT a | nd 6:SBT | L, Start of | 1st Gree | n | |
| Natural Cycle: 70 | | | | | | | |
| Control Type: Actuated-Coo | ordinated | | | | | | |
| Maximum v/c Ratio: 0.48 | | | | | | | |
| Intersection Signal Delay: 5 | .0 | | | lr | ntersectio | n LOS: A | |
| Intersection Capacity Utiliza | ation 61.5% | | | IC | CU Level | of Service E | 3 |
| Analysis Period (min) 15 | | | | | | | |
| Splits and Phases: 2134: | British Col | ombia Ro | I/Dufferin | St & Sasl | katchewa | n Rd | |
| 12- | A | 01110101110 | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | 01 0 000 | tatorio ira | | |
| Ø1 | Tø2 (R) | | | | | | |
| 14 s 40 | S | | | | | | |
| . A | | | | | | | |
| ▼ Ø6 (R) | | | | | | | |

2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

09/30/2021

| | • | * | † | ~ | - | ţ |
|------------------------|-------|------|----------|------|------|-------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Group Flow (vph) | 17 | 73 | 527 | 36 | 174 | 806 |
| v/c Ratio | 0.04 | 0.30 | 0.40 | 0.04 | 0.31 | 0.48 |
| Control Delay | 21.7 | 8.2 | 8.7 | 5.8 | 2.5 | 2.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 21.7 | 8.2 | 8.7 | 5.8 | 2.5 | 2.4 |
| Queue Length 50th (m) | 1.9 | 0.0 | 15.7 | 0.4 | 0.0 | 0.0 |
| Queue Length 95th (m) | 5.9 | 5.6 | 86.8 | 6.3 | 11.0 | 41.7 |
| Internal Link Dist (m) | 124.7 | | 241.9 | | | 167.3 |
| Turn Bay Length (m) | 30.0 | | | 15.0 | 30.0 | |
| Base Capacity (vph) | 429 | 284 | 1302 | 962 | 585 | 1662 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 4 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.04 | 0.26 | 0.40 | 0.04 | 0.30 | 0.49 |
| Intersection Cummens | | | | | | |

HCM Signalized Intersection Capacity Analysis 2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

09/30/2021

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|-----------------------------------|----------|-------|----------|-------------|------------|----------------|------|
| Movement | WBL | WBR | NBT | NBR | SBL | SBT | |
| Lane Configurations | * | 7 | | 7 | * | † | |
| Traffic Volume (vph) | 14 | 61 | 443 | 30 | 146 | 677 | |
| Future Volume (vph) | 14 | 61 | 443 | 30 | 146 | 677 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Lane Width | 3.0 | 3.0 | 3.5 | 3.0 | 3.0 | 3.5 | |
| Total Lost time (s) | 4.0 | 3.0 | 6.0 | 6.0 | 3.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1560 | 1113 | 1807 | 1329 | 1274 | 1807 | |
| FIt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.40 | 1.00 | |
| Satd. Flow (perm) | 1560 | 1113 | 1807 | 1329 | 541 | 1807 | |
| Peak-hour factor, PHF | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | |
| Adj. Flow (vph) | 17 | 73 | 527 | 36 | 174 | 806 | |
| RTOR Reduction (vph) | 0 | 61 | 0 | 5 | 0 | 0 | |
| Lane Group Flow (vph) | 17 | 12 | 527 | 31 | 174 | 806 | |
| Confl. Peds. (#/hr) | | | | 7 | 7 | | |
| Heavy Vehicles (%) | 8% | 30% | 4% | 10% | 32% | 4% | |
| Bus Blockages (#/hr) | 0 | 10 | 0 | 0 | 0 | 0 | |
| Turn Type | Perm | pm+ov | NA | Perm | pm+pt | NA | |
| Protected Phases | | 1 | 2 | | 1 | 6 | |
| Permitted Phases | 8 | 8 | | 2 | 6 | | |
| Actuated Green, G (s) | 4.2 | 11.3 | 52.7 | 52.7 | 63.8 | 63.8 | |
| Effective Green, g (s) | 5.2 | 13.3 | 53.7 | 53.7 | 64.8 | 64.8 | |
| Actuated g/C Ratio | 0.07 | 0.17 | 0.67 | 0.67 | 0.81 | 0.81 | |
| Clearance Time (s) | 5.0 | 4.0 | 7.0 | 7.0 | 4.0 | 7.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 101 | 185 | 1212 | 892 | 512 | 1463 | |
| v/s Ratio Prot | | 0.01 | 0.29 | | 0.03 | c0.45 | |
| v/s Ratio Perm | c0.01 | 0.00 | | 0.02 | 0.24 | | |
| v/c Ratio | 0.17 | 0.07 | 0.43 | 0.03 | 0.34 | 0.55 | |
| Uniform Delay, d1 | 35.4 | 28.1 | 6.1 | 4.4 | 2.2 | 2.6 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 0.54 | 0.39 | |
| Incremental Delay, d2 | 0.8 | 0.2 | 1.1 | 0.1 | 0.3 | 1.3 | |
| Delay (s) | 36.1 | 28.3 | 7.2 | 4.5 | 1.5 | 2.3 | |
| Level of Service | D | С | Α | Α | Α | Α | |
| Approach Delay (s) | 29.8 | | 7.1 | | | 2.2 | |
| Approach LOS | С | | Α | | | Α | |
| ntersection Summary | | | | | | | |
| HCM 2000 Control Delay | | | 5.4 | Н | CM 2000 | Level of Servi | ce A |
| HCM 2000 Volume to Capaci | ty ratio | | 0.55 | | | | |
| Actuated Cycle Length (s) | | | 80.0 | S | um of lost | time (s) | 14.0 |
| Intersection Capacity Utilization | on | | 61.5% | | CU Level o | | В |
| Analysis Period (min) | | | 15 | | | | |
| Critical Lane Group | | | | | | | |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Lane Group

Lane Configurations

Traffic Volume (vph)

Future Volume (vph)

Ideal Flow (vphpl)

Lane Util. Factor

Ped Bike Factor

Satd. Flow (prot)

Satd. Flow (perm)

Right Turn on Red

Satd, Flow (RTOR)

Link Speed (k/h)

Link Distance (m)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr)

Peak Hour Factor

Adj. Flow (vph)

Lane Alignment

Median Width(m)

Headway Factor

Turning Speed (k/h)

Number of Detectors

Leading Detector (m)

Trailing Detector (m)

Detector 1 Size(m)

Detector 1 Channel

Detector 1 Extend (s)

Detector 1 Queue (s)

Detector 1 Delay (s)

Detector 2 Size(m)

Detector 2 Channel
Detector 2 Extend (s)

Protected Phases

Detector 2 Type

Turn Type

Detector 2 Position(m)

Detector 1 Type

Detector 1 Position(m)

Detector Template

Crosswalk Width(m)

Two way Left Turn Lane

Link Offset(m)

Bus Blockages (#/hr)

Shared Lane Traffic (%)

Lane Group Flow (vph)

Enter Blocked Intersection

Travel Time (s)

FIt Protected

Flt Permitted

EBL

16

1900 1900

1.00

878

0.90

18

0

Left

1.01

24

Left

6.1 30.5

0.0

0.0

6.1

0.0

0.0

→ ← **♦ ↓ ↓**

14

1900 1900

1.00 1.00

SBL

75 104

0.47

0.921

0.980

0.980

774

50

54.1

3.9

757

0.90

83 116

199

Left Right

3.5

0.0

4.8

Left

6.1

0.0

0.0

6.1

0.0

0.0

0.0

Perm

CI+Ex

0 1038

0

Yes

878

0.90

0

16

0

No

14 24

1900

1.00

0

0

Yes

853

0.90

0

14

EBT WBT

122

1900

1.00

0.986

1691

1691

14

40

198.4

0.90

0

136

No

Left Right

0.0

0.0

1.01

Thru

30.5

0.0

0.0

1.8

0.0

0.0

1.8 1.8 CI+Ex CI+Ex

0.0

NA

6

37

1.00

0.84

0.985

0.915

87.6

7.9 17.9

0.90

41

59 152

Left

0.0

0.0

4.8 4.8

1.09

Thru

0.0

0.0

1.8

0.0

0.0

28.7 28.7

0.0

NA

2

CI+Ex CI+Ex CI+Ex

0 1713

0 1338



Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 51 Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 52

9023: New Liberty St & Atlantic Ave

09/30/2021

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|------------------------|------|-------|-------------|
| | | | |
| Lane Group | EBT | WBT | SBL |
| Lane Group Flow (vph) | 59 | 152 | 199 |
| v/c Ratio | 0.08 | 0.17 | 0.75 |
| Control Delay | 10.2 | 9.7 | 32.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 |
| Total Delay | 10.2 | 9.7 | 32.2 |
| Queue Length 50th (m) | 3.0 | 7.3 | 14.0 |
| Queue Length 95th (m) | 8.9 | 17.6 | #37.8 |
| Internal Link Dist (m) | 63.6 | 174.4 | 30.1 |
| Turn Bay Length (m) | | | |
| Base Capacity (vph) | 715 | 910 | 325 |
| Starvation Cap Reductn | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.08 | 0.17 | 0.61 |
| | | | |

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 9023: New Liberty St & Atlantic Ave

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|---|------------|------------|----------|-------------|-------------|------------------|----|----|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR | | |
| Lane Configurations | | 4 | <u></u> | · · · · · · | W | 02.1 | | |
| Traffic Volume (vph) | 16 | 37 | 122 | 14 | 75 | 104 | | |
| Future Volume (vph) | 16 | 37 | 122 | 14 | 75 | 104 | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | | |
| Total Lost time (s) | 1000 | 5.0 | 5.0 | 1000 | 5.0 | 1000 | | |
| Lane Util. Factor | | 1.00 | 1.00 | | 1.00 | | | |
| Frpb, ped/bikes | | 1.00 | 0.93 | | 0.62 | | | |
| Flpb, ped/bikes | | 0.84 | 1.00 | | 0.75 | | | |
| Frt | | 1.00 | 0.99 | | 0.73 | | | |
| Flt Protected | | 0.98 | 1.00 | | 0.98 | | | |
| Satd. Flow (prot) | | 1440 | 1691 | | 774 | | | |
| Flt Permitted | | 0.92 | 1.00 | | 0.98 | | | |
| Satd. Flow (perm) | | 1339 | 1691 | | 774 | | | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | | |
| | 18 | 0.90 41 | 136 | 16 | 83 | 116 | | |
| Adj. Flow (vph) RTOR Reduction (vph) | 0 | 0 | 7 | 0 | 1 | 0 | | |
| | 0 | 59 | 145 | 0 | 198 | 0 | | |
| Lane Group Flow (vph) Confl. Peds. (#/hr) | 878 | 59 | 140 | 878 | 757 | 853 | | |
| Confl. Bikes (#/hr) | 010 | | | 8 | 101 | 000 | | |
| | 0 | 14 | 0 | 0 | 0 | 0 | | |
| Bus Blockages (#/hr) | | | NA | U | | U | | |
| Turn Type | Perm | NA | | | Perm | | | |
| Protected Phases | _ | 2 | 6 | | | | | |
| Permitted Phases | 2 | 00.5 | 00.5 | | 4 | | | |
| Actuated Green, G (s) | | 23.5 | 23.5 | | 14.5 | | | |
| Effective Green, g (s) | | 24.5 | 24.5 | | 15.5 | | | |
| Actuated g/C Ratio | | 0.49 | 0.49 | | 0.31 | | | |
| Clearance Time (s) | | 6.0 | 6.0 | | 6.0 | | | |
| Vehicle Extension (s) | | 3.0 | 3.0 | | 3.0 | | | |
| Lane Grp Cap (vph) | | 656 | 828 | | 239 | | | |
| v/s Ratio Prot | | 0.07 | c0.09 | | | | | |
| v/s Ratio Perm | | 0.04 | | | c0.26 | | | |
| v/c Ratio | | 0.09 | 0.17 | | 0.83 | | | |
| Uniform Delay, d1 | | 6.8 | 7.1 | | 16.0 | | | |
| Progression Factor | | 1.00 | 1.00 | | 1.00 | | | |
| Incremental Delay, d2 | | 0.3 | 0.5 | | 20.6 | | | |
| Delay (s) | | 7.1 | 7.6 | | 36.6 | | | |
| Level of Service | | A | A | | D | | | |
| Approach Delay (s) | | 7.1 | 7.6 | | 36.6 | | | |
| Approach LOS | | Α | Α | | D | | | |
| ntersection Summary | | | | | | | | |
| HCM 2000 Control Delay | | | 21.6 | H | CM 2000 | Level of Service |) | С |
| HCM 2000 Volume to Capa | city ratio | | 0.44 | | | | | |
| Actuated Cycle Length (s) | | | 50.0 | Sı | um of lost | time (s) | 11 | .0 |
| Intersection Capacity Utiliza | ation | | 41.7% | | U Level c | | | Α |
| Analysis Period (min) | | | 15 | | | | | |
| c Critical Lane Group | | | | | | | | |
| | | | | | | | | |

Lanes, Volumes, Timings 9024: Dufferin St & New Liberty St

09/30/2021

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|------------------------------------|-------|-------|----------|--------|-------|----------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | ኘ | 7 | 1 | | * | <u> </u> |
| Traffic Volume (vph) | 173 | 56 | 392 | 128 | 21 | 669 |
| Future Volume (vph) | 173 | 56 | 392 | 128 | 21 | 669 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 15.0 | 0.0 | 1000 | 0.0 | 0.0 | 1000 |
| Storage Lanes | 13.0 | 1 | | 0.0 | 1 | |
| | 7.5 | | | U | 7.5 | |
| Taper Length (m) Lane Util, Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 1.00 | 0.62 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | 0.967 | | | |
| | 0.050 | 0.830 | 0.967 | | 0.050 | |
| Fit Protected | 0.950 | 1500 | 1704 | 0 | 0.950 | 1040 |
| Satd. Flow (prot) | 1750 | 1566 | 1781 | 0 | 1750 | 1842 |
| Flt Permitted | 0.950 | | 4707 | _ | 0.393 | 10.15 |
| Satd. Flow (perm) | 1750 | 971 | 1781 | 0 | 724 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 62 | 40 | | | |
| Link Speed (k/h) | 40 | | 30 | | | 30 |
| Link Distance (m) | 107.6 | | 191.3 | | | 74.7 |
| Travel Time (s) | 9.7 | | 23.0 | | | 9.0 |
| Confl. Peds. (#/hr) | | 163 | | | | |
| Confl. Bikes (#/hr) | | 5 | | | | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 192 | 62 | 436 | 142 | 23 | 743 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 192 | 62 | 578 | 0 | 23 | 743 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | ragnt | 3.5 | rugill | Loit | 3.5 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 4.8 | | 4.8 | | | 4.8 |
| (/ | 4.8 | | 4.0 | | | 4.8 |
| Two way Left Turn Lane | 4.04 | 1.04 | 4.04 | 4.04 | 4.04 | 4.04 |
| Headway Factor | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | 1 | 2 |
| Detector Template | Left | Right | Thru | | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | 6.1 | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | 6.1 | 1.8 |
| Detector 1 Type | CI+Ex | CI+Ex | CI+Ex | | CI+Ex | CI+Ex |
| Detector 1 Channel | | | | | - | - |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 2 Position(m) | 0.0 | 0.0 | 28.7 | | 0.0 | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| | | | CI+Ex | | | |
| Detector 2 Type | | | UI+EX | | | CI+Ex |
| Detector 2 Channel | | | 0.0 | | | 0.0 |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 55 Lanes, Volumes, Timings

9024: Dufferin St & New Liberty St

09/30/2021

| rm Type | | € | • | † | | - | ţ | |
|--|-------------------------------|----------------|-----------|------------|--------------|---------|---------------|--|
| Image | Lane Group | WBL | WBR | NBT | NBR | SBL | SBT | |
| Contected Phases 2 6 6 | Turn Type | Perm | Perm | NA | | Perm | NA | |
| ###################################### | Protected Phases | | | | | | | |
| etector Phase witch Phase witc | Permitted Phases | 8 | 8 | | | 6 | | |
| witch Phase inimum Initial (s) 7.0 7.0 7.0 7.0 7.0 7.0 inimum Split (s) 24.0 24.0 24.0 24.0 24.0 tal Split (s) 24.0 24.0 56.0 56.0 56.0 56.0 tal Split (w) 30.0% 30.0% 70.0% 70.0% 70.0% aximum Green (s) 18.0 18.0 50.0 50.0 50.0 50.0 eximum Green (s) 18.0 18.0 50.0 50.0 50.0 50.0 eximum Green (s) 18.0 18.0 50.0 50.0 50.0 50.0 eximum Green (s) 18.0 18.0 50.0 50.0 50.0 50.0 eximum Green (s) 18.0 18.0 50.0 50.0 50.0 50.0 eximum Green (s) 18.0 18.0 50.0 50.0 50.0 50.0 eximum Green (s) 18.0 18.0 50.0 50.0 50.0 50.0 eximum Green (s) 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 exit Line (s) 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 exall Mode None C-Max C-Max C-Max C-Max C-Max C-Max C-Max G-Max | Detector Phase | | | 2 | | | 6 | |
| inimum Initial (s) 7.0 7.0 7.0 7.0 7.0 inimum Split (s) 24.0 24.0 24.0 24.0 24.0 24.0 24.0 24.0 | Switch Phase | | | | | | | |
| inimum Split (s) | Minimum Initial (s) | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| total Split (s) 24.0 24.0 56.0 56.0 56.0 56.0 56.0 56.0 56.0 56 | Minimum Split (s) | | | | | | | |
| total Spitt (%) 30.0% 30.0% 70.0% 70.0% 70.0% aximum Green (s) 18.0 18.0 50.0 50.0 50.0 50.0 50.0 set Time (s) 4.0 4.0 4.0 4.0 4.0 4.0 4.0 set Time (s) 2.0 2.0 2.0 2.0 2.0 2.0 2.0 set Time Adjust (s) -1.0 -1.0 -1.0 -1.0 -1.0 -1.0 -1.0 set Time (s) 5.0 5.0 5.0 5.0 5.0 5.0 5.0 set Time Adjust (s) -1.0 -1.0 -1.0 -1.0 -1.0 -1.0 set Time (s) set Time (s) 5.0 5.0 5.0 5.0 5.0 5.0 5.0 set Time Adjust (s) -1.0 -1.0 -1.0 -1.0 -1.0 -1.0 set Time (s) set Time (s) 5.0 5.0 5.0 5.0 5.0 5.0 set Time Adjust (s) set Time (s) 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 | Total Split (s) | | | | | | | |
| aximum Green (s) 18.0 18.0 50.0 50.0 50.0 50.0 solutions (s) 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 | Total Split (%) | | | | | | | |
| Sellow Time (s) | Maximum Green (s) | | | | | | | |
| I-Red Time (s) | Yellow Time (s) | | | | | | | |
| set Time Adjust (s) | All-Red Time (s) | | | | | | | |
| tal Lost Time (s) 5.0 5.0 5.0 5.0 5.0 5.0 sad/Lag sad/Lag Optimize? shicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 acall Mode None None C-Max C-Max C-Max alk Time (s) 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 3.0 ash Dont Walk (s) 11.0 11.0 11.0 11.0 11.0 11.0 11.0 section Capacity Other (s) 14.7 14.7 55.3 55.3 55.3 55.3 55.3 55.3 55.3 55 | Lost Time Adjust (s) | | | | | | | |
| add-Lag Optimize? shicle Extension (s) | | | | | | | | |
| Pad-Lag Optimize? Pathicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 | | 5.0 | 5.0 | 5.0 | | 5.0 | 0.0 | |
| An analysis Period Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 | | | | | | | | |
| None None C-Max C-Max C-Max | | 3.0 | 3.0 | 3 በ | | 3 0 | 3.0 | |
| alk Time (s) 7.0 7.0 7.0 7.0 7.0 7.0 ash Dont Walk (s) 11.0 11.0 11.0 11.0 11.0 11.0 11.0 11. | | | | | - | | | |
| ash Dont Walk (s) | | | | | , | | | |
| adestrian Calls (#/hr) | () | | | | | | | |
| tell Effct Green (s) 14.7 14.7 55.3 55.3 55.3 tutated g/C Ratio 0.18 0.18 0.69 0.69 0.69 0.69 0.69 0.69 0.69 0.69 | | | | | | | | |
| Catalog Cata | | | | | | | | |
| c Ratio | | | | | | | | |
| ## Service Body 37.2 10.6 11.6 3.2 5.5 ## Service Body 30.7 11.6 3.2 5.5 ## Service Body 30.7 11.6 5.4 ## Service Body 5.5 ## Servi | | | | | | | | |
| ueue Delay | | | | | | | | |
| Stal Delay 37.2 10.6 11.6 3.2 5.5 S | | | | | | | | |
| DS D B B A A A A proceed by 30.7 11.6 5.4 proceed by 30.7 11.6 pr | Queue Delay | | | | | | | |
| proach Delay 30.7 11.6 5.4 proach LOS C B A tersection Summary ea Type: Other yole Length: 80 ctuated Cycle Length: 80 fiset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green attural Cycle: 60 ontrol Type: Actuated-Coordinated aximum v/c Ratio: 0.60 tersection Signal Delay: 11.7 Intersection LOS: B tersection Capacity Utilization 58.5% ICU Level of Service B halysis Period (min) 15 libits and Phases: 9024: Dufferin St & New Liberty St | Total Delay | | | | | | | |
| proach LOS C B A tersection Summary rea Type: Other yole Length: 80 tutated Cycle Length: 80 fiset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green atural Cycle: 60 control Type: Actuated-Coordinated aximum v/c Ratio: 0.60 tersection Capacity Utilization 58.5% ICU Level of Service B halysis Period (min) 15 Journal Cycle: 80 Journ | LOS | | В | | | Α | | |
| tersection Summary ea Type: Other ycle Length: 80 tutated Cycle Length: 80 ffset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green atural Cycle: 60 ontrol Type: Actuated-Coordinated aximum v/c Ratio: 0.60 tersection Signal Delay: 11.7 Intersection LOS: B tersection Capacity Utilization 58.5% ICU Level of Service B halysis Period (min) 15 Jolits and Phases: 9024: Dufferin St & New Liberty St | Approach Delay | | | | | | | |
| rea Type: Other ycle Length: 80 ttuated Cycle Length: 80 ffset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green atural Cycle: 60 ontrol Type: Actuated-Coordinated aximum v/c Ratio: 0.60 tersection Signal Delay: 11.7 Intersection LOS: B tersection Capacity Utilization 58.5% ICU Level of Service B halysis Period (min) 15 Journal Cycle: 60 Journal Cycle: 60 ICU Level of Service B Journal Cycle: 60 Journ | Approach LOS | С | | В | | | Α | |
| ycle Length: 80 tuated Cycle Length: 80 ffset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green atural Cycle: 60 ontrol Type: Actuated-Coordinated aximum v/c Ratio: 0.60 teresection Signal Delay: 11.7 Intersection LOS: B teresection Capacity Utilization 58.5% ICU Level of Service B halysis Period (min) 15 Dilits and Phases: 9024: Dufferin St & New Liberty St | Intersection Summary | | | | | | | |
| Stuated Čycle Length: 80 ffset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green attural Cycle: 60 ontrol Type: Actuated-Coordinated aximum v/c Ratio: 0.60 tersection Signal Delay: 11.7 Intersection LOS: B tersection Capacity Utilization 58.5% ICU Level of Service B halysis Period (min) 15 Dilits and Phases: 9024: Dufferin St & New Liberty St | Area Type: | Other | | | | | | |
| cituated Čycle Length: 80 ffset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green attural Cycle: 60 ontrol Type: Actuated-Coordinated aximum v/c Ratio: 0.60 tersection Signal Delay: 11.7 Intersection LOS: B tersection Capacity Utilization 58.5% ICU Level of Service B halysis Period (min) 15 Dilits and Phases: 9024: Dufferin St & New Liberty St | Cycle Length: 80 | | | | | | | |
| ffset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green atural Cycle: 60 notical Type: Actuated-Coordinated eximum v/c Ratio: 0.60 tersection Signal Delay: 11.7 tersection Capacity Utilization 58.5% lCU Level of Service B nalysis Period (min) 15 lits and Phases: 9024: Dufferin St & New Liberty St | Actuated Cycle Length: 80 |) | | | | | | |
| atural Cycle: 60 ontrol Type: Actuated-Coordinated aximum v/c Ratio: 0.60 tersection Signal Delay: 11.7 Intersection LOS: B tersection Capacity Utilization 58.5% ICU Level of Service B halysis Period (min) 15 Dilits and Phases: 9024: Dufferin St & New Liberty St | | | NBT and | 6:SBTL. S | Start of Gre | en | | |
| ontrol Type: Actuated-Coordinated aximum v/c Ratio: 0.60 tersection Signal Delay: 11.7 tersection Capacity Utilization 58.5% lcu Level of Service B halysis Period (min) 15 Dilits and Phases: 9024: Dufferin St & New Liberty St | Natural Cycle: 60 | | 2 . 2.10 | , 0 | | | | |
| aximum v/c Ratio: 0.60 tersection Signal Delay: 11.7 tersection Capacity Utilization 58.5% tCU Level of Service B halysis Period (min) 15 Dilits and Phases: 9024: Dufferin St & New Liberty St | | oordinated | | | | | | |
| tersection Signal Delay: 11.7 Intersection LOS: B tersection Capacity Utilization 58.5% ICU Level of Service B nalysis Period (min) 15 Dilits and Phases: 9024: Dufferin St & New Liberty St 22 (R) 55 5 | Maximum v/c Ratio: 0.60 | | | | | | | |
| tersection Capacity Utilization 58.5% ICU Level of Service B nalysis Period (min) 15 Dilts and Phases: 9024: Dufferin St & New Liberty St | | 11 7 | | | Inte | rsectio | n I OS: B | |
| nalysis Period (min) 15 Dilits and Phases: 9024: Dufferin St & New Liberty St 02 (R) 55 | | | | | | | | |
| Dilits and Phases: 9024: Dufferin St & New Liberty St | | | | | 100 | LOVE | OI OOI VICE D | |
| 1 02 (R) | raidiyələ i Gilou (illill) 13 | | | | | | | |
| 1 02 (R) | Splits and Phases: 9024 | 4: Dufferin St | t & New L | Liberty St | | | | |
| 6s | | | | , | | | | |
| 05 S | I Ø2 (R) | | | | | | _ | |
| Ø6 (R) | 56 s | | | | | | | |
| T DO (IV) | (D) | | | | | | | |
| | 56 s | | | | | | | |

Scenario 1 Future Background AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

9024: Dufferin St & New Liberty St

09/30/2021

| | • | • | † | - | ļ |
|------------------------|------|------|----------|------|-------|
| Lane Group | WBL | WBR | NBT | SBL | SBT |
| Lane Group Flow (vph) | 192 | 62 | 578 | 23 | 743 |
| v/c Ratio | 0.60 | 0.27 | 0.47 | 0.05 | 0.58 |
| Control Delay | 37.2 | 10.6 | 11.6 | 3.2 | 5.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 37.2 | 10.6 | 11.6 | 3.2 | 5.5 |
| Queue Length 50th (m) | 26.9 | 0.0 | 31.4 | 0.5 | 32.3 |
| Queue Length 95th (m) | 43.9 | 9.1 | 121.2 | m0.9 | m56.6 |
| Internal Link Dist (m) | 83.6 | | 167.3 | | 50.7 |
| Turn Bay Length (m) | 15.0 | | | | |
| Base Capacity (vph) | 415 | 277 | 1242 | 500 | 1273 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.46 | 0.22 | 0.47 | 0.05 | 0.58 |

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

| | • | • | † | / | > | ↓ | | |
|-------------------------------|------------|------|----------|-------|-------------|----------------|----|--|
| Movement | WBL | WBR | NBT | NBR | SBL | SBT | | |
| Lane Configurations | * | 7 | ₽ | | * | † | | |
| Traffic Volume (vph) | 173 | 56 | 392 | 128 | 21 | 669 | | |
| Future Volume (vph) | 173 | 56 | 392 | 128 | 21 | 669 | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | | |
| Total Lost time (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | |
| Frpb, ped/bikes | 1.00 | 0.62 | 1.00 | | 1.00 | 1.00 | | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | |
| Frt | 1.00 | 0.85 | 0.97 | | 1.00 | 1.00 | | |
| Flt Protected | 0.95 | 1.00 | 1.00 | | 0.95 | 1.00 | | |
| Satd. Flow (prot) | 1750 | 969 | 1781 | | 1750 | 1842 | | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | 0.39 | 1.00 | | |
| Satd. Flow (perm) | 1750 | 969 | 1781 | | 724 | 1842 | | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | | |
| Adj. Flow (vph) | 192 | 62 | 436 | 142 | 23 | 743 | | |
| RTOR Reduction (vph) | 0 | 51 | 12 | 0 | 0 | 0 | | |
| Lane Group Flow (vph) | 192 | 11 | 566 | 0 | 23 | 743 | | |
| Confl. Peds. (#/hr) | | 163 | | | | | | |
| Confl. Bikes (#/hr) | | 5 | | | | | | |
| Turn Type | Perm | Perm | NA | | Perm | NA | | |
| Protected Phases | | | 2 | | | 6 | | |
| Permitted Phases | 8 | 8 | | | 6 | | | |
| Actuated Green, G (s) | 13.7 | 13.7 | 54.3 | | 54.3 | 54.3 | | |
| Effective Green, g (s) | 14.7 | 14.7 | 55.3 | | 55.3 | 55.3 | | |
| Actuated g/C Ratio | 0.18 | 0.18 | 0.69 | | 0.69 | 0.69 | | |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | | |
| Lane Grp Cap (vph) | 321 | 178 | 1231 | | 500 | 1273 | | |
| v/s Ratio Prot | | | 0.32 | | | c0.40 | | |
| v/s Ratio Perm | c0.11 | 0.01 | | | 0.03 | | | |
| v/c Ratio | 0.60 | 0.06 | 0.46 | | 0.05 | 0.58 | | |
| Uniform Delay, d1 | 29.9 | 27.0 | 5.6 | | 3.9 | 6.4 | | |
| Progression Factor | 1.00 | 1.00 | 1.74 | | 0.63 | 0.71 | | |
| Incremental Delay, d2 | 3.0 | 0.2 | 1.2 | | 0.0 | 0.2 | | |
| Delay (s) | 32.9 | 27.1 | 10.9 | | 2.5 | 4.7 | | |
| Level of Service | С | С | В | | Α | Α | | |
| Approach Delay (s) | 31.5 | | 10.9 | | | 4.7 | | |
| Approach LOS | С | | В | | | Α | | |
| Intersection Summary | | | | | | | | |
| HCM 2000 Control Delay | | | 11.2 | Н | CM 2000 | Level of Servi | `p | |
| HCM 2000 Volume to Capa | city ratio | | 0.59 | - 110 | OW 2000 | LOVE OF OCIVI | | |
| Actuated Cycle Length (s) | ony radio | | 80.0 | Si | um of lost | time (s) | | |
| Intersection Capacity Utiliza | ation | | 58.5% | | | of Service | | |
| Analysis Period (min) | | | 15 | 10 | | J. 501 1100 | | |
| 0.00 1000 (11111) | | | 10 | | | | | |

c Critical Lane Group

| | • | • | 4 | † | ↓ | ✓ | |
|-------------------------------|-----------|------|-------|----------|-------------|---------|---|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR | |
| Lane Configurations | * | 7 | Ţ | † | † | | |
| Traffic Volume (veh/h) | 0 | 81 | 0 | 552 | 372 | 86 | |
| Future Volume (Veh/h) | 0 | 81 | 0 | 552 | 372 | 86 | |
| 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 | 90 | 0 | 613 | 413 | 96 | |
| Pedestrians | | | | | | | |
| Lane Width (m) | | | | | | | |
| Walking Speed (m/s) | | | | | | | |
| Percent Blockage | | | | | | | |
| Right turn flare (veh) | | | | | | | |
| Median type | | | | None | None | | |
| Median storage veh) | | | | | | | |
| Upstream signal (m) | | | | 241 | | | |
| pX, platoon unblocked | 0.86 | | | | | | |
| vC, conflicting volume | 1074 | 461 | 509 | | | | |
| vC1, stage 1 conf vol | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | |
| vCu, unblocked vol | 1006 | 461 | 509 | | | | |
| 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 | 85 | 100 | | | | |
| cM capacity (veh/h) | 231 | 600 | 1056 | | | | |
| Direction. Lane # | EB 1 | EB 2 | NB 1 | NB 2 | SB 1 | | |
| Volume Total | 0 | 90 | 0 | 613 | 509 | | |
| Volume Left | 0 | 0 | 0 | 013 | 0 | | |
| Volume Right | 0 | 90 | 0 | 0 | 96 | | |
| volume Right cSH | 1700 | 600 | 1700 | 1700 | 1700 | | |
| Volume to Capacity | 0.00 | 0.15 | 0.00 | 0.36 | 0.30 | | |
| | | | | 0.36 | 0.30 | | |
| Queue Length 95th (m) | 0.0 | 4.0 | 0.0 | | | | |
| Control Delay (s) Lane LOS | 0.0 A | 12.0 | 0.0 | 0.0 | 0.0 | | |
| | | В | 0.0 | | 0.0 | | |
| Approach Delay (s) | 12.0 B | | 0.0 | | 0.0 | | |
| Approach LOS | В | | | | | | |
| Intersection Summary | | | | | | | |
| Average Delay | | | 0.9 | | | | |
| Intersection Capacity Utili: | zation | | 36.5% | IC | CU Level of | Service | Α |
| Analysis Period (min) | | | 15 | | | | |

HCM Unsignalized Intersection Capacity Analysis 9025: Strachan Ave & New Liberty St

Lanes, Volumes, Timings 97: Yukon Place & British Colombia Rd

09/30/2021

| | ၨ | - | • | • | ← | • | 4 | † | <i>></i> | - | ļ | 4 |
|----------------------------|-------|-----------|-------|-------|----------|-------|-------|-------|-------------|-------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ሻ | \$ | | 7 | † | 7 | | 4 | | | 4 | |
| Traffic Volume (vph) | 1 | 423 | 0 | 1 | 308 | 1 | 7 | 1 | 0 | 0 | 0 | 26 |
| Future Volume (vph) | 1 | 423 | 0 | 1 | 308 | 1 | 7 | 1 | 0 | 0 | 0 | 26 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 20.0 | | 20.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| 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 |
| Ped Bike Factor | | | | 1.00 | | | | 0.99 | | | 0.97 | |
| Frt | | | | | | 0.850 | | | | | 0.865 | |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.957 | | | | |
| Satd. Flow (prot) | 1685 | 1824 | 0 | 1685 | 1756 | 1507 | 0 | 1798 | 0 | 0 | 1574 | 0 |
| Flt Permitted | 0.555 | | | 0.494 | | | | | | | | |
| Satd. Flow (perm) | 984 | 1824 | 0 | 874 | 1756 | 1507 | 0 | 1860 | 0 | 0 | 1574 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | | 45 | | | | | 514 | |
| Link Speed (k/h) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (m) | | 164.9 | | | 265.9 | | | 92.0 | | | 121.3 | |
| Travel Time (s) | | 19.8 | | | 31.9 | | | 11.0 | | | 14.6 | |
| Confl. Peds. (#/hr) | | | 2 | 2 | | | 6 | | | | | 6 |
| Confl. Bikes (#/hr) | | | | | | | | | 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 (%) | 0% | 3% | 0% | 0% | 7% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Adj. Flow (vph) | 1 | 470 | 0 | 1 | 342 | 1 | 8 | 1 | 0 | 0 | 0 | 29 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 1 | 470 | 0 | 1 | 342 | 1 | 0 | 9 | 0 | 0 | 29 | 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) | | 3.0 | | | 3.0 | | | 0.0 | | | 0.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.09 | 1.01 | 1.01 | 1.09 | 1.01 | 1.09 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | CI+Ex | Cl+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report

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Lanes, Volumes, Timings 97: Yukon Place & British Colombia Rd

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|-------------------------|-------|----------|-----|-------|----------|-------|-------|----------|-----|----------|-------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | Perm | Perm | NA | | | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 33.0 | 33.0 | | 33.0 | 33.0 | 33.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Minimum Split (s) | 39.0 | 39.0 | | 39.0 | 39.0 | 39.0 | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Total Split (s) | 47.0 | 47.0 | | 47.0 | 47.0 | 47.0 | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Total Split (%) | 65.3% | 65.3% | | 65.3% | 65.3% | 65.3% | 34.7% | 34.7% | | 34.7% | 34.7% | |
| Maximum Green (s) | 41.0 | 41.0 | | 41.0 | 41.0 | 41.0 | 19.0 | 19.0 | | 19.0 | 19.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | | -1.0 | -1.0 | -1.0 | | -1.0 | | | -1.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | Max | Max | | Max | Max | Max | None | None | | None | None | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 9.0 | 9.0 | | 9.0 | 9.0 | 9.0 | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 58.5 | 58.5 | | 58.5 | 58.5 | 58.5 | | 8.0 | | | 8.0 | |
| Actuated g/C Ratio | 0.90 | 0.90 | | 0.90 | 0.90 | 0.90 | | 0.12 | | | 0.12 | |
| v/c Ratio | 0.00 | 0.29 | | 0.00 | 0.22 | 0.00 | | 0.04 | | | 0.05 | |
| Control Delay | 2.0 | 2.3 | | 2.0 | 2.1 | 0.0 | | 27.0 | | | 0.1 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | | | 0.0 | |
| Total Delay | 2.0 | 2.3 | | 2.0 | 2.1 | 0.0 | | 27.0 | | | 0.1 | |
| LOS | Α | Α | | Α | Α | Α | | С | | | Α | |
| Approach Delay | | 2.3 | | | 2.1 | | | 27.0 | | | 0.1 | |
| Approach LOS | | Α | | | Α | | | С | | | Α | |
| Intersection Summary | | | | | | | | | | | | |

| Intersection Summa | ary | |
|---------------------|----------------------|------------------------|
| Area Type: | Other | |
| Cycle Length: 72 | | |
| Actuated Cycle Len | igth: 65.2 | |
| Natural Cycle: 65 | | |
| Control Type: Semi | Act-Uncoord | |
| Maximum v/c Ratio | : 0.29 | |
| Intersection Signal | Delay: 2.4 | Intersection LOS: A |
| Intersection Capaci | ty Utilization 73.3% | ICU Level of Service D |
| Analysis Period (mi | n) 15 | |

Splits and Phases: 97: Yukon Place & British Colombia Rd



Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report

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HCM Signalized Intersection Capacity Analysis 97: Yukon Place & British Colombia Rd

09/30/2021

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|--------------------------------|-----------|----------|-------|------|------------|------------|---------|----------|------|----------|------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | 7 | 1 | | ሻ | * | 7 | | 4 | | | 4 | |
| Traffic Volume (vph) | 1 | 423 | 0 | 1 | 308 | 1 | 7 | 1 | 0 | 0 | 0 | 26 |
| Future Volume (vph) | 1 | 423 | 0 | 1 | 308 | 1 | 7 | 1 | 0 | 0 | 0 | 26 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | | | 0.97 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 0.99 | | | 1.00 | |
| Frt | 1.00 | 1.00 | | 1.00 | 1.00 | 0.85 | | 1.00 | | | 0.86 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | | 0.96 | | | 1.00 | |
| Satd. Flow (prot) | 1685 | 1824 | | 1681 | 1756 | 1507 | | 1781 | | | 1574 | |
| Flt Permitted | 0.56 | 1.00 | | 0.49 | 1.00 | 1.00 | | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | 985 | 1824 | | 873 | 1756 | 1507 | | 1860 | | | 1574 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 1 | 470 | 0 | 1 | 342 | 1 | 8 | 1 | 0 | 0 | 0 | 29 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 0 |
| Lane Group Flow (vph) | 1 | 470 | 0 | 1 | 342 | 1 | 0 | 9 | 0 | 0 | 2 | 0 |
| Confl. Peds. (#/hr) | | | 2 | 2 | | | 6 | | | | | 6 |
| Confl. Bikes (#/hr) | | | | | | | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 3% | 0% | 0% | 7% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Turn Type | Perm | NA | | Perm | NA | Perm | Perm | NA | | | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 54.3 | 54.3 | | 54.3 | 54.3 | 54.3 | | 2.6 | | | 2.6 | |
| Effective Green, g (s) | 55.3 | 55.3 | | 55.3 | 55.3 | 55.3 | | 3.6 | | | 3.6 | |
| Actuated g/C Ratio | 0.80 | 0.80 | | 0.80 | 0.80 | 0.80 | | 0.05 | | | 0.05 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 790 | 1463 | | 700 | 1409 | 1209 | | 97 | | | 82 | |
| v/s Ratio Prot | | c0.26 | | | 0.19 | | | | | | 0.00 | |
| v/s Ratio Perm | 0.00 | | | 0.00 | | 0.00 | | c0.00 | | | | |
| v/c Ratio | 0.00 | 0.32 | | 0.00 | 0.24 | 0.00 | | 0.09 | | | 0.02 | |
| Uniform Delay, d1 | 1.3 | 1.8 | | 1.3 | 1.7 | 1.3 | | 31.1 | | | 31.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 0.0 | 0.6 | | 0.0 | 0.4 | 0.0 | | 0.4 | | | 0.1 | |
| Delay (s) | 1.3 | 2.4 | | 1.3 | 2.1 | 1.3 | | 31.5 | | | 31.1 | |
| Level of Service | Α | Α | | Α | Α | Α | | С | | | С | |
| Approach Delay (s) | | 2.4 | | | 2.1 | | | 31.5 | | | 31.1 | |
| Approach LOS | | Α | | | Α | | | С | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 3.5 | Н | CM 2000 | Level of S | Service | | A | | | |
| HCM 2000 Volume to Capac | ity ratio | | 0.31 | | J.71 2000 | 23101010 | 3014100 | | - 11 | | | |
| Actuated Cycle Length (s) | , | | 68.9 | Si | um of lost | time (s) | | | 10.0 | | | |
| Intersection Capacity Utilizat | ion | | 73.3% | | | of Service | | | D | | | |
| Analysis Period (min) | | | 15 | 10 | 2 20.510 | | | | | | | |
| c Critical Lane Group | | | ., | | | | | | | | | |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements

Lanes, Volumes, Timings 222: Lakeshore Blvd & Strachan Ave

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|-------------------------------------|-------|----------|---------------|-------|----------|---------|-------|----------|----------|-------|-------|---------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | 7 | ^ | | ř | ተተተ | | | 4 | | , N | 4 | 7 |
| Traffic Volume (vph) | 523 | 1621 | 3 | 12 | 2476 | 0 | 0 | 12 | 0 | 519 | 48 | 404 |
| Future Volume (vph) | 523 | 1621 | 3 | 12 | 2476 | 0 | 0 | 12 | 0 | 519 | 48 | 404 |
| Ideal Flow (vphpl) | 2150 | 1900 | 1900 | 1900 | 2150 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 |
| Storage Length (m) | 60.0 | | 0.0 | 60.0 | | 50.0 | 0.0 | | 0.0 | 140.0 | | 50.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 0 | | 0 | 1 | | 1 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 0.91 | 0.91 | 1.00 | *0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Ped Bike Factor | | 1.00 | | 1.00 | | | | | | | | 0.92 |
| Frt | | | | | | | | | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | | | | 0.950 | 0.960 | |
| Satd. Flow (prot) | 1816 | 4794 | 0 | 1685 | 5883 | 0 | 0 | 1879 | 0 | 1585 | 1699 | 1507 |
| Flt Permitted | 0.072 | | | 0.098 | | | | | | 0.749 | 0.753 | |
| Satd. Flow (perm) | 138 | 4794 | 0 | 174 | 5883 | 0 | 0 | 1879 | 0 | 1249 | 1333 | 1388 |
| Right Turn on Red | | | Yes | | | Yes | - | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | | | | | | | | 230 |
| Link Speed (k/h) | | 60 | | | 60 | | | 40 | | | 40 | |
| Link Distance (m) | | 310.3 | | | 196.6 | | | 116.5 | | | 205.6 | |
| Travel Time (s) | | 18.6 | | | 11.8 | | | 10.5 | | | 18.5 | |
| Confl. Peds. (#/hr) | 5 | 10.0 | 8 | 8 | 11.0 | 5 | 43 | 10.0 | | | 10.0 | 43 |
| Confl. Bikes (#/hr) | | | Ŭ | Ū | | | -10 | | 12 | | | 37 |
| Peak Hour Factor | 0.90 | 0.95 | 0.95 | 0.90 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Heavy Vehicles (%) | 5% | 7% | 0% | 0% | 3% | 0% | 0% | 0% | 0% | 1% | 0% | 0% |
| Adj. Flow (vph) | 581 | 1706 | 3 | 13 | 2606 | 0 | 0 | 13 | 0 | 546 | 51 | 425 |
| Shared Lane Traffic (%) | 001 | 1100 | , i | 10 | 2000 | | | 10 | | 46% | 01 | 120 |
| Lane Group Flow (vph) | 581 | 1709 | 0 | 13 | 2606 | 0 | 0 | 13 | 0 | 295 | 302 | 425 |
| 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) | Lon | 3.0 | rtigiit | Loit | 3.0 | rtigiit | Lon | 3.0 | rtigiit | Lon | 3.0 | rtigrit |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | 1.0 | | | 1.0 | | | 1.0 | | | 1.0 | |
| Headway Factor | 0.93 | 1.01 | 1.01 | 1.09 | 0.86 | 1.09 | 1.01 | 1.01 | 1.01 | 1.09 | 1.01 | 1.09 |
| Turning Speed (k/h) | 24 | 1.01 | 14 | 24 | 0.00 | 1.03 | 24 | 1.01 | 1.01 | 24 | 1.01 | 1.03 |
| Number of Detectors | 1 | 2 | 17 | 1 | 2 | 17 | 1 | 2 | 17 | 1 | 2 | 1 |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | Right |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 |
| Detector 1 Type | CI+Ex | Cl+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | CI+Ex |
| Detector 1 Type Detector 1 Channel | CI+EX | CI+EX | | CI+EX | CI+EX | | CI+EX | CI+EX | | CI+EX | CI+EX | CI+EX |
| | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Extend (s) | | | | | | | | | | | | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 5

HDR Corporation

Lanes, Volumes, Timings 222: Lakeshore Blvd & Strachan Ave

09/30/2021

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|------------------------------|-----------|-------------|----------|-------|-------------|------------|-------|----------|-----|-------|----------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | pm+pt | NA | | pm+pt | NA | | | NA | | Perm | NA | pm+ov |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 3 | | | 4 | 5 |
| Permitted Phases | 2 | | | 6 | | | 3 | | | 4 | | 4 |
| Detector Phase | 5 | 2 | | 1 | 6 | | 3 | 3 | | 4 | 4 | 5 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 29.0 | | 6.0 | 30.0 | | 12.0 | 12.0 | | 10.0 | 10.0 | 6.0 |
| Minimum Split (s) | 12.0 | 35.0 | | 12.0 | 36.0 | | 21.0 | 21.0 | | 45.0 | 45.0 | 12.0 |
| Total Split (s) | 27.0 | 66.0 | | 12.0 | 51.0 | | 21.0 | 21.0 | | 45.0 | 45.0 | 27.0 |
| Total Split (%) | 18.8% | 45.8% | | 8.3% | 35.4% | | 14.6% | 14.6% | | 31.3% | 31.3% | 18.8% |
| Maximum Green (s) | 21.0 | 60.0 | | 6.0 | 45.0 | | 12.0 | 12.0 | | 37.0 | 37.0 | 21.0 |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| All-Red Time (s) | 3.0 | 2.0 | | 3.0 | 2.0 | | 6.0 | 6.0 | | 5.0 | 5.0 | 3.0 |
| Lost Time Adjust (s) | -3.0 | -1.0 | | -1.0 | -3.0 | | | -1.0 | | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 3.0 | 5.0 | | 5.0 | 3.0 | | | 8.0 | | 7.0 | 7.0 | 5.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lead | | Lag | Lag | Lead |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | Max | | None | Max | | None | None | | None | None | None |
| Walk Time (s) | | 7.0 | | | 7.0 | | | | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | | 22.0 | | | 22.0 | | | | | 30.0 | 30.0 | |
| Pedestrian Calls (#/hr) | | 3 | | | 2 | | | | | 0 | 0 | |
| Act Effct Green (s) | 75.8 | 69.5 | | 53.6 | 48.5 | | | 13.1 | | 34.7 | 34.7 | 59.0 |
| Actuated g/C Ratio | 0.59 | 0.54 | | 0.42 | 0.38 | | | 0.10 | | 0.27 | 0.27 | 0.46 |
| v/c Ratio | 1.46 | 0.66 | | 0.08 | 1.17 | | | 0.07 | | 0.87 | 0.84 | 0.54 |
| Control Delay | 250.0 | 26.2 | | 18.9 | 117.8 | | | 58.8 | | 71.6 | 65.9 | 13.0 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.2 | | | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Delay | 250.0 | 26.2 | | 18.9 | 118.1 | | | 58.8 | | 71.6 | 65.9 | 13.0 |
| LOS | F | С | | В | F | | | Е | | Е | Е | В |
| Approach Delay | | 83.0 | | | 117.6 | | | 58.8 | | | 45.6 | |
| Approach LOS | | F | | | F | | | Е | | | D | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 144 | | | | | | | | | | | | |
| Actuated Cycle Length: 12 | 8.1 | | | | | | | | | | | |
| Natural Cycle: 145 | | | | | | | | | | | | |
| Control Type: Semi Act-Ur | ncoord | | | | | | | | | | | |
| Maximum v/c Ratio: 1.46 | | | | | | | | | | | | |
| Intersection Signal Delay: | 91.7 | | | lr | ntersection | LOS: F | | | | | | |
| Intersection Capacity Utiliz | | % | | IC | CU Level o | of Service | H | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| * User Entered Value | | | | | | | | | | | | |
| Splits and Phases: 222: | Lakeshore | Blvd & Stra | achan Av | /e | | | | | | | | |
| √ø₁ ♣ø₂ | | | | | | ∜Îø3 | | 1 | 4 | | | |
| 12 s 66 s | | | | | | 21 s | | 45 s | | | | |
| ₹ Ø5 | ₹ ø6 | | | | | | | | | | | |

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|------------------------|--------|-------|------|----------|----------|--------|----------|------|--|
| Lane Group | EBL | EBT | WBL | WBT | NBT | SBL | SBT | SBR | |
| Lane Group Flow (vph) | 581 | 1709 | 13 | 2606 | 13 | 295 | 302 | 425 | |
| v/c Ratio | 1.46 | 0.66 | 0.08 | 1.17 | 0.07 | 0.87 | 0.84 | 0.54 | |
| Control Delay | 250.0 | 26.2 | 18.9 | 117.8 | 58.8 | 71.6 | 65.9 | 13.0 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 250.0 | 26.2 | 18.9 | 118.1 | 58.8 | 71.6 | 65.9 | 13.0 | |
| Queue Length 50th (m) | ~175.2 | 90.3 | 1.2 | ~257.1 | 2.9 | 67.7 | 68.5 | 24.6 | |
| Queue Length 95th (m) | #298.7 | 178.4 | 5.5 | #361.5 | 10.5 | #141.4 | #140.1 | 66.7 | |
| Internal Link Dist (m) | | 286.3 | | 172.6 | 92.5 | | 181.6 | | |
| Turn Bay Length (m) | 60.0 | | 60.0 | | | 140.0 | | 50.0 | |
| Base Capacity (vph) | 399 | 2602 | 156 | 2228 | 192 | 374 | 399 | 783 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 186 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 1.46 | 0.66 | 0.08 | 1.28 | 0.07 | 0.79 | 0.76 | 0.54 | |

| HCM | Signal | ızed | Interse | ection | Capacity | Analysis |
|--------|--------|-------|---------|--------|----------|----------|
| 222· I | akesh | ore F | & hvl | Strack | nan Ave | |

| ZZZ. Lakeshore Di | | acriari | AVC | | | | | | | | • | 00/2021 |
|------------------------------|-------------|---------|--------|-------|------------|------------|---------|-------|------|-------|------|---------|
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| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | Ť | ተተኈ | | 7 | ተተተ | | | 4 | | ሻ | ર્ન | 7 |
| Traffic Volume (vph) | 523 | 1621 | 3 | 12 | 2476 | 0 | 0 | 12 | 0 | 519 | 48 | 404 |
| Future Volume (vph) | 523 | 1621 | 3 | 12 | 2476 | 0 | 0 | 12 | 0 | 519 | 48 | 404 |
| Ideal Flow (vphpl) | 2150 | 1900 | 1900 | 1900 | 2150 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 |
| Total Lost time (s) | 3.0 | 5.0 | | 5.0 | 3.0 | | | 8.0 | | 7.0 | 7.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.91 | | 1.00 | *0.95 | | | 1.00 | | 0.95 | 0.95 | 1.00 |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.95 |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | | 1.00 | | 0.95 | 0.96 | 1.00 |
| Satd. Flow (prot) | 1816 | 4793 | | 1685 | 5883 | | | 1879 | | 1585 | 1700 | 1436 |
| Flt Permitted | 0.07 | 1.00 | | 0.10 | 1.00 | | | 1.00 | | 0.75 | 0.75 | 1.00 |
| Satd. Flow (perm) | 138 | 4793 | | 174 | 5883 | | | 1879 | | 1249 | 1333 | 1436 |
| Peak-hour factor, PHF | 0.90 | 0.95 | 0.95 | 0.90 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 581 | 1706 | 3 | 13 | 2606 | 0 | 0 | 13 | 0 | 546 | 51 | 425 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 135 |
| Lane Group Flow (vph) | 581 | 1709 | 0 | 13 | 2606 | 0 | 0 | 13 | 0 | 295 | 302 | 290 |
| Confl. Peds. (#/hr) | 5 | | 8 | 8 | | 5 | 43 | | | | | 43 |
| Confl. Bikes (#/hr) | | | | | | | | | 12 | | | 37 |
| Heavy Vehicles (%) | 5% | 7% | 0% | 0% | 3% | 0% | 0% | 0% | 0% | 1% | 0% | 0% |
| Turn Type | pm+pt | NA | | pm+pt | NA | | | NA | | Perm | NA | pm+ov |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 3 | | | 4 | 5 |
| Permitted Phases | 2 | | | 6 | | | 3 | | | 4 | | 4 |
| Actuated Green, G (s) | 76.6 | 68.5 | | 51.5 | 49.4 | | | 4.3 | | 33.7 | 33.7 | 54.9 |
| Effective Green, g (s) | 79.6 | 69.5 | | 53.5 | 52.4 | | | 5.3 | | 34.7 | 34.7 | 56.9 |
| Actuated g/C Ratio | 0.58 | 0.51 | | 0.39 | 0.38 | | | 0.04 | | 0.25 | 0.25 | 0.41 |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | | 9.0 | | 8.0 | 8.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 374 | 2420 | | 101 | 2240 | | | 72 | | 314 | 336 | 593 |
| v/s Ratio Prot | c0.27 | 0.36 | | 0.00 | 0.44 | | | c0.01 | | | | 0.08 |
| v/s Ratio Perm | c0.62 | | | 0.05 | | | | | | c0.24 | 0.23 | 0.12 |
| v/c Ratio | 1.55 | 0.71 | | 0.13 | 1.16 | | | 0.18 | | 0.94 | 0.90 | 0.49 |
| Uniform Delay, d1 | 46.0 | 26.2 | | 26.5 | 42.6 | | | 64.0 | | 50.4 | 49.8 | 29.7 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 261.9 | 1.8 | | 0.6 | 78.9 | | | 1.2 | | 34.7 | 25.2 | 0.6 |
| Delay (s) | 307.9 | 28.0 | | 27.1 | 121.5 | | | 65.3 | | 85.2 | 75.0 | 30.3 |
| Level of Service | F | С | | С | F | | | Е | | F | Е | C |
| Approach Delay (s) | | 99.0 | | | 121.0 | | | 65.3 | | | 59.3 | |
| Approach LOS | | F | | | F | | | Е | | | Е | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 101.8 | Н | CM 2000 | Level of S | Service | | F | | | |
| HCM 2000 Volume to Capa | acity ratio | | 1.39 | | | | | | _ | | | |
| Actuated Cycle Length (s) | , | | 137.6 | S | um of lost | time (s) | | | 25.0 | | | |
| Intersection Capacity Utiliz | ation | | 109.2% | | CU Level | . , | | | Н | | | |
| Analysis Period (min) | | | 15 | · · | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

| Intersection Summary | | | | |
|-----------------------------------|--------|---------------------------|------|--|
| HCM 2000 Control Delay | 101.8 | HCM 2000 Level of Service | F | |
| HCM 2000 Volume to Capacity ratio | 1.39 | | | |
| Actuated Cycle Length (s) | 137.6 | Sum of lost time (s) | 25.0 | |
| Intersection Capacity Utilization | 109.2% | ICU Level of Service | Н | |
| Analysis Period (min) | 15 | | | |
| - 0-1111 0 | | | | |

c Critical Lane Group

Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings 538: Strachan Ave & King St

09/30/2021

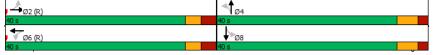
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|----------------------------|-------|----------|---------------|-------|----------|-------|-------|----------|-------|-------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 414 | | | 414 | | 7 | f) | | ሻ | f) | |
| Traffic Volume (vph) | 0 | 472 | 85 | 4 | 842 | 68 | 248 | 350 | 156 | 27 | 228 | 27 |
| Future Volume (vph) | 0 | 472 | 85 | 4 | 842 | 68 | 248 | 350 | 156 | 27 | 228 | 27 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 0.0 | 25.0 | | 0.0 | 25.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 0 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | 0.94 | | | 0.99 | | 0.89 | 0.97 | | 0.97 | 0.98 | |
| Frt | | 0.977 | | | 0.989 | | | 0.954 | | | 0.984 | |
| Flt Protected | | | | | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 0 | 2618 | 0 | 0 | 2869 | 0 | 1486 | 1546 | 0 | 1516 | 1616 | 0 |
| Flt Permitted | | | | | 0.953 | | 0.541 | | | 0.276 | | |
| Satd. Flow (perm) | 0 | 2618 | 0 | 0 | 2732 | 0 | 749 | 1546 | 0 | 428 | 1616 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 32 | | | 13 | | | 36 | | | 10 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 40 | | | 40 | |
| Link Distance (m) | | 255.2 | | | 358.6 | | | 424.1 | | | 379.9 | |
| Travel Time (s) | | 18.4 | | | 25.8 | | | 38.2 | | | 34.2 | |
| Confl. Peds. (#/hr) | 77 | | 179 | 179 | | 77 | 158 | | 81 | 81 | | 158 |
| Confl. Bikes (#/hr) | | | 5 | | | 4 | | | 24 | | | 5 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles (%) | 0% | 6% | 17% | 100% | 4% | 0% | 2% | 1% | 0% | 0% | 1% | 0% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 0 | 502 | 90 | 4 | 896 | 72 | 264 | 372 | 166 | 29 | 243 | 29 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 592 | 0 | 0 | 972 | 0 | 264 | 538 | 0 | 29 | 272 | 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 | | | 3.0 | • | | 3.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.16 | 1.23 | 1.16 | 1.16 | 1.23 | 1.16 | 1.25 | 1.16 | 1.16 | 1.25 | 1.16 | 1.16 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 9 Lanes, Volumes, Timings 538: Strachan Ave & King St

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|-----------------------------|--------------|-----------|----------|-----------|-------------|------------|-------|----------|-----|-------|-------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Detector 2 Type | | Cl+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 4 | | | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Detector Phase | 2 | 2 | | 6 | 6 | | 4 | 4 | | 8 | 8 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 21.0 | 21.0 | | 21.0 | 21.0 | |
| Minimum Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 27.0 | 27.0 | | 27.0 | 27.0 | |
| Total Split (s) | 40.0 | 40.0 | | 40.0 | 40.0 | | 40.0 | 40.0 | | 40.0 | 40.0 | |
| Total Split (%) | 50.0% | 50.0% | | 50.0% | 50.0% | | 50.0% | 50.0% | | 50.0% | 50.0% | |
| Maximum Green (s) | 34.0 | 34.0 | | 34.0 | 34.0 | | 34.0 | 34.0 | | 34.0 | 34.0 | |
| Yellow Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | -1.0 | | | -1.0 | | -1.0 | -1.0 | | -1.0 | -1.0 | |
| Total Lost Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | C-Max | C-Max | | C-Max | C-Max | | Max | Max | | Max | Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 13.0 | 13.0 | | 13.0 | 13.0 | | 14.0 | 14.0 | | 14.0 | 14.0 | |
| Pedestrian Calls (#/hr) | 100 | 100 | | 25 | 25 | | 27 | 27 | | 100 | 100 | |
| Act Effct Green (s) | | 35.0 | | | 35.0 | | 35.0 | 35.0 | | 35.0 | 35.0 | |
| Actuated q/C Ratio | | 0.44 | | | 0.44 | | 0.44 | 0.44 | | 0.44 | 0.44 | |
| v/c Ratio | | 0.51 | | | 0.81 | | 0.81 | 0.77 | | 0.16 | 0.38 | |
| Control Delay | | 17.2 | | | 15.3 | | 41.4 | 27.1 | | 24.6 | 25.8 | |
| Queue Delay | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | | 17.2 | | | 15.3 | | 41.4 | 27.1 | | 24.6 | 25.8 | |
| LOS | | В | | | В | | D | С | | С | С | |
| Approach Delay | | 17.2 | | | 15.3 | | | 31.8 | | | 25.7 | |
| Approach LOS | | В | | | В | | | С | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | CBD | | | | | | | | | | | |
| Cycle Length: 80 | | | | | | | | | | | | |
| Actuated Cycle Length: 8 | 0 | | | | | | | | | | | |
| Offset: 50 (63%), Referen | ced to phase | 2:EBTL a | and 6:WB | ΓL, Start | of 1st Gre | en | | | | | | |
| Natural Cycle: 55 | | | | | | | | | | | | |
| Control Type: Actuated-C | oordinated | | | | | | | | | | | |
| Maximum v/c Ratio: 0.81 | | | | | | | | | | | | |
| Intersection Signal Delay: | 21.9 | | | Ir | ntersection | LOS: C | | | | | | |
| Intersection Capacity Utili | zation 94.5% | | | IC | CU Level o | of Service | F | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Splits and Phases: 538 | : Strachan A | ve & Kina | St | | | | | | | | | |
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538: Strachan Ave & King St

09/30/2021

Synchro 11 Report

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|------------------------|-------|----------|-------|----------|------|----------|
| Lane Group | EBT | WBT | NBL | NBT | SBL | SBT |
| Lane Group Flow (vph) | 592 | 972 | 264 | 538 | 29 | 272 |
| v/c Ratio | 0.51 | 0.81 | 0.81 | 0.77 | 0.16 | 0.38 |
| Control Delay | 17.2 | 15.3 | 41.4 | 27.1 | 24.6 | 25.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 17.2 | 15.3 | 41.4 | 27.1 | 24.6 | 25.8 |
| Queue Length 50th (m) | 31.1 | 19.8 | 33.6 | 62.7 | 3.7 | 38.0 |
| Queue Length 95th (m) | 45.4 | 59.5 | #75.5 | #109.1 | m8.0 | m56.6 |
| Internal Link Dist (m) | 231.2 | 334.6 | | 400.1 | | 355.9 |
| Turn Bay Length (m) | | | 25.0 | | 25.0 | |
| Base Capacity (vph) | 1163 | 1202 | 327 | 696 | 187 | 712 |
| 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 | 0.51 | 0.81 | 0.81 | 0.77 | 0.16 | 0.38 |

HCM Signalized Intersection Capacity Analysis

538: Strachan Ave & King St

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|--------------------------------|------------|----------|-------|------|------------|--------------|---------|----------|------|-------------|----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 413 | | | 413 | | , j | ĵ, | | Ť | î, | |
| Traffic Volume (vph) | 0 | 472 | 85 | 4 | 842 | 68 | 248 | 350 | 156 | 27 | 228 | 27 |
| Future Volume (vph) | 0 | 472 | 85 | 4 | 842 | 68 | 248 | 350 | 156 | 27 | 228 | 27 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frpb, ped/bikes | | 0.94 | | | 0.99 | | 1.00 | 0.97 | | 1.00 | 0.98 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | 0.89 | 1.00 | | 0.97 | 1.00 | |
| Frt | | 0.98 | | | 0.99 | | 1.00 | 0.95 | | 1.00 | 0.98 | |
| Flt Protected | | 1.00 | | | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 2618 | | | 2866 | | 1316 | 1546 | | 1472 | 1616 | |
| Flt Permitted | | 1.00 | | | 0.95 | | 0.54 | 1.00 | | 0.28 | 1.00 | |
| Satd. Flow (perm) | | 2618 | | | 2732 | | 749 | 1546 | | 427 | 1616 | |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 0 | 502 | 90 | 4 | 896 | 72 | 264 | 372 | 166 | 29 | 243 | 29 |
| RTOR Reduction (vph) | 0 | 18 | 0 | 0 | 7 | 0 | 0 | 20 | 0 | 0 | 6 | 0 |
| Lane Group Flow (vph) | 0 | 574 | 0 | 0 | 965 | 0 | 264 | 518 | 0 | 29 | 266 | 0 |
| Confl. Peds. (#/hr) | 77 | | 179 | 179 | | 77 | 158 | | 81 | 81 | | 158 |
| Confl. Bikes (#/hr) | | | 5 | | | 4 | | | 24 | | | 5 |
| Heavy Vehicles (%) | 0% | 6% | 17% | 100% | 4% | 0% | 2% | 1% | 0% | 0% | 1% | 0% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Turn Type | | NA | | Perm | NA | | Perm | NA | - | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 4 | | | 8 | |
| Permitted Phases | 2 | = | | 6 | - | | 4 | | | 8 | - | |
| Actuated Green, G (s) | | 34.0 | | | 34.0 | | 34.0 | 34.0 | | 34.0 | 34.0 | |
| Effective Green, g (s) | | 35.0 | | | 35.0 | | 35.0 | 35.0 | | 35.0 | 35.0 | |
| Actuated g/C Ratio | | 0.44 | | | 0.44 | | 0.44 | 0.44 | | 0.44 | 0.44 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 1145 | | | 1195 | | 327 | 676 | | 186 | 707 | |
| v/s Ratio Prot | | 0.22 | | | 1100 | | OL1 | 0.33 | | 100 | 0.16 | |
| v/s Ratio Perm | | 0.22 | | | c0.35 | | c0.35 | 0.00 | | 0.07 | 0.10 | |
| v/c Ratio | | 0.50 | | | 0.81 | | 0.81 | 0.77 | | 0.16 | 0.38 | |
| Uniform Delay, d1 | | 16.2 | | | 19.6 | | 19.6 | 19.0 | | 13.6 | 15.2 | |
| Progression Factor | | 1.00 | | | 0.46 | | 1.00 | 1.00 | | 1.58 | 1.62 | |
| Incremental Delay, d2 | | 1.6 | | | 5.8 | | 18.9 | 8.1 | | 1.6 | 1.4 | |
| Delay (s) | | 17.8 | | | 14.8 | | 38.5 | 27.1 | | 23.1 | 26.0 | |
| Level of Service | | В | | | В | | D | C | | C | C | |
| Approach Delay (s) | | 17.8 | | | 14.8 | | | 30.9 | | - | 25.7 | |
| Approach LOS | | В | | | В | | | C | | | C | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 21.5 | Н | CM 2000 | Level of S | Service | | С | | | |
| HCM 2000 Volume to Capac | rity ratio | | 0.81 | - 11 | 2.71 2000 | 23101010 | 2014100 | | 3 | | | |
| Actuated Cycle Length (s) | ny ratio | | 80.0 | Q | um of lost | time (s) | | | 10.0 | | | |
| Intersection Capacity Utilizat | ion | | 94.5% | | | of Service | | | 10.0 | | | |
| Analysis Period (min) | | | 15 | ic | C LOVEI (| JI JUI VILLE | | | ' | | | |
| c Critical Lane Group | | | 10 | | | | | | | | | |
| | | | | | | | | | | | | |

^{# 95}th 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.

09/30/2021

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|----------------------------|-------|-------|---------------|-------|----------|------------|-------|----------|------------|----------|-------|----------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 473 | | | 413 | | | 413- | | | 414 | |
| Traffic Volume (vph) | 81 | 458 | 54 | 33 | 793 | 104 | 54 | 614 | 42 | 113 | 317 | 74 |
| Future Volume (vph) | 81 | 458 | 54 | 33 | 793 | 104 | 54 | 614 | 42 | 113 | 317 | 74 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.96 | | | 0.96 | | | 0.97 | | | 0.93 | |
| Frt | | 0.986 | | | 0.983 | | | 0.991 | | | 0.978 | |
| Flt Protected | | 0.993 | | | 0.998 | | | 0.996 | | | 0.989 | |
| Satd. Flow (prot) | 0 | 2874 | 0 | 0 | 2821 | 0 | 0 | 2684 | 0 | 0 | 2590 | 0 |
| Flt Permitted | | 0.587 | | | 0.904 | | | 0.808 | | | 0.638 | |
| Satd. Flow (perm) | 0 | 1690 | 0 | 0 | 2546 | 0 | 0 | 2159 | 0 | 0 | 1634 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 15 | | | 20 | | | 9 | | | 24 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 291.1 | | | 316.7 | | | 212.5 | | | 385.1 | |
| Travel Time (s) | | 21.0 | | | 22.8 | | | 15.3 | | | 27.7 | |
| Confl. Peds. (#/hr) | 278 | | 317 | 317 | | 278 | 331 | | 263 | 263 | | 331 |
| Confl. Bikes (#/hr) | | | 3 | | | 73 | | | 118 | | | 6 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles (%) | 6% | 3% | 4% | 2% | 2% | 4% | 7% | 9% | 9% | 5% | 13% | 5% |
| Bus Blockages (#/hr) | 12 | 12 | 12 | 24 | 24 | 24 | 12 | 30 | 30 | 0 | 18 | 18 |
| Adj. Flow (vph) | 93 | 526 | 62 | 38 | 911 | 120 | 62 | 706 | 48 | 130 | 364 | 85 |
| Shared Lane Traffic (%) | | | | | *** | | | | | | | |
| Lane Group Flow (vph) | 0 | 681 | 0 | 0 | 1069 | 0 | 0 | 816 | 0 | 0 | 579 | 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 | J . | | 0.0 | J . | | 0.0 | J - | | 0.0 | J |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.16 | 1.20 | 1.16 | 1.16 | 1.23 | 1.16 | 1.16 | 1.25 | 1.16 | 1.16 | 1.22 | 1.16 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | 3 | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Minimum Split (s) | 27.0 | 27.0 | | 27.0 | 27.0 | | 10.0 | 27.0 | | 27.0 | 27.0 | |
| Total Split (s) | 45.0 | 45.0 | | 45.0 | 45.0 | | 10.0 | 45.0 | | 35.0 | 35.0 | |
| Total Split (%) | 50.0% | 50.0% | | 50.0% | 50.0% | | 11.1% | 50.0% | | 38.9% | 38.9% | |
| Maximum Green (s) | 39.0 | 39.0 | | 39.0 | 39.0 | | 6.0 | 39.0 | | 29.0 | 29.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | -1.0 | | | -1.0 | | | -1.0 | | | -2.0 | |
| Total Lost Time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 4.0 | |
| Lead/Lag | | | | | | | Lead | | | Lag | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | | | Yes | Yes | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | | 14.0 | | 14.0 | 14.0 | |
| Pedestrian Calls (#/hr) | 100 | 100 | | 100 | 100 | | | 100 | | 100 | 100 | |
| Act Effct Green (s) | | 40.0 | | | 40.0 | | | 40.0 | | | 31.0 | |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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Lanes, Volumes, Timings 539: Dufferin St & King St

| 539: Dufferin St & | • | | | | | | | | | | 09/3 | 0/2021 |
|------------------------------|---------------|----------|--------|----------|-------------|------------|-------------|------|-------------|----------|--------------|--------|
| | • | → | • | • | + | 4 | • | † | <i>></i> | / | | 4 |
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Actuated g/C Ratio | | 0.44 | | | 0.44 | | | 0.44 | | | 0.34 | |
| v/c Ratio | | 0.90 | | | 0.94 | | | 0.82 | | | 1.00 | |
| Control Delay | | 39.6 | | | 39.7 | | | 29.6 | | | 68.1 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 39.6 | | | 39.7 | | | 29.6 | | | 68.1 | |
| LOS | | D | | | D | | | С | | | Е | |
| Approach Delay | | 39.6 | | | 39.7 | | | 29.6 | | | 68.1 | |
| Approach LOS | | D | | | D | | | С | | | Е | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | CBD | | | | | | | | | | | |
| Cycle Length: 90 | | | | | | | | | | | | |
| Actuated Cycle Length: 90 | | | | | | | | | | | | |
| Offset: 0 (0%), Referenced | to phase 2:E | EBTL and | 6:WBTL | Start of | 1st Greer | | | | | | | |
| Natural Cycle: 90 | | | | | | | | | | | | |
| Control Type: Pretimed | | | | | | | | | | | | |
| Maximum v/c Ratio: 1.00 | | | | | | | | | | | | |
| Intersection Signal Delay: | | | | | tersection | | | | | | | |
| Intersection Capacity Utiliz | ation 105.4% |) | | IC | CU Level of | of Service | G | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Splits and Phases: 539: | Dufferin St 8 | Kina St | | | | | | | | | | |
| <i>A</i> . | | <u> </u> | | | 4 | | \ | | | | | |
| →Ø2 (R) | | | | | | 73 | ▼ Ø4 | | | | | |
| 45 S | | | | | 10 s | | 35 s | | | | | |
| ₩ Ø6 (R) | | | | | -1≪1 | 78 | | | | | | |
| 45 - | | | | | AE - | | | | | | | |

539: Dufferin St & King St

09/30/2021

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| | - | - | - ↑ | . ↓ |
|------------------------|-------|--------|-------|-------|
| Lane Group | EBT | WBT | NBT | SBT |
| | | | | |
| Lane Group Flow (vph) | 681 | 1069 | 816 | 579 |
| v/c Ratio | 0.90 | 0.94 | 0.82 | 1.00 |
| Control Delay | 39.6 | 39.7 | 29.6 | 68.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 39.6 | 39.7 | 29.6 | 68.1 |
| Queue Length 50th (m) | 54.4 | 88.2 | 56.6 | ~50.4 |
| Queue Length 95th (m) | #85.2 | #124.4 | 73.3 | #81.6 |
| Internal Link Dist (m) | 267.1 | 292.7 | 188.5 | 361.1 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 759 | 1142 | 993 | 578 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.90 | 0.94 | 0.82 | 1.00 |
| Reduced v/c Ratio | 0.90 | 0.94 | 0.82 | 1.00 |

HCM Signalized Intersection Capacity Analysis 539: Dufferin St & King St

| | • | → | • | • | + | • | • | † | ~ | / | ↓ | 4 |
|-------------------------------|-------------|--------------|--------|---------|-------------|------------|---------|-----------|------|----------|-----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 413- | | | 413 | | | 413- | | | 414 | |
| Traffic Volume (vph) | 81 | 458 | 54 | 33 | 793 | 104 | 54 | 614 | 42 | 113 | 317 | 74 |
| Future Volume (vph) | 81 | 458 | 54 | 33 | 793 | 104 | 54 | 614 | 42 | 113 | 317 | 74 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 4.0 | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | | 0.97 | | | 0.96 | | | 0.98 | | | 0.95 | |
| Flpb, ped/bikes | | 0.99 | | | 1.00 | | | 0.99 | | | 0.98 | |
| Frt | | 0.99 | | | 0.98 | | | 0.99 | | | 0.98 | |
| Flt Protected | | 0.99 | | | 1.00 | | | 1.00 | | | 0.99 | |
| Satd. Flow (prot) | | 2861 | | | 2812 | | | 2667 | | | 2533 | |
| Flt Permitted | | 0.59 | | | 0.90 | | | 0.81 | | | 0.64 | |
| Satd. Flow (perm) | | 1690 | | | 2548 | | | 2164 | | | 1635 | |
| Peak-hour factor, PHF | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Adj. Flow (vph) | 93 | 526 | 62 | 38 | 911 | 120 | 62 | 706 | 48 | 130 | 364 | 85 |
| RTOR Reduction (vph) | 0 | 8 | 0 | 0 | 11 | 0 | 0 | 5 | 0 | 0 | 16 | 0 |
| Lane Group Flow (vph) | 0 | 673 | 0 | 0 | 1058 | 0 | 0 | 811 | 0 | 0 | 563 | 0 |
| Confl. Peds. (#/hr) | 278 | 0,0 | 317 | 317 | 1000 | 278 | 331 | 011 | 263 | 263 | 000 | 331 |
| Confl. Bikes (#/hr) | 2.0 | | 3 | 0 | | 73 | 001 | | 118 | 200 | | 6 |
| Heavy Vehicles (%) | 6% | 3% | 4% | 2% | 2% | 4% | 7% | 9% | 9% | 5% | 13% | 5% |
| Bus Blockages (#/hr) | 12 | 12 | 12 | 24 | 24 | 24 | 12 | 30 | 30 | 0 | 18 | 18 |
| Turn Type | Perm | NA | | Perm | NA. | | pm+pt | NA | | Perm | NA | |
| Protected Phases | 1 Cilli | 2 | | 1 Cilli | 6 | | 3 | 8 | | 1 Gilli | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | _ | 39.0 | | Ū | 39.0 | | • | 39.0 | | | 29.0 | |
| Effective Green, g (s) | | 40.0 | | | 40.0 | | | 40.0 | | | 31.0 | |
| Actuated g/C Ratio | | 0.44 | | | 0.44 | | | 0.44 | | | 0.34 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | |
| Lane Grp Cap (vph) | | 751 | | | 1132 | | | 1000 | | | 563 | |
| v/s Ratio Prot | | 731 | | | 1132 | | | c0.06 | | | 505 | |
| v/s Ratio Perm | | 0.40 | | | c0.42 | | | 0.30 | | | c0.34 | |
| v/c Ratio | | 0.40 | | | 0.93 | | | 0.81 | | | 1.00 | |
| Uniform Delay, d1 | | 23.1 | | | 23.8 | | | 21.7 | | | 29.5 | |
| | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | |
| Progression Factor | | | | | 15.0 | | | 7.1 | | | 38.0 | |
| Incremental Delay, d2 | | 15.5 38.6 | | | 38.8 | | | 28.8 | | | 67.5 | |
| Delay (s) Level of Service | | 38.6 D | | | 38.8 D | | | 28.8 C | | | 67.5 E | |
| | | 38.6 | | | 38.8 | | | 28.8 | | | 67.5 | |
| Approach Delay (s) | | | | | | | | | | | | |
| Approach LOS | | D | | | D | | | С | | | E | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 41.5 | Н | CM 2000 | Level of | Service | | D | | | |
| HCM 2000 Volume to Capa | icity ratio | | 0.95 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 90.0 | | um of lost | | | | 12.0 | | | |
| Intersection Capacity Utiliza | ation | | 105.4% | IC | CU Level of | of Service | 9 | | G | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

| Intersection Summary | | | | |
|-----------------------------------|--------|---------------------------|------|--|
| HCM 2000 Control Delay | 41.5 | HCM 2000 Level of Service | D | |
| HCM 2000 Volume to Capacity ratio | 0.95 | | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 105.4% | ICU Level of Service | G | |
| Analysis Period (min) | 15 | | | |
| c Critical Lane Group | | | | |

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

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

Queue shown is maximum after two cycles.

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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| Lane Group | Ø10 | Ø12 | Ø14 | Ø16 |
|--|------|------|-----|------|
| | 2010 | N IZ | דוט | 2010 |
| Lane Configurations Traffic Volume (vph) | | | | |
| | | | | |
| Future Volume (vph) | | | | |
| Ideal Flow (vphpl) | | | | |
| Lane Width (m) | | | | |
| Storage Length (m) | | | | |
| Storage Lanes | | | | |
| Taper Length (m) | | | | |
| Lane Util. Factor | | | | |
| Ped Bike Factor | | | | |
| Frt | | | | |
| Flt Protected | | | | |
| Satd. Flow (prot) | | | | |
| Flt Permitted | | | | |
| Satd. Flow (perm) | | | | |
| Right Turn on Red | | | | |
| Satd. Flow (RTOR) | | | | |
| Link Speed (k/h) | | | | |
| Link Distance (m) | | | | |
| Travel Time (s) | | | | |
| Confl. Peds. (#/hr) | | | | |
| Confl. Bikes (#/hr) | | | | |
| Peak Hour Factor | | | | |
| Heavy Vehicles (%) | | | | |
| Adj. Flow (vph) | | | | |
| Shared Lane Traffic (%) | | | | |
| Lane Group Flow (vph) | | | | |
| Enter Blocked Intersection | | | | |
| Lane Alignment | | | | |
| Median Width(m) | | | | |
| | | | | |
| Link Offset(m) Crosswalk Width(m) | | | | |
| | | | | |
| Two way Left Turn Lane | | | | |
| Headway Factor | | | | |
| Turning Speed (k/h) | | | | |
| Number of Detectors | | | | |
| Detector Template | | | | |
| Leading Detector (m) | | | | |
| Trailing Detector (m) | | | | |
| Detector 1 Position(m) | | | | |
| Detector 1 Size(m) | | | | |
| Detector 1 Type | | | | |
| Detector 1 Channel | | | | |
| Detector 1 Extend (s) | | | | |
| Detector 1 Queue (s) | | | | |
| Detector 1 Delay (s) | | | | |
| Detector 2 Position(m) | | | | |
| Detector 2 Size(m) | | | | |
| Detector 2 Type | | | | |
| 20100101 L 13P0 | | | | |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements

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|------------------------------|--------------|-----------|------------|----------|------------|-------------|-------------|-------|-----|----------|-------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 32.0 | 32.0 | | 32.0 | 32.0 | 32.0 | 29.0 | 29.0 | | 29.0 | 29.0 | |
| Minimum Split (s) | 39.0 | 39.0 | | 39.0 | 39.0 | 39.0 | 36.0 | 36.0 | | 36.0 | 36.0 | |
| Total Split (s) | 39.0 | 39.0 | | 39.0 | 39.0 | 39.0 | 61.0 | 61.0 | | 61.0 | 61.0 | |
| Total Split (%) | 27.1% | 27.1% | | 27.1% | 27.1% | 27.1% | 42.4% | 42.4% | | 42.4% | 42.4% | |
| Maximum Green (s) | 32.0 | 32.0 | | 32.0 | 32.0 | 32.0 | 54.0 | 54.0 | | 54.0 | 54.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | | 3.0 | -1.0 | -1.0 | -1.0 | -1.0 | | -1.0 | -1.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lead/Lag | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | Max | Max | | Max | Max | Max | Max | Max | | Max | Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 25.0 | 25.0 | | 25.0 | 25.0 | 25.0 | 22.0 | 22.0 | | 22.0 | 22.0 | |
| Pedestrian Calls (#/hr) | 18 | 18 | | 100 | 100 | 100 | 11 | 11 | | 12 | 12 | |
| Act Effct Green (s) | 33.5 | 33.5 | | | 33.5 | 33.5 | 55.9 | 55.9 | | 55.9 | 55.9 | |
| Actuated g/C Ratio | 0.30 | 0.30 | | | 0.30 | 0.30 | 0.50 | 0.50 | | 0.50 | 0.50 | |
| v/c Ratio | 0.63 | 0.42 | | | 0.61 | 0.15 | 2.13 | 0.70 | | 0.48 | 0.95 | |
| Control Delay | 51.1 | 8.1 | | | 47.6 | 0.7 | 585.4 | 29.9 | | 34.2 | 50.4 | |
| Queue Delay | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 0.5 | | 0.0 | 0.0 | |
| Total Delay | 51.1 | 8.1 | | | 47.6 | 0.7 | 585.4 | 30.4 | | 34.2 | 50.4 | |
| LOS | D | Α | | | D | Α | F | С | | С | D | |
| Approach Delay | | 25.0 | | | 35.1 | | | 131.9 | | | 48.8 | |
| Approach LOS | | С | | | D | | | F | | | D | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 144 | | | | | | | | | | | | |
| Actuated Cycle Length: 11 | 2 | | | | | | | | | | | |
| Natural Cycle: 150 | | | | | | | | | | | | |
| Control Type: Semi Act-Un | coord | | | | | | | | | | | |
| Maximum v/c Ratio: 2.13 | | | | | | | | | | | | |
| Intersection Signal Delay: | 70.2 | | | Ir | ntersectio | n I OS: F | | | | | | |
| Intersection Capacity Utiliz | | % | | | CU Level | | | | | | | |
| Analysis Period (min) 15 | .αιιοπ 100.0 | 70 | | | JO LOVOI | OI OCI VICE | 7 11 | | | | | |
| , , , | Ctrocker A | 0 Ca | da Dh1/r | Tlast Ct | | | | | | | | |
| Splits and Phases: 571: | Strachan A | ve & Cana | iua Biva/h | | | 114 | h | | | 14 | _ | |
| Ø2 | | | | ÅΑ̈́ | 10 | | Ø4 | | | | Ø12 | |
| 61s | | | | 22 s | | 39 s | | | | 22 : | | |
| I Do | | | | _ | | 14 | _ | | | 2 | | |

| Lane Group | Ø10 | Ø12 | Ø14 | Ø16 | |
|-------------------------|------|------|------|------|---|
| Detector 2 Channel | | | | | |
| Detector 2 Extend (s) | | | | | |
| Turn Type | | | | | |
| Protected Phases | 10 | 12 | 14 | 16 | j |
| Permitted Phases | | | | | |
| Detector Phase | | | | | |
| Switch Phase | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | 7.0 |) |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 |) |
| Total Split (s) | 22.0 | 22.0 | 22.0 | 22.0 |) |
| Total Split (%) | 15% | 15% | 15% | 15% | , |
| Maximum Green (s) | 14.0 | 14.0 | 14.0 | 14.0 | J |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | j |
| All-Red Time (s) | 4.0 | 4.0 | 4.0 | 4.0 |) |
| Lost Time Adjust (s) | | | | | |
| Total Lost Time (s) | | | | | |
| Lead/Lag | | | | | |
| Lead-Lag Optimize? | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | j |
| Recall Mode | None | None | None | None | , |
| Walk Time (s) | 0.0 | 0.0 | 0.0 | 0.0 |) |
| Flash Dont Walk (s) | 0.0 | 0.0 | 0.0 | 0.0 |) |
| Pedestrian Calls (#/hr) | 16 | 16 | 16 | 16 | j |
| Act Effct Green (s) | | | | | |
| Actuated g/C Ratio | | | | | |
| v/c Ratio | | | | | |
| Control Delay | | | | | |
| Queue Delay | | | | | |
| Total Delay | | | | | |
| LOS | | | | | |
| Approach Delay | | | | | |
| | | | | | |
| Approach LOS | | | | | |

Lanes, Volumes, Timings

571: Strachan Ave & Canada Blvd/Fleet St

| | • | - | ← | • | 4 | † | - | ↓ | |
|------------------------|-------|-------|----------|------|-------|----------|------|----------|--|
| Lane Group | EBL | EBT | WBT | WBR | NBL | NBT | SBL | SBT | |
| Lane Group Flow (vph) | 146 | 226 | 174 | 63 | 132 | 590 | 93 | 814 | |
| v/c Ratio | 0.63 | 0.42 | 0.61 | 0.15 | 2.13 | 0.70 | 0.48 | 0.95 | |
| Control Delay | 51.1 | 8.1 | 47.6 | 0.7 | 585.4 | 29.9 | 34.2 | 50.4 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | |
| Total Delay | 51.1 | 8.1 | 47.6 | 0.7 | 585.4 | 30.4 | 34.2 | 50.4 | |
| Queue Length 50th (m) | 23.1 | 0.9 | 27.4 | 0.0 | ~26.7 | 73.7 | 10.1 | 127.2 | |
| Queue Length 95th (m) | #67.6 | 22.1 | #73.1 | 0.0 | #84.5 | #182.0 | 38.9 | #316.4 | |
| Internal Link Dist (m) | | 119.4 | 205.0 | | | 181.6 | | 217.4 | |
| Turn Bay Length (m) | 25.0 | | | 50.0 | 30.0 | | 25.0 | | |
| Base Capacity (vph) | 233 | 542 | 287 | 427 | 62 | 846 | 193 | 855 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 57 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.63 | 0.42 | 0.61 | 0.15 | 2.13 | 0.75 | 0.48 | 0.95 | |
| | | | | | | | | | |

| , | • | → | • | • | — | • | 4 | † | ~ | / | | ✓ |
|-------------------------------|-------------|-----------|--------|---------|----------------------|------------|----------|----------|------|----------|------------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | 7 | ĵ. | | | ર્ન | 7 | * | ĵ» | | * | ĵ. | |
| Traffic Volume (vph) | 139 | 7 | 208 | 77 | 88 | 60 | 125 | 473 | 87 | 88 | 706 | 67 |
| Future Volume (vph) | 139 | 7 | 208 | 77 | 88 | 60 | 125 | 473 | 87 | 88 | 706 | 67 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frpb, ped/bikes | 1.00 | 0.88 | | | 1.00 | 0.75 | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 0.83 | 1.00 | | | 0.97 | 1.00 | 1.00 | 1.00 | | 0.98 | 1.00 | |
| Frt | 1.00 | 0.85 | | | 1.00 | 0.85 | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | | 0.98 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1314 | 1327 | | | 1554 | 1133 | 1652 | 1690 | | 1548 | 1712 | |
| Flt Permitted | 0.58 | 1.00 | | | 0.61 | 1.00 | 0.07 | 1.00 | | 0.23 | 1.00 | |
| Satd. Flow (perm) | 802 | 1327 | | | 963 | 1133 | 124 | 1690 | | 381 | 1712 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 146 | 7 | 219 | 81 | 93 | 63 | 132 | 498 | 92 | 93 | 743 | 71 |
| RTOR Reduction (vph) | 0 | 159 | 0 | 0 | 0 | 46 | 0 | 4 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 146 | 67 | 0 | 0 | 174 | 17 | 132 | 586 | 0 | 93 | 812 | 0 |
| Confl. Peds. (#/hr) | 122 | - | 55 | 55 | | 122 | 37 | | 33 | 33 | • | 37 |
| Confl. Bikes (#/hr) | | | 3 | | | | | | | | | 2 |
| Heavy Vehicles (%) | 6% | 12% | 6% | 1% | 26% | 0% | 2% | 8% | 2% | 7% | 8% | 1% |
| Turn Type | Perm | NA | | Perm | NA | Perm | Perm | NA | | Perm | NA | - 77 |
| Protected Phases | 1 01111 | 4 | | 1 01111 | 8 | 1 01111 | 1 01111 | 2 | | 1 01111 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 32.5 | 32.5 | | | 32.5 | 32.5 | 54.9 | 54.9 | | 54.9 | 54.9 | |
| Effective Green, g (s) | 33.5 | 33.5 | | | 33.5 | 33.5 | 55.9 | 55.9 | | 55.9 | 55.9 | |
| Actuated g/C Ratio | 0.27 | 0.27 | | | 0.27 | 0.27 | 0.46 | 0.46 | | 0.46 | 0.46 | |
| Clearance Time (s) | 7.0 | 7.0 | | | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 219 | 363 | | | 263 | 310 | 56 | 773 | | 174 | 783 | |
| v/s Ratio Prot | 213 | 0.05 | | | 200 | 310 | 50 | 0.35 | | 174 | 0.47 | |
| v/s Ratio Perm | c0.18 | 0.00 | | | 0.18 | 0.02 | c1.06 | 0.00 | | 0.24 | 0.47 | |
| v/c Ratio | 0.67 | 0.18 | | | 0.16 | 0.02 | 2.36 | 0.76 | | 0.53 | 1.04 | |
| Uniform Delay, d1 | 39.4 | 33.9 | | | 39.3 | 32.7 | 33.2 | 27.5 | | 23.8 | 33.2 | |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 14.9 | 1.1 | | | 12.4 | 0.3 | 662.2 | 6.9 | | 11.3 | 42.1 | |
| Delay (s) | 54.3 | 35.0 | | | 51.7 | 33.0 | 695.4 | 34.4 | | 35.1 | 75.2 | |
| Level of Service | D | D | | | D D | C | F | C | | D | 7 5.2 E | |
| Approach Delay (s) | D | 42.6 | | | 46.7 | U | | 155.2 | | D | 71.1 | |
| Approach LOS | | 42.0 D | | | 40.7 D | | | F | | | 71.1 E | |
| | | D | | | U | | | | | | | |
| Intersection Summary | | | 00.0 | - 11 | 014 0000 | | <u> </u> | | | | | |
| HCM 2000 Control Delay | | | 90.9 | Н | CM 2000 | Level of | Service | | F | | | |
| HCM 2000 Volume to Capa | acity ratio | | 1.62 | ^ | | Mar - / \ | | | 00.0 | | | |
| Actuated Cycle Length (s) | | | 122.2 | | Sum of lost time (s) | | | | 28.0 | | | |
| Intersection Capacity Utiliza | ation | | 139.0% | IC | U Level o | of Service | | | Н | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

| HCM 2000 Control Delay | 90.9 | HCM 2000 Level of Service | F | |
|-----------------------------------|--------|---------------------------|------|--|
| HCM 2000 Volume to Capacity ratio | 1.62 | | | |
| Actuated Cycle Length (s) | 122.2 | Sum of lost time (s) | 28.0 | |
| Intersection Capacity Utilization | 139.0% | ICU Level of Service | Н | |
| Analysis Period (min) | 15 | | | |
| c Critical Lane Group | | | | |

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

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

Queue shown is maximum after two cycles.

| | ۶ | → | • | • | ← | • | 4 | † | 1 | - | ļ | 1 |
|----------------------------|-------|----------|--------|------|----------|--------|------|--------------|--------|------|-------|---------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | * | ^ | | | | 77 | | ተ ተ ጉ | | | | |
| Traffic Volume (vph) | 54 | 517 | 0 | 0 | 0 | 571 | 0 | 2888 | 4 | 0 | 0 | 0 |
| Future Volume (vph) | 54 | 517 | 0 | 0 | 0 | 571 | 0 | 2888 | 4 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 2000 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 15.0 | | 0.0 | 0.0 | | 80.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 0 | | 1 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util, Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.88 | 1.00 | 0.91 | 0.91 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | 0.98 | | | | | | |
| Frt | | | | | | 0.850 | | | | | | |
| Flt Protected | 0.950 | | | | | | | | | | | |
| Satd. Flow (prot) | 1652 | 1939 | 0 | 0 | 0 | 2756 | 0 | 5029 | 0 | 0 | 0 | 0 |
| Flt Permitted | 0.950 | | | | | | | | | | | |
| Satd. Flow (perm) | 1652 | 1939 | 0 | 0 | 0 | 2709 | 0 | 5029 | 0 | 0 | 0 | 0 |
| Right Turn on Red | Yes | 1000 | Yes | | | Yes | | 0020 | Yes | | | Yes |
| Satd. Flow (RTOR) | 76 | | . 00 | | | 407 | | | . 00 | | | . 00 |
| Link Speed (k/h) | | 60 | | | 30 | | | 60 | | | 60 | |
| Link Distance (m) | | 411.9 | | | 164.9 | | | 800.6 | | | 492.6 | |
| Travel Time (s) | | 24.7 | | | 19.8 | | | 48.0 | | | 29.6 | |
| Confl. Bikes (#/hr) | | 21.7 | 1 | | 10.0 | 4 | | 10.0 | | | 20.0 | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 57 | 544 | 0 | 0.00 | 0.00 | 601 | 0.00 | 3040 | 4 | 0.00 | 0.00 | 0.00 |
| Shared Lane Traffic (%) | · · | | | | | | | 00.10 | | | | |
| Lane Group Flow (vph) | 57 | 544 | 0 | 0 | 0 | 601 | 0 | 3044 | 0 | 0 | 0 | 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) | Loit | 3.0 | rugiit | Loit | 3.0 | rugiit | Loit | 3.0 | rugiit | Loit | 3.0 | rtigric |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | 1.0 | | | | | | 1.0 | | | | |
| Headway Factor | 1.09 | 0.95 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 0.00 | 14 | 24 | 1.01 | 14 | 24 | | 14 | 24 | 1.01 | 14 |
| Number of Detectors | 1 | 2 | | | | 1 | | 2 | - '' | | | |
| Detector Template | Left | Thru | | | | Right | | Thru | | | | |
| Leading Detector (m) | 6.1 | 30.5 | | | | 6.1 | | 30.5 | | | | |
| Trailing Detector (m) | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Detector 1 Position(m) | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Detector 1 Size(m) | 6.1 | 1.8 | | | | 6.1 | | 1.8 | | | | |
| Detector 1 Type | CI+Ex | CI+Ex | | | | CI+Ex | | CI+Ex | | | | |
| Detector 1 Channel | OITEX | OI LX | | | | OI LX | | OI-LX | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Detector 2 Position(m) | 0.0 | 28.7 | | | | 0.0 | | 28.7 | | | | |
| Detector 2 Size(m) | | 1.8 | | | | | | 1.8 | | | | |
| Detector 2 Type | | Cl+Ex | | | | | | CI+Ex | | | | |
| Detector 2 Channel | | OI. LX | | | | | | JI-LX | | | | |
| Detector 2 Extend (s) | | 0.0 | | | | | | 0.0 | | | | |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 23 Lanes, Volumes, Timings

1344: Lakeshore Blvd & British Colombia Rd

09/30/2021

| | • | - | • | • | ← | • | 4 | † | - | - | ļ | 1 |
|------------------------------|--------------|-------|-----|-----|----------|------------|-----|----------|-----|-----|-----|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Turn Type | Perm | NA | | | | Perm | | NA | | | | |
| Protected Phases | | 4 | | | | | | 2 | | | | |
| Permitted Phases | 4 | | | | | 9 | | | | | | |
| Detector Phase | 4 | 4 | | | | 9 | | 2 | | | | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | | | | 7.0 | | 22.0 | | | | |
| Minimum Split (s) | 13.0 | 13.0 | | | | 30.0 | | 29.0 | | | | |
| Total Split (s) | 36.0 | 36.0 | | | | 30.0 | | 78.0 | | | | |
| Total Split (%) | 25.0% | 25.0% | | | | 20.8% | | 54.2% | | | | |
| Maximum Green (s) | 30.0 | 30.0 | | | | 24.0 | | 71.0 | | | | |
| Yellow Time (s) | 4.0 | 4.0 | | | | 4.0 | | 4.0 | | | | |
| All-Red Time (s) | 2.0 | 2.0 | | | | 2.0 | | 3.0 | | | | |
| Lost Time Adjust (s) | -1.0 | -3.0 | | | | -1.0 | | -1.0 | | | | |
| Total Lost Time (s) | 5.0 | 3.0 | | | | 5.0 | | 6.0 | | | | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | 3.0 | | 3.0 | | | | |
| Recall Mode | None | None | | | | None | | None | | | | |
| Walk Time (s) | 0.0 | 0.0 | | | | | | 7.0 | | | | |
| Flash Dont Walk (s) | 0.0 | 0.0 | | | | | | 15.0 | | | | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | | | | 0 | | | | |
| Act Effct Green (s) | 31.1 | 33.1 | | | | 17.2 | | 72.1 | | | | |
| Actuated g/C Ratio | 0.23 | 0.24 | | | | 0.13 | | 0.53 | | | | |
| v/c Ratio | 0.13 | 1.16 | | | | 0.86 | | 1.14 | | | | |
| Control Delay | 5.4 | 138.3 | | | | 31.7 | | 101.1 | | | | |
| Queue Delay | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Total Delay | 5.4 | 138.3 | | | | 31.7 | | 101.1 | | | | |
| LOS | Α | F | | | | С | | F | | | | |
| Approach Delay | | 125.7 | | | 31.7 | | | 101.1 | | | | |
| Approach LOS | | F | | | С | | | F | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 144 | | | | | | | | | | | | |
| Actuated Cycle Length: 13 | 36.4 | | | | | | | | | | | |
| Natural Cycle: 150 | | | | | | | | | | | | |
| Control Type: Semi Act-U | ncoord | | | | | | | | | | | |
| Maximum v/c Ratio: 1.16 | | | | | | | | | | | | |
| Intersection Signal Delay: | | | | | | n LOS: F | | | | | | |
| Intersection Capacity Utiliz | zation 95.0% | | | IC | U Level | of Service | F | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |

Splits and Phases: 1344: Lakeshore Blvd & British Colombia Rd

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

1344: Lakeshore Blvd & British Colombia Rd

09/30/2021

Synchro 11 Report

Page 25

| | • | - | • | Ť |
|------------------------|------|--------|------|--------|
| Lane Group | EBL | EBT | WBR | NBT |
| Lane Group Flow (vph) | 57 | 544 | 601 | 3044 |
| v/c Ratio | 0.13 | 1.16 | 0.86 | 1.14 |
| Control Delay | 5.4 | 138.3 | 31.7 | 101.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 5.4 | 138.3 | 31.7 | 101.1 |
| Queue Length 50th (m) | 0.0 | ~173.7 | 30.0 | ~353.0 |
| Queue Length 95th (m) | 7.2 | #260.1 | 54.4 | #409.5 |
| Internal Link Dist (m) | | 387.9 | | 776.6 |
| Turn Bay Length (m) | 15.0 | | 80.0 | |
| Base Capacity (vph) | 434 | 470 | 829 | 2659 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.13 | 1.16 | 0.72 | 1.14 |

HCM Signalized Intersection Capacity Analysis 1344: Lakeshore Blvd & British Colombia Rd

| | ۶ | - | • | • | ← | • | 4 | 1 | / | - | ↓ | 1 |
|-------------------------------|------------|----------|-------|------|------------|------------|---------|-------------|------|------|------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ሻ | • | | | | 77 | | ↑ ↑₽ | | | | |
| Traffic Volume (vph) | 54 | 517 | 0 | 0 | 0 | 571 | 0 | 2888 | 4 | 0 | 0 | 0 |
| Future Volume (vph) | 54 | 517 | 0 | 0 | 0 | 571 | 0 | 2888 | 4 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 2000 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 5.0 | 3.0 | | | | 5.0 | | 6.0 | | | | |
| Lane Util. Factor | 1.00 | 1.00 | | | | 0.88 | | 0.91 | | | | |
| Frpb, ped/bikes | 1.00 | 1.00 | | | | 0.98 | | 1.00 | | | | |
| Flpb, ped/bikes | 1.00 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Frt | 1.00 | 1.00 | | | | 0.85 | | 1.00 | | | | |
| Flt Protected | 0.95 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Satd. Flow (prot) | 1652 | 1939 | | | | 2703 | | 5028 | | | | |
| Flt Permitted | 0.95 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Satd. Flow (perm) | 1652 | 1939 | | | | 2703 | | 5028 | | | | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 57 | 544 | 0 | 0 | 0 | 601 | 0 | 3040 | 4 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 44 | 0 | 0 | 0 | 0 | 356 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 13 | 544 | 0 | 0 | 0 | 245 | 0 | 3044 | 0 | 0 | 0 | 0 |
| Confl. Bikes (#/hr) | | | 1 | | | 4 | | | | | | |
| Turn Type | Perm | NA | | | | Perm | | NA | | | | |
| Protected Phases | | 4 | | | | | | 2 | | | | |
| Permitted Phases | 4 | | | | | 9 | | | | | | |
| Actuated Green, G (s) | 30.1 | 30.1 | | | | 16.2 | | 71.1 | | | | |
| Effective Green, g (s) | 31.1 | 33.1 | | | | 17.2 | | 72.1 | | | | |
| Actuated g/C Ratio | 0.23 | 0.24 | | | | 0.13 | | 0.53 | | | | |
| Clearance Time (s) | 6.0 | 6.0 | | | | 6.0 | | 7.0 | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | 3.0 | | 3.0 | | | | |
| Lane Grp Cap (vph) | 376 | 470 | | | | 340 | | 2657 | | | | |
| v/s Ratio Prot | | c0.28 | | | | | | c0.61 | | | | |
| v/s Ratio Perm | 0.01 | | | | | c0.09 | | | | | | |
| v/c Ratio | 0.03 | 1.16 | | | | 0.72 | | 1.15 | | | | |
| Uniform Delay, d1 | 41.0 | 51.6 | | | | 57.3 | | 32.2 | | | | |
| Progression Factor | 1.00 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Incremental Delay, d2 | 0.0 | 92.4 | | | | 7.4 | | 70.5 | | | | |
| Delay (s) | 41.0 | 144.1 | | | | 64.7 | | 102.6 | | | | |
| Level of Service | D | F | | | | Е | | F | | | | |
| Approach Delay (s) | | 134.3 | | | 64.7 | | | 102.6 | | | 0.0 | |
| Approach LOS | | F | | | Е | | | F | | | Α | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 101.8 | Н | CM 2000 | Level of S | Service | | F | | | |
| HCM 2000 Volume to Capa | city ratio | | 1.10 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 136.4 | | um of lost | | | | 15.0 | | | |
| Intersection Capacity Utiliza | ition | | 95.0% | IC | U Level o | of Service | | | F | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| | | | | | | | | | | | | |

c Critical Lane Group

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

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

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings 1449: Dufferin St & Dwy/Liberty St

09/30/2021

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|----------------------------|-------|----------|-------|----------|----------|-------|-------|-----------|-----------|-----------|-----------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 4 | | | 4 | | | 413- | | | 413 | |
| Traffic Volume (vph) | 5 | 4 | 2 | 236 | 0 | 189 | 0 | 608 | 194 | 91 | 422 | 0 |
| Future Volume (vph) | 5 | 4 | 2 | 236 | 0 | 189 | 0 | 608 | 194 | 91 | 422 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.96 | | | 0.88 | | | 0.87 | | | 0.98 | |
| Frt | | 0.979 | | | 0.940 | | | 0.964 | | | | |
| Fit Protected | | 0.977 | | | 0.973 | | | | | | 0.991 | |
| Satd. Flow (prot) | 0 | 1761 | 0 | 0 | 1600 | 0 | 0 | 2756 | 0 | 0 | 3298 | 0 |
| Flt Permitted | | 0.867 | | | 0.820 | | | | | | 0.626 | Ī |
| Satd. Flow (perm) | 0 | 1536 | 0 | 0 | 1260 | 0 | 0 | 2756 | 0 | 0 | 2049 | 0 |
| Right Turn on Red | | | Yes | | .200 | Yes | | 2.00 | Yes | | 20.0 | Yes |
| Satd. Flow (RTOR) | | 2 | . 00 | | 41 | | | 68 | | | | . 00 |
| Link Speed (k/h) | | 50 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 106.6 | | | 106.9 | | | 249.2 | | | 212.5 | |
| Travel Time (s) | | 7.7 | | | 9.6 | | | 17.9 | | | 15.3 | |
| Confl. Peds. (#/hr) | 86 | 1.1 | 90 | 90 | 3.0 | 86 | 128 | 17.5 | 216 | 216 | 13.3 | 128 |
| Confl. Bikes (#/hr) | 00 | | 30 | 30 | | 00 | 120 | | 118 | 210 | | 6 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| | 0.88 | 0.00 | 0.00 | 1% | 0.00 | 2% | 0.88 | 2% | 2% | 0.00 | 1% | 0.00 |
| Heavy Vehicles (%) | | | | | 0% | 2% | | | | | | |
| Bus Blockages (#/hr) | 0 | 0 5 | 0 | 0 268 | 0 | 215 | 12 | 30 691 | 30 220 | 12 103 | 30 480 | 30 |
| Adj. Flow (vph) | Ö | 5 | 2 | 208 | U | 215 | U | 091 | 220 | 103 | 480 | 0 |
| Shared Lane Traffic (%) | 0 | 40 | ^ | 0 | 400 | 0 | 0 | 044 | ^ | ^ | 500 | 0 |
| Lane Group Flow (vph) | | 13 | 0 | 0 | 483 | | | 911 | 0 | 0 | 583 | 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) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.10 | 1.01 | 1.01 | 1.10 | 1.01 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | | NA | | Perm | NA | |
| , p== | | | | | | | | | | | | |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 27

Lanes, Volumes, Timings 1449: Dufferin St & Dwy/Liberty St

| | • | → | \rightarrow | • | ← | • | 4 | † | / | > | ↓ | 4 |
|-------------------------------|-------------|------------|---------------|-----------|-------------|------------|-------|-----------|-----|-------------|-----------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Minimum Split (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Total Split (s) | 40.0 | 40.0 | | 40.0 | 40.0 | | 40.0 | 40.0 | | 40.0 | 40.0 | |
| Total Split (%) | 50.0% | 50.0% | | 50.0% | 50.0% | | 50.0% | 50.0% | | 50.0% | 50.0% | |
| Maximum Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 34.0 | 34.0 | | 34.0 | 34.0 | |
| Yellow Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | -1.0 | | | -2.0 | | | -1.0 | | | -1.0 | |
| Total Lost Time (s) | | 4.0 | | | 3.0 | | | 5.0 | | | 5.0 | |
| Lead/Lag | | | | | 0.0 | | | 0.0 | | | 0.0 | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | C-Max | C-Max | | C-Max | | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 30 | 30 | | 29 | 29 | | 100 | 100 | | 100 | 100 | |
| Act Effct Green (s) | 30 | 32.8 | | 29 | 33.8 | | 100 | 38.2 | | 100 | 38.2 | |
| Actuated g/C Ratio | | 0.41 | | | 0.42 | | | 0.48 | | | 0.48 | |
| v/c Ratio | | 0.41 | | | 0.42 | | | 0.40 | | | 0.40 | |
| Control Delay | | 11.5 | | | 36.6 | | | 18.8 | | | 19.5 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 11.5 | | | 36.6 | | | 18.8 | | | 19.5 | |
| LOS | | 11.5 B | | | 30.0 D | | | 10.0 B | | | 19.5 B | |
| | | 11.5 | | | 36.6 | | | 18.8 | | | 19.5 | |
| Approach Delay | | | | | | | | | | | | |
| Approach LOS | | В | | | D | | | В | | | В | |
| Intersection Summary | | | | | | | | | | | | |
| 71 | Other | | | | | | | | | | | |
| Cycle Length: 80 | | | | | | | | | | | | |
| Actuated Cycle Length: 80 | | | | | | | | | | | | |
| Offset: 79 (99%), Reference | d to phase | 2:NBTL a | and 6:SB | TL, Start | of Green | | | | | | | |
| Natural Cycle: 50 | | | | | | | | | | | | |
| Control Type: Actuated-Coo | rdinated | | | | | | | | | | | |
| Maximum v/c Ratio: 0.87 | | | | | | | | | | | | |
| Intersection Signal Delay: 2 | 3.3 | | | lr | ntersection | LOS: C | | | | | | |
| Intersection Capacity Utiliza | tion 85.4% | | | IC | CU Level of | of Service | Ε | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Splits and Phases: 1449: | Dufferin St | & Dww/Li | herty St | | | | | | | | | |
| opino anu i nascs. 1445. | Danielii 91 | . G DWy/Li | DOILY OL | | T A | | | | | | | |
| √Tø2 (R) | | | | | | 04 | | | | | | |
| 40 s | | | | | 40 s | | | | | | | |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 28

1449: Dufferin St & Dwy/Liberty St

09/30/2021

| | - | — | † | ↓ |
|------------------------|------|----------|----------|----------|
| Lane Group | EBT | WBT | NBT | SBT |
| Lane Group Flow (vph) | 13 | 483 | 911 | 583 |
| v/c Ratio | 0.02 | 0.87 | 0.67 | 0.60 |
| Control Delay | 11.5 | 36.6 | 18.8 | 19.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 11.5 | 36.6 | 18.8 | 19.5 |
| Queue Length 50th (m) | 0.9 | 55.2 | 53.9 | 35.2 |
| Queue Length 95th (m) | 3.7 | #104.7 | 73.2 | 51.0 |
| Internal Link Dist (m) | 82.6 | 82.9 | 225.2 | 188.5 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 692 | 604 | 1351 | 978 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.02 | 0.80 | 0.67 | 0.60 |
| | | | | |

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 1449: Dufferin St & Dwy/Liberty St

| | • | → | \rightarrow | • | ← | • | 1 | † | / | - | ļ | 4 |
|-----------------------------------|----------|----------|---------------|------|------------|------------|----------|----------|----------|------|------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 4 | | | 4 | | | 413 | | | 414 | |
| Traffic Volume (vph) | 5 | 4 | 2 | 236 | 0 | 189 | 0 | 608 | 194 | 91 | 422 | 0 |
| Future Volume (vph) | 5 | 4 | 2 | 236 | 0 | 189 | 0 | 608 | 194 | 91 | 422 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 3.0 | | | 5.0 | | | 5.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | | 0.98 | | | 0.94 | | | 0.87 | | | 1.00 | |
| Flpb, ped/bikes | | 0.98 | | | 0.93 | | | 1.00 | | | 0.98 | |
| Frt | | 0.98 | | | 0.94 | | | 0.96 | | | 1.00 | |
| Flt Protected | | 0.98 | | | 0.97 | | | 1.00 | | | 0.99 | |
| Satd. Flow (prot) | | 1733 | | | 1495 | | | 2759 | | | 3243 | |
| Flt Permitted | | 0.87 | | | 0.82 | | | 1.00 | | | 0.63 | |
| Satd. Flow (perm) | | 1538 | | | 1261 | | | 2759 | | | 2049 | |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 6 | 5 | 2 | 268 | 0 | 215 | 0 | 691 | 220 | 103 | 480 | 0 |
| RTOR Reduction (vph) | 0 | 1 | 0 | 0 | 24 | 0 | 0 | 36 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 12 | 0 | 0 | 459 | 0 | 0 | 875 | 0 | 0 | 583 | 0 |
| Confl. Peds. (#/hr) | 86 | | 90 | 90 | | 86 | 128 | | 216 | 216 | | 128 |
| Confl. Bikes (#/hr) | | | | | | | | | 118 | | | 6 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 1% | 0% | 2% | 0% | 2% | 2% | 0% | 1% | 0% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 30 | 30 | 12 | 30 | 30 |
| Turn Type | Perm | NA | | Perm | NA | | | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 31.8 | | | 31.8 | | | 37.2 | | | 37.2 | |
| Effective Green, g (s) | | 32.8 | | | 33.8 | | | 38.2 | | | 38.2 | |
| Actuated g/C Ratio | | 0.41 | | | 0.42 | | | 0.48 | | | 0.48 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | | 630 | | | 532 | | | 1317 | | | 978 | |
| v/s Ratio Prot | | | | | | | | c0.32 | | | | |
| v/s Ratio Perm | | 0.01 | | | c0.36 | | | | | | 0.28 | |
| v/c Ratio | | 0.02 | | | 0.86 | | | 0.66 | | | 0.60 | |
| Uniform Delay, d1 | | 14.0 | | | 21.0 | | | 16.0 | | | 15.3 | |
| Progression Factor | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | | 0.0 | | | 13.6 | | | 2.7 | | | 2.7 | |
| Delay (s) | | 14.0 | | | 34.6 | | | 18.7 | | | 17.9 | |
| Level of Service | | В | | | С | | | В | | | В | |
| Approach Delay (s) | | 14.0 | | | 34.6 | | | 18.7 | | | 17.9 | |
| Approach LOS | | В | | | С | | | В | | | В | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 22.3 | Н | CM 2000 | Level of S | Service | | С | | | |
| HCM 2000 Volume to Capaci | tv ratio | | 0.77 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 80.0 | Si | um of lost | time (s) | | | 9.0 | | | |
| Intersection Capacity Utilization | on | | 85.4% | | U Level o | | | | Е | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Lanes, Volumes, Timings 1628: Shaw St & King St

| | • | - | \rightarrow | • | — | • | 4 | † | 1 | - | ↓ | 4 |
|----------------------------|-------|-------|---------------|-------|----------|-------|-------|----------|-------|-------|----------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 414 | | | 414 | | | 413 | | | 413 | |
| Traffic Volume (vph) | 15 | 509 | 34 | 0 | 896 | 187 | 84 | 251 | 7 | 80 | 164 | 111 |
| Future Volume (vph) | 15 | 509 | 34 | 0 | 896 | 187 | 84 | 251 | 7 | 80 | 164 | 111 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.99 | | | 0.97 | | | 0.98 | | | 0.94 | |
| Frt | | 0.991 | | | 0.974 | | | 0.997 | | | 0.953 | |
| Flt Protected | | 0.999 | | | | | | 0.988 | | | 0.989 | |
| Satd. Flow (prot) | 0 | 2778 | 0 | 0 | 2811 | 0 | 0 | 3132 | 0 | 0 | 2703 | 0 |
| Flt Permitted | | 0.903 | | | | | | 0.716 | | | 0.739 | |
| Satd. Flow (perm) | 0 | 2510 | 0 | 0 | 2811 | 0 | 0 | 2237 | 0 | 0 | 1982 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 15 | | | 57 | | | 3 | | | 45 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 40 | | | 40 | |
| Link Distance (m) | | 199.1 | | | 255.2 | | | 127.7 | | | 380.6 | |
| Travel Time (s) | | 14.3 | | | 18.4 | | | 11.5 | | | 34.3 | |
| Confl. Peds. (#/hr) | 129 | | 116 | 116 | | 129 | 104 | | 145 | 145 | | 104 |
| Confl. Bikes (#/hr) | | | | | | 42 | | | | | | |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Heavy Vehicles (%) | 100% | 6% | 0% | 100% | 4% | 0% | 0% | 1% | 0% | 19% | 3% | 7% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 18 | 599 | 40 | 0 | 1054 | 220 | 99 | 295 | 8 | 94 | 193 | 131 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 657 | 0 | 0 | 1274 | 0 | 0 | 402 | 0 | 0 | 418 | 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) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.16 | 1.23 | 1.16 | 1.16 | 1.23 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | | NA | | Perm | NA | | Perm | NA | |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 31

Lanes, Volumes, Timings 1628: Shaw St & King St

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|--------------------------------|---------------|-----------|---------------|------------|-------------|------------|-------|-------------|-----|-------|-------------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Protected Phases | | 2 | | | 6 | | | 4 | | | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Detector Phase | 2 | 2 | | 6 | 6 | | 4 | 4 | | 8 | 8 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 22.0 | 22.0 | | 22.0 | 22.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Minimum Split (s) | 28.0 | 28.0 | | 28.0 | 28.0 | | 26.0 | 26.0 | | 26.0 | 26.0 | |
| Total Split (s) | 44.0 | 44.0 | | 44.0 | 44.0 | | 26.0 | 26.0 | | 26.0 | 26.0 | |
| Total Split (%) | 62.9% | 62.9% | | 62.9% | 62.9% | | 37.1% | 37.1% | | 37.1% | 37.1% | |
| Maximum Green (s) | 38.0 | 38.0 | | 38.0 | 38.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | -1.0 | | | -1.0 | | | -1.0 | | | -1.0 | |
| Total Lost Time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 5.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | C-Max | | | C-Max | | | None | None | | None | None | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 15.0 | 15.0 | | 15.0 | 15.0 | | 13.0 | 13.0 | | 13.0 | 13.0 | |
| Pedestrian Calls (#/hr) | 100 | 100 | | 100 | 100 | | 100 | 100 | | 100 | 100 | |
| Act Effct Green (s) | | 39.0 | | | 39.0 | | | 21.0 | | | 21.0 | |
| Actuated g/C Ratio | | 0.56 | | | 0.56 | | | 0.30 | | | 0.30 | |
| v/c Ratio | | 0.47 | | | 0.80 | | | 0.60 | | | 0.67 | |
| Control Delay | | 10.4 | | | 16.7 0.0 | | | 25.1 0.0 | | | 25.2 0.0 | |
| Queue Delay | | | | | | | | | | | | |
| Total Delay | | 10.4 | | | 16.7 | | | 25.1 | | | 25.2 | |
| LOS | | B 10.4 | | | B | | | C | | | C 25.2 | |
| Approach Delay Approach LOS | | 10.4 B | | | 16.7 B | | | 25.1 C | | | 25.2 C | |
| Approach LOS | | Б | | | D | | | C | | | C | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | CBD | | | | | | | | | | | |
| Cycle Length: 70 | | | | | | | | | | | | |
| Actuated Cycle Length: 70 | | | | | | | | | | | | |
| Offset: 1 (1%), Referenced | d to phase 2: | EBTL and | l 6:WBTL | , Start of | 1st Greer | 1 | | | | | | |
| Natural Cycle: 60 | | | | | | | | | | | | |
| Control Type: Actuated-Co | oordinated | | | | | | | | | | | |
| Maximum v/c Ratio: 0.80 | | | | | | | | | | | | |
| Intersection Signal Delay: | | | | | ntersection | | | | | | | |
| Intersection Capacity Utiliz | zation 81.1% | | | I(| CU Level | of Service | e D | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Splits and Phases: 1628 | 8: Shaw St & | King St | | | | | | | | | | |
| → Ø2 (R) | | | | | | | 1 | 04 | | | | |
| 44 s | | | | | | | 26 s | | | | | |
| | | | | | | | | | | | | |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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1628: Shaw St & King St

09/30/2021

Synchro 11 Report

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|------------------------|-------|-------|-------|-------|
| Lane Group | EBT | WBT | NBT | SBT |
| Lane Group Flow (vph) | 657 | 1274 | 402 | 418 |
| v/c Ratio | 0.47 | 0.80 | 0.60 | 0.67 |
| Control Delay | 10.4 | 16.7 | 25.1 | 25.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 10.4 | 16.7 | 25.1 | 25.2 |
| Queue Length 50th (m) | 24.0 | 61.2 | 23.2 | 22.2 |
| Queue Length 95th (m) | 32.7 | 78.1 | 34.0 | 33.8 |
| Internal Link Dist (m) | 175.1 | 231.2 | 103.7 | 356.6 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1405 | 1591 | 673 | 626 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.47 | 0.80 | 0.60 | 0.67 |
| Intersection Summary | | | | |

HCM Signalized Intersection Capacity Analysis 1628: Shaw St & King St

09/30/2021

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|-----------------------------------|----------|----------|-------|------|------------|------------|---------|----------|----------|----------|----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 413- | | | 413- | | | सीक | | | 414 | |
| Traffic Volume (vph) | 15 | 509 | 34 | 0 | 896 | 187 | 84 | 251 | 7 | 80 | 164 | 111 |
| Future Volume (vph) | 15 | 509 | 34 | 0 | 896 | 187 | 84 | 251 | 7 | 80 | 164 | 111 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 5.0 | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | | 0.99 | | | 0.97 | | | 1.00 | | | 0.96 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | | 0.99 | | | 0.98 | |
| Frt | | 0.99 | | | 0.97 | | | 1.00 | | | 0.95 | |
| Flt Protected | | 1.00 | | | 1.00 | | | 0.99 | | | 0.99 | |
| Satd. Flow (prot) | | 2775 | | | 2811 | | | 3086 | | | 2652 | |
| Flt Permitted | | 0.90 | | | 1.00 | | | 0.72 | | | 0.74 | |
| Satd. Flow (perm) | | 2510 | | | 2811 | | | 2238 | | | 1983 | |
| Peak-hour factor, PHF | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Adj. Flow (vph) | 18 | 599 | 40 | 0 | 1054 | 220 | 99 | 295 | 8 | 94 | 193 | 131 |
| RTOR Reduction (vph) | 0 | 7 | 0 | 0 | 25 | 0 | 0 | 2 | 0 | 0 | 32 | 0 |
| Lane Group Flow (vph) | 0 | 650 | 0 | 0 | 1249 | 0 | 0 | 400 | 0 | 0 | 387 | 0 |
| Confl. Peds. (#/hr) | 129 | | 116 | 116 | | 129 | 104 | | 145 | 145 | | 104 |
| Confl. Bikes (#/hr) | | | | | | 42 | | | | | | |
| Heavy Vehicles (%) | 100% | 6% | 0% | 100% | 4% | 0% | 0% | 1% | 0% | 19% | 3% | 7% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Turn Type | Perm | NA | | | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 4 | | | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | | 38.0 | | | 38.0 | | | 20.0 | | | 20.0 | |
| Effective Green, g (s) | | 39.0 | | | 39.0 | | | 21.0 | | | 21.0 | |
| Actuated g/C Ratio | | 0.56 | | | 0.56 | | | 0.30 | | | 0.30 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | | 1398 | | | 1566 | | | 671 | | | 594 | |
| v/s Ratio Prot | | | | | c0.44 | | | | | | | |
| v/s Ratio Perm | | 0.26 | | | | | | 0.18 | | | c0.19 | |
| v/c Ratio | | 0.47 | | | 0.80 | | | 0.60 | | | 0.65 | |
| Uniform Delay, d1 | | 9.3 | | | 12.4 | | | 20.9 | | | 21.3 | |
| Progression Factor | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | | 1.1 | | | 4.3 | | | 1.4 | | | 2.6 | |
| Delay (s) | | 10.4 | | | 16.7 | | | 22.3 | | | 23.9 | |
| Level of Service | | В | | | В | | | С | | | С | |
| Approach Delay (s) | | 10.4 | | | 16.7 | | | 22.3 | | | 23.9 | |
| Approach LOS | | В | | | В | | | С | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 17.1 | Н | CM 2000 | Level of S | Service | | В | | | |
| HCM 2000 Volume to Capaci | ty ratio | | 0.75 | | | | | | | | | |
| Actuated Cycle Length (s) | , | | 70.0 | Si | um of lost | time (s) | | | 10.0 | | | |
| Intersection Capacity Utilization | on | | 81.1% | | U Level o | | | | D | | | |
| Analysis Period (min) | | | 15 | | | 2 2 | | | | | | |
| c Critical Lane Group | | | ., | | | | | | | | | |

c Critical Lane Group

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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|----------------------------|-------|-------|---------------|-------|----------|--------|-------|----------|--------|----------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 414 | | | 414 | | | 4 | | | 4 | |
| Traffic Volume (vph) | 0 | 705 | 0 | 0 | 764 | 115 | 0 | 0 | 0 | 97 | 0 | 75 |
| Future Volume (vph) | 0 | 705 | 0 | 0 | 764 | 115 | 0 | 0 | 0 | 97 | 0 | 75 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | 0.98 | | | | | | 0.91 | |
| Frt | | | | | 0.980 | | | | | | 0.941 | |
| Flt Protected | | | | | | | | | | | 0.973 | |
| Satd. Flow (prot) | 0 | 2707 | 0 | 0 | 2585 | 0 | 0 | 1691 | 0 | 0 | 1262 | 0 |
| Flt Permitted | | | | | | | | | | | 0.834 | |
| Satd. Flow (perm) | 0 | 2707 | 0 | 0 | 2585 | 0 | 0 | 1691 | 0 | 0 | 1041 | 0 |
| Right Turn on Red | | | Yes | | | Yes | - | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | 34 | | | | | | 51 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 318.4 | | | 199.1 | | | 158.6 | | | 196.7 | |
| Travel Time (s) | | 22.9 | | | 14.3 | | | 11.4 | | | 14.2 | |
| Confl. Peds. (#/hr) | 76 | 22.0 | 183 | 183 | 14.0 | 76 | 91 | 111 | 59 | 59 | 11.2 | 91 |
| Confl. Bikes (#/hr) | ,,, | | 100 | 100 | | 4 | 01 | | 00 | - 00 | | 01 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Heavy Vehicles (%) | 0.57 | 13% | 0.57 | 0.57 | 14% | 12% | 0.57 | 0.57 | 0.57 | 17% | 0.57 | 16% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 /0 | 0 /8 | 0 /0 | 0 | 0 /8 | 0 |
| Adj. Flow (vph) | 0 | 727 | 0 | 0 | 788 | 119 | 0 | 0 | 0 | 100 | 0 | 77 |
| Shared Lane Traffic (%) | U | 121 | U | U | 700 | 113 | U | U | U | 100 | U | - 11 |
| Lane Group Flow (vph) | 0 | 727 | 0 | 0 | 907 | 0 | 0 | 0 | 0 | 0 | 177 | 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) | Leit | 0.0 | Rigiil | Leit | 0.0 | Rigiit | Leit | 0.0 | Rigiit | Leit | 0.0 | Rigit |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Crosswalk Width(m) | | 1.0 | | | 1.0 | | | 1.0 | | | 1.0 | |
| Two way Left Turn Lane | 1.16 | 1.23 | 1.16 | 1.16 | 1.23 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 |
| Headway Factor | 1.16 | 1.23 | 1.10 | 24 | 1.23 | 1.16 | 24 | 1.10 | 1.10 | 1.16 | 1.10 | |
| Turning Speed (k/h) | | _ | 14 | | 0 | 14 | = " | 0 | 14 | = - | _ | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | Cl+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | | NA | | | NA | | | | | Perm | NA | |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 35 Lanes, Volumes, Timings

| 1851: King St & S | Sudbury S | St | | | | | | | | | 09/ | 30/202 |
|----------------------------|----------------|-----------|---------|------------|-------------|--------|-------|----------|-----|-------------|-------|--------|
| | ۶ | → | • | • | ← | • | 4 | † | ~ | > | ļ | 4 |
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SB |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Detector Phase | 2 | 2 | | 6 | 6 | | 8 | 8 | | 4 | 4 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 21.0 | 21.0 | | 21.0 | 21.0 | |
| Minimum Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 26.0 | 26.0 | | 26.0 | 26.0 | |
| Total Split (s) | 50.0 | 50.0 | | 50.0 | 50.0 | | 30.0 | 30.0 | | 30.0 | 30.0 | |
| Total Split (%) | 62.5% | 62.5% | | 62.5% | 62.5% | | 37.5% | 37.5% | | 37.5% | 37.5% | |
| Maximum Green (s) | 44.0 | 44.0 | | 44.0 | 44.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | -1.0 | | | -1.0 | | | -1.0 | | | -1.0 | |
| Total Lost Time (s) | | 5.0 | | | 5.0 | | | 4.0 | | | 4.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | C-Max | C-Max | | C-Max | C-Max | | None | None | | None | None | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 17.0 | 17.0 | | 17.0 | 17.0 | | 14.0 | 14.0 | | 14.0 | 14.0 | |
| Pedestrian Calls (#/hr) | 100 | 100 | | 25 | 25 | | 30 | 30 | | 19 | 19 | |
| Act Effct Green (s) | | 48.4 | | | 48.4 | | | | | | 22.6 | |
| Actuated g/C Ratio | | 0.60 | | | 0.60 | | | | | | 0.28 | |
| v/c Ratio | | 0.44 | | | 0.58 | | | | | | 0.53 | |
| Control Delay | | 9.8 | | | 11.2 | | | | | | 23.6 | |
| Queue Delay | | 0.0 | | | 0.0 | | | | | | 0.0 | |
| Total Delay | | 9.8 | | | 11.2 | | | | | | 23.6 | |
| LOS | | Α | | | В | | | | | | С | |
| Approach Delay | | 9.8 | | | 11.2 | | | | | | 23.6 | |
| Approach LOS | | Α | | | В | | | | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | CBD | | | | | | | | | | | |
| Cycle Length: 80 | | | | | | | | | | | | |
| Actuated Cycle Length: 8 | 80 | | | | | | | | | | | |
| Offset: 1 (1%), Reference | | ·FRTI and | 16·WRTI | Start of | 1st Green | | | | | | | |
| Natural Cycle: 60 | 54 to pridoo 2 | | | ., σιαπτοι | 101 01001 | | | | | | | |
| Control Type: Actuated-C | Coordinated | | | | | | | | | | | |
| Maximum v/c Ratio: 0.58 | | | | | | | | | | | | |
| Intersection Signal Delay | | | | - I | ntersection | LOS: B | | | | | | |
| Intersection Capacity Util | | , | | | CU Level | | | | | | | |
| Analysis Period (min) 15 | | | | | 2.5 20.01 | | | | | | | |
| . , | | | | | | | | | | | | |
| Splits and Phases: 18 | 51: King St & | Sudbury S | St | | | | | | | | | |
| . A. | | | | | | | 1 | | | | | |



Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

1851: King St & Sudbury St

09/30/2021

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|------------------------|-------|-------|-------|
| Lane Group | EBT | WBT | SBT |
| Lane Group Flow (vph) | 727 | 907 | 177 |
| v/c Ratio | 0.44 | 0.58 | 0.53 |
| Control Delay | 9.8 | 11.2 | 23.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 |
| Total Delay | 9.8 | 11.2 | 23.6 |
| Queue Length 50th (m) | 27.5 | 37.1 | 15.9 |
| Queue Length 95th (m) | 43.7 | 59.0 | 33.7 |
| Internal Link Dist (m) | 294.4 | 175.1 | 172.7 |
| Turn Bay Length (m) | | | |
| Base Capacity (vph) | 1637 | 1576 | 372 |
| Starvation Cap Reductn | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.44 | 0.58 | 0.48 |
| Intersection Summary | | | |

HCM Signalized Intersection Capacity Analysis 1851: King St & Sudbury St

09/30/2021

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|----------------------------------|---------|----------|-------|------|------------|------------|---------|----------|------|----------|-------------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 475 | | | 413- | | | 4 | | | 4 | |
| Traffic Volume (vph) | 0 | 705 | 0 | 0 | 764 | 115 | 0 | 0 | 0 | 97 | 0 | 75 |
| Future Volume (vph) | 0 | 705 | 0 | 0 | 764 | 115 | 0 | 0 | 0 | 97 | 0 | 75 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | | | | | 4.0 | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | | | | | 1.00 | |
| Frpb, ped/bikes | | 1.00 | | | 0.98 | | | | | | 0.95 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | | | | | 0.96 | |
| Frt | | 1.00 | | | 0.98 | | | | | | 0.94 | |
| Flt Protected | | 1.00 | | | 1.00 | | | | | | 0.97 | |
| Satd. Flow (prot) | | 2707 | | | 2586 | | | | | | 1214 | |
| Flt Permitted | | 1.00 | | | 1.00 | | | | | | 0.83 | |
| Satd. Flow (perm) | | 2707 | | | 2586 | | | | | | 1041 | |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 0.07 | 727 | 0 | 0.07 | 788 | 119 | 0 | 0.07 | 0.07 | 100 | 0 | 77 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 37 | 0 |
| Lane Group Flow (vph) | 0 | 727 | 0 | 0 | 894 | 0 | 0 | 0 | 0 | 0 | 140 | 0 |
| Confl. Peds. (#/hr) | 76 | | 183 | 183 | | 76 | 91 | | 59 | 59 | | 91 |
| Confl. Bikes (#/hr) | 10 | | 100 | 100 | | 4 | 01 | | 00 | 00 | | 01 |
| Heavy Vehicles (%) | 0% | 13% | 0% | 0% | 14% | 12% | 0% | 0% | 0% | 17% | 0% | 16% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Turn Type | | NA | | | NA. | | | | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 8 | | I CIIII | 4 | |
| Permitted Phases | 2 | | | 6 | U | | 8 | U | | 4 | | |
| Actuated Green, G (s) | | 47.4 | | U | 47.4 | | U | | | | 21.6 | |
| Effective Green, q (s) | | 48.4 | | | 48.4 | | | | | | 22.6 | |
| Actuated g/C Ratio | | 0.60 | | | 0.60 | | | | | | 0.28 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | | | | | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | | | | 3.0 | |
| Lane Grp Cap (vph) | | 1637 | | | 1564 | | | | | | 294 | |
| v/s Ratio Prot | | 0.27 | | | c0.35 | | | | | | 234 | |
| v/s Ratio Perm | | 0.27 | | | 00.55 | | | | | | c0.13 | |
| | | 0.44 | | | 0.57 | | | | | | 0.48 | |
| v/c Ratio | | 8.5 | | | 9.5 | | | | | | 23.8 | |
| Uniform Delay, d1 | | 1.00 | | | 1.00 | | | | | | | |
| Progression Factor | | 0.9 | | | 1.00 | | | | | | 1.00 | |
| Incremental Delay, d2 | | 9.4 | | | 11.1 | | | | | | 1.2 25.0 | |
| Delay (s) Level of Service | | 9.4 A | | | 11.1 B | | | | | | 25.0 C | |
| | | | | | | | | 0.0 | | | | |
| Approach Delay (s) | | 9.4 | | | 11.1 | | | 0.0 | | | 25.0 | |
| Approach LOS | | Α | | | В | | | Α | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 11.8 | Н | CM 2000 | Level of S | Service | | В | | | |
| HCM 2000 Volume to Capacity | y ratio | | 0.54 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 80.0 | Sı | um of lost | time (s) | | | 9.0 | | | |
| Intersection Capacity Utilizatio | n | | 53.2% | IC | U Level | of Service | | | Α | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

c Critical Lane Group

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Lanes, Volumes, Timings 1912: Atlantic Ave & King St

| | - | • | • | ← | 4 | 1 |
|------------------------------------|--------------|-------|-------|----------|-------|----------|
| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations | † } | | | 41 | ሻ | 7 |
| Traffic Volume (vph) | 453 | 285 | 2 | 624 | 255 | 270 |
| Future Volume (vph) | 453 | 285 | 2 | 624 | 255 | 270 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.0 |
| Storage Length (m) | 0.0 | 0.0 | 0.0 | 5.5 | 30.0 | 0.0 |
| Storage Length (III) Storage Lanes | | 0.0 | 0.0 | | 30.0 | 1 |
| Taper Length (m) | | U | 2.5 | | 2.5 | <u> </u> |
| | 0.0F | O OF | 0.95 | 0 OF | 1.00 | 1.00 |
| Lane Util. Factor Ped Bike Factor | 0.95 0.80 | 0.95 | 0.93 | 0.95 | 0.91 | 0.93 |
| | | | | 1.00 | 0.91 | |
| Frt | 0.942 | | | | 0.050 | 0.850 |
| Fit Protected | 0400 | | | 077. | 0.950 | 4000 |
| Satd. Flow (prot) | 2192 | 0 | 0 | 2774 | 1486 | 1233 |
| FIt Permitted | | | | 0.953 | 0.950 | |
| Satd. Flow (perm) | 2192 | 0 | 0 | 2643 | 1354 | 1149 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | 268 | | | | | 33 |
| Link Speed (k/h) | 50 | | | 50 | 30 | |
| Link Distance (m) | 191.3 | | | 318.4 | 198.0 | |
| Travel Time (s) | 13.8 | | | 22.9 | 23.8 | |
| Confl. Peds. (#/hr) | | 340 | 340 | | 85 | 55 |
| Confl. Bikes (#/hr) | | 1 | | | | |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles (%) | 6% | 3% | 100% | 10% | 2% | 10% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 0 | 0 |
| Adj. Flow (vph) | 521 | 328 | 2 | 717 | 293 | 310 |
| Shared Lane Traffic (%) | 321 | 320 | 2 | 717 | 293 | 310 |
| | 849 | 0 | 0 | 719 | 293 | 310 |
| Lane Group Flow (vph) | | _ | _ | | | |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 0.0 | | | 0.0 | 3.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.23 | 1.16 | 1.16 | 1.23 | 1.25 | 1.25 |
| Turning Speed (k/h) | | 14 | 24 | | 24 | 14 |
| Number of Detectors | 2 | | 1 | 2 | 1 | 1 |
| Detector Template | Thru | | Left | Thru | Left | Right |
| Leading Detector (m) | 30.5 | | 6.1 | 30.5 | 6.1 | 6.1 |
| Trailing Detector (m) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 1.8 | | 6.1 | 1.8 | 6.1 | 6.1 |
| | CI+Ex | | CI+Ex | CI+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Type | UI+EX | | ∪I+EX | UI+EX | UI+EX | OI+EX |
| Detector 1 Channel | | | ^ ^ | | | |
| Detector 1 Extend (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | 28.7 | | | 28.7 | | |
| Detector 2 Size(m) | 1.8 | | | 1.8 | | |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

| | - | \rightarrow | • | • | 4 | 1 |
|---------------------------|------------------|---------------|---------|------------|------------|------------|
| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
| Detector 2 Type | CI+Ex | | | CI+Ex | | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | 0.0 | | | 0.0 | | |
| Turn Type | NA | | Perm | NA | Perm | Perm |
| Protected Phases | 2 | | | 6 | | |
| Permitted Phases | | | 6 | | 8 | 8 |
| Detector Phase | 2 | | 6 | 6 | 8 | 8 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 21.0 | | 21.0 | 21.0 | 20.0 | 20.0 |
| Minimum Split (s) | 28.0 | | 28.0 | 28.0 | 26.0 | 26.0 |
| Total Split (s) | 39.0 | | 39.0 | 39.0 | 31.0 | 31.0 |
| Total Split (%) | 55.7% | | 55.7% | 55.7% | 44.3% | 44.3% |
| Maximum Green (s) | 32.0 | | 32.0 | 32.0 | 25.0 | 25.0 |
| Yellow Time (s) | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 3.0 | | 3.0 | 3.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | -1.0 | | | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 6.0 | | | 6.0 | 5.0 | 5.0 |
| Lead/Lag | | | | 2.0 | 2.0 | 2.0 |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | C-Max | | C-Max | C-Max | None | None |
| Walk Time (s) | 7.0 | | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Dont Walk (s) | 14.0 | | 14.0 | 14.0 | 13.0 | 13.0 |
| Pedestrian Calls (#/hr) | 100 | | 8 | 8 | 28 | 28 |
| Act Effct Green (s) | 35.5 | | Ť | 35.5 | 23.5 | 23.5 |
| Actuated g/C Ratio | 0.51 | | | 0.51 | 0.34 | 0.34 |
| v/c Ratio | 0.68 | | | 0.54 | 0.64 | 0.76 |
| Control Delay | 12.4 | | | 14.1 | 26.7 | 31.7 |
| Queue Delay | 0.0 | | | 0.0 | 0.0 | 0.0 |
| Total Delay | 12.4 | | | 14.1 | 26.7 | 31.7 |
| LOS | В | | | В. | 20.7 C | C |
| Approach Delay | 12.4 | | | 14.1 | 29.3 | |
| Approach LOS | В. | | | В | C | |
| •• | ь | | | В | | |
| Intersection Summary | | | | | | |
| Area Type: | CBD | | | | | |
| Cycle Length: 70 | | | | | | |
| Actuated Cycle Length: | | | | | | |
| Offset: 6 (9%), Reference | ed to phase 2:E | BT and | 6:WBTL, | Start of 1 | st Green | |
| Natural Cycle: 60 | | | | | | |
| Control Type: Actuated-0 | | | | | | |
| Maximum v/c Ratio: 0.76 | 6 | | | | | |
| Intersection Signal Delay | y: 17.7 | | | li | ntersectio | n LOS: B |
| Intersection Capacity Uti | | | | 10 | CU Level | of Service |
| Analysis Period (min) 15 | 5 | | | | | |
| | | | | | | |
| Splits and Phases: 19 | 12: Atlantic Ave | & King | St | | | |
| | | | | | | |

1912: Atlantic Ave & King St

09/30/2021

| | - | • | 1 | - |
|------------------------|-------|-------|-------|-------|
| Lane Group | EBT | WBT | NBL | NBR |
| Lane Group Flow (vph) | 849 | 719 | 293 | 310 |
| v/c Ratio | 0.68 | 0.54 | 0.64 | 0.76 |
| Control Delay | 12.4 | 14.1 | 26.7 | 31.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 12.4 | 14.1 | 26.7 | 31.7 |
| Queue Length 50th (m) | 27.4 | 31.5 | 31.8 | 31.7 |
| Queue Length 95th (m) | 47.0 | 47.0 | 50.7 | #55.5 |
| Internal Link Dist (m) | 167.3 | 294.4 | 174.0 | |
| Turn Bay Length (m) | | | 30.0 | |
| Base Capacity (vph) | 1242 | 1338 | 502 | 447 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.68 | 0.54 | 0.58 | 0.69 |

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 1912: Atlantic Ave & King St

09/30/2021

| Movement EBT EBR WBL WBT NBL NBR | |
|--|------|
| Lane Configurations † 7 | |
| Traffic Volume (vph) 453 285 2 624 255 270 | |
| Future Volume (vph) 453 285 2 624 255 270 | |
| Ideal Flow (vphpl) 1900 1900 1900 1900 1900 | |
| Lane Width 3.5 3.5 3.5 3.0 3.0 | |
| Total Lost time (s) 6.0 5.0 5.0 5.0 | |
| Lane Util, Factor 0.95 0.95 1.00 1.00 | |
| Frpb, ped/bikes 0.80 1.00 0.93 | |
| Fipb, ped/bikes 1.00 1.00 0.91 1.00 | |
| Frit 0.94 1.00 0.91 | |
| Fit Protected 1.00 1.00 0.05 | |
| Satd. Flow (prot) 2193 2773 1354 1149 | |
| Fit Permitted 1.00 0.95 0.95 1.00 | |
| Satd. Flow (perm) 2193 2643 1354 1149 | |
| | |
| Peak-hour factor, PHF 0.87 0.87 0.87 0.87 0.87 | |
| Adj. Flow (vph) 521 328 2 717 293 310 | |
| RTOR Reduction (vph) 132 0 0 0 0 22 | |
| Lane Group Flow (vph) 717 0 0 719 293 288 | |
| Confl. Peds. (#/hr) 340 340 85 55 | |
| Confl. Bikes (#/hr) 1 | |
| Heavy Vehicles (%) 6% 3% 100% 10% 2% 10% | |
| Bus Blockages (#/hr) 24 24 24 0 0 | |
| Turn Type NA Perm NA Perm Perm | |
| Protected Phases 2 6 | |
| Permitted Phases 6 8 8 | |
| Actuated Green, G (s) 34.5 22.5 22.5 | |
| Effective Green, g (s) 35.5 35.5 23.5 23.5 | |
| Actuated g/C Ratio 0.51 0.51 0.34 0.34 | |
| Clearance Time (s) 7.0 7.0 6.0 6.0 | |
| Vehicle Extension (s) 3.0 3.0 3.0 | |
| Lane Grp Cap (vph) 1112 1340 454 385 | |
| v/s Ratio Prot c0.33 | |
| v/s Ratio Perm 0.27 0.22 c0.25 | |
| v/c Ratio 0.64 0.54 0.65 0.75 | |
| Uniform Delay, d1 12.6 11.7 19.7 20.6 | |
| Progression Factor 1.00 1.00 1.00 1.00 | |
| Incremental Delay, d2 2.9 1.5 3.1 7.8 | |
| Delay (s) 15.5 13.2 22.9 28.4 | |
| Level of Service B B C C | |
| Approach Delay (s) 15.5 13.2 25.7 | |
| Approach LOS B C | |
| Intersection Summary | |
| HCM 2000 Control Delay 17.6 HCM 2000 Level of Service | В |
| HCM 2000 Volume to Capacity ratio 0.70 | |
| Actuated Cycle Length (s) 70.0 Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization 59.5% ICU Level of Service | В |
| Analysis Period (min) 15 | |
| c Critical Lane Group | |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

| | • | - | • | • | - | 4 |
|----------------------------|-------|-------|-------------|-------|--------|-------|
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | LUL | 41 | † | 1101 | ₩. | ODIN |
| Traffic Volume (vph) | 0 | 647 | 907 | 131 | 93 | 23 |
| Future Volume (vph) | 0 | 647 | 907 | 131 | 93 | 23 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 |
| Ped Bike Factor | 0.50 | 0.93 | 0.99 | 0.55 | 0.99 | 1.00 |
| Frt Fred Bike Factor | | | 0.981 | | 0.99 | |
| | | | 0.901 | | 0.973 | |
| Fit Protected | 0 | 2941 | 2858 | 0 | 1459 | 0 |
| Satd. Flow (prot) | U | 2941 | 2000 | U | | U |
| Fit Permitted | _ | 0044 | 2050 | ^ | 0.962 | _ |
| Satd. Flow (perm) | 0 | 2941 | 2858 | 0 | 1459 | 0 |
| Right Turn on Red | | | 0.5 | Yes | 4.5 | Yes |
| Satd. Flow (RTOR) | | | 38 | | 15 | |
| Link Speed (k/h) | | 50 | 50 | | 50 | |
| Link Distance (m) | | 316.7 | 191.3 | | 100.8 | |
| Travel Time (s) | | 22.8 | 13.8 | | 7.3 | |
| Confl. Peds. (#/hr) | 42 | | | 42 | | 15 |
| Confl. Bikes (#/hr) | | | | 19 | | |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Heavy Vehicles (%) | 0% | 4% | 4% | 0% | 0% | 39% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 0.0 | 0 |
| Adj. Flow (vph) | 0 | 727 | 1019 | 147 | 104 | 26 |
| Shared Lane Traffic (%) | U | 121 | 1019 | 147 | 104 | 20 |
| | 0 | 727 | 1166 | 0 | 120 | 0 |
| Lane Group Flow (vph) | | | 1166 | | 130 | |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Left | Right | Left | Right |
| Median Width(m) | | 0.0 | 0.0 | | 3.5 | |
| Link Offset(m) | | 0.0 | 0.0 | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | 1.6 | | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.16 | 1.23 | 1.23 | 1.16 | 1.16 | 1.16 |
| Turning Speed (k/h) | 24 | | | 14 | 24 | 14 |
| Number of Detectors | 1 | 2 | 2 | | 1 | |
| Detector Template | Left | Thru | Thru | | Left | |
| Leading Detector (m) | 6.1 | 30.5 | 30.5 | | 6.1 | |
| | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Trailing Detector (m) | | | | | | |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | 1.8 | | 6.1 | |
| Detector 1 Type | CI+Ex | CI+Ex | CI+Ex | | CI+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 2 Position(m) | | 28.7 | 28.7 | | | |
| Detector 2 Size(m) | | 1.8 | 1.8 | | | |
| Detector 2 Type | | CI+Ex | CI+Ex | | | |
| Detector 2 Channel | | A | <u>-</u> /\ | | | |
| Detector 2 Extend (s) | | 0.0 | 0.0 | | | |
| Turn Type | | NA | NA | | Perm | |
| rum rype | | INA | INA | | reiiil | |

| Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements | |
|---|--|
| HDR Corporation | |

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| | • | → | ← | • | - | 4 | |
|-------------------------------|-------------|-----------|-------------|-----|-------------|--------------|--|
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR | |
| Protected Phases | | 2 | 6 | | | | |
| Permitted Phases | 2 | | | | 8 | | |
| Detector Phase | 2 | 2 | 6 | | 8 | | |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 20.0 | 20.0 | 20.0 | | 18.0 | | |
| Minimum Split (s) | 26.0 | 26.0 | 26.0 | | 23.0 | | |
| Total Split (s) | 55.0 | 55.0 | 55.0 | | 25.0 | | |
| Total Split (%) | 68.8% | 68.8% | 68.8% | | 31.3% | | |
| Maximum Green (s) | 49.0 | 49.0 | 49.0 | | 20.0 | | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | | 3.0 | | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | 2.0 | | |
| Lost Time Adjust (s) | | -1.0 | -1.0 | | -1.0 | | |
| Total Lost Time (s) | | 5.0 | 5.0 | | 4.0 | | |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | | |
| Recall Mode | C-Max | C-Max | None | | None | | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | | 7.0 | | |
| Flash Dont Walk (s) | 13.0 | 13.0 | 13.0 | | 11.0 | | |
| Pedestrian Calls (#/hr) | 100 | 100 | 14 | | 5 | | |
| Act Effct Green (s) | | 57.6 | 57.6 | | 19.0 | | |
| Actuated g/C Ratio | | 0.72 | 0.72 | | 0.24 | | |
| v/c Ratio | | 0.34 | 0.56 | | 0.36 | | |
| Control Delay | | 6.3 | 8.3 | | 25.9 | | |
| Queue Delay | | 0.0 | 0.0 | | 0.0 | | |
| Total Delay | | 6.3 | 8.3 | | 25.9 | | |
| LOS | | A | A | | C | | |
| Approach Delay | | 6.3 | 8.3 | | 25.9 | | |
| Approach LOS | | Α | Α | | С | | |
| Intersection Summary | | | | | | | |
| Area Type: | CBD | | | | | | |
| Cycle Length: 80 | | | | | | | |
| Actuated Cycle Length: 80 | | | | | | | |
| Offset: 1 (1%), Referenced | to phase 2: | EBTL, St | art of Gree | en | | | |
| Natural Cycle: 60 | | | | | | | |
| Control Type: Actuated-Coo | ordinated | | | | | | |
| Maximum v/c Ratio: 0.56 | | | | | | | |
| Intersection Signal Delay: 8 | | | | | ntersection | LOS: A | |
| Intersection Capacity Utiliza | ation 55.4% | | | 1 | CU Level o | of Service B | |
| Analysis Period (min) 15 | | | | | | | |
| Splits and Phases: 2081: | King St & | Joe Shust | ter Way | | | | |
| A | _ | | - | | | | |
| → Ø2 (R) | | | | | | | |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Lanes, Volumes, Timings 2081: King St & Joe Shuster Way

2081: King St & Joe Shuster Way

09/30/2021

| | - | • | - |
|------------------------|-------|-------|------|
| Lane Group | EBT | WBT | SBL |
| Lane Group Flow (vph) | 727 | 1166 | 130 |
| v/c Ratio | 0.34 | 0.56 | 0.36 |
| Control Delay | 6.3 | 8.3 | 25.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 |
| Total Delay | 6.3 | 8.3 | 25.9 |
| Queue Length 50th (m) | 23.6 | 46.1 | 14.5 |
| Queue Length 95th (m) | 32.3 | 62.3 | 29.1 |
| Internal Link Dist (m) | 292.7 | 167.3 | 76.8 |
| Turn Bay Length (m) | | | |
| Base Capacity (vph) | 2117 | 2068 | 394 |
| Starvation Cap Reductn | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.34 | 0.56 | 0.33 |
| Intersection Summary | | | |

HCM Signalized Intersection Capacity Analysis

2081: King St & Joe Shuster Way

09/30/2021

| | • | - | ← | • | - | 4 | |
|-----------------------------------|----------|------|-------------|------|------------|------------------|------|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR | |
| Lane Configurations | | 414 | ↑ 1> | | ¥ | | |
| Traffic Volume (vph) | 0 | 647 | 907 | 131 | 93 | 23 | |
| Future Volume (vph) | 0 | 647 | 907 | 131 | 93 | 23 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Total Lost time (s) | | 5.0 | 5.0 | | 4.0 | | |
| Lane Util. Factor | | 0.95 | 0.95 | | 1.00 | | |
| Frpb, ped/bikes | | 1.00 | 0.99 | | 0.99 | | |
| Flpb, ped/bikes | | 1.00 | 1.00 | | 1.00 | | |
| Frt | | 1.00 | 0.98 | | 0.97 | | |
| Flt Protected | | 1.00 | 1.00 | | 0.96 | | |
| Satd. Flow (prot) | | 2941 | 2859 | | 1458 | | |
| FIt Permitted | | 1.00 | 1.00 | | 0.96 | | |
| Satd. Flow (perm) | | 2941 | 2859 | | 1458 | | |
| Peak-hour factor, PHF | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | _ |
| Adj. Flow (vph) | 0 | 727 | 1019 | 147 | 104 | 26 | |
| RTOR Reduction (vph) | 0 | 0 | 12 | 0 | 12 | 0 | |
| Lane Group Flow (vph) | 0 | 727 | 1154 | 0 | 118 | 0 | |
| Confl. Peds. (#/hr) | 42 | | | 42 | | 15 | |
| Confl. Bikes (#/hr) | | | | 19 | | | |
| Heavy Vehicles (%) | 0% | 4% | 4% | 0% | 0% | 39% | |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 0 | 0 | |
| Turn Type | | NA | NA | | Perm | | |
| Protected Phases | | 2 | 6 | | | | |
| Permitted Phases | 2 | | | | 8 | | |
| Actuated Green, G (s) | | 54.6 | 54.6 | | 14.4 | | |
| Effective Green, g (s) | | 55.6 | 55.6 | | 15.4 | | |
| Actuated g/C Ratio | | 0.70 | 0.70 | | 0.19 | | |
| Clearance Time (s) | | 6.0 | 6.0 | | 5.0 | | |
| Vehicle Extension (s) | | 3.0 | 3.0 | | 3.0 | | |
| Lane Grp Cap (vph) | | 2043 | 1987 | | 280 | | |
| v/s Ratio Prot | | 0.25 | c0.40 | | | | |
| v/s Ratio Perm | | | | | c0.08 | | |
| v/c Ratio | | 0.36 | 0.58 | | 0.42 | | |
| Uniform Delay, d1 | | 4.9 | 6.2 | | 28.4 | | |
| Progression Factor | | 1.00 | 1.00 | | 1.00 | | |
| Incremental Delay, d2 | | 0.5 | 0.4 | | 1.0 | | |
| Delay (s) | | 5.4 | 6.7 | | 29.4 | | |
| Level of Service | | Α | Α | | С | | |
| Approach Delay (s) | | 5.4 | 6.7 | | 29.4 | | |
| Approach LOS | | Α | Α | | С | | |
| Intersection Summary | | | | | | | |
| HCM 2000 Control Delay | | | 7.7 | Н | CM 2000 | Level of Service | Α |
| HCM 2000 Volume to Capaci | ty ratio | | 0.55 | | | | |
| Actuated Cycle Length (s) | | | 80.0 | Sı | um of lost | time (s) | 10.0 |
| Intersection Capacity Utilization | on | | 55.4% | | U Level o | | В |
| Analysis Period (min) | | | 15 | | | | |
| c Critical Lane Group | | | | | | | |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Lanes, Volumes, Timings 2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

09/30/2021

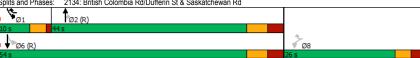
| | • | • | † | / | - | ļ |
|-------------------------------------|-------|-------|----------|-------|-------|----------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | * | 7 | <u> </u> | 7 | * | <u> </u> |
| Traffic Volume (vph) | 56 | 227 | 732 | 21 | 86 | 824 |
| Future Volume (vph) | 56 | 227 | 732 | 21 | 86 | 824 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.0 | 3.5 | 3.0 | 3.0 | 3.5 |
| Storage Length (m) | 30.0 | 0.0 | 0.0 | 15.0 | 30.0 | 0.0 |
| Storage Lanes | 1 | 1 | | 13.0 | 1 | |
| Taper Length (m) | 2.5 | | | | 2.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 1.00 | 0.86 | 1.00 | 0.94 | 1.00 | 1.00 |
| Frt | | | | | | |
| | 0.950 | 0.850 | | 0.850 | 0.950 | |
| Fit Protected | | 4204 | 4040 | 4507 | | 4040 |
| Satd. Flow (prot) | 1685 | 1304 | 1842 | 1507 | 1478 | 1842 |
| Flt Permitted | 0.950 | 4400 | 10.15 | 4446 | 0.159 | 10.15 |
| Satd. Flow (perm) | 1685 | 1122 | 1842 | 1416 | 247 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 94 | | 7 | | |
| Link Speed (k/h) | 30 | | 30 | | | 30 |
| Link Distance (m) | 148.7 | | 265.9 | | | 191.3 |
| Travel Time (s) | 17.8 | | 31.9 | | | 23.0 |
| Confl. Peds. (#/hr) | | | | 27 | 27 | |
| Confl. Bikes (#/hr) | | 117 | | 2 | | |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Heavy Vehicles (%) | 0% | 11% | 2% | 0% | 14% | 2% |
| Bus Blockages (#/hr) | 0 | 10 | 0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 63 | 255 | 822 | 24 | 97 | 926 |
| Shared Lane Traffic (%) | 00 | 200 | OLL | | 01 | 020 |
| Lane Group Flow (vph) | 63 | 255 | 822 | 24 | 97 | 926 |
| Enter Blocked Intersection | No | No | No | No. | No | No |
| | Left | | Left | | Left | Left |
| Lane Alignment | | Right | | Right | Leπ | |
| Median Width(m) | 3.0 | | 3.0 | | | 3.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.09 | 1.15 | 1.01 | 1.09 | 1.09 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| Detector 1 Type | CI+Ex | Cl+Ex | Cl+Ex | CI+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Type Detector 1 Channel | CITEX | OITEX | OITEX | OITEX | OI+EX | OITEX |
| | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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Lanes, Volumes, Timings 2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

| | • | • | † | / | > | ţ |
|-----------------------------|-----------------|-------------|--|------------|-------------|-------------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Detector 2 Type | | | Cl+Ex | | | CI+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Perm | pm+ov | NA | Perm | pm+pt | NA |
| Protected Phases | | 1 | 2 | | 1 | 6 |
| Permitted Phases | 8 | 8 | | 2 | 6 | |
| Detector Phase | 8 | 1 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 21.0 | 6.0 | 27.0 | 27.0 | 6.0 | 27.0 |
| Minimum Split (s) | 26.0 | 10.0 | 34.0 | 34.0 | 10.0 | 34.0 |
| Total Split (s) | 26.0 | 10.0 | 44.0 | 44.0 | 10.0 | 54.0 |
| Total Split (%) | 32.5% | 12.5% | 55.0% | 55.0% | 12.5% | 67.5% |
| Maximum Green (s) | 21.0 | 6.0 | 37.0 | 37.0 | 6.0 | 47.0 |
| Yellow Time (s) | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 |
| All-Red Time (s) | 2.0 | 1.0 | 3.0 | 3.0 | 1.0 | 3.0 |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 4.0 | 3.0 | 6.0 | 6.0 | 3.0 | 6.0 |
| Lead/Lag | | Lead | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | J | J | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | C-Max | C-Max | None | C-Max |
| Walk Time (s) | 7.0 | | 7.0 | 7.0 | | 0.0 |
| Flash Dont Walk (s) | 14.0 | | 20.0 | 20.0 | | 0.0 |
| Pedestrian Calls (#/hr) | 0 | | 9 | 9 | | 0 |
| Act Effct Green (s) | 22.0 | 22.3 | 46.9 | 46.9 | 61.4 | 60.8 |
| Actuated g/C Ratio | 0.28 | 0.28 | 0.59 | 0.59 | 0.77 | 0.76 |
| v/c Ratio | 0.14 | 0.64 | 0.76 | 0.03 | 0.30 | 0.66 |
| Control Delay | 22.9 | 20.4 | 22.8 | 9.1 | 7.4 | 13.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Total Delay | 22.9 | 20.4 | 22.8 | 9.1 | 7.4 | 13.3 |
| LOS | C | С | C | Α | Α | В |
| Approach Delay | 20.9 | - | 22.4 | | | 12.7 |
| Approach LOS | С | | С | | | В |
| Intersection Summary | | | | | | |
| Area Type: | Other | | | | | |
| Cycle Length: 80 | Outo | | | | | |
| Actuated Cycle Length: 8 | 0 | | | | | |
| Offset: 31 (39%), Referen | | 2·NRT a | nd 6:SBT | 1 Start o | f 1st Gree | en en |
| Natural Cycle: 80 | lood to pridoc | | 110 0.0D1 | L, Otari o | 1 100 0100 | ,,, |
| Control Type: Actuated-C | oordinated | | | | | |
| Maximum v/c Ratio: 0.76 | ooramatoa | | | | | |
| Intersection Signal Delay: | 17.7 | | | l. | torcoctio | n LOS: B |
| Intersection Capacity Utili | | | | | | of Service |
| Analysis Period (min) 15 | ZudUII 1 Z.1 /0 | | | I | JO LEVEI | OI OCI VICE |
| Analysis i enou (min) 13 | | | | | | |
| Splits and Phases: 213 | 4: British Col | ombia Ro | l/Dufferin | St & Sasi | katchewa | n Rd |
| 14. A | T. BIILIOIT CO. | 01110101111 | ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, | 01 0 000 | | |



2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

09/30/2021

| | • | • | † | / | / | . ↓ |
|------------------------|-------|------|----------|------|------|--------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Group Flow (vph) | 63 | 255 | 822 | 24 | 97 | 926 |
| v/c Ratio | 0.14 | 0.64 | 0.76 | 0.03 | 0.30 | 0.66 |
| Control Delay | 22.9 | 20.4 | 22.8 | 9.1 | 7.4 | 13.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Total Delay | 22.9 | 20.4 | 22.8 | 9.1 | 7.4 | 13.3 |
| Queue Length 50th (m) | 7.2 | 15.9 | 112.9 | 1.3 | 5.1 | 102.3 |
| Queue Length 95th (m) | 16.0 | 33.9 | #184.8 | 4.9 | 10.2 | #164.9 |
| Internal Link Dist (m) | 124.7 | | 241.9 | | | 167.3 |
| Turn Bay Length (m) | 30.0 | | | 15.0 | 30.0 | |
| Base Capacity (vph) | 463 | 399 | 1080 | 833 | 319 | 1400 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 52 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.14 | 0.64 | 0.76 | 0.03 | 0.30 | 0.69 |

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

09/30/2021

| | • | • | † | / | \ | ↓ | |
|-------------------------------|------------|-------|----------|---------|------------|---------------|-----------|
| Movement | WBL | WBR | NBT | NBR | SBL | SBT | |
| Lane Configurations | * | 1 | * | 7 | * | * | |
| Traffic Volume (vph) | 56 | 227 | 732 | 21 | 86 | 824 | |
| Future Volume (vph) | 56 | 227 | 732 | 21 | 86 | 824 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Lane Width | 3.0 | 3.0 | 3.5 | 3.0 | 3.0 | 3.5 | |
| Total Lost time (s) | 4.0 | 3.0 | 6.0 | 6.0 | 3.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frpb, ped/bikes | 1.00 | 0.89 | 1.00 | 0.94 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1685 | 1162 | 1842 | 1416 | 1477 | 1842 | |
| FIt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.16 | 1.00 | |
| Satd. Flow (perm) | 1685 | 1162 | 1842 | 1416 | 247 | 1842 | |
| Peak-hour factor, PHF | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | |
| Adj. Flow (vph) | 63 | 255 | 822 | 24 | 97 | 926 | |
| RTOR Reduction (vph) | 0 | 68 | 0 | 3 | 0 | 0 | |
| Lane Group Flow (vph) | 63 | 187 | 822 | 21 | 97 | 926 | |
| Confl. Peds. (#/hr) | 00 | | 022 | 27 | 27 | 020 | |
| Confl. Bikes (#/hr) | | 117 | | 2 | | | |
| Heavy Vehicles (%) | 0% | 11% | 2% | 0% | 14% | 2% | |
| Bus Blockages (#/hr) | 0 | 10 | 0 | 0 | 0 | 0 | |
| Turn Type | Perm | pm+ov | NA | Perm | pm+pt | NA | |
| Protected Phases | 1 01111 | 1 | 2 | 1 01111 | 1 | 6 | |
| Permitted Phases | 8 | 8 | _ | 2 | 6 | • | |
| Actuated Green, G (s) | 12.6 | 20.1 | 43.9 | 43.9 | 55.4 | 55.4 | |
| Effective Green, g (s) | 13.6 | 22.1 | 44.9 | 44.9 | 56.4 | 56.4 | |
| Actuated g/C Ratio | 0.17 | 0.28 | 0.56 | 0.56 | 0.70 | 0.70 | |
| Clearance Time (s) | 5.0 | 4.0 | 7.0 | 7.0 | 4.0 | 7.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 286 | 321 | 1033 | 794 | 304 | 1298 | |
| v/s Ratio Prot | 200 | c0.06 | c0.45 | 104 | 0.03 | c0.50 | |
| v/s Ratio Perm | 0.04 | 0.10 | UU.7U | 0.01 | 0.03 | 50.00 | |
| v/c Ratio | 0.22 | 0.58 | 0.80 | 0.03 | 0.13 | 0.71 | |
| Uniform Delay, d1 | 28.6 | 25.0 | 13.9 | 7.8 | 9.0 | 7.0 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.4 | 2.7 | 6.3 | 0.1 | 0.6 | 3.4 | |
| Delay (s) | 29.0 | 27.7 | 20.3 | 7.9 | 9.7 | 10.4 | |
| Level of Service | C | C | C | A | A | В | |
| Approach Delay (s) | 27.9 | | 19.9 | - '` | - ' ' | 10.3 | |
| Approach LOS | C | | В | | | В | |
| Intersection Summary | | | | | | | |
| HCM 2000 Control Delay | | | 16.6 | Ц | CM 2000 | Level of Serv | vice B |
| HCM 2000 Control Delay | city ratio | | 0.76 | П | CIVI 2000 | reveror serv | vice D |
| Actuated Cycle Length (s) | orly ratio | | 80.0 | c | um of lost | time (c) | 14.0 |
| Intersection Capacity Utiliza | tion | | 72.7% | | CU Level | | 14.0 C |
| Analysis Period (min) | uon | | 12.1% | 10 | O Level (| JI JEI VICE | U |
| c Critical Lane Group | | | 13 | | | | |
| C Official Larie Group | | | | | | | |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

| 3023. New Liberty | <u> </u> | | | _ | | , |
|---------------------------------|----------|-------|-------|-------|--------|-------|
| | • | - | • | • | - | 4 |
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | LUL | 4 | ₩D1 | TTUI | ₩ W | יוםטי |
| Traffic Volume (vph) | 9 | 159 | 42 | 15 | 93 | 78 |
| Future Volume (vph) | 9 | 159 | 42 | 15 | 93 | 78 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 1.00 | 0.97 | 0.83 | 1.00 | 0.60 | 1.00 |
| Frt | | 0.57 | 0.964 | | 0.938 | |
| Fit Protected | | 0.997 | 0.904 | | 0.938 | |
| Satd. Flow (prot) | 0 | 1734 | 1467 | 0 | 1458 | 0 |
| Satd. Flow (prot) FIt Permitted | U | 0.989 | 140/ | U | 0.974 | U |
| | 0 | 1666 | 1467 | 0 | 1002 | 0 |
| Satd. Flow (perm) | 0 | 0001 | 140/ | Yes | 1002 | Yes |
| Right Turn on Red | | | 17 | res | 0 | res |
| Satd. Flow (RTOR) | | 40 | 17 | | 2 | |
| Link Speed (k/h) | | 40 | 40 | | 50 | |
| Link Distance (m) | | 87.6 | 198.4 | | 42.4 | |
| Travel Time (s) | | 7.9 | 17.9 | | 3.1 | |
| Confl. Peds. (#/hr) | 871 | | | 871 | 636 | 200 |
| Confl. Bikes (#/hr) | | | | 14 | | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Bus Blockages (#/hr) | 0 | 14 | 0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 10 | 177 | 47 | 17 | 103 | 87 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 187 | 64 | 0 | 190 | 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 | J | 3.5 | J |
| Link Offset(m) | | 0.0 | 0.0 | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | 1.6 | | 1.6 | |
| Two way Left Turn Lane | | 0 | | | | |
| Headway Factor | 1.01 | 1.09 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 1.03 | 1.01 | 1.01 | 24 | 1.01 |
| Number of Detectors | 1 | 2 | 2 | 14 | 1 | 14 |
| Detector Template | Left | Thru | Thru | | Left | |
| Leading Detector (m) | 6.1 | 30.5 | 30.5 | | 6.1 | |
| Trailing Detector (m) | 0.0 | | 0.0 | | 0.0 | |
| | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Position(m) | | 0.0 | | | | |
| Detector 1 Size(m) | 6.1 | 1.8 | 1.8 | | 6.1 | |
| Detector 1 Type | CI+Ex | CI+Ex | CI+Ex | | CI+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 2 Position(m) | | 28.7 | 28.7 | | | |
| Detector 2 Size(m) | | 1.8 | 1.8 | | | |
| Detector 2 Type | | CI+Ex | CI+Ex | | | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | 0.0 | 0.0 | | | |
| Turn Type | Perm | NA | NA | | Perm | |
| Protected Phases | | 2 | 6 | | | |
| .0.00.00 1 110000 | | 2 | 0 | | | |

| Scenario 1 Future Background PM 11:59 pm 05/05/201 | 4 No Improvements |
|--|-------------------|
| HDR Corporation | |

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| Lane Group Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (y6) Maximum Green (s) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Vehicle Extension (s) Recall Mode Walk Time (s) Flash Dont Walk (s) Pedestrian Calls (#/hr) | 2 2 7.0 24.0 26.0 52.0% 20.0 4.0 2.0 C-Max 7.0 | 7.0 24.0 26.0 52.0% 20.0 4.0 2.0 -1.0 5.0 | 6 7.0 24.0 26.0 52.0% 20.0 4.0 2.0 -1.0 5.0 | WBR | 7.0 24.0 24.0 48.0% 18.0 4.0 2.0 -1.0 5.0 | SBR | | |
|--|---|---|--|-------------|---|--------------|--|--|
| Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (y) Maximum Green (s) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Vehicle Extension (s) Recall Mode Walk Time (s) Flash Dont Walk (s) Pedestrian Calls (#hr) | 2 7.0 24.0 26.0 52.0% 20.0 4.0 2.0 | 7.0 24.0 26.0 52.0% 20.0 4.0 2.0 -1.0 5.0 | 7.0 24.0 26.0 52.0% 20.0 4.0 2.0 -1.0 | | 7.0 24.0 24.0 48.0% 18.0 4.0 2.0 -1.0 | | | |
| Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (%) Maximum Green (s) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead/Lag Optimize? Vehicle Extension (s) Recall Mode Walk Time (s) Flash Dont Walk (s) Pedestrian Calls (#hr) | 7.0 24.0 26.0 52.0% 20.0 4.0 2.0 | 7.0 24.0 26.0 52.0% 20.0 4.0 2.0 -1.0 5.0 | 7.0 24.0 26.0 52.0% 20.0 4.0 2.0 -1.0 | | 7.0 24.0 24.0 48.0% 18.0 4.0 2.0 -1.0 | | | |
| Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (%) Maximum Green (s) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Optimize? Vehicle Extension (s) Recall Mode Walk Time (s) Flash Dont Walk (s) Pedestrian Calls (#/hr) | 24.0 26.0 52.0% 20.0 4.0 2.0 3.0 C-Max | 24.0 26.0 52.0% 20.0 4.0 2.0 -1.0 5.0 | 24.0 26.0 52.0% 20.0 4.0 2.0 -1.0 | | 24.0 24.0 48.0% 18.0 4.0 2.0 -1.0 | | | |
| Minimum Split (s) Total Split (s) Total Split (%) Maximum Green (s) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Optimize? Vehicle Extension (s) Recall Mode Walk Time (s) Fleash Dont Walk (s) Pedestrian Calls (#/hr) | 24.0 26.0 52.0% 20.0 4.0 2.0 3.0 C-Max | 24.0 26.0 52.0% 20.0 4.0 2.0 -1.0 5.0 | 24.0 26.0 52.0% 20.0 4.0 2.0 -1.0 | | 24.0 24.0 48.0% 18.0 4.0 2.0 -1.0 | | | |
| Total Split (s) Total Split (%) Maximum Green (s) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead/Lag Optimize? Vehicle Extension (s) Recall Mode Walk Time (s) Flash Dont Walk (s) Pedestrian Calls (#/hr) | 26.0 52.0% 20.0 4.0 2.0 3.0 C-Max | 26.0 52.0% 20.0 4.0 2.0 -1.0 5.0 | 26.0 52.0% 20.0 4.0 2.0 -1.0 | | 24.0 48.0% 18.0 4.0 2.0 -1.0 | | | |
| Total Split (s) Total Split (%) Maximum Green (s) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead/Lag Optimize? Vehicle Extension (s) Recall Mode Walk Time (s) Flash Dont Walk (s) Pedestrian Calls (#/hr) | 26.0 52.0% 20.0 4.0 2.0 3.0 C-Max | 26.0 52.0% 20.0 4.0 2.0 -1.0 5.0 | 26.0 52.0% 20.0 4.0 2.0 -1.0 | | 24.0 48.0% 18.0 4.0 2.0 -1.0 | | | |
| Total Split (%) Maximum Green (s) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Vehicle Extension (s) Recall Mode Walk Time (s) Flash Dont Walk (s) Pedestrian Calls (#/hr) | 52.0% 20.0 4.0 2.0 3.0 C-Max | 52.0% 20.0 4.0 2.0 -1.0 5.0 | 52.0% 20.0 4.0 2.0 -1.0 | | 48.0% 18.0 4.0 2.0 -1.0 | | | |
| Maximum Green (s) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Optimize? Vehicle Extension (s) Recall Mode Walk Time (s) Flash Dont Walk (s) Pedestrian Calls (#/hr) | 20.0 4.0 2.0 3.0 C-Max | 20.0 4.0 2.0 -1.0 5.0 | 20.0 4.0 2.0 -1.0 | | 18.0 4.0 2.0 -1.0 | | | |
| Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Vehicle Extension (s) Recall Mode Walk Time (s) Flash Dont Walk (s) Pedestrian Calls (#/hr) | 3.0 C-Max | 4.0 2.0 -1.0 5.0 | 4.0 2.0 -1.0 | | 4.0 2.0 -1.0 | | | |
| All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead/Lag Optimize? Vehicle Extension (s) Recall Mode Walk Time (s) Flash Dont Walk (s) Pedestrian Calls (#/hr) | 3.0 C-Max | 2.0 -1.0 5.0 | 2.0 -1.0 | | 2.0 -1.0 | | | |
| Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Vehicle Extension (s) Recall Mode Walk Time (s) Flash Dont Walk (s) Pedestrian Calls (#/hr) | 3.0 C-Max | -1.0 5.0 | -1.0 | | -1.0 | | | |
| Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Vehicle Extension (s) Recall Mode Walk Time (s) Flash Dont Walk (s) Pedestrian Calls (#/hr) | C-Max | 5.0 | | | | | | |
| Lead/Lag Lead-Lag Optimize? Vehicle Extension (s) Recall Mode Walk Time (s) Flash Dont Walk (s) Pedestrian Calls (#/hr) | C-Max | | 5.0 | | 5.0 | | | |
| Lead-Lag Optimize? Vehicle Extension (s) Recall Mode Walk Time (s) Flash Dont Walk (s) Pedestrian Calls (#/hr) | C-Max | 3.0 | | | | | | |
| Vehicle Extension (s) Recall Mode Walk Time (s) Flash Dont Walk (s) Pedestrian Calls (#/hr) | C-Max | 3.0 | | | | | | |
| Recall Mode Walk Time (s) Flash Dont Walk (s) Pedestrian Calls (#/hr) | C-Max | | 3.0 | | 3.0 | | | |
| Walk Time (s) Flash Dont Walk (s) Pedestrian Calls (#/hr) | | C-Max | C-Max | | None | | | |
| Flash Dont Walk (s) Pedestrian Calls (#/hr) | | 7.0 | 7.0 | | 7.0 | | | |
| Pedestrian Calls (#/hr) | 11.0 | 11.0 | 11.0 | | 11.0 | | | |
| | 100 | 100 | 100 | | 100 | | | |
| | 100 | | | | | | | |
| Act Effct Green (s) | | 28.1 | 28.1 | | 15.6 | | | |
| Actuated g/C Ratio | | 0.56 | 0.56 | | 0.31 | | | |
| v/c Ratio | | 0.20 | 0.08 | | 0.61 | | | |
| Control Delay | | 9.5 | 7.3 | | 22.2 | | | |
| Queue Delay | | 0.0 | 0.0 | | 0.0 | | | |
| Total Delay | | 9.5 | 7.3 | | 22.2 | | | |
| LOS | | Α | Α | | С | | | |
| Approach Delay | | 9.5 | 7.3 | | 22.2 | | | |
| Approach LOS | | Α | Α | | С | | | |
| Intersection Summary | | | | | | | | |
| Area Type: | Other | | | | | | | |
| Cycle Length: 50 | | | | | | | | |
| Actuated Cycle Length: 50 | J | | | | | | | |
| Offset: 0 (0%), Reference | d to phase 2: | EBTL and | d 6:WBT, | Start of Gr | reen | | | |
| Natural Cycle: 50 | | | | | | | | |
| Control Type: Actuated-Co | oordinated | | | | | | | |
| Maximum v/c Ratio: 0.61 | | | | | | | | |
| Intersection Signal Delay: | 14.6 | | | Int | tersection | LOS: B | | |
| Intersection Capacity Utiliz | zation 38.9% | | | ICI | U Level o | of Service A | | |
| Analysis Period (min) 15 | | | | | | | | |
| Splits and Phases: 902 | 3: New Libert | tv St & At | tlantic Ave | | | | | |
| A | <u> </u> | . , 0. a . | | | | la. | | |
| → Ø2 (R) | | | | | 24- | Ø4 | | |
| 26 S | | | | | 24 s | | | |
| Ø6 (R) | | | | | | | | |

Lanes, Volumes, Timings 9023: New Liberty St & Atlantic Ave

9023: New Liberty St & Atlantic Ave

09/30/2021

| | - | - | - |
|------------------------|------|-------|------|
| Lane Group | EBT | WBT | SBL |
| Lane Group Flow (vph) | 187 | 64 | 190 |
| v/c Ratio | 0.20 | 0.08 | 0.61 |
| Control Delay | 9.5 | 7.3 | 22.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 |
| Total Delay | 9.5 | 7.3 | 22.2 |
| Queue Length 50th (m) | 10.3 | 2.4 | 12.2 |
| Queue Length 95th (m) | 20.8 | 7.6 | 27.5 |
| Internal Link Dist (m) | 63.6 | 174.4 | 18.4 |
| Turn Bay Length (m) | | | |
| Base Capacity (vph) | 935 | 831 | 382 |
| Starvation Cap Reductn | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.20 | 0.08 | 0.50 |
| Intersection Summary | | | |

HCM Signalized Intersection Capacity Analysis 9023: New Liberty St & Atlantic Ave

| | • | - | • | • | 1 | 4 | | |
|-------------------------------|-------------|-----------|-------|------|------------|------------------|----|----|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR | | |
| Lane Configurations | | 4 | 1> | | ¥ | | | |
| Fraffic Volume (vph) | 9 | 159 | 42 | 15 | 93 | 78 | | |
| Future Volume (vph) | 9 | 159 | 42 | 15 | 93 | 78 | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | | |
| Total Lost time (s) | | 5.0 | 5.0 | | 5.0 | | | |
| Lane Util, Factor | | 1.00 | 1.00 | | 1.00 | | | |
| Frpb, ped/bikes | | 1.00 | 0.83 | | 0.87 | | | |
| Flpb, ped/bikes | | 0.97 | 1.00 | | 0.69 | | | |
| Frt | | 1.00 | 0.96 | | 0.94 | | | |
| Flt Protected | | 1.00 | 1.00 | | 0.97 | | | |
| Satd. Flow (prot) | | 1680 | 1468 | | 1002 | | | |
| FIt Permitted | | 0.99 | 1.00 | | 0.97 | | | |
| Satd. Flow (perm) | | 1666 | 1468 | | 1002 | | | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | | |
| Adj. Flow (vph) | 10 | 177 | 47 | 17 | 103 | 87 | | |
| RTOR Reduction (vph) | 0 | 0 | 8 | 0 | 1 | 0 | | |
| Lane Group Flow (vph) | 0 | 187 | 56 | 0 | 189 | 0 | | |
| Confl. Peds. (#/hr) | 871 | | | 871 | 636 | 200 | | |
| Confl. Bikes (#/hr) | | | | 14 | | | | |
| Bus Blockages (#/hr) | 0 | 14 | 0 | 0 | 0 | 0 | | |
| Turn Type | Perm | NA | NA | | Perm | | | |
| Protected Phases | | 2 | 6 | | | | | |
| Permitted Phases | 2 | _ | | | 4 | | | |
| Actuated Green, G (s) | | 24.9 | 24.9 | | 13.1 | | | |
| Effective Green, g (s) | | 25.9 | 25.9 | | 14.1 | | | |
| Actuated g/C Ratio | | 0.52 | 0.52 | | 0.28 | | | |
| Clearance Time (s) | | 6.0 | 6.0 | | 6.0 | | | |
| Vehicle Extension (s) | | 3.0 | 3.0 | | 3.0 | | | |
| Lane Grp Cap (vph) | | 862 | 760 | | 282 | | | |
| //s Ratio Prot | | - · · · - | 0.04 | | | | | |
| //s Ratio Perm | | c0.11 | | | c0.19 | | | |
| //c Ratio | | 0.22 | 0.07 | | 0.67 | | | |
| Uniform Delay, d1 | | 6.5 | 6.0 | | 15.9 | | | |
| Progression Factor | | 1.00 | 1.00 | | 1.00 | | | |
| Incremental Delay, d2 | | 0.6 | 0.2 | | 5.9 | | | |
| Delay (s) | | 7.1 | 6.2 | | 21.8 | | | |
| Level of Service | | Α | Α | | С | | | |
| Approach Delay (s) | | 7.1 | 6.2 | | 21.8 | | | |
| Approach LOS | | Α | Α | | С | | | |
| Intersection Summary | | | | | | | | |
| HCM 2000 Control Delay | | | 13.3 | H | CM 2000 | Level of Service | 9 | В |
| HCM 2000 Volume to Capa | acity ratio | | 0.39 | | | | | |
| Actuated Cycle Length (s) | | | 50.0 | Sı | um of lost | time (s) | 11 | .0 |
| Intersection Capacity Utiliza | ation | | 38.9% | IC | U Level c | of Service | | Α |
| Analysis Period (min) | | | 15 | | | | | |
| Critical Lane Group | | | | | | | | |
| | | | | | | | | |

Lanes, Volumes, Timings 9024: Dufferin St & New Liberty St

09/30/2021

| | • | • | † | 1 | - | ↓ |
|------------------------------------|-------|--------|----------|--------|-------|----------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | ሻ | 7 | 1 | | * | <u> </u> |
| Traffic Volume (vph) | 162 | 53 | 828 | 158 | 12 | 768 |
| Future Volume (vph) | 162 | 53 | 828 | 158 | 12 | 768 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 15.0 | 0.0 | 1000 | 0.0 | 0.0 | 1000 |
| Storage Lanes | 13.0 | 1 | | 0.0 | 1 | |
| | 2.5 | | | U | 2.5 | |
| Taper Length (m) Lane Util, Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 1.00 | 0.79 | 0.98 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.79 | | | | |
| | 0.050 | 0.830 | 0.978 | | 0.950 | |
| Fit Protected | 0.950 | 1500 | 1766 | ^ | | 1040 |
| Satd. Flow (prot) | 1750 | 1566 | 1766 | 0 | 1750 | 1842 |
| Flt Permitted | 0.950 | 10.15 | 4705 | _ | 0.134 | 10.15 |
| Satd. Flow (perm) | 1750 | 1240 | 1766 | 0 | 247 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 58 | 24 | | | |
| Link Speed (k/h) | 40 | | 30 | | | 30 |
| Link Distance (m) | 107.6 | | 191.3 | | | 74.7 |
| Travel Time (s) | 9.7 | | 23.0 | | | 9.0 |
| Confl. Peds. (#/hr) | | 137 | | | | |
| Confl. Bikes (#/hr) | | 2 | | 118 | | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 180 | 59 | 920 | 176 | 13 | 853 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 180 | 59 | 1096 | 0 | 13 | 853 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | rugiic | 3.5 | rugiit | Loit | 3.5 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| (/ | 1.0 | | 1.0 | | | 1.0 |
| Two way Left Turn Lane | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 |
| Headway Factor | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | _ |
| Number of Detectors | 1 | 1 | 2 | | 1 | 2 |
| Detector Template | Left | Right | Thru | | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | 6.1 | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | 6.1 | 1.8 |
| Detector 1 Type | CI+Ex | Cl+Ex | CI+Ex | | CI+Ex | CI+Ex |
| Detector 1 Channel | | | | | - | - |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 2 Position(m) | 0.0 | 0.0 | 28.7 | | 0.0 | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| | | | CI+Ex | | | CI+Ex |
| Detector 2 Type | | | ∪I+EX | | | UI+EX |
| Detector 2 Channel | | | 0.0 | | | 0.0 |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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Lanes, Volumes, Timings 9024: Dufferin St & New Liberty St

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|---|---------------|----------|-----------|------------|-----------|------------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Turn Type | Perm | Perm | NA | | Perm | NA |
| Protected Phases | | | 2 | | | 6 |
| Permitted Phases | 8 | 8 | | | 6 | |
| Detector Phase | 8 | 8 | 2 | | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 |
| Minimum Split (s) | 24.0 | 24.0 | 24.0 | | 24.0 | 24.0 |
| Total Split (s) | 24.0 | 24.0 | 26.0 | | 26.0 | 26.0 |
| Total Split (%) | 48.0% | 48.0% | 52.0% | | 52.0% | 52.0% |
| Maximum Green (s) | 18.0 | 18.0 | 20.0 | | 20.0 | 20.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | | -1.0 | -1.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 |
| Lead/Lag | 0.0 | 0.0 | 5.5 | | 0.0 | 0.0 |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 |
| Recall Mode | None | None | C-Max | | C-Max | C-Max |
| 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) | 11.5 | 11.5 | 32.1 | | 32.1 | 32.1 |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.64 | | 0.64 | 0.64 |
| v/c Ratio | 0.45 | 0.18 | 0.96 | | 0.04 | 0.72 |
| Control Delay | 19.4 | 6.2 | 36.2 | | 8.1 | 15.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Total Delay | 19.4 | 6.2 | 36.2 | | 8.1 | 15.7 |
| LOS | 13.4 B | 0.2 A | J0.2 | | Α. | 13.7 B |
| Approach Delay | 16.1 | ^ | 36.2 | | ^ | 15.6 |
| Approach LOS | 10.1 B | | 30.2 D | | | 15.0 B |
| • | ٥ | | U | | | D |
| Intersection Summary | | | | | | |
| Area Type: | Other | | | | | |
| Cycle Length: 50 | | | | | | |
| Actuated Cycle Length: 50 | | | | | | |
| Offset: 0 (0%), Referenced | I to phase 2: | NBT and | 6:SBTL, S | Start of G | reen | |
| Natural Cycle: 80 | | | | | | |
| Control Type: Actuated-Co | ordinated | | | | | |
| Maximum v/c Ratio: 0.96 | | | | | | |
| Intersection Signal Delay: | | | | In | tersectio | n LOS: C |
| Intersection Capacity Utiliz | ation 76.5% | | | IC | U Level | of Service |
| Analysis Period (min) 15 | | | | | | |
| | | | | | | |
| Splits and Phases: 9024 | : Dufferin St | & New L | iberty St | | | |
| ↑ | | | | | | |
| Ø2 (R) | | | | | | |
| 26 s | | | | | | |
| Ø6 (R) | | | | | | Ø8 |
| 7 20 (K) | | | _ | | 2.4 | + 20 |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

9024: Dufferin St & New Liberty St

09/30/2021

| | • | • | † | - | ↓ |
|------------------------|------|------|----------|------|--------|
| Lane Group | WBL | WBR | NBT | SBL | SBT |
| Lane Group Flow (vph) | 180 | 59 | 1096 | 13 | 853 |
| v/c Ratio | 0.45 | 0.18 | 0.96 | 0.08 | 0.72 |
| Control Delay | 19.4 | 6.2 | 36.2 | 8.1 | 15.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 19.4 | 6.2 | 36.2 | 8.1 | 15.7 |
| Queue Length 50th (m) | 13.8 | 0.1 | ~113.5 | 0.4 | 51.8 |
| Queue Length 95th (m) | 24.6 | 5.9 | #190.0 | 3.0 | #132.6 |
| Internal Link Dist (m) | 83.6 | | 167.3 | | 50.7 |
| Turn Bay Length (m) | 15.0 | | | | |
| Base Capacity (vph) | 665 | 507 | 1141 | 158 | 1181 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.27 | 0.12 | 0.96 | 0.08 | 0.72 |

HCM Signalized Intersection Capacity Analysis 9024: Dufferin St & New Liberty St

| | • | • | † | / | > | ↓ | |
|------------------------------|-------------|-------------|-----------|------|-------------|------------------|-----|
| Movement | WBL | WBR | NBT | NBR | SBL | SBT | |
| Lane Configurations | ሻ | 7 | - 1> | | ሻ | ↑ | |
| Traffic Volume (vph) | 162 | 53 | 828 | 158 | 12 | 768 | |
| Future Volume (vph) | 162 | 53 | 828 | 158 | 12 | 768 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Total Lost time (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frpb, ped/bikes | 1.00 | 0.79 | 0.99 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | 0.98 | | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1750 | 1238 | 1775 | | 1750 | 1842 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | 0.13 | 1.00 | |
| Satd. Flow (perm) | 1750 | 1238 | 1775 | | 246 | 1842 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | |
| Adj. Flow (vph) | 180 | 59 | 920 | 176 | 13 | 853 | |
| RTOR Reduction (vph) | 0 | 46 | 10 | 0 | 0 | 0 | |
| Lane Group Flow (vph) | 180 | 13 | 1086 | 0 | 13 | 853 | |
| Confl. Peds. (#/hr) | | 137 | | 446 | | | |
| Confl. Bikes (#/hr) | | 2 | | 118 | | | |
| Turn Type | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | ^ | • | 2 | | • | 6 | |
| Permitted Phases | 8 | 8 | 00.0 | | 6 | 00.0 | |
| Actuated Green, G (s) | 9.1 | 9.1 | 28.9 | | 28.9 | 28.9 | |
| Effective Green, g (s) | 10.1 | 10.1 | 29.9 | | 29.9 | 29.9 | |
| Actuated g/C Ratio | 0.20 | 0.20 | 0.60 | | 0.60 | 0.60 | |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 353 | 250 | 1061 | | 147 | 1101 | |
| v/s Ratio Prot | -0.40 | 0.04 | c0.61 | | 0.05 | 0.46 | |
| v/s Ratio Perm | c0.10 | 0.01 | 4.00 | | 0.05 | 0.77 | |
| v/c Ratio | 0.51 | 0.05 | 1.02 | | 0.09 | 0.77 | |
| Uniform Delay, d1 | 17.7 | 16.1 | 10.1 | | 4.3 | 7.5 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.2 18.9 | 0.1 16.2 | 33.8 | | 1.2 | 5.3 | |
| Delay (s) | 18.9 B | 16.2 B | 43.9 D | | 5.5 | 12.9 B | |
| Level of Service | 18.2 | В | 43.9 | | Α | | |
| Approach LOS | 18.2 B | | 43.9 D | | | 12.8 B | |
| Approach LOS | В | | U | | | Б | |
| Intersection Summary | | | | | | | |
| HCM 2000 Control Delay | | | 28.9 | H | CM 2000 | Level of Service |) (|
| HCM 2000 Volume to Capa | acity ratio | | 0.92 | | | | |
| Actuated Cycle Length (s) | | | 50.0 | | um of lost | (-) | 11. |
| Intersection Capacity Utiliz | ation | | 76.5% | IC | U Level c | of Service | l l |
| Analysis Period (min) | | | 15 | | | | |

c Critical Lane Group

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

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

Queue shown is maximum after two cycles.

| | • | • | 1 | † | ↓ . | 4 |
|-------------------------------|-------|----------|-------|----------|---------------|---------|
| Movement | EBL | EBR | NBL | NBT | SBT : | SBR |
| Lane Configurations | * | 7 | | | † | |
| Traffic Volume (veh/h) | 0 | 228 | 0 | 720 | 670 | 41 |
| Future Volume (Veh/h) | 0 | 228 | 0 | 720 | 670 | 41 |
| 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 | 253 | 0 | 800 | 744 | 46 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | 241 | | |
| pX, platoon unblocked | 0.71 | | | | | |
| vC, conflicting volume | 1567 | 767 | 790 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1594 | 767 | 790 | | | |
| 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 | 37 | 100 | | | |
| cM capacity (veh/h) | 84 | 402 | 830 | | | |
| Direction, Lane # | EB 1 | EB 2 | NB 1 | NB 2 | SB 1 | |
| | | 253 | 0 | 800 | 790 | |
| Volume Total | 0 | | - | | | |
| Volume Left | 0 | 0 253 | 0 | 0 | 0 46 | |
| Volume Right | | 402 | 1700 | - | 1700 | |
| cSH | 1700 | | | 1700 | | |
| Volume to Capacity | 0.00 | 0.63 | 0.00 | 0.47 | 0.46 | |
| Queue Length 95th (m) | 0.0 | 31.6 | 0.0 | 0.0 | 0.0 | |
| Control Delay (s) | 0.0 | 28.0 | 0.0 | 0.0 | 0.0 | |
| Lane LOS | A | D | | | | |
| Approach Delay (s) | 28.0 | | 0.0 | | 0.0 | |
| Approach LOS | D | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 3.8 | | | |
| Intersection Capacity Utiliza | ation | | 58.5% | IC | CU Level of S | Service |
| Analysis Period (min) | | | 15 | | | |
| - , , | | | | | | |

| | - | * | 7 | ı | * | • |
|-------------------------------|------------|-------|------|----------|-----------|--------------|
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | * | 7 | ٦ | † | † | |
| Traffic Volume (vph) | 0 | 228 | 0 | 720 | 670 | 41 |
| Future Volume (vph) | 0 | 228 | 0 | 720 | 670 | 41 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 15.0 | 0.0 | 15.0 | | | 0.0 |
| Storage Lanes | 1 | 1 | 1 | | | 0 |
| Taper Length (m) | 2.5 | | 2.5 | | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | | 0.850 | | | 0.992 | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 1842 | 1566 | 1842 | 1842 | 1827 | 0 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 1842 | 1566 | 1842 | 1842 | 1827 | 0 |
| Link Speed (k/h) | 40 | | | 40 | 40 | |
| Link Distance (m) | 579.0 | | | 241.4 | 424.1 | |
| Travel Time (s) | 52.1 | | | 21.7 | 38.2 | |
| Confl. Bikes (#/hr) | | | | | | 18 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 0 | 253 | 0 | 800 | 744 | 46 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 253 | 0 | 800 | 790 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 3.5 | 3.5 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Sign Control | Stop | | | Free | Free | |
| Intersection Summary | | _ | _ | _ | _ | |
| | 011 | | | | | |
| | Other | | | | | |
| Control Type: Unsignalized | # FO FO | | | | NIII 1 | |
| Intersection Capacity Utiliza | tion 58.5% | | | IC | U Level (| of Service I |
| Analysis Period (min) 15 | | | | | | |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 59 Scenario 1 Future Background PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

| Scenario 1 Future Background PM 11:59 pm 05/05/2014 With Improvements | |
|---|--|
| HDR Corporation | |

Synchro 11 Report Page 1

| Long Croup | Ø10 | Ø12 | Ø14 | Ø16 |
|----------------------------|-----|-----|-----|-----|
| Lane Group | טוש | WIZ | W14 | סוש |
| Lane Configurations | | | | |
| Traffic Volume (vph) | | | | |
| Future Volume (vph) | | | | |
| Ideal Flow (vphpl) | | | | |
| Lane Width (m) | | | | |
| Storage Length (m) | | | | |
| Storage Lanes | | | | |
| Taper Length (m) | | | | |
| Lane Util. Factor | | | | |
| Ped Bike Factor | | | | |
| Frt | | | | |
| Flt Protected | | | | |
| Satd. Flow (prot) | | | | |
| Flt Permitted | | | | |
| Satd. Flow (perm) | | | | |
| Right Turn on Red | | | | |
| Satd. Flow (RTOR) | | | | |
| Link Speed (k/h) | | | | |
| Link Distance (m) | | | | |
| Travel Time (s) | | | | |
| Confl. Peds. (#/hr) | | | | |
| | | | | |
| Confl. Bikes (#/hr) | | | | |
| Peak Hour Factor | | | | |
| Heavy Vehicles (%) | | | | |
| Adj. Flow (vph) | | | | |
| Shared Lane Traffic (%) | | | | |
| Lane Group Flow (vph) | | | | |
| Enter Blocked Intersection | | | | |
| Lane Alignment | | | | |
| Median Width(m) | | | | |
| Link Offset(m) | | | | |
| Crosswalk Width(m) | | | | |
| Two way Left Turn Lane | | | | |
| Headway Factor | | | | |
| Turning Speed (k/h) | | | | |
| Number of Detectors | | | | |
| Detector Template | | | | |
| Leading Detector (m) | | | | |
| Trailing Detector (m) | | | | |
| Detector 1 Position(m) | | | | |
| Detector 1 Size(m) | | | | |
| | | | | |
| Detector 1 Type | | | | |
| Detector 1 Channel | | | | |
| Detector 1 Extend (s) | | | | |
| Detector 1 Queue (s) | | | | |
| Detector 1 Delay (s) | | | | |
| Detector 2 Position(m) | | | | |
| Detector 2 Size(m) | | | | |
| Detector 2 Type | | | | |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 With Improvements HDR Corporation

Synchro 11 Report Page 2

Scenario 1 Future Background PM 11:59 pm 05/05/2014 With Improvements

HDR Corporation

Synchro 11 Report

Page 3

| | ۶ | - | \rightarrow | • | • | 4 | 4 | † | 1 | - | ţ | 1 |
|------------------------------|---------------|-----------|---------------|-------|-------------------|------------|-------|----------|-----|-------|-------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | Perm | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | 8 | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 32.0 | 32.0 | | 32.0 | 32.0 | 32.0 | 7.0 | 29.0 | | 29.0 | 29.0 | |
| Minimum Split (s) | 39.0 | 39.0 | | 39.0 | 39.0 | 39.0 | 14.0 | 36.0 | | 36.0 | 36.0 | |
| Total Split (s) | 39.0 | 39.0 | | 39.0 | 39.0 | 39.0 | 14.0 | 71.0 | | 57.0 | 57.0 | |
| Total Split (%) | 25.3% | 25.3% | | 25.3% | 25.3% | 25.3% | 9.1% | 46.1% | | 37.0% | 37.0% | |
| Maximum Green (s) | 32.0 | 32.0 | | 32.0 | 32.0 | 32.0 | 7.0 | 64.0 | | 50.0 | 50.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 3.0 | | 3.0 | 3.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 4.0 | | 4.0 | 4.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | | | -1.0 | -1.0 | -1.0 | -1.0 | | -1.0 | -1.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | | Lead | | | Lag | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | | | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | Max | Max | | Max | Max | Max | None | Max | | Max | Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | 7.0 | | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 25.0 | 25.0 | | 25.0 | 25.0 | 25.0 | | 22.0 | | 22.0 | 22.0 | |
| Pedestrian Calls (#/hr) | 18 | 18 | | 100 | 100 | 100 | | 11 | | 12 | 12 | |
| Act Effct Green (s) | 33.5 | 33.5 | | | 33.5 | 33.5 | 65.9 | 65.9 | | 51.7 | 51.7 | |
| Actuated g/C Ratio | 0.27 | 0.27 | | | 0.27 | 0.27 | 0.54 | 0.54 | | 0.42 | 0.42 | |
| v/c Ratio | 0.72 | 0.44 | | | 0.72 | 0.15 | 0.80 | 0.65 | | 0.40 | 1.12 | |
| Control Delay | 64.2 | 9.0 | | | 60.7 | 0.7 | 56.8 | 26.7 | | 35.4 | 106.0 | |
| Queue Delay | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 1.1 | | 0.0 | 0.0 | |
| Total Delay | 64.2 | 9.0 | | | 60.7 | 0.7 | 56.8 | 27.8 | | 35.4 | 106.0 | |
| LOS | Е | Α | | | Е | Α | Е | С | | D | F | |
| Approach Delay | | 30.7 | | | 44.8 | | | 33.1 | | | 98.8 | |
| Approach LOS | | С | | | D | | | С | | | F | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 154 | | | | | | | | | | | | |
| Actuated Cycle Length: 12 | 22 | | | | | | | | | | | |
| Natural Cycle: 145 | | | | | | | | | | | | |
| Control Type: Semi Act-Ur | ncoord | | | | | | | | | | | |
| Maximum v/c Ratio: 1.12 | | | | | | | | | | | | |
| Intersection Signal Delay: | 60.6 | | | lı | ntersectio | n LOS: E | | | | | | |
| Intersection Capacity Utiliz | zation 128.1° | % | | 10 | CU Level | of Service | e H | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Splits and Phases: 571: | Strachan A | ve & Cana | ıda Blvd/F | | | | | | | | | |
| ¶ø2 | | | | | ∳k _{Ø10} | | | | | (| Ø12 | |
| 71 s | | | | 2 | 2 s | | 39 s | | | 22 | ŚS | |

| LOS | | | |
|----------------------|--|--|--|
| Approach Delay | | | |
| Approach LOS | | | |
| Intersection Summary | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Lanes, Volumes, Timings

Lane Group

Detector 2 Channel Detector 2 Extend (s) Turn Type Protected Phases

Permitted Phases Detector Phase Switch Phase Minimum Initial (s)

Minimum Split (s)

Maximum Green (s)

Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Vehicle Extension (s)

Total Split (s)

Total Split (%)

Yellow Time (s)

All-Red Time (s)

Recall Mode

Walk Time (s)

Flash Dont Walk (s)

Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay

Pedestrian Calls (#/hr)

571: Strachan Ave & Canada Blvd/Fleet St

7.0

22.0

14.0

4.0

4.0 4.0

3.0 3.0

None

0.0

0.0

22.0 22.0

14% 14%

Ø10 Ø12 Ø14 Ø16

10 12 14

7.0

22.0

14.0

4.0

None

0.0

0.0

16

7.0 7.0

22.0

22.0

14%

14.0

4.0

4.0 4.0

3.0

0.0

0.0 0.0

16

None None

22.0

22.0

14%

14.0

4.0

3.0

0.0

16

HDR Corporation

| | • | - | — | • | 4 | † | - | ļ | |
|------------------------|-------|-------|----------|------|-------|----------|------|--------|--|
| Lane Group | EBL | EBT | WBT | WBR | NBL | NBT | SBL | SBT | |
| Lane Group Flow (vph) | 146 | 226 | 174 | 63 | 132 | 590 | 93 | 814 | |
| v/c Ratio | 0.72 | 0.44 | 0.72 | 0.15 | 0.80 | 0.65 | 0.40 | 1.12 | |
| Control Delay | 64.2 | 9.0 | 60.7 | 0.7 | 56.8 | 26.7 | 35.4 | 106.0 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.1 | 0.0 | 0.0 | |
| Total Delay | 64.2 | 9.0 | 60.7 | 0.7 | 56.8 | 27.8 | 35.4 | 106.0 | |
| Queue Length 50th (m) | 27.2 | 1.1 | 32.5 | 0.0 | 13.4 | 73.8 | 12.5 | ~186.5 | |
| Queue Length 95th (m) | #77.2 | 23.7 | #86.9 | 0.0 | #62.7 | 178.5 | 38.3 | #366.8 | |
| Internal Link Dist (m) | | 119.4 | 205.0 | | | 181.6 | | 217.4 | |
| Turn Bay Length (m) | 25.0 | | | 50.0 | 30.0 | | 25.0 | | |
| Base Capacity (vph) | 203 | 511 | 243 | 424 | 166 | 914 | 231 | 725 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 141 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.72 | 0.44 | 0.72 | 0.15 | 0.80 | 0.76 | 0.40 | 1.12 | |

| | • | → | • | • | + | • | 1 | † | / | / | + | ✓ |
|---|------------|----------|--------|------|-------------|------------|---------|----------|----------|------|----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | * | 1> | | | ર્ન | 7 | 7 | 1> | | Ť | 14 | |
| Traffic Volume (vph) | 139 | 7 | 208 | 77 | 88 | 60 | 125 | 473 | 87 | 88 | 706 | 67 |
| Future Volume (vph) | 139 | 7 | 208 | 77 | 88 | 60 | 125 | 473 | 87 | 88 | 706 | 67 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frpb, ped/bikes | 1.00 | 0.87 | | | 1.00 | 0.73 | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 0.82 | 1.00 | | | 0.97 | 1.00 | 1.00 | 1.00 | | 0.97 | 1.00 | |
| Frt | 1.00 | 0.85 | | | 1.00 | 0.85 | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | | 0.98 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1297 | 1314 | | | 1551 | 1105 | 1652 | 1689 | | 1533 | 1711 | |
| Flt Permitted | 0.56 | 1.00 | | | 0.56 | 1.00 | 0.07 | 1.00 | | 0.34 | 1.00 | |
| Satd. Flow (perm) | 763 | 1314 | | | 891 | 1105 | 120 | 1689 | | 545 | 1711 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 146 | 7 | 219 | 81 | 93 | 63 | 132 | 498 | 92 | 93 | 743 | 71 |
| RTOR Reduction (vph) | 0 | 164 | 0 | 0 | 0 | 47 | 0 | 4 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 146 | 62 | 0 | 0 | 174 | 16 | 132 | 586 | 0 | 93 | 812 | 0 |
| Confl. Peds. (#/hr) | 122 | | 55 | 55 | | 122 | 37 | | 33 | 33 | | 37 |
| Confl. Bikes (#/hr) | | | 3 | | | | | | | | | 2 |
| Heavy Vehicles (%) | 6% | 12% | 6% | 1% | 26% | 0% | 2% | 8% | 2% | 7% | 8% | 1% |
| Turn Type | Perm | NA | | Perm | NA | Perm | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 32.4 | 32.4 | | | 32.4 | 32.4 | 64.9 | 64.9 | | 50.8 | 50.8 | |
| Effective Green, g (s) | 33.4 | 33.4 | | | 33.4 | 33.4 | 65.9 | 65.9 | | 51.8 | 51.8 | |
| Actuated g/C Ratio | 0.25 | 0.25 | | | 0.25 | 0.25 | 0.50 | 0.50 | | 0.39 | 0.39 | |
| Clearance Time (s) | 7.0 | 7.0 | | | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 192 | 332 | | | 225 | 279 | 153 | 842 | | 213 | 670 | |
| v/s Ratio Prot | | 0.05 | | | | | 0.05 | c0.35 | | | c0.47 | |
| v/s Ratio Perm | 0.19 | | | | c0.20 | 0.01 | 0.37 | | | 0.17 | | |
| v/c Ratio | 0.76 | 0.19 | | | 0.77 | 0.06 | 0.86 | 0.70 | | 0.44 | 1.21 | |
| Uniform Delay, d1 | 45.6 | 38.7 | | | 45.8 | 37.4 | 32.7 | 25.4 | | 29.4 | 40.1 | |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 24.3 | 1.2 | | | 22.4 | 0.4 | 36.2 | 4.7 | | 6.4 | 108.9 | |
| Delay (s) | 69.9 | 40.0 | | | 68.2 | 37.8 | 68.9 | 30.2 | | 35.8 | 149.1 | |
| Level of Service | Е | D | | | Е | D | Е | С | | D | F | |
| Approach Delay (s) | | 51.7 | | | 60.1 | | | 37.2 | | | 137.5 | |
| Approach LOS | | D | | | Е | | | D | | | F | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 82.7 | Н | CM 2000 | Level of | Service | | F | | | |
| HCM 2000 Volume to Capac | city ratio | | 0.98 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 132.1 | | um of lost | . , | | | 34.0 | | | |
| Intersection Capacity Utiliza | tion | | 128.1% | IC | CU Level of | of Service |) | | Н | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

| Intersection Capacity Utilization | 128.1% | ICU Level of Service | Н |
|-----------------------------------|--------|----------------------|---|
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |
| | | | |
| | | | |

HCM Signalized Intersection Capacity Analysis

571: Strachan Ave & Canada Blvd/Fleet St

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

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

Queue shown is maximum after two cycles.

Lane Group

Lane Configurations Traffic Volume (vph) Future Volume (vph)

Ideal Flow (vphpl)

Storage Length (m)

Storage Lanes
Taper Length (m)

Lane Util. Factor

Ped Bike Factor

Satd. Flow (prot)

Satd. Flow (perm)

Right Turn on Red

Satd. Flow (RTOR)

Link Speed (k/h)

Link Distance (m)

Confl. Peds. (#/hr) Confl. Bikes (#/hr)

Peak Hour Factor

Shared Lane Traffic (%) Lane Group Flow (vph)

Enter Blocked Intersection

Adj. Flow (vph)

Lane Alignment

Median Width(m)

Crosswalk Width(m)

Turning Speed (k/h)

Number of Detectors

Leading Detector (m)

Trailing Detector (m)

Detector 1 Size(m)

Detector 1 Channel

Detector 1 Extend (s) Detector 1 Queue (s)

Detector 1 Delay (s)

Detector 2 Size(m)

Detector 2 Channel
Detector 2 Extend (s)

Detector 2 Type

Detector 2 Position(m)

Detector 1 Type

Detector 1 Position(m)

Detector Template

Two way Left Turn Lane Headway Factor

Link Offset(m)

Travel Time (s)

Flt Protected

Flt Permitted

162

1900

15.0

2.5

1.00

0.950

1750

0.950

1750

40

9.7

0.90

180

180

No

Left Right

3.5

0.0

1.01

24

1

Left Right

6.1

0.0

0.0

6.1

0.0

CI+Ex CI+Ex

107.6

53 828

1900

1.00

30

191.3

23.0

0.90

920

No

Left Right

3.5

0.0

1.6

1.01

Thru

0.0

0.0

1.8

0.0

0.0

28.7

1.8

0.0

CI+Ex

CI+Ex

1900

0.0

1.00

0.64 0.99 0.850 0.978

1566 1777

1005

Yes

2

0.90

59

59 1096

No

1.01

14

6.1 30.5

0.0

0.0

6.1

0.0

158

1900

0.0

1.00

Yes

118

0.90

176

0

No

1.01

SBT

1900

1.00

1842

1842

30

74.7

9.0

0.90

No

Left

3.5

0.0

1.6

1.01

6.1 30.5

0.0

0.0

1.8

0.0

0.0

28.7

1.8

0.0

CI+Ex

CI+Ex

12 768

1900

0.0

2.5

1.00

0.950

1750

0.131

241

0.90

13 853

13 853

No

Left

1.01

14 24

Left Thru

0.0

0.0

6.1

CI+Ex

0.0

0.0

| Scenario 1 Future Background PM 11:59 pm 05/05/2014 With | n Improvements |
|--|----------------|
| HDR Corporation | |

Synchro 11 Report Page 7 Lanes, Volumes, Timings

9024: Dufferin St & New Liberty St

| U | 91 | J | U/ | 4 | U. | _ | |
|---|----|---|----|---|----|---|--|
| | | | | | | | |
| | | | | | | | |

| | • | • | † | ~ | > | ļ |
|-------------------------------|----------------|---------|-----------|------------|-------------|-------------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Turn Type | Perm | Perm | NA | | Perm | NA |
| Protected Phases | . 0.111 | . 0 | 2 | | . 0 | 6 |
| Permitted Phases | 8 | 8 | | | 6 | |
| Detector Phase | 8 | 8 | 2 | | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 |
| Minimum Split (s) | 24.0 | 24.0 | 24.0 | | 24.0 | 24.0 |
| Total Split (s) | 24.0 | 24.0 | 66.0 | | 66.0 | 66.0 |
| Total Split (%) | 26.7% | 26.7% | 73.3% | | 73.3% | 73.3% |
| Maximum Green (s) | 18.0 | 18.0 | 60.0 | | 60.0 | 60.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | | -1.0 | -1.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 |
| Lead/Lag | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 |
| Recall Mode | None | None | C-Max | | C-Max | C-Max |
| 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) | 15.1 | 15.1 | 64.9 | | 64.9 | 64.9 |
| Actuated g/C Ratio | 0.17 | 0.17 | 0.72 | | 0.72 | 0.72 |
| v/c Ratio | 0.17 | 0.17 | 0.72 | | 0.72 | 0.72 |
| Control Delay | 43.5 | 11.9 | 18.4 | | 5.9 | 10.0 |
| | | | | | | |
| Queue Delay | 0.0 | 0.0 | 3.8 | | 0.0 | 0.0 |
| Total Delay | 43.5 | 11.9 | 22.2 | | 5.9 | 10.0 |
| LOS | D | В | C | | Α | В |
| Approach Delay | 35.7 | | 22.2 | | | 9.9 |
| Approach LOS | D | | С | | | Α |
| Intersection Summary | | | | | | |
| Area Type: | Other | | | | | |
| Cycle Length: 90 | - 0.00 | | | | | |
| Actuated Cycle Length: 90 | | | | | | |
| Offset: 0 (0%), Referenced | | NBT and | 6:SBTL S | Start of G | reen | |
| Natural Cycle: 80 | p.1000 E. | | 3.03.2,0 | | | |
| Control Type: Actuated-Co | ordinated | | | | | |
| Maximum v/c Ratio: 0.85 | | | | | | |
| Intersection Signal Delay: | 18 9 | | | In | tersection | n LOS: B |
| Intersection Capacity Utiliz | | | | | | of Service |
| Analysis Period (min) 15 | | | | ı | J LOVOI | J. OUI VIOE |
| raidiyolo i oriod (iriiri) 10 | | | | | | |
| Splits and Phases: 9024 | l: Dufferin St | & New L | iberty St | | | |
| + | | | , | | | |
| Ø2 (R) | | | | | | |
| 66 s | | | | | | |
| 1 Pac (n) | | | | | | |
| Ø6 (R) | | | | | | |
| 00 5 | | | | | | |

Scenario 1 Future Background PM 11:59 pm 05/05/2014 With Improvements HDR Corporation

9024: Dufferin St & New Liberty St

09/30/2021

| | • | • | † | - | .↓ |
|------------------------|------|------|----------|------|-------|
| Lane Group | WBL | WBR | NBT | SBL | SBT |
| Lane Group Flow (vph) | 180 | 59 | 1096 | 13 | 853 |
| v/c Ratio | 0.61 | 0.27 | 0.85 | 0.08 | 0.64 |
| Control Delay | 43.5 | 11.9 | 18.4 | 5.9 | 10.0 |
| Queue Delay | 0.0 | 0.0 | 3.8 | 0.0 | 0.0 |
| Total Delay | 43.5 | 11.9 | 22.2 | 5.9 | 10.0 |
| Queue Length 50th (m) | 29.0 | 0.0 | 114.5 | 0.6 | 65.5 |
| Queue Length 95th (m) | 47.3 | 9.7 | #249.9 | 2.8 | 116.4 |
| Internal Link Dist (m) | 83.6 | | 167.3 | | 50.7 |
| Turn Bay Length (m) | 15.0 | | | | |
| Base Capacity (vph) | 369 | 258 | 1288 | 173 | 1328 |
| Starvation Cap Reductn | 0 | 0 | 125 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.49 | 0.23 | 0.94 | 0.08 | 0.64 |
| Intersection Summary | | | | | |

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 9024: Dufferin St & New Liberty St

| | • | • | † | ~ | / | ↓ | |
|----------------------------|-------------|------|----------|------|------------|------------------|-----|
| Movement | WBL | WBR | NBT | NBR | SBL | SBT | |
| ne Configurations | J. | 7 | î, | | , j | † | |
| affic Volume (vph) | 162 | 53 | 828 | 158 | 12 | 768 | |
| ure Volume (vph) | 162 | 53 | 828 | 158 | 12 | 768 | |
| al Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| tal Lost time (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| ne Util. Factor | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| pb, ped/bikes | 1.00 | 0.64 | 0.99 | | 1.00 | 1.00 | |
| pb, ped/bikes | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| t | 1.00 | 0.85 | 0.98 | | 1.00 | 1.00 | |
| It Protected | 0.95 | 1.00 | 1.00 | | 0.95 | 1.00 | |
| atd. Flow (prot) | 1750 | 1004 | 1779 | | 1750 | 1842 | |
| It Permitted | 0.95 | 1.00 | 1.00 | | 0.13 | 1.00 | |
| atd. Flow (perm) | 1750 | 1004 | 1779 | | 241 | 1842 | |
| eak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | |
| dj. Flow (vph) | 180 | 59 | 920 | 176 | 13 | 853 | |
| TOR Reduction (vph) | 0 | 49 | 7 | 0 | 0 | 0 | |
| ane Group Flow (vph) | 180 | 10 | 1089 | 0 | 13 | 853 | |
| onfl. Peds. (#/hr) | | 137 | | | | | |
| onfl. Bikes (#/hr) | | 2 | | 118 | | | |
| ırn Type | Perm | Perm | NA | | Perm | NA | |
| rotected Phases | | | 2 | | | 6 | |
| ermitted Phases | 8 | 8 | | | 6 | | |
| ctuated Green, G (s) | 14.1 | 14.1 | 63.9 | | 63.9 | 63.9 | |
| Effective Green, g (s) | 15.1 | 15.1 | 64.9 | | 64.9 | 64.9 | |
| ctuated g/C Ratio | 0.17 | 0.17 | 0.72 | | 0.72 | 0.72 | |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| /ehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| ane Grp Cap (vph) | 293 | 168 | 1282 | | 173 | 1328 | |
| /s Ratio Prot | | | c0.61 | | | 0.46 | |
| /s Ratio Perm | c0.10 | 0.01 | | | 0.05 | | |
| /c Ratio | 0.61 | 0.06 | 0.85 | | 0.08 | 0.64 | |
| Iniform Delay, d1 | 34.7 | 31.5 | 9.0 | | 3.7 | 6.5 | |
| rogression Factor | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| ncremental Delay, d2 | 3.8 | 0.1 | 7.2 | | 0.8 | 2.4 | |
| elay (s) | 38.5 | 31.6 | 16.2 | | 4.5 | 8.9 | |
| evel of Service | D | С | В | | Α | Α | |
| pproach Delay (s) | 36.8 | | 16.2 | | | 8.9 | |
| oproach LOS | D | | В | | | Α | |
| ersection Summary | | | | | | | |
| CM 2000 Control Delay | | | 15.6 | Ш | CM 2000 | Level of Service | e l |
| CM 2000 Control Delay | acity ratio | | 0.81 | П | OW 2000 | Feaci of Scial | |
| ctuated Cycle Length (s) | acity ratio | | 90.0 | 9 | um of lost | time (s) | 11. |
| tersection Capacity Utiliz | ration | | 76.5% | | U Level c | | 11. |
| nalysis Period (min) | Laudii | | 15 | IC | O LEVEL | A OCI VICE | |
| aiyələ Fellou (IIIIII) | | | 13 | | | | |

c Critical Lane Group

Lanes, Volumes, Timings 97: Yukon Place & British Colombia Rd

09/30/2021

| | ۶ | - | • | • | ← | • | 4 | † | / | / | ļ | 4 |
|----------------------------|-------|-------|-------|-------|----------|-------|-------|----------|----------|----------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | * | 4 | | ሻ | † | 7 | | 4 | | | 4 | |
| Traffic Volume (vph) | 1 | 423 | 0 | 1 | 308 | 1 | 7 | 1 | 0 | 0 | 0 | 26 |
| Future Volume (vph) | 1 | 423 | 0 | 1 | 308 | 1 | 7 | 1 | 0 | 0 | 0 | 26 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 20.0 | | 20.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| 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 |
| Ped Bike Factor | | | | 1.00 | | | | 0.99 | | | 0.97 | |
| Frt | | | | | | 0.850 | | | | | 0.865 | |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.957 | | | | |
| Satd. Flow (prot) | 1685 | 1824 | 0 | 1685 | 1756 | 1507 | 0 | 1798 | 0 | 0 | 1574 | 0 |
| Flt Permitted | 0.555 | | | 0.494 | | | | | | | | |
| Satd. Flow (perm) | 984 | 1824 | 0 | 874 | 1756 | 1507 | 0 | 1860 | 0 | 0 | 1574 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | | 45 | | | | | 514 | |
| Link Speed (k/h) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (m) | | 164.9 | | | 265.9 | | | 92.0 | | | 121.3 | |
| Travel Time (s) | | 19.8 | | | 31.9 | | | 11.0 | | | 14.6 | |
| Confl. Peds. (#/hr) | | | 2 | 2 | | | 6 | | | | | 6 |
| Confl. Bikes (#/hr) | | | | | | | | | 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 (%) | 0% | 3% | 0% | 0% | 7% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Adj. Flow (vph) | 1 | 470 | 0 | 1 | 342 | 1 | 8 | 1 | 0 | 0 | 0 | 29 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 1 | 470 | 0 | 1 | 342 | 1 | 0 | 9 | 0 | 0 | 29 | 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) | | 3.0 | | | 3.0 | | | 0.0 | | | 0.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.09 | 1.01 | 1.01 | 1.09 | 1.01 | 1.09 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | CI+Ex | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report

Page 1

Lanes, Volumes, Timings 97: Yukon Place & British Colombia Rd

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|----|-----|---|----|---|----|---|
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|-------------------------|-------|-------|---------------|-------|----------|-------|-------|----------|-----|-------------|-------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | Perm | Perm | NA | | | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 33.0 | 33.0 | | 33.0 | 33.0 | 33.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Minimum Split (s) | 39.0 | 39.0 | | 39.0 | 39.0 | 39.0 | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Total Split (s) | 47.0 | 47.0 | | 47.0 | 47.0 | 47.0 | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Total Split (%) | 65.3% | 65.3% | | 65.3% | 65.3% | 65.3% | 34.7% | 34.7% | | 34.7% | 34.7% | |
| Maximum Green (s) | 41.0 | 41.0 | | 41.0 | 41.0 | 41.0 | 19.0 | 19.0 | | 19.0 | 19.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | | -1.0 | -1.0 | -1.0 | | -1.0 | | | -1.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | Max | Max | | Max | Max | Max | None | None | | None | None | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 9.0 | 9.0 | | 9.0 | 9.0 | 9.0 | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 58.5 | 58.5 | | 58.5 | 58.5 | 58.5 | | 8.0 | | | 8.0 | |
| Actuated g/C Ratio | 0.90 | 0.90 | | 0.90 | 0.90 | 0.90 | | 0.12 | | | 0.12 | |
| v/c Ratio | 0.00 | 0.29 | | 0.00 | 0.22 | 0.00 | | 0.04 | | | 0.05 | |
| Control Delay | 2.0 | 2.3 | | 2.0 | 2.1 | 0.0 | | 27.0 | | | 0.1 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | | | 0.0 | |
| Total Delay | 2.0 | 2.3 | | 2.0 | 2.1 | 0.0 | | 27.0 | | | 0.1 | |
| LOS | Α | Α | | Α | Α | Α | | С | | | Α | |
| Approach Delay | | 2.3 | | | 2.1 | | | 27.0 | | | 0.1 | |
| Approach LOS | | Α | | | Α | | | С | | | Α | |
| Intersection Summary | | | | | | | | | | | | |

| Intersection Summa | ary | |
|---------------------|----------------------|------------------------|
| Area Type: | Other | |
| Cycle Length: 72 | | |
| Actuated Cycle Len | gth: 65.2 | |
| Natural Cycle: 65 | | |
| Control Type: Semi | Act-Uncoord | |
| Maximum v/c Ratio | : 0.29 | |
| Intersection Signal | Delay: 2.4 | Intersection LOS: A |
| Intersection Capaci | ty Utilization 73.3% | ICU Level of Service D |
| Analysis Period (mi | n) 15 | |

Splits and Phases: 97: Yukon Place & British Colombia Rd



Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Lane Group Lane Group Flow (vph)

Control Delay

Queue Delay

Queue Length 50th (m)

Queue Length 95th (m) Internal Link Dist (m)

Turn Bay Length (m)

Base Capacity (vph)

Starvation Cap Reductn

Spillback Cap Reductn

Storage Cap Reductn

Intersection Summary

Reduced v/c Ratio

Total Delay

v/c Ratio

EBT

470

0.29

2.3

2.3

0.0

140.9

0

0

0.00

2.0

2.0

0.0

0.3 18.3

20.0

783

0

0

0.00

0.00

2.0

2.0

0.0

0.3 26.4

30.0

0

0

0.00 0.29 342

0.22

2.1

2.1

0.0

0

0

0.22

241.9

0.00

0.0 27.0

0.0 27.0

0.0

0.0

20.0

1356

0

0

0.00

0.04

0.9

4.5

68.0

574

0

0

0.02

0.05

0.1

0.0

0.1

0.0

0.0

97.3

840

0

0

0

0.03

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|--|------------|----------|---------------|------|------------|-------------|----------|----------|-------------|------|------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Lane Configurations | * | £ | | 7 | * | 7 | | 4 | | | 4 | |
| Traffic Volume (vph) | 1 | 423 | 0 | 1 | 308 | 1 | 7 | 1 | 0 | 0 | 0 | 26 |
| Future Volume (vph) | 1 | 423 | 0 | 1 | 308 | 1 | 7 | 1 | 0 | 0 | 0 | 26 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | | | 0.97 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 0.99 | | | 1.00 | |
| Frt | 1.00 | 1.00 | | 1.00 | 1.00 | 0.85 | | 1.00 | | | 0.86 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | | 0.96 | | | 1.00 | |
| Satd. Flow (prot) | 1685 | 1824 | | 1681 | 1756 | 1507 | | 1781 | | | 1574 | |
| Flt Permitted | 0.56 | 1.00 | | 0.49 | 1.00 | 1.00 | | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | 985 | 1824 | | 873 | 1756 | 1507 | | 1860 | | | 1574 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 1 | 470 | 0 | 1 | 342 | 1 | 8 | 1 | 0 | 0 | 0 | 29 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | (|
| Lane Group Flow (vph) | 1 | 470 | 0 | 1 | 342 | 1 | 0 | 9 | 0 | 0 | 2 | (|
| Confl. Peds. (#/hr) | | | 2 | 2 | | | 6 | | | | | 6 |
| Confl. Bikes (#/hr) | | | | | | | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 3% | 0% | 0% | 7% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Turn Type | Perm | NA | | Perm | NA | Perm | Perm | NA | | | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 54.3 | 54.3 | | 54.3 | 54.3 | 54.3 | | 2.6 | | | 2.6 | |
| Effective Green, q (s) | 55.3 | 55.3 | | 55.3 | 55.3 | 55.3 | | 3.6 | | | 3.6 | |
| Actuated g/C Ratio | 0.80 | 0.80 | | 0.80 | 0.80 | 0.80 | | 0.05 | | | 0.05 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 790 | 1463 | | 700 | 1409 | 1209 | | 97 | | | 82 | |
| v/s Ratio Prot | | c0.26 | | | 0.19 | | | | | | 0.00 | |
| v/s Ratio Perm | 0.00 | | | 0.00 | | 0.00 | | c0.00 | | | | |
| v/c Ratio | 0.00 | 0.32 | | 0.00 | 0.24 | 0.00 | | 0.09 | | | 0.02 | |
| Uniform Delay, d1 | 1.3 | 1.8 | | 1.3 | 1.7 | 1.3 | | 31.1 | | | 31.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 0.0 | 0.6 | | 0.0 | 0.4 | 0.0 | | 0.4 | | | 0.1 | |
| Delay (s) | 1.3 | 2.4 | | 1.3 | 2.1 | 1.3 | | 31.5 | | | 31.1 | |
| Level of Service | A | Α | | Α | Α | Α | | С | | | С | |
| Approach Delay (s) | | 2.4 | | | 2.1 | | | 31.5 | | | 31.1 | |
| Approach LOS | | Α | | | Α | | | С | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 3.5 | Н | CM 2000 | Level of S | Service | | A | | | |
| HCM 2000 Control Delay HCM 2000 Volume to Capa | city ratio | | 0.31 | П | JIVI 2000 | LOVE! UI | JOI VICE | | | | | |
| Actuated Cycle Length (s) | iony radio | | 68.9 | Şı | um of lost | time (s) | | | 10.0 | | | |
| Intersection Capacity Utiliza | ation | | 73.3% | | | of Service | | | 10.0 D | | | |
| Analysis Period (min) | au/II | | 15.5 % | IC | O LEVEL | JI GEI VICE | | | U | | | |
| c Critical Lane Group | | | 10 | | | | | | | | | |

| | • | - | \rightarrow | • | ← | • | 1 | † | - | > | ļ | 1 |
|-------------------------------|------------|-------|---------------|------|------------|------------|---------|----------|------|-------------|------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Lane Configurations | 7 | î, | | 7 | * | 7 | | 4 | | | 4 | |
| Traffic Volume (vph) | 1 | 423 | 0 | 1 | 308 | 1 | 7 | 1 | 0 | 0 | 0 | 26 |
| Future Volume (vph) | 1 | 423 | 0 | 1 | 308 | 1 | 7 | 1 | 0 | 0 | 0 | 26 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | | | 0.97 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 0.99 | | | 1.00 | |
| Frt | 1.00 | 1.00 | | 1.00 | 1.00 | 0.85 | | 1.00 | | | 0.86 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | | 0.96 | | | 1.00 | |
| Satd. Flow (prot) | 1685 | 1824 | | 1681 | 1756 | 1507 | | 1781 | | | 1574 | |
| Flt Permitted | 0.56 | 1.00 | | 0.49 | 1.00 | 1.00 | | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | 985 | 1824 | | 873 | 1756 | 1507 | | 1860 | | | 1574 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 1 | 470 | 0 | 1 | 342 | 1 | 8 | 1 | 0 | 0 | 0 | 29 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | (|
| Lane Group Flow (vph) | 1 | 470 | 0 | 1 | 342 | 1 | 0 | 9 | 0 | 0 | 2 | (|
| Confl. Peds. (#/hr) | | | 2 | 2 | | | 6 | | | | | 6 |
| Confl. Bikes (#/hr) | | | | | | | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 3% | 0% | 0% | 7% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Turn Type | Perm | NA | | Perm | NA | Perm | Perm | NA | | | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 54.3 | 54.3 | | 54.3 | 54.3 | 54.3 | | 2.6 | | | 2.6 | |
| Effective Green, g (s) | 55.3 | 55.3 | | 55.3 | 55.3 | 55.3 | | 3.6 | | | 3.6 | |
| Actuated g/C Ratio | 0.80 | 0.80 | | 0.80 | 0.80 | 0.80 | | 0.05 | | | 0.05 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 790 | 1463 | | 700 | 1409 | 1209 | | 97 | | | 82 | |
| v/s Ratio Prot | | c0.26 | | | 0.19 | | | | | | 0.00 | |
| v/s Ratio Perm | 0.00 | | | 0.00 | | 0.00 | | c0.00 | | | | |
| v/c Ratio | 0.00 | 0.32 | | 0.00 | 0.24 | 0.00 | | 0.09 | | | 0.02 | |
| Uniform Delay, d1 | 1.3 | 1.8 | | 1.3 | 1.7 | 1.3 | | 31.1 | | | 31.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 0.0 | 0.6 | | 0.0 | 0.4 | 0.0 | | 0.4 | | | 0.1 | |
| Delay (s) | 1.3 | 2.4 | | 1.3 | 2.1 | 1.3 | | 31.5 | | | 31.1 | |
| Level of Service | Α | Α | | Α | Α | Α | | С | | | С | |
| Approach Delay (s) | | 2.4 | | | 2.1 | | | 31.5 | | | 31.1 | |
| Approach LOS | | Α | | | Α | | | С | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 3.5 | Н | CM 2000 | Level of S | Service | | Α | | | |
| HCM 2000 Volume to Capa | city ratio | | 0.31 | | | ,,,,,,,,, | | | | | | |
| Actuated Cycle Length (s) | ,, | | 68.9 | Sı | um of lost | time (s) | | | 10.0 | | | |
| Intersection Capacity Utiliza | ation | | 73.3% | | | of Service | | | D | | | |
| Analysis Period (min) | | | 15 | | | 2200 | | | | | | |
| c Critical Lane Group | | | ., | | | | | | | | | |

| HCM 2000 Control Delay | 3.5 | HCM 2000 Level of Service | Α | |
|-----------------------------------|-------|---------------------------|------|--|
| HCM 2000 Volume to Capacity ratio | 0.31 | | | |
| Actuated Cycle Length (s) | 68.9 | Sum of lost time (s) | 10.0 | |
| Intersection Capacity Utilization | 73.3% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |
| c Critical Lane Group | | | | |

Lanes, Volumes, Timings 222: Strachan Ave & Lakeshore Blvd

09/30/2021

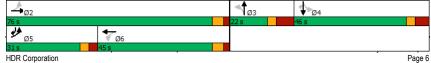
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|----------------------------|-------|----------|-------|-------|----------|-------|-------|-------|-------|----------|----------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ተተው | | ሻ | ተተተ | | | 4 | | | ર્ન | 7 |
| Traffic Volume (vph) | 502 | 3996 | 5 | 8 | 1196 | 0 | 0 | 40 | 0 | 297 | 21 | 235 |
| Future Volume (vph) | 502 | 3996 | 5 | 8 | 1196 | 0 | 0 | 40 | 0 | 297 | 21 | 235 |
| Ideal Flow (vphpl) | 2150 | 2100 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 |
| Storage Length (m) | 60.0 | | 0.0 | 60.0 | | 50.0 | 0.0 | | 0.0 | 140.0 | | 50.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 0 | | 0 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | *1.00 | 0.91 | 1.00 | 0.91 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Ped Bike Factor | | 1.00 | | | | | | | | | | 0.92 |
| Frt | | | | | | | | | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | | | | 0.950 | 0.958 | |
| Satd. Flow (prot) | 1643 | 5990 | 0 | 1685 | 4885 | 0 | 0 | 1879 | 0 | 1585 | 1695 | 1507 |
| Flt Permitted | 0.087 | | | 0.098 | | | | | | 0.728 | 0.721 | |
| Satd. Flow (perm) | 151 | 5990 | 0 | 174 | 4885 | 0 | 0 | 1879 | 0 | 1214 | 1276 | 1388 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | | | | | | | | 261 |
| Link Speed (k/h) | | 60 | | | 60 | | | 40 | | | 40 | |
| Link Distance (m) | | 310.3 | | | 196.6 | | | 116.5 | | | 205.6 | |
| Travel Time (s) | | 18.6 | | | 11.8 | | | 10.5 | | | 18.5 | |
| Confl. Peds. (#/hr) | 6 | | 8 | 8 | | 6 | 52 | | | | | 52 |
| Confl. Bikes (#/hr) | | | | | | | | | 40 | | | 17 |
| 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 (%) | 16% | 4% | 0% | 0% | 5% | 33% | 0% | 0% | 0% | 1% | 0% | 0% |
| Adj. Flow (vph) | 558 | 4440 | 6 | 9 | 1329 | 0 | 0 | 44 | 0 | 330 | 23 | 261 |
| Shared Lane Traffic (%) | | | | | | | | | | 49% | | |
| Lane Group Flow (vph) | 558 | 4446 | 0 | 9 | 1329 | 0 | 0 | 44 | 0 | 168 | 185 | 261 |
| 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) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 0.93 | 0.89 | 1.01 | 1.09 | 1.01 | 1.09 | 1.01 | 1.01 | 1.01 | 1.09 | 1.01 | 1.09 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | 1 |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | Right |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | CI+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 5

Lanes, Volumes, Timings 222: Strachan Ave & Lakeshore Blvd

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|------------------------------|--------------|-----------|---------------|-------|-------------|--------|--------|-------------|-----|-------|----------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | pm+pt | NA | | Perm | NA | | | NA | | Perm | NA | pm+o\ |
| Protected Phases | 5 | 2 | | | 6 | | | 3 | | | 4 | 5 |
| Permitted Phases | 2 | | | 6 | | | 3 | | | 4 | | 4 |
| Detector Phase | 5 | 2 | | 6 | 6 | | 3 | 3 | | 4 | 4 | 5 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 29.0 | | 30.0 | 30.0 | | 12.0 | 12.0 | | 10.0 | 10.0 | 6.0 |
| Minimum Split (s) | 12.0 | 35.0 | | 36.0 | 36.0 | | 21.0 | 21.0 | | 45.0 | 45.0 | 12.0 |
| Total Split (s) | 31.0 | 76.0 | | 45.0 | 45.0 | | 22.0 | 22.0 | | 46.0 | 46.0 | 31.0 |
| Total Split (%) | 21.5% | 52.8% | | 31.3% | 31.3% | | 15.3% | 15.3% | | 31.9% | 31.9% | 21.5% |
| Maximum Green (s) | 25.0 | 70.0 | | 39.0 | 39.0 | | 13.0 | 13.0 | | 38.0 | 38.0 | 25.0 |
| Yellow Time (s) | 3.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| All-Red Time (s) | 3.0 | 2.0 | | 2.0 | 2.0 | | 6.0 | 6.0 | | 5.0 | 5.0 | 3.0 |
| Lost Time Adjust (s) | -3.0 | -3.0 | | -1.0 | -1.0 | | | -1.0 | | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 3.0 | 3.0 | | 5.0 | 5.0 | | | 8.0 | | 7.0 | 7.0 | 5.0 |
| Lead/Lag | Lead | | | Lag | Lag | | Lead | Lead | | Lag | Lag | Lead |
| Lead-Lag Optimize? | | | | - 3 | | | | | | - 3 | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | Max | | Max | Max | | None | None | | None | None | None |
| Walk Time (s) | 110.10 | 7.0 | | 7.0 | 7.0 | | 110110 | 110110 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | | 22.0 | | 22.0 | 22.0 | | | | | 30.0 | 30.0 | |
| Pedestrian Calls (#/hr) | | 3 | | 2 | 2 | | | | | 0 | 0 | |
| Act Effct Green (s) | 74.2 | 74.2 | | 40.7 | 40.7 | | | 13.2 | | 24.4 | 24.4 | 52.8 |
| Actuated g/C Ratio | 0.60 | 0.60 | | 0.33 | 0.33 | | | 0.11 | | 0.20 | 0.20 | 0.42 |
| v/c Ratio | 1.30 | 1.25 | | 0.16 | 0.83 | | | 0.22 | | 0.71 | 0.74 | 0.34 |
| Control Delay | 183.0 | 139.6 | | 44.8 | 46.4 | | | 59.2 | | 64.3 | 66.2 | 3.5 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Delay | 183.0 | 139.6 | | 44.8 | 46.4 | | | 59.2 | | 64.3 | 66.2 | 3.5 |
| LOS | F | F | | D | D | | | E | | Ε. | E | A |
| Approach Delay | | 144.5 | | | 46.4 | | | 59.3 | | | 39.0 | |
| Approach LOS | | F | | | D | | | E | | | D | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 144 | | | | | | | | | | | | |
| Actuated Cycle Length: 12 | 24.7 | | | | | | | | | | | |
| Natural Cycle: 145 | | | | | | | | | | | | |
| Control Type: Semi Act-U | ncoord | | | | | | | | | | | |
| Maximum v/c Ratio: 1.30 | | | | | | | | | | | | |
| Intersection Signal Delay: | 115.9 | | | Ir | ntersection | LOS: F | | | | | | |
| Intersection Capacity Utiliz | | % | | | CU Level | | Н | | | | | |
| Analysis Period (min) 15 | | | | | | | ., | | | | | |
| * User Entered Value | | | | | | | | | | | | |
| Splits and Phases: 222 | : Strachan A | uo & Lako | choro Plu | d | | | | | | | | |
| A | . Suacrian A | ve & Lake | SHOLE BIA | u | Т. | ¶ø3 | | -A. | | | | |
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222: Strachan Ave & Lakeshore Blvd

09/30/2021

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|------------------------|--------|--------|------|--------|----------|-------|-------|------|--|
| Lane Group | EBL | EBT | WBL | WBT | NBT | SBL | SBT | SBR | |
| Lane Group Flow (vph) | 558 | 4446 | 9 | 1329 | 44 | 168 | 185 | 261 | |
| v/c Ratio | 1.30 | 1.25 | 0.16 | 0.83 | 0.22 | 0.71 | 0.74 | 0.34 | |
| Control Delay | 183.0 | 139.6 | 44.8 | 46.4 | 59.2 | 64.3 | 66.2 | 3.5 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 183.0 | 139.6 | 44.8 | 46.4 | 59.2 | 64.3 | 66.2 | 3.5 | |
| Queue Length 50th (m) | ~172.8 | ~482.3 | 1.7 | 116.8 | 10.4 | 42.5 | 47.1 | 0.0 | |
| Queue Length 95th (m) | #272.2 | #566.5 | 7.5 | #163.6 | 24.0 | 67.8 | 73.8 | 13.9 | |
| Internal Link Dist (m) | | 286.3 | | 172.6 | 92.5 | | 181.6 | | |
| Turn Bay Length (m) | 60.0 | | 60.0 | | | 140.0 | | 50.0 | |
| Base Capacity (vph) | 430 | 3565 | 56 | 1593 | 214 | 385 | 405 | 763 | |
| Starvation Cap Reductn | 0 | 67 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 1.30 | 1.27 | 0.16 | 0.83 | 0.21 | 0.44 | 0.46 | 0.34 | |

HCM Signalized Intersection Capacity Analysis 222: Strachan Ave & Lakeshore Blvd

09/30/2021

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|------------------------------|--------------|----------|--------|------|------------|------------|---------|-----------|------|-------------|-------|-------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | - 1 | ተተው | | | ተተተ | | | 4 | | 7 | 4 | 7 |
| Traffic Volume (vph) | 502 | 3996 | 5 | 8 | 1196 | 0 | 0 | 40 | 0 | 297 | 21 | 235 |
| Future Volume (vph) | 502 | 3996 | 5 | 8 | 1196 | 0 | 0 | 40 | 0 | 297 | 21 | 235 |
| Ideal Flow (vphpl) | 2150 | 2100 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 |
| Total Lost time (s) | 3.0 | 3.0 | | 5.0 | 5.0 | | | 8.0 | | 7.0 | 7.0 | 5.0 |
| Lane Util. Factor | 1.00 | *1.00 | | 1.00 | 0.91 | | | 1.00 | | 0.95 | 0.95 | 1.00 |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.96 |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | | 1.00 | | 0.95 | 0.96 | 1.00 |
| Satd. Flow (prot) | 1643 | 5989 | | 1685 | 4885 | | | 1879 | | 1585 | 1695 | 1455 |
| Flt Permitted | 0.09 | 1.00 | | 0.10 | 1.00 | | | 1.00 | | 0.73 | 0.72 | 1.00 |
| Satd. Flow (perm) | 151 | 5989 | | 174 | 4885 | | | 1879 | | 1215 | 1276 | 1455 |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 558 | 4440 | 6 | 9 | 1329 | 0 | 0 | 44 | 0 | 330 | 23 | 261 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 156 |
| Lane Group Flow (vph) | 558 | 4446 | 0 | 9 | 1329 | 0 | 0 | 44 | 0 | 168 | 185 | 105 |
| Confl. Peds. (#/hr) | 6 | | 8 | 8 | | 6 | 52 | | | | | 52 |
| Confl. Bikes (#/hr) | | | | | | | | | 40 | | | 17 |
| Heavy Vehicles (%) | 16% | 4% | 0% | 0% | 5% | 33% | 0% | 0% | 0% | 1% | 0% | 0% |
| Turn Type | pm+pt | NA | | Perm | NA | | | NA | | Perm | NA | pm+ov |
| Protected Phases | 5 | 2 | | | 6 | | | 3 | | | 4 | 5 |
| Permitted Phases | 2 | | | 6 | | | 3 | | | 4 | | 4 |
| Actuated Green, G (s) | 71.2 | 71.2 | | 39.8 | 39.8 | | - | 9.1 | | 23.4 | 23.4 | 48.8 |
| Effective Green, q (s) | 74.2 | 74.2 | | 40.8 | 40.8 | | | 10.1 | | 24.4 | 24.4 | 50.8 |
| Actuated g/C Ratio | 0.59 | 0.59 | | 0.32 | 0.32 | | | 0.08 | | 0.19 | 0.19 | 0.40 |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | | 9.0 | | 8.0 | 8.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 422 | 3507 | | 56 | 1573 | | | 149 | | 233 | 245 | 583 |
| v/s Ratio Prot | c0.30 | 0.74 | | | 0.27 | | | c0.02 | | 200 | 2.0 | 0.04 |
| v/s Ratio Perm | c0.48 | 0 | | 0.05 | 0.2. | | | 00.02 | | 0.14 | c0.14 | 0.03 |
| v/c Ratio | 1.32 | 1.27 | | 0.16 | 0.84 | | | 0.30 | | 0.72 | 0.76 | 0.18 |
| Uniform Delay, d1 | 39.5 | 26.2 | | 30.7 | 40.0 | | | 54.9 | | 48.0 | 48.3 | 24.5 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 160.8 | 122.9 | | 6.1 | 5.8 | | | 1.1 | | 10.5 | 12.4 | 0.1 |
| Delay (s) | 200.3 | 149.1 | | 36.8 | 45.8 | | | 56.1 | | 58.4 | 60.7 | 24.6 |
| Level of Service | - F | F | | D | D | | | E | | E | E | C |
| Approach Delay (s) | ' | 154.8 | | | 45.7 | | | 56.1 | | _ | 44.8 | |
| Approach LOS | | F | | | D | | | 50.1 E | | | D | |
| | | | | | | | | _ | | | | |
| Intersection Summary | | | 123.7 | 11. | CM 2000 | Level of S | Comileo | | F | | | |
| HCM 2000 Control Delay | a aitu ratio | | | H | UN 2000 | Level of S | pervice | | F | | | |
| HCM 2000 Volume to Capa | acity ratio | | 1.17 | 0 | um of le- | time (a) | | | 25.0 | | | |
| Actuated Cycle Length (s) | _4: | | 126.7 | | um of lost | . , | | | 25.0 | | | |
| Intersection Capacity Utiliz | ation | | 136.4% | IC | U Level o | of Service | | | Н | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| | | | | | | | | | | | | |

| Intersection Summary | | | | |
|-----------------------------------|--------|---------------------------|------|--|
| HCM 2000 Control Delay | 123.7 | HCM 2000 Level of Service | F | |
| HCM 2000 Volume to Capacity ratio | 1.17 | | | |
| Actuated Cycle Length (s) | 126.7 | Sum of lost time (s) | 25.0 | |
| Intersection Capacity Utilization | 136.4% | ICU Level of Service | Н | |
| Analysis Period (min) | 15 | | | |
| - O-HII O | | | | |

c Critical Lane Group

HDR Corporation

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

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

Queue shown is maximum after two cycles.

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements

Lanes, Volumes, Timings 538: Strachan Ave & King St

09/30/2021

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|----------------------------|-------|----------|-------|-------|----------|-------|-------|----------|-------------|----------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 414 | | | 4î> | | 7 | 1₃ | | 7 | 1₃ | |
| Traffic Volume (vph) | 0 | 627 | 146 | 66 | 561 | 40 | 132 | 340 | 126 | 27 | 214 | 20 |
| Future Volume (vph) | 0 | 627 | 146 | 66 | 561 | 40 | 132 | 340 | 126 | 27 | 214 | 20 |
| Ideal Flow (vphpl) | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 0.0 | 25.0 | | 0.0 | 25.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 0 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | 0.90 | | | 0.98 | | 0.85 | 0.96 | | 0.96 | 0.98 | |
| Frt | | 0.972 | | | 0.991 | | | 0.959 | | | 0.987 | |
| Flt Protected | | | | | 0.995 | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 0 | 1559 | 0 | 0 | 1695 | 0 | 1458 | 1476 | 0 | 1516 | 1603 | 0 |
| Flt Permitted | | | | | 0.768 | | 0.479 | | | 0.160 | | |
| Satd. Flow (perm) | 0 | 1559 | 0 | 0 | 1293 | 0 | 625 | 1476 | 0 | 246 | 1603 | 0 |
| Right Turn on Red | | 1000 | Yes | , , | 1200 | Yes | 020 | 1470 | Yes | 2.10 | 1000 | Yes |
| Satd. Flow (RTOR) | | 54 | 100 | | 13 | 100 | | 24 | 100 | | 6 | 100 |
| Link Speed (k/h) | | 50 | | | 50 | | | 40 | | | 40 | |
| Link Distance (m) | | 255.2 | | | 358.6 | | | 424.1 | | | 379.9 | |
| Travel Time (s) | | 18.4 | | | 25.8 | | | 38.2 | | | 34.2 | |
| Confl. Peds. (#/hr) | 54 | 10.4 | 300 | 300 | 20.0 | 54 | 216 | 50.2 | 124 | 124 | 04.2 | 216 |
| Confl. Bikes (#/hr) | 01 | | 40 | 000 | | 16 | 210 | | 13 | 121 | | 12 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles (%) | 0% | 9% | 28% | 100% | 7% | 5% | 4% | 6% | 3% | 0% | 2% | 0% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 0 | 729 | 170 | 77 | 652 | 47 | 153 | 395 | 147 | 31 | 249 | 23 |
| Shared Lane Traffic (%) | | . 20 | | | 002 | | | 000 | | 0. | 2.0 | |
| Lane Group Flow (vph) | 0 | 899 | 0 | 0 | 776 | 0 | 153 | 542 | 0 | 31 | 272 | 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 | | | 3.0 | | | 3.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.92 | 2.03 | 1.92 | 1.92 | 2.03 | 1.92 | 1.25 | 1.16 | 1.16 | 1.25 | 1.16 | 1.16 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | Cl+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | Cl+Ex | CI+Ex | |
| Detector 1 Channel | 01.27 | 0. Ex | | O. LA | O. LX | | O. LX | O. LA | | 0. 2. | O. LX | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | 0.0 | 28.7 | | 0.0 | 28.7 | | 0.0 | 28.7 | | 0.0 | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| 20100101 2 0120(111) | | 1.0 | | | 1.0 | | | 1.0 | | | 1.0 | |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 9 Lanes, Volumes, Timings 538: Strachan Ave & King St

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|--|--------------|-----------|------------|-----------|---------------------------|------------|-------------|----------|-----|-------|-------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Detector 2 Type | | Cl+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 4 | | | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Detector Phase | 2 | 2 | | 6 | 6 | | 4 | 4 | | 8 | 8 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 21.0 | 21.0 | | 21.0 | 21.0 | |
| Minimum Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 27.0 | 27.0 | | 27.0 | 27.0 | |
| Total Split (s) | 50.0 | 50.0 | | 50.0 | 50.0 | | 30.0 | 30.0 | | 30.0 | 30.0 | |
| Total Split (%) | 62.5% | 62.5% | | 62.5% | 62.5% | | 37.5% | 37.5% | | 37.5% | 37.5% | |
| Maximum Green (s) | 44.0 | 44.0 | | 44.0 | 44.0 | | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Yellow Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | -1.0 | | | -1.0 | | -1.0 | -1.0 | | -1.0 | -1.0 | |
| Total Lost Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | C-Max | C-Max | | C-Max | C-Max | | Max | Max | | Max | Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 13.0 | 13.0 | | 13.0 | 13.0 | | 14.0 | 14.0 | | 14.0 | 14.0 | |
| Pedestrian Calls (#/hr) | 100 | 100 | | 16 | 16 | | 100 | 100 | | 100 | 100 | |
| Act Effct Green (s) | | 45.0 | | | 45.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Actuated g/C Ratio | | 0.56 | | | 0.56 | | 0.31 | 0.31 | | 0.31 | 0.31 | |
| v/c Ratio | | 1.00 | | | 1.06 | | 0.78 | 1.14 | | 0.41 | 0.54 | |
| Control Delay | | 48.5 | | | 65.3 | | 55.1 | 112.0 | | 45.8 | 33.1 | |
| Queue Delay | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | | 48.5 | | | 65.3 | | 55.1 | 112.0 | | 45.8 | 33.1 | |
| LOS | | D | | | E | | E | F | | D | C | |
| Approach Delay | | 48.5 | | | 65.3 | | _ | 99.5 | | | 34.4 | |
| Approach LOS | | D.0 | | | E | | | F | | | C | |
| | | | | | | | | | | | 0 | |
| Intersection Summary Area Type: | CBD | | | | | | | | | | | |
| Cycle Length: 80 | CDD | | | | | | | | | | | |
| Actuated Cycle Length: 80 | ı | | | | | | | | | | | |
| Offset: 42 (53%), Reference | | 2-ERTL a | and 6:MR | TI Start | of 1ct Cro | on | | | | | | |
| Natural Cycle: 80 | bed to phase | Z.LDIL 6 | iliu U.VVD | TL, Start | 01 131 016 | CII | | | | | | |
| Control Type: Actuated-Co | ordinated | | | | | | | | | | | |
| Maximum v/c Ratio: 1.14 | Jorumaleu | | | | | | | | | | | |
| | SE O | | | | ntersection | I Oe · E | | | | | | |
| Intersection Signal Delay: Intersection Capacity Utiliz | |)/ | | | itersection CU Level o | | , LI | | | | | |
| Analysis Period (min) 15 | .alion 133.0 | /0 | | ľ | JO LEVEI (| ii Seivice | <i>7</i> П | | | | | |
| Califo and Dhagon: 520- | Ctrophon A | o 9 Vina | C+ | | | | | | | | | |
| Splits and Phases: 538: | Strachan A | ve & King | ા | | | | 1.4 | | | | | |
| - 402 (R) | | | | | | | * †₀ | и | | | | |

538: Strachan Ave & King St

09/30/2021

Synchro 11 Report

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|------------------------|--------|-------|-------|----------|------|-------|
| Lane Group | EBT | WBT | NBL | NBT | SBL | SBT |
| Lane Group Flow (vph) | 899 | 776 | 153 | 542 | 31 | 272 |
| v/c Ratio | 1.00 | 1.06 | 0.78 | 1.14 | 0.41 | 0.54 |
| Control Delay | 48.5 | 65.3 | 55.1 | 112.0 | 45.8 | 33.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 48.5 | 65.3 | 55.1 | 112.0 | 45.8 | 33.1 |
| Queue Length 50th (m) | 63.5 | ~53.2 | 21.0 | ~95.1 | 4.6 | 41.3 |
| Queue Length 95th (m) | #101.3 | #93.9 | #48.6 | #142.9 | m9.2 | m57.6 |
| Internal Link Dist (m) | 231.2 | 334.6 | | 400.1 | | 355.9 |
| Turn Bay Length (m) | | | 25.0 | | 25.0 | |
| Base Capacity (vph) | 900 | 733 | 195 | 477 | 76 | 505 |
| 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 | 1.06 | 0.78 | 1.14 | 0.41 | 0.54 |

Intersection Summar

HCM Signalized Intersection Capacity Analysis

538: Strachan Ave & King St

09/30/2021

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|---|-----------|-----------|--------|---------|------------|------------|----------|----------|-----------|-------------|-----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 413 | | | 413 | | 7 | ĵ. | | 7 | î, | |
| Traffic Volume (vph) | 0 | 627 | 146 | 66 | 561 | 40 | 132 | 340 | 126 | 27 | 214 | 20 |
| Future Volume (vph) | 0 | 627 | 146 | 66 | 561 | 40 | 132 | 340 | 126 | 27 | 214 | 20 |
| Ideal Flow (vphpl) | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frpb, ped/bikes | | 0.90 | | | 0.99 | | 1.00 | 0.96 | | 1.00 | 0.98 | |
| Flpb, ped/bikes | | 1.00 | | | 0.99 | | 0.85 | 1.00 | | 0.96 | 1.00 | |
| Frt | | 0.97 | | | 0.99 | | 1.00 | 0.96 | | 1.00 | 0.99 | |
| Flt Protected | | 1.00 | | | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1558 | | | 1675 | | 1239 | 1476 | | 1460 | 1604 | |
| Flt Permitted | | 1.00 | | | 0.77 | | 0.48 | 1.00 | | 0.16 | 1.00 | |
| Satd. Flow (perm) | | 1558 | | | 1293 | | 624 | 1476 | | 246 | 1604 | |
| Peak-hour factor, PHF | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Adj. Flow (vph) | 0 | 729 | 170 | 77 | 652 | 47 | 153 | 395 | 147 | 31 | 249 | 23 |
| RTOR Reduction (vph) | 0 | 24 | 0 | 0 | 6 | 0 | 0 | 17 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 0 | 875 | 0 | 0 | 770 | 0 | 153 | 526 | 0 | 31 | 268 | 0 |
| Confl. Peds. (#/hr) | 54 | | 300 | 300 | | 54 | 216 | | 124 | 124 | | 216 |
| Confl. Bikes (#/hr) | | | 40 | | | 16 | | | 13 | | | 12 |
| Heavy Vehicles (%) | 0% | 9% | 28% | 100% | 7% | 5% | 4% | 6% | 3% | 0% | 2% | 0% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Turn Type | | NA. | | Perm | NA. | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | 1 01111 | 6 | | 1 01111 | 4 | | 1 01111 | 8 | |
| Permitted Phases | 2 | - | | 6 | | | 4 | • | | 8 | · | |
| Actuated Green, G (s) | | 44.0 | | | 44.0 | | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Effective Green, q (s) | | 45.0 | | | 45.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Actuated g/C Ratio | | 0.56 | | | 0.56 | | 0.31 | 0.31 | | 0.31 | 0.31 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 876 | | | 727 | | 195 | 461 | | 76 | 501 | |
| v/s Ratio Prot | | 0.56 | | | 121 | | 133 | c0.36 | | 70 | 0.17 | |
| v/s Ratio Perm | | 0.50 | | | c0.60 | | 0.25 | 60.50 | | 0.13 | 0.17 | |
| v/c Ratio | | 1.00 | | | 1.06 | | 0.23 | 1.14 | | 0.13 | 0.53 | |
| Uniform Delay, d1 | | 17.5 | | | 17.5 | | 25.0 | 27.5 | | 21.7 | 22.7 | |
| Progression Factor | | 1.00 | | | 0.69 | | 1.00 | 1.00 | | 1.26 | 1.28 | |
| Incremental Delay, d2 | | 30.2 | | | 49.6 | | 26.4 | 86.2 | | 14.2 | 3.7 | |
| Delay (s) | | 47.7 | | | 61.7 | | 51.5 | 113.7 | | 41.6 | 32.9 | |
| Level of Service | | 41.1 D | | | 01.7 E | | J1.J | F | | 41.0 D | 32.9 C | |
| Approach Delay (s) | | 47.7 | | | 61.7 | | U | 100.0 | | U | 33.8 | |
| Approach LOS | | 41.1 D | | | 61.7 E | | | F | | | 33.0 C | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 63.8 | Ш | CM 2000 | Level of S | Convice | | Е | | | |
| | ity ratio | | 1.09 | П | CIVI ZUUU | Level of 3 | oei vice | | | | | |
| HCM 2000 Volume to Capac Actuated Cycle Length (s) | ity Tallo | | 80.0 | 0. | um of lost | time (c) | | | 10.0 | | | |
| | ion | | 135.0% | | | of Service | | | 10.0 H | | | |
| Intersection Capacity Utilizat Analysis Period (min) | 1011 | | 135.0% | IC | O Level (| n Service | | | Н | | | |
| c Critical Lane Group | | | 10 | | | | | | | | | |
| 5 Shillour Eurio Group | | | | | | | | | | | | |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

^{# 95}th 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.

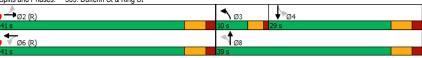
09/30/2021

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|----------------------------|---------|-------|---------------|---------|----------|---------|-------|----------|----------|---------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 414 | | | 4î> | | | 414 | | | 414 | |
| Traffic Volume (vph) | 56 | 747 | 86 | 42 | 463 | 106 | 34 | 273 | 44 | 112 | 612 | 42 |
| Future Volume (vph) | 56 | 747 | 86 | 42 | 463 | 106 | 34 | 273 | 44 | 112 | 612 | 42 |
| Ideal Flow (vphpl) | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.97 | | | 0.96 | | | 0.97 | | | 0.97 | |
| Frt | | 0.985 | | | 0.974 | | | 0.981 | | | 0.992 | |
| Flt Protected | | 0.997 | | | 0.997 | | | 0.995 | | | 0.993 | |
| Satd. Flow (prot) | 0 | 1878 | 0 | 0 | 1806 | 0 | 0 | 1722 | 0 | 0 | 2781 | 0 |
| Flt Permitted | | 0.855 | | | 0.758 | | | 0.738 | | | 0.806 | |
| Satd. Flow (perm) | 0 | 1605 | 0 | 0 | 1370 | 0 | 0 | 1273 | 0 | 0 | 2226 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 19 | | | 40 | | | 23 | | | 8 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 291.1 | | | 316.7 | | | 212.5 | | | 385.1 | |
| Travel Time (s) | | 21.0 | | | 22.8 | | | 15.3 | | | 27.7 | |
| Confl. Peds. (#/hr) | 144 | | 212 | 212 | | 144 | 189 | | 143 | 143 | | 189 |
| Confl. Bikes (#/hr) | | | 78 | | | 6 | | | 12 | | | 125 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles (%) | 5% | 4% | 10% | 2% | 4% | 7% | 8% | 12% | 0% | 3% | 9% | 7% |
| Bus Blockages (#/hr) | 12 | 12 | 12 | 24 | 24 | 24 | 12 | 30 | 30 | 0 | 18 | 18 |
| Adj. Flow (vph) | 65 | 869 | 100 | 49 | 538 | 123 | 40 | 317 | 51 | 130 | 712 | 49 |
| Shared Lane Traffic (%) | 00 | 000 | 100 | -10 | 000 | 120 | -10 | 011 | 01 | 100 | 7 12 | -10 |
| Lane Group Flow (vph) | 0 | 1034 | 0 | 0 | 710 | 0 | 0 | 408 | 0 | 0 | 891 | 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) | Lon | 0.0 | ragni | LUIT | 0.0 | rtigiit | LOIL | 0.0 | rtigiit | Loit | 0.0 | ragni |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | 1.0 | | | 1.0 | | | 1.0 | | | 1.0 | |
| Headway Factor | 1.92 | 1.97 | 1.92 | 1.92 | 2.03 | 1.92 | 1.92 | 2.06 | 1.92 | 1.16 | 1.22 | 1.16 |
| Turning Speed (k/h) | 24 | 1.01 | 14 | 24 | 2.00 | 14 | 24 | 2.00 | 14 | 24 | 1.22 | 14 |
| Turn Type | Perm | NA | | Perm | NA | - 11 | pm+pt | NA | 1-1 | Perm | NA | |
| Protected Phases | 1 Cilli | 2 | | 1 Cilli | 6 | | 3 | 8 | | 1 Cilli | 4 | |
| Permitted Phases | 2 | 2 | | 6 | U | | 8 | U | | 4 | 7 | |
| Minimum Split (s) | 27.0 | 27.0 | | 27.0 | 27.0 | | 10.0 | 27.0 | | 27.0 | 27.0 | |
| Total Split (s) | 41.0 | 41.0 | | 41.0 | 41.0 | | 10.0 | 39.0 | | 29.0 | 29.0 | |
| Total Split (%) | 51.3% | 51.3% | | 51.3% | 51.3% | | 12.5% | 48.8% | | 36.3% | 36.3% | |
| Maximum Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 6.0 | 33.0 | | 23.0 | 23.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 2.0 | -2.0 | | 2.0 | -1.0 | | 1.0 | -1.0 | | 2.0 | -1.0 | |
| Total Lost Time (s) | | 4.0 | | | 5.0 | | | 5.0 | | | 5.0 | |
| Lead/Lag | | 4.0 | | | 3.0 | | Lead | 3.0 | | Lag | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | | | Yes | Yes | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 165 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | | 14.0 | | 14.0 | 14.0 | |
| | 100 | 100 | | 100 | 100 | | | 14.0 | | 100 | 14.0 | |
| Pedestrian Calls (#/hr) | 100 | | | 100 | | | | | | 100 | | |
| Act Effct Green (s) | | 37.0 | | | 36.0 | | | 34.0 | | | 24.0 | |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 13 Lanes, Volumes, Timings 539: Dufferin St & King St

09/30/2021 EBL WBT NBT Lane Group EBT Actuated g/C Ratio 0.42 0.30 0.46 v/c Ratio 1.38 1.11 0.70 1.32 Control Delay 198.1 84.8 17.8 183.0 Queue Delay 0.0 0.0 0.0 0.0 Total Delay 198.1 84.8 17.8 183.0 LOS В Approach Delay 198.1 84.8 Approach LOS F F В Intersection Summary Area Type: CBD Cycle Length: 80
Actuated Cycle Length: 80 Offset: 15 (19%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green Natural Cycle: 130 Control Type: Pretimed
Maximum v/c Ratio: 1.38
Intersection Signal Delay: 143.0 Intersection LOS: F Intersection Capacity Utilization 131.4% ICU Level of Service H Analysis Period (min) 15 Splits and Phases: 539: Dufferin St & King St **↑** Ø3 ≠_{Ø2 (R)} Ø4



539: Dufferin St & King St

09/30/2021

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|------------------------|--------|-------|-------|--------|
| Lane Group | EBT | WBT | NBT | SBT |
| Lane Group Flow (vph) | 1034 | 710 | 408 | 891 |
| v/c Ratio | 1.38 | 1.11 | 0.70 | 1.32 |
| Control Delay | 198.1 | 84.8 | 17.8 | 183.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 198.1 | 84.8 | 17.8 | 183.0 |
| Queue Length 50th (m) | ~111.5 | ~64.7 | 17.4 | ~94.1 |
| Queue Length 95th (m) | #139.3 | #89.5 | m19.4 | #121.5 |
| Internal Link Dist (m) | 267.1 | 292.7 | 188.5 | 361.1 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 752 | 638 | 582 | 673 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.38 | 1.11 | 0.70 | 1.32 |

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

HCM Signalized Intersection Capacity Analysis 539: Dufferin St & King St

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|----|-----|---|----|---|---|
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|-------------------------------|------------|----------|---------------|------|------------|------------|---------|----------|----------|-------------|-------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 414 | | | 414 | | | 414 | | | 413 | |
| Traffic Volume (vph) | 56 | 747 | 86 | 42 | 463 | 106 | 34 | 273 | 44 | 112 | 612 | 42 |
| Future Volume (vph) | 56 | 747 | 86 | 42 | 463 | 106 | 34 | 273 | 44 | 112 | 612 | 42 |
| Ideal Flow (vphpl) | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 5.0 | | | 5.0 | | | 5.0 | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | | 0.97 | | | 0.96 | | | 0.98 | | | 0.98 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | | 1.00 | | | 0.99 | |
| Frt | | 0.99 | | | 0.97 | | | 0.98 | | | 0.99 | |
| Flt Protected | | 1.00 | | | 1.00 | | | 1.00 | | | 0.99 | |
| Satd. Flow (prot) | | 1872 | | | 1801 | | | 1719 | | | 2742 | |
| Flt Permitted | | 0.85 | | | 0.76 | | | 0.74 | | | 0.81 | |
| Satd. Flow (perm) | | 1605 | | | 1370 | | | 1275 | | | 2225 | |
| Peak-hour factor, PHF | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Adj. Flow (vph) | 65 | 869 | 100 | 49 | 538 | 123 | 40 | 317 | 51 | 130 | 712 | 49 |
| RTOR Reduction (vph) | 0 | 10 | 0 | 0 | 22 | 0 | 0 | 13 | 0 | 0 | 6 | 0 |
| Lane Group Flow (vph) | 0 | 1024 | 0 | 0 | 688 | 0 | 0 | 395 | 0 | 0 | 885 | 0 |
| Confl. Peds. (#/hr) | 144 | | 212 | 212 | | 144 | 189 | | 143 | 143 | | 189 |
| Confl. Bikes (#/hr) | | | 78 | | | 6 | | | 12 | | | 125 |
| Heavy Vehicles (%) | 5% | 4% | 10% | 2% | 4% | 7% | 8% | 12% | 0% | 3% | 9% | 7% |
| Bus Blockages (#/hr) | 12 | 12 | 12 | 24 | 24 | 24 | 12 | 30 | 30 | 0 | 18 | 18 |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | 3 | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 35.0 | | | 35.0 | | | 33.0 | | | 23.0 | |
| Effective Green, g (s) | | 37.0 | | | 36.0 | | | 34.0 | | | 24.0 | |
| Actuated g/C Ratio | | 0.46 | | | 0.45 | | | 0.42 | | | 0.30 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | |
| Lane Grp Cap (vph) | | 742 | | | 616 | | | 580 | | | 667 | |
| v/s Ratio Prot | | | | | | | | c0.06 | | | | |
| v/s Ratio Perm | | c0.64 | | | 0.50 | | | 0.23 | | | c0.40 | |
| v/c Ratio | | 1.38 | | | 1.12 | | | 0.68 | | | 1.33 | |
| Uniform Delay, d1 | | 21.5 | | | 22.0 | | | 18.6 | | | 28.0 | |
| Progression Factor | | 0.83 | | | 0.68 | | | 0.86 | | | 1.00 | |
| Incremental Delay, d2 | | 179.2 | | | 68.3 | | | 2.2 | | | 157.6 | |
| Delay (s) | | 197.0 | | | 83.2 | | | 18.1 | | | 185.6 | |
| Level of Service | | F | | | F | | | В | | | F | |
| Approach Delay (s) | | 197.0 | | | 83.2 | | | 18.1 | | | 185.6 | |
| Approach LOS | | F | | | F | | | В | | | F | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 143.1 | Н | CM 2000 | Level of | Service | | F | | | |
| HCM 2000 Volume to Capa | city ratio | | 1.31 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 80.0 | S | um of lost | time (s) | | | 13.0 | | | |
| Intersection Capacity Utiliza | ition | | 131.4% | IC | CU Level | of Service |) | | Н | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements

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|---|--------------|--------------|-------|-------------|----------|--------------|------------|--------------|----------|-------|--------------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | 7 | ĵ. | | | ની | 7 | * | 4 | | Ť | ĵ. | |
| Traffic Volume (vph) | 91 | 86 | 50 | 119 | 56 | 90 | 83 | 346 | 182 | 51 | 315 | 80 |
| Future Volume (vph) | 91 | 86 | 50 | 119 | 56 | 90 | 83 | 346 | 182 | 51 | 315 | 80 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| Storage Length (m) | 25.0 | | 0.0 | 0.0 | | 50.0 | 30.0 | | 0.0 | 25.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 0 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| 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 |
| Ped Bike Factor | 0.86 | 0.97 | | | 0.97 | 0.77 | 0.98 | 0.97 | | | 0.98 | |
| Frt | | 0.945 | | | | 0.850 | | 0.948 | | | 0.970 | |
| Flt Protected | 0.950 | | | | 0.967 | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1589 | 1655 | 0 | 0 | 1682 | 1436 | 1652 | 1676 | 0 | 1620 | 1708 | 0 |
| Flt Permitted | 0.546 | | | | 0.659 | | 0.368 | | | 0.237 | | |
| Satd. Flow (perm) | 784 | 1655 | 0 | 0 | 1108 | 1112 | 628 | 1676 | 0 | 404 | 1708 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 19 | | | | 152 | | 21 | | | 10 | |
| Link Speed (k/h) | | 30 | | | 50 | | | 40 | | | 40 | |
| Link Distance (m) | | 143.4 | | | 229.0 | | | 205.6 | | | 241.4 | |
| Travel Time (s) | | 17.2 | | | 16.5 | | | 18.5 | | | 21.7 | |
| Confl. Peds. (#/hr) | 93 | | 29 | 29 | | 93 | 22 | | 25 | 25 | | 22 |
| Confl. Bikes (#/hr) | | | 1 | | | | | | 1 | | | 36 |
| 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 (%) | 6% | 5% | 2% | 0% | 25% | 5% | 2% | 5% | 0% | 4% | 5% | 2% |
| Adj. Flow (vph) | 101 | 96 | 56 | 132 | 62 | 100 | 92 | 384 | 202 | 57 | 350 | 89 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 101 | 152 | 0 | 0 | 194 | 100 | 92 | 586 | 0 | 57 | 439 | 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) | | 3.0 | | | 3.0 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | 4.00 | 4.04 | 4.04 | 4.04 | 4.04 | 4.00 | 4.00 | 4.04 | 4.04 | 4.00 | 4.04 | 4.04 |
| Headway Factor | 1.09 | 1.01 | 1.01 | 1.01 | 1.01 | 1.09 | 1.09 | 1.01 | 1.01 | 1.09 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 2 | 14 | 24 1 | 2 | 14 | 24 | 2 | 14 | 24 | 2 | 14 |
| Number of Detectors | Left | | | | | | Left | | | Left | | |
| Detector Template | | Thru 30.5 | | Left 6.1 | Thru | Right 2.0 | 2.0 | Thru 30.5 | | | Thru 30.5 | |
| Leading Detector (m) | 6.1 | | | | 30.5 | | | | | 2.0 | | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | | | | 0.0 6.1 | 1.8 | 0.0 2.0 | 0.0 2.0 | 1.8 | | 2.0 | 1.8 | |
| Detector 1 Size(m) | 6.1 CI+Ex | 1.8 CI+Ex | | CI+Ex | CI+Ex | CI+Ex | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Type Detector 1 Channel | CI+EX | CI+EX | | CI+EX | CI+EX | CI+EX | CI+EX | CI+EX | | CI+EX | CI+EX | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) Detector 2 Position(m) | 0.0 | 28.7 | | 0.0 | 28.7 | 0.0 | 0.0 | 28.7 | | 0.0 | 28.7 | |
| | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Size(m) | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Type | | UI+EX | | | UI+EX | | | ∪I+EX | | | UI+EX | |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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| Traffic Volume (vph) Future Volume (vph) Ideal Flow (vphpl) Lane Width (m) Storage Length (m) Storage Length (m) Storage Length (m) Lane Util. Factor Ped Bike Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (k/h) Link Distance (m) Travel Time (s) Confl. Peds. (#/hr) Confl. Bikes (#/hr) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) |
|--|
| Ideal Flow (vphpl) Lane Width (m) Storage Length (m) Storage Lanes Taper Length (m) Lane Uili. Factor Ped Bike Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (k/h) Link Distance (m) Travel Time (s) Confl. Peds. (#hr) Confl. Bikes (#hr) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) |
| Ideal Flow (vphpl) Lane Width (m) Storage Length (m) Storage Lanes Taper Length (m) Lane Uili. Factor Ped Bike Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (k/h) Link Distance (m) Travel Time (s) Confl. Peds. (#hr) Confl. Bikes (#hr) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) |
| Storage Length (m) Storage Lanes Taper Length (m) Lane Util. Factor Ped Bike Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (k/h) Link Distance (m) Travel Time (s) Confl. Peds. (#/hr) Confl. Bikes (#/hr) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) |
| Storage Lanes Taper Length (m) Lane Util. Factor Ped Bike Factor Fit Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (k/h) Link Distance (m) Travel Time (s) Confl. Peds. (#hr) Confl. Bikes (#hr) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) |
| Storage Lanes Taper Length (m) Lane Util. Factor Ped Bike Factor Fit Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (k/h) Link Distance (m) Travel Time (s) Confl. Peds. (#hr) Confl. Bikes (#hr) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) |
| Lane Util. Factor Ped Blike Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (k/h) Link Distance (m) Travel Time (s) Confl. Peds. (#/hr) Confl. Bikes (#/hr) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) |
| Ped Bike Factor Frt Frt FrtProtected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (k/h) Link Distance (m) Travel Time (s) Confl. Peds. (#/hr) Confl. Bikes (#/hr) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) |
| Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (k/h) Link Distance (m) Travel Time (s) Confl. Peds. (#hr) Confl. Bikes (#hr) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) |
| Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (k/h) Link Distance (m) Travel Time (s) Confl. Peds. (#hr) Confl. Bikes (#hr) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) |
| Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (k/h) Link Distance (m) Travel Time (s) Confl. Peds. (#/hr) Confl. Bikes (#/hr) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) |
| Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (k/h) Link Distance (m) Travel Time (s) Confl. Peds. (#/hr) Confl. Bikes (#/hr) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) |
| Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (k/h) Link Distance (m) Travel Time (s) Confl. Peds. (#/hr) Confl. Bikes (#/hr) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) |
| Right Turn on Red Satd. Flow (RTOR) Link Speed (k/h) Link Distance (m) Travel Time (s) Confl. Peds. (#/hr) Confl. Bikes (#/hr) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) |
| Satd. Flow (RTOR) Link Speed (k/h) Link Distance (m) Travel Time (s) Confl. Peds. (#/hr) Confl. Bikes (#/hr) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) |
| Link Speed (k/h) Link Distance (m) Travel Time (s) Confl. Peds. (#/hr) Confl. Bikes (#/hr) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) |
| Link Distance (m) Travel Time (s) Confl. Peds. (#/hr) Confl. Bikes (#/hr) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) |
| Travel Time (s) Confl. Peds. (#/hr) Confl. Bikes (#/hr) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (yph) Shared Lane Traffic (%) |
| Confl. Peds. (#/hr) Confl. Bilkes (#/hr) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) |
| Confl. Bikes (#/hr) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) |
| Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) |
| Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) |
| Adj. Flow (vph) Shared Lane Traffic (%) |
| Shared Lane Traffic (%) |
| |
| |
| Lane Group Flow (vph) |
| Enter Blocked Intersection |
| Lane Alignment |
| Median Width(m) |
| Link Offset(m) |
| Crosswalk Width(m) |
| Two way Left Turn Lane |
| Headway Factor |
| Turning Speed (k/h) |
| Number of Detectors |
| Detector Template |
| Leading Detector (m) |
| Trailing Detector (m) |
| Detector 1 Position(m) |
| Detector 1 Size(m) |
| Detector 1 Type |
| Detector 1 Channel |
| Detector 1 Extend (s) |
| Detector 1 Queue (s) |
| Detector 1 Delay (s) |
| Detector 2 Position(m) |
| Detector 2 Size(m) |
| Detector 2 Type |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Lanes, Volumes, Timings

571: Strachan Ave & Canada Blvd/Fleet St

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HDR Corporation

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements

Synchro 11 Report Page 19

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|------------------------------|---------------|-----------|---------------|----------|------------|------------|-------|----------|-------------|-------|-------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 32.0 | 32.0 | | 32.0 | 32.0 | 32.0 | 29.0 | 29.0 | | 29.0 | 29.0 | |
| Minimum Split (s) | 39.0 | 39.0 | | 39.0 | 39.0 | 39.0 | 36.0 | 36.0 | | 36.0 | 36.0 | |
| Total Split (s) | 39.0 | 39.0 | | 39.0 | 39.0 | 39.0 | 61.0 | 61.0 | | 61.0 | 61.0 | |
| Total Split (%) | 27.1% | 27.1% | | 27.1% | 27.1% | 27.1% | 42.4% | 42.4% | | 42.4% | 42.4% | |
| Maximum Green (s) | 32.0 | 32.0 | | 32.0 | 32.0 | 32.0 | 54.0 | 54.0 | | 54.0 | 54.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | | 0.0 | -1.0 | -1.0 | -1.0 | -1.0 | | -1.0 | -1.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lead/Lag | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | Max | Max | | Max | Max | Max | Max | Max | | Max | Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 25.0 | 25.0 | | 25.0 | 25.0 | 25.0 | 22.0 | 22.0 | | 22.0 | 22.0 | |
| Pedestrian Calls (#/hr) | 10 | 10 | | 28 | 28 | 28 | 7 | 7 | | 6 | 6 | |
| Act Effct Green (s) | 33.5 | 33.5 | | 20 | 33.5 | 33.5 | 55.9 | 55.9 | | 55.9 | 55.9 | |
| Actuated g/C Ratio | 0.30 | 0.30 | | | 0.30 | 0.30 | 0.50 | 0.50 | | 0.50 | 0.50 | |
| v/c Ratio | 0.43 | 0.30 | | | 0.59 | 0.23 | 0.29 | 0.69 | | 0.28 | 0.51 | |
| Control Delay | 42.8 | 31.2 | | | 45.2 | 2.3 | 24.0 | 29.0 | | 26.4 | 23.9 | |
| Queue Delay | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 0.5 | | 0.0 | 0.0 | |
| Total Delay | 42.8 | 31.2 | | | 45.2 | 2.3 | 24.0 | 29.5 | | 26.4 | 23.9 | |
| LOS | 72.0 D | C | | | D | Α. | C | C | | C | C | |
| Approach Delay | | 35.8 | | | 30.6 | | U | 28.7 | | Ū | 24.2 | |
| Approach LOS | | D | | | C | | | C | | | C | |
| •• | | | | | | | | | | | | |
| Intersection Summary | Other | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 144 | 10 | | | | | | | | | | | |
| Actuated Cycle Length: 11 | 12 | | | | | | | | | | | |
| Natural Cycle: 130 | | | | | | | | | | | | |
| Control Type: Semi Act-Ur | ncoora | | | | | | | | | | | |
| Maximum v/c Ratio: 0.69 | 00.0 | | | | | | | | | | | |
| Intersection Signal Delay: | | ., | | | ntersectio | | | | | | | |
| Intersection Capacity Utiliz | zation 127.65 | /o | | 10 | CU Level | of Service | e H | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Splits and Phases: 571: | : Strachan A | ve & Cana | da Blvd/F | Fleet St | | | | | | | | |
| Ø2 | <u> </u> | | | #1. | 110 | - 12 | •Ø4 | | | 1 | Ø12 | |
| 61 s | | | | 22 s | | 20.0 | - | | | 22. | | |

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| Lane Group | טוש | Ø IZ | Ø 14 | טוש |
|-------------------------|------|------|------|------|
| Detector 2 Channel | | | | |
| Detector 2 Extend (s) | | | | |
| Turn Type | | | | |
| Protected Phases | 10 | 12 | 14 | 16 |
| Permitted Phases | | | | |
| Detector Phase | | | | |
| Switch Phase | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | 7.0 |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 |
| Total Split (s) | 22.0 | 22.0 | 22.0 | 22.0 |
| Total Split (%) | 15% | 15% | 15% | 15% |
| Maximum Green (s) | 14.0 | 14.0 | 14.0 | 14.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 4.0 | 4.0 | 4.0 | 4.0 |
| Lost Time Adjust (s) | 1.0 | 1.0 | 1.0 | 1.0 |
| Total Lost Time (s) | | | | |
| Lead/Lag | | | | |
| Lead-Lag Optimize? | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None |
| Walk Time (s) | 0.0 | 0.0 | 0.0 | 0.0 |
| Flash Dont Walk (s) | 0.0 | 0.0 | 0.0 | 0.0 |
| Pedestrian Calls (#/hr) | 19 | 19 | 19 | 19 |
| Act Effct Green (s) | 13 | 19 | 19 | 13 |
| Actuated g/C Ratio | | | | |
| v/c Ratio | | | | |
| Control Delay | | | | |
| | | | | |
| Queue Delay | | | | |
| Total Delay LOS | | | | |
| | | | | |
| Approach Delay | | | | |
| Approach LOS | | | | |
| Intersection Summary | | | | |
| | | | | |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements

Lanes, Volumes, Timings

Lane Group

571: Strachan Ave & Canada Blvd/Fleet St

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Synchro 11 Report

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|------------------------|------|-------|-------|------|------|----------|------|----------|--|
| Lane Group | EBL | EBT | WBT | WBR | NBL | NBT | SBL | SBT | |
| Lane Group Flow (vph) | 101 | 152 | 194 | 100 | 92 | 586 | 57 | 439 | |
| v/c Ratio | 0.43 | 0.30 | 0.59 | 0.23 | 0.29 | 0.69 | 0.28 | 0.51 | |
| Control Delay | 42.8 | 31.2 | 45.2 | 2.3 | 24.0 | 29.0 | 26.4 | 23.9 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | |
| Total Delay | 42.8 | 31.2 | 45.2 | 2.3 | 24.0 | 29.5 | 26.4 | 23.9 | |
| Queue Length 50th (m) | 14.9 | 18.6 | 30.3 | 0.0 | 8.9 | 71.2 | 5.5 | 47.5 | |
| Queue Length 95th (m) | 41.4 | 47.6 | #74.4 | 3.1 | 30.8 | 176.3 | 22.0 | 118.4 | |
| Internal Link Dist (m) | | 119.4 | 205.0 | | | 181.6 | | 217.4 | |
| Turn Bay Length (m) | 25.0 | | | 50.0 | 30.0 | | 25.0 | | |
| Base Capacity (vph) | 234 | 508 | 331 | 439 | 313 | 847 | 201 | 857 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 54 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.43 | 0.30 | 0.59 | 0.23 | 0.29 | 0.74 | 0.28 | 0.51 | |
| | | | | | | | | | |

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

Queue shown is maximum after two cycles.

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|--------------------------------|-----------|------|--------|------|------------|------------|---------|-----------|------|-----------|-----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Lane Configurations | 7 | ĵ. | | | ર્ન | 7 | Ť | ĵ. | | ሻ | î» | |
| Traffic Volume (vph) | 91 | 86 | 50 | 119 | 56 | 90 | 83 | 346 | 182 | 51 | 315 | 80 |
| Future Volume (vph) | 91 | 86 | 50 | 119 | 56 | 90 | 83 | 346 | 182 | 51 | 315 | 80 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frpb, ped/bikes | 1.00 | 0.97 | | | 1.00 | 0.81 | 1.00 | 0.98 | | 1.00 | 0.98 | |
| Flpb, ped/bikes | 0.87 | 1.00 | | | 0.97 | 1.00 | 0.98 | 1.00 | | 0.99 | 1.00 | |
| Frt | 1.00 | 0.94 | | | 1.00 | 0.85 | 1.00 | 0.95 | | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | | 0.97 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1390 | 1661 | | | 1633 | 1157 | 1621 | 1682 | | 1599 | 1712 | |
| Flt Permitted | 0.55 | 1.00 | | | 0.66 | 1.00 | 0.37 | 1.00 | | 0.24 | 1.00 | |
| Satd. Flow (perm) | 799 | 1661 | | | 1113 | 1157 | 628 | 1682 | | 399 | 1712 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 101 | 96 | 56 | 132 | 62 | 100 | 92 | 384 | 202 | 57 | 350 | 89 |
| RTOR Reduction (vph) | 0 | 14 | 0 | 0 | 0 | 73 | 0 | 11 | 0 | 0 | 5 | (|
| Lane Group Flow (vph) | 101 | 138 | 0 | 0 | 194 | 27 | 92 | 575 | 0 | 57 | 434 | (|
| Confl. Peds. (#/hr) | 93 | | 29 | 29 | | 93 | 22 | | 25 | 25 | | 22 |
| Confl. Bikes (#/hr) | | | 1 | | | | | | 1 | | | 36 |
| Heavy Vehicles (%) | 6% | 5% | 2% | 0% | 25% | 5% | 2% | 5% | 0% | 4% | 5% | 2% |
| Turn Type | Perm | NA | | Perm | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 32.5 | 32.5 | | | 32.5 | 32.5 | 54.9 | 54.9 | | 54.9 | 54.9 | |
| Effective Green, q (s) | 33.5 | 33.5 | | | 33.5 | 33.5 | 55.9 | 55.9 | | 55.9 | 55.9 | |
| Actuated g/C Ratio | 0.27 | 0.27 | | | 0.27 | 0.27 | 0.46 | 0.46 | | 0.46 | 0.46 | |
| Clearance Time (s) | 7.0 | 7.0 | | | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 219 | 455 | | | 305 | 317 | 287 | 769 | | 182 | 783 | |
| v/s Ratio Prot | 2.0 | 0.08 | | | 000 | 0 | 20. | c0.34 | | .02 | 0.25 | |
| v/s Ratio Perm | 0.13 | 0.00 | | | c0.17 | 0.02 | 0.15 | 00.01 | | 0.14 | 0.20 | |
| v/c Ratio | 0.46 | 0.30 | | | 0.64 | 0.02 | 0.32 | 0.75 | | 0.31 | 0.55 | |
| Uniform Delay, d1 | 36.9 | 35.1 | | | 39.0 | 33.0 | 21.1 | 27.3 | | 21.0 | 24.1 | |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 6.8 | 1.7 | | | 9.7 | 0.5 | 2.9 | 6.5 | | 4.4 | 2.8 | |
| Delay (s) | 43.7 | 36.8 | | | 48.7 | 33.5 | 24.0 | 33.9 | | 25.4 | 26.9 | |
| Level of Service | 73.7 D | D | | | TO.7 | C | C C | C | | 20.4 C | 20.5 C | |
| Approach Delay (s) | D | 39.6 | | | 43.6 | U | U | 32.5 | | U | 26.7 | |
| Approach LOS | | D D | | | 75.0 D | | | 02.5 C | | | 20.7 C | |
| | | | | | | | | | | | | |
| Intersection Summary | | | 00.0 | | 014 0000 | | · · | | | | | |
| HCM 2000 Control Delay | | | 33.8 | Н | CIVI 2000 | Level of | service | | С | | | |
| HCM 2000 Volume to Capac | ity ratio | | 0.67 | ^ | | Alman (.) | | | 00.0 | | | |
| Actuated Cycle Length (s) | | | 122.2 | | um of lost | | | | 28.0 | | | |
| Intersection Capacity Utilizat | ION | | 127.6% | IC | U Level o | of Service | | | Н | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |

| 33.8 | HCM 2000 Level of Service | С | |
|--------|---------------------------|---|--|
| 0.67 | | | |
| 122.2 | Sum of lost time (s) | 28.0 | |
| 127.6% | ICU Level of Service | Н | |
| 15 | | | |
| | 0.67 122.2 127.6% | 0.67 122.2 Sum of lost time (s) 127.6% ICU Level of Service | 0.67 122.2 Sum of lost time (s) 28.0 127.6% ICU Level of Service H |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Lanes, Volumes, Timings 1344: Lakeshore Blvd & British Colombia Rd

09/30/2021

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|----------------------------|-------|----------|-------|------|----------|-------|------|-------|-------|------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | * | * | | | | 11 | | ተተጉ | | | | |
| Traffic Volume (vph) | 54 | 508 | 0 | 0 | 0 | 430 | 0 | 1402 | 14 | 0 | 0 | 0 |
| Future Volume (vph) | 54 | 508 | 0 | 0 | 0 | 430 | 0 | 1402 | 14 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 15.0 | | 0.0 | 0.0 | | 80.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 0 | | 1 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.88 | 1.00 | 0.91 | 0.91 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | 0.99 | | | | | | |
| Frt | | | | | | 0.850 | | 0.998 | | | | |
| Flt Protected | 0.950 | | | | | | | | | | | |
| Satd. Flow (prot) | 1620 | 1807 | 0 | 0 | 0 | 2652 | 0 | 4968 | 0 | 0 | 0 | 0 |
| Flt Permitted | 0.950 | | | | | | | | | | | |
| Satd. Flow (perm) | 1620 | 1807 | 0 | 0 | 0 | 2615 | 0 | 4968 | 0 | 0 | 0 | 0 |
| Right Turn on Red | Yes | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | 99 | | | | | 767 | | 1 | | | | |
| Link Speed (k/h) | | 60 | | | 30 | | | 60 | | | 60 | |
| Link Distance (m) | | 411.9 | | | 164.9 | | | 800.6 | | | 492.6 | |
| Travel Time (s) | | 24.7 | | | 19.8 | | | 48.0 | | | 29.6 | |
| Confl. Peds. (#/hr) | | | 1 | 1 | | | 17 | | | | | 17 |
| Confl. Bikes (#/hr) | | | 1 | | | 2 | | | | | | |
| 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 (%) | 4% | 4% | 4% | 0% | 0% | 6% | 0% | 3% | 7% | 0% | 0% | 0% |
| Adj. Flow (vph) | 60 | 564 | 0 | 0 | 0 | 478 | 0 | 1558 | 16 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 60 | 564 | 0 | 0 | 0 | 478 | 0 | 1574 | 0 | 0 | 0 | 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) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.09 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | | | 1 | | 2 | | | | |
| Detector Template | Left | Thru | | | | Right | | Thru | | | | |
| Leading Detector (m) | 6.1 | 30.5 | | | | 6.1 | | 30.5 | | | | |
| Trailing Detector (m) | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Detector 1 Position(m) | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Detector 1 Size(m) | 6.1 | 1.8 | | | | 6.1 | | 1.8 | | | | |
| Detector 1 Type | CI+Ex | CI+Ex | | | | CI+Ex | | Cl+Ex | | | | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Detector 2 Position(m) | | 28.7 | | | | | | 28.7 | | | | |
| Detector 2 Size(m) | | 1.8 | | | | | | 1.8 | | | | |
| Detector 2 Type | | CI+Ex | | | | | | CI+Ex | | | | |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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Lanes, Volumes, Timings 1344: Lakeshore Blvd & British Colombia Rd

09/30/2021

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|------------------------------|-------------|-----------|------------|---------|----------|------------|-----|-----------|-----|-----|-----|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | | | | 0.0 | | | | |
| Turn Type | Perm | NA | | | | Perm | | NA | | | | |
| Protected Phases | | 4 | | | | | | 2 | | | | |
| Permitted Phases | 4 | | | | | 9 | | | | | | |
| Detector Phase | 4 | 4 | | | | 9 | | 2 | | | | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | | | | 7.0 | | 22.0 | | | | |
| Minimum Split (s) | 13.0 | 13.0 | | | | 30.0 | | 29.0 | | | | |
| Total Split (s) | 40.0 | 40.0 | | | | 30.0 | | 40.0 | | | | |
| Total Split (%) | 36.4% | 36.4% | | | | 27.3% | | 36.4% | | | | |
| Maximum Green (s) | 34.0 | 34.0 | | | | 24.0 | | 33.0 | | | | |
| Yellow Time (s) | 4.0 | 4.0 | | | | 4.0 | | 4.0 | | | | |
| All-Red Time (s) | 2.0 | 2.0 | | | | 2.0 | | 3.0 | | | | |
| Lost Time Adjust (s) | -1.0 | -1.0 | | | | -1.0 | | -1.0 | | | | |
| Total Lost Time (s) | 5.0 | 5.0 | | | | 5.0 | | 6.0 | | | | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | 3.0 | | 3.0 | | | | |
| Recall Mode | None | None | | | | None | | None | | | | |
| Walk Time (s) | 0.0 | 0.0 | | | | 110110 | | 7.0 | | | | |
| Flash Dont Walk (s) | 0.0 | 0.0 | | | | | | 15.0 | | | | |
| Pedestrian Calls (#/hr) | 0.0 | 0.0 | | | | | | 0.0 | | | | |
| Act Effct Green (s) | 34.8 | 34.8 | | | | 8.0 | | 34.0 | | | | |
| Actuated g/C Ratio | 0.38 | 0.38 | | | | 0.09 | | 0.37 | | | | |
| v/c Ratio | 0.09 | 0.83 | | | | 0.52 | | 0.86 | | | | |
| Control Delay | 1.7 | 39.0 | | | | 2.1 | | 33.5 | | | | |
| Queue Delay | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Total Delay | 1.7 | 39.0 | | | | 2.1 | | 33.5 | | | | |
| LOS | Α. | 39.0 D | | | | 2.1 A | | 33.5 C | | | | |
| Approach Delay | А | 35.4 | | | 2.1 | А | | 33.5 | | | | |
| Approach LOS | | 33.4 D | | | 2.1 A | | | 33.5 C | | | | |
| •• | | U | | | А | | | | | | | |
| Intersection Summary | 011 | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 110 | ^ | | | | | | | | | | | |
| Actuated Cycle Length: 92 | .8 | | | | | | | | | | | |
| Natural Cycle: 100 | | | | | | | | | | | | |
| Control Type: Semi Act-Un | coora | | | | | | | | | | | |
| Maximum v/c Ratio: 0.86 | | | | | | | | | | | | |
| Intersection Signal Delay: 2 | | | | | | n LOS: C | _ | | | | | |
| Intersection Capacity Utiliz | ation 63.3% | | | IC | U Level | of Service | В | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Splits and Phases: 1344 | : Lakeshore | Blvd & Bi | itish Colo | mbia Rd | | | | | | | | |
| ↑ | | | A | | | | | | 4_ | | | |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

1344: Lakeshore Blvd & British Colombia Rd

09/30/2021

| | • | | • | • |
|------------------------|------|--------|------|-------|
| | | - | _ | ı |
| Lane Group | EBL | EBT | WBR | NBT |
| Lane Group Flow (vph) | 60 | 564 | 478 | 1574 |
| v/c Ratio | 0.09 | 0.83 | 0.52 | 0.86 |
| Control Delay | 1.7 | 39.0 | 2.1 | 33.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 1.7 | 39.0 | 2.1 | 33.5 |
| Queue Length 50th (m) | 0.0 | 90.1 | 0.0 | 94.4 |
| Queue Length 95th (m) | 2.9 | #145.1 | 0.0 | 113.8 |
| Internal Link Dist (m) | | 387.9 | | 776.6 |
| Turn Bay Length (m) | 15.0 | | 80.0 | |
| Base Capacity (vph) | 672 | 682 | 1264 | 1821 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.09 | 0.83 | 0.38 | 0.86 |
| | | | | |

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 1344: Lakeshore Blvd & British Colombia Rd

| | • | → | • | • | ← | • | 1 | 1 | <i>></i> | / | + | 4 |
|--------------------------------|------------|-----------|-------|------|------------|------------|---------|-----------------|-------------|----------|----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | * | ^ | | | | 77 | | ተተ _ጉ | | | | |
| Traffic Volume (vph) | 54 | 508 | 0 | 0 | 0 | 430 | 0 | 1402 | 14 | 0 | 0 | 0 |
| Future Volume (vph) | 54 | 508 | 0 | 0 | 0 | 430 | 0 | 1402 | 14 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 5.0 | 5.0 | | | | 5.0 | | 6.0 | | | | |
| Lane Util. Factor | 1.00 | 1.00 | | | | 0.88 | | 0.91 | | | | |
| Frpb, ped/bikes | 1.00 | 1.00 | | | | 0.98 | | 1.00 | | | | |
| Flpb, ped/bikes | 1.00 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Frt | 1.00 | 1.00 | | | | 0.85 | | 1.00 | | | | |
| Flt Protected | 0.95 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Satd. Flow (prot) | 1620 | 1807 | | | | 2606 | | 4970 | | | | |
| Flt Permitted | 0.95 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Satd. Flow (perm) | 1620 | 1807 | | | | 2606 | | 4970 | | | | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 60 | 564 | 0.00 | 0.00 | 0.00 | 478 | 0.00 | 1558 | 16 | 0.00 | 0.00 | 0.00 |
| RTOR Reduction (vph) | 38 | 0 | 0 | 0 | 0 | 437 | 0 | 1 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 23 | 564 | 0 | 0 | 0 | 41 | 0 | 1573 | 0 | 0 | 0 | 0 |
| Confl. Peds. (#/hr) | 20 | 004 | 1 | 1 | U | | 17 | 1010 | Ū | U | v | 17 |
| Confl. Bikes (#/hr) | | | 1 | | | 2 | - '' | | | | | |
| Heavy Vehicles (%) | 4% | 4% | 4% | 0% | 0% | 6% | 0% | 3% | 7% | 0% | 0% | 0% |
| Turn Type | Perm | NA | .,, | 0,0 | 070 | Perm | 0,0 | NA | . ,, | 0,0 | 0,0 | 070 |
| Protected Phases | 1 01111 | 4 | | | | 1 01111 | | 2 | | | | |
| Permitted Phases | 4 | | | | | 9 | | | | | | |
| Actuated Green, G (s) | 33.8 | 33.8 | | | | 7.0 | | 33.0 | | | | |
| Effective Green, q (s) | 34.8 | 34.8 | | | | 8.0 | | 34.0 | | | | |
| Actuated g/C Ratio | 0.37 | 0.37 | | | | 0.09 | | 0.37 | | | | |
| Clearance Time (s) | 6.0 | 6.0 | | | | 6.0 | | 7.0 | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | 3.0 | | 3.0 | | | | |
| Lane Grp Cap (vph) | 607 | 677 | | | | 224 | | 1820 | | | | |
| v/s Ratio Prot | 007 | c0.31 | | | | 224 | | c0.32 | | | | |
| v/s Ratio Perm | 0.01 | 60.51 | | | | c0.02 | | CU.32 | | | | |
| v/c Ratio | 0.01 | 0.83 | | | | 0.18 | | 0.86 | | | | |
| Uniform Delay, d1 | 18.4 | 26.4 | | | | 39.4 | | 27.3 | | | | |
| Progression Factor | 1.00 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Incremental Delay, d2 | 0.0 | 8.7 | | | | 0.4 | | 4.6 | | | | |
| Delay (s) | 18.4 | 35.0 | | | | 39.8 | | 31.8 | | | | |
| Level of Service | 10.4 B | 33.0 D | | | | 39.0 D | | 31.0 C | | | | |
| | Б | 33.4 | | | 39.8 | U | | 31.8 | | | 0.0 | |
| Approach LOS | | 33.4 C | | | 39.8 D | | | 31.8 C | | | 0.0 A | |
| Approach LOS | | C | | | U | | | C | | | А | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 33.6 | Н | CM 2000 | Level of S | Service | | С | | | |
| HCM 2000 Volume to Capac | city ratio | | 0.79 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 92.8 | | um of lost | | | | 17.0 | | | |
| Intersection Capacity Utilizat | tion | | 63.3% | IC | U Level o | of Service | | | В | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

| HCM 2000 Control Delay | 33.6 | HCM 2000 Level of Service | С | |
|-----------------------------------|-------|---------------------------|------|--|
| HCM 2000 Volume to Capacity ratio | 0.79 | | | |
| Actuated Cycle Length (s) | 92.8 | Sum of lost time (s) | 17.0 | |
| Intersection Capacity Utilization | 63.3% | ICU Level of Service | В | |
| Analysis Period (min) | 15 | | | |
| c Critical Lane Group | | | | |

Lanes, Volumes, Timings 1449: Dufferin St & Dwy/Liberty St

09/30/2021

| | • | - | • | • | — | • | 4 | † | ~ | / | ţ | 4 |
|----------------------------|-------|-------|-------|-------|----------|-------|-------|----------|-----------|----------|-------|---------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 4 | | | 4 | | | 4î> | | | 414 | |
| Traffic Volume (vph) | 5 | 0 | 6 | 129 | 0 | 71 | 2 | 322 | 518 | 130 | 694 | 0 |
| Future Volume (vph) | 5 | 0 | 6 | 129 | 0 | 71 | 2 | 322 | 518 | 130 | 694 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1250 | 1400 | 1250 | 1250 | 1250 | 1250 |
| Lane Util, Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.76 | | | 0.72 | | | 0.67 | | | 0.98 | |
| Frt | | 0.921 | | | 0.952 | | | 0.908 | | | | |
| Flt Protected | | 0.980 | | | 0.969 | | | | | | 0.992 | |
| Satd. Flow (prot) | 0 | 1364 | 0 | 0 | 1549 | 0 | 0 | 1438 | 0 | 0 | 2020 | 0 |
| Flt Permitted | | 0.898 | | | 0.798 | | | 0.954 | | | 0.643 | |
| Satd. Flow (perm) | 0 | 1178 | 0 | 0 | 1009 | 0 | 0 | 1372 | 0 | 0 | 1285 | 0 |
| Right Turn on Red | | | Yes | | 1000 | Yes | | .0.2 | Yes | | .200 | Yes |
| Satd. Flow (RTOR) | | 41 | 100 | | 41 | 100 | | 23 | 100 | | | 100 |
| Link Speed (k/h) | | 50 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 106.6 | | | 106.9 | | | 249.2 | | | 212.5 | |
| Travel Time (s) | | 7.7 | | | 9.6 | | | 17.9 | | | 15.3 | |
| Confl. Peds. (#/hr) | 180 | 1.1 | 338 | 338 | 3.0 | 180 | 356 | 17.3 | 263 | 263 | 10.0 | 356 |
| Confl. Bikes (#/hr) | 100 | | 330 | 330 | | 100 | 330 | | 12 | 200 | | 160 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| | 0.92 | 2% | 0.92 | 1% | 0.92 | 4% | 0.92 | 12% | 1% | 0.92 | 10% | 0.92 |
| Heavy Vehicles (%) | 0% | 2% | 0% | 1% | 0% | 4% | 12 | 30 | | 12 | 30 | |
| Bus Blockages (#/hr) | 5 | 0 | 7 | 140 | 0 | 77 | 2 | 350 | 30 563 | 141 | 754 | 30 0 |
| Adj. Flow (vph) | 5 | U | - 1 | 140 | U | 11 | 2 | 350 | 503 | 141 | 754 | U |
| Shared Lane Traffic (%) | 0 | 12 | 0 | ٥ | 217 | 0 | 0 | 915 | 0 | 0 | 895 | 0 |
| Lane Group Flow (vph) | | | | 0 | | | - | | | | | 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) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | 4.04 | 4.04 | 4.04 | | 4.04 | 4.04 | 4 =0 | 4.00 | 4 =0 | 4 =0 | 4.00 | 4 =0 |
| Headway Factor | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.70 | 1.60 | 1.70 | 1.70 | 1.83 | 1.70 |
| Turning Speed (k/h) | 24 | _ | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 27

Lanes, Volumes, Timings 1449: Dufferin St & Dwy/Liberty St

| Lanes, volumes, 1 1449: Dufferin St & | - | iberty S | St | | | | | | | | 09/3 | 0/2021 |
|--|---------------|------------|----------|-------------|-------------|------------|-------|----------|-----|-------------|----------|--------|
| | ۶ | → | • | • | ← | • | 4 | † | ~ | > | ↓ | 4 |
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Minimum Split (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Total Split (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 56.0 | 56.0 | | 56.0 | 56.0 | |
| Total Split (%) | 30.0% | 30.0% | | 30.0% | 30.0% | | 70.0% | 70.0% | | 70.0% | 70.0% | |
| Maximum Green (s) | 19.0 | 19.0 | | 19.0 | 19.0 | | 50.0 | 50.0 | | 50.0 | 50.0 | |
| Yellow Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | -1.0 | | | -1.0 | | | -3.0 | | | -1.0 | |
| Total Lost Time (s) | | 4.0 | | | 4.0 | | | 3.0 | | | 5.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 100 | 100 | | 100 | 100 | | 100 | 100 | | 100 | 100 | |
| Act Effct Green (s) | | 19.6 | | | 19.6 | | | 53.4 | | | 51.4 | |
| Actuated g/C Ratio | | 0.24 | | | 0.24 | | | 0.67 | | | 0.64 | |
| v/c Ratio | | 0.04 | | | 0.78 | | | 1.18dr | | | 1.08 | |
| Control Delay | | 0.5 | | | 44.2 | | | 45.2 | | | 70.3 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 0.5 | | | 44.2 | | | 45.2 | | | 70.3 | |
| LOS | | Α | | | D | | | D | | | Е | |
| Approach Delay | | 0.5 | | | 44.2 | | | 45.2 | | | 70.3 | |
| Approach LOS | | Α | | | D | | | D | | | Е | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 80 | | | | | | | | | | | | |
| Actuated Cycle Length: 80 | | | | | | | | | | | | |
| Offset: 40 (50%), Reference | ed to phase | 2:NBTL a | ind 6:SB | ΓL, Start (| of Green | | | | | | | |
| Natural Cycle: 90 | | | | | | | | | | | | |
| Control Type: Actuated-Co | ordinated | | | | | | | | | | | |
| Maximum v/c Ratio: 1.08 | | | | | | | | | | | | |
| Intersection Signal Delay: 5 | 55.8 | | | | ntersection | | | | | | | |
| Intersection Capacity Utiliz | ation 105.49 | % | | IC | CU Level | of Service | e G | | | | | |
| nalysis Period (min) 15 | | | | | | | | | | | | |
| r Defacto Right Lane. Recode with 1 though lane as a right lane. | | | | | | | | | | | | |
| Splits and Phases: 1449 | : Dufferin St | t & Dwy/Li | berty St | | | | | | | | | |
| Ø2 (R) | | <u> </u> | , 20 | | | | | 4 | 74 | | | |
| | | | | | | | | - x | | | | |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Ø6 (R)

Synchro 11 Report Page 28

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1449: Dufferin St & Dwy/Liberty St

09/30/2021

Synchro 11 Report

Page 29

| | - | • | Ť | ¥ |
|------------------------|------|-------|--------|-------|
| Lane Group | EBT | WBT | NBT | SBT |
| Lane Group Flow (vph) | 12 | 217 | 915 | 895 |
| v/c Ratio | 0.04 | 0.78 | 1.18dr | 1.08 |
| Control Delay | 0.5 | 44.2 | 45.2 | 70.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 0.5 | 44.2 | 45.2 | 70.3 |
| Queue Length 50th (m) | 0.0 | 24.9 | 75.1 | ~75.8 |
| Queue Length 95th (m) | 0.5 | #59.7 | #115.0 | m47.5 |
| Internal Link Dist (m) | 82.6 | 82.9 | 225.2 | 188.5 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 325 | 283 | 923 | 825 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.04 | 0.77 | 0.99 | 1.08 |

- Volume exceeds capacity, queue is theoretically infinite.
- Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dr Defacto Right Lane. Recode with 1 though lane as a right lane.

HCM Signalized Intersection Capacity Analysis

1449: Dufferin St & Dwy/Liberty St

09/30/2021

| | ٠ | → | • | • | ← | • | 4 | † | / | - | ↓ | 4 |
|-----------------------------------|-----------------|----------|----------|----------------|------------|------------|----------|-----------|----------|------|-----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 4 | | | 4 | | | र्सी | | | 414 | |
| Traffic Volume (vph) | 5 | 0 | 6 | 129 | 0 | 71 | 2 | 322 | 518 | 130 | 694 | 0 |
| Future Volume (vph) | 5 | 0 | 6 | 129 | 0 | 71 | 2 | 322 | 518 | 130 | 694 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1250 | 1400 | 1250 | 1250 | 1250 | 1250 |
| Total Lost time (s) | | 4.0 | | | 4.0 | | | 3.0 | | | 5.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | | 0.80 | | | 0.91 | | | 0.67 | | | 1.00 | |
| Flpb, ped/bikes | | 0.94 | | | 0.79 | | | 1.00 | | | 0.98 | |
| Frt | | 0.92 | | | 0.95 | | | 0.91 | | | 1.00 | |
| Flt Protected | | 0.98 | | | 0.97 | | | 1.00 | | | 0.99 | |
| Satd. Flow (prot) | | 1286 | | | 1225 | | | 1437 | | | 1983 | |
| Flt Permitted | | 0.90 | | | 0.80 | | | 0.95 | | | 0.64 | |
| Satd. Flow (perm) | | 1178 | | | 1008 | | | 1371 | | | 1285 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 5 | 0 | 7 | 140 | 0 | 77 | 2 | 350 | 563 | 141 | 754 | 0 |
| RTOR Reduction (vph) | 0 | 9 | 0 | 0 | 31 | 0 | 0 | 8 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 3 | 0 | 0 | 186 | 0 | 0 | 907 | 0 | 0 | 895 | 0 |
| Confl. Peds. (#/hr) | 180 | | 338 | 338 | | 180 | 356 | | 263 | 263 | | 356 |
| Confl. Bikes (#/hr) | | | | | | | | | 12 | | | 160 |
| Heavy Vehicles (%) | 0% | 2% | 0% | 1% | 0% | 4% | 0% | 12% | 1% | 0% | 10% | 0% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 30 | 30 | 12 | 30 | 30 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | . 0 | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | Ť | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 18.6 | | | 18.6 | | _ | 50.4 | | - | 50.4 | |
| Effective Green, g (s) | | 19.6 | | | 19.6 | | | 53.4 | | | 51.4 | |
| Actuated g/C Ratio | | 0.25 | | | 0.25 | | | 0.67 | | | 0.64 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | | 288 | | | 246 | | | 915 | | | 825 | |
| v/s Ratio Prot | | 200 | | | 210 | | | 010 | | | 020 | |
| v/s Ratio Perm | | 0.00 | | | c0.18 | | | 0.66 | | | c0.70 | |
| v/c Ratio | | 0.00 | | | 0.76 | | | 1.18dr | | | 1.08 | |
| Uniform Delay, d1 | | 22.9 | | | 28.0 | | | 13.1 | | | 14.3 | |
| Progression Factor | | 1.00 | | | 1.00 | | | 1.22 | | | 2.12 | |
| Incremental Delay, d2 | | 0.0 | | | 12.4 | | | 27.5 | | | 40.5 | |
| Delay (s) | | 22.9 | | | 40.4 | | | 43.4 | | | 70.9 | |
| Level of Service | | C | | | D | | | D | | | 7 G.S | |
| Approach Delay (s) | | 22.9 | | | 40.4 | | | 43.4 | | | 70.9 | |
| Approach LOS | | C C | | | 40.4 D | | | 45.4 D | | | 70.5 E | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 55.1 | Н | CM 2000 | Level of | Service | | Е | | | |
| HCM 2000 Volume to Capacit | v ratio | | 0.99 | 11 | OW 2000 | L040101 | 001 4100 | | _ | | | |
| Actuated Cycle Length (s) | , , , , , , , , | | 80.0 | Q ₁ | um of lost | time (s) | | | 9.0 | | | |
| Intersection Capacity Utilization | n | | 105.4% | | U Level o | | | | 9.0 G | | | |
| Analysis Period (min) | /11 | | 15 | IC | O LEVEL | , oei vide | | | 9 | | | |
| dr Defacto Right Lane. Rec | ode with | 1 though | | right land | | | | | | | | |
| c Critical Lane Group | OGG WILL | alougiii | une as a | ngiit iaile | | | | | | | | |

c Critical Lane Group

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|--|-------|-------------|---------------|-------|-------------|------------|-----------|-------------|-------|-----------|-------------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 4î> | | | 414 | | | 414 | | | 414 | |
| Traffic Volume (vph) | 21 | 676 | 17 | 0 | 596 | 103 | 63 | 226 | 19 | 128 | 87 | 116 |
| Future Volume (vph) | 21 | 676 | 17 | 0 | 596 | 103 | 63 | 226 | 19 | 128 | 87 | 116 |
| Ideal Flow (vphpl) | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util, Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.99 | | | 0.98 | | | 0.96 | | **** | 0.88 | |
| Frt | | 0.996 | | | 0.978 | | | 0.991 | | | 0.947 | |
| Flt Protected | | 0.999 | | | | | | 0.990 | | | 0.981 | |
| Satd. Flow (prot) | 0 | 1815 | 0 | 0 | 1809 | 0 | 0 | 3071 | 0 | 0 | 2346 | 0 |
| Flt Permitted | | 0.919 | | | | | | 0.795 | | | 0.700 | |
| Satd. Flow (perm) | 0 | 1669 | 0 | 0 | 1809 | 0 | 0 | 2394 | 0 | 0 | 1622 | 0 |
| Right Turn on Red | | | Yes | | 1000 | Yes | | 200. | Yes | | .022 | Yes |
| Satd. Flow (RTOR) | | 6 | | | 45 | 100 | | 10 | | | 133 | . 00 |
| Link Speed (k/h) | | 50 | | | 50 | | | 40 | | | 40 | |
| Link Distance (m) | | 199.1 | | | 255.2 | | | 127.7 | | | 380.6 | |
| Travel Time (s) | | 14.3 | | | 18.4 | | | 11.5 | | | 34.3 | |
| Confl. Peds. (#/hr) | 90 | 17.0 | 289 | 289 | 10.4 | 90 | 239 | 11.0 | 126 | 126 | 07.0 | 239 |
| Confl. Bikes (#/hr) | 30 | | 203 | 200 | | 25 | 200 | | 120 | 120 | | 200 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles (%) | 100% | 7% | 0.07 | 100% | 8% | 2% | 5% | 1% | 0.07 | 33% | 2% | 7% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 /0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 24 | 777 | 20 | 0 | 685 | 118 | 72 | 260 | 22 | 147 | 100 | 133 |
| Shared Lane Traffic (%) | 24 | 111 | 20 | U | 000 | 110 | 12 | 200 | 22 | 147 | 100 | 133 |
| | 0 | 821 | 0 | 0 | 803 | 0 | 0 | 354 | 0 | 0 | 380 | 0 |
| Lane Group Flow (vph) Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| | | | | | | | | | | | | |
| Lane Alignment | Left | Left 0.0 | Right | Left | Left 0.0 | Right | Left | Left 0.0 | Right | Left | Left 0.0 | Right |
| Median Width(m) | | 0.0 | | | 0.0 | | | | | | | |
| Link Offset(m) | | | | | | | | 0.0 4.8 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | 4.00 | 0.00 | 4.00 | 4.00 | 0.00 | 4.00 | 4.40 | 4.40 | 4.40 | 4.40 | 4.40 | 1.16 |
| Headway Factor | 1.92 | 2.03 | 1.92 | 1.92 | 2.03 | 1.92 14 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 | |
| Turning Speed (k/h) | = " | _ | 14 | | _ | 14 | = " | 0 | 14 | = - | _ | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 Left | 2 | | 1 Left | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | | Thru | | | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | | NA | | Perm | NA | | Perm | NA | |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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Lanes, Volumes, Timings 1628: Shaw St & King St

| | ۶ | - | \rightarrow | • | • | • | 4 | † | 1 | > | ļ | 4 |
|-------------------------------|--------------|----------|---------------|------------|-------------|------------|-------|----------|-----|-------------|-------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Protected Phases | | 2 | | | 6 | | | 4 | | | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Detector Phase | 2 | 2 | | 6 | 6 | | 4 | 4 | | 8 | 8 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 22.0 | 22.0 | | 22.0 | 22.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Minimum Split (s) | 28.0 | 28.0 | | 28.0 | 28.0 | | 26.0 | 26.0 | | 26.0 | 26.0 | |
| Total Split (s) | 44.0 | 44.0 | | 44.0 | 44.0 | | 26.0 | 26.0 | | 26.0 | 26.0 | |
| Total Split (%) | 62.9% | 62.9% | | 62.9% | 62.9% | | 37.1% | 37.1% | | 37.1% | 37.1% | |
| Maximum Green (s) | 38.0 | 38.0 | | 38.0 | 38.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | -1.0 | | | -1.0 | | | -1.0 | | | -1.0 | |
| Total Lost Time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 5.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | C-Max | C-Max | | C-Max | C-Max | | None | None | | None | None | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 15.0 | 15.0 | | 15.0 | 15.0 | | 13.0 | 13.0 | | 13.0 | 13.0 | |
| Pedestrian Calls (#/hr) | 100 | 100 | | 29 | 29 | | 100 | 100 | | 100 | 100 | |
| Act Effct Green (s) | | 39.0 | | | 39.0 | | | 21.0 | | | 21.0 | |
| Actuated g/C Ratio | | 0.56 | | | 0.56 | | | 0.30 | | | 0.30 | |
| v/c Ratio | | 0.88 | | | 0.78 | | | 0.49 | | | 0.66 | |
| Control Delay | | 27.0 | | | 18.4 | | | 22.3 | | | 19.9 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 27.0 | | | 18.4 | | | 22.3 | | | 19.9 | |
| LOS | | C | | | В | | | C | | | В | |
| Approach Delay | | 27.0 | | | 18.4 | | | 22.3 | | | 19.9 | |
| Approach LOS | | C C | | | В | | | C | | | В | |
| | | | | | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | CBD | | | | | | | | | | | |
| Cycle Length: 70 | | | | | | | | | | | | |
| Actuated Cycle Length: 70 | | | | | | | | | | | | |
| Offset: 1 (1%), Referenced | to phase 2 | EBTL and | 6:WBTL | , Start of | 1st Green | | | | | | | |
| Natural Cycle: 65 | | | | | | | | | | | | |
| Control Type: Actuated-Co | ordinated | | | | | | | | | | | |
| Maximum v/c Ratio: 0.88 | | | | | | | | | | | | |
| Intersection Signal Delay: 2 | 22.2 | | | lr | ntersection | LOS: C | | | | | | |
| Intersection Capacity Utiliza | ation 104.29 | % | | IC | CU Level o | of Service | G | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Splits and Phases: 1628 | : Shaw St 8 | King St | | | | | | | | | | |
| A | | - | | | | | ⊸÷ | | | | | |
| →ø2 (R) | | | | | | | | 34 | | | | |
| 44 s | | | | | | | 26 s | | | | | |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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1628: Shaw St & King St

09/30/2021

| | - | • | † | ↓ |
|------------------------|-------|-------|----------|----------|
| Lane Group | EBT | WBT | NBT | SBT |
| Lane Group Flow (vph) | 821 | 803 | 354 | 380 |
| v/c Ratio | 0.88 | 0.78 | 0.49 | 0.66 |
| Control Delay | 27.0 | 18.4 | 22.3 | 19.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 27.0 | 18.4 | 22.3 | 19.9 |
| Queue Length 50th (m) | 44.5 | 37.4 | 19.2 | 14.2 |
| Queue Length 95th (m) | #79.6 | 57.2 | 29.5 | 26.9 |
| Internal Link Dist (m) | 175.1 | 231.2 | 103.7 | 356.6 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 932 | 1027 | 725 | 579 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.88 | 0.78 | 0.49 | 0.66 |
| | | | | |

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1628: Shaw St & King St

09/30/2021

| 1020. Shaw St & K | .ing 3t | | | | + | • | • | • | | _ | 1 | سالم |
|-------------------------------|------------|-------|----------|------|------------|------------|---------|------|-------|------|----------|------|
| Movement | EBL | EBT | ₹ EBR | ₩BL | WBT | WBR | NBL | NBT | NBR | SBL | ♥ SBT | SBR |
| Lane Configurations | EDL | 473 | EDIN | WDL | 4P | WDK | INDL | 47 | INDIX | SDL | 413 | ODN |
| Traffic Volume (vph) | 21 | 676 | 17 | 0 | 596 | 103 | 63 | 226 | 19 | 128 | 87 | 116 |
| Future Volume (vph) | 21 | 676 | 17 | 0 | 596 | 103 | 63 | 226 | 19 | 128 | 87 | 116 |
| Ideal Flow (vphpl) | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 1200 | 5.0 | 1200 | 1200 | 5.0 | 1200 | 1000 | 5.0 | 1000 | 1000 | 5.0 | 1000 |
| Lane Util. Factor | | 0.95 | | | 0.95 | | | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | | 0.99 | | | 0.98 | | | 0.99 | | | 0.91 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | | 0.97 | | | 0.97 | |
| Frt | | 1.00 | | | 0.98 | | | 0.99 | | | 0.95 | |
| Flt Protected | | 1.00 | | | 1.00 | | | 0.99 | | | 0.98 | |
| Satd. Flow (prot) | | 1814 | | | 1809 | | | 2980 | | | 2275 | |
| Flt Permitted | | 0.92 | | | 1.00 | | | 0.80 | | | 0.70 | |
| Satd. Flow (perm) | | 1669 | | | 1809 | | | 2393 | | | 1623 | |
| Peak-hour factor, PHF | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Adj. Flow (vph) | 24 | 777 | 20 | 0 | 685 | 118 | 72 | 260 | 22 | 147 | 100 | 133 |
| RTOR Reduction (vph) | 0 | 3 | 0 | 0 | 20 | 0 | 0 | 7 | 0 | 0 | 93 | 0 |
| Lane Group Flow (vph) | 0 | 818 | 0 | 0 | 783 | 0 | 0 | 347 | 0 | 0 | 287 | 0 |
| Confl. Peds. (#/hr) | 90 | | 289 | 289 | | 90 | 239 | | 126 | 126 | | 239 |
| Confl. Bikes (#/hr) | | | | | | 25 | | | | | | |
| Heavy Vehicles (%) | 100% | 7% | 0% | 100% | 8% | 2% | 5% | 1% | 0% | 33% | 2% | 7% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Turn Type | Perm | NA | | | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 4 | | | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | | 38.0 | | | 38.0 | | | 20.0 | | | 20.0 | |
| Effective Green, g (s) | | 39.0 | | | 39.0 | | | 21.0 | | | 21.0 | |
| Actuated g/C Ratio | | 0.56 | | | 0.56 | | | 0.30 | | | 0.30 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | | 929 | | | 1007 | | | 717 | | | 486 | |
| v/s Ratio Prot | | | | | 0.43 | | | | | | | |
| v/s Ratio Perm | | c0.49 | | | | | | 0.14 | | | c0.18 | |
| v/c Ratio | | 0.88 | | | 0.78 | | | 0.48 | | | 0.59 | |
| Uniform Delay, d1 | | 13.5 | | | 12.1 | | | 20.1 | | | 20.8 | |
| Progression Factor | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | | 11.8 | | | 5.9 | | | 0.5 | | | 1.9 | |
| Delay (s) | | 25.2 | | | 18.0 | | | 20.6 | | | 22.8 | |
| Level of Service | | С | | | В | | | С | | | С | |
| Approach Delay (s) | | 25.2 | | | 18.0 | | | 20.6 | | | 22.8 | |
| Approach LOS | | С | | | В | | | С | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 21.7 | Н | CM 2000 | Level of | Service | | С | | | |
| HCM 2000 Volume to Capa | city ratio | | 0.78 | | | | | | | | | |
| Actuated Cycle Length (s) | , i | | 70.0 | S | um of lost | time (s) | | | 10.0 | | | |
| Intersection Capacity Utiliza | ition | | 104.2% | IC | U Level | of Service | | | G | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

c Critical Lane Group

HDR Corporation

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements

09/30/2021

| Lane Configurations | | • | - | • | • | ← | • | 4 | † | ~ | / | ļ | 4 |
|--|-----------------------|-------|-------|------------|-------|----------|----------|-------|-------------|----------|----------|-------|-------|
| Traffic Volume (vph) 0 791 5 0 681 114 0 5 0 166 0 96 Future Volume (vph) 0 791 5 0 681 114 0 5 0 166 0 96 Ideal Flow (vphpl) 1250 1250 1250 1250 1250 1250 190 1900 | Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | | NBR | SBL | SBT | SBR |
| Traffic Volume (vph) 0 791 5 0 681 114 0 5 0 166 0 96 Future Volume (vph) 0 791 5 0 681 114 0 5 0 166 0 96 Ideal Flow (vphpl) 1250 1250 1250 1250 1250 1250 190 1900 | Lane Configurations | | 414 | | | 414 | | | 4 | | | 4 | |
| Ideal Flow (vphpl) | Traffic Volume (vph) | 0 | 791 | 5 | 0 | 681 | 114 | 0 | | 0 | 166 | 0 | 96 |
| Lane Util. Factor | Future Volume (vph) | 0 | 791 | 5 | 0 | 681 | 114 | 0 | 5 | 0 | 166 | 0 | 96 |
| Ped Bike Factor | Ideal Flow (vphpl) | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Fit Protected | Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Fit Protected | Ped Bike Factor | | 1.00 | | | 0.98 | | | | | | 0.90 | |
| Satd. Flow (prot) | | | 0.999 | | | 0.978 | | | | | | 0.951 | |
| Fit Permitted | Flt Protected | | | | | | | | | | | 0.969 | |
| Satd. Flow (perm) | Satd. Flow (prot) | 0 | 1701 | 0 | 0 | 1740 | 0 | 0 | 1409 | 0 | 0 | 1350 | 0 |
| Right Turn on Red Yes Yes Yes Yes Yes Yes Yes Yes Stad: Flow (RTOR) 1 42 42 42 42 42 42 43 49 49 49 41 52 50 50 50 50 50 50 50 50 50 50 50 50 50 60 40 41 41 41 41 41 42 42 <td>FIt Permitted</td> <td></td> <td>0.804</td> <td></td> | FIt Permitted | | | | | | | | | | | 0.804 | |
| Right Turn on Red Yes Yes Yes Yes Yes Yes Yes Yes Stad: Flow (RTOR) 1 42 42 42 42 42 42 43 49 49 49 41 52 50 50 50 50 50 50 50 50 50 50 50 50 50 60 40 41 41 41 41 41 42 42 <td>Satd. Flow (perm)</td> <td>0</td> <td>1701</td> <td>0</td> <td>0</td> <td>1740</td> <td>0</td> <td>0</td> <td>1409</td> <td>0</td> <td>0</td> <td>1081</td> <td>0</td> | Satd. Flow (perm) | 0 | 1701 | 0 | 0 | 1740 | 0 | 0 | 1409 | 0 | 0 | 1081 | 0 |
| Link Speed (k/h) 50 50 50 50 Link Distance (m) 318.4 199.1 158.6 196.7 Travel Time (s) 22.9 14.3 11.4 14.2 Confl. Peds. (#/hr) 78 219 219 78 158 49 49 49 158 Confl. Bikes (#/hr) 16 16 16 18 18 0.88 | | | | Yes | | | Yes | | | Yes | | | Yes |
| Link Speed (k/h) 50 50 50 50 50 Link Distance (m) 318.4 199.1 158.6 196.7 196.7 158.6 196.7 158.6 196.7 158.6 196.7 158.6 196.7 158.6 196.7 158.6 196.7 158.7 | Satd. Flow (RTOR) | | 1 | | | 41 | | | | | | 41 | |
| Travel Time (s) 22.9 14.3 11.4 14.2 15.2 15.5 15.6 15.5 15. | | | 50 | | | 50 | | | 50 | | | 50 | |
| Travel Time (s) 22.9 14.3 11.4 14.2 Confi. Peds. (#/hr) 78 219 219 78 158 49 49 158 Confi. Peds. (#/hr) 16 | Link Distance (m) | | 318.4 | | | 199.1 | | | 158.6 | | | 196.7 | |
| Confl. Peds. (#/hr) 78 219 219 78 158 49 49 158 Confl. Bikes (#/hr) - 16 Peak Hour Factor 0.88 0.80 0.80 0 | | | | | | 14.3 | | | 11.4 | | | 14.2 | |
| Confl. Bikes (#/hr) | | 78 | | 219 | 219 | | 78 | 158 | | 49 | 49 | | 158 |
| Peak Hour Factor 0.88 0.80 0.0 0.0 0.0 0.0 0.0 | | | | | | | 16 | | | | | | |
| Heavy Vehicles (%) | | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Bus Blockages (#/hr) 24 24 24 24 24 24 24 0 109 0 109 0 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>10%</td></t<> | | | | | | | | | | | | | 10% |
| Adj. Flow (vph) 0 899 6 0 774 130 0 6 0 189 0 109 Shared Lane Traffic (%) Lane Group Flow (vph) 0 905 0 0 904 0 0 6 0 0 298 0 Enter Blocked Intersection No | | | | | | | | | | | | | 0 |
| Shared Lane Traffic (%) Lane Group Flow (vph) 0 905 0 0 904 0 0 6 0 0 298 0 | | | | | | | | | | | | | 109 |
| Lane Group Flow (vph) 0 905 0 0 904 0 0 6 0 0 298 0 Enter Blocked Intersection No | | | | | | | | | | | | | |
| Enter Blocked Intersection No | | 0 | 905 | 0 | 0 | 904 | 0 | 0 | 6 | 0 | 0 | 298 | 0 |
| Median Width(m) 0.0 0.0 0.0 0.0 | | No | No | No | No | No | No | No | No | No | No | No | No |
| Median Width(m) 0.0 0.0 0.0 | Lane Alignment | Left | Left | Right | Left | Left | Riaht | Left | Left | Right | Left | Left | Right |
| | | | 0.0 | J - | | 0.0 | J | | 0.0 | J | | | J . |
| | | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) 4.8 4.8 4.8 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | | |
| | | 1.92 | 2.03 | 1.92 | 1.92 | 2.03 | 1.92 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 |
| | | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors 1 2 1 2 1 2 1 2 | Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template Left Thru Left Thru Left Thru Left Thru | Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) 6.1 30.5 6.1 30.5 6.1 30.5 6.1 30.5 | Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) 6.1 1.8 6.1 1.8 6.1 1.8 6.1 1.8 | Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type CI+Ex CI+Ex CI+Ex CI+Ex CI+Ex CI+Ex CI+Ex CI+Ex | Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | | |
| Detector 1 Extend (s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 | Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 | | 0.0 | 0.0 | | | 0.0 | | 0.0 | 0.0 | | | 0.0 | |
| Detector 2 Position(m) 28.7 28.7 28.7 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) 1.8 1.8 1.8 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type CI+Ex CI+Ex CI+Ex CI+Ex | () | | | | | | | | | | | | |
| Detector 2 Channel | | | ^ | | | M | | | <u>-</u> ., | | | | |
| Detector 2 Extend (s) 0.0 0.0 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type NA NA NA Perm NA | | | | | | | | | | | Perm | | |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 35 Lanes, Volumes, Timings

| 1851: King St & S | udbury S | St | | | | | | | | | 09/3 | 30/202 |
|------------------------------|--------------|------------|------------|-------------|-------------|------------|-------|-------|-----|----------|-------|--------|
| | ۶ | → | • | • | ← | • | 1 | † | ~ | / | ļ | 4 |
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SB |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Detector Phase | 2 | 2 | | 6 | 6 | | 8 | 8 | | 4 | 4 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 21.0 | 21.0 | | 21.0 | 21.0 | |
| Minimum Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 26.0 | 26.0 | | 26.0 | 26.0 | |
| Total Split (s) | 52.0 | 52.0 | | 52.0 | 52.0 | | 28.0 | 28.0 | | 28.0 | 28.0 | |
| Total Split (%) | 65.0% | 65.0% | | 65.0% | 65.0% | | 35.0% | 35.0% | | 35.0% | 35.0% | |
| Maximum Green (s) | 46.0 | 46.0 | | 46.0 | 46.0 | | 23.0 | 23.0 | | 23.0 | 23.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | -1.0 | | | -1.0 | | | -1.0 | | | -1.0 | |
| Total Lost Time (s) | | 5.0 | | | 5.0 | | | 4.0 | | | 4.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | C-Max | C-Max | | C-Max | C-Max | | None | None | | None | None | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 17.0 | 17.0 | | 17.0 | 17.0 | | 14.0 | 14.0 | | 14.0 | 14.0 | |
| Pedestrian Calls (#/hr) | 100 | 100 | | 24 | 24 | | 100 | 100 | | 16 | 16 | |
| Act Effct Green (s) | | 47.5 | | | 47.5 | | | 23.5 | | | 23.5 | |
| Actuated g/C Ratio | | 0.59 | | | 0.59 | | | 0.29 | | | 0.29 | |
| v/c Ratio | | 0.90 | | | 0.86 | | | 0.01 | | | 0.86 | |
| Control Delay | | 28.3 | | | 23.8 | | | 20.0 | | | 48.5 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 28.3 | | | 23.8 | | | 20.0 | | | 48.5 | |
| LOS | | С | | | С | | | В | | | D | |
| Approach Delay | | 28.3 | | | 23.8 | | | 20.0 | | | 48.5 | |
| Approach LOS | | С | | | С | | | В | | | D | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | CBD | | | | | | | | | | | |
| Cycle Length: 80 | CDD | | | | | | | | | | | |
| Actuated Cycle Length: 80 | | | | | | | | | | | | |
| Offset: 1 (1%), Referenced | | ·EDTI one | I G-\M/DTI | Start of | 1ct Croon | | | | | | | |
| Natural Cycle: 75 | to priase z | .EDIL alic | I O.WIDIL | ., Start Or | ist Green | | | | | | | |
| Control Type: Actuated-Co | ordinated | | | | | | | | | | | |
| Maximum v/c Ratio: 0.90 | Ulullialeu | | | | | | | | | | | |
| Intersection Signal Delay: | 20.2 | | | l. | ntersection | 100.0 | | | | | | |
| Intersection Capacity Utiliz | | | | | CU Level | | . C | | | | | |
| Analysis Period (min) 15 | alion 72.270 |) | | ľ | DO LEVEI (| JI SEIVICE | 50 | | | | | |
| | · Kina Ct 0 | Cudhur C | • | | | | | | | | | |
| | : King St & | Suubury S | ι | | | | | | | | | |
| → Ø2 (R) | | | | | | | 1.1 | 04 | | | | |



Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

1851: King St & Sudbury St

09/30/2021

| | - | ← | † | ↓ |
|------------------------|-------|----------|----------|-------|
| Lane Group | EBT | WBT | NBT | SBT |
| Lane Group Flow (vph) | 905 | 904 | 6 | 298 |
| v/c Ratio | 0.90 | 0.86 | 0.01 | 0.86 |
| Control Delay | 28.3 | 23.8 | 20.0 | 48.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 28.3 | 23.8 | 20.0 | 48.5 |
| Queue Length 50th (m) | 58.0 | 53.3 | 0.6 | 36.7 |
| Queue Length 95th (m) | #99.8 | #94.7 | 3.1 | #76.9 |
| Internal Link Dist (m) | 294.4 | 175.1 | 134.6 | 172.7 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1010 | 1049 | 422 | 353 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.90 | 0.86 | 0.01 | 0.84 |
| | | | | |

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 1851: King St & Sudbury St

| | ۶ | → | • | • | + | 4 | 4 | † | ~ | / | ↓ | 4 |
|-----------------------------------|-------|----------|-------|------|------------|------------|---------|----------|------|----------|----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 414 | | | 414 | | | 4 | | | 4 | |
| Traffic Volume (vph) | 0 | 791 | 5 | 0 | 681 | 114 | 0 | 5 | 0 | 166 | 0 | 96 |
| Future Volume (vph) | 0 | 791 | 5 | 0 | 681 | 114 | 0 | 5 | 0 | 166 | 0 | 96 |
| Ideal Flow (vphpl) | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | | 4.0 | | | 4.0 | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | | 1.00 | | | 0.98 | | | 1.00 | | | 0.93 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | | 1.00 | | | 0.96 | |
| Frt | | 1.00 | | | 0.98 | | | 1.00 | | | 0.95 | |
| Flt Protected | | 1.00 | | | 1.00 | | | 1.00 | | | 0.97 | |
| Satd. Flow (prot) | | 1701 | | | 1741 | | | 1409 | | | 1302 | |
| Flt Permitted | | 1.00 | | | 1.00 | | | 1.00 | | | 0.80 | |
| Satd. Flow (perm) | | 1701 | | | 1741 | | | 1409 | | | 1080 | |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 0 | 899 | 6 | 0 | 774 | 130 | 0 | 6 | 0 | 189 | 0 | 109 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 29 | 0 |
| Lane Group Flow (vph) | 0 | 905 | 0 | 0 | 887 | 0 | 0 | 6 | 0 | 0 | 269 | 0 |
| Confl. Peds. (#/hr) | 78 | | 219 | 219 | | 78 | 158 | | 49 | 49 | | 158 |
| Confl. Bikes (#/hr) | | | | | | 16 | | | | | | |
| Heavy Vehicles (%) | 0% | 18% | 0% | 0% | 11% | 8% | 0% | 20% | 0% | 6% | 0% | 10% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Turn Type | | NA | | | NA | | | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 46.5 | | | 46.5 | | | 22.5 | | | 22.5 | |
| Effective Green, g (s) | | 47.5 | | | 47.5 | | | 23.5 | | | 23.5 | |
| Actuated g/C Ratio | | 0.59 | | | 0.59 | | | 0.29 | | | 0.29 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | | 5.0 | | | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | | 1009 | | | 1033 | | | 413 | | | 317 | |
| v/s Ratio Prot | | c0.53 | | | 0.51 | | | 0.00 | | | | |
| v/s Ratio Perm | | | | | | | | | | | c0.25 | |
| v/c Ratio | | 0.90 | | | 0.86 | | | 0.01 | | | 0.85 | |
| Uniform Delay, d1 | | 14.1 | | | 13.5 | | | 20.0 | | | 26.6 | |
| Progression Factor | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | | 12.2 | | | 9.3 | | | 0.0 | | | 18.6 | |
| Delay (s) | | 26.4 | | | 22.7 | | | 20.1 | | | 45.2 | |
| Level of Service | | С | | | С | | | С | | | D | |
| Approach Delay (s) | | 26.4 | | | 22.7 | | | 20.1 | | | 45.2 | |
| Approach LOS | | С | | | С | | | С | | | D | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 27.4 | Н | CM 2000 | Level of S | Service | | С | | | |
| HCM 2000 Volume to Capacity | ratio | | 0.88 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 80.0 | S | um of lost | time (s) | | | 9.0 | | | |
| Intersection Capacity Utilization | 1 | | 72.2% | IC | U Level | of Service | | | С | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

| Intersection Summary | | | | |
|-----------------------------------|-------|---------------------------|-----|--|
| HCM 2000 Control Delay | 27.4 | HCM 2000 Level of Service | С | |
| HCM 2000 Volume to Capacity ratio | 0.88 | | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 9.0 | |
| Intersection Capacity Utilization | 72.2% | ICU Level of Service | С | |
| Analysis Period (min) | 15 | | | |
| 0 111 0 | | | | |

c Critical Lane Group

| | - | • | • | • | 4 | 1 |
|----------------------------|-------------|-------|-------|-------|-------|-------|
| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations | † 1> | | | 41 | ኘ | 7 |
| Traffic Volume (vph) | 697 | 83 | 4 | 779 | 299 | 180 |
| Future Volume (vph) | 697 | 83 | 4 | 779 | 299 | 180 |
| Ideal Flow (vphpl) | 1250 | 1250 | 1250 | 1250 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.0 |
| Storage Length (m) | 0.0 | 0.0 | 0.0 | 0.0 | 30.0 | 0.0 |
| Storage Lanes | | 0.0 | 0.0 | | 1 | 1 |
| Taper Length (m) | | J | 7.5 | | 7.5 | |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 |
| Ped Bike Factor | 0.94 | 0.00 | 0.00 | 1.00 | 0.95 | 0.95 |
| Frt | 0.984 | | | 1.00 | 0.93 | 0.850 |
| FIt Protected | 0.304 | | | | 0.950 | 0.000 |
| Satd. Flow (prot) | 1689 | 0 | 0 | 1821 | 1458 | 1159 |
| Flt Permitted | 1009 | U | U | 0.950 | 0.950 | 1109 |
| | 1600 | 0 | 0 | | | 1000 |
| Satd. Flow (perm) | 1689 | 0 | 0 | 1729 | 1383 | 1099 |
| Right Turn on Red | 20 | Yes | | | | Yes |
| Satd. Flow (RTOR) | 29 | | | F.0 | 00 | 19 |
| Link Speed (k/h) | 50 | | | 50 | 30 | |
| Link Distance (m) | 191.3 | | | 318.4 | 198.0 | |
| Travel Time (s) | 13.8 | 000 | 200 | 22.9 | 23.8 | 0.0 |
| Confl. Peds. (#/hr) | | 388 | 388 | | 49 | 39 |
| Confl. Bikes (#/hr) | | 10 | | | | |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles (%) | 11% | 6% | 100% | 10% | 4% | 17% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 0 | 0 |
| Adj. Flow (vph) | 810 | 97 | 5 | 906 | 348 | 209 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 907 | 0 | 0 | 911 | 348 | 209 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 0.0 | | | 0.0 | 3.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 4.8 | | | 4.8 | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 2.03 | 1.92 | 1.92 | 2.03 | 1.25 | 1.25 |
| Turning Speed (k/h) | | 14 | 24 | | 24 | 14 |
| Number of Detectors | 2 | | 1 | 2 | 1 | 1 |
| Detector Template | Thru | | Left | Thru | Left | Right |
| Leading Detector (m) | 30.5 | | 6.1 | 30.5 | 6.1 | 6.1 |
| Trailing Detector (m) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 1.8 | | 6.1 | 1.8 | 6.1 | 6.1 |
| Detector 1 Type | CI+Ex | | CI+Ex | CI+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | OIFLX | | OIYLX | OITEX | OLYLA | OLYLX |
| Detector 1 Extend (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | | | 0.0 | | 0.0 | 0.0 |
| Detector 2 Position(m) | 28.7 | | | 28.7 | | |
| Detector 2 Size(m) | 1.8 | | | 1.8 | | |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

| | - | \rightarrow | • | ← | 4 | / |
|----------------------------|------------------|---------------|----------|------------|------------|------------|
| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
| Detector 2 Type | CI+Ex | | | CI+Ex | | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | 0.0 | | | 0.0 | | |
| Turn Type | NA | | Perm | NA | Perm | Perm |
| Protected Phases | 2 | | | 6 | | |
| Permitted Phases | | | 6 | | 8 | 8 |
| Detector Phase | 2 | | 6 | 6 | 8 | 8 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 21.0 | | 21.0 | 21.0 | 20.0 | 20.0 |
| Minimum Split (s) | 28.0 | | 28.0 | 28.0 | 26.0 | 26.0 |
| Total Split (s) | 44.0 | | 44.0 | 44.0 | 26.0 | 26.0 |
| Total Split (%) | 62.9% | | 62.9% | 62.9% | 37.1% | 37.1% |
| Maximum Green (s) | 37.0 | | 37.0 | 37.0 | 20.0 | 20.0 |
| Yellow Time (s) | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 3.0 | | 3.0 | 3.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | -1.0 | | | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 6.0 | | | 6.0 | 5.0 | 5.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | C-Max | | C-Max | C-Max | None | None |
| Walk Time (s) | 7.0 | | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Dont Walk (s) | 14.0 | | 14.0 | 14.0 | 13.0 | 13.0 |
| Pedestrian Calls (#/hr) | 100 | | 7 | 7 | 16 | 16 |
| Act Effct Green (s) | 38.0 | | | 38.0 | 21.0 | 21.0 |
| Actuated g/C Ratio | 0.54 | | | 0.54 | 0.30 | 0.30 |
| v/c Ratio | 0.98 | | | 0.97 | 0.84 | 0.61 |
| Control Delay | 41.8 | | | 41.3 | 43.7 | 27.9 |
| Queue Delay | 0.0 | | | 0.0 | 0.0 | 0.0 |
| Total Delay | 41.8 | | | 41.3 | 43.7 | 27.9 |
| LOS | D | | | D | D | С |
| Approach Delay | 41.8 | | | 41.3 | 37.8 | |
| Approach LOS | D | | | D | D | |
| Intersection Summary | | | | | | |
| Area Type: | CBD | | | | | |
| Cycle Length: 70 | | | | | | |
| Actuated Cycle Length: 7 | | | | | | |
| Offset: 6 (9%), Reference | ed to phase 2:E | BT and | 6:WBTL, | Start of 1 | st Green | |
| Natural Cycle: 90 | | | | | | |
| Control Type: Actuated-C | | | | | | |
| Maximum v/c Ratio: 0.98 | | | | | | |
| Intersection Signal Delay | | | | | ntersectio | |
| Intersection Capacity Util | | | | I(| CU Level | of Service |
| Analysis Period (min) 15 | | | | | | |
| Splits and Phases: 19 | 12: Atlantic Ave | & Kina | St | | | |
| i e | 12.710011007100 | , a rang | <u> </u> | | | |
| →ø2 (R) | | | | | | |

1912: Atlantic Ave & King St

09/30/2021

Synchro 11 Report

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| | - | • | 1 | |
|------------------------|-------|-------|-------|------|
| Lane Group | EBT | WBT | NBL | NBR |
| Lane Group Flow (vph) | 907 | 911 | 348 | 209 |
| v/c Ratio | 0.98 | 0.97 | 0.84 | 0.61 |
| Control Delay | 41.8 | 41.3 | 43.7 | 27.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 41.8 | 41.3 | 43.7 | 27.9 |
| Queue Length 50th (m) | 54.4 | 55.7 | 42.2 | 21.0 |
| Queue Length 95th (m) | #90.6 | #91.1 | #78.3 | 39.5 |
| Internal Link Dist (m) | 167.3 | 294.4 | 174.0 | |
| Turn Bay Length (m) | | | 30.0 | |
| Base Capacity (vph) | 930 | 938 | 414 | 343 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.98 | 0.97 | 0.84 | 0.61 |

HCM Signalized Intersection Capacity Analysis 1912: Atlantic Ave & King St

09/30/2021

| | → | \rightarrow | • | • | 4 | <i>></i> | | |
|--------------------------------|------------|---------------|---------|-----------|------------|---------------|----|--|
| Movement | EBT | EBR | WBL | WBT | NBL | NBR | | |
| Lane Configurations | † Ъ | | | 414 | * | # | | |
| Traffic Volume (vph) | 697 | 83 | 4 | 779 | 299 | 180 | | |
| Future Volume (vph) | 697 | 83 | 4 | 779 | 299 | 180 | | |
| Ideal Flow (vphpl) | 1250 | 1250 | 1250 | 1250 | 1900 | 1900 | | |
| ane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.0 | | |
| Total Lost time (s) | 6.0 | 0.0 | 0.0 | 6.0 | 5.0 | 5.0 | | |
| Lane Util. Factor | 0.95 | | | 0.95 | 1.00 | 1.00 | | |
| Frpb, ped/bikes | 0.94 | | | 1.00 | 1.00 | 0.95 | | |
| Flpb, ped/bikes | 1.00 | | | 1.00 | 0.95 | 1.00 | | |
| Frt | 0.98 | | | 1.00 | 1.00 | 0.85 | | |
| Flt Protected | 1.00 | | | 1.00 | 0.95 | 1.00 | | |
| Satd, Flow (prot) | 1689 | | | 1819 | 1383 | 1099 | | |
| Flt Permitted | 1.00 | | | 0.95 | 0.95 | 1.00 | | |
| Satd. Flow (perm) | 1689 | | | 1729 | 1383 | 1099 | | |
| Peak-hour factor, PHF | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | | |
| Adj. Flow (vph) | 810 | 97 | 5 | 906 | 348 | 209 | | |
| RTOR Reduction (vph) | 13 | 0 | 0 | 0 | 0 | 13 | | |
| Lane Group Flow (vph) | 894 | 0 | 0 | 911 | 348 | 196 | | |
| Confl. Peds. (#/hr) | 001 | 388 | 388 | 011 | 49 | 39 | | |
| Confl. Bikes (#/hr) | | 10 | 000 | | -10 | 00 | | |
| Heavy Vehicles (%) | 11% | 6% | 100% | 10% | 4% | 17% | | |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 0 | 0 | | |
| Turn Type | NA | | Perm | NA | Perm | Perm | | |
| Protected Phases | 2 | | 7 61111 | 6 | 7 61111 | 1 01111 | | |
| Permitted Phases | _ | | 6 | - 3 | 8 | 8 | | |
| Actuated Green, G (s) | 37.0 | | J | 37.0 | 20.0 | 20.0 | | |
| Effective Green, g (s) | 38.0 | | | 38.0 | 21.0 | 21.0 | | |
| Actuated g/C Ratio | 0.54 | | | 0.54 | 0.30 | 0.30 | | |
| Clearance Time (s) | 7.0 | | | 7.0 | 6.0 | 6.0 | | |
| Vehicle Extension (s) | 3.0 | | | 3.0 | 3.0 | 3.0 | | |
| Lane Grp Cap (vph) | 916 | | | 938 | 414 | 329 | | |
| v/s Ratio Prot | c0.53 | | | 900 | 414 | 323 | | |
| v/s Ratio Prot | 00.00 | | | 0.53 | c0.25 | 0.18 | | |
| v/c Ratio | 0.98 | | | 0.53 | 0.84 | 0.10 | | |
| Uniform Delay, d1 | 15.6 | | | 15.5 | 22.9 | 20.9 | | |
| Progression Factor | 1.00 | | | 1.00 | 1.00 | 1.00 | | |
| Incremental Delay, d2 | 24.4 | | | 23.2 | 14.2 | 2.9 | | |
| Delay (s) | 40.0 | | | 38.7 | 37.2 | 2.9 | | |
| Level of Service | 40.0 D | | | 30.1 D | 37.2 D | 23.0 C | | |
| | 40.0 | | | 38.7 | 32.1 | U | | |
| Approach Delay (s) | 40.0 D | | | 38.7 D | 32.1 C | | | |
| Approach LOS | ט | | | ט | U | | | |
| ntersection Summary | | | | | | | | |
| HCM 2000 Control Delay | | | 37.6 | H | CM 2000 | Level of Serv | ce | |
| HCM 2000 Volume to Capac | city ratio | | 0.94 | | | | | |
| Actuated Cycle Length (s) | | | 70.0 | Si | um of lost | time (s) | | |
| Intersection Capacity Utilizat | tion | | 68.7% | IC | U Level c | of Service | | |
| Analysis Period (min) | | | 15 | | | | | |
| c Critical Lane Group | | | | | | | | |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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

Queue shown is maximum after two cycles.

Lane Group

Lane Configurations Traffic Volume (vph)

Future Volume (vph)

Ideal Flow (vphpl)

Lane Util. Factor

Ped Bike Factor

Satd. Flow (prot)

Satd. Flow (perm)

Right Turn on Red

Satd. Flow (RTOR)

Link Speed (k/h)

Link Distance (m)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr) Peak Hour Factor

Heavy Vehicles (%)

Bus Blockages (#/hr)

Shared Lane Traffic (%) Lane Group Flow (vph)

Enter Blocked Intersection

Adj. Flow (vph)

Lane Alignment

Link Offset(m)

Median Width(m)

Crosswalk Width(m)

Turning Speed (k/h)

Number of Detectors

Detector Template

Leading Detector (m)

Trailing Detector (m)

Detector 1 Size(m)

Detector 1 Channel
Detector 1 Extend (s)

Detector 1 Queue (s)

Detector 1 Delay (s)

Detector 2 Size(m)

Detector 2 Channel

Detector 2 Extend (s)

Detector 2 Type

Turn Type

Detector 2 Position(m)

Detector 1 Type

Detector 1 Position(m)

Two way Left Turn Lane Headway Factor

Travel Time (s)

Flt Protected

Flt Permitted

→ ← < √ √

79 144

1250 1900

0.95 1.00

0.99

0.969

0.963

0.963

17

50

100.8

7.3

0.88

3% 21%

212

No

Left

3.5

0.0

4.8

1.16 1.16

24

6.1

0.0

0.0

6.1

0.0

0.0

0.0

Perm

CI+Ex

0

0 1460

0 1460

43

0.88

3%

24

90 164

No

Right

1.92

42

1900

1.00

0

0

Yes

23

0.88

0

48

No

Right

EBT

862

0.95

0 1881

0 1881

635

1250

0.95

0.99

0.983

1819

1819

34

50

13.8

0.88

8%

24

722

812

No

Left

0.0

0.0

4.8

2.03

Thru

0.0

0.0

1.8

0.0

0.0

0.0

0.0

NA

2

316.7 191.3

22.8

0.88

24

980

No

Left

0.0

0.0

4.8

2.03

2

Thru

0.0

0.0

1.8

0.0

0.0

0.0

28.7 28.7

1.8 1.8

0.0

NA

CI+Ex CI+Ex

CI+Ex CI+Ex CI+Ex

0 862

1250 1250

43

0.88

0%

24

0 980

No

Left

1.92

24

1

6.1 30.5 30.5

0.0

0.0

0.0

0.0

0.0

0.95

| | • | - | ← | • | - | 4 |
|------------------------------|-----------|----------|-------------|-----|------------|-------------|
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
| Protected Phases | | 2 | 6 | | | |
| Permitted Phases | 2 | | | | 8 | |
| Detector Phase | 2 | 2 | 6 | | 8 | |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 20.0 | 20.0 | 20.0 | | 18.0 | |
| Minimum Split (s) | 26.0 | 26.0 | 26.0 | | 23.0 | |
| Total Split (s) | 57.0 | 57.0 | 57.0 | | 23.0 | |
| Total Split (%) | 71.3% | 71.3% | 71.3% | | 28.8% | |
| Maximum Green (s) | 51.0 | 51.0 | 51.0 | | 18.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | | 3.0 | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | 2.0 | |
| Lost Time Adjust (s) | | -1.0 | -1.0 | | -1.0 | |
| Total Lost Time (s) | | 5.0 | 5.0 | | 4.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | |
| Recall Mode | C-Max | C-Max | None | | None | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | | 7.0 | |
| Flash Dont Walk (s) | 13.0 | 13.0 | 13.0 | | 11.0 | |
| Pedestrian Calls (#/hr) | 100 | 100 | 13 | | 7 | |
| Act Effct Green (s) | | 52.0 | 52.0 | | 19.0 | |
| Actuated g/C Ratio | | 0.65 | 0.65 | | 0.24 | |
| v/c Ratio | | 0.80 | 0.68 | | 0.59 | |
| Control Delay | | 16.4 | 12.0 | | 32.5 | |
| Queue Delay | | 0.0 | 0.0 | | 0.0 | |
| Total Delay | | 16.4 | 12.0 | | 32.5 | |
| LOS | | В | В | | С | |
| Approach Delay | | 16.4 | 12.0 | | 32.5 | |
| Approach LOS | | В | В | | С | |
| Intersection Summary | | | | | | |
| Area Type: | CBD | | | | | |
| Cycle Length: 80 | | | | | | |
| Actuated Cycle Length: 80 | | | | | | |
| Offset: 1 (1%), Referenced | | EBTL, St | art of Gree | en | | |
| Natural Cycle: 65 | , | , | | | | |
| Control Type: Actuated-Co | ordinated | | | | | |
| Maximum v/c Ratio: 0.80 | | | | | | |
| Intersection Signal Delay: | 16.3 | | | In | tersection | LOS: B |
| Intersection Capacity Utiliz | | | | IC | U Level o | f Service B |
| Analysis Period (min) 15 | | | | | | |

| Splits and Phases: | 2081: King St & Joe Shuster Way | |
|--------------------|---------------------------------|------|
| Ø2 (R) | | |
| 57 s | | |
| ← Ø6 | | Ø8 |
| 57 s | | 23 s |
| | | |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 43 Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

2081: King St & Joe Shuster Way

09/30/2021

Synchro 11 Report

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| | _ | ← | · /• |
|------------------------|-------|-------|------|
| | | | • |
| Lane Group | EBT | WBT | SBL |
| Lane Group Flow (vph) | 980 | 812 | 212 |
| v/c Ratio | 0.80 | 0.68 | 0.59 |
| Control Delay | 16.4 | 12.0 | 32.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 |
| Total Delay | 16.4 | 12.0 | 32.5 |
| Queue Length 50th (m) | 50.3 | 34.0 | 26.3 |
| Queue Length 95th (m) | m34.1 | 50.9 | 46.3 |
| Internal Link Dist (m) | 292.7 | 167.3 | 76.8 |
| Turn Bay Length (m) | | | |
| Base Capacity (vph) | 1222 | 1194 | 359 |
| Starvation Cap Reductn | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.80 | 0.68 | 0.59 |
| Interception Cummen | | | |

HCM Signalized Intersection Capacity Analysis 2081: King St & Joe Shuster Way

09/30/2021

| | • | - | • | • | \ | 4 | | |
|-----------------------------------|----------|-------|------------|------|------------|------------------|------|--|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR | | |
| Lane Configurations | | 4₽ | ↑ ↑ | | Y | | | |
| Traffic Volume (vph) | 0 | 862 | 635 | 79 | 144 | 42 | | |
| Future Volume (vph) | 0 | 862 | 635 | 79 | 144 | 42 | | |
| Ideal Flow (vphpl) | 1250 | 1250 | 1250 | 1250 | 1900 | 1900 | | |
| Total Lost time (s) | | 5.0 | 5.0 | | 4.0 | | | |
| Lane Util. Factor | | 0.95 | 0.95 | | 1.00 | | | |
| Frpb, ped/bikes | | 1.00 | 0.99 | | 0.99 | | | |
| Flpb, ped/bikes | | 1.00 | 1.00 | | 1.00 | | | |
| Frt | | 1.00 | 0.98 | | 0.97 | | | |
| Flt Protected | | 1.00 | 1.00 | | 0.96 | | | |
| Satd. Flow (prot) | | 1881 | 1820 | | 1460 | | | |
| FIt Permitted | | 1.00 | 1.00 | | 0.96 | | | |
| Satd. Flow (perm) | | 1881 | 1820 | | 1460 | | | |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | | |
| Adj. Flow (vph) | 0 | 980 | 722 | 90 | 164 | 48 | | |
| RTOR Reduction (vph) | 0 | 0 | 12 | 0 | 13 | 0 | | |
| Lane Group Flow (vph) | 0 | 980 | 800 | 0 | 199 | 0 | | |
| Confl. Peds. (#/hr) | 43 | | | 43 | | 23 | | |
| Confl. Bikes (#/hr) | | | | 5 | | | | |
| Heavy Vehicles (%) | 0% | 7% | 8% | 3% | 3% | 21% | | |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 0 | 0 | | |
| Turn Type | | NA | NA | | Perm | - | | |
| Protected Phases | | 2 | 6 | | | | | |
| Permitted Phases | 2 | | | | 8 | | | |
| Actuated Green, G (s) | = | 51.0 | 51.0 | | 18.0 | | | |
| Effective Green, q (s) | | 52.0 | 52.0 | | 19.0 | | | |
| Actuated g/C Ratio | | 0.65 | 0.65 | | 0.24 | | | |
| Clearance Time (s) | | 6.0 | 6.0 | | 5.0 | | | |
| Vehicle Extension (s) | | 3.0 | 3.0 | | 3.0 | | | |
| Lane Grp Cap (vph) | | 1222 | 1183 | | 346 | | | |
| v/s Ratio Prot | | c0.52 | 0.44 | | 010 | | | |
| v/s Ratio Perm | | 00.02 | 0.11 | | c0.14 | | | |
| v/c Ratio | | 0.80 | 0.68 | | 0.58 | | | |
| Uniform Delay, d1 | | 10.2 | 8.7 | | 26.9 | | | |
| Progression Factor | | 1.43 | 1.00 | | 1.00 | | | |
| Incremental Delay, d2 | | 0.5 | 1.5 | | 2.3 | | | |
| Delay (s) | | 15.1 | 10.3 | | 29.2 | | | |
| Level of Service | | В | В | | C | | | |
| Approach Delay (s) | | 15.1 | 10.3 | | 29.2 | | | |
| Approach LOS | | В | В | | C | | | |
| Intersection Summary | | | | | | | | |
| HCM 2000 Control Delay | | | 14.7 | Н | CM 2000 | Level of Service | В | |
| HCM 2000 Volume to Capaci | tv ratio | | 0.75 | | | | | |
| Actuated Cycle Length (s) | ., | | 80.0 | Sı. | um of lost | time (s) | 10.0 | |
| Intersection Capacity Utilization | on | | 62.7% | | U Level c | . , | В | |
| Analysis Period (min) | U.1 | | 15 | 10 | C LOVOI C | 5011100 | | |
| c Critical Lane Group | | | 13 | | | | | |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements

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

Lanes, Volumes, Timings 2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

| | U2. |
|--|-----|
| | |

| | • | • | † | ~ | - | ↓ |
|----------------------------|-------|--------|---------------|--------|-------|----------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | ሻ | 7 | 11.5 1 | 7 | 7 | <u> </u> |
| Traffic Volume (vph) | 14 | 61 | 465 | 30 | 146 | 689 |
| Future Volume (vph) | 14 | 61 | 465 | 30 | 146 | 689 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.0 | 3.5 | 3.0 | 3.0 | 3.5 |
| Storage Length (m) | 30.0 | 0.0 | 0.0 | 15.0 | 30.0 | 0.0 |
| Storage Lanes | 1 | 1 | | 13.0 | 1 | |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 |
| Frt | | 0.850 | | 0.850 | 1.00 | |
| Fit Protected | 0.950 | 0.000 | | 0.000 | 0.950 | |
| | | 1112 | 1007 | 1270 | | 1007 |
| Satd. Flow (prot) | 1560 | 1113 | 1807 | 1370 | 1276 | 1807 |
| Flt Permitted | 0.950 | 4446 | 1005 | 1000 | 0.388 | 4005 |
| Satd. Flow (perm) | 1560 | 1113 | 1807 | 1326 | 519 | 1807 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 73 | | 15 | | |
| Link Speed (k/h) | 30 | | 30 | | | 30 |
| Link Distance (m) | 148.7 | | 265.9 | | | 191.3 |
| Travel Time (s) | 17.8 | | 31.9 | | | 23.0 |
| Confl. Peds. (#/hr) | | | | 8 | 8 | |
| Confl. Bikes (#/hr) | | | | 1 | | |
| Peak Hour Factor | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 |
| Heavy Vehicles (%) | 8% | 30% | 4% | 10% | 32% | 4% |
| Bus Blockages (#/hr) | 0 | 10 | 0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 17 | 73 | 554 | 36 | 174 | 820 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 17 | 73 | 554 | 36 | 174 | 820 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.0 | rugiit | 3.0 | rugill | Lon | 3.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 4.8 | | 4.8 | | | 4.8 |
| Two way Left Turn Lane | 4.0 | | 4.0 | | | 4.0 |
| | 1.00 | 1 1E | 1.01 | 1.09 | 1.00 | 1.01 |
| Headway Factor | 1.09 | 1.15 | 1.01 | 1.09 | 1.09 | 1.01 |
| Turning Speed (k/h) | | | ^ | | | 0 |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| Detector 1 Type | CI+Ex | CI+Ex | CI+Ex | CI+Ex | CI+Ex | CI+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector & OIZE(III) | | | 1.0 | | | 1.0 |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 47

Lanes, Volumes, Timings 2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

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|-------------------------------|---------------|-------------|------------|------------|-------------|------------|---|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT | |
| Detector 2 Type | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | pm+ov | NA | Perm | pm+pt | NA | |
| Protected Phases | | 1 | 2 | | 1 | 6 | |
| Permitted Phases | 8 | 8 | | 2 | 6 | | |
| Detector Phase | 8 | 1 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 21.0 | 6.0 | 27.0 | 27.0 | 6.0 | 27.0 | |
| Minimum Split (s) | 26.0 | 10.0 | 34.0 | 34.0 | 10.0 | 34.0 | |
| Total Split (s) | 26.0 | 13.0 | 41.0 | 41.0 | 13.0 | 54.0 | |
| Total Split (%) | 32.5% | 16.3% | 51.3% | 51.3% | 16.3% | 67.5% | |
| Maximum Green (s) | 21.0 | 9.0 | 34.0 | 34.0 | 9.0 | 47.0 | |
| Yellow Time (s) | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 1.0 | 3.0 | 3.0 | 1.0 | 3.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | |
| Total Lost Time (s) | 4.0 | 3.0 | 6.0 | 6.0 | 3.0 | 6.0 | |
| Lead/Lag | | Lead | Lag | Lag | Lead | | |
| Lead-Lag Optimize? | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | None | C-Max | C-Max | None | C-Max | |
| Walk Time (s) | 7.0 | | 7.0 | 7.0 | | 0.0 | |
| Flash Dont Walk (s) | 14.0 | | 20.0 | 20.0 | | 0.0 | |
| Pedestrian Calls (#/hr) | 0 | | 2 | 2 | | 0 | |
| Act Effct Green (s) | 22.0 | 13.1 | 57.9 | 57.9 | 71.8 | 73.6 | |
| Actuated g/C Ratio | 0.28 | 0.16 | 0.72 | 0.72 | 0.90 | 0.92 | |
| v/c Ratio | 0.04 | 0.30 | 0.42 | 0.04 | 0.32 | 0.49 | |
| Control Delay | 21.7 | 8.4 | 8.7 | 5.7 | 2.6 | 2.6 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 21.7 | 8.4 | 8.7 | 5.7 | 2.6 | 2.6 | |
| LOS | С | Α | Α | Α | Α | Α | |
| Approach Delay | 10.9 | | 8.5 | | | 2.6 | |
| Approach LOS | В | | Α | | | Α | |
| Intersection Summary | | | | | | | |
| Area Type: | Other | | | | | | |
| Cycle Length: 80 | | | | | | | |
| Actuated Cycle Length: 80 | | | | | | | |
| Offset: 15 (19%), Referenc | ed to phase | 2:NBT a | nd 6:SBT | L, Start o | f 1st Gree | en | |
| Natural Cycle: 70 | | | | | | | |
| Control Type: Actuated-Co | ordinated | | | | | | |
| Maximum v/c Ratio: 0.49 | | | | | | | |
| Intersection Signal Delay: 5 | 5.1 | | | | ntersectio | | |
| Intersection Capacity Utiliza | ation 62.1% | | | 10 | CU Level | of Service | В |
| Analysis Period (min) 15 | | | | | | | |
| Splits and Phases: 2134 | : British Col | ombia Ro | I/Dufferin | St & Sasi | katchewa | n Rd | |
| 1/2 | 4 . | OIIIDIA 110 | Danonii | 01 0 000 | natorio wa | iiitu | |
| ™ Ø1 | Ø2 (R) | | | | | | |

2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

09/30/2021

Synchro 11 Report

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| | • | * | † | ~ | - | ţ |
|------------------------|-------|------|----------|------|------|-------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Group Flow (vph) | 17 | 73 | 554 | 36 | 174 | 820 |
| v/c Ratio | 0.04 | 0.30 | 0.42 | 0.04 | 0.32 | 0.49 |
| Control Delay | 21.7 | 8.4 | 8.7 | 5.7 | 2.6 | 2.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 21.7 | 8.4 | 8.7 | 5.7 | 2.6 | 2.6 |
| Queue Length 50th (m) | 1.9 | 0.0 | 16.9 | 0.5 | 0.0 | 0.0 |
| Queue Length 95th (m) | 5.9 | 5.7 | 90.6 | 6.2 | 11.5 | 43.9 |
| Internal Link Dist (m) | 124.7 | | 241.9 | | | 167.3 |
| Turn Bay Length (m) | 30.0 | | | 15.0 | 30.0 | |
| Base Capacity (vph) | 429 | 271 | 1306 | 962 | 560 | 1662 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 4 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.04 | 0.27 | 0.42 | 0.04 | 0.31 | 0.49 |
| Intersection Summany | | | | | | |

HCM Signalized Intersection Capacity Analysis 2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

09/30/2021

| Movement |
|--|
| Lane Configurations Traffic Volume (vph) 14 61 465 30 146 689 Future Volume (vph) 14 61 465 30 146 689 Ideal Flow (vphpl) 1900 1900 1900 1900 1900 1900 Lane Width 3.0 3.0 3.5 3.0 3.0 3.5 Total Lost time (s) 4.0 3.0 6.0 6.0 3.0 6.0 Lane Util. Factor 1.00 1.00 1.00 1.00 1.00 1.00 Fipb, ped/bikes 1.00 1.00 1.00 1.00 1.00 1.00 Fipb, ped/bikes 1.00 1.00 1.00 1.00 1.00 1.00 Fit Protected 0.95 1.00 1.00 1.00 0.85 1.00 1.00 Satd. Flow (prot) 1560 1113 1807 1326 1274 1807 Fit Permitted 0.95 1.00 1.00 1.00 0.39 1.00 Satd. Flow (perm) 1560 1113 1807 1326 520 1807 Peak-hour factor, PHF 0.84 0.84 0.84 0.84 0.84 0.84 0.84 Adj. Flow (vph) 17 73 554 36 174 820 RTOR Reduction (vph) 17 12 554 31 174 820 Confl. Peds. (#/hr) Confl. Bikes (#/hr) 1 Heavy Vehicles (%) 8% 30% 4% 10% 32% 4% Bus Blockages (#/hr) 0 10 0 0 0 0 Turn Type Perm pm+ov NA Perm pm+pt NA Protected Phases 8 8 2 6 REffective Green, g (s) 5.2 13.1 53.9 53.9 64.8 64.8 Actuated g/C Ratio 0.07 0.16 0.67 0.67 0.81 0.81 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 Lane Grop Cap (vph) 101 182 1217 893 495 1463 |
| Traffic Volume (vph) 14 61 465 30 146 689 Future Volume (vph) 14 61 465 30 146 689 Ideal Flow (vphpl) 1900 1900 1900 1900 1900 1900 Lane Width 3.0 3.0 3.5 3.0 3.0 3.5 Total Lost time (s) 4.0 3.0 6.0 6.0 3.0 6.0 Lane Util. Factor 1.00 1.00 1.00 1.00 1.00 1.00 1.00 Fitp, ped/bikes 1.00 1.00 1.00 1.00 1.00 1.00 1.00 Fitp Protected 0.95 1.00 |
| Future Volume (vph) |
| Ideal Flow (vphpl) |
| Lane Width 3.0 3.0 3.5 3.0 3.0 3.5 Total Lost time (s) 4.0 3.0 6.0 6.0 3.0 6.0 Lane Util. Factor 1.00 1.00 1.00 1.00 1.00 1.00 1.00 Fripb, ped/bikes 1.00 1.00 1.00 1.00 1.00 1.00 1.00 Fipb, ped/bikes 1.00 1.00 1.00 1.00 1.00 1.00 1.00 Fipb, ped/bikes 1.00 1.00 1.00 1.00 1.00 1.00 1.00 Fith end to the first series of the first series o |
| Total Lost time (s) |
| Lane Util. Factor 1.00 1.00 1.00 1.00 1.00 1.00 1.00 Frpb, ped/bikes 1.00 1.00 1.00 1.00 1.00 1.00 1.00 Frpb, ped/bikes 1.00 1.00 1.00 1.00 1.00 1.00 1.00 Frt 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0 |
| Frpb, ped/bikes 1.00 1.00 1.00 0.97 1.00 |
| Fipb, ped/bikes 1.00 1.00 1.00 1.00 1.00 1.00 Fit 1.00 0.85 1.00 0.85 1.00 1.00 1.00 Fit 1.00 0.85 1.00 1.00 1.00 1.00 1.00 Satd. Flow (prot) 1560 1113 1807 1326 1274 1807 Flt Permitted 0.95 1.00 1.00 1.00 0.39 1.00 Satd. Flow (prom) 1560 1113 1807 1326 520 1807 Peak-hour factor, PHF 0.84 0.84 0.84 0.84 0.84 0.84 0.84 0.84 |
| Frit 1.00 0.85 1.00 0.85 1.00 1.00 Fit Protected 0.95 1.00 1.00 1.00 0.95 1.00 Satd. Flow (prot) 1560 1113 1807 1326 1274 1807 Fit Permitted 0.95 1.00 1.00 1.00 0.39 1.00 Satd. Flow (perm) 1560 1113 1807 1326 520 1807 Peak-hour factor, PHF 0.84 0.84 0.84 0.84 0.84 0.84 Adj. Flow (yph) 17 73 554 36 174 820 RTOR Reduction (yph) 0 61 0 5 0 0 Lane Group Flow (yph) 17 12 554 31 174 820 Confl. Peds. (#/hr) 8 8 8 Confl. Reavy Vehicles (%) 8% 30% 4% 10% 32% 4% Bus Blockages (#/hr) 0 10 0 0 0 0 Turn Type Perm pm+ov NA Perm pm+pt NA Protected Phases 1 2 1 6 Permitted Phases 8 8 2 6 6 Actuated Green, G (s) 4.2 11.1 52.9 52.9 63.8 63.8 Effective Green g (s) 5.2 13.1 53.9 53.9 64.8 64.8 Actuated g/C Ratio 0.07 0.16 0.67 0.67 0.81 0.81 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 101 182 1217 893 495 1463 |
| Fit Protected 0.95 1.00 1.00 1.00 0.95 1.00 Satd. Flow (prot) 1560 1113 1807 1326 1274 1807 Fit Permitted 0.95 1.00 1.00 1.00 0.39 1.00 Satd. Flow (perm) 1560 1113 1807 1326 520 1807 Peak-hour factor, PHF 0.84 0.84 0.84 0.84 0.84 0.84 0.84 0.84 |
| Satd. Flow (prot) 1560 1113 1807 1326 1274 1807 Fit Permitted 0.95 1.00 1.00 1.00 0.39 1.00 Satd. Flow (perm) 1560 1113 1807 1326 520 1807 Peak-hour factor, PHF 0.84 0.84 0.84 0.84 0.84 0.84 0.84 Adj. Flow (vph) 17 73 554 36 174 820 RTOR Reduction (vph) 0 61 0 5 0 0 Lane Group Flow (vph) 17 12 554 31 174 820 Confl. Peds. (#hr) 8 8 8 8 8 8 Confl. Bikes (#hr) 1 1 14 |
| Fit Permitted 0.95 1.00 1.00 1.00 0.39 1.00 Satd. Flow (perm) 1560 1113 1807 1326 520 1807 Peak-hour factor, PHF 0.84 0.84 0.84 0.84 0.84 0.84 0.84 0.84 |
| Peak-hour factor, PHF 0.84 0.82 |
| Peak-hour factor, PHF 0.84 0.82 0.82 0.82 0.82 0.82 0.84 |
| Adj. Flow (vph) 17 73 554 36 174 820 RTOR Reduction (vph) 0 61 0 5 0 0 Lane Group Flow (vph) 17 12 554 31 174 820 Confl. Peds. (#hr) 8 8 8 Confl. Bikes (#hr) 1 1 1 Heavy Vehicles (%) 8% 30% 4% 10% 32% 4% Bus Blockages (#hr) 0 10 0 0 0 0 Turn Type Perm pm+ov NA Perm pm+pt NA Protected Phases 1 2 1 6 Permitted Phases 8 8 2 6 Actuated Green, G (s) 4.2 11.1 52.9 52.9 63.8 63.8 Effective Green, g (s) 5.2 13.1 53.9 53.9 64.8 64.8 Actuated g/C Ratio 0.07 0.16 0.67 0.67 0.81 0.81 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Lane Gry Cap (vph) < |
| RTOR Reduction (vph) 0 61 0 5 0 0 Lane Group Flow (vph) 17 12 554 31 174 820 Confl. Peds. (#/hr) 8 8 8 8 Confl. Bikes (#/hr) 1 1 1 Heavy Vehicles (%) 8% 30% 4% 10% 32% 4% Bus Blockages (#/hr) 0 10 0 0 0 0 Turn Type Perm pm+ov NA Perm pm+pt NA Permitted Phases 1 2 1 6 Permitted Phases 8 2 6 Actuated Green, G (s) 4.2 11.1 52.9 52.9 63.8 63.8 Effective Green, g (s) 5.2 13.1 53.9 53.9 64.8 64.8 Actuated g/C Ratio 0.07 0.16 0.67 0.81 0.81 Clearance Time (s) 5.0 4.0 7.0 7.0 |
| Lane Group Flow (vph) 17 12 554 31 174 820 Confl. Peds. (#/hr) 8 8 8 Heavy Vehicles (%) 8% 30% 4% 10% 32% 4% Bus Blockages (#/hr) 0 10 0 0 0 0 Tum Type Perm pm+ov NA Perm pm+pt NA Protected Phases 1 2 1 6 Permitted Phases 8 8 2 6 Actuated Green, G (s) 4.2 11.1 52.9 52.9 63.8 63.8 Effective Green, g (s) 5.2 13.1 53.9 53.9 64.8 64.8 Actuated g/C Ratio 0.07 0.16 0.67 0.81 0.81 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 101 182 1217 893 495 1463 |
| Confl. Peds. (#/hr) Confl. Bikes (#/hr) Heavy Vehicles (%) Bus Blockages (#/hr) Tum Type Perm pm+ov NA Perm pm+pt NA Perm pm+pt NA Permitted Phases 8 8 8 2 6 Actuated Green, G (s) 4.2 11,1 52.9 52.9 63.8 63.8 Effective Green, g (s) 5.2 13.1 53.9 53.9 64.8 64.8 Actuated g/C Ratio 0.07 0.16 0.67 0.67 0.81 0.81 Clearance Time (s) 5.0 4.0 7.0 7.0 7.0 4.0 7.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 101 182 1217 893 495 |
| Heavy Vehicles (%) 8% 30% 4% 10% 32% 4% Bus Blockages (#/hr) 0 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 |
| Bus Blockages (#l/hr) 0 10 0 0 0 0 Turn Type Perm pm+ov NA Perm pm+pt NA Protected Phases 1 2 1 6 Permitted Phases 8 2 6 Actuated Green, G (s) 4.2 11.1 52.9 52.9 63.8 63.8 Effective Green, g (s) 5.2 13.1 53.9 53.9 64.8 64.8 Actuated g/C Ratio 0.07 0.16 0.67 0.81 0.81 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 101 182 1217 893 495 1463 |
| Tum Type Perm pm+ov NA Perm pm+pt NA Protected Phases 1 2 1 6 Permitted Phases 8 8 8 2 6 Actuated Green, G (s) 4.2 11.1 52.9 52.9 63.8 63.8 Effective Green, g (s) 5.2 13.1 53.9 53.9 64.8 64.8 Actuated g/C Ratio 0.07 0.16 0.67 0.67 0.81 0.81 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 101 182 1217 893 495 1463 |
| Protected Phases 1 2 1 6 Permitted Phases 8 8 8 2 6 Actuated Green, G (s) 4.2 11.1 52.9 52.9 63.8 63.8 Effective Green, g (s) 5.2 13.1 53.9 53.9 64.8 64.8 Actuated g/C Ratio 0.07 0.16 0.67 0.67 0.81 0.81 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 101 182 1217 893 495 1463 |
| Protected Phases 1 2 1 6 Permitted Phases 8 8 8 2 6 Actuated Green, G (s) 4.2 11.1 52.9 52.9 63.8 63.8 Effective Green, g (s) 5.2 13.1 53.9 53.9 64.8 64.8 Actuated g/C Ratio 0.07 0.16 0.67 0.67 0.81 0.81 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 101 182 1217 893 495 1463 |
| Actuated Green, G (s) 4.2 11.1 52.9 52.9 63.8 63.8 Effective Green, g (s) 5.2 13.1 53.9 53.9 64.8 64.8 Actuated g/C Ratio 0.07 0.16 0.67 0.81 0.81 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 101 182 1217 893 495 1463 |
| Effective Green, g (s) 5.2 13.1 53.9 53.9 64.8 64.8 Actuated g/C Ratio 0.07 0.16 0.67 0.81 0.81 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 101 182 1217 893 495 1463 |
| Actuated g/C Ratio 0.07 0.16 0.67 0.67 0.81 0.81 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 |
| Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 101 182 1217 893 495 1463 |
| Vehicle Extension (s) 3.0 |
| Lane Grp Cap (vph) 101 182 1217 893 495 1463 |
| |
| |
| V/S RATIO PTOT U.U1 U.31 U.U3 CU.45 |
| v/s Ratio Perm c0.01 0.00 0.02 0.25 |
| v/c Ratio 0.17 0.07 0.46 0.03 0.35 0.56 |
| Uniform Delay, d1 35.4 28.3 6.1 4.4 2.3 2.6 |
| Progression Factor 1.00 1.00 1.00 0.54 0.41 |
| Incremental Delay, d2 0.8 0.2 1.2 0.1 0.4 1.3 |
| Delay (s) 36.1 28.4 7.4 4.4 1.6 2.4 |
| Level of Service D C A A A A |
| Approach Delay (s) 29.9 7.2 2.3 |
| Approach LOS C A A |
| Intersection Summary |
| HCM 2000 Control Delay 5.5 HCM 2000 Level of Service A |
| HCM 2000 Volume to Capacity ratio 0.56 |
| Actuated Cycle Length (s) 80.0 Sum of lost time (s) 14.0 |
| Intersection Capacity Utilization 62.1% ICU Level of Service B |
| Analysis Period (min) 15 |
| c Critical Lane Group |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

| | • | • | † | <i>></i> | \ | ļ |
|--------------------------------|-----------|-------|----------|-------------|----------|------------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | ¥ | | f) | | | ર્ન |
| Traffic Volume (vph) | 16 | 2 | 128 | 24 | 0 | 26 |
| Future Volume (vph) | 16 | 2 | 128 | 24 | 0 | 26 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.986 | | 0.979 | | | |
| Flt Protected | 0.957 | | | | | |
| Satd. Flow (prot) | 1738 | 0 | 1803 | 0 | 0 | 1842 |
| Flt Permitted | 0.957 | | | | | |
| Satd. Flow (perm) | 1738 | 0 | 1803 | 0 | 0 | 1842 |
| Link Speed (k/h) | 50 | | 50 | | | 50 |
| Link Distance (m) | 78.7 | | 80.2 | | | 351.8 |
| Travel Time (s) | 5.7 | | 5.8 | | | 25.3 |
| Confl. Peds. (#/hr) | 11 | 14 | | 936 | 936 | |
| Confl. Bikes (#/hr) | | 2 | | 5 | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 17 | 2 | 139 | 26 | 0 | 28 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 19 | 0 | 165 | 0 | 0 | 28 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 0.0 | | | 0.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 4.8 | | 4.8 | | | 4.8 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Sign Control | Stop | | Free | | | Free |
| Intersection Summary | | | | | | |
| Area Type: | Other | | | | | |
| Control Type: Unsignalized | | | | | | |
| Intersection Capacity Utilizat | ion 27.1% | | | IC | U Level | of Service |
| Analysis Period (min) 15 | | | | | | |

| | € | • | † | 1 | - | ļ |
|------------------------------|--------|------|----------|------|-----------|------------|
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | ¥ | | î, | | | ર્ની |
| Traffic Volume (veh/h) | 16 | 2 | 128 | 24 | 0 | 26 |
| Future Volume (Veh/h) | 16 | 2 | 128 | 24 | 0 | 26 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 17 | 2 | 139 | 26 | 0 | 28 |
| Pedestrians | 936 | | 11 | | | 14 |
| Lane Width (m) | 3.5 | | 3.5 | | | 3.5 |
| Walking Speed (m/s) | 1.2 | | 1.2 | | | 1.2 |
| Percent Blockage | 76 | | 1 | | | 1 |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 1127 | 1102 | | | 1101 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1127 | 1102 | | | 1101 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | 0.1 | 0.2 | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 69 | 97 | | | 100 | |
| cM capacity (veh/h) | 54 | 61 | | | 153 | |
| | | | | | | |
| Direction, Lane # | WB 1 | NB 1 | SB 1 | | | |
| Volume Total | 19 | 165 | 28 | | | |
| Volume Left | 17 | 0 | 0 | | | |
| Volume Right | 2 | 26 | 0 | | | |
| cSH | 55 | 1700 | 153 | | | |
| Volume to Capacity | 0.35 | 0.10 | 0.00 | | | |
| Queue Length 95th (m) | 9.5 | 0.0 | 0.0 | | | |
| Control Delay (s) | 102.0 | 0.0 | 0.0 | | | |
| Lane LOS | F | | | | | |
| Approach Delay (s) | 102.0 | 0.0 | 0.0 | | | |
| Approach LOS | F | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 9.1 | | | |
| Intersection Capacity Utiliz | zation | | 27.1% | IC | U Level o | of Service |
| Analysis Period (min) | | | 15 | | | |

HCM Unsignalized Intersection Capacity Analysis 9004: Jefferson Ave & Site B Driveway

Lanes, Volumes, Timings 9006: Atlantic Ave & Site B Driveway

09/30/2021

| | • | • | 1 | Ť | ¥ | 4 |
|----------------------------|-------|-------|------|-------|-------|-------|
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | W | | | ર્ન | ĥ | |
| Traffic Volume (vph) | 28 | 8 | 25 | 46 | 178 | 17 |
| Future Volume (vph) | 28 | 8 | 25 | 46 | 178 | 17 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.969 | | | | 0.988 | |
| Flt Protected | 0.963 | | | 0.983 | | |
| Satd. Flow (prot) | 1719 | 0 | 0 | 1811 | 1820 | 0 |
| Flt Permitted | 0.963 | | | 0.983 | | |
| Satd. Flow (perm) | 1719 | 0 | 0 | 1811 | 1820 | 0 |
| Link Speed (k/h) | 50 | | | 50 | 50 | |
| Link Distance (m) | 78.7 | | | 22.4 | 217.5 | |
| Travel Time (s) | 5.7 | | | 1.6 | 15.7 | |
| Confl. Peds. (#/hr) | | 818 | 234 | | | 234 |
| Confl. Bikes (#/hr) | | 2 | | | | 26 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 30 | 9 | 27 | 50 | 193 | 18 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 39 | 0 | 0 | 77 | 211 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 4.8 | | | 4.8 | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Sign Control | Stop | | | Free | Free | |
| Intersection Summary | | | | | | |
| Area Type: | Other | | | | | |
| Control Type: Unsignalized | | | | | | |

| Intersection Summary | |
|--------------------------------------|----------------------------|
| Area Type: Other | |
| Control Type: Unsignalized | |
| Intersection Capacity Utilization 40 | .5% ICU Level of Service A |
| Analysis Period (min) 15 | |

HCM Unsignalized Intersection Capacity Analysis 9006: Atlantic Ave & Site B Driveway

| | • | * | 1 | † | ↓ | 1 |
|-----------------------------|--------|------|-------|------|------------|-----------|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | ¥ | | | 4 | 1> | |
| Traffic Volume (veh/h) | 28 | 8 | 25 | 46 | 178 | 17 |
| Future Volume (Veh/h) | 28 | 8 | 25 | 46 | 178 | 17 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 30 | 9 | 27 | 50 | 193 | 18 |
| Pedestrians | 234 | | | 818 | | |
| Lane Width (m) | 3.5 | | | 3.5 | | |
| Walking Speed (m/s) | 1.2 | | | 1.2 | | |
| Percent Blockage | 19 | | | 66 | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | 77 | | |
| pX, platoon unblocked | | | | .,, | | |
| vC, conflicting volume | 540 | 1254 | 445 | | | |
| vC1, stage 1 conf vol | 010 | 1201 | 110 | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 540 | 1254 | 445 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | 0.1 | 0.2 | 4.1 | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 92 | 84 | 97 | | | |
| cM capacity (veh/h) | 395 | 57 | 904 | | | |
| | | | | | | _ |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 39 | 77 | 211 | | | |
| Volume Left | 30 | 27 | 0 | | | |
| Volume Right | 9 | 0 | 18 | | | |
| cSH | 167 | 904 | 1700 | | | |
| Volume to Capacity | 0.23 | 0.03 | 0.12 | | | |
| Queue Length 95th (m) | 6.6 | 0.7 | 0.0 | | | |
| Control Delay (s) | 32.9 | 3.4 | 0.0 | | | |
| Lane LOS | D | Α | | | | |
| Approach Delay (s) | 32.9 | 3.4 | 0.0 | | | |
| Approach LOS | D | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 4.7 | | | |
| Intersection Capacity Utili | zation | | 40.5% | IC | CU Level o | f Service |
| Analysis Period (min) | | | 15 | | | |
| ananyolo i orioa (iiiiii) | | | 10 | | | |

| | • | - | • | • | - | 4 |
|--------------------------------|-----------|-------|-------|-------|----------|------------|
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | | નુ | 4 | | W | |
| Traffic Volume (vph) | 57 | 63 | 191 | 48 | 11 | 1 |
| Future Volume (vph) | 57 | 63 | 191 | 48 | 11 | 1 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | | | 0.973 | | 0.990 | |
| Flt Protected | | 0.977 | | | 0.956 | |
| Satd. Flow (prot) | 0 | 1800 | 1792 | 0 | 1743 | 0 |
| Flt Permitted | | 0.977 | | | 0.956 | |
| Satd. Flow (perm) | 0 | 1800 | 1792 | 0 | 1743 | 0 |
| Link Speed (k/h) | | 40 | 40 | | 50 | |
| Link Distance (m) | | 198.4 | 579.0 | | 130.0 | |
| Travel Time (s) | | 17.9 | 52.1 | | 9.4 | |
| Confl. Peds. (#/hr) | 731 | | | 731 | | |
| Confl. Bikes (#/hr) | | | | 45 | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 62 | 68 | 208 | 52 | 12 | 1 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 130 | 260 | 0 | 13 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Left | Right | Left | Right |
| Median Width(m) | | 3.5 | 3.5 | _ | 3.5 | |
| Link Offset(m) | | 0.0 | 0.0 | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | 4.8 | | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | | | 14 | 24 | 14 |
| Sign Control | | Free | Free | | Stop | |
| Intersection Summary | | | | | | |
| | Other | | | | | |
| Control Type: Unsignalized | | | | | | |
| Intersection Capacity Utilizat | ion 35.0% | | | IC | CU Level | of Service |
| Analysis Period (min) 15 | | | | | | |
| , | | | | | | |

| | ۶ | - | - | • | / | 4 |
|------------------------------|-------|--------|----------|------|-----------|------------|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | | ર્ન | 1 | | Y | |
| Traffic Volume (veh/h) | 57 | 63 | 191 | 48 | 11 | 1 |
| Future Volume (Veh/h) | 57 | 63 | 191 | 48 | 11 | 1 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 62 | 68 | 208 | 52 | 12 | 1 |
| Pedestrians | | | | | 731 | |
| Lane Width (m) | | | | | 3.5 | |
| Walking Speed (m/s) | | | | | 1.2 | |
| Percent Blockage | | | | | 59 | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | 110110 | 110.10 | | | |
| Upstream signal (m) | | 198 | | | | |
| pX, platoon unblocked | | 100 | | | | |
| vC, conflicting volume | 991 | | | | 1157 | 965 |
| vC1, stage 1 conf vol | 001 | | | | 1101 | 000 |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 991 | | | | 1157 | 965 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | 4.1 | | | | 0.4 | 0.2 |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 78 | | | | 83 | 99 |
| cM capacity (veh/h) | 284 | | | | 69 | 126 |
| | | | | | 09 | 120 |
| Direction, Lane # | EB 1 | WB 1 | SB 1 | | | |
| Volume Total | 130 | 260 | 13 | | | |
| Volume Left | 62 | 0 | 12 | | | |
| Volume Right | 0 | 52 | 1 | | | |
| cSH | 284 | 1700 | 72 | | | |
| Volume to Capacity | 0.22 | 0.15 | 0.18 | | | |
| Queue Length 95th (m) | 6.2 | 0.0 | 4.7 | | | |
| Control Delay (s) | 12.6 | 0.0 | 66.0 | | | |
| Lane LOS | В | | F | | | |
| Approach Delay (s) | 12.6 | 0.0 | 66.0 | | | |
| Approach LOS | | | F | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 6.2 | | | |
| Intersection Capacity Utiliz | ation | | 35.0% | IC | U Level o | of Service |
| Analysis Period (min) | | | 15 | | | |
| analysis i sinsa (mm) | | | 10 | | | |

HCM Unsignalized Intersection Capacity Analysis 9007: New Liberty St & Hanna Ave

| | ۶ | - | ← | • | > | 4 |
|--------------------------------|------------|-------|----------|-------|-------------|--------------|
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | | ર્ન | î, | | ¥ | |
| Traffic Volume (vph) | 198 | 76 | 174 | 66 | 0 | 44 |
| Future Volume (vph) | 198 | 76 | 174 | 66 | 0 | 44 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | | | 0.963 | | 0.865 | |
| Flt Protected | | 0.965 | | | | |
| Satd. Flow (prot) | 0 | 1778 | 1675 | 0 | 1593 | 0 |
| Flt Permitted | | 0.965 | | | | |
| Satd. Flow (perm) | 0 | 1778 | 1675 | 0 | 1593 | 0 |
| Link Speed (k/h) | | 40 | 40 | | 50 | |
| Link Distance (m) | | 121.2 | 87.6 | | 80.2 | |
| Travel Time (s) | | 10.9 | 7.9 | | 5.8 | |
| Confl. Peds. (#/hr) | 516 | | | 516 | | |
| Confl. Bikes (#/hr) | | | | 3 | | 10 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Bus Blockages (#/hr) | 0 | 0 | 14 | 14 | 0 | 0 |
| Adj. Flow (vph) | 220 | 84 | 193 | 73 | 0 | 49 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 304 | 266 | 0 | 49 | 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 | , | 3.5 | J . |
| Link Offset(m) | | 0.0 | 0.0 | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | 4.8 | | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.01 | 1.01 | 1.09 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | | | 14 | 24 | 14 |
| Sign Control | | Stop | Stop | | Stop | |
| Intersection Summary | | | | | | |
| | Other | | | | | |
| Control Type: Unsignalized | Ulliel | | | | | |
| | ion 44 20/ | | | 10 | III ovel | of Service |
| Intersection Capacity Utilizat | 1011 44.2% | | | IC | o Level (| or service . |
| Analysis Period (min) 15 | | | | | | |

| | ۶ | → | ← | • | > | √ |
|--------------------------------|------|----------|----------|------|-------------|---------|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | | ર્ન | f) | | ¥ | |
| Sign Control | | Stop | Stop | | Stop | |
| Traffic Volume (vph) | 198 | 76 | 174 | 66 | 0 | 44 |
| Future Volume (vph) | 198 | 76 | 174 | 66 | 0 | 44 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 220 | 84 | 193 | 73 | 0 | 49 |
| Direction, Lane # | EB 1 | WB 1 | SB 1 | | | |
| Volume Total (vph) | 304 | 266 | 49 | | | |
| Volume Left (vph) | 220 | 0 | 0 | | | |
| Volume Right (vph) | 0 | 73 | 49 | | | |
| Hadj (s) | 0.18 | -0.13 | -0.57 | | | |
| Departure Headway (s) | 4.5 | 4.2 | 4.6 | | | |
| Degree Utilization, x | 0.38 | 0.31 | 0.06 | | | |
| Capacity (veh/h) | 791 | 829 | 699 | | | |
| Control Delay (s) | 10.1 | 9.1 | 7.9 | | | |
| Approach Delay (s) | 10.1 | 9.1 | 7.9 | | | |
| Approach LOS | В | Α | Α | | | |
| Intersection Summary | | | | | | |
| Delay | | | 9.5 | | | |
| Level of Service | | | Α | | | |
| Intersection Capacity Utilizat | tion | | 44.2% | IC | U Level of | Service |
| Analysis Period (min) | | | 15 | | | |

HCM Unsignalized Intersection Capacity Analysis 9022: New Liberty St & Jefferson Ave

| | • | - | ← | • | - | 1 |
|--------------------------------------|---------|-------|----------|-------|-------------|-------|
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | LUL | 4 | 1 | 1101 | ₩. | ODIN |
| Traffic Volume (vph) | 40 | 37 | 122 | 39 | T 83 | 118 |
| Future Volume (vph) | 40 | 37 | 122 | 39 | 83 | 118 |
| | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Ideal Flow (vphpl) Lane Util, Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | 1.00 | | | 1.00 | | 1.00 |
| Ped Bike Factor | | 0.70 | 0.82 | | 0.46 | |
| Frt | | 0.075 | 0.968 | | 0.921 | |
| Flt Protected | | 0.975 | 4400 | | 0.980 | |
| Satd. Flow (prot) | 0 | 1695 | 1462 | 0 | 1032 | 0 |
| FIt Permitted | | 0.816 | | | 0.980 | |
| Satd. Flow (perm) | 0 | 994 | 1462 | 0 | 769 | 0 |
| Right Turn on Red | | | | Yes | | Yes |
| Satd. Flow (RTOR) | | | 37 | | | |
| Link Speed (k/h) | | 40 | 40 | | 50 | |
| Link Distance (m) | | 87.6 | 198.4 | | 54.1 | |
| Travel Time (s) | | 7.9 | 17.9 | | 3.9 | |
| Confl. Peds. (#/hr) | 1229 | | 3 | 1229 | 790 | 853 |
| Confl. Bikes (#/hr) | 0 | | | 10 | | 3 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Bus Blockages (#/hr) | 0.90 | 14 | 0.90 | 0.90 | 0.90 | 0.90 |
| | 44 | 41 | 136 | 43 | 92 | 131 |
| Adj. Flow (vph) | 44 | 41 | 130 | 43 | 92 | 137 |
| Shared Lane Traffic (%) | _ | 0.5 | 470 | _ | 000 | _ |
| Lane Group Flow (vph) | 0 | 85 | 179 | 0 | 223 | 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 | | 3.5 | |
| Link Offset(m) | | 0.0 | 0.0 | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | 4.8 | | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.01 | 1.09 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 1.00 | | 14 | 24 | 14 |
| Number of Detectors | 1 | 2 | 2 | | 1 | |
| Detector Template | Left | Thru | Thru | | Left | |
| | | | | | | |
| Leading Detector (m) | 6.1 | 30.5 | 30.5 | | 6.1 | |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | 1.8 | | 6.1 | |
| Detector 1 Type | CI+Ex | CI+Ex | CI+Ex | | CI+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 2 Position(m) | | 28.7 | 28.7 | | | |
| Detector 2 Size(m) | | 1.8 | 1.8 | | | |
| Detector 2 Type | | CI+Ex | CI+Ex | | | |
| Detector 2 Channel | | J X | J LX | | | |
| Detector 2 Extend (s) | | 0.0 | 0.0 | | | |
| Turn Type | Perm | NA | NA | | Perm | |
| | I CIIII | 2 | 6 | | I CIIII | |
| Protected Phases | | - 2 | б | | | |

| Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements | |
|--|--|
| HDR Corporation | |

| | ٠ | - | ← | • | > | 4 |
|---------------------------|----------------|------------|-------------|------------|-------------|--------------|
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
| Permitted Phases | 2 | | | | 4 | |
| Detector Phase | 2 | 2 | 6 | | 4 | |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | | 7.0 | |
| Minimum Split (s) | 24.0 | 24.0 | 24.0 | | 24.0 | |
| Total Split (s) | 24.0 | 24.0 | 24.0 | | 26.0 | |
| Total Split (%) | 48.0% | 48.0% | 48.0% | | 52.0% | |
| Maximum Green (s) | 18.0 | 18.0 | 18.0 | | 20.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | 2.0 | |
| Lost Time Adjust (s) | | -1.0 | -1.0 | | -1.0 | |
| Total Lost Time (s) | | 5.0 | 5.0 | | 5.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | |
| Recall Mode | C-Max | C-Max | C-Max | | None | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | | 7.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | 11.0 | | 11.0 | |
| Pedestrian Calls (#/hr) | 100 | 100 | 100 | | 100 | |
| Act Effct Green (s) | | 21.7 | 21.7 | | 18.3 | |
| Actuated g/C Ratio | | 0.43 | 0.43 | | 0.37 | |
| v/c Ratio | | 0.20 | 0.27 | | 0.79 | |
| Control Delay | | 11.9 | 9.8 | | 36.4 | |
| Queue Delay | | 0.0 | 0.0 | | 0.0 | |
| Total Delay | | 11.9 | 9.8 | | 36.4 | |
| LOS | | В | A | | D | |
| Approach Delay | | 11.9 | 9.8 | | 36.4 | |
| Approach LOS | | В | Α. | | D | |
| •• | | | • • • | | | |
| Intersection Summary | | | | | | |
| Area Type: | Other | | | | | |
| Cycle Length: 50 | | | | | | |
| Actuated Cycle Length: | | | | | | |
| Offset: 0 (0%), Reference | ed to phase 2: | EBTL an | d 6:WBT, | Start of G | ireen | |
| Natural Cycle: 55 | | | | | | |
| Control Type: Actuated- | | | | | | |
| Maximum v/c Ratio: 0.79 | | | | | | |
| Intersection Signal Delay | | | | | tersection | |
| Intersection Capacity Ut | | | | IC | CU Level o | of Service A |
| Analysis Period (min) 15 | 5 | | | | | |
| Calita and Dhases: 00 | 100 Mauri 2 | L. C. O A. | lantin A··- | | | |
| Splits and Phases: 90 | 23: New Liber | ty St & At | iantic Ave | | | |
| Ø2 (R) | | | | | Ø4 | |
| 24 s | | | | | 26 s | |
| — | | | | | | |
| Ø6 (R) | | | | | l | |
| 24 s | | | | | | |

9023: New Liberty St & Atlantic Ave

09/30/2021

| | _ | • | · / |
|------------------------|------|-------|-------|
| | _ | | - |
| Lane Group | EBT | WBT | SBL |
| Lane Group Flow (vph) | 85 | 179 | 223 |
| v/c Ratio | 0.20 | 0.27 | 0.79 |
| Control Delay | 11.9 | 9.8 | 36.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 |
| Total Delay | 11.9 | 9.8 | 36.4 |
| Queue Length 50th (m) | 4.9 | 8.3 | 15.3 |
| Queue Length 95th (m) | 12.7 | 19.3 | #44.1 |
| Internal Link Dist (m) | 63.6 | 174.4 | 30.1 |
| Turn Bay Length (m) | | | |
| Base Capacity (vph) | 430 | 654 | 322 |
| Starvation Cap Reductn | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.20 | 0.27 | 0.69 |

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 9023: New Liberty St & Atlantic Ave

| | ۶ | → | ← | • | > | 4 | | | |
|-----------------------------------|----------|------------|----------|------|-------------|------------------|---|------|--|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR | | | |
| Lane Configurations | | 4 | 1> | | ¥ | | | | |
| Traffic Volume (vph) | 40 | 37 | 122 | 39 | 83 | 118 | | | |
| Future Volume (vph) | 40 | 37 | 122 | 39 | 83 | 118 | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | | | |
| Total Lost time (s) | | 5.0 | 5.0 | | 5.0 | | | | |
| Lane Util. Factor | | 1.00 | 1.00 | | 1.00 | | | | |
| Frpb, ped/bikes | | 1.00 | 0.82 | | 0.62 | | | | |
| Flpb, ped/bikes | | 0.70 | 1.00 | | 0.74 | | | | |
| Frt | | 1.00 | 0.97 | | 0.92 | | | | |
| Flt Protected | | 0.97 | 1.00 | | 0.98 | | | | |
| Satd. Flow (prot) | | 1188 | 1462 | | 768 | | | | |
| Flt Permitted | | 0.82 | 1.00 | | 0.98 | | | | |
| Satd. Flow (perm) | | 994 | 1462 | | 768 | | | | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | | | |
| | 0.90 | 0.90 41 | 136 | 43 | 92 | | | | |
| Adj. Flow (vph) | 44 | 41 | 136 | 43 | 92 | 131 | | | |
| RTOR Reduction (vph) | 0 | 85 | 158 | 0 | 223 | 0 | | | |
| Lane Group Flow (vph) | - | 85 | 158 | | | | | | |
| Confl. Peds. (#/hr) | 1229 | | | 1229 | 790 | 853 | | | |
| Confl. Bikes (#/hr) | • | | • | 10 | • | 3 | | | |
| Bus Blockages (#/hr) | 0 | 14 | 0 | 0 | 0 | 0 | | | |
| Turn Type | Perm | NA | NA | | Perm | | | | |
| Protected Phases | | 2 | 6 | | | | | | |
| Permitted Phases | 2 | | | | 4 | | | | |
| Actuated Green, G (s) | | 20.7 | 20.7 | | 17.3 | | | | |
| Effective Green, g (s) | | 21.7 | 21.7 | | 18.3 | | | | |
| Actuated g/C Ratio | | 0.43 | 0.43 | | 0.37 | | | | |
| Clearance Time (s) | | 6.0 | 6.0 | | 6.0 | | | | |
| Vehicle Extension (s) | | 3.0 | 3.0 | | 3.0 | | | | |
| Lane Grp Cap (vph) | | 431 | 634 | | 281 | | | | |
| v/s Ratio Prot | | | c0.11 | | | | | | |
| v/s Ratio Perm | | 0.09 | | | c0.29 | | | | |
| v/c Ratio | | 0.20 | 0.25 | | 0.79 | | | | |
| Uniform Delay, d1 | | 8.8 | 9.0 | | 14.2 | | | | |
| Progression Factor | | 1.00 | 1.00 | | 1.00 | | | | |
| Incremental Delay, d2 | | 1.0 | 0.9 | | 14.2 | | | | |
| Delay (s) | | 9.8 | 9.9 | | 28.4 | | | | |
| Level of Service | | A | Α | | С | | | | |
| Approach Delay (s) | | 9.8 | 9.9 | | 28.4 | | | | |
| Approach LOS | | Α | А | | С | | | | |
| Intersection Summary | | | | | | | | | |
| HCM 2000 Control Delay | | | 18.4 | Н | CM 2000 | Level of Service | 2 | В | |
| HCM 2000 Volume to Capaci | tv ratio | | 0.51 | | | | - | | |
| Actuated Cycle Length (s) | i, idio | | 50.0 | Sı | um of lost | time (s) | | 11.0 | |
| Intersection Capacity Utilization | on | | 52.0% | | | of Service | | Α | |
| Analysis Period (min) | | | 15 | 10 | C LOTOI C | 5311100 | | ,, | |
| c Critical Lane Group | | | 13 | | | | | | |
| o ondoar Laire Group | | | | | | | | | |

Lanes, Volumes, Timings 9024: Dufferin St & New Liberty St

09/30/2021

| | • | • | † | / | - | ↓ |
|----------------------------|--------|--------|----------|----------|--------|----------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | * | 7 | 1 | | ሻ | † |
| Traffic Volume (vph) | 185 | 75 | 392 | 150 | 47 | 669 |
| Future Volume (vph) | 185 | 75 | 392 | 150 | 47 | 669 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 15.0 | 0.0 | .003 | 0.0 | 0.0 | .000 |
| Storage Lanes | 10.0 | 1 | | 0.0 | 1 | |
| Taper Length (m) | 7.5 | | | - 0 | 7.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 1.00 | 0.60 | 0.99 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | 0.963 | | 1.00 | |
| Flt Protected | 0.950 | 0.000 | 5.000 | | 0.950 | |
| Satd. Flow (prot) | 1750 | 1566 | 1763 | 0 | 1750 | 1842 |
| Flt Permitted | 0.950 | 1000 | 1700 | U | 0.375 | 1072 |
| Satd. Flow (perm) | 1750 | 937 | 1763 | 0 | 690 | 1842 |
| Right Turn on Red | 1730 | Yes | 1703 | Yes | 090 | 1042 |
| Satd. Flow (RTOR) | | 83 | 48 | 168 | | |
| | 40 | 03 | 30 | | | 30 |
| Link Speed (k/h) | | | | | | |
| Link Distance (m) | 107.6 | | 191.3 | | | 74.7 |
| Travel Time (s) | 9.7 | 470 | 23.0 | | | 9.0 |
| Confl. Peds. (#/hr) | | 170 | | 1 | 1 | |
| Confl. Bikes (#/hr) | | 12 | 0.05 | 1 | 0.05 | 0.05 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 206 | 83 | 436 | 167 | 52 | 743 |
| Shared Lane Traffic (%) | 00- | 0.5 | 205 | | | |
| Lane Group Flow (vph) | 206 | 83 | 603 | 0 | 52 | 743 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 3.5 | | | 3.5 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 4.8 | | 4.8 | | | 4.8 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | 1 | 2 |
| Detector Template | Left | Right | Thru | | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | 6.1 | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | 6.1 | 1.8 |
| Detector 1 Type | CI+Ex | CI+Ex | CI+Ex | | CI+Ex | CI+Ex |
| Detector 1 Channel | OI. LX | JI. LX | JI-LX | | OI. LX | JI. LA |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 2 Position(m) | 0.0 | 0.0 | 28.7 | | 0.0 | 28.7 |
| | | | 1.8 | | | 1.8 |
| Detector 2 Size(m) | | | | | | |
| Detector 2 Type | | | CI+Ex | | | CI+Ex |
| Detector 2 Channel | | | 0.5 | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 65

Lanes, Volumes, Timings 9024: Dufferin St & New Liberty St

09/30/2021

| | • | • | † | / | - | ţ | |
|------------------------------|----------------|-----------|------------|------------|-----------|-------------|---|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT | |
| Turn Type | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | | | 2 | | | 6 | |
| Permitted Phases | 8 | 8 | | | 6 | | |
| Detector Phase | 8 | 8 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Minimum Split (s) | 24.0 | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Total Split (s) | 24.0 | 24.0 | 56.0 | | 56.0 | 56.0 | |
| Total Split (%) | 30.0% | 30.0% | 70.0% | | 70.0% | 70.0% | |
| Maximum Green (s) | 18.0 | 18.0 | 50.0 | | 50.0 | 50.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | | -1.0 | -1.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead-Lag Optimize? | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | C-Max | | C-Max | C-Max | |
| 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) | 15.2 | 15.2 | 54.8 | | 54.8 | 54.8 | |
| Actuated g/C Ratio | 0.19 | 0.19 | 0.68 | | 0.68 | 0.68 | |
| v/c Ratio | 0.19 | 0.19 | 0.66 | | 0.00 | 0.66 | |
| Control Delay | 37.8 | 10.5 | 12.2 | | 3.4 | 5.7 | |
| | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Queue Delay | 37.8 | 10.5 | 12.2 | | 3.4 | 5.7 | |
| Total Delay LOS | 37.8 D | 10.5 B | 12.2 B | | 3.4 A | 5.7 A | |
| | 29.9 | В | 12.2 | | А | 5.5 | |
| Approach Delay | | | | | | | |
| Approach LOS | С | | В | | | Α | |
| Intersection Summary | | | | | _ | | |
| Area Type: | Other | | | | | | |
| Cycle Length: 80 | | | | | | | |
| Actuated Cycle Length: 80 |) | | | | | | |
| Offset: 0 (0%), Reference | | NBT and | 6:SBTL. S | Start of G | reen | | |
| Natural Cycle: 60 | | | , | | | | |
| Control Type: Actuated-Co | oordinated | | | | | | |
| Maximum v/c Ratio: 0.62 | ooramatoa | | | | | | |
| Intersection Signal Delay: | 12 1 | | | In | tersectio | n LOS: B | |
| Intersection Capacity Utiliz | | | | | | of Service | B |
| Analysis Period (min) 15 | LUUUII UL.4 /0 | | | IC | C LOVEI | O1 O61 VICE | _ |
| Analysis i chica (mill) 13 | | | | | | | |
| Splits and Phases: 902 | 4: Dufferin St | & New I | iherty St | | | | |
| Spiils and Friases. 302 | 4. Dullelli Si | A New L | liberty St | | | | |
| Tø2 (R) | | | | | | | |
| 56 s | | | | | | | |
| \ | | | | | | | |
| ▼ Ø6 (R) | | | | | | | |
| 56 s | | | | | | | |

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Scenario 1 Total Future AM 11:59 pm 05/05/2014 No Improvements

HDR Corporation

| | • | • | † | - | Ţ |
|--------------------------|----------------|---------|----------|----------|-------|
| Lane Group | WBL | WBR | NBT | SBL | SBT |
| Lane Group Flow (vph) | 206 | 83 | 603 | 52 | 743 |
| v/c Ratio | 0.62 | 0.34 | 0.49 | 0.11 | 0.59 |
| Control Delay | 37.8 | 10.5 | 12.2 | 3.4 | 5.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 37.8 | 10.5 | 12.2 | 3.4 | 5.7 |
| Queue Length 50th (m) | 28.8 | 0.0 | 34.1 | 1.2 | 34.8 |
| Queue Length 95th (m) | 46.8 | 10.6 | 125.8 | m2.0 | m54.0 |
| Internal Link Dist (m) | 83.6 | | 167.3 | | 50.7 |
| Turn Bay Length (m) | 15.0 | | | | |
| Base Capacity (vph) | 415 | 285 | 1223 | 473 | 1262 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.50 | 0.29 | 0.49 | 0.11 | 0.59 |
| Intersection Summary | | | | | |
| m Volume for 95th percer | ntile queue is | metered | by upstr | eam sign | ıal. |

| | • | • | † | / | \ | ↓ | | | |
|-------------------------------|-------------|-----------|----------|------|-----------|------------------|---|------|--|
| Movement | WBL | WBR | NBT | NBR | SBL | SBT | | | |
| Lane Configurations | ሻ | 7 | f | | ሻ | † | | | |
| Traffic Volume (vph) | 185 | 75 | 392 | 150 | 47 | 669 | | | |
| Future Volume (vph) | 185 | 75 | 392 | 150 | 47 | 669 | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | | | |
| Total Lost time (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | | |
| Frpb, ped/bikes | 1.00 | 0.60 | 0.99 | | 1.00 | 1.00 | | | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | | |
| Frt | 1.00 | 0.85 | 0.96 | | 1.00 | 1.00 | | | |
| Flt Protected | 0.95 | 1.00 | 1.00 | | 0.95 | 1.00 | | | |
| Satd. Flow (prot) | 1750 | 932 | 1762 | | 1749 | 1842 | | | |
| FIt Permitted | 0.95 | 1.00 | 1.00 | | 0.38 | 1.00 | | | |
| Satd. Flow (perm) | 1750 | 932 | 1762 | | 691 | 1842 | | | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | | | |
| Adj. Flow (vph) | 206 | 83 | 436 | 167 | 52 | 743 | | | |
| RTOR Reduction (vph) | 0 | 67 | 15 | 0 | 0 | 0 | | | |
| Lane Group Flow (vph) | 206 | 16 | 588 | 0 | 52 | 743 | | | |
| Confl. Peds. (#/hr) | 200 | 170 | 000 | 1 | 1 | 0 | | | |
| Confl. Bikes (#/hr) | | 12 | | 1 | | | | | |
| Turn Type | Perm | Perm | NA | | Perm | NA | | | |
| Protected Phases | 1 01111 | 1 01111 | 2 | | 1 01111 | 6 | | | |
| Permitted Phases | 8 | 8 | | | 6 | | | | |
| Actuated Green, G (s) | 14.2 | 14.2 | 53.8 | | 53.8 | 53.8 | | | |
| Effective Green, g (s) | 15.2 | 15.2 | 54.8 | | 54.8 | 54.8 | | | |
| Actuated g/C Ratio | 0.19 | 0.19 | 0.68 | | 0.68 | 0.68 | | | |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | | | |
| Lane Grp Cap (vph) | 332 | 177 | 1206 | | 473 | 1261 | | | |
| v/s Ratio Prot | 002 | 111 | 0.33 | | 7/0 | c0.40 | | | |
| v/s Ratio Perm | c0.12 | 0.02 | 0.00 | | 0.08 | 60.40 | | | |
| v/c Ratio | 0.62 | 0.02 | 0.49 | | 0.00 | 0.59 | | | |
| Uniform Delay, d1 | 29.8 | 26.7 | 6.0 | | 4.3 | 6.7 | | | |
| Progression Factor | 1.00 | 1.00 | 1.74 | | 0.62 | 0.72 | | | |
| Incremental Delay, d2 | 3.6 | 0.2 | 1.74 | | 0.02 | 0.72 | | | |
| Delay (s) | 33.3 | 26.9 | 11.7 | | 2.7 | 4.9 | | | |
| Level of Service | 33.3 C | 20.3 C | В | | Α. | 4.3 A | | | |
| Approach Delay (s) | 31.5 | - 3 | 11.7 | | - 11 | 4.8 | | | |
| Approach LOS | 01.0 C | | В | | | Α. | | | |
| •• | - 0 | | | | | ,, | | | |
| Intersection Summary | | | 44.0 | | 1014 0000 | 1 1 (0 : | | | |
| HCM 2000 Control Delay | | | 11.8 | Н | ICM 2000 | Level of Service | 9 | В | |
| HCM 2000 Volume to Capa | icity ratio | | 0.60 | _ | | | | 44.0 | |
| Actuated Cycle Length (s) | | | 80.0 | | um of los | | | 11.0 | |
| Intersection Capacity Utiliza | ation | | 62.4% | IC | CU Level | of Service | | В | |
| Analysis Period (min) | | | 15 | | | | | | |
| | | | | | | | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis 9024: Dufferin St & New Liberty St

| | • | • | 1 | † | ↓ | 4 |
|-------------------------------|------------|-------|------|----------|-------------|--------------|
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | * | 7 | ሻ | * | † | |
| Traffic Volume (vph) | 0 | 95 | 0 | 571 | 372 | 135 |
| Future Volume (vph) | 0 | 95 | 0 | 571 | 372 | 135 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 15.0 | 0.0 | 15.0 | | | 0.0 |
| Storage Lanes | 1 | 1 | 1 | | | 0 |
| Taper Length (m) | 7.5 | | 7.5 | | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | | 0.850 | | | 0.964 | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 1842 | 1566 | 1842 | 1842 | 1776 | 0 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 1842 | 1566 | 1842 | 1842 | 1776 | 0 |
| Link Speed (k/h) | 40 | | | 40 | 40 | - |
| Link Distance (m) | 579.0 | | | 241.4 | 424.1 | |
| Travel Time (s) | 52.1 | | | 21.7 | 38.2 | |
| Confl. Peds. (#/hr) | | | 9 | | | 9 |
| Confl. Bikes (#/hr) | | 4 | | | | 76 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 0 | 106 | 0 | 634 | 413 | 150 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 106 | 0 | 634 | 563 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | 2011 | 3.5 | 3.5 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 4.8 | | | 4.8 | 4.8 | |
| Two way Left Turn Lane | 1.0 | | | 1.5 | 1.0 | |
| Headway Factor | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 1.01 | 24 | 1.01 | 1.01 | 1.01 |
| Sign Control | Stop | 17 | 24 | Free | Free | 17 |
| - | Otop | | | 1100 | 1100 | |
| Intersection Summary | | | | | | |
| | Other | | | | | |
| Control Type: Unsignalized | | | | | | |
| Intersection Capacity Utiliza | tion 40.6% | | | IC | CU Level of | of Service A |
| Analysis Period (min) 15 | | | | | | |

| | ۶ | • | 4 | † | ↓ | 4 | | |
|-------------------------------|--------|------|-------|----------|------------|---------|---|--|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR | | |
| Lane Configurations | ሻ | 7 | ሻ | † | * | | _ | |
| Traffic Volume (veh/h) | 0 | 95 | 0 | 571 | 372 | 135 | | |
| Future Volume (Veh/h) | 0 | 95 | 0 | 571 | 372 | 135 | | |
| 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 | 106 | 0 | 634 | 413 | 150 | | |
| Pedestrians | 9 | | | | | | | |
| Lane Width (m) | 3.5 | | | | | | | |
| Walking Speed (m/s) | 1.2 | | | | | | | |
| Percent Blockage | 1 | | | | | | | |
| Right turn flare (veh) | | | | | | | | |
| Median type | | | | None | None | | | |
| Median storage veh) | | | | | | | | |
| Upstream signal (m) | | | | 241 | | | | |
| pX, platoon unblocked | 0.83 | | | | | | | |
| vC, conflicting volume | 1131 | 497 | 572 | | | | | |
| vC1, stage 1 conf vol | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | |
| vCu, unblocked vol | 1057 | 497 | 572 | | | | | |
| 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 | 81 | 100 | | | | | |
| cM capacity (veh/h) | 206 | 569 | 993 | | | | | |
| Direction, Lane # | EB 1 | EB 2 | NB 1 | NB 2 | SB 1 | | | |
| Volume Total | 0 | 106 | 0 | 634 | 563 | | | |
| Volume Left | 0 | 0 | 0 | 0 | 0 | | | |
| Volume Right | 0 | 106 | 0 | 0 | 150 | | | |
| cSH | 1700 | 569 | 1700 | 1700 | 1700 | | | |
| Volume to Capacity | 0.00 | 0.19 | 0.00 | 0.37 | 0.33 | | | |
| Queue Length 95th (m) | 0.0 | 5.2 | 0.0 | 0.0 | 0.0 | | | |
| Control Delay (s) | 0.0 | 12.8 | 0.0 | 0.0 | 0.0 | | | |
| Lane LOS | Α | В | 0.0 | 0.0 | 0.0 | | | |
| Approach Delay (s) | 12.8 | | 0.0 | | 0.0 | | | |
| Approach LOS | В | | 0.0 | | 0.0 | | | |
| Intersection Summary | | | | | | | | |
| Average Delay | | | 1.0 | | | | | |
| Intersection Capacity Utiliza | tion | | 40.6% | ıc | U Level of | Service | | |
| Analysis Period (min) | ILIUII | | 15 | ic | O LEVEI U | SCIVICE | | |
| Analysis Penou (IIIIII) | | | 10 | | | | | |

HCM Unsignalized Intersection Capacity Analysis 9025: Strachan Ave & New Liberty St

HCM Unsignalized Intersection Capacity Analysis 9029: Atlantic Ave

09/30/2021

| | • | • | † | <i>></i> | \ | ↓ |
|--------------------------------|-----------|-------|-------|-------------|----------|------------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | W | | 4 | | | 4 |
| Traffic Volume (vph) | 14 | 4 | 47 | 24 | 6 | 40 |
| Future Volume (vph) | 14 | 4 | 47 | 24 | 6 | 40 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | 0.973 | | 0.954 | | | |
| Flt Protected | 0.962 | | | | | 0.993 |
| Satd. Flow (prot) | 1724 | 0 | 1757 | 0 | 0 | 1829 |
| Flt Permitted | 0.962 | | | | | 0.993 |
| Satd. Flow (perm) | 1724 | 0 | 1757 | 0 | 0 | 1829 |
| Link Speed (k/h) | 50 | | 50 | | | 50 |
| Link Distance (m) | 47.7 | | 54.1 | | | 22.4 |
| Travel Time (s) | 3.4 | | 3.9 | | | 1.6 |
| Confl. Peds. (#/hr) | 54 | 1 | | 360 | 360 | |
| Confl. Bikes (#/hr) | | 2 | | 6 | | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 16 | 4 | 52 | 27 | 7 | 44 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 20 | 0 | 79 | 0 | 0 | 51 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 0.0 | - | | 0.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 4.8 | | 4.8 | | | 4.8 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Sign Control | Stop | | Free | | | Free |
| Intersection Summary | | | | | | |
| Area Type: | Other | | | | | |
| Control Type: Unsignalized | | | | | | |
| Intersection Capacity Utilizat | ion 23.7% | | | IC | U Level | of Service |
| Analysis Period (min) 15 | | | | | | |

| | • | • | † | ~ | / | |
|--------------------------------|------|------|-------|------|-----------|--------------|
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | ¥ | | 1> | | | ની |
| Traffic Volume (veh/h) | 14 | 4 | 47 | 24 | 6 | 40 |
| Future Volume (Veh/h) | 14 | 4 | 47 | 24 | 6 | 40 |
| 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) | 16 | 4 | 52 | 27 | 7 | 44 |
| Pedestrians | 360 | | 54 | | | 1 |
| Lane Width (m) | 3.5 | | 3.5 | | | 3.5 |
| Walking Speed (m/s) | 1.2 | | 1.2 | | | 1.2 |
| Percent Blockage | 29 | | 4 | | | 0 |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | 54 | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 538 | 426 | | | 439 | |
| vC1, stage 1 conf vol | 000 | .20 | | | 100 | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 538 | 426 | | | 439 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | 0.2 | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 95 | 99 | | | 99 | |
| cM capacity (veh/h) | 339 | 444 | | | 794 | |
| Direction, Lane # | WB 1 | NB 1 | SB 1 | | | |
| Volume Total | 20 | 79 | 51 | | | |
| Volume Total Volume Left | 16 | 0 | 7 | | | |
| Volume Right | 4 | 27 | 0 | | | |
| cSH | 356 | 1700 | 794 | | | |
| | 0.06 | 0.05 | 0.01 | | | |
| Volume to Capacity | 1.4 | | | | | |
| Queue Length 95th (m) | | 0.0 | 0.2 | | | |
| Control Delay (s) | 15.7 | 0.0 | 1.4 | | | |
| Lane LOS | C | 0.0 | A | | | |
| Approach Delay (s) | 15.7 | 0.0 | 1.4 | | | |
| Approach LOS | С | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 2.6 | | | |
| Intersection Capacity Utilizat | tion | | 23.7% | IC | U Level o | of Service |
| Analysis Period (min) | | | 15 | | | |
| , | | | | | | |

Lanes, Volumes, Timings

97: Yukon Place & British Colombia Rd

09/30/2021

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|----------------------------|-------|----------|-------|-------|----------|-------|-------|-------|-------------|----------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ሻ | 1 | | 7 | † | 7 | | 4 | | | 4 | |
| Traffic Volume (vph) | 1 | 423 | 0 | 1 | 308 | 1 | 7 | 1 | 0 | 0 | 0 | 26 |
| Future Volume (vph) | 1 | 423 | 0 | 1 | 308 | 1 | 7 | 1 | 0 | 0 | 0 | 26 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 20.0 | | 20.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| 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 |
| Ped Bike Factor | | | | 1.00 | | | | 0.99 | | | 0.97 | |
| Frt | | | | | | 0.850 | | | | | 0.865 | |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.957 | | | | |
| Satd. Flow (prot) | 1685 | 1824 | 0 | 1685 | 1756 | 1507 | 0 | 1798 | 0 | 0 | 1574 | 0 |
| Flt Permitted | 0.555 | | | 0.494 | | | | | | | | |
| Satd. Flow (perm) | 984 | 1824 | 0 | 874 | 1756 | 1507 | 0 | 1860 | 0 | 0 | 1574 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | | 45 | | | | | 514 | |
| Link Speed (k/h) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (m) | | 164.9 | | | 265.9 | | | 92.0 | | | 121.3 | |
| Travel Time (s) | | 19.8 | | | 31.9 | | | 11.0 | | | 14.6 | |
| Confl. Peds. (#/hr) | | | 2 | 2 | | | 6 | | | | | 6 |
| Confl. Bikes (#/hr) | | | | | | | | | 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 (%) | 0% | 3% | 0% | 0% | 7% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Adj. Flow (vph) | 1 | 470 | 0 | 1 | 342 | 1 | 8 | 1 | 0 | 0 | 0 | 29 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 1 | 470 | 0 | 1 | 342 | 1 | 0 | 9 | 0 | 0 | 29 | 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) | | 3.0 | | | 3.0 | | | 0.0 | | | 0.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.09 | 1.01 | 1.01 | 1.09 | 1.01 | 1.09 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | CI+Ex | Cl+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report

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Lanes, Volumes, Timings

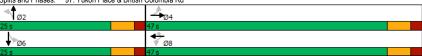
97: Yukon Place & British Colombia Rd

09/30/2021

| | • | → | • | • | • | • | 4 | † | <i>></i> | - | ļ | 1 |
|-------------------------|-------|----------|-----|-------|-------|-------|-------|----------|-------------|-------|-------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | Perm | Perm | NA | | | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 33.0 | 33.0 | | 33.0 | 33.0 | 33.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Minimum Split (s) | 39.0 | 39.0 | | 39.0 | 39.0 | 39.0 | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Total Split (s) | 47.0 | 47.0 | | 47.0 | 47.0 | 47.0 | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Total Split (%) | 65.3% | 65.3% | | 65.3% | 65.3% | 65.3% | 34.7% | 34.7% | | 34.7% | 34.7% | |
| Maximum Green (s) | 41.0 | 41.0 | | 41.0 | 41.0 | 41.0 | 19.0 | 19.0 | | 19.0 | 19.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | | -1.0 | -1.0 | -1.0 | | -1.0 | | | -1.0 | |
| Total Lost Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | Max | Max | | Max | Max | Max | None | None | | None | None | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 9.0 | 9.0 | | 9.0 | 9.0 | 9.0 | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 58.5 | 58.5 | | 58.5 | 58.5 | 58.5 | | 8.0 | | | 8.0 | |
| Actuated g/C Ratio | 0.90 | 0.90 | | 0.90 | 0.90 | 0.90 | | 0.12 | | | 0.12 | |
| v/c Ratio | 0.00 | 0.29 | | 0.00 | 0.22 | 0.00 | | 0.04 | | | 0.05 | |
| Control Delay | 2.0 | 2.3 | | 2.0 | 2.1 | 0.0 | | 27.0 | | | 0.1 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | | | 0.0 | |
| Total Delay | 2.0 | 2.3 | | 2.0 | 2.1 | 0.0 | | 27.0 | | | 0.1 | |
| LOS | Α | Α | | Α | Α | Α | | С | | | Α | |
| Approach Delay | | 2.3 | | | 2.1 | | | 27.0 | | | 0.1 | _ |
| Approach LOS | | Α | | | Α | | | С | | | Α | |

Intersection Summary Area Type: Cycle Length: 72 Other Actuated Cycle Length: 65.2 Natural Cycle: 65 Control Type: Semi Act-Uncoord Maximum v/c Ratio: 0.29 Intersection Signal Delay: 2.4
Intersection Capacity Utilization 73.3%
Analysis Period (min) 15 Intersection LOS: A ICU Level of Service D

Splits and Phases: 97: Yukon Place & British Colombia Rd



Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report

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HCM Signalized Intersection Capacity Analysis 97: Yukon Place & British Colombia Rd

09/30/2021

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|--|------------|----------|--------|----------------|------------|------------|----------|-------|-----------|------|------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | 7 | f) | | ሻ | ↑ | 7 | | 4 | | | 4 | |
| Traffic Volume (vph) | 1 | 423 | 0 | 1 | 308 | 1 | 7 | 1 | 0 | 0 | 0 | 26 |
| Future Volume (vph) | 1 | 423 | 0 | 1 | 308 | 1 | 7 | 1 | 0 | 0 | 0 | 26 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | | 5.0 | | | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | | | 1.00 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | | | 0.97 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 0.99 | | | 1.00 | |
| Frt | 1.00 | 1.00 | | 1.00 | 1.00 | 0.85 | | 1.00 | | | 0.86 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | | 0.96 | | | 1.00 | |
| Satd. Flow (prot) | 1685 | 1824 | | 1681 | 1756 | 1507 | | 1781 | | | 1574 | |
| Flt Permitted | 0.56 | 1.00 | | 0.49 | 1.00 | 1.00 | | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | 985 | 1824 | | 873 | 1756 | 1507 | | 1860 | | | 1574 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 1 | 470 | 0 | 1 | 342 | 1 | 8 | 1 | 0 | 0 | 0 | 29 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 0 |
| Lane Group Flow (vph) | 1 | 470 | 0 | 1 | 342 | 1 | 0 | 9 | 0 | 0 | 2 | 0 |
| Confl. Peds. (#/hr) | | | 2 | 2 | | | 6 | | | | | 6 |
| Confl. Bikes (#/hr) | | | | | | | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 3% | 0% | 0% | 7% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Turn Type | Perm | NA | | Perm | NA | Perm | Perm | NA | | | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 54.3 | 54.3 | | 54.3 | 54.3 | 54.3 | | 2.6 | | | 2.6 | |
| Effective Green, g (s) | 55.3 | 55.3 | | 55.3 | 55.3 | 55.3 | | 3.6 | | | 3.6 | |
| Actuated g/C Ratio | 0.80 | 0.80 | | 0.80 | 0.80 | 0.80 | | 0.05 | | | 0.05 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 790 | 1463 | | 700 | 1409 | 1209 | | 97 | | | 82 | |
| v/s Ratio Prot | , , , | c0.26 | | | 0.19 | 1200 | | 0. | | | 0.00 | |
| v/s Ratio Perm | 0.00 | | | 0.00 | | 0.00 | | c0.00 | | | | |
| v/c Ratio | 0.00 | 0.32 | | 0.00 | 0.24 | 0.00 | | 0.09 | | | 0.02 | |
| Uniform Delay, d1 | 1.3 | 1.8 | | 1.3 | 1.7 | 1.3 | | 31.1 | | | 31.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 0.0 | 0.6 | | 0.0 | 0.4 | 0.0 | | 0.4 | | | 0.1 | |
| Delay (s) | 1.3 | 2.4 | | 1.3 | 2.1 | 1.3 | | 31.5 | | | 31.1 | |
| Level of Service | Α | Α. | | Α. | Α. | Α. | | C | | | C | |
| Approach Delay (s) | ,, | 2.4 | | / (| 2.1 | 71 | | 31.5 | | | 31.1 | |
| Approach LOS | | Α.Τ | | | Α. | | | C C | | | C | |
| Intersection Summary | | - ' | | | - ' ' | | | | | | | |
| HCM 2000 Control Delay | | | 3.5 | Н | CM 2000 | Level of S | Service | | A | | | |
| HCM 2000 Control Delay HCM 2000 Volume to Capa | city ratio | | 0.31 | П | OW 2000 | -0401 01 C | DOI VICE | | | | | |
| Actuated Cycle Length (s) | orly ratio | | 68.9 | Q ₁ | um of lost | time (s) | | | 10.0 | | | |
| Intersection Capacity Utiliza | tion | | 73.3% | | | of Service | | | 10.0 D | | | |
| Analysis Period (min) | iuOII | | 15.5 % | IC | O LEVEL | , oei vice | | | U | | | |
| c Critical Lane Group | | | 10 | | | | | | | | | |
| o ontion cario oroup | | | | | | | | | | | | |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements

Lanes, Volumes, Timings 222: Lakeshore Blvd & Strachan Ave

09/30/2021

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|----------------------------|-------|----------|-------|-------|----------|-------|-------|-------|-------|----------|----------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | * | ተተው | | 7 | ተተተ | | | 4 | | | ર્ન | 7 |
| Traffic Volume (vph) | 523 | 1621 | 3 | 12 | 2476 | 0 | 0 | 16 | 0 | 538 | 49 | 404 |
| Future Volume (vph) | 523 | 1621 | 3 | 12 | 2476 | 0 | 0 | 16 | 0 | 538 | 49 | 404 |
| Ideal Flow (vphpl) | 2150 | 1900 | 1900 | 1900 | 2150 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 |
| Storage Length (m) | 60.0 | | 0.0 | 60.0 | | 50.0 | 0.0 | | 0.0 | 140.0 | | 50.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 0 | | 0 | 1 | | 1 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 0.91 | 0.91 | 1.00 | *0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Ped Bike Factor | | 1.00 | | 1.00 | | | | | | | | 0.92 |
| Frt | | | | | | | | | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | | | | 0.950 | 0.960 | |
| Satd. Flow (prot) | 1816 | 4794 | 0 | 1685 | 5883 | 0 | 0 | 1879 | 0 | 1585 | 1699 | 1507 |
| Flt Permitted | 0.072 | | | 0.096 | | | | | | 0.746 | 0.750 | |
| Satd. Flow (perm) | 138 | 4794 | 0 | 170 | 5883 | 0 | 0 | 1879 | 0 | 1244 | 1328 | 1382 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | | | | | | | | 230 |
| Link Speed (k/h) | | 60 | | | 60 | | | 40 | | | 40 | |
| Link Distance (m) | | 310.3 | | | 196.6 | | | 116.5 | | | 205.6 | |
| Travel Time (s) | | 18.6 | | | 11.8 | | | 10.5 | | | 18.5 | |
| Confl. Peds. (#/hr) | 5 | | 8 | 8 | | 5 | 46 | | | | | 46 |
| Confl. Bikes (#/hr) | | | | | | | | | 16 | | | 38 |
| Peak Hour Factor | 0.90 | 0.95 | 0.95 | 0.90 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Heavy Vehicles (%) | 5% | 7% | 0% | 0% | 3% | 0% | 0% | 0% | 0% | 1% | 0% | 0% |
| Adj. Flow (vph) | 581 | 1706 | 3 | 13 | 2606 | 0 | 0 | 17 | 0 | 566 | 52 | 425 |
| Shared Lane Traffic (%) | | | | | | | | | | 46% | | |
| Lane Group Flow (vph) | 581 | 1709 | 0 | 13 | 2606 | 0 | 0 | 17 | 0 | 306 | 312 | 425 |
| 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) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 0.93 | 1.01 | 1.01 | 1.09 | 0.86 | 1.09 | 1.01 | 1.01 | 1.01 | 1.09 | 1.01 | 1.09 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | 1 |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | Right |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | CI+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 5

HDR Corporation

Lanes, Volumes, Timings 222: Lakeshore Blvd & Strachan Ave

09/30/2021

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|------------------------------|--------------|-------------|---------------|--------|------------|-------------|--------|------------|-----|-------------|------------|-----------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | pm+pt | NA | | pm+pt | NA | | | NA | | Perm | NA | pm+ov |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 3 | | | 4 | 5 |
| Permitted Phases | 2 | | | 6 | | | 3 | | | 4 | | 4 |
| Detector Phase | 5 | 2 | | 1 | 6 | | 3 | 3 | | 4 | 4 | 5 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 29.0 | | 6.0 | 30.0 | | 12.0 | 12.0 | | 10.0 | 10.0 | 6.0 |
| Minimum Split (s) | 12.0 | 35.0 | | 12.0 | 36.0 | | 21.0 | 21.0 | | 45.0 | 45.0 | 12.0 |
| Total Split (s) | 27.0 | 66.0 | | 12.0 | 51.0 | | 21.0 | 21.0 | | 45.0 | 45.0 | 27.0 |
| Total Split (%) | 18.8% | 45.8% | | 8.3% | 35.4% | | 14.6% | 14.6% | | 31.3% | 31.3% | 18.8% |
| Maximum Green (s) | 21.0 | 60.0 | | 6.0 | 45.0 | | 12.0 | 12.0 | | 37.0 | 37.0 | 21.0 |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| All-Red Time (s) | 3.0 | 2.0 | | 3.0 | 2.0 | | 6.0 | 6.0 | | 5.0 | 5.0 | 3.0 |
| Lost Time Adjust (s) | -3.0 | -1.0 | | -1.0 | -3.0 | | | -1.0 | | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 3.0 | 5.0 | | 5.0 | 3.0 | | | 8.0 | | 7.0 | 7.0 | 5.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lead | | Lag | Lag | Lead |
| Lead-Lag Optimize? | | 3 | | | 3 | | | | | 3 | 3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | Max | | None | Max | | None | None | | None | None | None |
| Walk Time (s) | 110.10 | 7.0 | | 110110 | 7.0 | | 110.10 | 110.10 | | 7.0 | 7.0 | 110110 |
| Flash Dont Walk (s) | | 22.0 | | | 22.0 | | | | | 30.0 | 30.0 | |
| Pedestrian Calls (#/hr) | | 3 | | | 2 | | | | | 0.0 | 0 | |
| Act Effct Green (s) | 75.6 | 69.3 | | 53.5 | 48.4 | | | 13.1 | | 36.2 | 36.2 | 60.4 |
| Actuated g/C Ratio | 0.58 | 0.54 | | 0.41 | 0.37 | | | 0.10 | | 0.28 | 0.28 | 0.47 |
| v/c Ratio | 1.47 | 0.67 | | 0.09 | 1.19 | | | 0.09 | | 0.88 | 0.84 | 0.54 |
| Control Delay | 258.8 | 26.8 | | 19.0 | 124.8 | | | 59.0 | | 71.8 | 65.7 | 12.9 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.2 | | | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Delay | 258.8 | 26.8 | | 19.0 | 125.1 | | | 59.0 | | 71.8 | 65.7 | 12.9 |
| LOS | F | C | | В | F | | | E | | 7 1.0 E | E | 12.3 B |
| Approach Delay | | 85.6 | | | 124.5 | | | 59.0 | | | 46.0 | |
| Approach LOS | | F | | | F | | | E | | | -10.0 D | |
| •• | | | | | | | | | | | | |
| Intersection Summary | Other | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 144 | 0.5 | | | | | | | | | | | |
| Actuated Cycle Length: 12 | 9.5 | | | | | | | | | | | |
| Natural Cycle: 145 | | | | | | | | | | | | |
| Control Type: Semi Act-Ur | ncoora | | | | | | | | | | | |
| Maximum v/c Ratio: 1.47 | | | | | | | | | | | | |
| Intersection Signal Delay: | | ., | | | tersection | | | | | | | |
| Intersection Capacity Utiliz | ation 109.59 | % | | IC | CU Level o | of Service | H | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| * User Entered Value | | | | | | | | | | | | |
| Splits and Phases: 222: | Lakeshore | Blvd & Stra | achan A | /e | | | | | | | | |
| √ø1 - ø2 | | | | | | ↑ ø3 | | ₽ ø | 4 | | | |
| 12 s 66 s | | | | | | 21 s | | 45 s | | | | |

| | • | - | 1 | • | † | - | . ↓ | 4 | |
|------------------------|--------|-------|------|--------|----------|--------|--------|------|--|
| Lane Group | EBL | EBT | WBL | WBT | NBT | SBL | SBT | SBR | |
| Lane Group Flow (vph) | 581 | 1709 | 13 | 2606 | 17 | 306 | 312 | 425 | |
| v/c Ratio | 1.47 | 0.67 | 0.09 | 1.19 | 0.09 | 0.88 | 0.84 | 0.54 | |
| Control Delay | 258.8 | 26.8 | 19.0 | 124.8 | 59.0 | 71.8 | 65.7 | 12.9 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 258.8 | 26.8 | 19.0 | 125.1 | 59.0 | 71.8 | 65.7 | 12.9 | |
| Queue Length 50th (m) | ~175.2 | 90.3 | 1.2 | ~257.1 | 3.8 | 71.2 | 71.6 | 24.6 | |
| Queue Length 95th (m) | #298.7 | 178.4 | 5.5 | #361.5 | 12.5 | #149.8 | #146.7 | 66.7 | |
| Internal Link Dist (m) | | 286.3 | | 172.6 | 92.5 | | 181.6 | | |
| Turn Bay Length (m) | 60.0 | | 60.0 | | | 140.0 | | 50.0 | |
| Base Capacity (vph) | 394 | 2565 | 152 | 2199 | 190 | 368 | 393 | 789 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 186 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 1.47 | 0.67 | 0.09 | 1.29 | 0.09 | 0.83 | 0.79 | 0.54 | |

Intersection Summary

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|---|-----------|----------------|--------|-------|-----------|------------|---------|----------|------|----------|------|-------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | * | ተተ | | 7 | ተተተ | | | 4 | | 7 | ર્ન | 7 |
| Traffic Volume (vph) | 523 | 1621 | 3 | 12 | 2476 | 0 | 0 | 16 | 0 | 538 | 49 | 404 |
| Future Volume (vph) | 523 | 1621 | 3 | 12 | 2476 | 0 | 0 | 16 | 0 | 538 | 49 | 404 |
| Ideal Flow (vphpl) | 2150 | 1900 | 1900 | 1900 | 2150 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.0 |
| Total Lost time (s) | 3.0 | 5.0 | | 5.0 | 3.0 | | | 8.0 | | 7.0 | 7.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.91 | | 1.00 | *0.95 | | | 1.00 | | 0.95 | 0.95 | 1.00 |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.95 |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | | 1.00 | | 0.95 | 0.96 | 1.00 |
| Satd. Flow (prot) | 1816 | 4793 | | 1685 | 5883 | | | 1879 | | 1585 | 1699 | 1431 |
| Flt Permitted | 0.07 | 1.00 | | 0.10 | 1.00 | | | 1.00 | | 0.75 | 0.75 | 1.00 |
| Satd. Flow (perm) | 138 | 4793 | | 170 | 5883 | | | 1879 | | 1245 | 1327 | 1431 |
| Peak-hour factor, PHF | 0.90 | 0.95 | 0.95 | 0.90 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 581 | 1706 | 3 | 13 | 2606 | 0 | 0 | 17 | 0 | 566 | 52 | 425 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 133 |
| Lane Group Flow (vph) | 581 | 1709 | 0 | 13 | 2606 | 0 | 0 | 17 | 0 | 306 | 312 | 292 |
| Confl. Peds. (#/hr) | 5 | | 8 | 8 | | 5 | 46 | | | | | 46 |
| Confl. Bikes (#/hr) | | | | | | | | | 16 | | | 38 |
| Heavy Vehicles (%) | 5% | 7% | 0% | 0% | 3% | 0% | 0% | 0% | 0% | 1% | 0% | 0% |
| Turn Type | pm+pt | NA | | pm+pt | NA | | | NA | | Perm | NA | pm+ov |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 3 | | | 4 | 5 |
| Permitted Phases | 2 | | | 6 | | | 3 | | | 4 | | 4 |
| Actuated Green, G (s) | 76.5 | 68.3 | | 51.5 | 49.3 | | | 4.3 | | 35.2 | 35.2 | 56.4 |
| Effective Green, g (s) | 79.5 | 69.3 | | 53.5 | 52.3 | | | 5.3 | | 36.2 | 36.2 | 58.4 |
| Actuated g/C Ratio | 0.57 | 0.50 | | 0.38 | 0.38 | | | 0.04 | | 0.26 | 0.26 | 0.42 |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | | 9.0 | | 8.0 | 8.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 371 | 2389 | | 100 | 2213 | | | 71 | | 324 | 345 | 601 |
| v/s Ratio Prot | c0.27 | 0.36 | | 0.00 | 0.44 | | | c0.01 | | | | 0.08 |
| v/s Ratio Perm | c0.62 | | | 0.05 | | | | | | c0.25 | 0.24 | 0.13 |
| v/c Ratio | 1.57 | 0.72 | | 0.13 | 1.18 | | | 0.24 | | 0.94 | 0.90 | 0.49 |
| Uniform Delay, d1 | 46.5 | 27.2 | | 27.2 | 43.4 | | | 64.9 | | 50.4 | 49.7 | 29.4 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 267.5 | 1.9 | | 0.6 | 85.0 | | | 1.7 | | 35.4 | 25.9 | 0.6 |
| Delay (s) | 314.0 | 29.0 | | 27.8 | 128.3 | | | 66.6 | | 85.8 | 75.6 | 30.0 |
| Level of Service | F | С | | С | F | | | Е | | F | Е | С |
| Approach Delay (s) | | 101.3 | | | 127.8 | | | 66.6 | | | 60.0 | |
| Approach LOS | | F | | | F | | | Е | | | Е | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 105.6 | Н | CM 2000 | Level of S | Service | | F | | | |
| HCM 2000 Volume to Capac | ity ratio | | 1.40 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 139.0 | S | um of los | t time (s) | | | 25.0 | | | |
| Intersection Capacity Utilizati | ion | | 109.5% | IC | CU Level | of Service | | | Н | | | _ |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

| HCM 2000 Control Delay | 105.6 | HCM 2000 Level of Service | F | |
|-----------------------------------|--------|---------------------------|------|--|
| HCM 2000 Volume to Capacity ratio | 1.40 | | | |
| Actuated Cycle Length (s) | 139.0 | Sum of lost time (s) | 25.0 | |
| Intersection Capacity Utilization | 109.5% | ICU Level of Service | Н | |
| Analysis Period (min) | 15 | | | |
| c Critical Lane Group | | | | |

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

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

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings 538: Strachan Ave & King St

09/30/2021

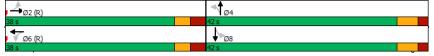
| | ۶ | - | \rightarrow | • | ← | • | 4 | † | 1 | / | ţ | 4 |
|----------------------------|-------|-------|---------------|-------|----------|-------|-------|----------------|-------|----------|-------|--------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 4î> | | | 414 | | ሻ | (î | | ሻ | f) | |
| Traffic Volume (vph) | 0 | 472 | 100 | 4 | 845 | 68 | 275 | 358 | 169 | 27 | 236 | 27 |
| Future Volume (vph) | 0 | 472 | 100 | 4 | 845 | 68 | 275 | 358 | 169 | 27 | 236 | 27 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 0.0 | 25.0 | | 0.0 | 25.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 0 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | 0.93 | | | 0.99 | | 0.88 | 0.96 | | 0.97 | 0.98 | |
| Frt | | 0.974 | | | 0.989 | | | 0.952 | | | 0.984 | |
| Fit Protected | | | | | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 0 | 2566 | 0 | 0 | 2866 | 0 | 1486 | 1536 | 0 | 1516 | 1614 | 0 |
| Flt Permitted | | 2000 | | | 0.953 | | 0.541 | .000 | | 0.276 | | ŭ |
| Satd. Flow (perm) | 0 | 2566 | 0 | 0 | 2729 | 0 | 743 | 1536 | 0 | 427 | 1614 | 0 |
| Right Turn on Red | | 2000 | Yes | | 2120 | Yes | 7 10 | 1000 | Yes | 12/ | 1014 | Yes |
| Satd. Flow (RTOR) | | 38 | 100 | | 13 | 100 | | 40 | 100 | | 10 | 100 |
| Link Speed (k/h) | | 50 | | | 50 | | | 40 | | | 40 | |
| Link Distance (m) | | 255.2 | | | 358.6 | | | 424.1 | | | 379.9 | |
| Travel Time (s) | | 18.4 | | | 25.8 | | | 38.2 | | | 34.2 | |
| Confl. Peds. (#/hr) | 83 | 10.4 | 194 | 194 | 25.0 | 83 | 170 | 30.2 | 89 | 89 | J4.Z | 170 |
| Confl. Bikes (#/hr) | 00 | | 9 | 134 | | 7 | 170 | | 26 | 03 | | 6 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles (%) | 0.34 | 6% | 17% | 100% | 4% | 0.94 | 2% | 1% | 0.34 | 0.94 | 1% | 0.94 |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 /0 | 0 /8 | 0 | 0 /8 |
| Adj. Flow (vph) | 0 | 502 | 106 | 4 | 899 | 72 | 293 | 381 | 180 | 29 | 251 | 29 |
| Shared Lane Traffic (%) | U | 302 | 100 | 4 | 099 | 12 | 293 | 301 | 100 | 23 | 201 | 29 |
| Lane Group Flow (vph) | 0 | 608 | 0 | 0 | 975 | 0 | 293 | 561 | 0 | 29 | 280 | 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) | Leit | 0.0 | Rigit | Leit | 0.0 | Rigit | Leit | 3.0 | Rigit | Leit | 3.0 | Rigiil |
| | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Link Offset(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Crosswalk Width(m) | | 1.0 | | | 1.0 | | | 1.0 | | | 1.0 | |
| Two way Left Turn Lane | 4.40 | 4.00 | 4.40 | 4.40 | 4.00 | 1.16 | 4.05 | 4.40 | 1.16 | 4.05 | 4.40 | 1.16 |
| Headway Factor | 1.16 | 1.23 | 1.16 | 1.16 | 1.23 | 1.16 | 1.25 | 1.16 | 1.16 | 1.25 | 1.16 | |
| Turning Speed (k/h) | | 0 | 14 | | 2 | 14 | | 2 | 14 | 1 | 2 | 14 |
| Number of Detectors | 1 | 2 | | 1 | | | 1 | | | | | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 9 Lanes, Volumes, Timings 538: Strachan Ave & King St

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|------------------------------|-------------|-----------|----------|-----------|-------------|------------|-------|----------|-----|-------|-------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Detector 2 Type | | Cl+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 4 | | | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Detector Phase | 2 | 2 | | 6 | 6 | | 4 | 4 | | 8 | 8 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 21.0 | 21.0 | | 21.0 | 21.0 | |
| Minimum Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 27.0 | 27.0 | | 27.0 | 27.0 | |
| Total Split (s) | 38.0 | 38.0 | | 38.0 | 38.0 | | 42.0 | 42.0 | | 42.0 | 42.0 | |
| Total Split (%) | 47.5% | 47.5% | | 47.5% | 47.5% | | 52.5% | 52.5% | | 52.5% | 52.5% | |
| Maximum Green (s) | 32.0 | 32.0 | | 32.0 | 32.0 | | 36.0 | 36.0 | | 36.0 | 36.0 | |
| Yellow Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | -1.0 | | | -1.0 | | -1.0 | -1.0 | | -1.0 | -1.0 | |
| Total Lost Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | C-Max | C-Max | | C-Max | C-Max | | Max | Max | | Max | Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 13.0 | 13.0 | | 13.0 | 13.0 | | 14.0 | 14.0 | | 14.0 | 14.0 | |
| Pedestrian Calls (#/hr) | 100 | 100 | | 25 | 25 | | 27 | 27 | | 100 | 100 | |
| Act Effct Green (s) | | 33.0 | | | 33.0 | | 37.0 | 37.0 | | 37.0 | 37.0 | |
| Actuated g/C Ratio | | 0.41 | | | 0.41 | | 0.46 | 0.46 | | 0.46 | 0.46 | |
| v/c Ratio | | 0.56 | | | 0.86 | | 0.85 | 0.77 | | 0.15 | 0.37 | |
| Control Delay | | 19.2 | | | 20.3 | | 45.2 | 25.3 | | 22.5 | 23.9 | |
| Queue Delay | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | | 19.2 | | | 20.3 | | 45.2 | 25.3 | | 22.5 | 23.9 | |
| LOS | | В | | | С | | D | С | | C | С | |
| Approach Delay | | 19.2 | | | 20.3 | | | 32.1 | | | 23.8 | |
| Approach LOS | | В | | | С | | | С | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | CBD | | | | | | | | | | | |
| Cycle Length: 80 | | | | | | | | | | | | |
| Actuated Cycle Length: 80 | | | | | | | | | | | | |
| Offset: 50 (63%), Reference | ed to phase | 2:EBTL a | and 6:WB | TL, Start | of 1st Gre | en | | | | | | |
| Natural Cycle: 55 | | | | | | | | | | | | |
| Control Type: Actuated-Co | ordinated | | | | | | | | | | | |
| Maximum v/c Ratio: 0.86 | | | | | | | | | | | | |
| Intersection Signal Delay: | 24.1 | | | li li | ntersection | LOS: C | | | | | | |
| Intersection Capacity Utiliz | ation 96.1% | | | 10 | CU Level o | of Service | F | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Califo and Dhases, 500: | Ctracker A | 0 I/ir- | Ct | | | | | | | | | |
| Splits and Phases: 538: | Strachan A | ve a ring | ા | | | | | | | | | |



538: Strachan Ave & King St

09/30/2021

Synchro 11 Report

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|------------------------|-------|-------|-------|--------|------|-------|
| Lane Group | EBT | WBT | NBL | NBT | SBL | SBT |
| Lane Group Flow (vph) | 608 | 975 | 293 | 561 | 29 | 280 |
| v/c Ratio | 0.56 | 0.86 | 0.85 | 0.77 | 0.15 | 0.37 |
| Control Delay | 19.2 | 20.3 | 45.2 | 25.3 | 22.5 | 23.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 19.2 | 20.3 | 45.2 | 25.3 | 22.5 | 23.9 |
| Queue Length 50th (m) | 33.7 | 44.5 | 37.8 | 63.4 | 3.6 | 37.9 |
| Queue Length 95th (m) | 49.3 | #71.0 | #84.2 | #107.3 | m7.6 | m57.3 |
| Internal Link Dist (m) | 231.2 | 334.6 | | 400.1 | | 355.9 |
| Turn Bay Length (m) | | | 25.0 | | 25.0 | |
| Base Capacity (vph) | 1080 | 1133 | 343 | 731 | 197 | 751 |
| 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 | 0.56 | 0.86 | 0.85 | 0.77 | 0.15 | 0.37 |

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

538: Strachan Ave & King St

09/30/2021

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|-----------------------------------|---------|----------|-------|------|--------------------------|------------|----------|------------|-----------|----------|----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 414 | | | 414 | | ሻ | 1 2 | | ሻ | î, | |
| Traffic Volume (vph) | 0 | 472 | 100 | 4 | 845 | 68 | 275 | 358 | 169 | 27 | 236 | 27 |
| Future Volume (vph) | 0 | 472 | 100 | 4 | 845 | 68 | 275 | 358 | 169 | 27 | 236 | 27 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frpb, ped/bikes | | 0.93 | | | 0.99 | | 1.00 | 0.96 | | 1.00 | 0.98 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | 0.88 | 1.00 | | 0.97 | 1.00 | |
| Frt | | 0.97 | | | 0.99 | | 1.00 | 0.95 | | 1.00 | 0.98 | |
| Flt Protected | | 1.00 | | | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 2565 | | | 2863 | | 1304 | 1536 | | 1470 | 1615 | |
| Flt Permitted | | 1.00 | | | 0.95 | | 0.54 | 1.00 | | 0.28 | 1.00 | |
| Satd. Flow (perm) | | 2565 | | | 2728 | | 743 | 1536 | | 428 | 1615 | |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 0 | 502 | 106 | 4 | 899 | 72 | 293 | 381 | 180 | 29 | 251 | 29 |
| RTOR Reduction (vph) | 0 | 22 | 0 | 0 | 8 | 0 | 0 | 22 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 0 | 586 | 0 | 0 | 967 | 0 | 293 | 540 | 0 | 29 | 275 | 0 |
| Confl. Peds. (#/hr) | 83 | | 194 | 194 | | 83 | 170 | | 89 | 89 | | 170 |
| Confl. Bikes (#/hr) | | | 9 | | | 7 | | | 26 | | | 6 |
| Heavy Vehicles (%) | 0% | 6% | 17% | 100% | 4% | 0% | 2% | 1% | 0% | 0% | 1% | 0% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Turn Type | | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 4 | | | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | | 32.0 | | | 32.0 | | 36.0 | 36.0 | | 36.0 | 36.0 | |
| Effective Green, q (s) | | 33.0 | | | 33.0 | | 37.0 | 37.0 | | 37.0 | 37.0 | |
| Actuated g/C Ratio | | 0.41 | | | 0.41 | | 0.46 | 0.46 | | 0.46 | 0.46 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 1058 | | | 1125 | | 343 | 710 | | 197 | 746 | |
| v/s Ratio Prot | | 0.23 | | | | | | 0.35 | | | 0.17 | |
| v/s Ratio Perm | | | | | c0.35 | | c0.39 | | | 0.07 | • | |
| v/c Ratio | | 0.55 | | | 0.86 | | 0.85 | 0.76 | | 0.15 | 0.37 | |
| Uniform Delay, d1 | | 17.9 | | | 21.4 | | 19.1 | 17.8 | | 12.4 | 13.9 | |
| Progression Factor | | 1.00 | | | 0.50 | | 1.00 | 1.00 | | 1.59 | 1.64 | |
| Incremental Delay, d2 | | 2.1 | | | 8.5 | | 22.8 | 7.5 | | 1.4 | 1.3 | |
| Delay (s) | | 20.0 | | | 19.2 | | 41.9 | 25.3 | | 21.1 | 24.1 | |
| Level of Service | | В | | | В | | D | С | | С | С | |
| Approach Delay (s) | | 20.0 | | | 19.2 | | | 31.0 | | | 23.8 | |
| Approach LOS | | В | | | В | | | C | | | C | |
| Intersection Summary | | _ | | | _ | | | _ | | | - | |
| HCM 2000 Control Delay | | | 23.6 | U | CM 2000 | Lovel of G | Sorvico | | С | | | |
| HCM 2000 Volume to Capacity | , ratio | | 0.86 | П | CIVI 2000 | revei oi s | DEI VICE | | U | | | |
| Actuated Cycle Length (s) | Tallo | | 80.0 | 0 | um of lost | time (c) | | | 10.0 | | | |
| Intersection Capacity Utilization | n . | | 96.1% | | um of lost CU Level o | | | | 10.0 F | | | |
| Analysis Period (min) | | | 96.1% | IC | o Level (| o Service | | | г | | | |
| c Critical Lane Group | | | 13 | | | | | | | | | |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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

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

09/30/2021

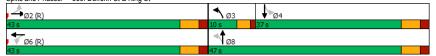
| 74 74 |
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| 74 |
| 14 |
| 1900 |
| 0.95 |
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| 0 |
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| 0 |
| Yes |
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| 331 |
| 12 |
| 0.87 |
| 5% |
| 18 |
| 85 |
| |
| 0 |
| No |
| Right |
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| 1.16 |
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Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 13 Lanes, Volumes, Timings 539: Dufferin St & King St

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|-------------------------------|--------------|-----------|------------|------------|------------|------------|-----|----------|-------------|-------------|------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Actuated g/C Ratio | | 0.42 | | | 0.42 | | | 0.47 | | | 0.37 | |
| v/c Ratio | | 1.04dl | | | 1.00 | | | 0.80 | | | 0.97 | |
| Control Delay | | 55.7 | | | 53.8 | | | 26.8 | | | 58.6 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 55.7 | | | 53.8 | | | 26.8 | | | 58.6 | |
| LOS | | Е | | | D | | | С | | | Е | |
| Approach Delay | | 55.7 | | | 53.8 | | | 26.8 | | | 58.6 | |
| Approach LOS | | Е | | | D | | | С | | | Е | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | CBD | | | | | | | | | | | |
| Cycle Length: 90 | | | | | | | | | | | | |
| Actuated Cycle Length: 90 | | | | | | | | | | | | |
| Offset: 0 (0%), Referenced | to phase 2:I | EBTL and | 6:WBTL | , Start of | 1st Green | | | | | | | |
| Natural Cycle: 90 | | | | | | | | | | | | |
| Control Type: Pretimed | | | | | | | | | | | | |
| Maximum v/c Ratio: 1.00 | | | | | | | | | | | | |
| Intersection Signal Delay: 4 | 8.0 | | | In | tersection | LOS: D | | | | | | |
| Intersection Capacity Utiliza | tion 106.8% | Ď | | IC | U Level o | of Service | G | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| dl Defacto Left Lane. Rec | code with 1 | though la | ne as a le | eft lane. | | | | | | | | |

Splits and Phases: 539: Dufferin St & King St



539: Dufferin St & King St

09/30/2021

| | - | - | - ↑ | Ţ |
|--|--------|--------|-------|-------|
| | | | • | * |
| Lane Group | EBT | WBT | NBT | SBT |
| Lane Group Flow (vph) | 688 | 1083 | 843 | 593 |
| v/c Ratio | 1.04dl | 1.00 | 0.80 | 0.97 |
| Control Delay | 55.7 | 53.8 | 26.8 | 58.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 55.7 | 53.8 | 26.8 | 58.6 |
| Queue Length 50th (m) | 59.0 | 94.5 | 56.6 | 50.5 |
| Queue Length 95th (m) | #92.2 | #133.0 | 73.1 | #81.3 |
| Internal Link Dist (m) | 267.1 | 292.7 | 188.5 | 361.1 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 704 | 1085 | 1055 | 611 |
| Starvation Cap Reductn | n 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.98 | 1.00 | 0.80 | 0.97 |
| Spillback Cap Reductn Storage Cap Reductn | 0 | 0 | 0 | 0 |

HCM Signalized Intersection Capacity Analysis 539: Dufferin St & King St

| 09/30/2021 |
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| | • | → | • | • | • | • | 1 | † | 1 | - | ţ | 4 |
|---|------------|-----------|--------|----------|-----------|-----------|---------|-----------|-----------|---------|-----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 414 | | | 414 | | | 414 | | | 414 | |
| Traffic Volume (vph) | 81 | 464 | 54 | 33 | 805 | 104 | 54 | 638 | 42 | 113 | 329 | 74 |
| Future Volume (vph) | 81 | 464 | 54 | 33 | 805 | 104 | 54 | 638 | 42 | 113 | 329 | 74 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 4.0 | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | | 0.97 | | | 0.96 | | | 0.98 | | | 0.95 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | | 0.99 | | | 0.98 | |
| Frt | | 0.99 | | | 0.98 | | | 0.99 | | | 0.98 | |
| Flt Protected | | 0.99 | | | 1.00 | | | 1.00 | | | 0.99 | |
| Satd. Flow (prot) | | 2876 | | | 2812 | | | 2669 | | | 2538 | |
| Flt Permitted | | 0.57 | | | 0.90 | | | 0.82 | | | 0.63 | |
| Satd. Flow (perm) | | 1651 | | | 2547 | | | 2196 | | | 1626 | |
| Peak-hour factor, PHF | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Adj. Flow (vph) | 93 | 533 | 62 | 38 | 925 | 120 | 62 | 733 | 48 | 130 | 378 | 85 |
| RTOR Reduction (vph) | 0 | 8 | 0 | 0 | 10 | 0 | 0 | 5 | 0 | 0 | 15 | 0 |
| Lane Group Flow (vph) | 0 | 680 | 0 | 0 | 1073 | 0 | 0 | 838 | 0 | 0 | 578 | 0 |
| Confl. Peds. (#/hr) | 296 | | 328 | 328 | | 296 | 331 | | 287 | 287 | | 331 |
| Confl. Bikes (#/hr) | | | 7 | | | 80 | | | 128 | | | 12 |
| Heavy Vehicles (%) | 6% | 3% | 4% | 2% | 2% | 4% | 7% | 9% | 9% | 5% | 13% | 5% |
| Bus Blockages (#/hr) | 12 | 12 | 12 | 24 | 24 | 24 | 12 | 30 | 30 | 0 | 18 | 18 |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | 1 01111 | 2 | | 1 01111 | 6 | | 3 | 8 | | 1 01111 | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | _ | 37.0 | | · | 37.0 | | · | 41.0 | | • | 31.0 | |
| Effective Green, g (s) | | 38.0 | | | 38.0 | | | 42.0 | | | 33.0 | |
| Actuated g/C Ratio | | 0.42 | | | 0.42 | | | 0.47 | | | 0.37 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | |
| Lane Grp Cap (vph) | | 697 | | | 1075 | | | 1061 | | | 596 | |
| v/s Ratio Prot | | 001 | | | 1075 | | | c0.06 | | | 330 | |
| v/s Ratio Perm | | 0.41 | | | c0.42 | | | 0.31 | | | c0.36 | |
| v/c Ratio | | 1.04dl | | | 1.00 | | | 0.79 | | | 0.97 | |
| Uniform Delay, d1 | | 25.5 | | | 26.0 | | | 20.3 | | | 28.0 | |
| Progression Factor | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | | 28.6 | | | 26.9 | | | 6.0 | | | 30.1 | |
| Delay (s) | | 54.1 | | | 52.9 | | | 26.3 | | | 58.1 | |
| Level of Service | | D D | | | J2.9 D | | | 20.5 C | | | 50.1 E | |
| Approach Delay (s) | | 54.1 | | | 52.9 | | | 26.3 | | | 58.1 | |
| Approach LOS | | J4.1 | | | J2.9 D | | | 20.5 C | | | 50.1 E | |
| | | | | | U | | | | | | | |
| Intersection Summary HCM 2000 Control Delay | | | 47.1 | - 11 | CM 2000 | Lovelof | Canica | | D | | | |
| HCM 2000 Control Delay | oity rotio | | 0.97 | н | CIVI ZUUU | revei oi | SELVICE | | U | | | |
| Actuated Cycle Length (s) | City ratio | | 90.0 | 0 | um of los | time (c) | | | 12.0 | | | |
| | tion | | 106.8% | | U Level | | | | 12.0 G | | | |
| Intersection Capacity Utilization Analysis Period (min) | uon | | 100.8% | IC | o Level (| o Service | | | G | | | |
| di Defacto Left Lane Rec | odo with 1 | though lo | | off lane | | | | | | | | |

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

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Detector 2 Type

Synchro 11 Report Page 18

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|----------------------------|-------|------------|---------|-------|----------|---------|-------|----------|-------------|-------|----------|--------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ሻ | 1 > | | | ર્ન | 7 | ሻ | ^ | | ሻ | ^ | |
| Traffic Volume (vph) | 139 | 7 | 208 | 77 | 88 | 61 | 125 | 486 | 87 | 89 | 725 | 67 |
| Future Volume (vph) | 139 | 7 | 208 | 77 | 88 | 61 | 125 | 486 | 87 | 89 | 725 | 67 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| Storage Length (m) | 25.0 | | 0.0 | 0.0 | | 50.0 | 30.0 | | 0.0 | 25.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 0 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| 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 |
| Ped Bike Factor | 0.78 | 0.85 | | | 0.96 | 0.68 | | 0.98 | | 0.98 | 0.99 | |
| Frt | | 0.855 | | | | 0.850 | | 0.977 | | | 0.987 | |
| Flt Protected | 0.950 | | | | 0.977 | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1589 | 1287 | 0 | 0 | 1605 | 1507 | 1652 | 1683 | 0 | 1574 | 1708 | 0 |
| Flt Permitted | 0.559 | | | | 0.561 | | 0.069 | | | 0.324 | | |
| Satd. Flow (perm) | 732 | 1287 | 0 | 0 | 888 | 1019 | 120 | 1683 | 0 | 524 | 1708 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 219 | | | | 191 | | 7 | | | 3 | |
| Link Speed (k/h) | | 30 | | | 50 | | | 40 | | | 40 | |
| Link Distance (m) | | 143.4 | | | 229.0 | | | 205.6 | | | 241.4 | |
| Travel Time (s) | | 17.2 | | | 16.5 | | | 18.5 | | | 21.7 | |
| Confl. Peds. (#/hr) | 129 | | 55 | 55 | 10.0 | 129 | 40 | 10.0 | 37 | 37 | | 40 |
| Confl. Bikes (#/hr) | | | 3 | | | 120 | | | 4 | Ŭ. | | 3 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Heavy Vehicles (%) | 6% | 12% | 6% | 1% | 26% | 0% | 2% | 8% | 2% | 7% | 8% | 1% |
| Adj. Flow (vph) | 146 | 7 | 219 | 81 | 93 | 64 | 132 | 512 | 92 | 94 | 763 | 71 |
| Shared Lane Traffic (%) | | | | | | | | · · · · | | | | |
| Lane Group Flow (vph) | 146 | 226 | 0 | 0 | 174 | 64 | 132 | 604 | 0 | 94 | 834 | 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) | 2011 | 3.0 | . ug.ic | 20.0 | 3.0 | , again | 20.0 | 3.5 | rugiii | 20.0 | 3.5 | . ug.u |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.09 | 1.01 | 1.01 | 1.01 | 1.01 | 1.09 | 1.09 | 1.01 | 1.01 | 1.09 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 1.01 | 14 | 24 | 1.01 | 14 | 24 | 1.01 | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | 2.0 | 2.0 | 30.5 | | 2.0 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | 2.0 | 2.0 | 1.8 | | 2.0 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | CI+Ex | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | J/ | | | · | | J/ | A | n | | J/ | n | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | 0.0 | 28.7 | | 0.0 | 28.7 | 0.0 | 0.0 | 28.7 | | 0.0 | 28.7 | |
| | | | | | | | | | | | | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |

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|---|--------------------------|-------------|-----------|-------------|-------------|-------------|------------|---------------|-----|---------------|-------------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | Perm | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | 8 | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | 20.0 | | 00.0 | | | | |
| Minimum Initial (s) | 32.0 | 32.0 | | 32.0 | 32.0 | 32.0 | 7.0 | 29.0 | | 29.0 | 29.0 | |
| Minimum Split (s) | 39.0 | 39.0 | | 39.0 | 39.0 | 39.0 | 14.0 | 36.0 | | 36.0 | 36.0 | |
| Total Split (s) | 39.0 | 39.0 | | 39.0 | 39.0 | 39.0 | 14.0 | 71.0 | | 57.0 37.0% | 57.0 | |
| Total Split (%) | 25.3% | 25.3% | | 25.3% | 25.3% | 25.3% | 9.1% | 46.1% 64.0 | | | 37.0% | |
| Maximum Green (s) Yellow Time (s) | 32.0 4.0 | 32.0 4.0 | | 32.0 4.0 | 32.0 4.0 | 32.0 4.0 | 7.0 4.0 | 3.0 | | 50.0 | 50.0 3.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 4.0 | | 4.0 | 4.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | | 3.0 | -1.0 | -1.0 | -1.0 | -1.0 | | -1.0 | -1.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lead/Lag | 0.0 | 0.0 | | | 0.0 | 0.0 | Lead | 0.0 | | Lag | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | | | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | Max | Max | | Max | Max | Max | None | Max | | Max | Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | 7.0 | 110110 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 25.0 | 25.0 | | 25.0 | 25.0 | 25.0 | | 22.0 | | 22.0 | 22.0 | |
| Pedestrian Calls (#/hr) | 18 | 18 | | 100 | 100 | 100 | | 11 | | 12 | 12 | |
| Act Effct Green (s) | 33.5 | 33.5 | | | 33.5 | 33.5 | 65.9 | 65.9 | | 51.7 | 51.7 | |
| Actuated g/C Ratio | 0.27 | 0.27 | | | 0.27 | 0.27 | 0.54 | 0.54 | | 0.42 | 0.42 | |
| v/c Ratio | 0.73 | 0.44 | | | 0.72 | 0.15 | 0.80 | 0.66 | | 0.43 | 1.15 | |
| Control Delay | 65.4 | 9.0 | | | 60.7 | 0.8 | 56.8 | 27.3 | | 36.6 | 116.2 | |
| Queue Delay | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 1.3 | | 0.0 | 0.0 | |
| Total Delay | 65.4 | 9.0 | | | 60.7 | 0.8 | 56.8 | 28.5 | | 36.6 | 116.2 | |
| LOS | E | Α | | | Е | Α | Е | С | | D | F | |
| Approach Delay | | 31.1 | | | 44.6 | | | 33.6 | | | 108.1 | |
| Approach LOS | | С | | | D | | | С | | | F | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 154 | | | | | | | | | | | | |
| Actuated Cycle Length: 122 | 2 | | | | | | | | | | | |
| Natural Cycle: 145 | | | | | | | | | | | | |
| Control Type: Semi Act-Un | coord | | | | | | | | | | | |
| Maximum v/c Ratio: 1.15 | | | | | | | | | | | | |
| Intersection Signal Delay: 6 | | | | | ntersectio | | | | | | | |
| Intersection Capacity Utilization 128.8% ICU Level of Service H | | | | | | | | | | | | |
| Analysis Period (min) 15 | Analysis Period (min) 15 | | | | | | | | | | | |
| Splits and Phases: 571: | Strachan A | ve & Cana | da Blvd/F | leet St | | | | | | | | |

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9014

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements

HDR Corporation

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#1_{Ø16}

Synchro 11 Report Page 19

| Lane Group | Ø10 | Ø12 | Ø14 | Ø16 |
|-------------------------|------|------|------|------|
| Detector 2 Channel | | | | |
| Detector 2 Extend (s) | | | | |
| Turn Type | | | | |
| Protected Phases | 10 | 12 | 14 | 16 |
| Permitted Phases | | | | |
| Detector Phase | | | | |
| Switch Phase | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | 7.0 |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 |
| Total Split (s) | 22.0 | 22.0 | 22.0 | 22.0 |
| Total Split (%) | 14% | 14% | 14% | 14% |
| Maximum Green (s) | 14.0 | 14.0 | 14.0 | 14.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 4.0 | 4.0 | 4.0 | 4.0 |
| Lost Time Adjust (s) | | | | |
| Total Lost Time (s) | | | | |
| Lead/Lag | | | | |
| Lead-Lag Optimize? | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None |
| Walk Time (s) | 0.0 | 0.0 | 0.0 | 0.0 |
| Flash Dont Walk (s) | 0.0 | 0.0 | 0.0 | 0.0 |
| Pedestrian Calls (#/hr) | 16 | 16 | 16 | 16 |
| Act Effct Green (s) | | | | |
| Actuated g/C Ratio | | | | |
| v/c Ratio | | | | |
| Control Delay | | | | |
| Queue Delay | | | | |
| Total Delay | | | | |
| LOS | | | | |
| Approach Delay | | | | |
| Approach LOS | | | | |
| Internation Comments | | | | |

HDR Corporation

Lanes, Volumes, Timings 571: Strachan Ave & Canada Blvd/Fleet St

Synchro 11 Report

Page 21

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|------------------------|-------|-------|-------|------|-------|----------|------|----------|--|
| Lane Group | EBL | EBT | WBT | WBR | NBL | NBT | SBL | SBT | |
| Lane Group Flow (vph) | 146 | 226 | 174 | 64 | 132 | 604 | 94 | 834 | |
| v/c Ratio | 0.73 | 0.44 | 0.72 | 0.15 | 0.80 | 0.66 | 0.43 | 1.15 | |
| Control Delay | 65.4 | 9.0 | 60.7 | 0.8 | 56.8 | 27.3 | 36.6 | 116.2 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 | 0.0 | 0.0 | |
| Total Delay | 65.4 | 9.0 | 60.7 | 0.8 | 56.8 | 28.5 | 36.6 | 116.2 | |
| Queue Length 50th (m) | 27.3 | 1.1 | 32.5 | 0.0 | 13.4 | 76.6 | 12.8 | ~195.8 | |
| Queue Length 95th (m) | #78.0 | 23.7 | #86.9 | 0.0 | #62.7 | 185.1 | 39.6 | #379.1 | |
| Internal Link Dist (m) | | 119.4 | 205.0 | | | 181.6 | | 217.4 | |
| Turn Bay Length (m) | 25.0 | | | 50.0 | 30.0 | | 25.0 | | |
| Base Capacity (vph) | 200 | 511 | 243 | 418 | 166 | 912 | 221 | 725 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 138 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.73 | 0.44 | 0.72 | 0.15 | 0.80 | 0.78 | 0.43 | 1.15 | |

| or i. Strachan Ave | & Carra | ua Div | u/i icc | ιοι | | | | | | | 00/0 | TOTEGET |
|-------------------------------|------------|----------|---------|------|-----------|-------------|---------|----------|-------------------|-------------|----------|---------|
| | ۶ | → | • | • | ← | • | 4 | † | / | > | ↓ | 1 |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ٦ | ĵ. | | | ની | 7 | , j | ĥ | | Ţ | ĥ | |
| Traffic Volume (vph) | 139 | 7 | 208 | 77 | 88 | 61 | 125 | 486 | 87 | 89 | 725 | 67 |
| Future Volume (vph) | 139 | 7 | 208 | 77 | 88 | 61 | 125 | 486 | 87 | 89 | 725 | 67 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.0 | 3.5 | 3.5 | 3.0 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frpb, ped/bikes | 1.00 | 0.87 | | | 1.00 | 0.72 | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flpb, ped/bikes | 0.81 | 1.00 | | | 0.97 | 1.00 | 1.00 | 1.00 | | 0.97 | 1.00 | |
| Frt | 1.00 | 0.85 | | | 1.00 | 0.85 | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | | 0.98 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1281 | 1314 | | | 1551 | 1084 | 1652 | 1687 | | 1530 | 1711 | |
| Flt Permitted | 0.56 | 1.00 | | | 0.56 | 1.00 | 0.07 | 1.00 | | 0.32 | 1.00 | |
| Satd. Flow (perm) | 753 | 1314 | | | 891 | 1084 | 120 | 1687 | | 522 | 1711 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 146 | 7 | 219 | 81 | 93 | 64 | 132 | 512 | 92 | 94 | 763 | 71 |
| RTOR Reduction (vph) | 0 | 164 | 0 | 0 | 0 | 48 | 0 | 4 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 146 | 62 | 0 | 0 | 174 | 16 | 132 | 600 | 0 | 94 | 832 | 0 |
| Confl. Peds. (#/hr) | 129 | | 55 | 55 | | 129 | 40 | | 37 | 37 | | 40 |
| Confl. Bikes (#/hr) | | | 3 | | | | | | 4 | | | 3 |
| Heavy Vehicles (%) | 6% | 12% | 6% | 1% | 26% | 0% | 2% | 8% | 2% | 7% | 8% | 1% |
| Turn Type | Perm | NA | | Perm | NA | Perm | pm+pt | NA | | Perm | NA | - 77 |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | _ | | 6 | | |
| Actuated Green, G (s) | 32.4 | 32.4 | | · | 32.4 | 32.4 | 64.9 | 64.9 | | 50.8 | 50.8 | |
| Effective Green, q (s) | 33.4 | 33.4 | | | 33.4 | 33.4 | 65.9 | 65.9 | | 51.8 | 51.8 | |
| Actuated g/C Ratio | 0.25 | 0.25 | | | 0.25 | 0.25 | 0.50 | 0.50 | | 0.39 | 0.39 | |
| Clearance Time (s) | 7.0 | 7.0 | | | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 190 | 332 | | | 225 | 274 | 153 | 841 | | 204 | 670 | |
| v/s Ratio Prot | 130 | 0.05 | | | 220 | 217 | 0.05 | c0.36 | | 204 | c0.49 | |
| v/s Ratio Perm | 0.19 | 0.00 | | | c0.20 | 0.01 | 0.37 | 00.00 | | 0.18 | 60.43 | |
| v/c Ratio | 0.77 | 0.19 | | | 0.77 | 0.06 | 0.86 | 0.71 | | 0.46 | 1.24 | |
| Uniform Delay, d1 | 45.8 | 38.7 | | | 45.8 | 37.4 | 32.7 | 25.8 | | 29.8 | 40.1 | |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 25.3 | 1.2 | | | 22.4 | 0.4 | 36.2 | 5.1 | | 7.3 | 121.3 | |
| Delay (s) | 71.1 | 40.0 | | | 68.2 | 37.8 | 68.9 | 30.9 | | 37.1 | 161.5 | |
| Level of Service | Ε. | D | | | E | D | E | C | | D | F | |
| Approach Delay (s) | _ | 52.2 | | | 60.0 | | _ | 37.7 | | | 148.9 | |
| Approach LOS | | D D | | | 00.0 E | | | D | | | F | |
| Intersection Summary | | | | | _ | | | | | | | |
| HCM 2000 Control Delay | | | 87.8 | Н | CM 2000 | Level of | Service | | F | | | |
| HCM 2000 Volume to Capa | city ratio | | 1.00 | - 11 | O.W. 2000 | 2040101 | COLAICO | | | | | |
| Actuated Cycle Length (s) | only rutto | | 132.1 | S | um of los | t time (s) | | | 34.0 | | | |
| Intersection Capacity Utiliza | tion | | 128.8% | | U Level | | 2 | | л ч. 0 | | | |
| Analysis Period (min) | | | 15 | ic | | J. OGI VICE | | | - '' | | | |
| c Critical Lane Group | | | - 10 | | | | | | | | | |
| 5 S.Mour Lario Group | | | | | | | | | | | | |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements

HDR Corporation

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

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

Queue shown is maximum after two cycles.

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Detector 2 Channel

Synchro 11 Report Page 23 Lanes, Volumes, Timings

1344: Lakeshore Blvd & British Colombia Rd

| | • | - | • | • | ← | • | 1 | † | / | - | ļ | 1 |
|------------------------------|-------------|-----------|-------------|---------|------------|--------------------------|----------|----------|----------|-----|-----|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Detector 2 Extend (s) | | 0.0 | | | | | | 0.0 | | | | |
| Turn Type | Perm | NA | | | | Perm | | NA | | | | |
| Protected Phases | | 4 | | | | | | 2 | | | | |
| Permitted Phases | 4 | | | | | 9 | | | | | | |
| Detector Phase | 4 | 4 | | | | 9 | | 2 | | | | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | | | | 7.0 | | 22.0 | | | | |
| Minimum Split (s) | 13.0 | 13.0 | | | | 30.0 | | 29.0 | | | | |
| Total Split (s) | 37.0 | 37.0 | | | | 30.0 | | 77.0 | | | | |
| Total Split (%) | 25.7% | 25.7% | | | | 20.8% | | 53.5% | | | | |
| Maximum Green (s) | 31.0 | 31.0 | | | | 24.0 | | 70.0 | | | | |
| Yellow Time (s) | 4.0 | 4.0 | | | | 4.0 | | 4.0 | | | | |
| All-Red Time (s) | 2.0 | 2.0 | | | | 2.0 | | 3.0 | | | | |
| Lost Time Adjust (s) | -1.0 | -3.0 | | | | -1.0 | | -1.0 | | | | |
| Total Lost Time (s) | 5.0 | 3.0 | | | | 5.0 | | 6.0 | | | | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | 3.0 | | 3.0 | | | | |
| Recall Mode | None | None | | | | None | | None | | | | |
| Walk Time (s) | 0.0 | 0.0 | | | | | | 7.0 | | | | |
| Flash Dont Walk (s) | 0.0 | 0.0 | | | | | | 15.0 | | | | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | | | | 0 | | | | |
| Act Effct Green (s) | 32.1 | 34.1 | | | | 17.8 | | 71.1 | | | | |
| Actuated g/C Ratio | 0.23 | 0.25 | | | | 0.13 | | 0.52 | | | | |
| v/c Ratio | 0.13 | 1.15 | | | | 0.87 | | 1.17 | | | | |
| Control Delay | 5.3 | 135.1 | | | | 31.8 | | 110.7 | | | | |
| Queue Delay | 0.0 | 0.0 | | | | 0.0 | | 0.0 | | | | |
| Total Delay | 5.3 | 135.1 | | | | 31.8 | | 110.7 | | | | |
| LOS | A | F | | | | С | | F | | | | |
| Approach Delay | ** | 123.0 | | | 31.8 | - | | 110.7 | | | | |
| Approach LOS | | F | | | С | | | F | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 144 | | | | | | | | | | | | |
| Actuated Cycle Length: 13 | 7 | | | | | | | | | | | |
| Natural Cycle: 150 | | | | | | | | | | | | |
| Control Type: Semi Act-Un | coord | | | | | | | | | | | |
| Maximum v/c Ratio: 1.17 | | | | | | | | | | | | |
| Intersection Signal Delay: | | | | | tersection | | | | | | | |
| Intersection Capacity Utiliz | ation 95.9% | | | IC | U Level | of Service | F | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Splits and Phases: 1344 | : Lakeshore | Blvd & Br | ritish Colo | mbia Rd | | | | | | | | |
| ↑ ø₂ | | | | | | <u>_</u> 4 _{Ø4} | | | | Ø9 | | |

1344: Lakeshore Blvd & British Colombia Rd

09/30/2021

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|------------------------|------|--------|------|----------|
| | | • | | ' |
| Lane Group | EBL | EBT | WBR | NBT |
| Lane Group Flow (vph) | 57 | 554 | 627 | 3044 |
| v/c Ratio | 0.13 | 1.15 | 0.87 | 1.17 |
| Control Delay | 5.3 | 135.1 | 31.8 | 110.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 5.3 | 135.1 | 31.8 | 110.7 |
| Queue Length 50th (m) | 0.0 | ~177.0 | 31.6 | ~360.0 |
| Queue Length 95th (m) | 7.1 | #262.6 | 56.7 | #413.3 |
| Internal Link Dist (m) | | 387.9 | | 776.6 |
| Turn Bay Length (m) | 15.0 | | 80.0 | |
| Base Capacity (vph) | 444 | 481 | 841 | 2611 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.13 | 1.15 | 0.75 | 1.17 |

HCM Signalized Intersection Capacity Analysis 1344: Lakeshore Blvd & British Colombia Rd

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|-------------------------------|------------|----------|---------------|------|-----------|------------|---------|----------|------|------|----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | 7 | ^ | | | | 77 | | ተተኈ | | | | |
| Traffic Volume (vph) | 54 | 526 | 0 | 0 | 0 | 596 | 0 | 2888 | 4 | 0 | 0 | 0 |
| Future Volume (vph) | 54 | 526 | 0 | 0 | 0 | 596 | 0 | 2888 | 4 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 2000 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 5.0 | 3.0 | | | | 5.0 | | 6.0 | | | | |
| Lane Util. Factor | 1.00 | 1.00 | | | | 0.88 | | 0.91 | | | | |
| Frpb, ped/bikes | 1.00 | 1.00 | | | | 0.98 | | 1.00 | | | | |
| Flpb, ped/bikes | 1.00 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Frt | 1.00 | 1.00 | | | | 0.85 | | 1.00 | | | | |
| Flt Protected | 0.95 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Satd. Flow (prot) | 1652 | 1939 | | | | 2699 | | 5028 | | | | |
| Flt Permitted | 0.95 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Satd. Flow (perm) | 1652 | 1939 | | | | 2699 | | 5028 | | | | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 57 | 554 | 0 | 0 | 0 | 627 | 0 | 3040 | 4 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 44 | 0 | 0 | 0 | 0 | 370 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 13 | 554 | 0 | 0 | 0 | 257 | 0 | 3044 | 0 | 0 | 0 | 0 |
| Confl. Peds. (#/hr) | | | 1 | 1 | | | | | | | | |
| Confl. Bikes (#/hr) | | | 2 | | | 5 | | | | | | |
| Turn Type | Perm | NA | | | | Perm | | NA | | | | |
| Protected Phases | | 4 | | | | | | 2 | | | | |
| Permitted Phases | 4 | | | | | 9 | | | | | | |
| Actuated Green, G (s) | 31.1 | 31.1 | | | | 16.8 | | 70.1 | | | | |
| Effective Green, g (s) | 32.1 | 34.1 | | | | 17.8 | | 71.1 | | | | |
| Actuated g/C Ratio | 0.23 | 0.25 | | | | 0.13 | | 0.52 | | | | |
| Clearance Time (s) | 6.0 | 6.0 | | | | 6.0 | | 7.0 | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | 3.0 | | 3.0 | | | | |
| Lane Grp Cap (vph) | 387 | 482 | | | | 350 | | 2609 | | | | |
| v/s Ratio Prot | | c0.29 | | | | | | c0.61 | | | | |
| v/s Ratio Perm | 0.01 | | | | | c0.10 | | | | | | |
| v/c Ratio | 0.03 | 1.15 | | | | 0.73 | | 1.17 | | | | |
| Uniform Delay, d1 | 40.5 | 51.5 | | | | 57.3 | | 33.0 | | | | |
| Progression Factor | 1.00 | 1.00 | | | | 1.00 | | 1.00 | | | | |
| Incremental Delay, d2 | 0.0 | 88.9 | | | | 7.8 | | 79.6 | | | | |
| Delay (s) | 40.5 | 140.4 | | | | 65.1 | | 112.5 | | | | |
| Level of Service | D | F | | | | Е | | F | | | | |
| Approach Delay (s) | | 131.1 | | | 65.1 | | | 112.5 | | | 0.0 | |
| Approach LOS | | F | | | Е | | | F | | | Α | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 108.2 | Н | CM 2000 | Level of | Service | | F | | | |
| HCM 2000 Volume to Capa | city ratio | | 1.11 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 137.0 | | um of los | | | | 15.0 | | | |
| Intersection Capacity Utiliza | ation | | 95.9% | IC | U Level | of Service | | | F | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

| HCM 2000 Control Delay | 108.2 | HCM 2000 Level of Service | F | |
|-----------------------------------|-------|---------------------------|------|--|
| HCM 2000 Volume to Capacity ratio | 1.11 | | | |
| Actuated Cycle Length (s) | 137.0 | Sum of lost time (s) | 15.0 | |
| Intersection Capacity Utilization | 95.9% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |
| Critical Lane Group | | | | |

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

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

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings 1449: Dufferin St & Dwy/Liberty St

09/30/2021

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|---|-------|-------|---------|-------|----------|---------|-------|----------|---------|----------|-------|---------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 4 | | | 4 | | | 414 | | | 414 | |
| Traffic Volume (vph) | 5 | 4 | 2 | 236 | 0 | 189 | 0 | 632 | 194 | 91 | 434 | 0 |
| Future Volume (vph) | 5 | 4 | 2 | 236 | 0 | 189 | 0 | 632 | 194 | 91 | 434 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util, Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.96 | | | 0.88 | | | 0.87 | | | 0.98 | |
| Frt | | 0.979 | | | 0.940 | | | 0.965 | | | | |
| Flt Protected | | 0.977 | | | 0.973 | | | | | | 0.991 | |
| Satd. Flow (prot) | 0 | 1761 | 0 | 0 | 1600 | 0 | 0 | 2754 | 0 | 0 | 3298 | 0 |
| Flt Permitted | | 0.866 | | | 0.820 | | | | | | 0.624 | |
| Satd. Flow (perm) | 0 | 1534 | 0 | 0 | 1260 | 0 | 0 | 2754 | 0 | 0 | 2044 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 2 | | | 41 | | | 66 | | | | |
| Link Speed (k/h) | | 50 | | | 40 | | | 50 | | | 50 | |
| Link Distance (m) | | 106.6 | | | 106.9 | | | 249.2 | | | 212.5 | |
| Travel Time (s) | | 7.7 | | | 9.6 | | | 17.9 | | | 15.3 | |
| Confl. Peds. (#/hr) | 86 | | 90 | 90 | 0.0 | 86 | 128 | 17.0 | 231 | 231 | 10.0 | 128 |
| Confl. Bikes (#/hr) | | | | | | | | | 128 | | | 12 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 1% | 0% | 2% | 0% | 2% | 2% | 0% | 1% | 0% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 30 | 30 | 12 | 30 | 30 |
| Adj. Flow (vph) | 6 | 5 | 2 | 268 | 0 | 215 | 0 | 718 | 220 | 103 | 493 | 0 |
| Shared Lane Traffic (%) | U | J | | 200 | U | 210 | U | 7 10 | 220 | 100 | 400 | U |
| Lane Group Flow (vph) | 0 | 13 | 0 | 0 | 483 | 0 | 0 | 938 | 0 | 0 | 596 | 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) | LOIL | 0.0 | rtigiit | LUIT | 0.0 | rtigitt | LOIL | 0.0 | rtigiit | LOIL | 0.0 | rtigrit |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | 1.0 | | | 1.0 | | | 1.0 | | | 1.0 | |
| Headway Factor | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.10 | 1.01 | 1.01 | 1.10 | 1.01 |
| Turning Speed (k/h) | 24 | 1.01 | 1.01 | 24 | 1.01 | 14 | 24 | 1.10 | 14 | 24 | 1.10 | 1.01 |
| Number of Detectors | 1 | 2 | 17 | 1 | 2 | 17 | 1 | 2 | 17 | 1 | 2 | 17 |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Type Detector 1 Channel | CI+EX | CI+EX | | CI+EX | CI+EX | | CI+EX | CI+EX | | CI+EX | CI+EX | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| \ / | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) Detector 2 Position(m) | 0.0 | 28.7 | | 0.0 | 28.7 | | 0.0 | 28.7 | | 0.0 | 28.7 | |
| | | | | | | | | 1.8 | | | 1.8 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | | | | | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Detector 2 Extend (s) | η. | 0.0 | | ρ. | 0.0 | | | 0.0 | | р. | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | | NA | | Perm | NA | |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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Lanes, Volumes, Timings 1449: Dufferin St & Dwy/Liberty St

| | • | - | • | • | ← | • | 4 | † | 1 | - | ↓ | 1 |
|------------------------------|---------------|-------------|----------|-----------|-------------|------------|-------|----------|-----|-------|-----------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Minimum Split (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Total Split (s) | 39.0 | 39.0 | | 39.0 | 39.0 | | 41.0 | 41.0 | | 41.0 | 41.0 | |
| Total Split (%) | 48.8% | 48.8% | | 48.8% | 48.8% | | 51.3% | 51.3% | | 51.3% | 51.3% | |
| Maximum Green (s) | 34.0 | 34.0 | | 34.0 | 34.0 | | 35.0 | 35.0 | | 35.0 | 35.0 | |
| Yellow Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | -1.0 | | | -2.0 | | | -1.0 | | | -1.0 | |
| Total Lost Time (s) | | 4.0 | | | 3.0 | | | 5.0 | | | 5.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 30 | 30 | | 29 | 29 | | 100 | 100 | | 100 | 100 | |
| Act Effct Green (s) | 00 | 32.2 | | 20 | 33.2 | | 100 | 38.8 | | 100 | 38.8 | |
| Actuated g/C Ratio | | 0.40 | | | 0.42 | | | 0.48 | | | 0.48 | |
| v/c Ratio | | 0.02 | | | 0.88 | | | 0.69 | | | 0.60 | |
| Control Delay | | 12.0 | | | 38.9 | | | 18.7 | | | 19.2 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 12.0 | | | 38.9 | | | 18.7 | | | 19.2 | |
| LOS | | 12.0 B | | | D D | | | В | | | 13.2 B | |
| Approach Delay | | 12.0 | | | 38.9 | | | 18.7 | | | 19.2 | |
| Approach LOS | | 12.0 B | | | 50.9 D | | | В | | | 13.2 B | |
| | | ь | | | U | | | D | | | ь | |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Cycle Length: 80 | | | | | | | | | | | | |
| Actuated Cycle Length: 80 | | | | | | | | | | | | |
| Offset: 79 (99%), Reference | ced to phase | 2:NBTL a | and 6:SB | TL, Start | of Green | | | | | | | |
| Natural Cycle: 50 | | | | | | | | | | | | |
| Control Type: Actuated-Co | ordinated | | | | | | | | | | | |
| Maximum v/c Ratio: 0.88 | | | | | | | | | | | | |
| Intersection Signal Delay: | 23.6 | | | - In | ntersection | LOS: C | | | | | | |
| Intersection Capacity Utiliz | ation 86.0% | | | 10 | CU Level | of Service | Ε | | | | | |
| Analysis Period (min) 15 | | | | | | | | | | | | |
| Splits and Phases: 1449 | 9: Dufferin S | t & Dww/Li | horty St | | | | | | | | | |
| | . Dulleliil 3 | . G. DWy/LI | DUTTY OF | | 1.3 | | | | | | | |
| Ø2 (R) | | | | | | Ø4 | | | | | | |
| 41 s | | | | | 39 s | | | | | | | |
| | | | | | | | | | | | | |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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1449: Dufferin St & Dwy/Liberty St

09/30/2021

Synchro 11 Report

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| | - | ← | † | ↓ |
|------------------------|------|--------|----------|-------|
| Lane Group | EBT | WBT | NBT | SBT |
| Lane Group Flow (vph) | 13 | 483 | 938 | 596 |
| v/c Ratio | 0.02 | 0.88 | 0.69 | 0.60 |
| Control Delay | 12.0 | 38.9 | 18.7 | 19.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 12.0 | 38.9 | 18.7 | 19.2 |
| Queue Length 50th (m) | 0.9 | 56.7 | 55.3 | 35.5 |
| Queue Length 95th (m) | 3.8 | #107.1 | 74.6 | 51.2 |
| Internal Link Dist (m) | 82.6 | 82.9 | 225.2 | 188.5 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 672 | 589 | 1368 | 990 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.02 | 0.82 | 0.69 | 0.60 |
| | | | | |

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 1449: Dufferin St & Dwy/Liberty St

09/30/2021

| | ۶ | → | • | • | ← | 4 | 4 | † | / | / | | 1 |
|-----------------------------------|----------|----------|-------|------|------------|------------|----------|----------|----------|----------|---------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 4 | | | 4 | | | 413 | | | 413- | |
| Traffic Volume (vph) | 5 | 4 | 2 | 236 | 0 | 189 | 0 | 632 | 194 | 91 | 434 | 0 |
| Future Volume (vph) | 5 | 4 | 2 | 236 | 0 | 189 | 0 | 632 | 194 | 91 | 434 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 3.0 | | | 5.0 | | | 5.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | | 0.98 | | | 0.94 | | | 0.87 | | | 1.00 | |
| Flpb, ped/bikes | | 0.98 | | | 0.93 | | | 1.00 | | | 0.98 | |
| Frt | | 0.98 | | | 0.94 | | | 0.96 | | | 1.00 | |
| Flt Protected | | 0.98 | | | 0.97 | | | 1.00 | | | 0.99 | |
| Satd. Flow (prot) | | 1733 | | | 1495 | | | 2756 | | | 3245 | |
| Flt Permitted | | 0.87 | | | 0.82 | | | 1.00 | | | 0.62 | |
| Satd. Flow (perm) | | 1536 | | | 1261 | | | 2756 | | | 2042 | |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 6 | 5 | 2 | 268 | 0 | 215 | 0 | 718 | 220 | 103 | 493 | 0 |
| RTOR Reduction (vph) | 0 | 1 | 0 | 0 | 24 | 0 | 0 | 34 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 12 | 0 | 0 | 459 | 0 | 0 | 904 | 0 | 0 | 596 | 0 |
| Confl. Peds. (#/hr) | 86 | | 90 | 90 | | 86 | 128 | | 231 | 231 | | 128 |
| Confl. Bikes (#/hr) | | | | | | | | | 128 | | | 12 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 1% | 0% | 2% | 0% | 2% | 2% | 0% | 1% | 0% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 30 | 30 | 12 | 30 | 30 |
| Turn Type | Perm | NA | | Perm | NA | | | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 31.2 | | | 31.2 | | | 37.8 | | | 37.8 | |
| Effective Green, q (s) | | 32.2 | | | 33.2 | | | 38.8 | | | 38.8 | |
| Actuated g/C Ratio | | 0.40 | | | 0.42 | | | 0.48 | | | 0.48 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | | 618 | | | 523 | | | 1336 | | | 990 | |
| v/s Ratio Prot | | | | | | | | c0.33 | | | | |
| v/s Ratio Perm | | 0.01 | | | c0.36 | | | | | | 0.29 | |
| v/c Ratio | | 0.02 | | | 0.88 | | | 0.68 | | | 0.60 | |
| Uniform Delay, d1 | | 14.4 | | | 21.5 | | | 15.8 | | | 15.0 | |
| Progression Factor | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | | 0.0 | | | 15.3 | | | 2.8 | | | 2.7 | |
| Delay (s) | | 14.4 | | | 36.8 | | | 18.6 | | | 17.7 | |
| Level of Service | | В | | | D | | | В | | | В | |
| Approach Delay (s) | | 14.4 | | | 36.8 | | | 18.6 | | | 17.7 | |
| Approach LOS | | В | | | D | | | В | | | В | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 22.6 | Н | CM 2000 | Level of S | Service | | С | | | |
| HCM 2000 Volume to Capaci | ty ratio | | 0.78 | - 11 | O.71 2000 | L040101 | JOI VICO | | - 0 | | | |
| Actuated Cycle Length (s) | ., 1000 | | 80.0 | S | um of lost | time (s) | | | 9.0 | | | |
| Intersection Capacity Utilization | n | | 86.0% | | U Level | | | | 5.0 E | | | |
| Analysis Period (min) | | | 15 | | | 501 1100 | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

| Intersection Summary | | | | |
|-----------------------------------|-------|---------------------------|-----|--|
| HCM 2000 Control Delay | 22.6 | HCM 2000 Level of Service | С | |
| HCM 2000 Volume to Capacity ratio | 0.78 | | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 9.0 | |
| Intersection Capacity Utilization | 86.0% | ICU Level of Service | Е | |
| Analysis Period (min) | 15 | | | |
| c Critical Lane Group | | | | |

09/30/2021

| | • | - | • | • | ← | • | 4 | † | / | / | ţ | 4 |
|----------------------------|-------|-------|-------|-------|----------|-------|-------|-------|-------|----------|-------|-------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 414 | | | 4î> | | | 413 | | | 414 | |
| Traffic Volume (vph) | 15 | 511 | 34 | 0 | 902 | 211 | 84 | 251 | 7 | 94 | 164 | 111 |
| Future Volume (vph) | 15 | 511 | 34 | 0 | 902 | 211 | 84 | 251 | 7 | 94 | 164 | 111 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.99 | | | 0.97 | | | 0.98 | | | 0.94 | |
| Frt | | 0.991 | | | 0.972 | | | 0.997 | | | 0.955 | |
| Flt Protected | | 0.999 | | | | | | 0.988 | | | 0.987 | |
| Satd. Flow (prot) | 0 | 2778 | 0 | 0 | 2797 | 0 | 0 | 3132 | 0 | 0 | 2696 | 0 |
| Flt Permitted | | 0.901 | | | | | | 0.707 | | | 0.721 | |
| Satd. Flow (perm) | 0 | 2505 | 0 | 0 | 2797 | 0 | 0 | 2210 | 0 | 0 | 1928 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 15 | | | 65 | | | 3 | | | 44 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 40 | | | 40 | |
| Link Distance (m) | | 199.1 | | | 255.2 | | | 127.7 | | | 380.6 | |
| Travel Time (s) | | 14.3 | | | 18.4 | | | 11.5 | | | 34.3 | |
| Confl. Peds. (#/hr) | 132 | | 116 | 116 | | 132 | 104 | | 145 | 145 | | 104 |
| Confl. Bikes (#/hr) | | | | | | 49 | | | | | | |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Heavy Vehicles (%) | 100% | 6% | 0% | 100% | 4% | 0% | 0% | 1% | 0% | 19% | 3% | 7% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 18 | 601 | 40 | 0 | 1061 | 248 | 99 | 295 | 8 | 111 | 193 | 131 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 659 | 0 | 0 | 1309 | 0 | 0 | 402 | 0 | 0 | 435 | 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) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.16 | 1.23 | 1.16 | 1.16 | 1.23 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | CI+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | | NA | | Perm | NA | | Perm | NA | |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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Lanes, Volumes, Timings 1628: Shaw St & King St

| Protected Phases 2 6 6 4 4 8 Permitted Phases 2 6 6 4 4 8 Detector Phase 2 2 6 6 6 4 4 8 8 Detector Phase 2 2 6 6 6 4 4 4 8 8 Switch Phase 5 Switch Phase 6 Switch Phase 6 Switch Phase 7 Minimum Initial (s) 22.0 22.0 22.0 22.0 20.0 20.0 20.0 20. | 1628: Shaw St & | • | → | • | • | + | 4 | • | <u>†</u> | <u> </u> | \ | | 4 |
|---|----------------------------|--------------|----------|--------|------------|-------------|------------|-------|----------|----------|----------|---------|----|
| Permitted Phases 2 6 6 4 4 8 8 Delector Phase 2 2 6 6 6 4 4 4 8 8 Witch Phase 2 2 2 6 6 6 4 4 4 8 8 8 Witch Phase 4 4 8 8 8 Witch Phase 5 2 2 0 6 6 4 4 4 8 8 8 Witch Phase 6 2 2 2 0 2 2 0 2 0 2 0 2 0 2 0 2 0 2 0 | Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SB |
| Detector Phase 2 | Protected Phases | | 2 | | | 6 | | | 4 | | | 8 | |
| Detector Phase 2 | Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | - | |
| Minimum Initial (s) 22.0 22.0 22.0 22.0 20.0 20.0 20.0 20. | Detector Phase | 2 | 2 | | 6 | 6 | | 4 | 4 | | 8 | 8 | |
| Minimum Split (s) 28.0 28.0 28.0 28.0 26.0 26.0 26.0 26.0 26.0 Total Split (s) 44.0 44.0 44.0 26.0 26.0 26.0 26.0 26.0 26.0 26.0 26 | Switch Phase | | | | | | | | | | | | |
| Total Split (s) | Minimum Initial (s) | 22.0 | 22.0 | | 22.0 | 22.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Total Split (s) | Minimum Split (s) | 28.0 | 28.0 | | 28.0 | 28.0 | | 26.0 | 26.0 | | 26.0 | 26.0 | |
| Total Spiti (%) 62.9% 62.9% 62.9% 37.1% 37.1% 37.1% 37.1% 37.1% Maximum Green (s) 38.0 38.0 38.0 38.0 20.0 20.0 20.0 20.0 20.0 20.0 20.0 2 | Total Split (s) | 44.0 | 44.0 | | 44.0 | 44.0 | | 26.0 | 26.0 | | 26.0 | 26.0 | |
| Maximum Green (s) 38.0 38.0 38.0 38.0 20.0 20.0 20.0 20.0 20.0 Pellow Time (s) 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 | Total Split (%) | 62.9% | 62.9% | | 62.9% | 62.9% | | 37.1% | 37.1% | | 37.1% | 37.1% | |
| Yellow Time (s) | | | | | | 38.0 | | | 20.0 | | | 20.0 | |
| All-Red Time (s) 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 | Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lost Time Adjust (s) | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Total Lost Time (s) 5.0 5.0 5.0 5.0 5.0 5.0 Lead/Lag Lead-Lag Optimize? Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 | | | -1.0 | | | -1.0 | | | -1.0 | | | -1.0 | |
| Lead/Lag Optimize? Vehicle Extension (s) | | | | | | | | | | | | | |
| Lead-Lag Optimize? Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 | | | | | | | | | | | | | |
| Vehicle Extension (s) 3.0 7.0 7 | | | | | | | | | | | | | |
| Recall Mode | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Walk Time (s) 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 | | | | | | | | | None | | | | |
| Flash Dont Walk (s) 15.0 15.0 15.0 15.0 13.0 13.0 13.0 13.0 13.0 Pedestrian Calls (#/hr) 100 100 100 100 100 100 100 100 100 10 | | | | | | | | | | | | | |
| Pedestrian Calls (#hr) 100 100 100 100 100 100 100 100 100 Act Effet Green (s) 39.0 39.0 21.0 21.0 21.0 Act Lated g/C Ratio 0.56 0.56 0.30 0.30 0.30 0/c Ratio 0.47 0.82 0.60 0.71 Control Delay 10.4 17.8 25.4 27.4 Queue Delay 0.0 0.0 0.0 0.0 0.0 0.0 10.0 10.0 10.0 | | | | | | | | | | | | | |
| Act Leffct Green (s) 39.0 39.0 21.0 21.0 Actuated g/C Ratio 0.56 0.56 0.30 0.30 0.30 0.47 0.82 0.60 0.71 Control Delay 10.4 17.8 25.4 27.4 Queue Delay 0.0 0.0 0.0 0.0 0.0 0.0 0.0 10.1 Clar Delay 10.4 17.8 25.4 27.4 27.4 Clar Delay 10.4 17.8 25.4 27.4 27.4 27.4 27.4 27.4 27.4 27.4 27 | | | | | | | | | | | | | |
| Actuated g/C Ratio 0.56 0.56 0.30 0.30 0.30 0.30 0.60 0.71 0.82 0.60 0.71 0.82 0.60 0.71 0.82 0.60 0.71 0.82 0.60 0.71 0.82 0.60 0.71 0.82 0.60 0.71 0.82 0.60 0.71 0.82 0.60 0.71 0.82 0.60 0.71 0.82 0.60 0.71 0.82 0.74 0.82 0.74 0.74 0.82 0.74 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 | | | | | | | | | | | | | |
| v/c Ratio 0.47 0.82 0.60 0.71 Control Delay 10.4 17.8 25.4 27.4 Queue Delay 0.0 0.0 0.0 0.0 Total Delay 10.4 17.8 25.4 27.4 LOS B B B C C C Approach Delay 10.4 17.8 25.4 27.4 LOS B B B C C C Approach Delay 10.4 17.8 25.4 27.4 Approach LOS B B C C C C Intersection Summary Area Type: CBD Cycle Length: 70 Actuated Cycle Length: 70 Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green Natural Cycle: 60 Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.82 Intersection Capacity Utilization 82.3% ICU Level of Service E Analysis Period (min) 15 Splits and Phases: 1628: Shaw St & King St | (/ | | | | | | | | | | | | |
| Control Delay 10.4 17.8 25.4 27.4 Queue Delay 0.0 0.0 0.0 0.0 Total Delay 10.4 17.8 25.4 27.4 LOS B B B C C C Approach Delay 10.4 17.8 25.4 27.4 Approach LOS B B B C C C Approach LOS B B B C C C Intersection Summary Area Type: CBD Cycle Length: 70 Actuated Cycle Length: 70 Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green Natural Cycle: 60 Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.82 Intersection Capacity Utilization 82.3% ICU Level of Service E Analysis Period (min) 15 Splits and Phases: 1628: Shaw St & King St | | | | | | | | | | | | | |
| Queue Delay 0.0 0.0 0.0 0.0 Total Delay 10.4 17.8 25.4 27.4 LOS B B C C C Approach Delay 10.4 17.8 25.4 27.4 Approach LOS B B B C C C Intersection Summary Area Type: CBD Cycle Length: 70 Actuated Cycle Length: 70 Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green Natural Cycle: 60 Control Type: Actuated-Coordinated Maximum vic Ratio: 0.82 Intersection Signal Delay: 18.7 Intersection LOS: B Intersection Capacity Utilization 82.3% ICU Level of Service E Analysis Period (min) 15 Splits and Phases: 1628: Shaw St & King St | | | | | | | | | | | | | |
| Total Delay 10.4 17.8 25.4 27.4 LOS B B B C C Approach Delay 10.4 17.8 25.4 27.4 Approach LOS B B C C C Approach LOS B B C C C Intersection Summary Area Type: CBD Cycle Length: 70 Actuated Cycle Length: 70 Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green Natural Cycle: 60 Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.82 Intersection Signal Delay: 18.7 Intersection LOS: B Intersection Capacity Utilization 82.3% ICU Level of Service E Analysis Period (min) 15 Splits and Phases: 1628: Shaw St & King St | | | | | | | | | | | | | |
| B B C C | | | 10.4 | | | 17.8 | | | 25.4 | | | 27.4 | |
| Approach Delay 10.4 17.8 25.4 27.4 Approach LOS B B B C C C Intersection Summary Area Type: CBD Cycle Length: 70 Actuated Cycle Length: 70 Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green Natural Cycle: 60 Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.82 Intersection Signal Delay: 18.7 Intersection LOS: B Intersection Capacity Utilization 82.3% ICU Level of Service E Analysis Period (min) 15 Splits and Phases: 1628: Shaw St & King St | LOS | | | | | | | | | | | | |
| Approach LOS B B C C C Intersection Summary Area Type: CBD Cycle Length: 70 Actuated Cycle Length: 70 Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green Natural Cycle: 60 Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.82 Intersection Signal Delay: 18.7 Intersection LOS: B Intersection Capacity Utilization 82.3% ICU Level of Service E Analysis Period (min) 15 Splits and Phases: 1628: Shaw St & King St | | | 10.4 | | | 17.8 | | | 25.4 | | | 27.4 | |
| Area Type: CBD Cycle Length: 70 Actuated Cycle Length: 70 Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green Natural Cycle: 60 Control Type: Actuated-Coordinated Maximum v/c Ratic: 0.82 Intersection Signal Delay: 18.7 Intersection LOS: B Intersection Capacity Utilization 82.3% ICU Level of Service E Analysis Period (min) 15 Splits and Phases: 1628: Shaw St & King St | Approach LOS | | | | | | | | | | | | |
| Area Type: CBD Cycle Length: 70 Actuated Cycle Length: 70 Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green Natural Cycle: 60 Control Type: Actuated-Coordinated Maximum v/c Ratic: 0.82 Intersection Signal Delay: 18.7 Intersection LOS: B Intersection Capacity Utilization 82.3% ICU Level of Service E Analysis Period (min) 15 Splits and Phases: 1628: Shaw St & King St | Intersection Summary | | | | | | | | | | | | |
| Actuated Čycle Length: 70 Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green Natural Cycle: 60 Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.82 Intersection Signal Delay: 18.7 Intersection LOS: B Intersection Capacity Utilization 82.3% ICU Level of Service E Analysis Period (min) 15 Splits and Phases: 1628: Shaw St & King St | Area Type: | CBD | | | | | | | | | | | |
| Offset: 1 (1%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green Natural Cycle: 60 Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.82 Intersection Signal Delay: 18.7 Intersection LOS: B Intersection Capacity Utilization 82.3% ICU Level of Service E Analysis Period (min) 15 Splits and Phases: 1628: Shaw St & King St | Cycle Length: 70 | | | | | | | | | | | | |
| Natural Cycle: 60 Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.82 Intersection Signal Delay: 18.7 Intersection LOS: B Intersection Capacity Utilization 82.3% ICU Level of Service E Analysis Period (min) 15 Splits and Phases: 1628: Shaw St & King St | Actuated Cycle Length: 70 |) | | | | | | | | | | | |
| Control Type: Actuated-Coordinated Maximum v/c Ratio: 0.82 Intersection Signal Delay: 18.7 Intersection Capacity Utilization 82.3% ICU Level of Service E Analysis Period (min) 15 Splits and Phases: 1628: Shaw St & King St 20 (R) 44 5 | Offset: 1 (1%), Reference | d to phase 2 | EBTL and | 6:WBTL | , Start of | 1st Green | | | | | | | |
| Maximum v/c Ratio: 0.82 Intersection Signal Delay: 18.7 Intersection LOS: B Intersection Capacity Utilization 82.3% ICU Level of Service E Analysis Period (min) 15 Splits and Phases: 1628: Shaw St & King St | Natural Cycle: 60 | | | | | | | | | | | | |
| Intersection Signal Delay: 18.7 Intersection LOS: B Intersection Capacity Utilization 82.3% ICU Level of Service E Analysis Period (min) 15 Splits and Phases: 1628: Shaw St & King St 26 s | Control Type: Actuated-Co | oordinated | | | | | | | | | | | |
| Intersection Capacity Utilization 82.3% Analysis Period (min) 15 Splits and Phases: 1628: Shaw St & King St | Maximum v/c Ratio: 0.82 | | | | | | | | | | | | |
| Intersection Capacity Utilization 82.3% Analysis Period (min) 15 Splits and Phases: 1628: Shaw St & King St | Intersection Signal Delay: | 18.7 | | | li li | ntersection | LOS: B | | | | | | |
| Analysis Period (min) 15 Splits and Phases: 1628: Shaw St & King St 20 (R) 445 | | | | | 10 | CU Level o | of Service | Ε | | | | | |
| Ø4 445 265 | Analysis Period (min) 15 | | | | | | | | | | | | |
| Ø4 445 265 | Splits and Phases: 162 | 8: Shaw St & | Kina St | | | | | | | | | | |
| 44s 26s | | 000 | 9 01 | | | | | ⊸¢ | | | | | |
| 945 | Ø2 (R) | | | | | | | 1 0 | 04 | | | | |
| 06 (0) | 44 s | | | | | | | 26 s | | | | | |
| | 7 (AC (D) | | | | | | | 1 1 | 10 | | | | |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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1628: Shaw St & King St

09/30/2021

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|------------------------|-------|-------|-------|-------|
| Lane Group | EBT | WBT | NBT | SBT |
| Lane Group Flow (vph) | 659 | 1309 | 402 | 435 |
| v/c Ratio | 0.47 | 0.82 | 0.60 | 0.71 |
| Control Delay | 10.4 | 17.8 | 25.4 | 27.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 10.4 | 17.8 | 25.4 | 27.4 |
| Queue Length 50th (m) | 24.2 | 64.3 | 23.3 | 23.7 |
| Queue Length 95th (m) | 33.0 | 82.3 | 34.2 | 36.1 |
| Internal Link Dist (m) | 175.1 | 231.2 | 103.7 | 356.6 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1402 | 1587 | 665 | 609 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.47 | 0.82 | 0.60 | 0.71 |
| Intersection Summary | | | | |

HCM Signalized Intersection Capacity Analysis 1628: Shaw St & King St

09/30/2021

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|--------------------------------|-----------|----------|-------|------|------------|------------|---------|----------|------|------|----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 414 | | | 413 | | | 413 | | | 414 | |
| Traffic Volume (vph) | 15 | 511 | 34 | 0 | 902 | 211 | 84 | 251 | 7 | 94 | 164 | 111 |
| Future Volume (vph) | 15 | 511 | 34 | 0 | 902 | 211 | 84 | 251 | 7 | 94 | 164 | 111 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | 5.0 | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | | 0.99 | | | 0.97 | | | 1.00 | | | 0.96 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | | 0.99 | | | 0.98 | |
| Frt | | 0.99 | | | 0.97 | | | 1.00 | | | 0.95 | |
| Flt Protected | | 1.00 | | | 1.00 | | | 0.99 | | | 0.99 | |
| Satd. Flow (prot) | | 2776 | | | 2796 | | | 3088 | | | 2639 | |
| Flt Permitted | | 0.90 | | | 1.00 | | | 0.71 | | | 0.72 | |
| Satd. Flow (perm) | | 2505 | | | 2796 | | | 2209 | | | 1928 | |
| Peak-hour factor, PHF | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Adj. Flow (vph) | 18 | 601 | 40 | 0 | 1061 | 248 | 99 | 295 | 8 | 111 | 193 | 131 |
| RTOR Reduction (vph) | 0 | 7 | 0 | 0 | 29 | 0 | 0 | 2 | 0 | 0 | 31 | 0 |
| Lane Group Flow (vph) | 0 | 652 | 0 | 0 | 1280 | 0 | 0 | 400 | 0 | 0 | 404 | 0 |
| Confl. Peds. (#/hr) | 132 | | 116 | 116 | | 132 | 104 | | 145 | 145 | | 104 |
| Confl. Bikes (#/hr) | | | | | | 49 | | | | | | |
| Heavy Vehicles (%) | 100% | 6% | 0% | 100% | 4% | 0% | 0% | 1% | 0% | 19% | 3% | 7% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Turn Type | Perm | NA | | | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 4 | | | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Actuated Green, G (s) | | 38.0 | | | 38.0 | | | 20.0 | | | 20.0 | |
| Effective Green, g (s) | | 39.0 | | | 39.0 | | | 21.0 | | | 21.0 | |
| Actuated g/C Ratio | | 0.56 | | | 0.56 | | | 0.30 | | | 0.30 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | | 1395 | | | 1557 | | | 662 | | | 578 | |
| v/s Ratio Prot | | | | | c0.46 | | | | | | | |
| v/s Ratio Perm | | 0.26 | | | | | | 0.18 | | | c0.21 | |
| v/c Ratio | | 0.47 | | | 0.82 | | | 0.60 | | | 0.70 | |
| Uniform Delay, d1 | | 9.3 | | | 12.7 | | | 20.9 | | | 21.7 | |
| Progression Factor | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | | 1.1 | | | 5.0 | | | 1.6 | | | 3.7 | |
| Delay (s) | | 10.4 | | | 17.7 | | | 22.5 | | | 25.4 | |
| Level of Service | | В | | | В | | | С | | | С | |
| Approach Delay (s) | | 10.4 | | | 17.7 | | | 22.5 | | | 25.4 | |
| Approach LOS | | В | | | В | | | С | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 17.9 | Н | CM 2000 | Level of S | Service | | В | | | |
| HCM 2000 Volume to Capac | ity ratio | | 0.78 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 70.0 | S | um of lost | time (s) | | | 10.0 | | | |
| Intersection Capacity Utilizat | ion | | 82.3% | | U Level | | | | Е | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

| Intersection Summary | | | | |
|-----------------------------------|-------|---------------------------|------|--|
| HCM 2000 Control Delay | 17.9 | HCM 2000 Level of Service | В | |
| HCM 2000 Volume to Capacity ratio | 0.78 | | | |
| Actuated Cycle Length (s) | 70.0 | Sum of lost time (s) | 10.0 | |
| Intersection Capacity Utilization | 82.3% | ICU Level of Service | E | |
| Analysis Period (min) | 15 | | | |
| 0 111 11 0 | | | | |

c Critical Lane Group

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|----------------------------|-------|----------|---------------|-------|----------|---------|-------|----------|----------|-------|-------|---------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 414 | | | 414 | | | 4 | | | 4 | |
| Traffic Volume (vph) | 0 | 705 | 0 | 0 | 767 | 119 | 0 | 0 | 0 | 99 | 0 | 75 |
| Future Volume (vph) | 0 | 705 | 0 | 0 | 767 | 119 | 0 | 0 | 0 | 99 | 0 | 75 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | 0.98 | | | | | | 0.91 | |
| Frt | | | | | 0.980 | | | | | | 0.942 | |
| Flt Protected | | | | | | | | | | | 0.972 | |
| Satd. Flow (prot) | 0 | 2707 | 0 | 0 | 2580 | 0 | 0 | 1691 | 0 | 0 | 1263 | 0 |
| FIt Permitted | | | | | | | | | | | 0.832 | |
| Satd. Flow (perm) | 0 | 2707 | 0 | 0 | 2580 | 0 | 0 | 1691 | 0 | 0 | 1040 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | 35 | | | | | | 50 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 318.4 | | | 199.1 | | | 158.6 | | | 196.7 | |
| Travel Time (s) | | 22.9 | | | 14.3 | | | 11.4 | | | 14.2 | |
| Confl. Peds. (#/hr) | 81 | | 183 | 183 | | 81 | 91 | | 59 | 59 | | 91 |
| Confl. Bikes (#/hr) | | | | | | 7 | | | | | | |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Heavy Vehicles (%) | 0% | 13% | 0% | 0% | 14% | 12% | 0% | 0% | 0% | 17% | 0% | 16% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 0 | 727 | 0 | 0 | 791 | 123 | 0 | 0 | 0 | 102 | 0 | 77 |
| Shared Lane Traffic (%) | U | 121 | U | U | 701 | 120 | U | U | U | 102 | U | |
| Lane Group Flow (vph) | 0 | 727 | 0 | 0 | 914 | 0 | 0 | 0 | 0 | 0 | 179 | 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) | Lon | 0.0 | rtigiit | Lon | 0.0 | rtigitt | LOIL | 0.0 | rtigiit | LOIL | 0.0 | rtigrit |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | 1.0 | | | 1.0 | | | 1.0 | | | 1.0 | |
| Headway Factor | 1.16 | 1.23 | 1.16 | 1.16 | 1.23 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 | 1.16 |
| Turning Speed (k/h) | 24 | 1.20 | 14 | 24 | 1.20 | 14 | 24 | 1.10 | 14 | 24 | 1.10 | 14 |
| Number of Detectors | 1 | 2 | 17 | 1 | 2 | 17 | 1 | 2 | 17 | 1 | 2 | 17 |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | CI+Ex | CI+Ex | | CI+Ex | CI+Ex | | Cl+Ex | CI+Ex | |
| Detector 1 Channel | CITEX | CITEX | | CITEX | CITEX | | CITEX | CITEX | | CITEX | CITEX | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 28.7 | | 0.0 | 28.7 | | 0.0 | 28.7 | | 0.0 | 28.7 | |
| Detector 2 Position(m) | | | | | | | | | | | | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | CI+Ex | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | | NA | | | NA | | | | | Perm | NA | |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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Lanes, Volumes, Timings 1851: King St & Sudbury St

| | • | → | • | • | ← | * | 4 | † | / | - | Ţ | 1 |
|---------------------------------|---------------|-----------|---------|------------|-------------|-----------|------------|-----------|-----|-------|-------|-----|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | _ | | 6 | v | | 8 | U | | 4 | - | |
| Detector Phase | 2 | 2 | | 6 | 6 | | 8 | 8 | | 4 | 4 | |
| Switch Phase | _ | - | | • | • | | • | | | | • | |
| Minimum Initial (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 21.0 | 21.0 | | 21.0 | 21.0 | |
| Minimum Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 26.0 | 26.0 | | 26.0 | 26.0 | |
| Total Split (s) | 50.0 | 50.0 | | 50.0 | 50.0 | | 30.0 | 30.0 | | 30.0 | 30.0 | |
| Total Split (%) | 62.5% | 62.5% | | 62.5% | 62.5% | | 37.5% | 37.5% | | 37.5% | 37.5% | |
| Maximum Green (s) | 44.0 | 44.0 | | 44.0 | 44.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| ost Time Adjust (s) | | -1.0 | | | -1.0 | | | -1.0 | | | -1.0 | |
| Total Lost Time (s) | | 5.0 | | | 5.0 | | | 4.0 | | | 4.0 | |
| _ead/Lag | | | | | | | | | | | | |
| _ead-Lag Optimize? | | | | | | | | | | | | |
| /ehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | C-Max | C-Max | | C-Max | C-Max | | None | None | | None | None | |
| Valk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 17.0 | 17.0 | | 17.0 | 17.0 | | 14.0 | 14.0 | | 14.0 | 14.0 | |
| Pedestrian Calls (#/hr) | 100 | 100 | | 25 | 25 | | 30 | 30 | | 19 | 19 | |
| Act Effct Green (s) | 100 | 48.3 | | 20 | 48.3 | | 00 | | | 10 | 22.7 | |
| Actuated g/C Ratio | | 0.60 | | | 0.60 | | | | | | 0.28 | |
| //c Ratio | | 0.44 | | | 0.58 | | | | | | 0.54 | |
| Control Delay | | 9.8 | | | 11.3 | | | | | | 23.9 | |
| Queue Delay | | 0.0 | | | 0.0 | | | | | | 0.0 | |
| Total Delay | | 9.8 | | | 11.3 | | | | | | 23.9 | |
| LOS | | Α. | | | В | | | | | | C | |
| Approach Delay | | 9.8 | | | 11.3 | | | | | | 23.9 | |
| Approach LOS | | Α. | | | В | | | | | | C | |
| • • | | - ,, | | | | | | | | | | |
| Intersection Summary Area Type: | CBD | | | | | | | | | | | |
| Cycle Length: 80 | ODD | | | | | | | | | | | |
| Actuated Cycle Length: 80 | | | | | | | | | | | | |
| Offset: 1 (1%), Referenced | | FRTI and | 6·WRTI | Start of | 1et Green | | | | | | | |
| Natural Cycle: 60 | i to pridoc 2 | LDTL and | O.VVD1L | , otari or | 13t Olocii | | | | | | | |
| Control Type: Actuated-Co | ordinated | | | | | | | | | | | |
| Maximum v/c Ratio: 0.58 | ordinated | | | | | | | | | | | |
| Intersection Signal Delay: | 12 በ | | | lr. | ntersection | I OS: B | | | | | | |
| ntersection Capacity Utiliz | | | | | CU Level of | | ۸. | | | | | |
| Analysis Period (min) 15 | .au011 00.070 | | | - 10 | O LEVEL (| n Service | 7.1 | | | | | |
| Splits and Phases: 1851 | I: King St & | Sudbury S | t | | | | | | | | | |
| Ø2 (R) | ang ot a | caubary 0 | | | | | 1 | | | | | |
| and the last | | | | | | | - 1 - 1 To | CAL COLOR | | | | |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

₩ Ø6 (R)

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1851: King St & Sudbury St

09/30/2021

| | - | - | ¥ |
|------------------------|-------|-------|-------|
| Lane Group | EBT | WBT | SBT |
| Lane Group Flow (vph) | 727 | 914 | 179 |
| v/c Ratio | 0.44 | 0.58 | 0.54 |
| Control Delay | 9.8 | 11.3 | 23.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 |
| Total Delay | 9.8 | 11.3 | 23.9 |
| Queue Length 50th (m) | 27.5 | 37.5 | 16.4 |
| Queue Length 95th (m) | 44.1 | 60.3 | 34.0 |
| Internal Link Dist (m) | 294.4 | 175.1 | 172.7 |
| Turn Bay Length (m) | | | |
| Base Capacity (vph) | 1635 | 1571 | 371 |
| Starvation Cap Reductn | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.44 | 0.58 | 0.48 |
| Intersection Summary | | | |

HCM Signalized Intersection Capacity Analysis 1851: King St & Sudbury St

09/30/2021

| | ၨ | → | • | • | • | • | • | † | / | - | ţ | 4 |
|-----------------------------------|-------|----------|-------|------|------------|------------|---------|----------|------|------|-------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | 414 | | | 414 | | | 4 | | | 4 | |
| Traffic Volume (vph) | 0 | 705 | 0 | 0 | 767 | 119 | 0 | 0 | 0 | 99 | 0 | 75 |
| Future Volume (vph) | 0 | 705 | 0 | 0 | 767 | 119 | 0 | 0 | 0 | 99 | 0 | 75 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | | | | | 4.0 | |
| Lane Util. Factor | | 0.95 | | | 0.95 | | | | | | 1.00 | |
| Frpb, ped/bikes | | 1.00 | | | 0.98 | | | | | | 0.95 | |
| Flpb, ped/bikes | | 1.00 | | | 1.00 | | | | | | 0.96 | |
| Frt | | 1.00 | | | 0.98 | | | | | | 0.94 | |
| Flt Protected | | 1.00 | | | 1.00 | | | | | | 0.97 | |
| Satd. Flow (prot) | | 2707 | | | 2580 | | | | | | 1215 | |
| Flt Permitted | | 1.00 | | | 1.00 | | | | | | 0.83 | |
| Satd. Flow (perm) | | 2707 | | | 2580 | | | | | | 1040 | |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 0 | 727 | 0 | 0 | 791 | 123 | 0 | 0 | 0 | 102 | 0 | 77 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 36 | 0 |
| Lane Group Flow (vph) | 0 | 727 | 0 | 0 | 900 | 0 | 0 | 0 | 0 | 0 | 143 | 0 |
| Confl. Peds. (#/hr) | 81 | | 183 | 183 | | 81 | 91 | | 59 | 59 | | 91 |
| Confl. Bikes (#/hr) | | | | | | 7 | | | | | | |
| Heavy Vehicles (%) | 0% | 13% | 0% | 0% | 14% | 12% | 0% | 0% | 0% | 17% | 0% | 16% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| Turn Type | | NA | | | NA | | | | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 47.3 | | | 47.3 | | | | | | 21.7 | |
| Effective Green, g (s) | | 48.3 | | | 48.3 | | | | | | 22.7 | |
| Actuated g/C Ratio | | 0.60 | | | 0.60 | | | | | | 0.28 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | | | | | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | | | | 3.0 | |
| Lane Grp Cap (vph) | | 1634 | | | 1557 | | | | | | 295 | |
| v/s Ratio Prot | | 0.27 | | | c0.35 | | | | | | | |
| v/s Ratio Perm | | | | | | | | | | | c0.14 | |
| v/c Ratio | | 0.44 | | | 0.58 | | | | | | 0.49 | |
| Uniform Delay, d1 | | 8.6 | | | 9.6 | | | | | | 23.8 | |
| Progression Factor | | 1.00 | | | 1.00 | | | | | | 1.00 | |
| Incremental Delay, d2 | | 0.9 | | | 1.6 | | | | | | 1.3 | |
| Delay (s) | | 9.5 | | | 11.2 | | | | | | 25.1 | |
| Level of Service | | Α | | | В | | | | | | С | |
| Approach Delay (s) | | 9.5 | | | 11.2 | | | 0.0 | | | 25.1 | |
| Approach LOS | | Α | | | В | | | Α | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 11.9 | Н | CM 2000 | Level of S | Service | | В | | | |
| HCM 2000 Volume to Capacity | ratio | | 0.55 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 80.0 | S | um of lost | time (s) | | | 9.0 | | | |
| Intersection Capacity Utilization | 1 | | 53.5% | IC | U Level | of Service | | | Α | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

| Intersection Summary | | | | |
|-----------------------------------|-------|---------------------------|-----|--|
| HCM 2000 Control Delay | 11.9 | HCM 2000 Level of Service | В | |
| HCM 2000 Volume to Capacity ratio | 0.55 | | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 9.0 | |
| Intersection Capacity Utilization | 53.5% | ICU Level of Service | Α | |
| Analysis Period (min) | 15 | | | |
| 0.10. 11. 0 | | | | |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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Lanes, Volumes, Timings 1912: Atlantic Ave & King St

| | - | • | • | ← | 4 | 1 |
|-----------------------------------|------------|-------|-------|--------------|-------|-------|
| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
| Lane Configurations | ↑ ⊅ | LUI | 1102 | 414 | 7 | 7 |
| Traffic Volume (vph) | 453 | 291 | 2 | 624 | 261 | 270 |
| Future Volume (vph) | 453 | 291 | 2 | 624 | 261 | 270 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.0 | 3.0 |
| Storage Length (m) | 0.0 | 0.0 | 0.0 | 5.5 | 30.0 | 0.0 |
| Storage Lanes | | 0.0 | 0.0 | | 30.0 | 1 |
| | | U | 2.5 | | 2.5 | - 1 |
| Taper Length (m) | 0.95 | 0.95 | 0.95 | 0.05 | 1.00 | 1.00 |
| Lane Util. Factor Ped Bike Factor | | 0.95 | 0.95 | 0.95 1.00 | | 0.92 |
| | 0.79 | | | 1.00 | 0.91 | |
| Frt | 0.941 | | | | 0.050 | 0.850 |
| Flt Protected | 0.400 | | | 0==4 | 0.950 | 4000 |
| Satd. Flow (prot) | 2182 | 0 | 0 | 2774 | 1486 | 1233 |
| FIt Permitted | | | | 0.953 | 0.950 | |
| Satd. Flow (perm) | 2182 | 0 | 0 | 2643 | 1354 | 1136 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | 280 | | | | | 33 |
| Link Speed (k/h) | 50 | | | 50 | 30 | |
| Link Distance (m) | 191.3 | | | 318.4 | 198.0 | |
| Travel Time (s) | 13.8 | | | 22.9 | 23.8 | |
| Confl. Peds. (#/hr) | - | 341 | 341 | | 85 | 65 |
| Confl. Bikes (#/hr) | | 5 | | | | |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles (%) | 6% | 3% | 100% | 10% | 2% | 10% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 0 | 0 |
| Adj. Flow (vph) | 521 | 334 | 24 | 717 | 300 | 310 |
| | 521 | 334 | 2 | / 1/ | 300 | 310 |
| Shared Lane Traffic (%) | 055 | ٥ | 0 | 740 | 200 | 240 |
| Lane Group Flow (vph) | 855 | 0 | 0 | 719 | 300 | 310 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 0.0 | | | 0.0 | 3.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.23 | 1.16 | 1.16 | 1.23 | 1.25 | 1.25 |
| Turning Speed (k/h) | | 14 | 24 | | 24 | 14 |
| Number of Detectors | 2 | | 1 | 2 | 1 | 1 |
| Detector Template | Thru | | Left | Thru | Left | Right |
| Leading Detector (m) | 30.5 | | 6.1 | 30.5 | 6.1 | 6.1 |
| Trailing Detector (m) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 1.8 | | 6.1 | 1.8 | 6.1 | 6.1 |
| | | | | | | |
| Detector 1 Type | CI+Ex | | CI+Ex | CI+Ex | CI+Ex | CI+Ex |
| Detector 1 Channel | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Extend (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | 28.7 | | | 28.7 | | |
| Detector 2 Size(m) | 1.8 | | | 1.8 | | |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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| | - | \rightarrow | • | ← | 4 | / |
|---------------------------------|--------------------|---------------|----------|------------|------------|------------|
| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
| Detector 2 Type | CI+Ex | | | CI+Ex | | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | 0.0 | | | 0.0 | | |
| Turn Type | NA | | Perm | NA | Perm | Perm |
| Protected Phases | 2 | | | 6 | | |
| Permitted Phases | | | 6 | | 8 | 8 |
| Detector Phase | 2 | | 6 | 6 | 8 | 8 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 21.0 | | 21.0 | 21.0 | 20.0 | 20.0 |
| Minimum Split (s) | 28.0 | | 28.0 | 28.0 | 26.0 | 26.0 |
| Total Split (s) | 39.0 | | 39.0 | 39.0 | 31.0 | 31.0 |
| Total Split (%) | 55.7% | | 55.7% | 55.7% | 44.3% | 44.3% |
| Maximum Green (s) | 32.0 | | 32.0 | 32.0 | 25.0 | 25.0 |
| Yellow Time (s) | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 3.0 | | 3.0 | 3.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | -1.0 | | | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 6.0 | | | 6.0 | 5.0 | 5.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | C-Max | | C-Max | C-Max | None | None |
| Walk Time (s) | 7.0 | | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Dont Walk (s) | 14.0 | | 14.0 | 14.0 | 13.0 | 13.0 |
| Pedestrian Calls (#/hr |) 100 | | 8 | 8 | 28 | 28 |
| Act Effct Green (s) | 35.4 | | | 35.4 | 23.6 | 23.6 |
| Actuated q/C Ratio | 0.51 | | | 0.51 | 0.34 | 0.34 |
| v/c Ratio | 0.69 | | | 0.54 | 0.66 | 0.77 |
| Control Delay | 12.4 | | | 14.1 | 27.2 | 32.3 |
| Queue Delay | 0.0 | | | 0.0 | 0.0 | 0.0 |
| Total Delay | 12.4 | | | 14.1 | 27.2 | 32.3 |
| LOS | В. | | | В | C | C |
| Approach Delay | 12.4 | | | 14.1 | 29.8 | |
| Approach LOS | В | | | В | С | |
| | | | | | | |
| Intersection Summary Area Type: | CBD | | | | | |
| Cycle Length: 70 | CDD | | | | | |
| Actuated Cycle Length | h. 70 | | | | | |
| | | DT and | 6-M/DTI | Ctart of 1 | ot Croon | |
| Offset: 6 (9%), Refere | nced to phase 2:t | י מוומ ו סב | U.VVDIL, | SIGIL OF I | si Green | |
| Natural Cycle: 60 | d Coordinated | | | | | |
| Control Type: Actuate | | | | | | |
| Maximum v/c Ratio: 0 | | | | 1. | toroot! - | * I OC. D |
| Intersection Signal De | | | | | ntersectio | |
| Intersection Capacity | | | | 10 | JU Level | of Service |
| Analysis Period (min) | ıυ | | | | | |
| Splits and Phases: | 1912: Atlantic Ave | & Kina | St | | | |
| | | 9 | | | | |



1912: Atlantic Ave & King St

09/30/2021

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| | - | • | 1 | |
|------------------------|-------|-------|-------|-------|
| Lane Group | EBT | WBT | NBL | NBR |
| Lane Group Flow (vph) | 855 | 719 | 300 | 310 |
| v/c Ratio | 0.69 | 0.54 | 0.66 | 0.77 |
| Control Delay | 12.4 | 14.1 | 27.2 | 32.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 12.4 | 14.1 | 27.2 | 32.3 |
| Queue Length 50th (m) | 27.4 | 31.8 | 32.5 | 31.7 |
| Queue Length 95th (m) | 47.0 | 47.0 | 52.0 | #57.1 |
| Internal Link Dist (m) | 167.3 | 294.4 | 174.0 | |
| Turn Bay Length (m) | | | 30.0 | |
| Base Capacity (vph) | 1241 | 1336 | 502 | 442 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.69 | 0.54 | 0.60 | 0.70 |

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 1912: Atlantic Ave & King St

09/30/2021

| Lane Configurations 1 | | - | \rightarrow | • | • | 1 | <i>></i> | | |
|--|-----------------------|-------------|---------------|------|------|------------|------------------|---|------|
| Lane Configurations | Movement | EBT | EBR | WBL | WBT | NBL | NBR | | |
| Traeffice Volume (vph) | ane Configurations | # 12 | | | 412 | * | # | | |
| Future Volume (vph) | | | 291 | 2 | | | | | |
| Interest | | | | | | | | | |
| Lane Width 3.5 3.5 3.5 3.5 3.0 3.0 | | | 1900 | | | | | | |
| Total Lost time (s) | | | | | | | | | |
| Lane Util. Factor 0.95 0.95 1.00 1.00 Friph, pedibikes 0.79 1.00 1.00 0.92 Filph, pedibikes 1.00 1.00 0.91 1.00 Fit Protected 1.00 1.00 0.95 1.00 Satd. Flow (prot) 2183 2773 1354 1136 Filt Protected 1.00 0.95 0.95 1.00 Satd. Flow (prot) 2183 2643 1354 1136 Filt Permitted 1.00 0.95 0.95 1.00 Satd. Flow (perm) 2183 2643 1354 1136 Feak-hour factor, PHF 0.87 0.87 0.87 0.87 0.87 0.87 0.87 Adj. Flow (vph) 521 334 2 717 300 310 ATTOR Reduction (vph) 138 0 0 0 0 0 22 Lane Group Flow (vph) 717 0 0 0 719 300 288 Confl. Peds. (#/hr) 341 341 85 65 Confl. Bikes (#/hr) 5 Heavy Vehicles (%) 6% 3% 100% 10% 2% 10% Bus Blockages (#/hr) 24 24 24 24 0 0 0 Turm Type NA Perm NA Perm Perm Perm Perm Permeted Phases 6 8 8 8 Actuated Green, G (s) 34.4 34.4 22.6 22.6 Effective Green, G (s) 35.4 35.4 23.6 23.6 Clearance Time (s) 7.0 7.0 6.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 Lane Gry Cap (vph) 1103 1336 456 382 Vis Ratio Perm 0.27 0.22 c0.25 Vis Ratio Perm 0.65 0.65 Uniform Delay, d1 12.7 11.7 19.8 20.6 Progression Factor 1.00 1.00 1.00 1.00 1.00 Incremental Delay, d2 3.0 1.6 3.4 8.2 Delay (s) 15.7 13.3 23.2 28.8 Level of Service B C C C Approach Delay (s) 15.7 13.3 23.2 28.8 Level of Service B C C C C C C C C C C C C C C C C C C | | | | | | | | | |
| Frpb, ped/bikes | Lane Util. Factor | 0.95 | | | 0.95 | 1.00 | 1.00 | | |
| Fit Protected 1.00 1.00 0.85 Fit Protected 1.00 1.00 0.95 1.00 Satd. Flow (prot) 2183 2773 1354 1136 Fit Permitted 1.00 0.95 0.95 1.00 Satd. Flow (perm) 2183 2643 1354 1136 Fit Permitted 1.00 0.95 0.95 1.00 Satd. Flow (perm) 2183 2643 1354 1136 Peak-hour factor, PHF 0.87 0.87 0.87 0.87 0.87 0.87 0.87 Adj. Flow (vph) 521 334 2 717 300 310 RTOR Reduction (vph) 138 0 0 0 0 0 22 Lane Group Flow (vph) 717 0 0 719 300 288 Confl. Pedes. (#hrr) 341 341 85 65 Confl. Bikes (#hrr) 5 Heavy Vehicles (%) 6% 3% 100% 10% 2% 10% Bus Blockages (#hrr) 24 24 24 24 0 0 Turm Type NA Perm NA Perm Perm Perm Verotected Phases 2 6 8 Permitted Phases 6 8 8 8 Actuated Green, G (s) 34.4 34.4 22.6 22.6 Effective Green, G (s) 34.4 34.4 22.6 22.6 Effective Green, G (s) 35.4 35.4 23.6 23.6 Actuated g/C Ratio 0.51 0.51 0.34 0.34 Clearance Time (s) 7.0 7.0 6.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 Lane Gry Cap (vph) 1103 1336 456 382 Vis Ratio Port c0.33 Vis Ratio Port c0.34 Vis Ratio Port c0.34 Vis Ratio Port c0.35 Vis Ratio | Frpb. ped/bikes | 0.79 | | | 1.00 | 1.00 | 0.92 | | |
| First | Flpb, ped/bikes | 1.00 | | | 1.00 | 0.91 | 1.00 | | |
| Satd. Flow (prot) 2183 2773 1354 1136 | Frt | | | | | | 0.85 | | |
| Fit Permitted | Flt Protected | 1.00 | | | 1.00 | 0.95 | 1.00 | | |
| Fit Permitted 1.00 0.95 0.95 1.00 Satd. Flow (perm) 2183 2643 1354 1136 Pereak-hour factor, PHF 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 | Satd. Flow (prot) | 2183 | | | 2773 | 1354 | 1136 | | |
| Peak-hour factor, PHF | Flt Permitted | 1.00 | | | 0.95 | 0.95 | 1.00 | | |
| Peak-hour factor, PHF | Satd. Flow (perm) | 2183 | | | 2643 | 1354 | 1136 | | |
| Adj. Flow (vph) 521 334 2 717 300 310 RTOR Reduction (vph) 138 0 0 0 0 0 22 Lane Group Flow (vph) 717 0 0 719 300 288 Confl. Peds. (#/hr) 341 341 85 65 Confl. Peds. (#/hr) 5 Heavy Vehicles (%) 6% 3% 100% 10% 2% 10% Bus Blockages (#/hr) 24 24 24 24 0 0 0 Furm Type NA Perm NA Perm Perm Protected Phases 2 6 8 8 Actuated Green, G (s) 34.4 34.4 22.6 22.6 Effective Green, G (s) 35.4 35.4 23.6 23.6 Actuated g/C Ratio 0.51 0.51 0.34 0.34 Clearance Time (s) 7.0 7.0 6.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 1103 1336 456 382 Vis Ratio Prot c0.33 Vis Ratio Prot c0.33 Vis Ratio Prot c0.33 Vis Ratio Prot c0.34 Vis Ratio Prot c0.35 Vis Ratio Prot c0.35 Vis Ratio Prot c0.35 Vis Ratio Prot c0.35 Vis Ratio Prot c0.36 Vis Ratio Prot c0.36 Vis Ratio O.65 0.54 0.66 0.75 Uniform Delay, d1 12.7 11.7 19.8 20.6 Progression Factor 1.00 1.00 1.00 1.00 Incremental Delay, d2 3.0 1.6 3.4 8.2 Delay (s) 15.7 13.3 23.2 28.8 Level of Service B B B C C Approach Delay (s) 15.7 13.3 26.1 Approach LOS B C C Approach LOS B C C Intersection Summary HCM 2000 Volume to Capacity ratio Actuated Cycle Length (s) 70.0 Sum of lost time (s) 12.0 Intersection Capacity Utilization 60.2% ICU Level of Service B Analysis Period (min) 15 | | | 0.87 | 0.87 | | | | | |
| RTOR Reduction (vph) 138 0 0 0 0 0 22 Lane Group Flow (vph) 717 0 0 0 719 300 288 Confl. Pekes. (#/hr) 5 Heavy Vehicles (%) 6% 3% 100% 10% 2% 10% Bus Blockages (#/hr) 24 24 24 24 0 0 Turn Type NA Perm NA Perm Perm Protected Phases 2 6 Permitted Phases 6 8 8 Actuated Green, G (s) 34.4 34.4 22.6 22.6 Effective Green, g (s) 35.4 35.4 23.6 23.6 Actuated g/C Ratio 0.51 0.51 0.34 0.34 Clearance Time (s) 7.0 7.0 6.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 1103 1336 456 382 W/s Ratio Perm 0.27 0.22 c0.25 W/s Ratio Perm 0.65 0.54 0.66 0.75 Uniform Delay, d1 12.7 11.7 19.8 20.6 Progression Factor 1.00 1.00 1.00 Incremental Delay, d2 3.0 1.6 3.4 8.2 Delay (s) 15.7 13.3 23.2 28.8 Level of Service B B B C C Approach LOS B B B C Intersection Summary HCM 2000 Control Delay 17.8 HCM 2000 Level of Service B Analysis Period (min) 15 | | | | | | | | | |
| Lane Group Flow (vph) | | | | | | | | | |
| Confl. Peds. (#/hr) | | | - | - | | 300 | | | |
| Confl. Bikes (#/hr) 5 | | | | | | | | | |
| Heavy Vehicles (%) 6% 3% 100% 10% 2% 10% Bus Blockages (#/hr) 24 24 24 24 0 0 0 Turn Type NA Perm NA Perm Perm Perm Perm Protected Phases 2 6 8 8 8 Actuated Green, G (s) 34.4 34.4 22.6 22.6 Effective Green, g (s) 35.4 35.4 23.6 23.6 Actuated group (Ratio Clearance Time (s) 7.0 7.0 6.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 | | | 5 | | | | | | |
| Bus Blockages (#/hr) | | 6% | | 100% | 10% | 2% | 10% | | |
| Turn Type | | | | | | | | | |
| Protected Phases 2 6 8 8 8 Actuated Green, G (s) 34.4 34.4 22.6 22.6 Actuated Green, g (s) 35.4 35.4 23.6 23.6 Actuated g/C Ratio 0.51 0.51 0.34 0.34 Clearance Time (s) 7.0 7.0 6.0 6.0 Actuated g/C Ratio 0.51 3.0 3.0 3.0 3.0 Alearance Time (s) 7.0 7.0 6.0 6.0 Actuated g/C Ratio 0.51 0.51 0.34 0.34 Actuated g/C Ratio 0.51 0.51 0.35 0.30 Alearance Time (s) 7.0 7.0 6.0 6.0 Actuated g/C Ratio 0.51 0.51 0.34 0.34 Actuated g/C Ratio 0.51 0.51 0.34 0.34 Actuated g/C Ratio 0.51 0.51 0.34 0.34 Actuated g/C Ratio 0.51 0.52 0.50 Actuated Procession Factor 0.02 0.02 0.25 Actuated Procession Factor 0.00 0.00 0.00 Actuated Cycle Length (s) 15.7 13.3 26.1 Actuated Cycle Length (s) 70.0 Sum of lost time (s) 12.0 Actuated Cycle Length (s) 70.0 Sum of lost time (s) 12.0 Actuated Cycle Length (s) 70.0 Sum of lost time (s) 12.0 Actuated Cycle Length (s) 60.2% ICU Level of Service B | | NA | | Perm | NA | Perm | Perm | | |
| Permitted Phases 6 8 8 8 Actuated Green, G (s) 34.4 34.4 22.6 22.6 Effective Green, g (s) 35.4 35.4 23.6 23.6 Actuated g/C Ratio 0.51 0.51 0.34 0.34 Clearance Time (s) 7.0 7.0 6.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Actuated g/C Ratio 0.51 0.51 0.34 0.34 Clearance Time (s) 7.0 7.0 6.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Actuated g/C Ratio 0.033 Vehicle Extension (s) 3.0 0.0 Clearance Time (s) 7.0 Clearanc | | | | | | | | | |
| Effective Green, g (s) 35.4 35.4 23.6 23.6 Actuated g/C Ratio 0.51 0.51 0.34 0.34 0.34 0.04 0.02 0.02 0.02 0.02 0.02 0.03 0.0 0.00 0.0 | | | | 6 | - | 8 | 8 | | |
| Effective Green, g (s) 35.4 35.4 23.6 23.6 Actuated g/C Ratio 0.51 0.51 0.34 0.34 0.34 0.34 0.34 0.34 0.34 0.34 | | 34.4 | | | 34.4 | | | | |
| Actuated g/C Ratio 0.51 0.51 0.34 0.34 Clearance Time (s) 7.0 7.0 6.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 | | | | | | | | | |
| Clearance Time (s) 7.0 7.0 6.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 Jane Grp Cap (vph) 1103 1336 456 382 VIs Ratio Prot 0.033 3.0 3.0 3.0 VIs Ratio Perm 0.27 0.22 0.25 0.25 VIc Ratio 0.65 0.54 0.66 0.75 Iniform Delay, d1 12.7 11.7 19.8 20.6 Progression Factor 1.00 1.00 1.00 1.00 Incremental Delay, d2 3.0 1.6 3.4 8.2 2 Delay (s) 15.7 13.3 23.2 28.8 2 Level of Service B B C C Approach LOS B B C C Intersection Summary Intersection Summary Intersection Capacity Cleangth (s) 17.8 Intersection Capacity Utilization B Intersection Capacity Utilization B Intersection Capacity Utilization B Intersection Capacity Utilization B Intersection Capacity Utilization <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<> | | | | | | | | | |
| Vehicle Extension (s) 3.0 3.0 3.0 3.0 Lane Grp Cap (vph) 1103 1336 456 382 I/s Ratio Prot c0.33 0.27 0.22 c0.25 I/s Ratio Perm 0.27 0.22 c0.25 I/c Ratio 0.65 0.54 0.66 0.75 Uniform Delay, d1 12.7 11.7 19.8 20.6 Progression Factor 1.00 1.00 1.00 1.00 Incremental Delay, d2 3.0 1.6 3.4 8.2 2 Delay (s) 15.7 13.3 23.2 28.8 2 2.0 | Clearance Time (s) | | | | | | | | |
| Lane Grp Cap (vph) 1103 1336 456 382 v/s Ratio Prot 0.33 v/s Ratio Prot 0.33 v/s Ratio Perm 0.27 0.22 c0.25 v/c Ratio 0.65 0.54 0.66 0.75 Uniform Delay, d1 12.7 11.7 19.8 20.6 Progression Factor 1.00 1.00 1.00 1.00 Incremental Delay, d2 3.0 1.6 3.4 8.2 Delay (s) 15.7 13.3 23.2 28.8 Level of Service B B B C C Approach Delay (s) 15.7 13.3 26.1 Approach LOS B B C Intersection Summary HCM 2000 Control Delay 17.8 HCM 2000 Level of Service B HCM 2000 Volume to Capacity ratio 0.70 Actualed Cycle Length (s) 70.0 Sum of lost time (s) 12.0 Intersection Capacity Utilization 60.2% ICU Level of Service B Analysis Period (min) 15 | | | | | | | | | |
| ## Ratio Prot | | | | | | | | | |
| \(\text{Vs Ratio Perm} \) \(0.27 \) \(0.22 \) \(0.25 \) \(\text{Vc Ratio} \) \(0.65 \) \(0.65 \) \(0.65 \) \(0.66 \) \(0.75 \) \\(0.66 \) \(0.75 \) \\(0.66 \) \(0.75 \) \\(0.66 \) \(0.75 \) \\(0.66 \) \(0.75 \) \\(0.66 \) \(0.75 \) \\(0.66 \) \(0.75 \) \\(0.66 \) \(0.75 \) \\(0.66 \) \(0.75 \) \\(0.66 \) \\(0.75 \) \\(0.66 \) \\(0.76 \) \\(0.66 \) \\(0.76 \) \\(0.70 \) \\(0.70 \) \(0.70 \) \\(0.70 \) \\(0.70 \) \\(0.70 \) \\(0.70 \) \\(0.70 \) \\(0.70 \) \\(0.70 \) \\(0.70 \) \\(0.70 \) \\(0.70 \) \\(0.70 \) \\(0.70 \) \(0.70 \) \\(0.70 \) | | | | | .000 | | 002 | | |
| v/c Ratio 0.65 0.54 0.66 0.75 Uniform Delay, d1 12.7 11.7 19.8 20.6 Progression Factor 1.00 1.00 1.00 1.00 Incremental Delay, d2 3.0 1.6 3.4 8.2 Delay (s) 15.7 13.3 23.2 28.8 Level of Service B B C C Approach Delay (s) 15.7 13.3 26.1 Approach LOS B B C Intersection Summary HCM 2000 Control Delay 17.8 HCM 2000 Level of Service B HCM 2000 Volume to Capacity ratio 0.70 Actuated Cycle Length (s) 70.0 Sum of lost time (s) 12.0 Intersection Capacity Utilization 60.2% ICU Level of Service B | v/s Ratio Perm | 30.00 | | | 0.27 | 0.22 | c0.25 | | |
| Uniform Delay, d1 12.7 11.7 19.8 20.6 Progression Factor 1.00 1.00 1.00 1.00 Incremental Delay, d2 3.0 1.6 3.4 8.2 Delay (s) 15.7 13.3 23.2 28.8 Level of Service B B B C C Approach Delay (s) 15.7 13.3 26.1 Approach LOS B B C Intersection Summary HCM 2000 Control Delay 17.8 HCM 2000 Level of Service B HCM 2000 Volume to Capacity ratio 0.70 Actuated Cycle Length (s) 70.0 Sum of lost time (s) 12.0 Intersection Capacity Utilization 60.2% ICU Level of Service B Analysis Period (min) 15 | v/c Ratio | 0.65 | | | | | | | |
| Progression Factor 1.00 1.00 1.00 1.00 Incremental Delay, d2 3.0 1.6 3.4 8.2 Delay (s) 15.7 13.3 23.2 28.8 Level of Service B B C C Approach Delay (s) 15.7 13.3 26.1 A Approach LOS B B C C Intersection Summary Intersection Summary HCM 2000 Control Delay 17.8 HCM 2000 Level of Service B HCM 2000 Volume to Capacity ratio 0.70 Sum of lost time (s) 12.0 Actuated Cycle Length (s) 70.0 Sum of lost time (s) 12.0 Intersection Capacity Utilization 60.2% ICU Level of Service B Analysis Period (min) 15 | | | | | | | | | |
| Incremental Delay, d2 3.0 1.6 3.4 8.2 Delay (s) 15.7 13.3 23.2 28.8 Level of Service B B B C C Approach Delay (s) 15.7 13.3 26.1 Approach LOS B B C C Intersection Summary HCM 2000 Control Delay 17.8 HCM 2000 Level of Service B HCM 2000 Volume to Capacity ratio 0.70 Actuated Cycle Length (s) 70.0 Sum of lost time (s) 12.0 Intersection Capacity Utilization 60.2% ICU Level of Service B Analysis Period (min) 15 | | | | | | | | | |
| Delay (s) 15.7 13.3 23.2 28.8 Level of Service B B C C Approach Delay (s) 15.7 13.3 26.1 Approach LOS B B C Approach LOS B B C Intersection Summary HCM 2000 Control Delay 17.8 HCM 2000 Level of Service B HCM 2000 Volume to Capacity ratio 0.70 Actuated Cycle Length (s) 70.0 Sum of lost time (s) 12.0 Intersection Capacity Utilization 60.2% ICU Level of Service B Analysis Period (min) 15 | | | | | | | | | |
| Level of Service B | Delay (s) | | | | | | | | |
| Approach Delay (s) 15.7 Approach LOS 13.3 B C. Approach LOS B B C Intersection Summary HCM 2000 Control Delay 17.8 HCM 2000 Level of Service B HCM 2000 Volume to Capacity ratio 0.70 Control Length (s) 12.0 ICU Level of Service B Actuated Cycle Length (s) 60.2% ICU Level of Service B Analysis Period (min) 15 | Level of Service | | | | | | | | |
| Approach LOS B B C Intersection Summary HCM 2000 Control Delay 17.8 HCM 2000 Level of Service B HCM 2000 Volume to Capacity ratio 0.70 Actuated Cycle Length (s) 70.0 Sum of lost time (s) 12.0 Intersection Capacity Utilization 60.2% ICU Level of Service B Analysis Period (min) 15 | Approach Delay (s) | | | | | | | | |
| Intersection Summary | Approach LOS | | | | | | | | |
| HCM 2000 Control Delay 17.8 HCM 2000 Level of Service B HCM 2000 Volume to Capacity ratio 0.70 Sum of lost time (s) 12.0 Actuated Cycle Length (s) 60.2% ICU Level of Service B Analysis Period (min) 15 | Intersection Summary | | | | | | | | |
| HCM 2000 Volume to Capacity ratio 0.70 Actuated Cycle Length (s) 70.0 Sum of lost time (s) 12.0 Intersection Capacity Utilization 60.2% ICU Level of Service B Analysis Period (min) 15 | | | | 17.8 | Н | CM 2000 | Level of Service | e | В |
| Actuated Cycle Length (s) 70.0 Sum of lost time (s) 12.0 Intersection Capacity Utilization 60.2% ICU Level of Service B Analysis Period (min) 15 | | | | | | | | | |
| Intersection Capacity Utilization 60.2% ICU Level of Service B Analysis Period (min) 15 | | | | | Sı | um of lost | time (s) | | 12.0 |
| Analysis Period (min) 15 | | | | | | | (-) | | |
| | Analysis Period (min) | | | | | | | | |
| | | | | | | | | | |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

| | • | → | ← | • | \ | 1 |
|----------------------------|-------|----------|------------|---------|----------|--------|
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
| | LUL | 41∱ | | WOIN | SDL W | אושט |
| Lane Configurations | 0 | | ↑ ↑ | 131 | | 23 |
| Traffic Volume (vph) | 0 | 653 | 919 919 | 131 | 93 | 23 |
| Future Volume (vph) | | 653 | | | 93 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 |
| Ped Bike Factor | | | 0.98 | | 0.99 | |
| Frt | | | 0.981 | | 0.973 | |
| Flt Protected | | | | | 0.962 | |
| Satd. Flow (prot) | 0 | 2941 | 2855 | 0 | 1459 | 0 |
| Flt Permitted | | | | | 0.962 | |
| Satd. Flow (perm) | 0 | 2941 | 2855 | 0 | 1459 | 0 |
| Right Turn on Red | | | | Yes | | Yes |
| Satd. Flow (RTOR) | | | 37 | | 15 | |
| Link Speed (k/h) | | 50 | 50 | | 50 | |
| Link Distance (m) | | 316.7 | 191.3 | | 100.8 | |
| Travel Time (s) | | 22.8 | 13.8 | | 7.3 | |
| | 45 | 22.0 | 13.0 | 45 | 1.3 | 15 |
| Confl. Peds. (#/hr) | 45 | | | | | 15 |
| Confl. Bikes (#/hr) | 0.00 | 0.00 | 0.00 | 26 | 0.00 | 0.00 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Heavy Vehicles (%) | 0% | 4% | 4% | 0% | 0% | 39% |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 0 | 0 |
| Adj. Flow (vph) | 0 | 734 | 1033 | 147 | 104 | 26 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 734 | 1180 | 0 | 130 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Left | Right | Left | Right |
| Median Width(m) | 2011 | 0.0 | 0.0 | · ugint | 3.5 | . ugin |
| Link Offset(m) | | 0.0 | 0.0 | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | 1.6 | | 1.6 | |
| | | 1.0 | 1.0 | | 1.0 | |
| Two way Left Turn Lane | 4.40 | 4.00 | 4.00 | 4.40 | 4.40 | 4.40 |
| Headway Factor | 1.16 | 1.23 | 1.23 | 1.16 | 1.16 | 1.16 |
| Turning Speed (k/h) | 24 | | | 14 | 24 | 14 |
| Number of Detectors | 1 | 2 | 2 | | 1 | |
| Detector Template | Left | Thru | Thru | | Left | |
| Leading Detector (m) | 6.1 | 30.5 | 30.5 | | 6.1 | |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | 1.8 | | 6.1 | |
| Detector 1 Type | CI+Ex | Cl+Ex | CI+Ex | | CI+Ex | |
| Detector 1 Channel | OI-LX | JI. LX | 31. LX | | 31. LX | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Queue (s) | | | | | | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | 0.0 | |
| Detector 2 Position(m) | | 28.7 | 28.7 | | | |
| Detector 2 Size(m) | | 1.8 | 1.8 | | | |
| Detector 2 Type | | CI+Ex | CI+Ex | | | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | 0.0 | 0.0 | | | |
| Turn Type | | NA | NA | | Perm | |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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| | ٠ | - | • | • | - | ✓ | |
|--------------------------|-------------------|----------|-------------|-----|------------|--------------|--|
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR | |
| Protected Phases | | 2 | 6 | | | | |
| Permitted Phases | 2 | | | | 8 | | |
| Detector Phase | 2 | 2 | 6 | | 8 | | |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 20.0 | 20.0 | 20.0 | | 18.0 | | |
| Minimum Split (s) | 26.0 | 26.0 | 26.0 | | 23.0 | | |
| Total Split (s) | 55.0 | 55.0 | 55.0 | | 25.0 | | |
| Total Split (%) | 68.8% | 68.8% | 68.8% | | 31.3% | | |
| Maximum Green (s) | 49.0 | 49.0 | 49.0 | | 20.0 | | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | | 3.0 | | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | 2.0 | | |
| Lost Time Adjust (s) | | -1.0 | -1.0 | | -1.0 | | |
| Total Lost Time (s) | | 5.0 | 5.0 | | 4.0 | | |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | | |
| Recall Mode | C-Max | C-Max | None | | None | | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | | 7.0 | | |
| Flash Dont Walk (s) | 13.0 | 13.0 | 13.0 | | 11.0 | | |
| Pedestrian Calls (#/hr) | 100 | 100 | 14 | | 5 | | |
| Act Effct Green (s) | | 57.6 | 57.6 | | 19.0 | | |
| Actuated g/C Ratio | | 0.72 | 0.72 | | 0.24 | | |
| v/c Ratio | | 0.35 | 0.57 | | 0.36 | | |
| Control Delay | | 6.3 | 8.4 | | 25.9 | | |
| Queue Delay | | 0.0 | 0.0 | | 0.0 | | |
| Total Delay | | 6.3 | 8.4 | | 25.9 | | |
| LOS | | Α | Α | | С | | |
| Approach Delay | | 6.3 | 8.4 | | 25.9 | | |
| Approach LOS | | Α | Α | | С | | |
| Intersection Summary | | | | | | | |
| Area Type: | CBD | | | | | | |
| Cycle Length: 80 | | | | | | | |
| Actuated Cycle Length: | : 80 | | | | | | |
| Offset: 1 (1%), Referen | ced to phase 2: | EBTL, St | art of Gree | en | | | |
| Natural Cycle: 60 | | | | | | | |
| Control Type: Actuated | -Coordinated | | | | | | |
| Maximum v/c Ratio: 0.5 | 57 | | | | | | |
| Intersection Signal Dela | ay: 8.8 | | | In | tersection | LOS: A | |
| Intersection Capacity U | Itilization 55.8% | | | IC | CU Level | of Service B | |
| Analysis Period (min) 1 | 5 | | | | | | |
| | | | | | | | |
| Splits and Phases: 2 | 081: King St & | Joe Shus | ter Way | | | | |
| A | - | | | | | | |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Lanes, Volumes, Timings 2081: King St & Joe Shuster Way

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2081: King St & Joe Shuster Way

09/30/2021

| | - | _ | - |
|------------------------|-------|-------|------|
| Lane Group | EBT | WBT | SBL |
| Lane Group Flow (vph) | 734 | 1180 | 130 |
| v/c Ratio | 0.35 | 0.57 | 0.36 |
| Control Delay | 6.3 | 8.4 | 25.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 |
| Total Delay | 6.3 | 8.4 | 25.9 |
| Queue Length 50th (m) | 23.9 | 47.3 | 14.5 |
| Queue Length 95th (m) | 32.7 | 63.8 | 29.1 |
| Internal Link Dist (m) | 292.7 | 167.3 | 76.8 |
| Turn Bay Length (m) | | | |
| Base Capacity (vph) | 2117 | 2065 | 394 |
| Starvation Cap Reductn | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.35 | 0.57 | 0.33 |
| Intersection Summary | | | |

HCM Signalized Intersection Capacity Analysis 2081: King St & Joe Shuster Way

09/30/2021

| | • | - | ← | • | - | 4 | |
|-----------------------------------|----------|------|-------------|------|------------|------------------|------|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR | |
| Lane Configurations | | 414 | ∱ 1> | | ¥ | | |
| Traffic Volume (vph) | 0 | 653 | 919 | 131 | 93 | 23 | |
| Future Volume (vph) | 0 | 653 | 919 | 131 | 93 | 23 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Total Lost time (s) | | 5.0 | 5.0 | | 4.0 | | |
| Lane Util. Factor | | 0.95 | 0.95 | | 1.00 | | |
| Frpb, ped/bikes | | 1.00 | 0.98 | | 0.99 | | |
| Flpb, ped/bikes | | 1.00 | 1.00 | | 1.00 | | |
| Frt | | 1.00 | 0.98 | | 0.97 | | |
| Flt Protected | | 1.00 | 1.00 | | 0.96 | | |
| Satd. Flow (prot) | | 2941 | 2856 | | 1458 | | |
| FIt Permitted | | 1.00 | 1.00 | | 0.96 | | |
| Satd. Flow (perm) | | 2941 | 2856 | | 1458 | | |
| Peak-hour factor, PHF | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | |
| Adj. Flow (vph) | 0 | 734 | 1033 | 147 | 104 | 26 | |
| RTOR Reduction (vph) | 0 | 0 | 11 | 0 | 12 | 0 | |
| Lane Group Flow (vph) | 0 | 734 | 1169 | 0 | 118 | 0 | |
| Confl. Peds. (#/hr) | 45 | | | 45 | | 15 | |
| Confl. Bikes (#/hr) | | | | 26 | | | |
| Heavy Vehicles (%) | 0% | 4% | 4% | 0% | 0% | 39% | |
| Bus Blockages (#/hr) | 24 | 24 | 24 | 24 | 0 | 0 | |
| Turn Type | | NA | NA | | Perm | | |
| Protected Phases | | 2 | 6 | | | | |
| Permitted Phases | 2 | | | | 8 | | |
| Actuated Green, G (s) | | 54.6 | 54.6 | | 14.4 | | |
| Effective Green, q (s) | | 55.6 | 55.6 | | 15.4 | | |
| Actuated g/C Ratio | | 0.70 | 0.70 | | 0.19 | | |
| Clearance Time (s) | | 6.0 | 6.0 | | 5.0 | | |
| Vehicle Extension (s) | | 3.0 | 3.0 | | 3.0 | | |
| Lane Grp Cap (vph) | | 2043 | 1984 | | 280 | | |
| v/s Ratio Prot | | 0.25 | c0.41 | | | | |
| v/s Ratio Perm | | | | | c0.08 | | |
| v/c Ratio | | 0.36 | 0.59 | | 0.42 | | |
| Uniform Delay, d1 | | 5.0 | 6.3 | | 28.4 | | |
| Progression Factor | | 1.00 | 1.00 | | 1.00 | | |
| Incremental Delay, d2 | | 0.5 | 0.5 | | 1.0 | | |
| Delay (s) | | 5.5 | 6.8 | | 29.4 | | |
| Level of Service | | Α | A | | С | | |
| Approach Delay (s) | | 5.5 | 6.8 | | 29.4 | | |
| Approach LOS | | A | A | | C | | |
| Intersection Summary | | | | | | | |
| HCM 2000 Control Delay | | | 7.7 | Н | CM 2000 | Level of Service | A |
| HCM 2000 Volume to Capaci | tv ratio | | 0.56 | | 2.31 2000 | | |
| Actuated Cycle Length (s) | ., | | 80.0 | Sı | um of lost | time (s) | 10.0 |
| Intersection Capacity Utilization | on | | 55.8% | | U Level o | | В |
| Analysis Period (min) | | | 15 | | | | |
| c Critical Lane Group | | | | | | | |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Lanes, Volumes, Timings 2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

09/30/2021

| | • | • | † | 1 | - | ļ |
|----------------------------|-------|-------|----------|-------|-------|----------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | ሻ | 7 | A | 7 | 7 | <u> </u> |
| Traffic Volume (vph) | 56 | 227 | 741 | 21 | 86 | 849 |
| Future Volume (vph) | 56 | 227 | 741 | 21 | 86 | 849 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.0 | 3.0 | 3.5 | 3.0 | 3.0 | 3.5 |
| | 30.0 | 0.0 | 3.3 | 15.0 | 30.0 | 3.3 |
| Storage Length (m) | 30.0 | 1 | | 15.0 | 30.0 | |
| Storage Lanes | 2.5 | - 1 | | - 1 | 2.5 | |
| Taper Length (m) | | 4.00 | 4.00 | 4.00 | | 4.00 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | 0.86 | | 0.94 | | |
| Frt | | 0.850 | | 0.850 | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1685 | 1304 | 1842 | 1507 | 1478 | 1842 |
| Flt Permitted | 0.950 | | | | 0.152 | |
| Satd. Flow (perm) | 1685 | 1122 | 1842 | 1413 | 236 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 90 | | 7 | | |
| Link Speed (k/h) | 30 | | 30 | | | 30 |
| Link Distance (m) | 148.7 | | 265.9 | | | 191.3 |
| Travel Time (s) | 17.8 | | 31.9 | | | 23.0 |
| Confl. Peds. (#/hr) | 17.0 | | 31.3 | 28 | 28 | 20.0 |
| | | 117 | | 3 | 20 | |
| Confl. Bikes (#/hr) | 0.00 | | 0.00 | | 0.00 | 0.89 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | |
| Heavy Vehicles (%) | 0% | 11% | 2% | 0% | 14% | 2% |
| Bus Blockages (#/hr) | 0 | 10 | 0 | 0 | 0 | 0 |
| Adj. Flow (vph) | 63 | 255 | 833 | 24 | 97 | 954 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 63 | 255 | 833 | 24 | 97 | 954 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.0 | | 3.0 | _ | | 3.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | 1.0 | | 1.0 | | | 1.0 |
| Headway Factor | 1.09 | 1.15 | 1.01 | 1.09 | 1.09 | 1.01 |
| | 1.09 | 1.15 | 1.01 | 1.09 | 1.09 | 1.01 |
| Turning Speed (k/h) | | | ^ | | | ^ |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| Detector 1 Type | CI+Ex | CI+Ex | CI+Ex | CI+Ex | CI+Ex | CI+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

Synchro 11 Report Page 47

Lanes, Volumes, Timings 2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

09/30/2021

| | • | • | † | 1 | > | ļ | |
|-------------------------------|---------------|-------------|-------------|-------------|-------------|-------------|----|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT | |
| Detector 2 Type | | | CI+Ex | | | CI+Ex | |
| Detector 2 Channel | | | OI - EX | | | O. LA | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | pm+ov | NA | Perm | pm+pt | NA | |
| Protected Phases | | 1 | 2 | | 1 | 6 | |
| Permitted Phases | 8 | 8 | | 2 | 6 | | |
| Detector Phase | 8 | 1 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 21.0 | 6.0 | 27.0 | 27.0 | 6.0 | 27.0 | |
| Minimum Split (s) | 26.0 | 10.0 | 34.0 | 34.0 | 10.0 | 34.0 | |
| Total Split (s) | 26.0 | 10.0 | 44.0 | 44.0 | 10.0 | 54.0 | |
| Total Split (%) | 32.5% | 12.5% | 55.0% | 55.0% | 12.5% | 67.5% | |
| Maximum Green (s) | 21.0 | 6.0 | 37.0 | 37.0 | 6.0 | 47.0 | |
| Yellow Time (s) | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 1.0 | 3.0 | 3.0 | 1.0 | 3.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | |
| Total Lost Time (s) | 4.0 | 3.0 | 6.0 | 6.0 | 3.0 | 6.0 | |
| Lead/Lag | | Lead | Lag | Lag | Lead | | |
| Lead-Lag Optimize? | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | None | C-Max | C-Max | None | C-Max | |
| Walk Time (s) | 7.0 | | 7.0 | 7.0 | | 0.0 | |
| Flash Dont Walk (s) | 14.0 | | 20.0 | 20.0 | | 0.0 | |
| Pedestrian Calls (#/hr) | 0 | 20.0 | 9 | 9 | 24.4 | 0 | |
| Act Effct Green (s) | 22.0 | 22.3 | 46.9 | 46.9 | 61.4 | 60.8 | |
| Actuated g/C Ratio | 0.28 | 0.28 | 0.59 | 0.59 | 0.77 | 0.76 | |
| v/c Ratio | 0.14 | 0.64 | 0.77 | 0.03 | 0.31 | 0.68 | |
| Control Delay | 22.9 | 20.9 | 23.4 | 9.1 | 7.5 | 13.9 | |
| Queue Delay | 0.0 22.9 | 0.0 20.9 | 0.0 23.4 | 0.0 9.1 | 0.0 7.5 | 0.1 14.0 | |
| Total Delay LOS | 22.9 C | 20.9 C | 23.4 C | 9.1 A | 7.5 A | 14.0 B | |
| | 21.3 | C | 23.0 | А | А | 13.4 | |
| Approach Delay Approach LOS | 21.3 C | | 23.0 C | | | 13.4 B | |
| Approach LOS | U | | U | | | В | |
| Intersection Summary | | | | | | | |
| Area Type: | Other | | | | | | |
| Cycle Length: 80 | | | | | | | |
| Actuated Cycle Length: 80 | | | | | | | |
| Offset: 31 (39%), Reference | ed to phase | 2:NBT a | nd 6:SBT | L, Start of | f 1st Gree | en | |
| Natural Cycle: 80 | | | | | | | |
| Control Type: Actuated-Co | ordinated | | | | | | |
| Maximum v/c Ratio: 0.77 | | | | | | | |
| Intersection Signal Delay: 1 | | | | | ntersectio | | |
| Intersection Capacity Utiliza | ation 73.2% | | | IC | CU Level | of Service | D: |
| Analysis Period (min) 15 | | | | | | | |
| | | | | | | | |
| Splits and Phases: 2134 | : British Col | ombia Ro | l/Dufferin | St & Sasl | katchewa | n Rd | |
| Ø1 | (D) | | | | | | |
| 10 - 102 | (K) | | | | | | |

2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

09/30/2021

| | • | • | † | / | / | . ↓ |
|------------------------|-------|------|----------|------|------|--------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Group Flow (vph) | 63 | 255 | 833 | 24 | 97 | 954 |
| v/c Ratio | 0.14 | 0.64 | 0.77 | 0.03 | 0.31 | 0.68 |
| Control Delay | 22.9 | 20.9 | 23.4 | 9.1 | 7.5 | 13.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Total Delay | 22.9 | 20.9 | 23.4 | 9.1 | 7.5 | 14.0 |
| Queue Length 50th (m) | 7.2 | 16.4 | 115.6 | 1.3 | 5.1 | 108.9 |
| Queue Length 95th (m) | 16.0 | 34.5 | #188.3 | 4.9 | 10.2 | #192.8 |
| Internal Link Dist (m) | 124.7 | | 241.9 | | | 167.3 |
| Turn Bay Length (m) | 30.0 | | | 15.0 | 30.0 | |
| Base Capacity (vph) | 463 | 397 | 1078 | 830 | 313 | 1400 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 50 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.14 | 0.64 | 0.77 | 0.03 | 0.31 | 0.71 |

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 2134: British Colombia Rd/Dufferin St & Saskatchewan Rd

09/30/2021

| are Configurations | | • | • | † | / | - | ↓ | |
|--|-----------------------|-------------|-------|-------|------|------------|----------------|------|
| ane Configurations in a fraffic Volume (vph) 56 227 741 21 86 849 victure Volume (vph) 56 227 741 21 86 849 victure Volume (vph) 56 227 741 21 86 849 victure Volume (vph) 56 227 741 21 86 849 victure Volume (vph) 56 227 741 21 86 849 victure Volume (vph) 1900 1900 1900 1900 1900 1900 300 300 3.5 3.0 3.5 3.0 3.5 3.0 3.5 3.0 3.0 3.0 5.0 3.0 3.0 5.0 3.0 3.0 5.0 3.0 3.0 5.0 3.0 3.0 5.0 3.0 3.0 5.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3 | Movement | WBL | WBR | NBT | NBR | SBL | SBT | |
| Traffic Volume (vph) | | | | | | | | |
| Figure Volume (vph) | | | | | | | | |
| Deal Flow (vphpl) 1900 1 | | | | | | | | |
| Content | | | | | | | | |
| Stall Lost time (s) | Lane Width | | | | | | | |
| Cane Util. Factor | | | | | | | | |
| Producted Phases 1.00 0.89 1.00 1. | \ / | | | | | | | |
| | | | | | | | | |
| The content of the | | | | | | | | |
| Said Flow (prot) 1685 1162 1842 1413 1478 1842 1416 1478 1842 1417 1478 1842 1418 1478 1842 1418 | Frt | | | | | | | |
| Said. Flow (prot) | Flt Protected | | | 1.00 | | | | |
| Cit Permitted | Satd. Flow (prot) | 1685 | 1162 | 1842 | | | | |
| Peak-hour factor, PHF 0.89 0.99 0.90 | Flt Permitted | | 1.00 | 1.00 | 1.00 | 0.15 | 1.00 | |
| Peak-hour factor, PHF 0.89 0.99 0.90 | Satd. Flow (perm) | | | | | | | |
| Adj. Flow (vph) 63 255 833 24 97 954 ATTOR Reduction (vph) 0 65 0 3 0 0 ane Group Flow (vph) 63 190 833 21 97 954 Confl. Peds. (#/hr) 28 28 Confl. Bikes (#/hr) 117 3 deavy Vehicles (%) 0% 11% 2% 0% 14% 2% Bus Blockages (#/hr) 0 10 0 0 0 0 Turn Type Perm pm+ov NA Perm pm+pt NA Perotected Phases 8 8 2 6 Permitted Phases 8 8 2 6 Effective Green, g (s) 13.6 22.1 44.9 44.9 56.4 56.4 Actuated g/C Ratio 0.17 0.28 0.56 0.56 0.70 0.70 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 7.0 Pelicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 ane Grp Cap (vph) 286 321 1033 793 298 1298 Asia Permit Protected Phases 8 32 10.0 3.0 3.0 3.0 3.0 ane Grp Cap (vph) 286 321 1033 793 298 1298 Asia Permit Protected Phases 8 32 10.0 3 0.0 3.0 3.0 3.0 ane Grp Cap (vph) 286 321 1033 793 298 1298 Asia Permit Protected Phase 9.8 10.0 3 0.3 3.0 3.0 Ane Group Cap (vph) 286 321 1033 793 298 1298 Asia Permit Protected | Peak-hour factor, PHF | | | | | | | |
| ATOR Reduction (vph) 0 65 0 3 0 0 0 ane Group Flow (vph) 63 190 833 21 97 954 confl. Peds. (#hrr) 28 28 28 confl. Peds. (#hrr) 3 3 deavy Vehicles (%) 0% 11% 2% 0% 14% 2% 808 Blockages (#hrr) 0 10 0 0 0 0 0 0 confl. Peds. (#hrr) 170 117 3 3 deavy Vehicles (%) 0% 11% 2% 0% 14% 2% 808 Blockages (#hrr) 0 10 0 0 0 0 0 0 confl. Peds. (#hrr) 1 2 1 6 6 deavy Vehicles (%) 12.6 20.1 43.9 43.9 55.4 55.4 deavy Vehicles (%) 13.6 22.1 44.9 44.9 56.4 56.4 deavy Vehicles (%) 13.6 22.1 44.9 44.9 56.4 56.4 deavy Vehicles (%) 13.6 22.1 44.9 44.9 56.4 56.4 deavy Vehicles (%) 13.6 22.1 44.9 44.9 56.4 56.4 deavy Vehicles (%) 13.6 22.1 44.9 44.9 56.4 56.4 deavy Vehicles (%) 13.6 22.1 44.9 44.9 56.4 56.4 deavy Vehicles (%) 13.6 22.1 44.9 44.9 56.4 56.4 deavy Vehicles (%) 13.6 22.1 44.9 44.9 56.4 56.4 deavy Vehicles (%) 13.6 22.1 44.9 44.9 56.4 56.4 deavy Vehicles (%) 13.6 22.1 44.9 44.9 56.4 56.4 deavy Vehicles (%) 13.6 22.1 44.9 44.9 56.4 56.4 deavy Vehicles (%) 13.6 22.1 44.9 44.9 56.4 56.4 deavy Vehicles (%) 13.6 22.1 44.9 44.9 56.4 56.4 deavy Vehicles (%) 13.6 22.1 44.9 44.9 56.4 56.4 deavy Vehicles (%) 13.6 22.1 44.9 44.9 56.4 56.4 deavy Vehicles (%) 13.6 22.1 44.9 44.9 56.4 56.4 56.4 deavy Vehicles (%) 13.6 22.1 44.9 44.9 56.4 56.4 56.4 deavy Vehicles (%) 13.6 22.1 44.9 44.9 56.4 56.4 56.4 deavy Vehicles (%) 13.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 | | | | | | | | |
| Ame Group Flow (vph) 63 190 833 21 97 954 Confl. Bikes (#/hr) 28 28 28 Confl. Bikes (#/hr) 117 3 3 Cleavy Vehicles (%) 0% 11% 2% 0% 14% 2% 0% 14% 2% 0% 14% 2% 0% 14% 2% 0% 14% 2% 0% 14% 2% 0% 14% 2% 0% 0% 14% 2% 0% 0% 14% 2% 0% 0% 14% 2% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% | , (, , | | | | | | | |
| Confl. Peds. (#/hr) | | _ | | - | | | | |
| Confl. Bikes (#/hr) | Confl. Peds. (#/hr) | - 30 | | | | | | |
| Heavy Vehicles (%) | | | 117 | | 3 | | | |
| Sus Blockages (#/hr) | Heavy Vehicles (%) | 0% | 11% | 2% | | 14% | 2% | |
| Turn Type | Bus Blockages (#/hr) | 0 | 10 | 0 | 0 | 0 | 0 | |
| Protected Phases 8 8 8 2 6 6 Actuated Green, G (s) 12.6 20.1 43.9 43.9 55.4 55.4 Actuated Green, g (s) 13.6 22.1 44.9 44.9 56.4 56.4 Actuated g/C Ratio 0.17 0.28 0.56 0.56 0.70 0.70 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 Actuated g/C Ratio 0.17 0.28 0.56 0.56 0.70 0.70 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 Actuated g/C Ratio 0.17 0.28 0.56 0.56 0.70 0.70 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 7.0 Actuated g/C Ratio 0.17 0.28 0.56 0.56 0.70 0.70 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 7.0 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 7.0 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 7.0 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 7.0 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 7.0 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 7.0 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 7.0 Clearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 7.0 Clearance Time (s) 5.0 4.0 7.0 7.0 7.0 7.0 7.0 Clearance Time (s) 5.0 4.0 7.0 7.0 7.0 7.0 7.0 Clearance Time (s) 5.0 4.0 7.0 7.0 7.0 7.0 7.0 Clearance Time (s) 5.0 4.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7 | Turn Type | Perm | pm+ov | NA | Perm | pm+pt | NA | |
| Actuated Green, G (s) 12.6 20.1 43.9 43.9 55.4 55.4 Actuated Green, g (s) 13.6 22.1 44.9 44.9 56.4 56.4 Actuated g/C Ratio 0.17 0.28 0.56 0.56 0.70 0.70 Actuated g/C Ratio 0.17 0.28 0.56 0.56 0.70 0.70 Actuated g/C Ratio 0.17 0.28 0.56 0.56 0.70 0.70 Actuated g/C Ratio 0.17 0.28 0.50 0.56 0.56 0.70 0.70 Actuated g/C Ratio 0.17 0.28 0.50 0.56 0.56 0.70 0.70 Actuated g/C Ratio 0.10 0.01 0.01 0.01 0.02 Actuated Bream 0.04 0.10 0.01 0.19 Actuated Bream 0.04 0.10 0.01 0.19 Actuated Bream 0.04 0.10 0.01 0.00 0.03 0.03 0.052 Actuated Bream 0.04 0.10 0.01 0.00 0.03 0.03 0.052 Actuated Bream 0.04 0.10 0.01 0.00 0.03 0.03 0.052 Actuated Bream 0.04 0.10 0.01 0.00 0.01 0.09 Actuated Bream 0.04 0.10 0.01 0.00 0.00 0.00 0 0 0 0 0 0 0 | Protected Phases | | | | | | | |
| Effective Green, g (s) 13.6 22.1 44.9 44.9 56.4 56.4 Actuated g/C Ratio 0.17 0.28 0.56 0.56 0.70 0.70 Delarance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 Actuated g/C Ratio 0.13 3.0 3.0 3.0 3.0 3.0 3.0 3.0 Anne Grp Cap (vph) 286 321 1033 793 298 1298 As Ratio Prot 0.006 0.45 0.03 0.52 As Ratio Prot 0.006 0.45 0.03 0.52 As Ratio Prot 0.00 0.01 0.19 As Ratio Prot 0.04 0.10 0.01 0.19 As Ratio Prot 0.05 0.59 0.81 0.03 0.33 0.73 Annerm Delay, d1 28.6 25.0 14.1 7.8 9.4 7.2 Arogression Factor 1.00 1.00 1.00 1.00 1.00 1.00 Arogression Factor 1.00 1.00 | Permitted Phases | 8 | 8 | | 2 | 6 | | |
| Effective Green, g (s) 13.6 22.1 44.9 44.9 56.4 56.4 cutuated g/C Ratio 0.17 0.28 0.56 0.56 0.70 0.70 0.00 0.00 0.00 0.00 0.00 0.0 | Actuated Green, G (s) | 12.6 | 20.1 | 43.9 | 43.9 | 55.4 | 55.4 | |
| Actuated g/C Ratio 0.17 0.28 0.56 0.56 0.70 0.70 Dearance Time (s) 5.0 4.0 7.0 7.0 4.0 7.0 | | 13.6 | 22.1 | 44.9 | 44.9 | 56.4 | 56.4 | |
| //ehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 | Actuated q/C Ratio | 0.17 | 0.28 | 0.56 | 0.56 | 0.70 | 0.70 | |
| Ane Grp Cap (vph) 286 321 1033 793 298 1298 //s Ratio Prot 0.0.06 c0.45 0.03 c0.52 //s Ratio Perm 0.04 0.10 0.01 0.19 //c Ratio Perm 0.04 0.10 0.01 0.19 //c Ratio Perm 0.04 0.10 0.01 0.19 //c Ratio 0.22 0.59 0.81 0.03 0.33 0.73 //c Ratio Perm 0.04 1.00 1.00 1.00 0.00 0.00 0.00 0.00 | Clearance Time (s) | 5.0 | 4.0 | 7.0 | 7.0 | 4.0 | 7.0 | |
| Anne Grp Cap (vph) | Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| S Ratio Prot | Lane Grp Cap (vph) | 286 | 321 | 1033 | 793 | 298 | 1298 | |
| S Ratio Perm 0.04 0.10 0.01 0.19 0.19 0.19 0.16 0.22 0.59 0.81 0.03 0.33 0.73 0.35 0.73 0.35 0.73 0.35 0.74 0.35 0.35 0.74 0.35 0.35 0.75 0.35 0.35 0.75 0.35 0.35 0.75 0.35 0.35 0.75 0.35 0.35 0.35 0.75 0.35 | v/s Ratio Prot | | c0.06 | c0.45 | | 0.03 | c0.52 | |
| Refatio 0.22 0.59 0.81 0.03 0.33 0.73 0.73 0.75 0.75 0.81 0.03 0.33 0.73 0.75 | v/s Ratio Perm | 0.04 | | | 0.01 | | | |
| Progression Factor 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0 | v/c Ratio | | 0.59 | 0.81 | 0.03 | 0.33 | 0.73 | |
| Delay (d2 | Uniform Delay, d1 | 28.6 | 25.0 | 14.1 | 7.8 | 9.4 | 7.2 | |
| Comparison Com | Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Approach Delay (s) 28.2 20.4 10.9 | Incremental Delay, d2 | 0.4 | 2.9 | 6.7 | 0.1 | 0.6 | 3.7 | |
| Approach Delay (s) | Delay (s) | 29.0 | 28.0 | 20.8 | 7.9 | 10.0 | 11.0 | |
| Approach LOS | Level of Service | | С | С | Α | Α | В | |
| New York | Approach Delay (s) | 28.2 | | 20.4 | | | 10.9 | |
| HCM 2000 Control Delay 17.0 HCM 2000 Level of Service B HCM 2000 Volume to Capacity ratio 0.77 Volume to Capacity (s) 80.0 Sum of lost time (s) 14.0 Nactuated Cycle Length (s) 73.2% ICU Level of Service D Inallysis Period (min) 15 ICU Level of Service D | Approach LOS | С | | С | | | В | |
| HCM 2000 Control Delay 17.0 HCM 2000 Level of Service B HCM 2000 Volume to Capacity ratio 0.77 Cutuated Cycle Length (s) 80.0 Sum of lost time (s) 14.0 Intersection Capacity Utilization 73.2% ICU Level of Service D Inallysis Period (min) 15 | Intersection Summary | | | | | | | |
| HCM 2000 Volume to Capacity ratio 0.77 Actuated Cycle Length (s) 80.0 Sum of lost time (s) 14.0 Intersection Capacity Utilization 73.2% ICU Level of Service D Analysis Period (min) 15 | | | | 17.0 | Н | CM 2000 | Level of Servi | ce B |
| Actuated Cycle Length (s) 80.0 Sum of lost time (s) 14.0 ntersection Capacity Utilization 73.2% ICU Level of Service D Analysis Period (min) 15 | | acity ratio | | | | | | |
| ntersection Capacity Utilization 73.2% ICU Level of Service D Analysis Period (min) 15 | | | | | S | um of lost | t time (s) | 14.0 |
| Analysis Period (min) 15 | | ation | | | | | | |
| | Analysis Period (min) | | | | | | | |
| , Chilical Lane Group | c Critical Lane Group | | | | | | | |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

| | • | • | † | / | > | ↓ | |
|-------------------------------|------------|-------|----------|-------|-------------|------------|-----|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT | |
| Lane Configurations | Y | | f) | | | 4 | |
| Traffic Volume (vph) | 30 | 4 | 174 | 15 | 0 | 117 | |
| Future Volume (vph) | 30 | 4 | 174 | 15 | 0 | 117 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Ped Bike Factor | | | | | | | |
| Frt | 0.985 | | 0.989 | | | | |
| Flt Protected | 0.957 | | | | | | |
| Satd. Flow (prot) | 1736 | 0 | 1822 | 0 | 0 | 1842 | |
| Flt Permitted | 0.957 | | | | | | |
| Satd. Flow (perm) | 1736 | 0 | 1822 | 0 | 0 | 1842 | |
| Link Speed (k/h) | 50 | | 50 | | | 50 | |
| Link Distance (m) | 78.7 | | 80.2 | | | 351.8 | |
| Travel Time (s) | 5.7 | | 5.8 | | | 25.3 | |
| Confl. Peds. (#/hr) | 5 | 11 | | 882 | 882 | | |
| Confl. Bikes (#/hr) | | 4 | | 14 | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | |
| Adj. Flow (vph) | 33 | 4 | 189 | 16 | 0 | 127 | |
| Shared Lane Traffic (%) | | | | | | | |
| Lane Group Flow (vph) | 37 | 0 | 205 | 0 | 0 | 127 | |
| Enter Blocked Intersection | No | No | No | No | No | No | |
| Lane Alignment | Left | Right | Left | Right | Left | Left | |
| Median Width(m) | 3.5 | | 0.0 | | | 0.0 | |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | |
| Headway Factor | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | | |
| Sign Control | Stop | | Free | | | Free | |
| Intersection Summary | | | | | | | |
| Area Type: | Other | | | | | | |
| Control Type: Unsignalized | | | | | | | |
| Intersection Capacity Utiliza | tion 26.4% | | | IC | U Level | of Service | e A |
| Analysis Period (min) 15 | | | | | | | |

| | € | • | † | / | - | ļ |
|------------------------------|---------|---------|------------|----------|-----------|-----------|
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | ¥ | | 1 > | | | ર્ન |
| Traffic Volume (veh/h) | 30 | 4 | 174 | 15 | 0 | 117 |
| Future Volume (Veh/h) | 30 | 4 | 174 | 15 | 0 | 117 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 33 | 4 | 189 | 16 | 0 | 127 |
| Pedestrians | 882 | | 5 | | | 11 |
| Lane Width (m) | 3.5 | | 3.5 | | | 3.5 |
| Walking Speed (m/s) | 1.2 | | 1.2 | | | 1.2 |
| Percent Blockage | 71 | | 0 | | | 1 |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 1211 | 1090 | | | 1087 | |
| vC1, stage 1 conf vol | | .000 | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1211 | 1090 | | | 1087 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | 0 | 0.2 | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 42 | 95 | | | 100 | |
| cM capacity (veh/h) | 57 | 74 | | | 183 | |
| Direction, Lane # | WB 1 | NB 1 | SB 1 | | | |
| | | | | | | |
| Volume Total | 37 | 205 | 127 | | | |
| Volume Left | 33 4 | 0 16 | 0 | | | |
| Volume Right cSH | 59 | 1700 | 183 | | | |
| | | | | | | |
| Volume to Capacity | 0.63 | 0.12 | 0.00 | | | |
| Queue Length 95th (m) | 19.8 | 0.0 | 0.0 | | | |
| Control Delay (s) | 139.2 | 0.0 | 0.0 | | | |
| Lane LOS | F | | | | | |
| Approach Delay (s) | 139.2 | 0.0 | 0.0 | | | |
| Approach LOS | F | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 14.0 | | | |
| Intersection Capacity Utiliz | zation | | 26.4% | IC | U Level o | f Service |
| Analysis Period (min) | | | 15 | | | |
| . , | | | | | | |

HCM Unsignalized Intersection Capacity Analysis 9004: Jefferson Ave & Site B Driveway

9006: Atlantic Ave & Site B Driveway

| α | 10 | 1 | 10 | α | d |
|----------|-----|---|----|----------|---|
| N9 | 1.1 | u | 1/ | w | |

| Lane Group EBL EBR NBL NBT SBT SBR Lane Configurations ↑ ↑ |
|---|
| Traffic Volume (vph) 39 11 20 107 162 14 Future Volume (vph) 39 11 20 107 162 14 Ideal Flow (vphpl) 1900 1900 1900 1900 1900 1900 |
| Traffic Volume (vph) 39 11 20 107 162 14 Future Volume (vph) 39 11 20 107 162 14 Ideal Flow (vphpl) 1900 1900 1900 1900 1900 1900 |
| Future Volume (vph) 39 11 20 107 162 14 Ideal Flow (vphpl) 1900 1900 1900 1900 1900 1900 |
| |
| Lane Util Factor 1 00 1 00 1 00 1 00 1 00 |
| |
| Ped Bike Factor |
| Frt 0.970 0.989 |
| Flt Protected 0.963 0.992 |
| Satd. Flow (prot) 1721 0 0 1827 1822 0 |
| Flt Permitted 0.963 0.992 |
| Satd. Flow (perm) 1721 0 0 1827 1822 0 |
| Link Speed (k/h) 50 50 50 |
| Link Distance (m) 78.7 34.0 217.5 |
| Travel Time (s) 5.7 2.4 15.7 |
| Confl. Peds. (#/hr) 820 223 223 |
| Confl. Bikes (#/hr) 1 13 |
| Peak Hour Factor 0.92 0.92 0.92 0.92 0.92 0.92 |
| Adj. Flow (vph) 42 12 22 116 176 15 |
| Shared Lane Traffic (%) |
| Lane Group Flow (vph) 54 0 0 138 191 0 |
| Enter Blocked Intersection No No No No No No |
| Lane Alignment Left Right Left Left Right |
| Median Width(m) 3.5 0.0 0.0 |
| Link Offset(m) 0.0 0.0 0.0 |
| Crosswalk Width(m) 1.6 1.6 1.6 |
| Two way Left Turn Lane |
| Headway Factor 1.01 1.01 1.01 1.01 1.01 |
| Turning Speed (k/h) 24 14 24 14 |
| Sign Control Stop Free Free |
| Intersection Summary |
| Area Type: Other |

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 42.7%
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis 9006: Atlantic Ave & Site B Driveway

09/30/2021

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|-------------------------------|-------|------|-------|----------|-----------|-----------|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | ¥ | | | 4 | £ | |
| Traffic Volume (veh/h) | 39 | 11 | 20 | 107 | 162 | 14 |
| Future Volume (Veh/h) | 39 | 11 | 20 | 107 | 162 | 14 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 42 | 12 | 22 | 116 | 176 | 15 |
| Pedestrians | 223 | | | 820 | | |
| Lane Width (m) | 3.5 | | | 3.5 | | |
| Walking Speed (m/s) | 1.2 | | | 1.2 | | |
| Percent Blockage | 18 | | | 66 | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | 77 | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 566 | 1226 | 414 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 566 | 1226 | 414 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 89 | 80 | 98 | | | |
| cM capacity (veh/h) | 388 | 60 | 938 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 54 | 138 | 191 | | | |
| Volume Left | 42 | 22 | 0 | | | |
| Volume Right | 12 | 0 | 15 | | | |
| cSH | 175 | 938 | 1700 | | | |
| Volume to Capacity | 0.31 | 0.02 | 0.11 | | | |
| Queue Length 95th (m) | 9.4 | 0.5 | 0.0 | | | |
| Control Delay (s) | 34.5 | 1.6 | 0.0 | | | |
| Lane LOS | D | Α | | | | |
| Approach Delay (s) | 34.5 | 1.6 | 0.0 | | | |
| Approach LOS | D | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 5.4 | | | |
| Intersection Capacity Utiliza | ation | | 42.7% | IC | U Level o | f Service |
| Analysis Period (min) | | | 15 | | | |
| , | | | | | | |

| 09/30/2021 |
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|--------------------------------|-----------|-------|----------|-------|----------|------------|-----|
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR | |
| Lane Configurations | | ની | 1 | | W | | |
| Traffic Volume (vph) | 64 | 200 | 75 | 15 | 32 | 3 | |
| Future Volume (vph) | 64 | 200 | 75 | 15 | 32 | 3 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Ped Bike Factor | | | | | | | |
| Frt | | | 0.978 | | 0.989 | | |
| Flt Protected | | 0.988 | | | 0.956 | | |
| Satd. Flow (prot) | 0 | 1820 | 1802 | 0 | 1742 | 0 | |
| Flt Permitted | | 0.988 | | | 0.956 | | |
| Satd. Flow (perm) | 0 | 1820 | 1802 | 0 | 1742 | 0 | |
| Link Speed (k/h) | | 40 | 40 | | 50 | | |
| Link Distance (m) | | 198.4 | 579.0 | | 130.0 | | |
| Travel Time (s) | | 17.9 | 52.1 | | 9.4 | | |
| Confl. Peds. (#/hr) | 727 | | | 727 | | | |
| Confl. Bikes (#/hr) | | | | 24 | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | |
| Adj. Flow (vph) | 70 | 217 | 82 | 16 | 35 | 3 | |
| Shared Lane Traffic (%) | | | | | | | |
| Lane Group Flow (vph) | 0 | 287 | 98 | 0 | 38 | 0 | |
| Enter Blocked Intersection | No | No | No | No | No | No | |
| Lane Alignment | Left | Left | Left | Right | Left | Right | |
| Median Width(m) | | 3.5 | 3.5 | | 3.5 | • | |
| Link Offset(m) | | 0.0 | 0.0 | | 0.0 | | |
| Crosswalk Width(m) | | 1.6 | 1.6 | | 1.6 | | |
| Two way Left Turn Lane | | | | | | | |
| Headway Factor | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | |
| Turning Speed (k/h) | 24 | | | 14 | 24 | 14 | |
| Sign Control | | Free | Free | | Stop | | |
| Intersection Summary | | | | | | | |
| Area Type: | Other | | | | | | |
| Control Type: Unsignalized | | | | | | | |
| Intersection Capacity Utilizat | ion 30.7% | | | IC | CU Level | of Service | A A |
| Analysis Period (min) 15 | | | | | | | |

HCM Unsignalized Intersection Capacity Analysis 9007: New Liberty St & Hanna Ave

| | | - | _ | _ | * | * |
|------------------------|------|------|-------|------|------|------|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | | 4 | î, | | Y | |
| Traffic Volume (veh/h) | 64 | 200 | 75 | 15 | 32 | 3 |
| Future Volume (Veh/h) | 64 | 200 | 75 | 15 | 32 | 3 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 70 | 217 | 82 | 16 | 35 | 3 |
| Pedestrians | | | | | 727 | |
| Lane Width (m) | | | | | 3.5 | |
| Walking Speed (m/s) | | | | | 1.2 | |
| Percent Blockage | | | | | 59 | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | 198 | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 825 | | | | 1174 | 817 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 825 | | | | 1174 | 817 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 79 | | | | 49 | 98 |
| cM capacity (veh/h) | 331 | | | | 69 | 155 |
| Direction, Lane # | EB 1 | WB 1 | SB 1 | | | |
| Volume Total | 287 | 98 | 38 | | | |
| Volume Left | 70 | 0 | 35 | | | |
| Volume Right | 0 | 16 | 3 | | | |
| cSH | 331 | 1700 | 72 | | | |
| Volume to Capacity | 0.21 | 0.06 | 0.53 | | | |
| Queue Length 95th (m) | 6.0 | 0.0 | 16.8 | | | |
| Control Delay (s) | 8.0 | 0.0 | 101.3 | | | |
| 1 100 | | | - | | | |

Synchro 11 Report

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Lane LOS Approach Delay (s) Approach LOS

Intersection Summary
Average Delay
Intersection Capacity Utilization
Analysis Period (min)

8.0

0.0 101.3

14.5 30.7%

ICU Level of Service

Α

09/30/2021

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|--------------------------------|------------|-------|-------|-------|------------|--------------|
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | | 4 | î, | | ¥ | |
| Traffic Volume (vph) | 161 | 135 | 102 | 43 | 44 | 160 |
| Future Volume (vph) | 161 | 135 | 102 | 43 | 44 | 160 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | | | 0.960 | | 0.894 | |
| Flt Protected | | 0.974 | | | 0.989 | |
| Satd. Flow (prot) | 0 | 1794 | 1669 | 0 | 1629 | 0 |
| Flt Permitted | | 0.974 | | | 0.989 | |
| Satd. Flow (perm) | 0 | 1794 | 1669 | 0 | 1629 | 0 |
| Link Speed (k/h) | | 40 | 40 | | 50 | |
| Link Distance (m) | | 121.2 | 87.6 | | 80.2 | |
| Travel Time (s) | | 10.9 | 7.9 | | 5.8 | |
| Confl. Peds. (#/hr) | 498 | | | 498 | | |
| Confl. Bikes (#/hr) | | | | 5 | | 62 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Bus Blockages (#/hr) | 0 | 0 | 14 | 14 | 0 | 0 |
| Adj. Flow (vph) | 179 | 150 | 113 | 48 | 49 | 178 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 329 | 161 | 0 | 227 | 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 | J 1 | 3.5 | |
| Link Offset(m) | | 0.0 | 0.0 | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | 1.6 | | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.01 | 1.01 | 1.09 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | | | 14 | 24 | 14 |
| Sign Control | | Stop | Stop | | Stop | |
| ŭ | | | | | P | |
| Intersection Summary | | | | | | |
| | Other | | | | | |
| Control Type: Unsignalized | | | | | | |
| Intersection Capacity Utilizat | tion 51.6% | | | IC | CU Level o | of Service A |
| Analysis Period (min) 15 | | | | | | |

| | • | - | - | • | > | 4 |
|------------------------------|-------|-------|-------|------|-------------|---------|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | | 4 | 1> | | Y | |
| Sign Control | | Stop | Stop | | Stop | |
| Traffic Volume (vph) | 161 | 135 | 102 | 43 | 44 | 160 |
| Future Volume (vph) | 161 | 135 | 102 | 43 | 44 | 160 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 179 | 150 | 113 | 48 | 49 | 178 |
| Direction, Lane # | EB 1 | WB 1 | SB 1 | | | |
| Volume Total (vph) | 329 | 161 | 227 | | | |
| Volume Left (vph) | 179 | 0 | 49 | | | |
| Volume Right (vph) | 0 | 48 | 178 | | | |
| Hadj (s) | 0.14 | -0.14 | -0.39 | | | |
| Departure Headway (s) | 4.8 | 4.7 | 4.7 | | | |
| Degree Utilization, x | 0.44 | 0.21 | 0.30 | | | |
| Capacity (veh/h) | 713 | 710 | 711 | | | |
| Control Delay (s) | 11.6 | 9.0 | 9.6 | | | |
| Approach Delay (s) | 11.6 | 9.0 | 9.6 | | | |
| Approach LOS | В | Α | Α | | | |
| Intersection Summary | | | | | | |
| Delay | | | 10.4 | | | |
| Level of Service | | | В | | | |
| Intersection Capacity Utiliz | ation | | 51.6% | IC | U Level of | Service |
| Analysis Period (min) | | | 15 | | | |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

HCM Unsignalized Intersection Capacity Analysis 9022: New Liberty St & Jefferson Ave

| Lane Group EBL EBT WBT WBR SBL SBR Lane Configurations ↓ |
|--|
| Lane Configurations Image: Configuration of the property of the proper |
| Traffic Volume (vph) 19 159 42 35 104 103 Future Volume (vph) 19 159 42 35 104 103 Ideal Flow (vphpl) 1900 1900 1900 1900 1900 Lane Util. Factor 1.00 1.00 1.00 1.00 1.00 Ped Bike Factor 0.93 0.66 0.60 Frt 0.939 0.933 |
| Future Volume (vph) 19 159 42 35 104 103 Ideal Flow (vphpl) 1900 1900 1900 1900 1900 Lane Util. Factor 1.00 1.00 1.00 1.00 1.00 Ped Bike Factor 0.93 0.66 0.60 0.60 Frt 0.939 0.933 0.933 |
| Ideal Flow (vphpl) 1900 |
| Lane Util. Factor 1.00 |
| Ped Bike Factor 0.93 0.66 0.60 Frt 0.939 0.933 |
| Frt 0.939 0.933 |
| *** |
| |
| Satd. Flow (prot) 0 1730 1141 0 1430 0 |
| Fit Permitted 0.971 0.975 |
| Satd, Flow (perm) 0 1571 1141 0 1007 0 |
| Right Turn on Red Yes Yes |
| 9 |
| |
| Link Speed (k/h) 40 40 50 |
| Link Distance (m) 87.6 198.4 42.4 |
| Travel Time (s) 7.9 17.9 3.1 |
| Confl. Peds. (#/hr) 1226 1226 671 200 |
| Confl. Bikes (#/hr) 19 5 |
| Peak Hour Factor 0.90 0.90 0.90 0.90 0.90 0.90 |
| Bus Blockages (#/hr) 0 14 0 0 0 |
| Adj. Flow (vph) 21 177 47 39 116 114 |
| Shared Lane Traffic (%) |
| Lane Group Flow (vph) 0 198 86 0 230 0 |
| Enter Blocked Intersection No No No No No No |
| Lane Alignment Left Left Right Left Right |
| Median Width(m) 0.0 0.0 3.5 |
| Link Offset(m) 0.0 0.0 0.0 |
| Crosswalk Width(m) 1.6 1.6 1.6 |
| Two way Left Turn Lane |
| Headway Factor 1.01 1.09 1.01 1.01 1.01 1.01 |
| Turning Speed (k/h) 24 14 24 14 |
| Number of Detectors 1 2 2 1 |
| Detector Template Left Thru Thru Left |
| Leading Detector (m) 6.1 30.5 30.5 6.1 |
| |
| 3 () |
| Detector 1 Position(m) 0.0 0.0 0.0 0.0 |
| Detector 1 Size(m) 6.1 1.8 1.8 6.1 |
| Detector 1 Type CI+Ex CI+Ex CI+Ex CI+Ex |
| Detector 1 Channel |
| Detector 1 Extend (s) 0.0 0.0 0.0 0.0 |
| Detector 1 Queue (s) 0.0 0.0 0.0 0.0 |
| Detector 1 Delay (s) 0.0 0.0 0.0 0.0 |
| Detector 2 Position(m) 28.7 28.7 |
| Detector 2 Size(m) 1.8 1.8 |
| Detector 2 Type CI+Ex CI+Ex |
| Detector 2 Channel |
| Detector 2 Extend (s) 0.0 0.0 |
| Turn Type Perm NA NA Perm |
| Protected Phases 2 6 |

| Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improve | ments |
|---|-------|
| HDR Corporation | |

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| | • | - | ← | • | \ | 4 | | |
|------------------------------|--------------|------------|------------|------------|------------|--------------|--|--|
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR | | |
| Permitted Phases | 2 | | | | 4 | | | |
| Detector Phase | 2 | 2 | 6 | | 4 | | | |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | 7.0 | | 7.0 | | | |
| Minimum Split (s) | 24.0 | 24.0 | 24.0 | | 24.0 | | | |
| Total Split (s) | 24.0 | 24.0 | 24.0 | | 26.0 | | | |
| Total Split (%) | 48.0% | 48.0% | 48.0% | | 52.0% | | | |
| Maximum Green (s) | 18.0 | 18.0 | 18.0 | | 20.0 | | | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | | 4.0 | | | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | 2.0 | | | |
| Lost Time Adjust (s) | | -1.0 | -1.0 | | -1.0 | | | |
| Total Lost Time (s) | | 5.0 | 5.0 | | 5.0 | | | |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | | | |
| Recall Mode | C-Max | C-Max | C-Max | | None | | | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | | 7.0 | | | |
| Flash Dont Walk (s) | 11.0 | 11.0 | 11.0 | | 11.0 | | | |
| Pedestrian Calls (#/hr) | 100 | 100 | 100 | | 100 | | | |
| Act Effct Green (s) | | 23.1 | 23.1 | | 16.9 | | | |
| Actuated g/C Ratio | | 0.46 | 0.46 | | 0.34 | | | |
| v/c Ratio | | 0.27 | 0.16 | | 0.68 | | | |
| Control Delay | | 11.2 | 7.3 | | 24.0 | | | |
| Queue Delay | | 0.0 | 0.0 | | 0.0 | | | |
| Total Delay | | 11.2 | 7.3 | | 24.0 | | | |
| LOS | | В | Α | | С | | | |
| Approach Delay | | 11.2 | 7.3 | | 24.0 | | | |
| Approach LOS | | В | Α | | С | | | |
| Intersection Summary | | | | | | | | |
| Area Type: | Other | | | | | | | |
| Cycle Length: 50 | | | | | | | | |
| Actuated Cycle Length: 50 | | | | | | | | |
| Offset: 0 (0%), Referenced | d to phase 2 | EBTL an | d 6:WBT, | Start of G | reen | | | |
| Natural Cycle: 50 | | | | | | | | |
| Control Type: Actuated-Co | oordinated | | | | | | | |
| Maximum v/c Ratio: 0.68 | | | | | | | | |
| Intersection Signal Delay: | | | | | tersection | | | |
| Intersection Capacity Utiliz | zation 40.4% | | | IC | U Level c | of Service A | | |
| Analysis Period (min) 15 | | | | | | | | |
| Splits and Phases: 9023 | 3: New Liber | ty St & At | lantic Ave | | | | | |
| →ø2 (R) | | | | | Ø4 | | | |
| 24 s | | | | | 26 s | | | |
| Ø6 (R) | | | | | | | | |
| 24 s | | | | | | | | |

9023: New Liberty St & Atlantic Ave

09/30/2021

| | - | _ | - |
|------------------------|------|-------|------|
| Lane Group | EBT | WBT | SBL |
| Lane Group Flow (vph) | 198 | 86 | 230 |
| v/c Ratio | 0.27 | 0.16 | 0.68 |
| Control Delay | 11.2 | 7.3 | 24.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 |
| Total Delay | 11.2 | 7.3 | 24.0 |
| Queue Length 50th (m) | 11.0 | 2.4 | 15.8 |
| Queue Length 95th (m) | 24.3 | 9.5 | 32.0 |
| Internal Link Dist (m) | 63.6 | 174.4 | 18.4 |
| Turn Bay Length (m) | | | |
| Base Capacity (vph) | 726 | 548 | 422 |
| Starvation Cap Reductn | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.27 | 0.16 | 0.55 |
| Intersection Summary | | | |

HCM Signalized Intersection Capacity Analysis 9023: New Liberty St & Atlantic Ave

09/30/2021

| | • | - | • | • | - | 4 | |
|-------------------------------|------------|----------|-------|------|------------------|------------------|------|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR | |
| Lane Configurations | | 4 | 1 | | W | | |
| Traffic Volume (vph) | 19 | 159 | 42 | 35 | 104 | 103 | |
| Future Volume (vph) | 19 | 159 | 42 | 35 | 104 | 103 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Total Lost time (s) | | 5.0 | 5.0 | | 5.0 | | |
| Lane Util. Factor | | 1.00 | 1.00 | | 1.00 | | |
| Frpb, ped/bikes | | 1.00 | 0.66 | | 0.85 | | |
| Flpb, ped/bikes | | 0.93 | 1.00 | | 0.70 | | |
| Frt | | 1.00 | 0.94 | | 0.93 | | |
| Flt Protected | | 0.99 | 1.00 | | 0.98 | | |
| Satd. Flow (prot) | | 1609 | 1141 | | 1007 | | |
| Flt Permitted | | 0.97 | 1.00 | | 0.98 | | |
| Satd. Flow (perm) | | 1570 | 1141 | | 1007 | | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | |
| Adj. Flow (vph) | 21 | 177 | 47 | 39 | 116 | 114 | |
| RTOR Reduction (vph) | 0 | 0 | 21 | 0 | 0 | 0 | |
| Lane Group Flow (vph) | 0 | 198 | 65 | 0 | 230 | 0 | |
| Confl. Peds. (#/hr) | 1226 | 100 | 00 | 1226 | 671 | 200 | |
| Confl. Bikes (#/hr) | 1220 | | | 19 | 011 | 5 | |
| Bus Blockages (#/hr) | 0 | 14 | 0 | 0 | 0 | 0 | |
| Turn Type | Perm | NA | NA | | Perm | | |
| Protected Phases | I CIIII | 2 | 6 | | 1 Cilli | | |
| Permitted Phases | 2 | 2 | U | | 4 | | |
| Actuated Green, G (s) | | 22.1 | 22.1 | | 15.9 | | |
| Effective Green, g (s) | | 23.1 | 23.1 | | 16.9 | | |
| Actuated g/C Ratio | | 0.46 | 0.46 | | 0.34 | | |
| Clearance Time (s) | | 6.0 | 6.0 | | 6.0 | | |
| Vehicle Extension (s) | | 3.0 | 3.0 | | 3.0 | | |
| Lane Grp Cap (vph) | | 725 | 527 | | 340 | | |
| v/s Ratio Prot | | 123 | 0.06 | | J 4 0 | | |
| v/s Ratio Perm | | c0.13 | 0.00 | | c0.23 | | |
| v/c Ratio | | 0.27 | 0.12 | | 0.68 | | |
| Uniform Delay, d1 | | 8.3 | 7.7 | | 14.2 | | |
| Progression Factor | | 1.00 | 1.00 | | 1.00 | | |
| Incremental Delay, d2 | | 0.9 | 0.5 | | 5.3 | | |
| Delay (s) | | 9.2 | 8.2 | | 19.5 | | |
| Level of Service | | 3.2 A | Α.2 | | 13.3 B | | |
| Approach Delay (s) | | 9.2 | 8.2 | | 19.5 | | |
| Approach LOS | | A | Α | | В | | |
| Intersection Summary | | | | | | | |
| HCM 2000 Control Delay | | | 13.6 | Н | CM 2000 | Level of Service | . E |
| HCM 2000 Control Delay | city ratio | | 0.45 | П | JIVI 2000 | LEVEL OF DELVICE | |
| Actuated Cycle Length (s) | orly ratio | | 50.0 | Q. | um of lost | time (s) | 11.0 |
| Intersection Capacity Utiliza | tion | | 40.4% | | U Level c | | 11.0 |
| Analysis Period (min) | iuon | | 15 | 10 | O LOVOI C | A COLVICE | , |
| c Critical Lane Group | | | 13 | | | | |
| C Official Latte Group | | | | | | | |

Lanes, Volumes, Timings 9024: Dufferin St & New Liberty St

09/30/2021

| | 1 | • | † | 1 | - | . ↓ |
|------------------------------------|-------|-------|----------|---------------------------------------|-------|----------|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations | 7 | 7 | 1 | HUIN | ኘ | <u> </u> |
| Traffic Volume (vph) | 187 | 84 | 828 | 167 | 28 | 768 |
| Future Volume (vph) | 187 | 84 | 828 | 167 | 28 | 768 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 15.0 | 0.0 | 1300 | 0.0 | 0.0 | 1300 |
| Storage Lanes | 1 | 1 | | 0.0 | 1 | |
| Taper Length (m) | 2.5 | | | U | 2.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | 1.00 | 0.61 | 0.99 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | 0.99 | | | |
| Fit Protected | 0.950 | 0.000 | 0.977 | | 0.950 | |
| | 1750 | 1566 | 1773 | 0 | 1750 | 1842 |
| Satd. Flow (prot) Flt Permitted | 0.950 | 1000 | 1773 | 0 | 0.116 | 1042 |
| | | 050 | 4770 | ^ | | 4040 |
| Satd. Flow (perm) | 1750 | 953 | 1773 | 0 | 214 | 1842 |
| Right Turn on Red | | Yes | 05 | Yes | | |
| Satd. Flow (RTOR) | | 93 | 25 | | | 0.0 |
| Link Speed (k/h) | 40 | | 30 | | | 30 |
| Link Distance (m) | 107.6 | | 191.3 | | | 74.7 |
| Travel Time (s) | 9.7 | | 23.0 | | | 9.0 |
| Confl. Peds. (#/hr) | | 146 | | 1 | 1 | |
| Confl. Bikes (#/hr) | | 12 | | 119 | | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 208 | 93 | 920 | 186 | 31 | 853 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 208 | 93 | 1106 | 0 | 31 | 853 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | T T | 3.5 | , , , , , , , , , , , , , , , , , , , | | 3.5 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | 1 | 2 |
| Detector Template | Left | Right | Thru | | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | 6.1 | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| 1 / | 6.1 | 6.1 | 1.8 | | 6.1 | 1.8 |
| Detector 1 Size(m) | | | | | | |
| Detector 1 Type | CI+Ex | CI+Ex | CI+Ex | | CI+Ex | CI+Ex |
| Detector 1 Channel | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | CI+Ex | | | CI+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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Lanes, Volumes, Timings 9024: Dufferin St & New Liberty St

09/30/2021

| Turn Type | | € | • | Ī | | - | † | |
|--|-----------------------------|-----------------------|-----------|-----------|------------|-----------|--------------|------|
| rotected Phases | Lane Group | WBL | WBR | NBT | NBR | SBL | SBT | |
| remitted Phases 8 8 8 2 6 6 elector Phase 8 8 2 6 6 elector Phase 8 8 2 6 6 elector Phase 8 elector Phase 9 elector Ph | Turn Type | Perm | Perm | NA | | Perm | NA | |
| Note Color | Protected Phases | | | 2 | | | 6 | |
| witch Phase inimum Initial (s) | ermitted Phases | 8 | 8 | | | 6 | | |
| inimum Initial (s) 7.0 7.0 7.0 7.0 7.0 7.0 inimum Split (s) 24.0 24.0 24.0 24.0 24.0 24.0 24.0 24.0 | etector Phase | 8 | 8 | 2 | | 6 | 6 | |
| inimum Split (s) | witch Phase | | | | | | | |
| otal Split (s) | linimum Initial (s) | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| otal Split (s) | linimum Split (s) | 24.0 | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Asximum Green (s) | otal Split (s) | 24.0 | 24.0 | 66.0 | | 66.0 | 66.0 | |
| Fellow Time (s) | otal Split (%) | 26.7% | 26.7% | 73.3% | | 73.3% | 73.3% | |
| All-Red Time (s) | Maximum Green (s) | 18.0 | 18.0 | 60.0 | | 60.0 | 60.0 | |
| ost Time Adjust (s) | rellow Time (s) | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| otal Lost Time (s) 5.0 5.0 5.0 5.0 5.0 5.0 aad/Lag ead-Lag Optimize? ehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 acteal Mode None None C-Max C-Max C-Max Valk Time (s) 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 acteal Mode None None C-Max C-Max C-Max Valk Time (s) 11.0 11.0 11.0 11.0 11.0 11.0 11.0 acted Estran Calls (#hr) 0 0 0 0 0 0 0 ct Effct Green (s) 16.1 16.1 63.9 63.9 63.9 63.9 cotted et g/C Ratio 0.18 0.18 0.71 0.71 0.71 c/c Ratio 0.67 0.38 0.87 0.20 0.65 control Delay 44.9 11.5 20.6 9.1 10.6 cotal Delay 0.0 0.0 5.1 0.0 0.0 cotal Delay 44.9 11.5 25.8 9.1 10.6 cos D B C A B pupproach Delay 34.6 25.8 10.6 pupproach LOS C C C B deteresction Summary trea Type: Other cotal Delay Cotal Delay 10.0 0.0 0.0 cotal Delay 10.0 0.0 0.0 0.0 cotal Delay 10.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0. | All-Red Time (s) | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | |
| ead/Lag Optimize? February February | ost Time Adjust (s) | -1.0 | -1.0 | -1.0 | | -1.0 | -1.0 | |
| ead/Lag Optimize? Fehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 Iteration (s) 3.0 3.0 3.0 3.0 Iteration (s) 3.0 3.0 3.0 Iteration (s) 7.0 7.0 7.0 7.0 Iteration (s) 7.0 7.0 7.0 7.0 Iteration (s) 7.0 Iteration (s) 7.0 7.0 Iterati | otal Lost Time (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | |
| ead-Lag Optimize? chicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 cleal Mode None None C-Max C-Max C-Max Valk Time (s) 7.0 7.0 7.0 7.0 7.0 7.0 7.0 lash Dont Walk (s) 11.0 11.0 11.0 11.0 11.0 11.0 cledestrian Calls (#hr) 0 0 0 0 0 0 0 cuteffct Green (s) 16.1 16.1 63.9 63.9 63.9 cutuated g/C Ratio 0.18 0.18 0.71 0.71 0.71 0.71 c/C Ratio 0.67 0.38 0.87 0.20 0.65 control Delay 44.9 11.5 20.6 9.1 10.6 cotal Delay 44.9 11.5 25.8 9.1 10.6 COS D B C A B approach Delay 34.6 25.8 10.6 pproach LoS C C B attersection Summary rea Type: Other cycle Length: 90 cutuated Cycle Length: 90 citoticol Type: Actuated-Coordinated laximum v/c Ratic: 0.87 tersection Signal Delay: 21.1 Intersection LOS: C tersection Capacity Utilization 77.1% Intersection LOS: C control Types: Outferin St & New Liberty St cycle Length: 90 control Type: Actuated-Coordinated laximum v/c Ratic: 0.87 tersection Capacity Utilization 77.1% Intersection LOS: C control Capacity Utilization 77.1% Intersection LOS: C control Types: Outferin St & New Liberty St | | | | | | | | |
| Tehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3. | .ead-Lag Optimize? | | | | | | | |
| Alexael Mode None None C-Max C-Max C-Max | | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Valk Time (s) 7.0 7.0 7.0 7.0 7.0 7.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1 | Recall Mode | | | | | | | |
| lash Dont Walk (s) 11.0 11.0 11.0 11.0 11.0 11.0 ledestrian Calls (#hhr) 0 0 0 0 0 0 0 0 cledestrian Calls (#hhr) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | Valk Time (s) | | | | | | | |
| Sedestrian Calls (#/hr) | \ / | | | | | | | |
| 16.1 16.1 16.1 63.9 | | | | | | | | |
| Cataled g/C Ratio 0.18 0.18 0.71 0.71 0.71 0.72 0.73 0.74 0.74 0.74 0.74 0.74 0.74 0.75 0 | | | | | | | | |
| /c Ratio 0.67 0.38 0.87 0.20 0.65 /control Delay 44.9 11.5 20.6 9.1 10.6 /cueue Delay 0.0 0.0 5.1 0.0 0.0 /cotal Delay 44.9 11.5 25.8 9.1 10.6 /cotal Delay 44.9 11.5 25.8 9.1 10.6 /cotal Delay 34.6 25.8 10.6 /cota | | | | | | | | |
| Control Delay 44.9 11.5 20.6 9.1 10.6 Capacity Delay 0.0 0.0 5.1 0.0 0.0 Capacity Delay 0.0 0.0 5.1 0.0 0.0 Capacity Delay 44.9 11.5 25.8 9.1 10.6 Capacity Delay 34.6 25.8 9.1 10.6 Capacity Delay 34.6 25.8 10.6 Capacity Delay 34.6 25.8 10.6 Capacity Delay Capac | //c Ratio | | | | | | | |
| Queue Delay | | | | | | | | |
| Otal Delay | | | | | | | | |
| OS D B C A B pproach Delay 34.6 25.8 10.6 pproach Delay 34.6 25.8 10.6 pproach LOS C C B buttersection Summary trea Type: Other Sycle Length: 90 Ctuated Cycle Length: 90 Ctuated Cycle Length: 90 Ctuated Cycle Length: 90 Control Type: Actuated-Coordinated laximum v/c Ratic: 0.87 terresection Signal Delay: 21.1 Intersection LOS: C Intersection Capacity Utilization 77.1% ICU Level of Service D Control Type: Period (min) 15 Splits and Phases: 9024: Dufferin St & New Liberty St | | 44.9 | 11.5 | 25.8 | | | | |
| pproach Delay 34.6 25.8 10.6 pproach LOS C C B Intersection Summary rea Type: Other Sycle Length: 90 Section Summary Office: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green latural Cycle: 90 Section Signal Delay: 21.1 Intersection LOS: C Intersection Capacity Utilization 77.1% ICU Level of Service D Inalysis Period (min) 15 Septits and Phases: 9024: Dufferin St & New Liberty St | LOS | | | | | | | |
| pproach LOS C C B Intersection Summary Irea Type: Other Sycle Length: 90 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green Intersection Capacity Utilization 77.1% Intersection LOS: C Intersection Capacity Utilization 77.1% Intersection Capacity Utilization 77.1% Intersection Capacity Utilization Intersection LOS: C Intersection Capacity Utilization Intersection LOS | | | | _ | | - / \ | | |
| ntersection Summary rea Type: Other cycle Length: 90 ctuated Cycle Length: 90 fifset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green latural Cycle: 90 control Type: Actuated-Coordinated laximum v/c Ratio: 0.87 tersection Signal Delay: 21.1 Intersection LOS: C tersection Capacity Utilization 77.1% ICU Level of Service D unallysis Period (min) 15 splits and Phases: 9024: Dufferin St & New Liberty St | | | | | | | | |
| rea Type: Other yde Length: 90 ctuated Cycle Length: 90 ffset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green atural Cycle: 90 ontrol Type: Actuated-Coordinated laximum v/c Ratio: 0.87 tersection Signal Delay: 21.1 Intersection LOS: C tersection Capacity Utilization 77.1% ICU Level of Service D nalysis Period (min) 15 plits and Phases: 9024: Dufferin St & New Liberty St | | | | | | | | |
| ycle Length: 90 ctuated Cycle Length: 90 ffiset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green atural Cycle: 90 control Type: Actuated-Coordinated laximum v/c Ratio: 0.87 tersection Signal Delay: 21.1 Intersection LOS: C tersection Capacity Utilization 77.1% ICU Level of Service D nalysis Period (min) 15 plits and Phases: 9024: Dufferin St & New Liberty St | | Other | | | | | | |
| Cituated Öycle Length: 90 Iffset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green Iatural Cycle: 90 Iontrol Type: Actuated-Coordinated Iaximum vic Ratio: 0.87 Intersection Signal Delay: 21.1 Intersection Capacity Utilization 77.1% IcU Level of Service D Inallysis Period (min) 15 Iplits and Phases: 9024: Dufferin St & New Liberty St | | 30101 | | | | | | |
| offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green latural Cycle: 90 control Type: Actuated-Coordinated laximum v/c Ratio: 0.87 ntersection Signal Delay: 21.1 Intersection LOS: C ntersection Capacity Utilization 77.1% ICU Level of Service D nalysis Period (min) 15 pilits and Phases: 9024: Dufferin St & New Liberty St | | 0 | | | | | | |
| latural Cycle: 90 control Type: Actuated-Coordinated latkimum v/c Ratio: 0.87 Intersection Signal Delay: 21.1 Intersection LOS: C Intersection Capacity Utilization 77.1% ICU Level of Service D Inalysis Period (min) 15 Icupits and Phases: 9024: Dufferin St & New Liberty St | | | NRT and | 6:SBTL 9 | Start of G | reen | | |
| control Type: Actuated-Coordinated laximum v/c Ratio: 0.87 tersection Signal Delay: 21.1 Intersection LOS: C tersection Capacity Utilization 77.1% ICU Level of Service D unalysis Period (min) 15 pults and Phases: 9024: Dufferin St & New Liberty St | | a to pridoo 2. | itDi ullu | 0.0D1L, 0 | oluit of O | 10011 | | |
| Askimum v/c Ratio: 0.87 Intersection Signal Delay: 21.1 Intersection LOS: C Icu Level of Service D Intersection (min) 15 Iplits and Phases: 9024: Dufferin St & New Liberty St | | oordinated | | | | | | |
| ntersection Signal Delay: 21.1 Intersection LOS: C Intersection Capacity Utilization 77.1% ICU Level of Service D Inalysis Period (min) 15 Iplits and Phases: 9024: Dufferin St & New Liberty St | | oordinated | | | | | | |
| ntersection Capacity Utilization 77.1% ICU Level of Service D nalysis Period (min) 15 pilits and Phases: 9024: Dufferin St & New Liberty St \$\int_{\sigma_2} \emptyset{\text{R}}\$ 100 150 150 150 150 150 110 150 150 150 150 110 150 150 150 150 110 150 150 150 150 110 150 150 150 150 110 150 150 150 110 150 150 150 110 150 150 150 110 150 150 150 110 150 110 150 150 110 150 150 110 150 150 110 150 150 110 150 150 110 150 150 110 150 1 | | 21.1 | | | In | torcoctio | n I OQ- C | |
| inalysis Period (min) 15 iplits and Phases: 9024: Dufferin St & New Liberty St | | | | | | | | |
| plits and Phases: 9024: Dufferin St & New Liberty St | | ZaliUII / / / / / / / | | | ic | o Level | OI SEIVICE L | |
| | analysis i silva (iiiii) is | | | | | | | |
| i6 s | Splits and Phases: 902 | 4: Dufferin St | & New L | iberty St | | | | |
| i6 s | T _{(72 (P)} | | | | | | | |
| → Ø6 (R) | 1 2/2 (K) | | | | | | | ı |
| ▼ Ø6 (R) Ø8 | \. | | | | | | | 3 |
| | ▼ [®] Ø6 (R) | | | | | | | √ Ø8 |

Scenario 1 Total Future PM 11:59 pm 05/05/2014 No Improvements HDR Corporation

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9024: Dufferin St & New Liberty St

09/30/2021

| | • | • | † | - | ţ |
|------------------------|------|------|----------|------|-------|
| Lane Group | WBL | WBR | NBT | SBL | SBT |
| Lane Group Flow (vph) | 208 | 93 | 1106 | 31 | 853 |
| v/c Ratio | 0.67 | 0.38 | 0.87 | 0.20 | 0.65 |
| Control Delay | 44.9 | 11.5 | 20.6 | 9.1 | 10.6 |
| Queue Delay | 0.0 | 0.0 | 5.1 | 0.0 | 0.0 |
| Total Delay | 44.9 | 11.5 | 25.8 | 9.1 | 10.6 |
| Queue Length 50th (m) | 33.5 | 0.0 | 125.7 | 1.6 | 70.0 |
| Queue Length 95th (m) | 54.2 | 12.2 | #254.4 | 6.2 | 116.4 |
| Internal Link Dist (m) | 83.6 | | 167.3 | | 50.7 |
| Turn Bay Length (m) | 15.0 | | | | |
| Base Capacity (vph) | 369 | 274 | 1266 | 152 | 1308 |
| Starvation Cap Reductn | 0 | 0 | 115 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.56 | 0.34 | 0.96 | 0.20 | 0.65 |

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 9024: Dufferin St & New Liberty St

09/30/2021

| ### A SEA 167 28 768 ### A SEA 100 1900 1900 1900 ### A SEA 100 1.00 1.00 1.00 ### A SEA 1.00 1.00 1.00 ### A SEA 1.00 1.00 ### A SEA 1.00 1.0 | | • | • | † | ~ | / | ↓ | | | |
|--|---------------------------|-------------|------|----------|------|------------|------------------|---|---|--|
| rizeffic Volume (vph) 187 84 828 167 28 768 | Movement | WBL | WBR | NBT | NBR | SBL | SBT | | | |
| Future Volume (vph) 187 84 828 167 28 768 deal Flow (vphp) 1900 1900 1900 1900 1900 1900 1900 190 | Lane Configurations | , j | 7 | f) | | | † | | | |
| | Traffic Volume (vph) | | | | | | | | | |
| Total Lost time (s) | Future Volume (vph) | 187 | | 828 | | 28 | | | | |
| Cane Util. Factor | Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | | | |
| Tipb, ped/bikes | Total Lost time (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | | |
| | Lane Util. Factor | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | | |
| Tit Continue of the continue o | Frpb, ped/bikes | 1.00 | 0.61 | 0.99 | | 1.00 | 1.00 | | | |
| Tit Protected 0.95 1.00 1.00 0.95 1.00 1.00 atd. Flow (prot) 1750 950 1775 1750 1842 1.00 atd. Flow (perm) 1750 950 1775 1750 1842 1.00 atd. Flow (perm) 1750 950 1775 214 1842 1.00 atd. Flow (perm) 1750 950 1775 214 1842 1.00 atd. Flow (ph) 208 93 920 186 31 853 1853 1853 1853 1853 1853 1853 18 | Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | | |
| Said. Flow (prot) 1750 950 1775 1750 1842 It Permitted 0.95 1.00 1.00 0.12 1.00 Said. Flow (perm) 1750 950 1775 214 1842 Said. Flow (perm) 1850 975 214 1842 Said. Flow (perm) 1850 975 214 1842 Said. Flow (perm) 1850 975 1775 214 1842 Said. Flow (perm) 1850 975 975 975 975 975 975 975 975 975 975 | Frt | 1.00 | 0.85 | 0.98 | | 1.00 | 1.00 | | | |
| Said. Flow (prot) 1750 950 1775 1750 1842 It Permitted 0.95 1.00 1.00 0.12 1.00 Said. Flow (perm) 1750 950 1775 214 1842 Said. Flow (perm) 1850 975 214 1842 Said. Flow (perm) 1850 975 214 1842 Said. Flow (perm) 1850 975 1775 214 1842 Said. Flow (perm) 1850 975 975 975 975 975 975 975 975 975 975 | Flt Protected | 0.95 | 1.00 | 1.00 | | 0.95 | 1.00 | | | |
| Cit Permitted 0.95 | Satd. Flow (prot) | | | | | | | | | |
| Sald. Flow (perm) 1750 950 1775 214 1842 Peak-hour factor, PHF 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.9 | Flt Permitted | | | | | | | | | |
| Peak-hour factor, PHF | | | | | | | | | | |
| Adj. Flow (vph) 208 93 920 186 31 853 ATTOR Reduction (vph) 0 76 7 0 0 0 0 Jonni Peds. (#/hr) 1099 0 31 853 Jonni Peds. (#/hr) 146 1 1 Jonni Deng. (#/hr) 12 119 Jonni Deng. (#/hr) 12 119 Jonni Deng. (#/hr) 15 12 119 Jonni Deng. (#/hr) 16 12 119 Jonni Deng. (#/hr) 16 12 119 Jonni Deng. (#/hr) 17 12 119 Jonni Deng. (#/hr) 18 18 18 19 Jonni Deng. (#/hr) 19 19 19 19 19 19 19 19 19 19 19 19 19 | | | | | 0.90 | | | | | |
| ATOR Reduction (vph) | | | | | | | | | | |
| Agriculture Continue Contin | | | | | | | | | | |
| Confi. Peds. (#/hr) | | | | | | | | | | |
| 12 119 | | 200 | | 1033 | | | 000 | | | |
| Turn Type | | | | | | | | | | |
| Protected Phases 8 8 8 6 6 | | | | | 119 | | NIA | | | |
| Permitted Phases 8 8 8 6 6 8 8 8 8 8 8 8 8 8 8 8 8 8 8 | | Perm | Perm | | | Perm | | | | |
| Interview Green, G (s) 15.1 15.1 62.9 62.9 62.9 Infective Green, g (s) 16.1 16.1 63.9 63.9 63.9 Actuated g/C Ratio 0.18 0.18 0.71 0.71 0.71 Dearance Time (s) 6.0 6.0 6.0 6.0 6.0 Jehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 Jane Grp Cap (vph) 313 169 1260 151 1307 I/s Ratio Port c0.62 0.46 I/s Ratio Perm c0.12 0.02 0.14 I/c Ratio 0.66 0.10 0.87 0.21 0.65 Iniform Delay, d1 34.4 30.9 9.9 4.4 7.1 Porgression Factor 1.00 1.00 1.00 1.00 Incremental Delay, d2 5.2 0.3 8.5 3.1 2.5 Delay (s) 39.7 31.1 18.4 7.5 9.6 Avered of Service D B A A perpoach LOS D B A A contraction Summary HCM 2000 Control Delay 17.4 HCM 2000 Level of Service B A contraction Capacity utilization | | • | • | 2 | | • | 6 | | | |
| Effective Green, g (s) 16.1 16.1 63.9 63.9 63.9 63.9 63.0 cctuated g/C Ratio 0.18 0.18 0.71 0.71 0.71 0.71 0.71 0.71 0.71 0.71 | | - | - | 00.0 | | | | | | |
| Actuated g/C Ratio 0.18 0.18 0.71 0.71 0.71 0.71 Diearance Time (s) 6.0 6.0 6.0 6.0 6.0 6.0 Vehicle Extension (s) 3.0 3.0 3.0 3.0 3.0 3.0 Vehicle Extension (s) 3.1 169 1260 151 1307 Very Ratio Prot c0.62 0.46 Very Ratio Prot c0.62 0.46 Very Ratio Porm c0.12 0.02 0.14 Very Ratio Company (a) 1.00 1.00 1.00 1.00 Iniform Delay, d1 34.4 30.9 9.9 4.4 7.1 Very Resion Factor 1.00 1.00 1.00 1.00 1.00 1.00 Incremental Delay, d2 5.2 0.3 8.5 3.1 2.5 Delay (s) 39.7 31.1 18.4 7.5 9.6 Revel of Service D C B A A Reproach Delay (s) 37.0 18.4 9.5 Reproach LOS D B A Intersection Summary ICM 2000 Control Delay 17.4 HCM 2000 Level of Service B Intersection Capacity utilization 77.1% ICU Level of Service D Intersection Capacity Utilization 77.1% ICU Level of Service D | | | | | | | | | | |
| Clearance Time (s) 6.0 6.0 6.0 6.0 6.0 6.0 6.0 | | | | | | | | | | |
| Vehicle Extension (s) 3.0 | | | | | | | | | | |
| Anne Grp Cap (vph) 313 169 1260 151 1307 158 | | | | | | | | | | |
| ## Ratio Prot | | | | | | | | | | |
| S Ratio Perm C0.12 0.02 0.14 | Lane Grp Cap (vph) | 313 | 169 | | | 151 | | | | |
| Variable | v/s Ratio Prot | | | c0.62 | | | 0.46 | | | |
| Dinform Delay, d1 | v/s Ratio Perm | | 0.02 | | | | | | | |
| Progression Factor 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0 | v/c Ratio | 0.66 | 0.10 | 0.87 | | 0.21 | 0.65 | | | |
| Progression Factor 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0 | Uniform Delay, d1 | 34.4 | 30.9 | 9.9 | | 4.4 | 7.1 | | | |
| Note | Progression Factor | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | | |
| Delay (s) 39.7 31.1 18.4 7.5 9.6 Level of Service D C B A A A Approach Delay (s) 37.0 18.4 9.5 A Intersection Summary HCM 2000 Control Delay 17.4 HCM 2000 Level of Service B A Intersection Capacity ratio 0.84 Cutated Cycle Length (s) 90.0 Sum of lost time (s) 11.0 Intersection Capacity Utilization 77.1% ICU Level of Service D | Incremental Delay, d2 | 5.2 | 0.3 | 8.5 | | 3.1 | 2.5 | | | |
| A | Delay (s) | 39.7 | 31.1 | 18.4 | | 7.5 | 9.6 | | | |
| Approach Delay (s) 37.0 18.4 9.5 Approach LOS D B A Intersection Summary ICM 2000 Control Delay 17.4 HCM 2000 Level of Service B ICM 2000 Volume to Capacity ratio 0.84 Ckutated Cycle Length (s) 90.0 Sum of lost time (s) 11.0 Intersection Capacity Utilization 77.1% ICU Level of Service D | Level of Service | | | | | | | | | |
| A A A A | Approach Delay (s) | | | | | | | | | |
| ## HCM 2000 Control Delay | | | | | | | | | | |
| ## HCM 2000 Control Delay 17.4 HCM 2000 Level of Service B ### HCM 2000 Volume to Capacity ratio 0.84 ### Actuated Cycle Length (s) 90.0 Sum of lost time (s) 11.0 ### ntersection Capacity Utilization 77.1% ICU Level of Service D | | | | | | | | | | |
| 4CM 2000 Volume to Capacity ratio 0.84 Actuated Cycle Length (s) 90.0 Sum of lost time (s) 11.0 Intersection Capacity Utilization 77.1% ICU Level of Service D | | | | | | | | | | |
| Actuated Cycle Length (s) 90.0 Sum of lost time (s) 11.0 ntersection Capacity Utilization 77.1% ICU Level of Service D | | | | | H | CM 2000 | Level of Service | е | В | |
| ntersection Capacity Utilization 77.1% ICU Level of Service D | | acity ratio | | | | | | | | |
| | Actuated Cycle Length (s) | | | | | | | | | |
| Analysis Period (min) 15 | | ation | | | IC | CU Level o | of Service | | D | |
| | Analysis Period (min) | | | 15 | | | | | | |

c Critical Lane Group

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

| | • | • | 4 | † | ļ | 4 |
|-------------------------------|------------|-------|------|----------|-------------|--------------|
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | * | 7 | 7 | * | * | |
| Traffic Volume (vph) | 0 | 248 | 0 | 733 | 670 | 74 |
| Future Volume (vph) | 0 | 248 | 0 | 733 | 670 | 74 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 15.0 | 0.0 | 15.0 | | | 0.0 |
| Storage Lanes | 1 | 1 | 1 | | | 0 |
| Taper Length (m) | 2.5 | | 2.5 | | | |
| Lane Util, Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | | 0.850 | | | 0.987 | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 1842 | 1566 | 1842 | 1842 | 1818 | 0 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 1842 | 1566 | 1842 | 1842 | 1818 | 0 |
| Link Speed (k/h) | 40 | | | 40 | 40 | • |
| Link Distance (m) | 579.0 | | | 241.4 | 424.1 | |
| Travel Time (s) | 52.1 | | | 21.7 | 38.2 | |
| Confl. Peds. (#/hr) | <u></u> | | 9 | | | 9 |
| Confl. Bikes (#/hr) | | 1 | * | | | 26 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 0.00 | 276 | 0.00 | 814 | 744 | 82 |
| Shared Lane Traffic (%) | | | | 0 | | |
| Lane Group Flow (vph) | 0 | 276 | 0 | 814 | 826 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | - ugu | 2011 | 3.5 | 3.5 | · tigitt |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | 1.0 | | | 1.0 | 1.0 | |
| Headway Factor | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 1.01 | 24 | 1.01 | 1.01 | 1.01 |
| Sign Control | Stop | 14 | 24 | Free | Free | 14 |
| • | Stop | | | 1166 | 1166 | |
| Intersection Summary | | | | | | |
| | Other | | | | | |
| Control Type: Unsignalized | | | | | | |
| Intersection Capacity Utiliza | tion 61.9% | | | IC | CU Level of | of Service I |
| Analysis Period (min) 15 | | | | | | |

| | • | * | • | † | + | 4 |
|--------------------------------|--------|-------------|-----------|-------------|-------------|-----------|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | * | 7 | ሻ | * | * | |
| Traffic Volume (veh/h) | 0 | 248 | 0 | 733 | 670 | 74 |
| Future Volume (Veh/h) | 0 | 248 | 0 | 733 | 670 | 74 |
| 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 | 276 | 0 | 814 | 744 | 82 |
| Pedestrians | 9 | | | | | |
| Lane Width (m) | 3.5 | | | | | |
| Walking Speed (m/s) | 1.2 | | | | | |
| Percent Blockage | 1 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | 241 | | |
| pX, platoon unblocked | 0.71 | | | 211 | | |
| vC, conflicting volume | 1608 | 794 | 835 | | | |
| vC1, stage 1 conf vol | .000 | | 000 | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1652 | 794 | 835 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | 0.1 | 0.2 | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 100 | 28 | 100 | | | |
| cM capacity (veh/h) | 77 | 385 | 793 | | | |
| . , , , | | | | ND 0 | 00.4 | |
| Direction, Lane # Volume Total | EB 1 | EB 2 276 | NB 1 0 | NB 2 814 | SB 1 826 | |
| Volume Left | 0 | 0 | 0 | 014 | 020 | |
| | 0 | 276 | 0 | 0 | 82 | |
| Volume Right cSH | 1700 | 385 | 1700 | 1700 | 1700 | |
| | | 0.72 | | 0.48 | 0.49 | |
| Volume to Capacity | 0.00 | | 0.00 | | | |
| Queue Length 95th (m) | 0.0 | 41.2 | 0.0 | 0.0 | 0.0 | |
| Control Delay (s) | 0.0 | 34.7 | 0.0 | 0.0 | 0.0 | |
| Lane LOS | A | D | | | | |
| Approach Delay (s) | 34.7 | | 0.0 | | 0.0 | |
| Approach LOS | D | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 5.0 | | | |
| Intersection Capacity Utili | zation | | 61.9% | IC | U Level o | f Service |
| Analysis Period (min) | | | 15 | | | |

HCM Unsignalized Intersection Capacity Analysis 9025: Strachan Ave & New Liberty St

HCM Unsignalized Intersection Capacity Analysis 9029: Atlantic Ave

09/30/2021

| 19 | | | | |
|----|--|--|--|--|
| | | | | |
| | | | | |

| | • | • | † | | - | ↓ | |
|---------------------------------|----------|-------|----------|-------|---------|------------|-----|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT | |
| Lane Configurations | ¥ | | † | | | ^ | |
| Traffic Volume (vph) | 25 | 6 | 30 | 10 | 4 | 72 | |
| Future Volume (vph) | 25 | 6 | 30 | 10 | 4 | 72 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Ped Bike Factor | | | | | | | |
| Frt | 0.973 | | 0.966 | | | | |
| Flt Protected | 0.962 | | | | | 0.998 | |
| Satd. Flow (prot) | 1724 | 0 | 1779 | 0 | 0 | 1838 | |
| Flt Permitted | 0.962 | | | | | 0.998 | |
| Satd. Flow (perm) | 1724 | 0 | 1779 | 0 | 0 | 1838 | |
| Link Speed (k/h) | 50 | | 50 | | | 50 | |
| Link Distance (m) | 66.8 | | 42.4 | | | 34.0 | |
| Travel Time (s) | 4.8 | | 3.1 | | | 2.4 | |
| Confl. Peds. (#/hr) | 53 | 2 | | 245 | 245 | | |
| Confl. Bikes (#/hr) | | 3 | | 8 | | | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | |
| Adj. Flow (vph) | 28 | 7 | 33 | 11 | 4 | 80 | |
| Shared Lane Traffic (%) | | | | | | | |
| Lane Group Flow (vph) | 35 | 0 | 44 | 0 | 0 | 84 | |
| Enter Blocked Intersection | No | No | No | No | No | No | |
| Lane Alignment | Left | Right | Left | Right | Left | Left | |
| Median Width(m) | 3.5 | | 0.0 | | | 0.0 | |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | |
| Headway Factor | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | | |
| Sign Control | Stop | | Free | | | Free | |
| Intersection Summary | | | | | | | |
| Area Type: | Other | | | | | | |
| Control Type: Unsignalized | | | | | | | |
| Intersection Capacity Utilizati | on 24.0% | | | IC | U Level | of Service | e A |
| Analysis Period (min) 15 | | | | | | | |
| . , , , | | | | | | | |

| 9029. Atlantic Ave | | | | | | | 03 |
|--------------------------------|------|------|----------|------|---------|------------|----|
| | • | * | † | 1 | - | Ţ | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT | |
| Lane Configurations | ¥ | | ^ | | | ^ | |
| Traffic Volume (veh/h) | 25 | 6 | 30 | 10 | 4 | 72 | |
| Future Volume (Veh/h) | 25 | 6 | 30 | 10 | 4 | 72 | |
| 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) | 28 | 7 | 33 | 11 | 4 | 80 | |
| Pedestrians | 245 | | 53 | | | 2 | |
| Lane Width (m) | 3.5 | | 3.5 | | | 3.5 | |
| Walking Speed (m/s) | 1.2 | | 1.2 | | | 1.2 | |
| Percent Blockage | 20 | | 4 | | | 0 | |
| Right turn flare (veh) | | | | | | | |
| Median type | | | None | | | None | |
| Median storage veh) | | | | | | | |
| Upstream signal (m) | | | 42 | | | | |
| pX, platoon unblocked | | | | | | | |
| vC, conflicting volume | 424 | 286 | | | 289 | | |
| vC1, stage 1 conf vol | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | |
| vCu, unblocked vol | 424 | 286 | | | 289 | | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | | |
| p0 queue free % | 94 | 99 | | | 100 | | |
| cM capacity (veh/h) | 448 | 603 | | | 1020 | | |
| Direction, Lane # | WB 1 | NB 1 | SB 1 | | | | |
| Volume Total | 35 | 44 | 84 | | | | |
| Volume Left | 28 | 0 | 4 | | | | |
| Volume Right | 7 | 11 | 0 | | | | |
| cSH | 472 | 1700 | 1020 | | | | |
| Volume to Capacity | 0.07 | 0.03 | 0.00 | | | | |
| Queue Length 95th (m) | 1.8 | 0.0 | 0.1 | | | | |
| Control Delay (s) | 13.2 | 0.0 | 0.4 | | | | |
| Lane LOS | В | | Α | | | | |
| Approach Delay (s) | 13.2 | 0.0 | 0.4 | | | | |
| Approach LOS | В | | | | | | |
| Intersection Summary | | | | | | | |
| Average Delay | | | 3.1 | | | | |
| Intersection Capacity Utilizat | tion | | 24.0% | IC | U Level | of Service | A |
| Analysis Period (min) | | | 15 | | | | |
| | | | | | | | |



Appendix E: Transportation Tomorrow Survey Queries

Mon Dec 14 2020 23:14:57 GMT-0500 (Eastern Standard Time)

Frequency Distribution Query Form - Transit - 2016 v1.1

Field: Access mode to transit - mode_accs

Filters:

GO rail boarding station - go_on In GS11,

and

Route used on link #1 - route_1 In GT01,GT02,GT03,GT05

and

Start time of trip - start_time In 0630-0930

Table: Tran 2016

| ROW: | Count: | Expande |
|-------------|--------|---------|
| Cycle | 5 | 55 |
| Auto driver | 1 | 14 |
| Walk | 10 | 139 |
| Total: | 16 | 208 |

| Mode | Trips | Share |
|----------------|-------|-------|
| Transit | 0 | 0% |
| Cycle | 55 | 26% |
| Auto driver | 14 | 7% |
| Auto passenger | 0 | 0% |
| Taxi | 0 | 0% |
| Walk | 139 | 67% |
| Other | 0 | 0% |
| Total | 208 | |

Mon Dec 14 2020 23:25:05 GMT-0500 (Eastern Standard Time)

Frequency Distribution Query Form - Transit - 2016 v1.1

Field: Access mode to transit - mode_accs

Filters:

GO rail boarding station - go_on In GS11,

and

Route used on link #1 - route_1 In GT01,GT02,GT03,GT05

and

Start time of trip - start_time In 1530-1830

Table: Tran 2016

| Row: | Count: | Expanded: |
|----------------|--------|-----------|
| Cycle | 1 | 11 |
| Auto passenger | 1 | 7 |
| Taxi passenger | 1 | 23 |
| Paid rideshare | 1 | 11 |
| Walk | 65 | 1305 |
| Total: | 69 | 1358 |

Assumed equal to Access Mode for PM

| Mode | Trips | Share |
|----------------|-------|-------|
| Transit | 0 | 0% |
| Cycle | 11 | 1% |
| Auto driver | 0 | 0% |
| Auto passenger | 7 | 1% |
| Taxi | 34 | 3% |
| Walk | 1305 | 96% |
| Other | 0 | 0% |
| Total | 1357 | · |

Mon Dec 14 2020 23:25:05 GMT-0500 (Eastern Standard Time)

Frequency Distribution Query Form - Transit - 2016 v1.1

Field: Access mode to transit - mode_accs

Filters:

GO rail boarding station - go_on In GS11,

and

Route used on link #1 - route_1 In GT01,GT02,GT03,GT05

and

Start time of trip - start_time In 1530-1830

Table: Tran 2016

| Row: | Count: | Expanded: |
|----------------|--------|-----------|
| Cycle | 1 | 11 |
| Auto passenger | 1 | 7 |
| Taxi passenger | 1 | 23 |
| Paid rideshare | 1 | 11 |
| Walk | 65 | 1305 |
| Total: | 69 | 1358 |

| Mode | Trips | Share |
|----------------|-------|-------|
| Transit | 0 | 0% |
| Cycle | 11 | 1% |
| Auto driver | 0 | 0% |
| Auto passenger | 7 | 1% |
| Taxi | 34 | 3% |
| Walk | 1305 | 96% |
| Other | 0 | 0% |
| Total | 1357 | |

16

208

Mon Dec 14 2020 23:14:57 GMT-0500 (Eastern Standard Time)

Frequency Distribution Query Form - Transit - 2016 v1.1

Field: Access mode to transit - mode_accs

Filters:

GO rail boarding station - go_on In GS11,

and

Route used on link #1 - route_1 In GT01,GT02,GT03,GT05

and

Total:

Start time of trip - start_time In 0630-0930

Table: Tran 2016

Row: Count Expanded:

 Cycle
 5
 55

 Auto driver
 1
 14

 Walk
 10
 139

| Assumed | equal | to Access |
|---------|--------|-----------|
| Mo | da for | |

| Mode | Trips | Share |
|----------------|-------|-------|
| Transit | 0 | 0% |
| Cycle | 55 | 26% |
| Auto driver | 14 | 7% |
| Auto passenger | 0 | 0% |
| Taxi | 0 | 0% |
| Walk | 139 | 67% |
| Other | 0 | 0% |
| Total | 208 | |

TTS Trip Distribution Summary

In order to inform the trip assignment stage of the analysis, informaton about the general trip distribution is required to inform the analysis. The distribution represents the proportion of trips to and away from the site in any given direction. The following pages summarizes the general trip distribution results, which were calculated using Transportation Tomorrow Survey (TTS) 2016 trip origin and destination data. Trips were grouped under cardinal directions based on the relative angle between trip origin and destination, and appropriate adjustments were made to the calculation to conform to local geography and street grid.

The "TTS Directional Distribution Summary" on the next page presents a summary of the calculations described above, along with notes on any details specific to the analysis in this report. The table shows the total number of trips to and from the subject site categorized into general directions (North, Northeast, East etc.) and the percentage share of trips in each general direction in all directions.

The pages after show graphical illustrations of the categorizations for all Traffic Analysis Zones (TAZ) in the TTS survey area. Note that the latest survey zones were last updated in 2006.

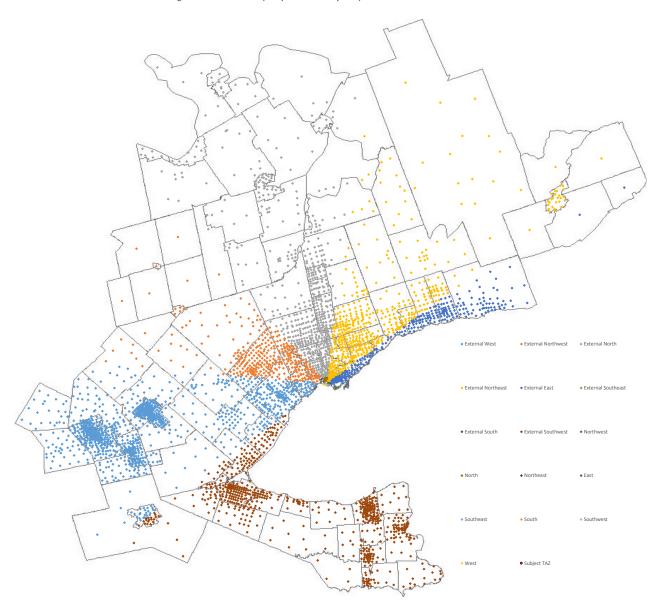
These results are used as reference information for the trip assignment. They do not directly determine the trip assignment on the study network. The final trip assignments are completed based on a combination of local context, engineering experience, and engineering judgement, with the trip distribution information presented here to illustrate general travel behaviour.

TTS Directional Distribution Summary: Test Project

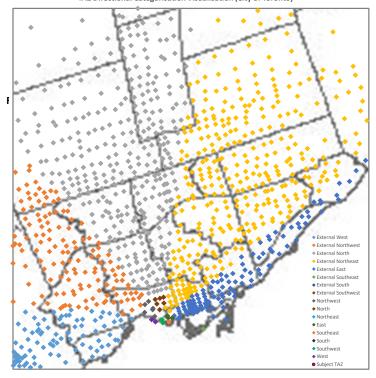
Notes:

- 1. Directions determined based on centroid coordinates of destination/origin traffic analysis zones.
- 2. 'Internal' refers to local trips made within the defined radius, while 'External' refers to trips made to areas outside of the defined radius.

| | | | | | | | Internal | | | | | | | | | External | | | | |
|------------|-------------|-----------|-----|-----|-----|-----|----------|----|----|------|-------|----|----|----|----|----------|----|----|----|-------|
| | Time Period | Direction | NW | N | NE | E | SE | S | SW | W | Total | NW | N | NE | E | SE | S | SW | W | Total |
| | A.M. | Inbound | 538 | 321 | 0 | 260 | 0 | 0 | 0 | 0 | 1119 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Trino | A.W. | Outbound | 564 | 638 | 0 | 666 | 14 | 0 | 0 | 0 | 1882 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| P.M. | ВΜ | Inbound | 611 | 832 | 0 | 589 | 0 | 0 | 12 | 0 | 2044 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Outbound | 783 | 480 | 0 | 320 | 11 | 0 | 18 | 0 | 1612 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | A.M. | Inbound | 48% | 29% | 0% | 23% | 0% | 0% | 0% | 0% | 100% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Porcontago | | Outbound | 30% | 34% | 0% | 35% | 1% | 0% | 0% | 0% | 100% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Percentage | | Inbound | 30% | 41% | 0% | 29% | 0% | 0% | 1% | 0% | 100% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | P.M. ⊢ | Outbound | 49% | 30% | 0% | 20% | 1% | 0% | 1% | 0% | 100% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |



TAZ Directional Categorisation Visualisation (City of Toronto)



| Outputs: | AM (IN) | Internal | | | | | | | | | External | | | | | | | | |
|----------|----------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|---------|
| - | | Internal | External | |
| | Direction | I | NW | N | NE | E | SE | S | SW | W | NW | N | NE | E | SE | S | SW | W | Totals |
| | Trips | 0 | 538 | 321 | 0 | 260 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1119 |
| | % | 0.00% | 48.08% | 28.69% | 0.00% | 23.24% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 100.00% |
| | % w/o trips in subject TAZ | 0.00% | 48.08% | 28.69% | 0.00% | 23.24% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 100.00% |

| | • | | | | | | | | | | | | | | | | | |
|---------|-----|-----------|-----------|--------------------------------------|-----------|------------------|---------------|------------|-----------|-------------|-------------|---------|--------------|--------------|-----------|---------|---------|---------|
| | | | | Input Area | | Format | | | | | | | | | | | | |
| | | | Finalized | | | | | | | | | | | | | | | |
| | Sum | Direction | Direction | Include Include | Incl | lude Include | Include | Include | Include | Include | Include | Include | Include | Include | Include | Include | Include | Include |
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| Include | | | | | | | | | | | | | 'C D | D.4. | A B.A | /INI\ | | |
| Include | | | | Cross Tabulation Query Form - | Trip - 20 | 016 v1.1 | | | | | | 11 | 'S Rav | v Data | a: AIVI | (III) | | |
| Include | | | | | | | | | | | | | | | | | | |
| Include | | | | Row: 2006 GTA zone of origin - | | | | | | | | | Trip Distrib | ution for Ol | L PPUDO t | rips | | |
| Include | | | | Column: Planning district of des | ination | - pd_dest | | | | | | | | | | | | |
| Include | | | | | | | | | | | | | | | | | | |
| Include | | | | | | | • | Trips beyo | ond 3.1kn | n from stat | ion are exc | luded | | | | | | |
| Include | | | | Filters: | | | | | | | | | | | | | | |
| Include | | | | Planning district of destir | 6 | | | | | | | | | | | | | |
| Include | | | | and | | | | | | | | | | | | | | |
| Include | | | | Start time of trip - start_time In 0 | 630-093 | 30 | | | | | | | | | | | | |
| Include | | | | | | | | | | | | | | | | | | |
| Include | | | | Trip 2016 | | | | | | | | | | | | | | |
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| Include | | | | PD 5 o | f To PD | 6 of Toronto | | | | | | | | | | | | |
| Include | 11 | | E | 85 | 0 | 11 | | | | | | | | | | | | |
| Include | 249 | | E | 89 | 69 | 180 | | | | | | | | | | | | |
| Include | 28 | | N | 96 | 28 | 0 | | | | | | | | | | | | |
| Include | | N | N | 97 | 5 | 5 | | | | | | | | | | | | |
| Include | 121 | | N | | 113 | 8 | | | | | | | | | | | | |
| Include | 136 | | N | 101 | 5 | 131 | | | | | | | | | | | | |
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| Include | | | NW | 107 | 64 | 52 | | | | | | | | | | | | |
| Include | | | NW | 108 | 0 | 32 | | | | | | | | | | | | |
| Include | | NW | NW | 109 | 22 | 6 | | | | | | | | | | | | |
| Include | | NW | NW | | 155 | 21 | | | | | | | | | | | | |
| Include | | NW | NW | 113 | 70 | 57 | | | | | | | | | | | | |
| Include | 59 | NW | NW | 114 | 55 | 4 | | | | | | | | | | | | |
| Include | | | | 9065 | 0 | 9 | | | | | | | | | | | | |
| Include | | | | 9998 | 44 | 0 | | | | | | | | | | | | |

| 0.4 | AM (OUT) | 1 | | | | | | | | | F t | | | | | | | | |
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| Outputs: | AM (OUT) | Internal | | | | | | | | | External | | | | | | | | |
| | | Internal | External | |
| | Direction | I | NW | N | NE | E | SE | S | SW | W | NW | N | NE | E | SE | S | SW | W | Totals |
| | Trips | 0 | 564 | 638 | 0 | 666 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1882 |
| | % | 0.00% | 29.97% | 33.90% | 0.00% | 35.39% | 0.74% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 100.00% |
| | % w/o trips in subject TAZ | 0.00% | 29.97% | 33.90% | 0.00% | 35.39% | 0.74% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 100.00% |

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| | | | | Input Area | | For | mat | | | | | | | | | | | | |
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| Include | | | | | | | | | | | | | TTC | e Dow | Doto | | OUT\ | | |
| Include | | | | Cross Tabulation Que | ry Form - Trip | - 2016 v1. | 1 | | | | | | 113 | S Raw | Dala | : AIVI (| 001) | | |
| Include | | | | | | | | | | | | | | | | | | | |
| Include | | | | Row: 2006 GTA zone | | | est | | | | | | | Trip Distrib | ution for O | L PPUDO t | rips | | |
| Include | | | | Column: Planning dist | rict of origin - | pd_orig | | | | | | | | | | | | | |
| Include | | | | | | | | | | | | | | | | | | | |
| Include | | | | | | | | | Trips bey | ond 3.1k | m from stat | tion are ex | cluded | | | | | | |
| Include | | | | Filters: | | | | | | | | | | | | | | | |
| Include | | | | Planning district of original | gin 6 | 6 | | | | | | | | | | | | | |
| Include | | | | and | | | | | | | | | | | | | | | |
| Include | | | | Start time of trip - star | t_time In 0630 | 0-0930 | | | | | | | | | | | | | |
| Include | | | | | | | | | | | | | | | | | | | |
| Include | | | | Trip 2016 | | | | | | | | | | | | | | | |
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| Include | | | | | PD 5 of To | PD 6 of To | oronto | | | | | | | | | | | | |
| Include | 56 | 6 E | E | 85 | C |) 50 | 6 | | | | | | | | | | | | |
| Include | 14 | 1 SE | SE | 86 | C |) 14 | 4 | | | | | | | | | | | | |
| Include | 610 |) E | E | 89 | 31 | 579 | 9 | | | | | | | | | | | | |
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| Include | 52 | 2 N | N | 97 | C | 5: | 2 | | | | | | | | | | | | |
| Include | 311 | I N | N | 101 | 119 | 19: | 2 | | | | | | | | | | | | |
| Include | 37 | 7 N | N | 102 | C |) 3 | 7 | | | | | | | | | | | | |
| Include | 110 | NW | NW | 107 | 61 | 49 | 9 | | | | | | | | | | | | |
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| Include | | | | 9030 | C | | | | | | | | | | | | | | |
| Include | | | | 9031 | 17 | | 0 | | | | | | | | | | | | |
| Include | | | | 9032 | 21 | 3. | 7 | | | | | | | | | | | | |
| Include | | | | 9053 | 8 | | 0 | | | | | | | | | | | | |
| Include | | | | 9066 | 33 | | 0 | | | | | | | | | | | | |
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| Outputs: | PM (IN) | Internal | | | | | | | | | External | | | | | | | | |
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| | | Internal | External | |
| | Direction | I | NW | N | NE | E | SE | S | SW | W | NW | N | NE | E | SE | S | SW | W | Totals |
| | Trips | 0 | 611 | 832 | 0 | 589 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | C | 0 | 0 | 0 | 2044 |
| | % | 0.00% | 29.89% | 40.70% | 0.00% | 28.82% | 0.00% | 0.00% | 0.59% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 100.00% |
| | % w/o trips in subject TAZ | 0.00% | 29.89% | 40.70% | 0.00% | 28.82% | 0.00% | 0.00% | 0.59% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 100.00% |

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| | | | | Input Area | | For | mat | | | | | | | | | | | | |
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| Include | | | | | | | | | | | | | TT | S Rav | v Date | a. DM | /INI\ | | |
| Include | | | | Cross Tabulation Que | ry Form - Trip | - 2016 v1. | 1 | | | | | | | 3 Nav | N Date | a. Pivi | (114) | | |
| Include | | | | | | | | | | | | | | | | | | | |
| Include | | | | Row: 2006 GTA zone | | | | | | | | | | Trip Distrib | ution for O | L PPUDO t | rips | | |
| Include | | | | Column: Planning dist | rict of destina | tion - pd_de | est | | | | | | | | | | | | |
| Include | | | | | | | | | | | | | | | | | | | |
| Include | | | | | | | | | Trips bey | ond 3.1k | m from stat | tion are exc | cluded | | | | | | |
| Include | | | | Filters: | | | | | | | | | | | | | | | |
| Include | | | | Planning district of de | stir 6 | j | | | | | | | | | | | | | |
| Include | | | | and | | | | | | | | | | | | | | | |
| Include | | | | Start time of trip - star | t_time In 1530 | 0-1830 | | | | | | | | | | | | | |
| Include | | | | | | | | | | | | | | | | | | | |
| Include | | | | Trip 2016 | | | | | | | | | | | | | | | |
| Include | | | | Table: | | | | | | | | | | | | | | | |
| Include | | | | | | | | | | | | | | | | | | | |
| Include | | | | | PD 5 of To | | | | | | | | | | | | | | |
| Include | 109 | | E | 85 | 21 | | | | | | | | | | | | | | |
| Include | | SW | SW | 88 | С | | | | | | | | | | | | | | |
| Include | 480 | | E | 89 | 20 | | | | | | | | | | | | | | |
| Include | 394 | | N | 96 | С | | | | | | | | | | | | | | |
| Include | 128 | | N | 97 | 71 | | | | | | | | | | | | | | |
| Include | 24 | | N | 99 | С | | | | | | | | | | | | | | |
| Include | 11 | | N | 100 | C | | | | | | | | | | | | | | |
| Include | 209 | | N | 101 | 37 | | | | | | | | | | | | | | |
| Include | 66 | | N | 102 | С | | | | | | | | | | | | | | |
| Include | | | NW | 107 | 130 | | | | | | | | | | | | | | |
| Include | | NW | NW | 109 | C | | | | | | | | | | | | | | |
| Include | | NW | NW | 110 | 22 | | | | | | | | | | | | | | |
| Include | | NW | NW | 113 | C | | | | | | | | | | | | | | |
| Include | 149 | NW | NW | 114 | 49 | | | | | | | | | | | | | | |
| Include | | | | 9030 | C | | | | | | | | | | | | | | |
| Include | | | | 9031 | 20 | | 0 | | | | | | | | | | | | |
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| Include | | | | 9066 | 33 | | 0 | | | | | | | | | | | | |
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| outs: PM (OUT) | Internal | | | | | | | | | External | | | | | | | | |
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| | Internal | Internal | Internal | Internal | Internal | Internal | Internal | Internal | Internal | External | 1 |
| Direction | _ | NW | N | NE | E | SE | S | SW | W | NW | N | NE | E | SE | S | SW | W | Totals |
| Trips | 0 | 783 | 480 | 0 | 320 | 11 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1612 |
| % | 0.00% | 48.57% | 29.78% | 0.00% | 19.85% | 0.68% | 0.00% | 1.12% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 100.00% |
| % w/o trips in subject TAZ | 0.00% | 48.57% | 29.78% | 0.00% | 19.85% | 0.68% | 0.00% | 1.12% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 100.00% |
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| | | | Input Area | | For | mat | | | | | | | | | | | | |

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| | Sum | Direction | Direction | Include | Include | Include | Include | Include Inc | lude Include | Include | Include | Include | Include | Include | Include | Include | Include | Include |
| Include | | | | Mon Dec 14 2020 21:11 | :13 GMT- | -0500 (Ea | stern Star | ndard Time) - | Run Time: 24 | 171 | | | | | | | | |
| Include | | | | | | | | | | | | ттс | e Daw | Data | DM / | OUT) | | |
| Include | | | | Cross Tabulation Query | Form - T | rip - 2016 | v1.1 | | | | | 113 | S Raw | Data | : PIVI (| UUI) | | |
| Include | | | | | | | | | | | | | | | | | | |
| Include | | | | Row: 2006 GTA zone of | | | | | | | | | Trip Distrib | ution for O | L PPUDO | trips | | |
| Include | | | | Column: Planning distric | t of origin | ı - pd_orig | 3 | | | | | | | | | | | |
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| Include | | | | | | | | Tri | ps beyond 3.1 | km from sta | ation are ex | cluded | | | | | | |
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| Include | | | | Planning district of origin | 1 6 | i | | | | | | | | | | | | |
| Include | | | | and | | | | | | | | | | | | | | |
| Include | | | | Start time of trip - start_t | time In 15 | 30-1830 | | | | | | | | | | | | |
| Include | | | | | | | | | | | | | | | | | | |
| Include | | | | Trip 2016 | | | | | | | | | | | | | | |
| Include | | | | Table: | | | | | | | | | | | | | | |
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| Include | | 40 E | E | 85 | 0 | 40 |) | | | | | | | | | | | |
| Include | | 11 SE | SE | 86 | 11 | 0 |) | | | | | | | | | | | |
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| Include | 28 | 80 E | E | 89 | 138 | 142 | | | | | | | | | | | | |
| Include | | 36 N | N | 96 | 17 | 19 |) | | | | | | | | | | | |
| Include | | 51 N | N | 97 | 15 | 36 | | | | | | | | | | | | |
| Include | 19 | 92 N | N | 99 | 113 | 79 |) | | | | | | | | | | | |
| Include | | 56 N | N | 100 | 20 | 36 | | | | | | | | | | | | |
| Include | 1: | 18 N | N | 101 | 29 | 89 |) | | | | | | | | | | | |
| Include | | 27 N | N | 102 | 11 | 16 | | | | | | | | | | | | |
| Include | 2: | 26 NW | NW | 107 | 64 | 162 | | | | | | | | | | | | |
| Include | | 35 NW | NW | 108 | 8 | 27 | | | | | | | | | | | | |
| Include | | 63 NW | NW | 109 | 0 | 63 | | | | | | | | | | | | |
| Include | | 29 NW | NW | 110 | 144 | 185 | i | | | | | | | | | | | |
| Include | | 93 NW | NW | 113 | 49 | 44 | | | | | | | | | | | | |
| Include | | 37 NW | NW | 114 | 30 | 7 | | | | | | | | | | | | |
| Include | | | | 9032 | 7 | 0 |) | | | | | | | | | | | |
| Include | | | | 9998 | 0 | 37 | | | | | | | | | | | | |

| | mn | Internal | | | | | | | | | External | | | | | | | | |
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| Outputs: | | | | | | | | | | | | | | | 1 | | | | - |
| | Direction | Internal | Internal NW | | Internal NE | Internal | Internal SE | | Internal | Internal | NW | | NE NE | External | External | | SW | External | |
| | | | NVV | N 11 | NE 10 | 35 | | ٥ ^ | SVV | VV | NVV | N O | NE C | 1 | | S | SW | VV 57 | Totals 129 |
| | Trips % | 0.00% | 0.00% | 8.53% | 7.75% | 27.13% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 12.409 | | 0.00% | 0.00% | | |
| | % w/o trips in subject TAZ | 0.00% | 0.00% | 8.53% | 7.75% | 27.13% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 12.409 | | | | | |
| | % W/O trips in subject TAZ | 0.00% | 0.00% | 6.53% | 7.75% | 21.13% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 12.407 | 0.00% | 0.00% | 0.007 | 44.19% | 100.00% |
| | | | | Input Area | | Fori | mat [| | | | | | | | | | | | |
| | | | Finalized | | | 1011 | ilat | | | | | | | | | | | | |
| | C | | Direction | | Include | Include | Include | landonia. | to all the | to a trade | Include | la alcoda | Include | Include | Include | Include | landonia. | Include | to alcore |
| Include | Sum | Direction | Direction | Fri Mar 12 2021 20:08:5 | | | | | | | include | include | include | include | include | include | include | include | include |
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| Include | | | | Cross Tabulation Query | Eorm - Trir | - 2016 v1 | 1 | | | | | | | | 115 Raw L | Jata: AWI (I | N) | | |
| Include | | | | Cross rabulation Query | - Omi - 111 | 7-2010 VI. | | | | | | | _ | | | | | | |
| Include | | | | Row: 2006 GTA zone of | origin ata | OG oria | | | | | | | Trin | Dietributi | on for exis | tina Evhil | ition CO | totion | |
| Include | | | | Column: 2006 GTA zone | | | doet | | | | | | шр | Distributi | OII IOI EXIS | ung Exilic | illion GO s | station | |
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| Include | | | | 2006 GTA zone of destir | 88 | 89 | | | | | | | | | | | | | |
| Include | | | | and | | . 03 | | | | | | | | | | | | | |
| Include | | | | Start time of trip - start t | ime In 063 | 0.0030 | | | | | | | | | | | | | |
| Include | | | | and | 1116 111 000 | 0-0330 | | | | | | | | | | | | | |
| Include | | | | Trip purpose of destinati | on - nurn (| lest In F | | | | | | | | | | | | | |
| Include | | | | Trip purpose of destinati | oii - puip_c | 2001 1111 | | | | | | | | | | | | | |
| Include | | | | Trip 2016 | | | | | | | | | | | | | | | |
| Include | | | | Table: | | | | | | | | | | | | | | | |
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| Include | | | | | 85 | 89 | | | | | | | | | | | | | |
| Include | 18 | F | E | 77 | 0 | | | | | | | | | | | | | | |
| Include | 17 | | F | 79 | 0 | 17 | | | | | | | | | | | | | |
| Include | | | NE | 91 | o o | | | | | | | | | | | | | | |
| Include | | | NE | 98 | o o | 5 | | | | | | | | | | | | | |
| Include | 11 | | N | 105 | 11 | | | | | | | | | | | | | | |
| Include | | | | 264 | 0 | | | | | | | | | | | | | | |
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| Include | | | | 313 | ä | | | | | | | | | | | | | | |
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| Outnuts: | AM (OUT) | Internal | | | | | | | | | External | | | | | | | | |
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| outputo. | | | Internal | Internal | Internal | Internal | Internal | Internal | Internal | | | External | External | External | External | External | External | External | - |
| | Direction | | NW | | NE | E | SE | | SW | | NW | N | NE | E | SE | | SW | W | Totals |
| | Trips | 0 | 18 | 0 | | - 0 | | 0 | 0 | 0 | 0 | 0 | 37 | - (|) (| | 0 | 48 | 108 |
| | % | 0.00% | 16.67% | 0.00% | 4.63% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 34.26% | 0.00% | 0.00% | 0.00% | 0.00% | | 100.00% |
| | % w/o trips in subject TAZ | 0.00% | 16.67% | 0.00% | 4.63% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 34.26% | 0.00% | 0.00% | 0.00% | 0.00% | | 100.00% |
| | | | | | | | | • | | | | | | | | | | | |
| | | | | Input Area | | Forr | nat | | | | | | | | | | | | |
| | | Default | Finalized | | | | | | | | | | | | | | | | |
| | Sum | Direction | Direction | Include | Include | Include | Include | Include | Include | Include | Include | Include | Include | Include | Include | Include | Include | Include | Include |
| Include | | | | Fri Mar 12 2021 19:51:3 | 4 GMT-050 | 0 (Eastern S | Standard Tir | ne) - Run | Time: 2622 | 2ms | | | | | | | | | |
| Include | | | | | | | | | | | | | | т | TS Raw Da | ta: AM (O | JT) | | |
| Include | | | | Cross Tabulation Query | Form - Trip | - 2016 v1.1 | | | | | | | | | | | | | |
| Include | | | | | | | | | | | | | | | | | | | - |
| Include | | | | Row: 2006 GTA zone of | | | st | | | | | | Trip | Distributi | on for exis | ting Exhib | ition GO s | tation | |
| Include | | | | Column: 2006 GTA zone | of origin - | gta06_orig | | | | | | | | | | | | | |
| Include | | | | | | | | | | | | | | | | | | | |
| Include | | | | | | | | | | | | | | | | | | | |
| Include | | | | Filters: | | | | | | | | | | | | | | | |
| Include | | | | 2006 GTA zone of origin | 88 | 89 | 1 | | | | | | | | | | | | |
| Include | | | | and | | | | | | | | | | | | | | | |
| Include | | | | Start time of trip - start_t | ime In 0630 | -0930 | | | | | | | | | | | | | |
| Include | | | | and | | | | | | | | | | | | | | | |
| Include | | | | Trip purpose of origin - p | urp_orig In | F | | | | | | | | | | | | | |
| Include | | | | | | | | | | | | | | | | | | | |
| Include | | | | Trip 2016 | | | | | | | | | | | | | | | |
| Include | | | | Table: | | | | | | | | | | | | | | | |
| Include | | | | | | | | | | | | | | | | | | | |
| Include | | | | | 85 | | | | | | | | | | | | | | |
| Include | | | NE | 98 | 0 | 5 | | | | | | | | | | | | | |
| Include | | | NW | 114 | 0 | | | | | | | | | | | | | | |
| Include | | | | 260 | 11 | 0 | | | | | | | | | | | | | |
| Include | | | | 301 | 0 | | | | | | | | | | | | | | |
| Include | | | XNE | 526 | 0 | | | | | | | | | | | | | | |
| Include | 17 | XW | XW | 3699 | 0 | 17 | | | | | | | | | | | | | |

| Outputs: | PM (IN) | Internal | | | | | | | | | External | | | | | | | | |
|----------|----------------------------|-----------|-----------|------------------------------|-------------|--------------|--------------|-------------|------------|----------|----------|----------|----------|--------------|-------------|-------------|------------|----------|---------|
| | | Internal | Internal | Internal | Internal | | | Internal | Internal | Internal | External | External | External | External | | External | External | External | |
| | Direction | I | NW | N | NE | E | SE | S | SW | W | NW | N | NE | E | SE | S | SW | W | Totals |
| | Trips | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | (| | 0 | 0 | 22 | |
| | % | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 24.14% | | | | 0.00% | | 100.00% |
| | % w/o trips in subject TAZ | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 24.14% | 0.00% | 0.00% | 0.00% | 0.00% | 75.86% | 100.00% |
| | | | | | | | | | | | | | | | | | | | |
| | | | | Input Area | | Forn | nat | | | | | | | | | | | | |
| | | | Finalized | | | | | | | | | | | | | | | | |
| | Sum | Direction | Direction | Include | Include | Include | Include | Include | Include | Include | Include | Include | Include | Include | Include | Include | Include | Include | Include |
| Include | | | | Fri Mar 12 2021 20:06:1 | 7 GMT-050 | 0 (Eastern S | Standard Tin | ne) - Run 1 | Time: 2368 | ms | | | | | | | | | |
| Include | | | | | | | | | | | | | | | TTS Raw D | ata: PM (II | N) | | |
| Include | | | | Cross Tabulation Query | Form - Trip | - 2016 v1.1 | | | | | | | | | | | | | |
| Include | | | | | | | | | | | | | | | | | | | _ |
| Include | | | | Row: 2006 GTA zone of | | | | | | | | | Trip | Distribution | on for exis | ting Exhib | ition GO s | tation | |
| Include | | | | Column: 2006 GTA zone | of destinat | ion - gta06_ | dest | | | | | | | | | | | | |
| Include | | | | | | | | | | | | | | | | | | | |
| Include | | | | | | | | | | | | | | | | | | | |
| Include | | | | Filters: | | | | | | | | | | | | | | | |
| Include | | | | 2006 GTA zone of destir | 88 | 89 | | | | | | | | | | | | | |
| Include | | | | and | | | | | | | | | | | | | | | |
| Include | | | | Start time of trip - start_t | ime In 1630 | -1930 | | | | | | | | | | | | | |
| Include | | | | and | | | | | | | | | | | | | | | |
| Include | | | | Trip purpose of destinati | on - purp_d | est In F | | | | | | | | | | | | | |
| Include | | | | | | | | | | | | | | | | | | | |
| Include | | | | Trip 2016 | | | | | | | | | | | | | | | |
| Include | | | | Table: | | | | | | | | | | | | | | | |
| Include | | | | | | | | | | | | | | | | | | | |
| Include | | | | | 89 | | | | | | | | | | | | | | |
| Include | | | XNE | 234 | 7 | | | | | | | | | | | | | | |
| Include | | | XW | 309 | 5 | | | | | | | | | | | | | | |
| Include | 17 | XW | XW | 313 | 17 | | | | | | | | | | | | | | |

| tputs | PM (OUT) | Internal | | | | | | | | | External | | | | | | | | |
|-------|----------------------------|-----------|-----------|------------------------------|-----------|------------|------------|-----------|-----------|----------|----------|---------|---------|-------------|-------------|------------|------------|----------|---------|
| | | Internal | | Internal | Internal | Internal | | | Internal | | | | | External | | | | External | |
| | Direction | I | NW | N | | E | | S | SW | W | NW | N | NE | E | SE | S | SW | W | Totals |
| | Trips | 0 | 0 | | 36 | | | | | 0 | 0 | | 0 | · | |) (| | 0 |) (|
| | % | 0.00% | | | 62.07% | | | 0.00% | | 0.00% | 0.00% | | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | 100.00 |
| | % w/o trips in subject TAZ | 0.00% | 0.00% | 8.62% | 62.07% | 29.31% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 100.00 |
| | | | | | | | | | | | | | | | | | | | |
| | | | | Input Area | | For | rmat | | | | | | | | | | | | |
| | | | Finalized | | | | | | | | | | | | | | | | |
| | Sum | Direction | Direction | | | | | | | | | Include | Include | Include | Include | Include | Include | Include | Include |
| | | | | Fri Mar 12 2021 19:56:0 | 0 GMT-0 | 500 (East | tern Stand | ard Time) | - Run Tim | e: 6139m | s | | | | | | | | |
| | | | | | | | | | | | | | | T | TS Raw Da | ata: PM (O | UT) | | |
| | | | | Cross Tabulation Query | Form - Tr | rip - 2016 | 3 v1.1 | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | Row: 2006 GTA zone of | | | | | | | | | Trip I | Distributio | on for exis | ting Exhib | ition GO s | station | |
| | | | | Column: 2006 GTA zone | of origin | - gta06_ | orig | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | Filters: | | | | | | | | | | | | | | | |
| | | | | 2006 GTA zone of origin | 88 | 89 | 9 | | | | | | | | | | | | |
| | | | | and | | | | | | | | | | | | | | | |
| | | | | Start time of trip - start_t | ime In 16 | 30-1930 | | | | | | | | | | | | | |
| | | | | and | | | | | | | | | | | | | | | |
| | | | | Trip purpose of origin - p | ourp_orig | In F | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | Trip 2016 | | | | | | | | | | | | | | | |
| | | | | Table: | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | 89 | | | | | | | | | | | | | | |
| | | 7 E | E | 34 | 17 | | | | | | | | | | | | | | |
| | | 1 NE | NE | 72 | 31 | | | | | | | | | | | | | | |
| | | 5 NE | NE | 90 | 5 | | | | | | | | | | | | | | |
| | | 5 N | N | 100 | 5 | | | | | | | | | | | | | | |



Appendix F: Exhibition Station Trip Transfer Matrix

| 2041, 1 Hour AM Peak | | OL EB | OL WB | GO Loc EB | GO Loc WE | GO Exp EB | GO EXP W | South | South | South | South | North | North | North | North | North | North | North | | South | | North | South | |
|-------------------------|-------|--------|---------|-----------|-----------|-----------|----------|-------|-------------|-----------|---------------|-------|---------|--------|---------|-------|-------------|----------|-------|----------|----------|-----------|-----------|--------|
| From/To | | | io Line | GO Rai | I - Local | GO Rail - | Express | | t Streetcar | Harbourfr | ont Streetcar | | rin Bus | Ossing | ton Bus | | cal Transit | Walk-out | | Walk-out | | to south- | to south- | Total |
| | | EB | WB | EB | WB | EB | WB | NB/EB | SB/WB | EB | WB | SB/EB | NB/WB | SB | NB | EB | WB | to north | to LV | to EP | to south | west | east | 1014 |
| Ontario Line | EB | | | - | - | | | | - | - | | | - | - | - | | - | | - | | - | | | - |
| ontario Emo | WB | - | | 50 | 300 | 50 | 0 | 0 | 0 | 0 | 20 | 10 | 130 | 0 | 260 | 0 | 0 | 180 | 1,740 | 20 | 0 | - | | 2,760 |
| GO Rail - Local | EB | 3,340 | | - | - | | | 10 | 0 | 60 | 30 | 10 | 180 | 0 | 370 | 0 | 0 | 120 | 170 | 10 | 0 | | | 4,300 |
| | WB | 0 | | - | - | | - | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 10 | 0 | 0 | 0 | 10 | 0 | 0 | - | - | 30 |
| GO Rail - Express | EB | 2,460 | | - | - | | | 0 | 0 | 40 | 20 | 10 | 130 | 0 | 270 | 0 | 0 | 80 | 130 | 0 | 0 | | | 3,140 |
| | WB | 0 | | - | - | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 |
| Bathurst Streetcar | NB/EB | 0 | | 0 | 0 | 0 | 0 | | - | - | | | - | - | - | | - | | - | | - | | | 0 |
| Sumurot otteetour | SB/WB | 20 | | 0 | 0 | 0 | 0 | | - | - | | | - | - | - | | - | | - | | - | | | 20 |
| Harbourfront Streetcar | EB | 240 | | 10 | 10 | 10 | 0 | | - | | | | | | - | | | | - | | | | | 270 |
| Tarbour on on occou | WB | 0 | | 10 | 10 | 10 | 0 | - | - | - | | | | - | - | | | | - | - | | | | 30 |
| Dufferin Bus | SB/EB | 380 | | 10 | 20 | 10 | 0 | | - | - | | | - | - | - | | - | | - | | - | | | 420 |
| Juliani Bus | NB/WB | 10 | | 0 | 0 | 0 | 0 | | - | | | | | | - | | | | - | | | | | 10 |
| Ossington bus | SB | 160 | | 10 | 10 | 10 | 0 | - | - | - | | | | - | - | | | | - | - | | | | 190 |
| oodington buo | NB | 0 | | 0 | 0 | 0 | 0 | | - | - | | | - | - | - | | - | | - | | - | | | 0 |
| Other Local Transit | EB | 0 | | 0 | 0 | 0 | 0 | | - | | | | | | - | | | | - | | | | | 0 |
| | WB | 0 | | 0 | 0 | 0 | 0 | | - | - | | | | - | - | | - | | - | | | | | 0 |
| Walk-in from North | | 200 | - | 20 | 50 | 20 | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | 290 |
| Walk-in from LV | | 510 | | 20 | 60 | 20 | 0 | | | | | | | | - | | | | - | | | | | 610 |
| Walk-in from EP | | 50 | | 10 | 10 | 10 | 0 | - | - | - | | - | - | - | - | - | - | | - | - | - | | | 80 |
| Walk-in from South | | 700 | | 20 | 50 | 20 | 0 | | - | - | | - | - | - | - | | - | | - | - | - | | | 790 |
| Walk-in from South-west | | 490.00 | | 14.00 | 35.00 | 14.00 | | | | | | | | | | | | | | | | | | |
| Walk-in from South-east | | 210.00 | | 6.00 | 15.00 | 6.00 | | | | | | | | | | | | | | | | | | |
| Total | | 8.070 | | 160 | 520 | 160 | 0 | 10 | 0 | 100 | 70 | 30 | 450 | 0 | 910 | 0 | 0 | 380 | 2.050 | 30 | 0 | | | 12,940 |

| From/To | | Ontar | io Line | GO Rai | il - Local | GO Rail | - Express | Bathurst | Streetcar | Harbourfro | nt Streetcar | Duffer | rin Bus | Ossing | ton Bus | Other Loc | al Transit | Walk-out | Walk-out | Walk-out | Walk-out | to south- | | Total |
|-------------------------|-------|-------|---------|--------|------------|---------|-----------|----------|-----------|------------|--------------|--------|---------|--------|---------|-----------|------------|----------|----------|----------|----------|-----------|-----------|--------|
| From/10 | | EB | WB | EB | WB | EB | WB | NB/EB | SB/WB | EB | WB | SB/EB | NB/WB | SB | NB | EB | WB | to north | to LV | to EP | to south | west | to south- | rotai |
| Ontario Line | EB | - | | - | - | | | | - | - | | | | - | - | - | | | - | - | | - | | |
| Sittano Eme | WB | | - | 0 | 3,340 | 0 | 2,460 | 20 | 0 | 0 | 240 | 10 | 380 | 0 | 160 | 0 | 0 | 200 | 510 | 50 | 700 | 490.00 | 210.00 | 8,070 |
| GO Rail - Local | EB | 300 | | - | - | | | 0 | 0 | 10 | 10 | 0 | 20 | 0 | 10 | 0 | 0 | 50 | 60 | 10 | 50 | 35.00 | 15.00 | 520 |
| | WB | 50 | | - | - | | | 0 | 0 | 10 | 10 | 0 | 10 | 0 | 10 | 0 | 0 | 20 | 20 | 10 | 20 | 14.00 | 6.00 | 160 |
| GO Rail - Express | EB | 0 | | - | - | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | - | 0 |
| • | WB | 50 | - | - | - | | | 0 | 0 | 10 | 10 | 0 | 10 | 0 | 10 | 0 | 0 | 20 | 20 | 10 | 20 | 14.00 | 6.00 | 160 |
| Bathurst Streetcar | NB/EB | 0 | | 0 | 0 | 0 | 0 | | - | - | - | | | - | - | - | | | - | - | | | | 0 |
| | SB/WB | 0 | | 0 | 10 | 0 | 0 | | - | - | | - | | - | - | - | - | | - | - | | | | 10 |
| larbourfront Streetcar | EB | 20 | | 0 | 30 | 0 | 20 | | - | | | | | | - | | | | - | - | | | | 70 |
| | WB | 0 | | 0 | 60 | 0 | 40 | | - | - | - | | | - | - | - | | | - | - | | | | 100 |
| Dufferin Bus | SB/EB | 130 | | 10 | 180 | 0 | 130 | | - | - | | - | | - | - | - | - | | - | - | | | | 450 |
| | NB/WB | 10 | | 0 | 10 | 0 | 10 | | - | | | | | | - | | | | - | - | | | | 30 |
| Ossington bus | SB | 260 | | 10 | 370 | 0 | 270 | | - | - | - | | | - | - | - | | | - | - | | | | 910 |
| | NB | 0 | | 0 | 0 | 0 | 0 | | - | - | - | | | - | - | - | | | - | - | | | | 0 |
| Other Local Transit | EB | 0 | | 0 | 0 | 0 | 0 | | - | | | | | | - | - | | | - | - | | | | 0 |
| | WB | 0 | | 0 | 0 | 0 | 0 | | - | - | - | | | - | - | - | | | - | - | | | | 0 |
| Walk-in from North | | 180 | | 0 | 120 | 0 | 80 | | - | - | | - | | - | - | - | - | | - | - | | | | 380 |
| Walk-in from LV | | 1,740 | | 10 | 170 | 0 | 130 | | - | | | | | | - | - | | | - | - | | | | 2,050 |
| Walk-in from EP | | 20 | | 0 | 10 | 0 | 0 | | - | - | - | | | - | - | - | | | - | - | | | | 30 |
| Walk-in from South | | 0 | | 0 | 0 | 0 | 0 | | - | - | - | - | - | - | - | - | - | | - | - | | | | 0 |
| Walk-in from South-west | | - | - | - | | | | | | | | | | | | | | | | | | | | |
| Walk-in from South-east | | - | - | - | - | | | | | | | | | | | | | | | | | | | |
| Total | | 2,760 | - | 30 | 4,300 | 0 | 3,140 | 20 | 0 | 30 | 270 | 10 | 420 | 0 | 190 | 0 | 0 | 290 | 610 | 80 | 790 | | | 12,940 |

| From/To | | Ontari | io Line | GO Rail | - Local | GO Rail | Express | Bathurst | Streetcar | Harbourfro | nt Streetcar | Duffer | in Bus | Ossing | ton Bus | Other Loc | al Transit | Walk-out | Walk-out | | Walk-out | Total |
|-----------------------|-------|--------|---------|---------|---------|---------|---------|----------|-----------|------------|--------------|--------|--------|--------|---------|-----------|------------|----------|----------|-------|----------|-------|
| 11011110 | | EB | WB | EB | WB | EB | WB | NB/EB | SB/WB | EB | WB | SB/EB | NB/WB | SB | NB | EB | WB | to north | to LV | to EP | to south | Total |
| tario Line | EB | - | | - | - | - | - | | - | - | | - | | - | - | - | | - | - | - | - | |
| | WB | | | 0 | 830 | 0 | 620 | 10 | 0 | 0 | 60 | 0 | 90 | 0 | 40 | 0 | 0 | 50 | 130 | 10 | 180 | 2,020 |
| Rail - Local | EB | 70 | - | - | - | | | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 10 | 10 | 0 | 10 | 110 |
| | WB | 10 | | - | - | - | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 | 0 | 10 | 40 |
| Rail - Express | EB | 0 | | - | - | - | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | WB | 10 | - | - | - | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 | 0 | 10 | 40 |
| thurst Streetcar | NB/EB | 0 | | 0 | 0 | 0 | 0 | | - | - | | | | - | - | - | | | - | - | - | 0 |
| | SB/WB | 0 | | 0 | 0 | 0 | 0 | | - | - | | | | - | - | - | | | - | - | - | 0 |
| rbourfront Streetcar | EB | 10 | - | 0 | 10 | 0 | 10 | | - | - | | | | - | - | - | - | - | - | - | - | 30 |
| | WB | 0 | | 0 | 10 | 0 | 10 | | - | - | | | | - | - | - | | | - | - | - | 20 |
| fferin Bus | SB/EB | 30 | | 0 | 40 | 0 | 30 | | - | - | | | | - | - | | | - | - | - | | 100 |
| | NB/WB | 0 | | 0 | 10 | 0 | 0 | | - | - | | | | | | | | | - | | - | 10 |
| sington bus | SB | 70 | | 0 | 90 | 0 | 70 | | - | - | | | | - | - | - | | | - | - | - | 23 |
| | NB | 0 | | 0 | 0 | 0 | 0 | | - | - | | | | - | - | - | | | - | - | - | 0 |
| her Local Transit | EB | 0 | - | 0 | 0 | 0 | 0 | | - | - | | | | - | - | - | - | - | - | - | - | 0 |
| | WB | 0 | | 0 | 0 | 0 | 0 | | - | - | | | | - | - | - | | | - | - | - | 0 |
| alk-in from North | | 50 | | 0 | 30 | 0 | 20 | | - | - | | | | - | - | - | | | - | - | - | 10 |
| lk-in from LV | | 430 | | 0 | 40 | 0 | 30 | | - | - | | | | | | - | | | - | | - | 50 |
| alk-in from EP | | 13,890 | - | 20,470 | 2,950 | 0 | 2,170 | 190 | 0 | 120 | 2,400 | 20 | 1,840 | 0 | 760 | - | - | - | 2,800 | - | - | 47,6 |
| lk-in from South | | 0 | - | 0 | 0 | 0 | 0 | | - | - | | | | - | - | - | | - | - | - | - | 0 |
| lk-in from South-west | | - | | - | - | | | | | | | | | | | | | | | | | |
| lk-in from South-east | | - | | - | - | | | | | | | | | | | | | | | | | |
| tal | | 14,570 | | 20,470 | 4,010 | 0 | 2,960 | 200 | 0 | 120 | 2,460 | 20 | 1,940 | 0 | 800 | 0 | 0 | 80 | 2,960 | 10 | 210 | 50,81 |

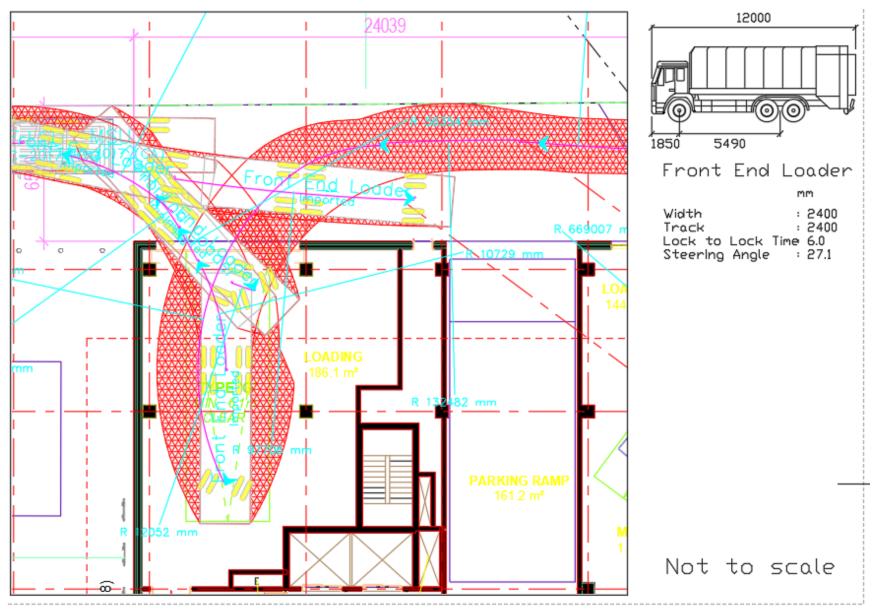
| From/To | | Ontari | o Line | GO Rai | - Local | GO Rail | Express | Bathurst | Streetcar | Harbourfro | nt Streetcar | Duffer | in Bus | Ossing | ton Bus | Other Loc | al Transit | Walk-out | Walk-out | Walk-out | Walk-out | | to south- | Total |
|-----------------------------|-------|--------|--------|--------|---------|---------|---------|----------|-----------|------------|--------------|--------|--------|--------|---------|-----------|------------|----------|----------|----------|----------|-----------|-----------|--------|
| Prom/10 | | EB | WB | EB | WB | EB | WB | NB/EB | SB/WB | EB | WB | SB/EB | NB/WB | SB | NB | EB | WB | to north | to LV | to EP | to south | to south- | east | lotai |
| Ontario Line | EB | | - | | - | - | | - | | - | - | - | - | - | - | - | | - | | | - | | | |
| Sittatio Line | WB | - | | 75 | 440 | 75 | 0 | 0 | 0 | 0 | 30 | 20 | 190 | 0 | 390 | 0 | 0 | 260 | 2,560 | 30 | 0 | | | 4,070 |
| GO Rail - Local | EB | 4,930 | | - | - | - | - | 10 | 0 | 90 | 50 | 20 | 260 | 0 | 540 | 0 | 0 | 170 | 250 | 10 | 0 | | | 6,330 |
| JO Hall Edda! | WB | 0 | | | | - | | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 20 | 0 | 0 | 0 | 10 | 0 | 0 | | | 40 |
| GO Rail - Express | EB | 3,620 | - | | - | - | | 0 | 0 | 60 | 30 | 20 | 190 | 0 | 400 | 0 | 0 | 120 | 190 | 0 | 0 | | | 4,630 |
| JO Rail - Express | WB | 0 | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 |
| Bathurst Streetcar | NB/EB | 0 | | 0 | 0 | 0 | 0 | | | | - | | | | | - | | | | | - | | | 0 |
| Jatilai St Gaeetcai | SB/WB | 30 | - | 0 | 0 | 0 | 0 | - | | - | - | - | - | - | - | - | | - | | | - | | | 30 |
| larbourfront Streetcar | EB | 360 | | 10 | 20 | 10 | 0 | | | | | | | | | | | | | | - | | | 400 |
| ian boar in our our out out | WB | 0 | | 10 | 10 | 10 | 0 | | | | | | | | | | | | | | | | | 30 |
| Oufferin Bus | SB/EB | 560 | | 10 | 30 | 10 | 0 | | | | | | - | | | | | | | | - | | | 610 |
| Janes III Bas | NB/WB | 10 | | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | - | | | 10 |
| Ossington bus | SB | 230 | | 10 | 10 | 10 | 0 | | | | | | - | | | | | | | | - | | | 260 |
| soomgton buo | NB | 0 | | 0 | 0 | 0 | 0 | | | | | | - | | | | | | | | - | | | 0 |
| Other Local Transit | EB | 0 | | 0 | 0 | 0 | 0 | | | - | - | | - | - | - | - | | - | | | - | | | 0 |
| | WB | 0 | | 0 | 0 | 0 | 0 | | | | | | - | | | | | | | | - | | | 0 |
| Valk-in from North | | 290 | | 30 | 70 | 30 | 0 | | | | | | - | | | | | | | | - | | | 420 |
| Valk-in from LV | | 750 | | 30 | 90 | 30 | 0 | | | | | | | | | | | | | | - | | | 900 |
| Valk-in from EP | | 70 | | 10 | 10 | 10 | 0 | | | | - | | | | | - | | - | | | - | | | 100 |
| Valk-in from South | | 1,030 | - | 30 | 80 | 30 | 0 | - | | - | - | - | - | - | - | - | | - | | | - | | | 1,170 |
| | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| otal | | 11,880 | | 215 | 760 | 215 | 0 | 10 | 0 | 150 | 110 | 60 | 650 | 0 | 1,350 | 0 | 0 | 550 | 3,010 | 40 | 0 | 0 | 0 | 19,000 |

| From/To | | Ontari | o Line | GO Rai | I - Local | GO Rail - | Express | Bathurst | Streetcar | Harbourfro | nt Streetcar | Duffer | in Bus | Ossing | ton Bus | Other Loc | cal Transit | Walk-out | Walk-out | Walk-out | Walk-out | walk-out to south- | walk-out | Total |
|-----------------------------------|----------|-------------|--------|--------|-----------|-----------|---------|----------|-----------|------------|--------------|--------|--------|--------|---------|-----------|-------------|----------|----------|----------|----------|-----------------------|----------|--------|
| FIUIIIII | | EB | WB | EB | WB | EB | WB | NB/EB | SB/WB | EB | WB | SB/EB | NB/WB | SB | NB | EB | WB | to north | to LV | to EP | to south | west | east | l Otal |
| ntario Line | EB | - | - | | - | - | - | - | - | - | - | - | - | | - | - | | - | - | - | - | | | |
| | WB | | | 0 | 4,927 | 0 | 3,623 | 30 | 0 | 0 | 360 | 10 | 560 | 0 | 230 | 0 | 0 | 290 | 750 | 70 | 1,030 | | | 11,880 |
| O Rail - Local | EB WB | 440 | | | | - | | 0 | 0 | 10 | 20 | 0 | 30 | 0 | 10 | 0 | 0 | 70 | 90 | 10 | 80 | | | 760 |
| | | 80 | | | | - | | 0 | 0 | 10 | 10 | 0 | 10 | 0 | 10 | 0 | 0 | 30 | 30 | 10 | 30 | | | 220 |
| O Rail - Express | EB | 0 | | | • | - | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 |
| | WB | 75 | | | | - | - | 0 | 0 | 10 | 10 | 0 | 10 | 0 | 10 | 0 | 0 | 30 | 30 | 10 | 30 | | | 215 |
| athurst Streetcar | NB/EB | 0 | | 0 | 0 | 0 | 0 | | | | - | | | | | - | | | | | | | | 0 |
| | SB/WB | 30 | | 0 | 10 50 | 0 | 0 | - | | | - | | - | - | - | - | - | | - | | - | | | 10 |
| rbourfront Streetcar | EB | | | 0 | | 0 | 30 | - | | - | - | - | - | | - | - | - | - | - | | - | | | 110 |
| | WB | 0 | | - 0 | 90 | 0 | 60 | | | | - | | | | | - | | | - | | | | | 150 |
| ufferin Bus | SB/EB | 190 | | 10 | 260 | 0 | 190 | | | | - | | | | | - | | | - | | | | | 650 |
| | NB/WB | 20 | | 0 | 20 | 0 | 400 | | | • | - | • | | | | - | | | - | | - | | | 60 |
| ssington bus | SB NB | 390 | | 20 | 540 | 0 | 400 | - | | | - | | - | - | - | - | - | | - | | - | | | 1,350 |
| | | 0 | | 0 | 0 | 0 | 0 | • | | | - | • | • | | | - | - | | - | • | - | | | 0 |
| ther Local Transit | EB WB | 0 | | 0 | 0 | 0 | 0 | | | • | - | | | | | - | | | - | • | - | | | 0 |
| lelle le form Newth | WB | 000 | | 0 | U | 0 | 400 | - | | - | - | - | - | - | | - | - | - | • | | - | | | 0 |
| alk-in from North 'alk-in from LV | | 260 | | 10 | 170 | 0 | 120 | - | | | - | | - | - | - | - | - | | - | | - | | | 550 |
| alk-in from EP | | 2,560 30 | | 10 | 250 | 0 | 190 | | | • | - | | | | | - | | | - | • | - | | | 3,010 |
| alk-in from South | | 0 | | 0 | 10 | 0 | 0 | • | | | - | • | • | | | - | - | | - | • | - | | | 0 |
| aik-in from South | | 0 | - | U | 0 | U | 0 | | - | - | - | | | - | - | - | - | | | | - | | | 0 |
| | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| | | 4 475 | | | 0.007 | | | | | | 100 | | | | | | | 400 | | | 4 470 | | | 19,005 |
| otal | | 4,075 | - | 40 | 6,327 | 0 | 4,633 | 30 | 0 | 30 | 400 | 10 | 610 | 0 | 260 | U | U | 420 | 900 | 100 | 1,170 | U | 0 | 19,0 |

| From/To | | Ontario Line | | GO Rail - Local | | GO Rail - Express | | Bathurst Streetcar Harbou | | Harbourfro | front Streetcar Dufferin | | in Bus Ossington B | | ton Bus | Other Local Transit | | Walk-out | Walk-out | Walk-out | Walk-out | | to south- | Total |
|------------------------|-------|--------------|----|-----------------|-------|-------------------|-------|---------------------------|-------|------------|--------------------------|-------|--------------------|----|---------|---------------------|----|----------|----------|----------|----------|------|-----------|-------|
| | | EB | WB | EB | WB | EB | WB | NB/EB | SB/WB | EB | WB | SB/EB | SB/EB NB/WB | SB | NB | EB | WB | to north | to LV | to EP | to south | west | to south- | TOTAL |
| Ontario Line | EB | - | - | | - | - | - | | | - | - | - | - | - | - | - | - | - | | | - | | | |
| | WB | - | - | 0 | 1,230 | 0 | 910 | 10 | 0 | 0 | 90 | 0 | 140 | 0 | 60 | 0 | 0 | 70 | 190 | 20 | 260 | | | 2,98 |
| GO Rail - Local | EB | 110 | - | - | - | - | | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 20 | 20 | 0 | 20 | | | 180 |
| | WB | 20 | - | | | - | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 | 0 | 10 | | | 50 |
| GO Rail - Express | EB | 0 | - | | | - | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 |
| | WB | 20 | - | - | | - | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 | 0 | 10 | | | 50 |
| Bathurst Streetcar | NB/EB | 0 | - | 0 | 0 | 0 | 0 | | - | - | - | - | - | | - | - | | - | - | - | - | | | 0 |
| | SB/WB | 0 | - | 0 | 0 | 0 | 0 | | | | - | | - | | | - | | | | | - | | | 0 |
| larbourfront Streetcar | EB | 10 | - | 0 | 10 | 0 | 10 | - | | - | - | | | | - | - | - | - | | | - | | | 30 |
| | WB | 0 | - | 0 | 20 | 0 | 20 | | | | - | | - | | | - | | | | | - | | | 40 |
| ufferin Bus | SB/EB | 50 | - | 0 | 60 | 0 | 50 | | | | - | | - | | | - | | | | | - | | | 160 |
| | NB/WB | 0 | - | 0 | 10 | 0 | 0 | - | | - | - | | | | - | - | - | - | | | - | | | 10 |
| Ossington bus | SB | 100 | - | 0 | 140 | 0 | 100 | | | | - | | - | | | - | | | | | - | | | 341 |
| | NB | 0 | - | 0 | 0 | 0 | 0 | | | | - | | - | | | - | | | | | - | | | 0 |
| Other Local Transit | EB | 0 | - | 0 | 0 | 0 | 0 | - | | - | - | | | | - | - | - | - | | | - | | | 0 |
| | WB | 0 | - | 0 | 0 | 0 | 0 | - | | - | - | | | | - | - | | - | | | - | | | 0 |
| Valk-in from North | | 70 | - | 0 | 40 | 0 | 30 | | | | - | | - | | | - | | | | | - | | | 140 |
| /alk-in from LV | | 640 | - | 0 | 60 | 0 | 50 | - | | | - | | - | | | - | | | | | - | | | 750 |
| Valk-in from EP | | 13,890 | - | 20,470 | 2,950 | 0 | 2,170 | 190 | 0 | 120 | 2,400 | 20 | 1,840 | 0 | 760 | - | | | 2,800 | | | | | 47,6 |
| /alk-in from South | | 0 | - | 0 | 0 | 0 | 0 | - | - | | - | - | - | | - | - | | | - | - | - | | | 0 |
| | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| tal | | 14,910 | | 20,470 | 4,520 | 0 | 3,340 | 200 | 0 | 120 | 2,490 | 20 | 1,990 | 0 | 820 | 0 | 0 | 110 | 3,030 | 20 | 300 | 0 | 0 | 52,34 |

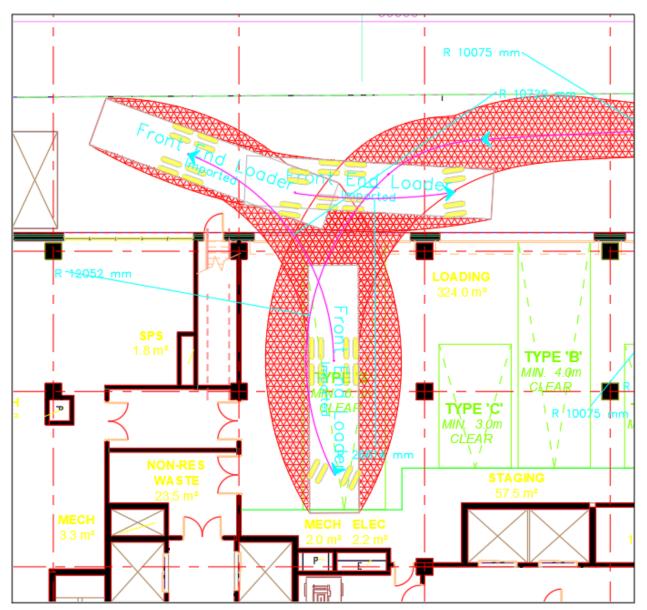


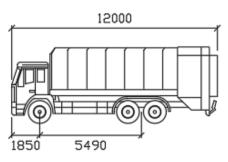
Appendix G: AutoTURN Turning Templates



Site A East Building Type G Loading Space

hdrinc.com





Front End Loader

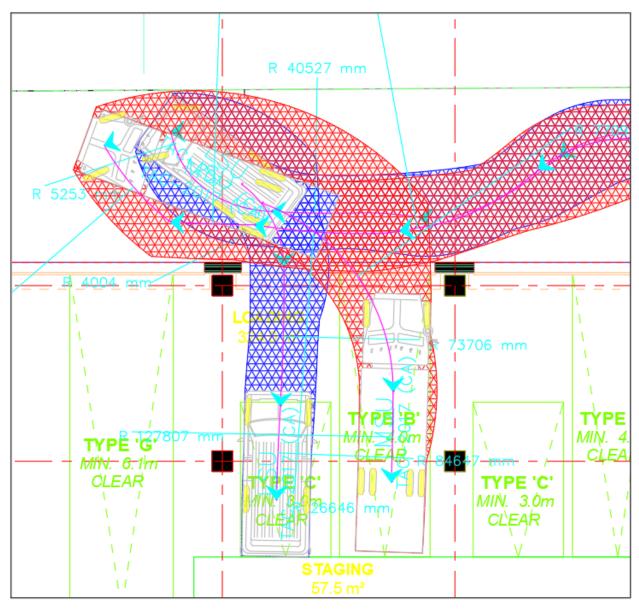
mm

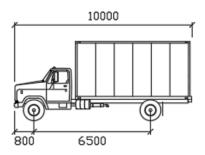
Width : 2400 Track : 2400 Lock to Lock Time 6.0 Steering Angle : 27.1

Not to scale

Site A West Building Type G Loading Space

hdrinc.com

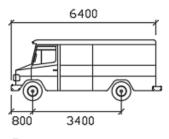




MSU

Width : 2600
Track : 2600
Lock to Lock Time 6.0
Steering Angle : 40.2

mm



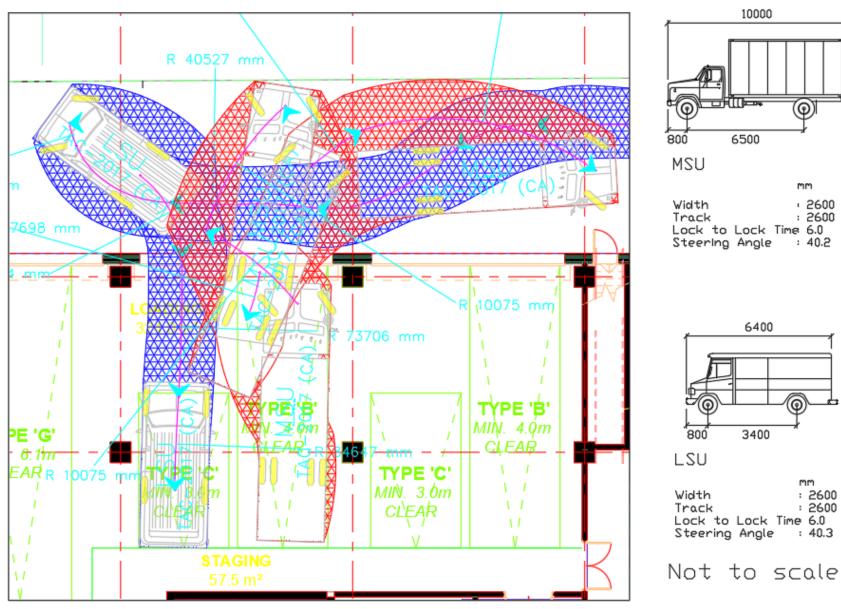
LSU

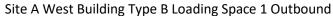
Width : 2600 Track : 2600 Lock to Lock Time 6.0 Steering Angle : 40.3

Not to scale

Site A West Building Type B Loading Space 1 Inbound

hdrinc.com





Use UPDATE/INSERT ADDRESS feature in ribbon hdrinc.com

10000

6500

6400

3400

¹800

(P)

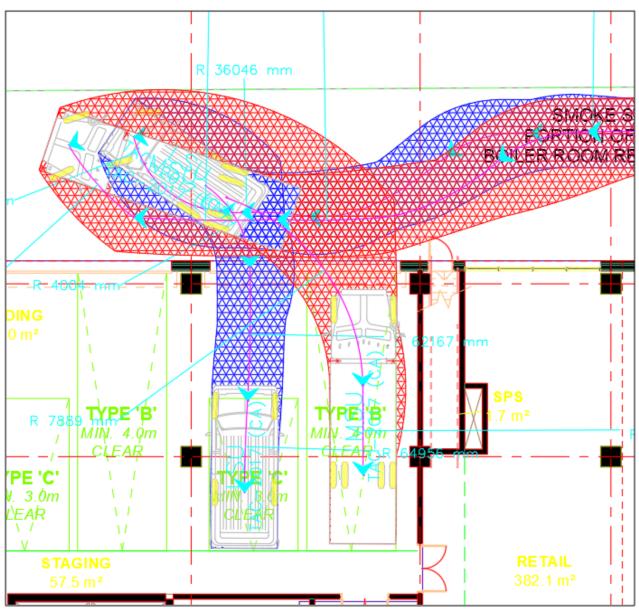
2600

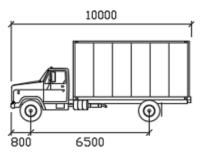
: 2600

: 40.2

: 2600 : 2600

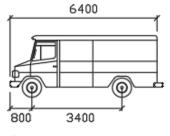
: 40.3





MSU

Width : 2600
Track : 2600
Lock to Lock Time 6.0
Steering Angle : 40.2



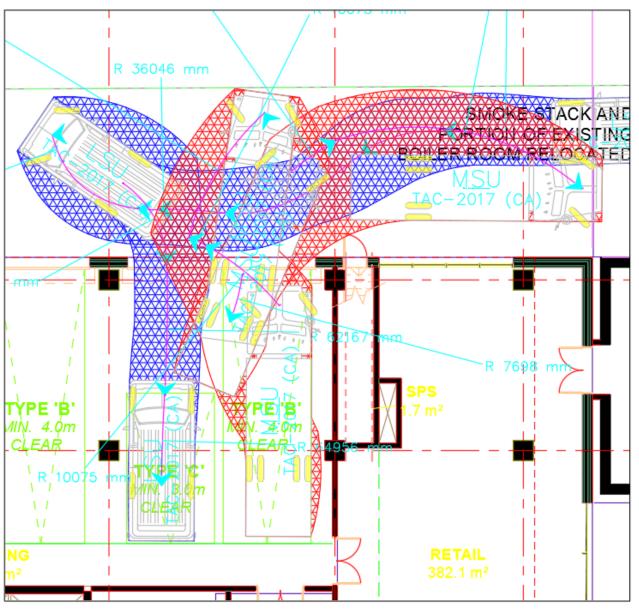
LSU

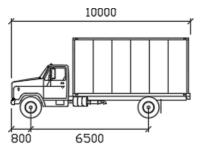
Width : 2600
Track : 2600
Lock to Lock Time 6.0
Steering Angle : 40.3

Not to scale

Site A West Building Type B Loading Space 2 Inbound

hdrinc.com

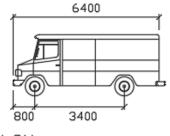




MSU

Width : 2600 Track : 2600 Lock to Lock Time 6.0 Steering Angle : 40.2

mm



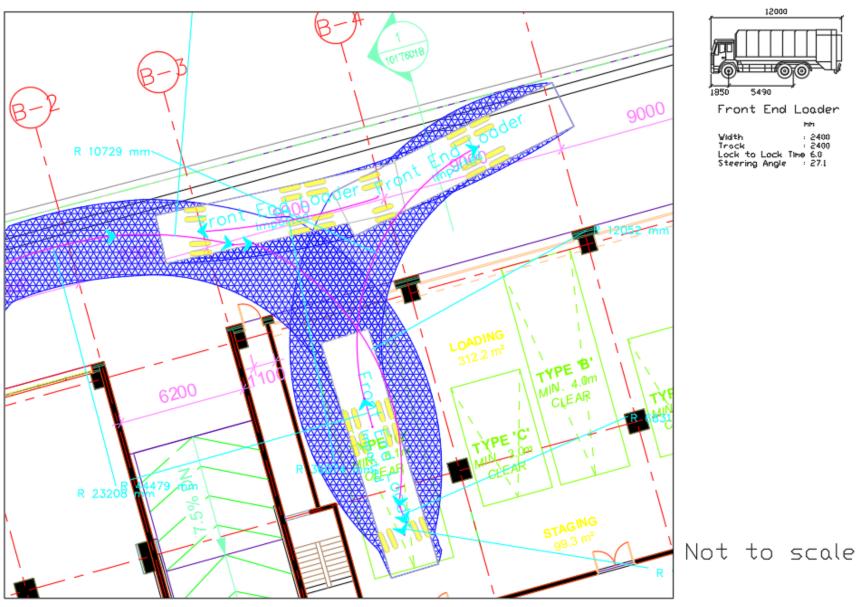
LSU

Width : 2600 Track : 2600 Lock to Lock Time 6.0 Steering Angle : 40.3

Not to scale

Site A West Building Type B Loading Space 2 Outbound

hdrinc.com



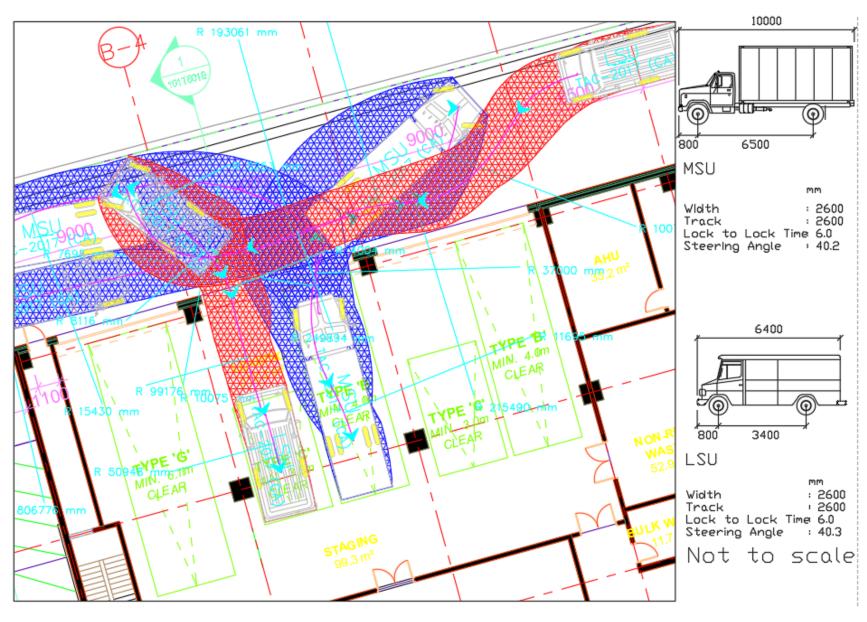
Site B Type G Loading Space

hdrinc.com

Use UPDATE/INSERT ADDRESS feature in ribbon

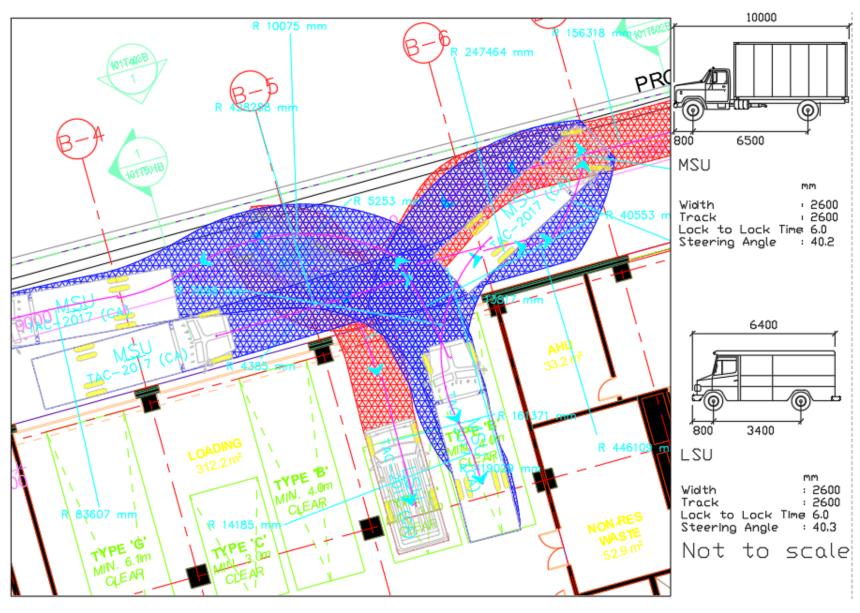
12000

5490



Site B Type B Loading Space 1

hdrinc.com Use UPDATE/INSERT ADDRESS feature in ribbon



Site B Type B Loading Space 2

hdrinc.com Use UPDATE/INSERT ADDRESS feature in ribbon