October 2018

10731854 Canada Inc.

788 March Road

TIA Strategy Report

PARSONS

788 March Road

Transportation Impact Assessment

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October 11, 2018

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PARSONS

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Table of Contents

List of Figures

List of Tables

List of Appendices

Transportation Impact Assessment

1. SCREENING FORM AND COMMENTS

The Screening Form is provided as Appendix A. The trip generation trigger was met based on the development's proposed number of residential units; the location trigger was met based on the development's driveway being located on a Spine Route and a future transit priority corridor; and the safety trigger was met based on the speed limit of the boundary roadway and the proposed site driveway's proximity to the March/Klondike signalized intersection. As triggers have been met, the Scoping Report has been prepared and is provided herein.

City Comments received to date have been addressed in this report, and are included in Appendix A.

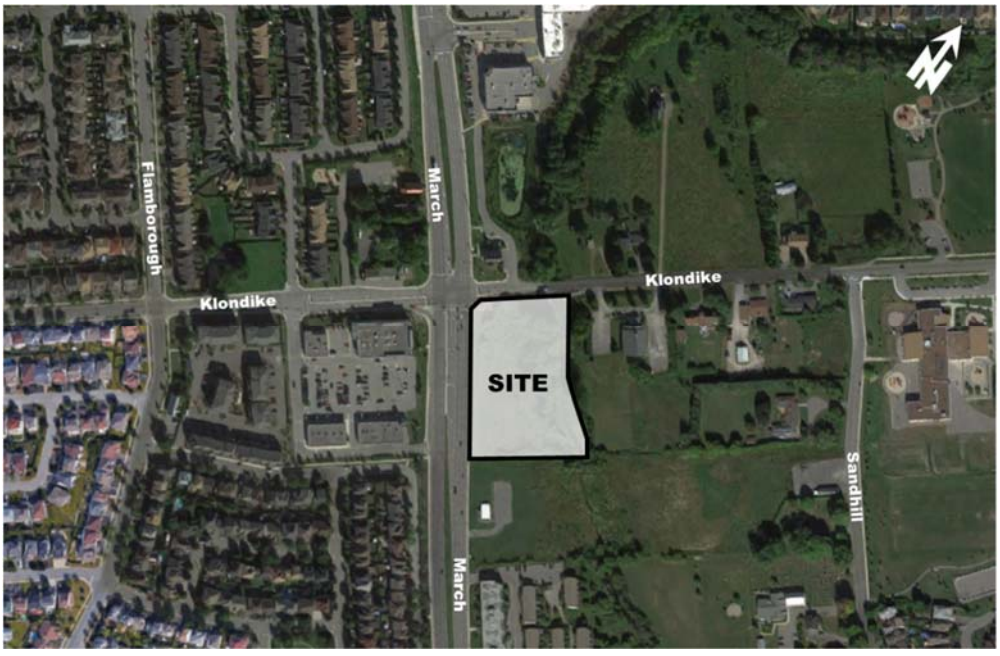
2. SCOPING REPORT

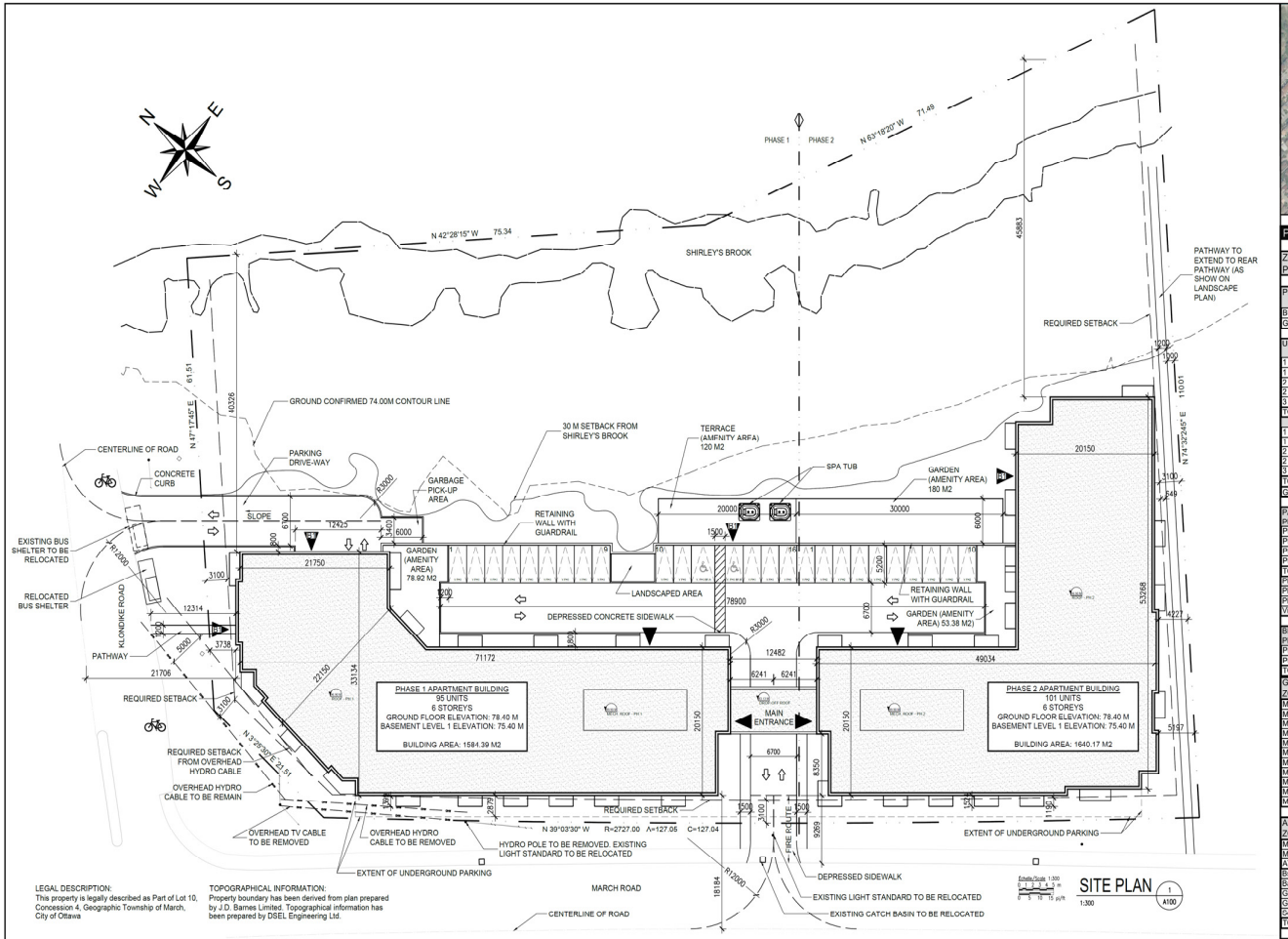
2.1. EXISTING AND PLANNED CONDITIONS

2.1.1. PROPOSED DEVELOPMENT

From the information provided, it is our understanding that the proponent is proposing to construct a residential development located at 788 March Road. The development will be constructed in two phases consisting of 95 residential units for the first phase and an additional 101 residential units for the second phase. The site is currently on vacant lands and zoned as General Mixed-Use (GM). As part of the pre-consultation process the developer removed the commercial aspect of the site from the Concept Plan, this reduced the need for as many parking spaces and reduced the site's traffic impact on the adjacent road network. The proposed number of parking spaces total approximately 270 spaces, with 244 spaces located underground for residents (accessed from Klondike Road) and 26 spaces available in a surface parking lot for visitors (accessed from March Road). The number of parking spaces is expected to be finalized through the SPA process. The local context of the site is provided as Figure 1 and the proposed Site Plan is provided as Figure 2.

Figure 1: Local Context





PROJECT INFORMATION 2018-07-19

Zoning	City of Ottawa zoning By-law No. 2008-250		
Property Area	12210.01 sq. m	131,429 sq. ft	

PROJECT STATISTICS	APARTMENT BUILDING PHASE 1 & PHASE 2
BUILDING HEIGHT (m)	20.35m
GROSS FLOOR AREA	16175,56m²

UNIT STATISTICS	APARTMENT BUILDING PHASE 1
1 Bedroom	24
1 Bedroom + Den	12
2 Bedroom	36
2 Bedroom + Den	17
3 Bedroom	6
TOTAL	95
	PHASE 2
1 Bedroom	24
1 Bedroom + Den	36
2 Bedroom	30
2 Bedroom + Den	5
3 Bedroom	6
TOTAL	101
GRAND TOTAL	196

PARKING PHASE 1 & 2	REQUIRED		PROVIDED
PHASE 1 - APARTMENT BUILDING - 95 UNITS	1.20	114	124
PHASE 1 - VISITORS	0.20	19	19
PHASE 2 - APARTMENT BUILDING - 101 UNITS	1.20	121	111
PHASE 2 - VISITORS	0.20	20	16
TOTAL	274		270
Phase 1 - Reduced parking stalls (Sec.106 up to 40%)	46		2
Phase 2 - Reduced parking stalls (Sec.106 up to 40%)	48		3
Phase 1 & Phase 2 - Accessible parking	7 (3 Type A + 4 Type B)		7
Visitor - Accessible parking	2 (1 Type A + 1 Type B)		2

BICYCLE PARKING PHASE 1 & 2	REQUIRED	PROVIDED
PHASE 1- APARTMENT BUILDING - 95 UNITS	0.50	48	48
PHASE 2 - APARTMENT BUILDING - 101 UNITS	0.50	51	51
TOTAL	99		99

GENERAL MIXED USE ZONE - GM ZONE PROVISION	REQUIRED	PROVIDED
MINIMUM LOT AREA	NO MINIMUM	12210.01m²
MINIMUM LOT WIDTH	NO MINIMUM	146.88m
MIN. FRONT YARD AND CORNER YARD SETBACK	3m	3.10m
MINIMUM INTERIOR SIDE YARD SETBACK	3m	3.10m
MINIMUM REAR YARD SETBACK	7.5m	40.33m
MAXIMUM BUILDING HEIGHT	18m	20.35m
MAXIMUM FLOOR SPACE INDEX	2	1.33
MINIMUM WIDTH OF LANSCAPE AREA	3m	3.10m
MINIMUM WIDTH OF DRIVE AISLE FOR PARKING LOT	6.7m	6.7m
MIN. WIDTH OF DRIVE AISLE FOR PARKING GARAGE	6.0m	6.0m
MAXIMUM PERMITED PROJECTIONS	2.0m	1.4m

AMENITY AREA ZONING BY-LAW SECTION 137	REQUIRED	PROVIDED
MIN. FOR APARTMMENT DWELLING: 6m² / UNIT	1176m²	1728.49m²
MINIMUM 50% COMMUNAL	588m²	598.85m²
AT LEAST ONE AREA > 54m²	54m²	166.55m²
Basement 1: Resident lounge	-	166.55m²
Basement 1: Exterior terrace + garden	-	300m²
Ground floor: Balconies	-	179.39m²
Ground floor: Resident gardens	-	132.3m²
Second to sixth floor: Balconies	-	850.22m²
TOTAL	1176m²	1728.49m²

WASTE MANAGEMENT PHASE 1 - 95 UNITS	REQUIRED	PROVIDED
GARBAGE - LOOSE	0.11/ UNIT	10.45y³	2- 6y³ CONT.
RECYCLING - FEL GLASS METAL PLASTIC	0.018/ UNIT	1.71y³	1- 2y³ CONT.
RECYCLING - FEL FIBER	0.038/ UNIT	3.61y³	1- 4y³ CONT.
ORGANICS	240/ 60 UNIT	1.0L	2 240 L
PHASE 2 - 101 UNITS	REQUIRED	PROVIDED
GARBAGE - LOOSE	0.11/ UNIT	11.11y³	2- 6y³ CONT.
RECYCLING - FEL GLASS METAL PLASTIC	0.018/ UNIT	1.819y³	1- 2y³ CONT.
RECYCLING - FEL FIBER	0.038/ UNIT	3.838y³	1- 4y³ CONT.
ORGANICS	240/ 50 UNIT	2.02L	3- 240L

SIGNS:

SIGNS SHALL BE PROVIDED FOR ALL VISITOR PARKINGS, BARRIER FREE PARKINGS & FIRE ROUTES
ALL THE SIGNS SHALL FOLLOW THE SPECIFICATIONS OF THE CITY OF OTTAWA

THE PARKING SIGNS WILL BE LABELED AS: "VISITOR ONLY" "RESIDENT ONLY" "ACCESSIBLE PARKING" AND REINFORCED: " UNATHORIZED VEHICLES TOWED AWAY"

GENERAL NOTE:
WHEN RETAINING WALLS ARE GREATER THAN 1 METER IN HEIGHT THE DESIGN WILL BE DONE BY A STRUCTURAL ENGINEER
SNOW STORAGE NOT PROVIDED ON SITE. SNOW WILL BE REMOVED FROM SITE

LEGEND

- PROPERTY LINE
- EXISTING OVERHEAD CABLES
- BUILDING AREA
- BUILDING ENTRANCE / EXIT (GROUND FLOOR)
- BUILDING EXIT (BASEMENT LEVEL 1)
- TRAFFIC DIRECTION
- EXISTING CYCLE PATH
- BICYCLE PARKING
- CAR PARKING R: RESIDENTIAL (WITH PHASES) V: VISITOR
- BARRIER FREE PARKING (TYPE B) R: RESIDENTIAL (WITH PHASES) V: VISITOR
- BARRIER FREE PARKING (TYPE A) R: RESIDENTIAL (WITH PHASES) V: VISITOR

NOTES GENERALES General Notes

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MÉCANIQUE Mechanic

STRUCTURE Structure

SCEAU Seal

NEUF
ARCHITECT(E)S

CLIENT Client
10731854 CANADA INC.

OUVRAGE Project
788 MARCH ROAD

EMPLACEMENT Location
OTTAWA

NO PROJET No.
11 802

NO	RÉVISION	DATE (aa.mm.jj)
1	ISSUED FOR PRELIMINARY	2018-06-18
2	ISSUED FOR COORDINATION	2018-06-22
3	ISSUED FOR COORDINATION	2018-07-06
4	ISSUED FOR COORDINATION	2018-07-19
5	ISSUED FOR COORDINATION	2018-07-30

Preliminary DO NOT USE FOR CONSTRUCTION

DESSINÉ PAR Drawn by
M.S. / E.C.

VÉRIFIÉ PAR Checked by
A.C.

DATE (aa.mm.jj)
18.07.30

ÉCHELLE Scale
AS SHOWN

TITRE DU DESSIN Drawing Title
SITE PLAN

RÉVISION Revision

NO. DESSIN Dwg Number
A100

PARSONS

Figure 2: Proposed Site Plan

2.1.2. EXISTING CONDITIONS

Area Road Network

March Road is a City-owned north-south arterial roadway with a six-lane divided cross-section within the study area. It extends from Eagleson Road in the south to Dunrobin Road in the north, where it continues west to Mississippi Mills. The posted speed limit is 80 km/h with auxiliary turn lanes provided at major intersections.

Klondike Road is a City-owned east-west collector roadway with a 2-lane undivided cross-section (4-lane divided cross-section between March Road and Weatherston Street, west of the study area). The posted speed on 50 km/h and auxiliary turn lanes are provided at major intersections. Approximately 75 m east of March Road, a bridge is provided along Klondike Road over an existing creek (Shirley's Brook). A bi-directional, at-grade multi-use path (MUP) was recently constructed along the south side of Klondike Road between March Road and Sandhill Road, as shown in Figure 3.

Figure 3: Klondike Road Bicycle Facilities

Pedestrian/Cycling Network

Sidewalk facilities within the vicinity of the site are provided along both sides of March Road and no sidewalk facilities are provided along Klondike Road. The MUP, located along the south side of Klondike Road provides walking facilities for pedestrians. With respect to cycling, there are painted bike lanes along both sides of March Road and Klondike Road is noted as a 'suggested route'. A recently constructed MUP exists along Klondike Road between Sandhill Road and March Road. The City's Cycling Plan identifies March Road as a Spine Route and Klondike Road as a Local Route. A major pathway is planned along Shirley's Brook.

With regard to pedestrian volumes, according to the most recent traffic count data, approximately 5 to 15 pedestrians per hour were observed at the March/Klondike intersection during the morning and afternoon peak hours. During mid-day, there were higher pedestrian volumes, ranging from 20 to 30 pedestrians per hour at the March/Klondike intersection.

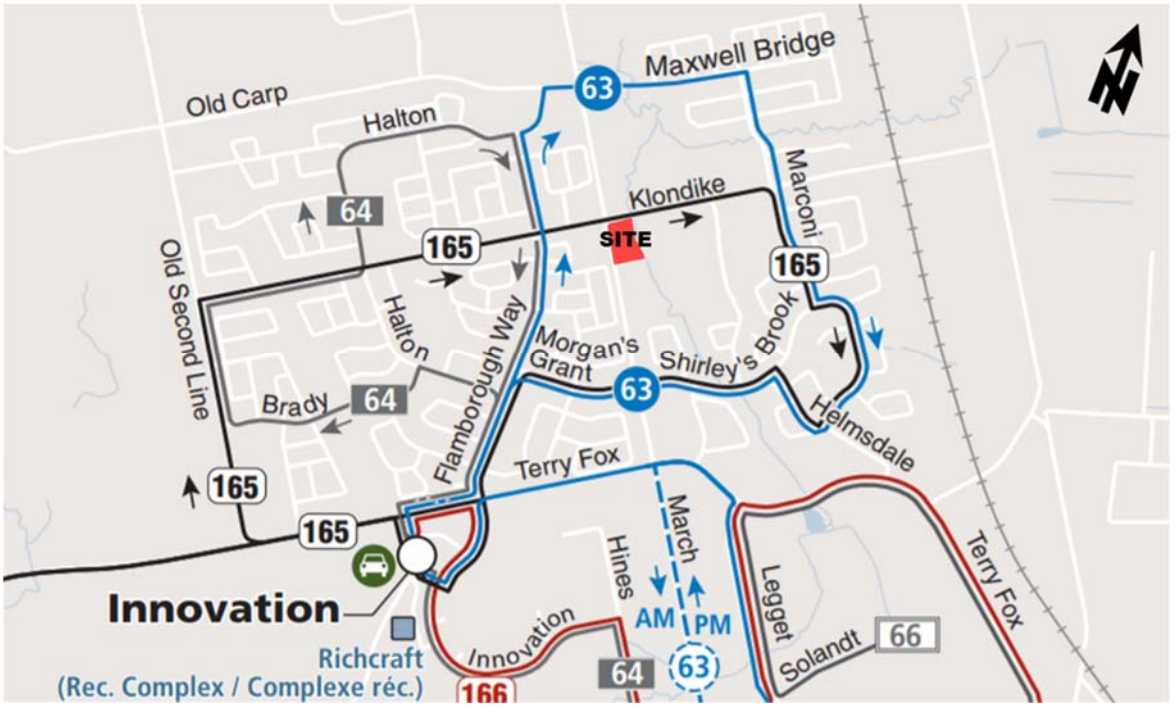
Cycling volumes along March Road range between 0 to 5 cyclists per hour in the northbound and southbound directions throughout the day. Along Klondike Road, 2 to 8 cyclists per hour were observed in the eastbound and westbound directions (August 2016).

Transit Network

Transit service within the vicinity of the site is currently provided by OC Transpo Local Route #165 (eastbound direction only) and two school routes. The eastbound bus stop for Route #165 is located along Klondike Road approximately 30 m from March Road. At this location, Route #165 provides morning (9AM to 2PM) and evening (7PM to 10PM) service every

hour in the eastbound direction only. A recently constructed bus shelter is provided, located adjacent to the site's planned Klondike Road driveway access, as shown in Figure 3 above.

Figure 4: Area Transit Network

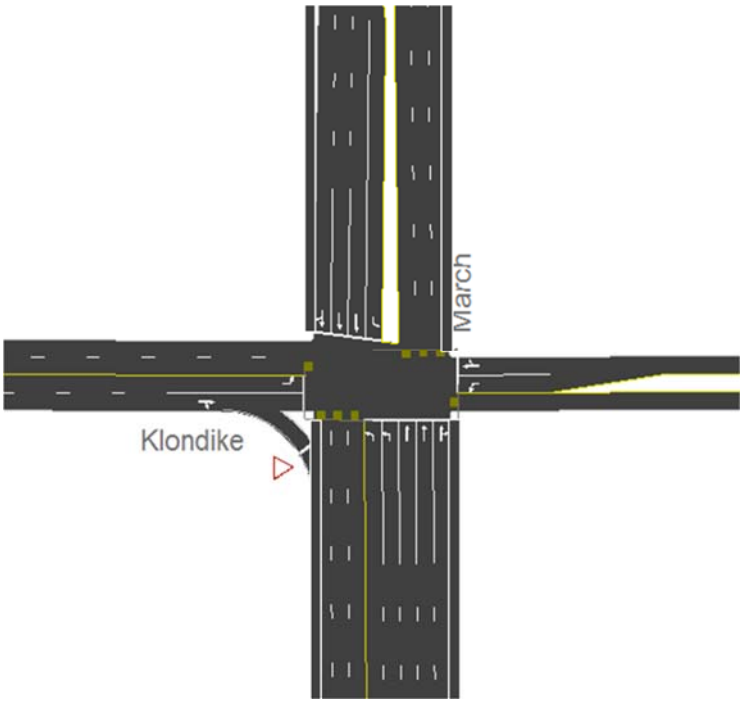


Source: OC Transpo System Map

Existing Study Area Intersection

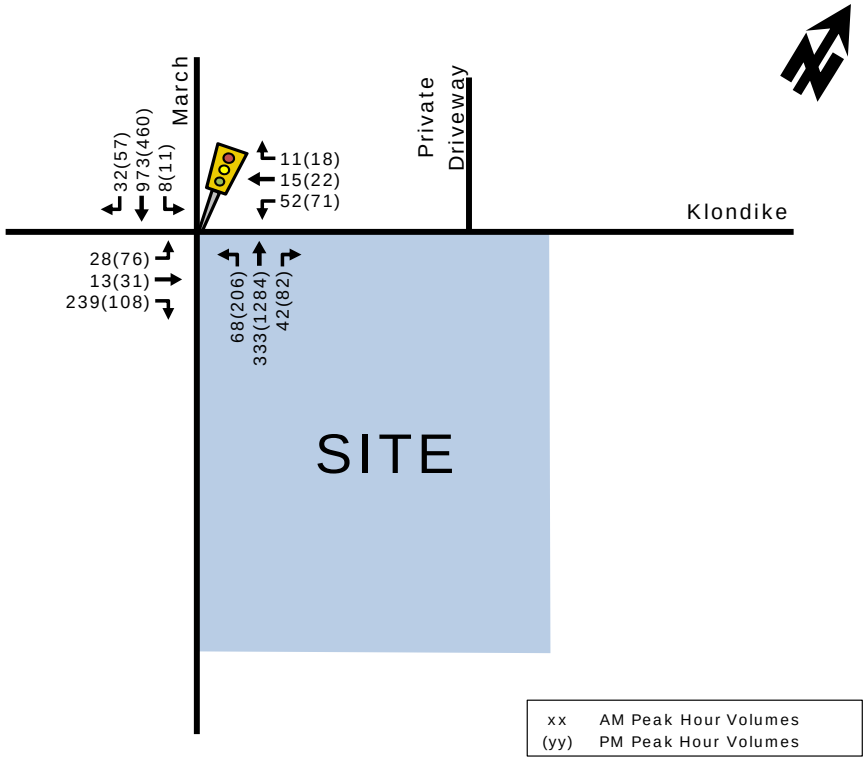
March/Klondike

The March/Klondike intersection is a signalized four-legged intersection. The northbound approach consists of dual left-turn lanes, two through lanes and a shared through/right-turn lane. The southbound approach consists of a single left-turn lane, two through lanes and a shared through/right-turn lane. North and southbound bicycle lanes are provided along both sides of March Road. The westbound approach consists of a single left-turn lane and a shared through/right-turn lane. The eastbound approach consists of a single left-turn lane and a shared through/channelized right-turn lane. All movements are permitted at this location.



Illustrated as Figure 5, are the most recent weekday morning and afternoon peak hour traffic volumes obtained from the City of Ottawa at the March/Klondike intersection. These peak hour traffic volumes are included as Appendix B.

Figure 5: Existing Peak Hour Traffic Volumes



Existing Road Safety Conditions

Collision history for the Klondike/March intersection, mid-block on March Road between Klondike and Morgan's Grant Way, and along Klondike Road between March and Sandhill (2012 to 2016, inclusive) was obtained from the City of Ottawa. Most collisions (77%) involved only property damage, indicating low impact speeds, and 23% involved personal injuries. The primary causes of collisions cited by police include; rear end (57%), turning movement (14%), and angle (14%) type collisions.

A standard unit of measure for assessing collisions at an intersection is based on the number collisions per million entering vehicles (MEV). At the March/Klondike intersection, there were a total of 31 collisions in a 5-year period, which equates to a rate of 0.70/MEV.

It is noteworthy that within the 5-years of recorded collision data there were no collisions that involved pedestrians or cyclists. The source collision data as provided by the City of Ottawa and related analysis is provided as Appendix C.

Adjacent Driveways

Along Klondike Road there is a private driveway that provides direct access to March House Spa, located in the northeast quadrant of the March/Klondike intersection. This driveway extends further north providing indirect access to a RioCan retail development via a private roadway. Along the south side of Klondike Road, there are two driveways serving Brookside Baptist Church and two driveways serving Greenwoods Academy School. These are located approximately 75 to 200 m east of the proposed driveway location.

Along the east side of March Road, there is a right-in/right-out driveway to a residential development located approximately 150 m south of the proposed right-in/right-out driveway for the subject site.

Area Traffic Management

No area traffic management is provided in the immediate study area adjacent to the site. The recently constructed MUP along Klondike Road provides a narrowing along Klondike Road, which is a type of traffic management.

2.1.3. PLANNED CONDITIONS

Planned Study Area Transportation Network Changes

Transit

The Affordable Network and Network Concept plans identify the Kanata North Transitway as a Bus Rapid Transit (BRT) project to be completed by 2031. The Affordable Network illustrates at-grade BRT along March Road between Solandt Road and Corkstown Road (just north of Hwy 417) and transit priority (isolated measures) along March Road between Solandt Road and Maxwell Bridge Road. The Network Concept illustrates at-grade BRT along March Road continuing from HWY 417 to Maxwell Bridge Road. A park-and-ride is also planned approximately 1 km north of Maxwell Bridge Road. The extension will provide transit access to major employment areas in Kanata North along March Road. The following Figure 5 illustrates the planned BRT and park-and-ride.

Figure 6: Planned BRT and Park-and-Ride in Kanata North – 2031 Affordable Concept

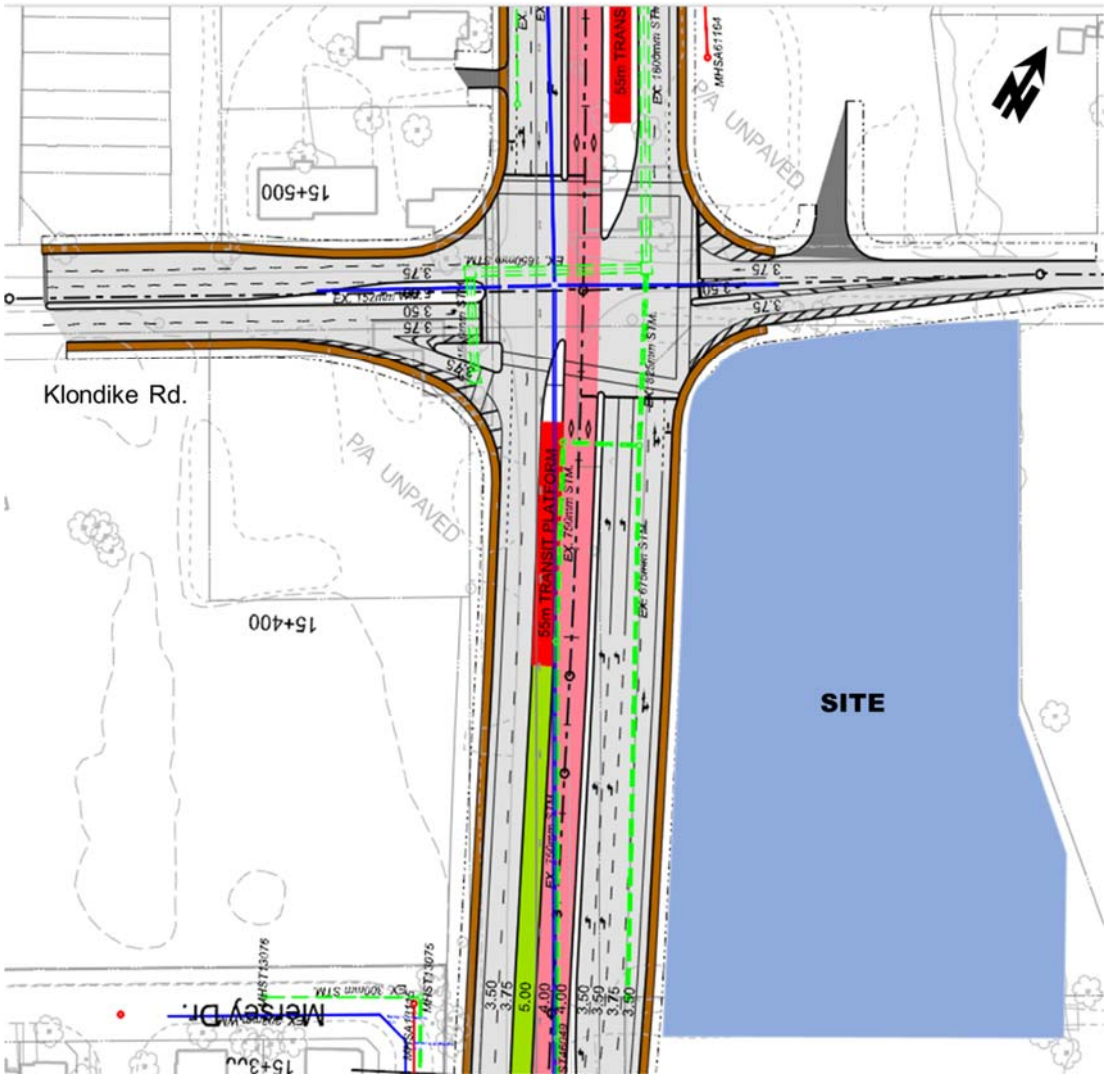
Source: Transportation Master Plan 2013, Map 5

The EA for the March Road Transitway was completed in 2012 and shows median bus lanes along March Road between HWY 417 to Maxwell Bridge Road. A transit station is planned at the March/Klondike intersection. The following Figure 7 shows the functional design from the EA study within the site's study area.

Road Network

The 2031 Network Concept identifies March Road to be widened from 2 to 4 lanes between Maxwell Bridge Road and Dunrobin Road. However, this is not identified in the 2031 Affordable Network.

Figure 7: Functional Design – March Road Transitway



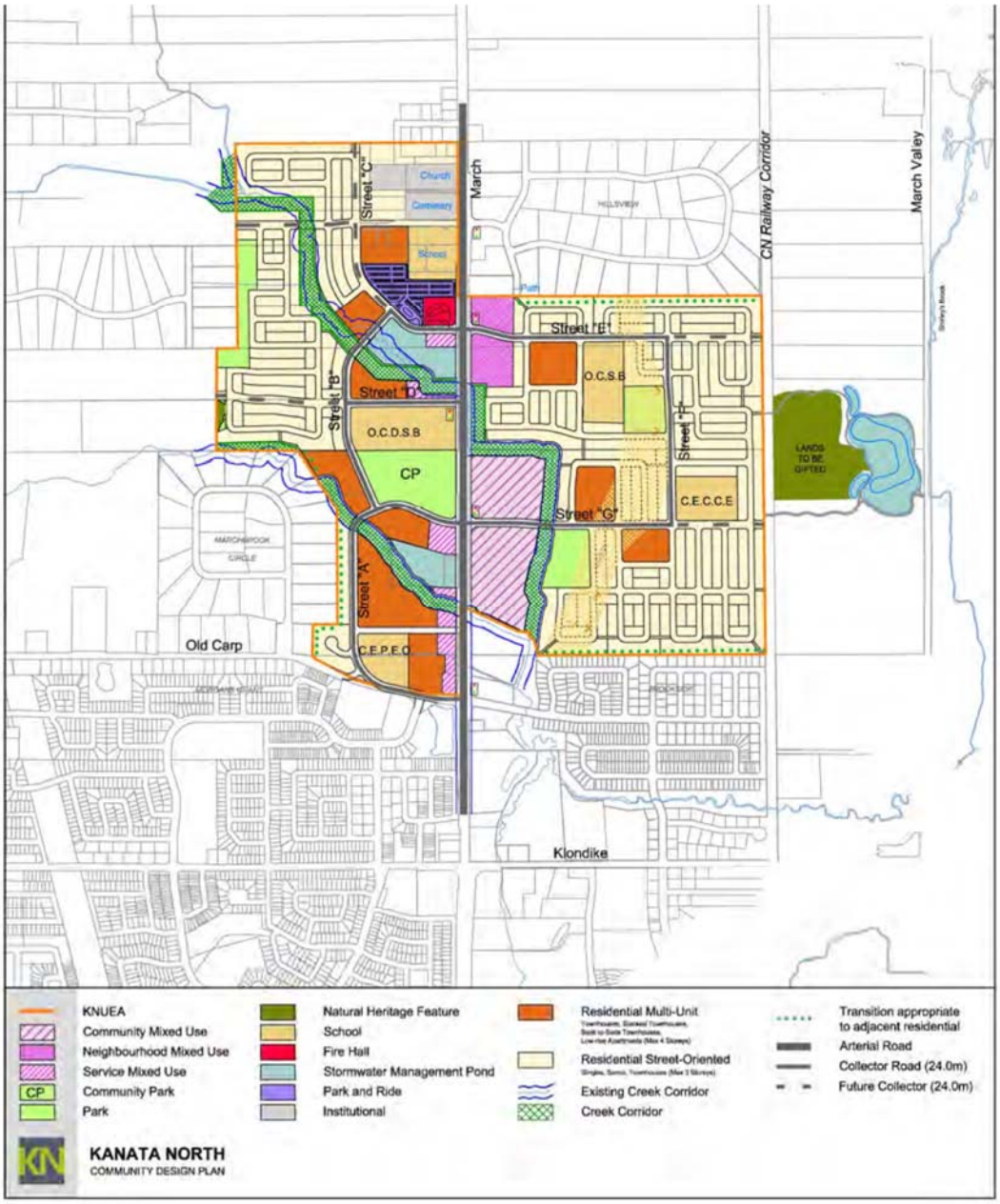
Other Area Development

With respect to other area development, the following development applications have been submitted to the City of Ottawa in the vicinity of the proposed site:

351 Sandhill Road
The Kanata Muslim Association is proposing to develop a place of worship at the above noted address, which is located east of the subject development. The Transportation Impact Assessment (prepared by D. J. Halpenny and Associates) projected an increase in vehicle traffic of approximately 133 veh/h during the place of worship's peak hour, which is Friday afternoon before and after service is held.

Kanata North Urban Expansion
Outlined in the Kanata North Transportation Master Plan (prepared by Novatech), approximately 400,000 ft^2 of commercial land use, 1,950 single family homes/townhomes, 1,090 multi-unit residential units, four schools, and a park-and-ride facility with 500 spaces are being proposed along March Road, north of Maxwell Bridge Road. The Master Plan projects an increase in vehicle traffic of approximately 3,500 and 4,000 veh/h during the morning and afternoon peak hours, respectively. The Kanata North Urban Expansion Demonstration Plan is provided as Figure 8.

Figure 8: Kanata North Urban Expansion Demonstration Plan



Source: Kanata North CDP: Transportation Master Plan, 2016

2.2. STUDY AREA AND TIME PERIODS

The proposed study area is outlined below and highlighted in Figure 9.

- March/Klondike intersection;
- Klondike Road – adjacent to the site; and
- March Road – adjacent to the site.

Figure 9: Study Area

Time Periods

As the proposed land use is residential, the time periods to be assessed are the weekday morning and afternoon commuter peak hours.

Horizon Years

The expected build out date for the proposed Phase 1 development is assumed to be 2021 and year 2023 for Phase 2. Depending on the growth rate of the study area, the horizon year 2028 will be assessed for 5-years beyond site build out.

2.3. EXEMPTION REVIEW

Based on the City's TIA guidelines and the subject site, the following sections of the TIA process will be exempt, unless otherwise directed.

Module	Element	Exemption Consideration
4.1 Development Design	4.1.3 New Street Networks	Not required for applications involving site plans.
4.2 Parking	4.2.2 Spillover Parking	The site's residential parking space rate meets the City's By-Law requirement. The visitor parking supply is deficient by 4 spaces.
4.6 Neighbourhood Traffic Management	All elements	Access is provided along an arterial roadway.
4.8 Review of Network Concept	All elements	This development is not expected to generate 200 person-trips more than the permitted zoning for the site.

3. FORECASTING REPORT

3.1. DEVELOPMENT-GENERATED TRAVEL DEMAND

3.1.1. TRIP GENERATION AND MODE SHARES

Appropriate trip generation rates for the proposed development consisting of approximately 196 mid/high-rise condominiums were obtained from the City's 2009 TRANS Trip Generation – Residential Trip Rates Report. These rates are summarized in Table 1.

Table 1: 2009 TRANS Residential Trip Generation Rates

Land Use	ITE Land Use Code	Trip Rates	
		AM Peak	PM Peak
High-Rise Condominiums	ITE 232	T = 0.46(du)	T = 0.46(du)

Notes: T = Average Vehicle Trip Ends
du = Dwelling units

Phase 1

Using the TRANS Trip Generation rates, the total amount of vehicle trips generated by the proposed Phase 1 residential development (89 units) was calculated. The results are summarized in Table 2.

Table 2: Projected Site Vehicle Trip Generation – Phase 1

Land Use	Area	AM Peak (Veh/h)			PM Peak (Veh/h)		
		In	Out	Total	In	Out	Total
High-Rise Condominiums	95 units	12	32	44	25	19	44

As shown in Table 2, a total of 45 veh/h are projected to travel to/from the proposed development during the weekday morning and afternoon commuter peak hours. Using the TRANS auto trips projected in Table 2, the total person trips projected to travel to/from the proposed development can be calculated. The mode share percentages outlined in the TRANS Trip Generation Report (Table 3.13), show a 34% to 33% transit modal splits for suburban areas for apartment units. Given the existing transit network in the area, this high transit modal split is not likely to be realized until the March Road rapid transit corridor is constructed. Similarly, the OD Survey for Kanata/Stittsville Area shows 21% to 24% transit mode for trips from the district in the morning and to the district in the afternoon (representing the direction of travel for residential trips). The percentage of transit trips over the 24-hour period ranges between 3% to 13% for the Kanata/Stittsville Area. As such, for Phase 1 and Phase 2 build-out years, a transit mode share of 10% was applied given the existing transit service within the study area and given the OD Survey's 24-hour results for Kanata/Stittsville Area. The future modal splits will be adjusted given the planned March Road rapid transit corridor, which is developed herein.

With regard to pedestrian and cycling modes, the TRANS Trip Generation Report provides a 9% to 13% mode splits for active modes. The OD Survey shows 0% for bike/walk for trips to/from the Kanata/Stittsville Area and approximately 15% to 20% for bike/walk trips within the district. As such, the active mode split is assumed to be 10% for the purposes of this analysis.

The resultant 80% of site-generated trips are vehicle related. Given the OD Survey for the area, auto passengers are noted to be approximately 15% of trips. As such, the driver modal split selected for the development is 65% as shown in the following Table 3, which provides a break down of all person trips projected to travel to/from the proposed development during the weekday morning and afternoon peak hours.

Table 3: Projected Site Person Trip Generation – Phase 1

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	65%	12	32	44	25	19	44
Auto Passenger	15%	3	8	11	6	5	11
Transit	10%	2	4	6	4	3	7
Non-motorized	10%	2	5	7	3	3	6
Total Person Trips	**100%**	**19**	**49**	**68**	**38**	**30**	**68**

As shown in Table 3, based on the TRANS Trip Generation method, the proposed Phase 1 site is projected to generate approximately 68 person-trips per hour during the weekday commuter peak hours. The increase in two-way transit and bike/walk trips is estimated to be approximately 6 to 7 persons per hour.

Phase 2

Phase 2 of the development consists of approximately 101 additional residential units. Following the same method as outlined above, the total projected person trip generation for the entire Phase 1 and 2 of the development, consisting of 195 units is summarized in Table 4.

Table 4: Projected Site Person Trip Generation – Phase 1 and 2

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	65%	25	65	90	52	38	90
Auto Passenger	15%	5	16	21	12	9	21
Transit	10%	4	9	13	8	6	14
Non-motorized	10%	4	10	14	7	6	13
Total Person Trips	**100%**	**38**	**100**	**138**	**79**	**59**	**138**

As shown in Table 4, the projected number of new vehicle trips travelling to/from the proposed Phase 1 and 2 developments is 90 veh/h during both the weekday morning and afternoon peak hour. The increase in transit and bike/walk trips is projected to be 13 to 14 additional trips during peak hours.

Mode Shares

The existing mode shares outlined in Tables 3 and 4 were obtained from a combination of the TRANS Trip Generation Report, the OD Survey and an assessment of the existing transit and ped/bike facilities in the surrounding area.

For the Horizon Year 2028, which represents five-years beyond full-build out, the following future mode share are forecasted. These mode shares reflect the construction of March Road transit priority adjacent to the subject site.

Table 5: Future Mode Share Targets for the Development

Travel Mode	Mode Share Target	Rationale
Transit	25%	Development is located adjacent to March Road, which is schedule to have transit priority lanes by 2031.
Walking	10%	As the Kanata North area is built-out, bike/walk modes are likely to increase slightly due to the construction of more active mode facilities and closer destinations (i.e. schools, places of employment etc.).
Biking	5%	
Auto Passenger	10%	As the area is developed and active mode and transit infrastructure is further developed, the driver/passenger mode shares are expected to decrease.
Auto Driver	50%	

Based on the future mode share targets for this development, the projected site-generated person trips are outlined in Table 6.

Table 6: Future Projected 2028 Site-Generated Person Trips

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	50%	19	50	69	40	29	69
Auto Passenger	10%	4	9	13	7	6	13
Transit	25%	9	26	35	20	15	35
Non-motorized	15%	5	16	21	12	9	21
Total Person Trips	**100%**	**37**	**101**	**138**	**79**	**59**	**138**

The future 2028 site-generated vehicle trips travelling to/from the proposed development are projected to be approximately 70 veh/h during both the weekday morning and afternoon peak hours.

3.1.2. TRIP DISTRIBUTION

Based on the existing traffic volume counts and the location of adjacent arterial roadways and neighbourhoods, the distribution of site-generated traffic volumes is as follows:

- 75% to/from the south;
- 10% to/from the west;
- 10% to/from the east; and
- 5% to/from the north.

3.1.3. TRIP ASSIGNMENT

A full movement driveway connection to Klondike Road is proposed to serve the subject development's underground parking garage and a right-in/right-out driveway is proposed to March Road to serve the visitor surface level parking lot. Given these proposed driveways, 'new' site-generated vehicle trips for Phase 1 are assigned to the study area network and illustrated as Figure 10. Phase 1 and 2 'new' site-generated vehicle trips are illustrated as Figure 19 and the 5-years beyond site-build out (increased transit ridership therefore fewer vehicle trips) vehicle trips are shown in Figure 12.

Figure 10: 'New' Phase 1 Site-Generated Traffic

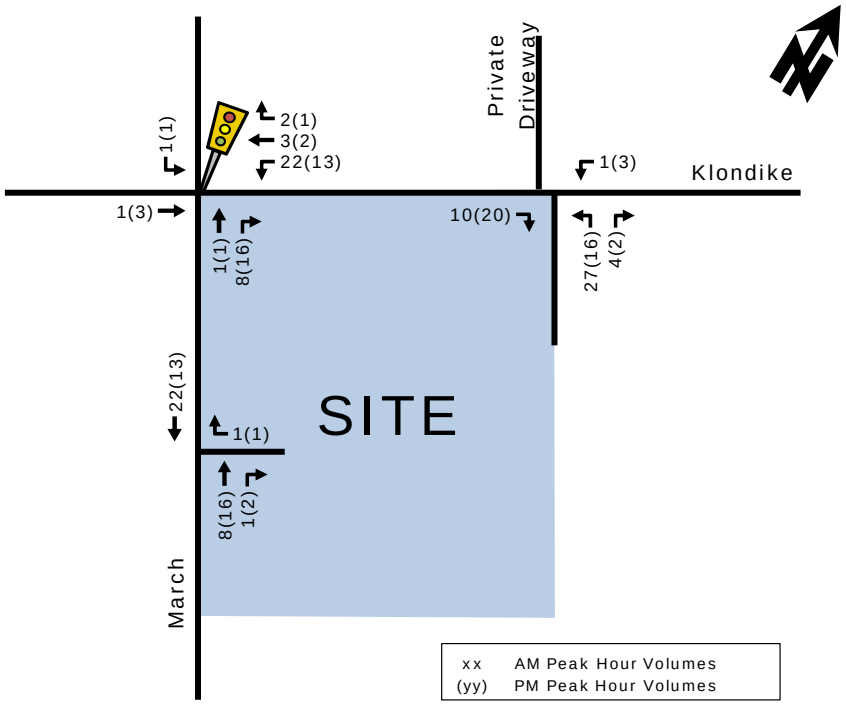


Figure 11: 'New' Phase 1 and 2 Site-Generated Traffic

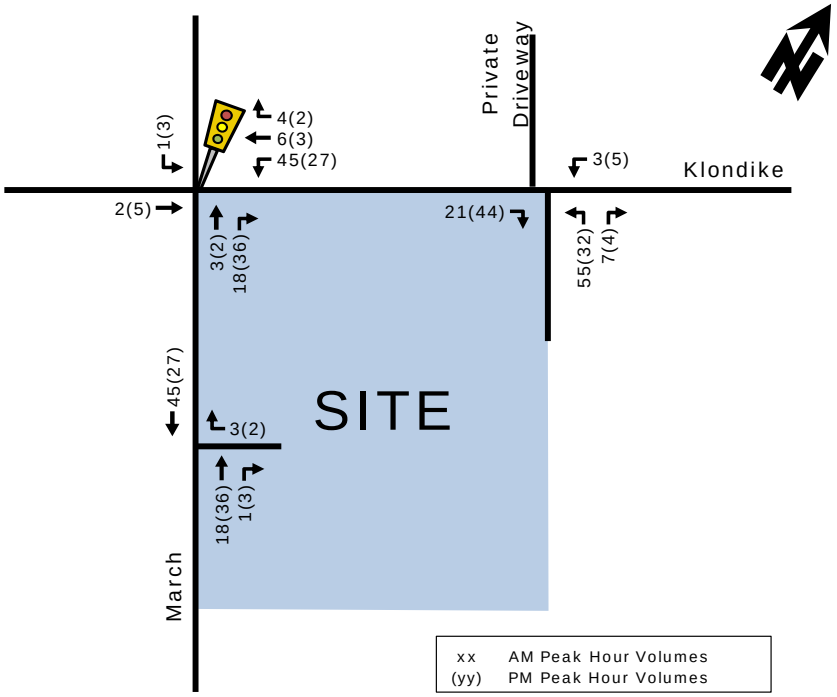
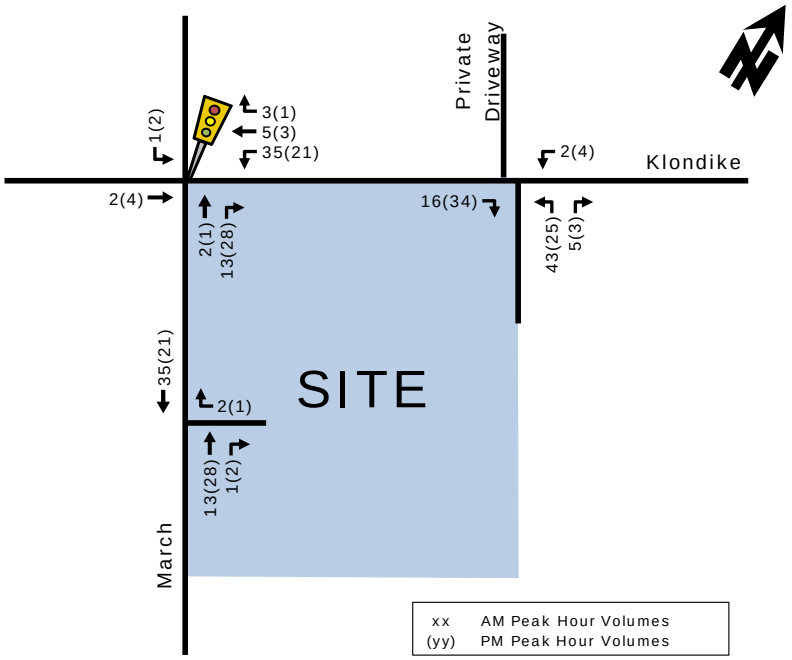


Figure 12: 'New' Phase 1 and 2 Site-Generated Traffic – 5-Years Beyond Site Build-Out (2028)



3.2. BACKGROUND NETWORK TRAVEL DEMANDS

3.2.1. TRANSPORTATION NETWORK PLANS

Refer to section 2.1.3 Planned Conditions – Planned Study Area Transportation Network Changes.

3.2.2. BACKGROUND GROWTH

The following background traffic growth through along March Road (summarized in Table 7) was calculated based on historical traffic count data (years 2010, 2012 and 2016) provided by the City of Ottawa at the March/Terry Fox intersection. Detailed background traffic growth analysis is included as Appendix D.

Table 7: March/Terry Fox Historical Background Growth (2010 – 2016)

Time Period	Percent Annual Change	
	North Leg	South Leg
8 hrs	2.47%	1.20%
AM Peak	0.90%	1.34%
PM Peak	2.93%	2.10%

As shown in Table 7, March Road, at the Terry Fox/March intersection, has experienced approximately 1% to 3% annual growth within recent years during the weekday morning and afternoon peak hours and over an 8-hour count. To account for the historic and future increases in traffic volumes and to account for the traffic generated by the previously identified area developments, a 2% per annum growth factor was applied to existing traffic volumes along March Road to obtain background traffic volumes for the 2021 Phase 1 built-out horizon year, 2023 Phase 2 build-out horizon year, and horizon year 2028 (5-years beyond site build-out). The resultant 2021, 2023, and 2028 background traffic volumes are depicted as Figures 13, 14, and 15, respectively.

Figure 13: 2021 Background Traffic Volumes

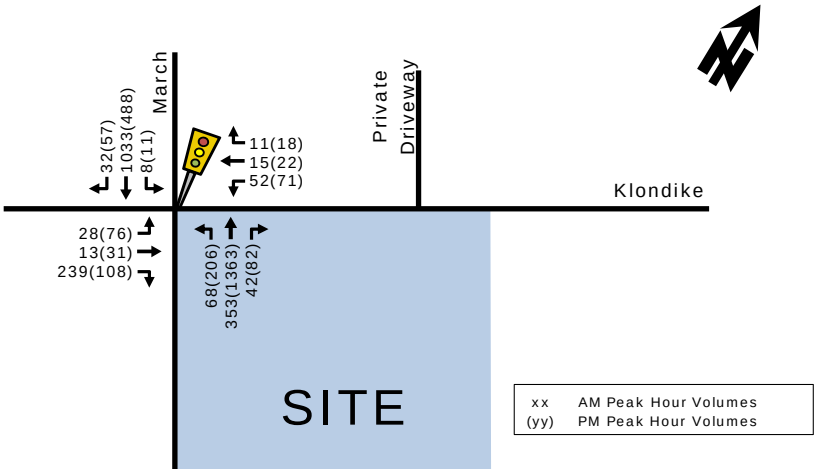


Figure 14: 2023 Background Traffic Volumes

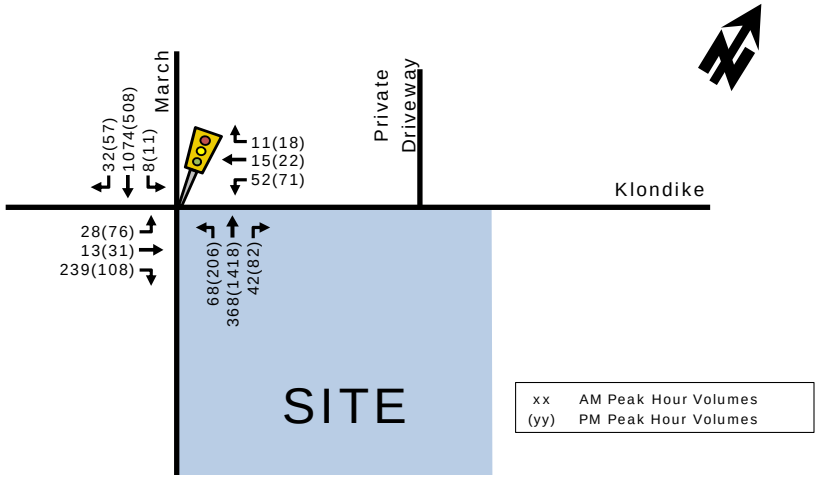
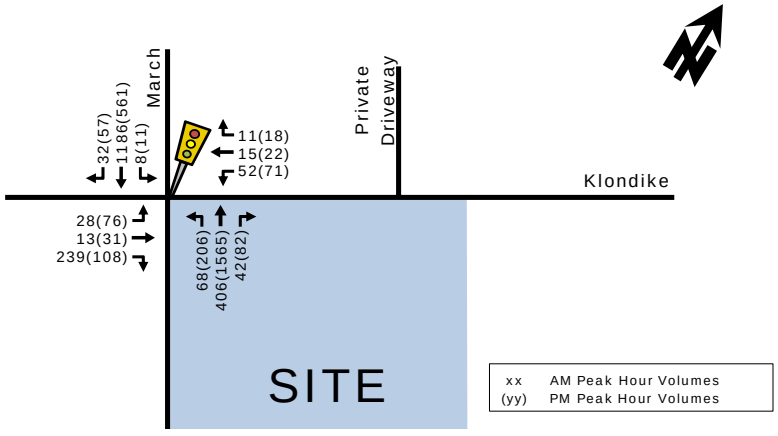


Figure 15: 2028 Background Traffic Volumes



3.2.3. OTHER DEVELOPMENTS

Refer to section 2.1.3 Planned Conditions – Other Area Developments.

4. STRATEGY REPORT

4.1. DEVELOPMENT DESIGN

4.1.1. DESIGN FOR SUSTAINABLE MODES

Vehicle and Bicycle Parking
A total of 270 parking spaces are proposed, of which 235 parking spaces are in a garage for residents and 35 parking spaces are at grade for visitors. With regard to bicycle parking, it is located within the underground parking structure and a total of 99 bicycle parking spaces are proposed. In addition, there are 88 storage units planned within the underground structure.

A pathway is proposed as part of this development along the eastern boundary of the site. The pathway, for pedestrians and cyclists, will connect to March Road, run along the rear side of the building and connect to Klondike Road.

Transit and Pedestrians
Transit service within the vicinity of the site is currently provided by OC Transpo Local Route #165 (eastbound direction only) and two school routes. The eastbound bus stop for Route #165 is located along Klondike Road approximately 30 m from March Road. At this location, Route #165 provides morning (9AM to 2PM) and evening (7PM to 10PM) service every hour in the eastbound direction only. The existing bus shelter is located at the site's proposed driveway connection to Klondike Road. As shown on the Site Plan (Figure 2), the proponent is proposing to relocate the existing bus shelter, approximately 15 m to the west, to accommodate the site's driveway. This bus shelter relocation is included in the attached RMA drawings.

Sidewalk facilities within the vicinity of the site are provided along both sides of March Road. A recently constructed MUP is provided along the south side of Klondike Road, fronting the site, connecting pedestrians to March Road, the proposed re-located bus shelter, and the neighbourhood to the east. As part of this project, the proponent is proposing to urbanize the Klondike Road MUP between March Road and the site's driveway. This will include a raised MUP, with a curb and buffer zone between the roadway and the MUP. The proposed drawings are attached as Appendix E.

4.1.2. CIRCULATION AND ACCESS

Two driveway accesses are proposed to serve the subject development. A full-movement driveway is proposed to Klondike Road that provides access to the underground parking garage. A right-in/right-out driveway connection is proposed to March Road that provides access to the visitor parking lot. Both driveway widths are noted to be 6.7 m, and the drive aisles within the parking garage/lot are noted to be 6 to 6.7 m wide. These widths meet the City's By-Law requirements and are sufficient for the circulation of two-way traffic.

Garbage pick up will take place on-site. The garbage bins are located in the proposed underground parking garage and will be rolled out to the garbage pick-up area located at the bottom of the ramp, with access to/from Klondike Road. The garbage truck can reverse into the site for pick-up such that it can exit the site driving forward. The truck turning templates are provided as Appendix E.

Move-in and delivery trucks will have access to the visitor parking area. The covered drive-way will be able to accommodate a box-truck. Truck turning templates are provided as Appendix E.

4.2. PARKING

4.2.1. PARKING SUPPLY

Vehicle Parking

A total of 235 underground parking spaces are proposed to serve the residents of the proposed development and 35 visitor parking spaces are proposed, 26 spaces are provided in a surface parking lot and the remainder located underground. This amount of residential parking meets the City's minimum By-Law requirements for 196 units within Area C, identified on the City's Schedule 1A. The number of visitor parking spaces required by By-Law is calculated to be 39 spaces. As such, the total of 35 visitor spaces is deficient by 4 spaces. We are advised by the developer's Architect that this amount of visitor parking is the maximum that can be provided given the spatial constraints of the visitor parking lot which is located adjacent to the Shirley's Brook Creek.

The majority of underground parking spaces (239 out of 244 spaces) and the 26 visitor parking spaces provided above-ground are noted to be 5.2 m in length and 2.6 m in width. These parking space dimensions meet the City's By-Law requirements. A total of five underground parking spaces are reduced in size, noted to be 4.6 m in length and 2.4 m in width, which is acceptable according to the City's By-Law.

Bicycle Parking

A total of 99 bicycle parking spaces are proposed in the underground parking lot to serve the subject residential development. This amount of bicycle parking meets the City's minimum requirement with respect to the City's By-Law. In addition, there are 88 storage lockers planned in the underground parking lot, which may also serve as bicycle parking for tenants.

4.3. BOUNDARY STREET DESIGN

The boundary streets for the development are March Road and Klondike Road. At this time, there has not been any complete street concepts prepared for either street. The existing roadways' geometries consist of the following features:

March Road

- 3 vehicle travel lanes in each direction;
- More than 3,000 vehicles per day per lane;
- Posted speed limit of 80km/h;
- 3.3 m wide lanes;
- Curbside bike lanes; and
- 1.8 m wide sidewalks.

Klondike Road

- 1 vehicle travel lane in each direction;
- Less than 3,000 vehicles per day per lane;
- Posted speed limit of 50km/h;
- Multi-use path along south side of road; and,
- No on-street parking.

The multi-modal level of service (MMLoS) analysis for the road segment along boundary streets adjacent to the site is summarized in Table 8, with detail analysis provided in Appendix F. The existing MMLoS targets for the General Urban Area were used for this site and are shown in Table 8.

Table 8: MMLOS – Boundary Street Segments, General Urban Area

Road Segment	Level of Service							
	Pedestrian (PLoS)		Bicycle (BLoS)		Transit (TLoS)		Truck (TkLoS)	
	PLoS	Target	BLoS	Target	TLoS	Target	TLoS	Target
March Road	E	C	E	C	D	D	C	D
Klondike Road	B	C	A	B	D	No target	C	No target

As shown in Table 8, the pedestrian and cycling target levels of service are not currently met along March Road. The transit and truck levels of service are met along March Road. Both the pedestrian and bicycle levels of service are met along the

site's frontage to Klondike Road. As there are no transit priority measures planned for Klondike Road and it does not form part of the truck route, there are no target levels of service for transit or trucks along Klondike.

With regard to pedestrians, the target PLoS 'C' is not met on March Road. A PLoS 'E' is realized on March Road due to the high-speeds and high vehicle volume. There are no recommendations to improve the PLoS along March Road as the level of service is dependent on the number of vehicles along the adjacent street and the speeds of the vehicles.

With regard to cyclists, the target BLoS 'C' is not met along March Road. Given the speed and number of lanes on March Road, to achieve the target BLoS, cycle tracks would have to be implemented along March Road. This is not recommended as part of this development project, however may be implemented with the BRT plans for March Road planned for the future.

As part of the developer's obligations, a pathway will be constructed along the eastern boundary of the site for pedestrians and cyclists. The pathway will connect to March Road along the southern portion of the site and continue along the eastern side of the site until Klondike Road. This pathway will provide an alternative for cyclists and pedestrians that would result in high levels of service for these modes as they will be physically separated from March Road. As the lands to the south are developed, this pathway can continue south.

In addition, the MUP along Klondike Road will be urbanized adjacent to the site as part of the development. The proposed drawing for this improved pathway is provided as Appendix E.

4.4. ACCESS INTERSECTION DESIGN

4.4.1. LOCATION AND DESIGN OF ACCESS

Two vehicle driveway connections are proposed for the site; one to March Road and the other to Klondike Road. The March Road access is proposed as a right-in/right-out driveway located approximately 85m south of the March/Klondike intersection and will provide access to the visitor parking lot and drop-off zone. The driveway is within the influence of the northbound dual left-turn lanes of the March/Klondike intersection, however, as the turn lanes provide approximately 150m of storage space and the site frontage is approximately 130m, there are no opportunities to move the driveway outside the area of influence of these turn lanes. Given the low number of vehicles projected to enter and exit this driveway during peak hours (approximately 1 to 2 veh/h), the driveway is expected to operate acceptably. As the proposed access crosses an existing bike-lane, it is recommended the break in the bike lane be painted with green thermoplastic paint. The width of the driveway and surface drive aisle are noted to be 6.7m which meets the City's Private Approach By-Law.

The proposed full-movement parking garage access on Klondike Road is located approximately 45m east of the March/Klondike intersection, which meets the City's Private Approach By-Law requirements. The driveway is off-set as much as possible from March Road given the location of the creek directly east of the proposed building. There is an adjacent driveway access located along the north side of Klondike Road which is off-set from this driveway by approximately 8 m. If the two driveways were aligned, the subject site driveway would be located approximately 30 m from March Road, which would no longer meet the Private Approach By-Law as it would be closer to the arterial roadway. Drivers exiting both driveways will have good visibility of each driveway and given the low number of vehicles exiting both driveways, minimal conflicts are expected to occur given this off-set. The width of the driveway is noted to be 6.7 m and the underground drive aisles are noted be range between 6 m and 6.7 m, which meets the City's By-Law requirements. The existing bus stop located where the driveway is proposed is being relocated south of the new access.

4.4.2. INTERSECTION CONTROL

Based on the projected number of vehicles traveling to/from the site's driveway, STOP control on the minor approach (site driveway) only is recommended. No further traffic control or turn lanes are warranted at either site driveway.

4.5. TRANSPORTATION DEMAND MANAGEMENT

With regard to the proposed development and its location adjacent to active and transit facilities, it is located within walking distance to the transit stop along Klondike Road, sidewalks are provided along March Road and there are cycle lanes/tracks along both March Road and Klondike Road. The Transportation Demand Management checklist is provided as Appendix G and highlighted below:

- Sidewalks along March Road frontage;
- Bicycle parking provided indoors;
- Buildings located adjacent to streets;
- Designated drop-off area provided for carpool drivers; and,
- Safe connections for pedestrians to nearby transit stops.

Given the type of development and its location, the number of TDM strategies are limited for the subject site.

4.6. NEIGHBOURHOOD TRAFFIC MANAGEMENT

Exempt – See Section 2.3.

4.7. TRANSIT

Total "new" two-way transit trips for Phases 1 and 2 are approximately 20 persons/h during the weekday peak hours. This amount of person trips can be accommodated on the existing transit route that travels adjacent to the site. As density in this area increases, the transit network will be further developed which will include the transit priority measures along March Road. With the increase in transit infrastructure, the future two-way transit trips projected to travel to/from the proposed development are expected to increase to approximately 35 persons/h.

4.8. REVIEW OF NETWORK CONCEPT

Exempt – See Section 2.3.

4.9. INTERSECTION DESIGN

4.9.1. EXISTING CONDITIONS

The following Table 9 provides a summary of the existing traffic operations at the study area intersections based on the SYNCHRO (V10) traffic analysis software and the existing traffic volumes (Figure 5). The subject signalized intersection was assessed in terms of the volume-to-capacity (v/c) ratio and the corresponding Level of Service (LoS) for the critical movement(s). The subject signalized intersection 'as a whole' was assessed based on weighted v/c ratio. The SYNCHRO model output of existing conditions is provided within Appendix H.

Table 9: Existing Intersection Performance

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
March/Klondike	A(A)	0.49(0.51)	EBT(NBL)	16.3(20.0)	A(A)	0.38(0.31)
Note: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.						

As shown in Table 9, the March/Klondike intersection 'as a whole' currently operates at an excellent LoS 'A' during the morning and afternoon peak hours. With regard to 'critical movements,' they are also operating at an acceptable LoS 'A'

during peak hours with regard to City of Ottawa operating standards. These results indicate that there is considerable spare vehicle capacity at this intersection.

Multi-Modal Level of Service – Existing Conditions

The MMLoS analysis for the March/Klondike signalized study area intersection is summarized in Table 10. The existing detailed MMLoS analysis is provided as Appendix F.

Table 10: MMLoS – Signalized March/Klondike Intersection, Existing Conditions

Intersection	Level of Service									
	Pedestrian (PLoS)		Bicycle (BLoS)		Transit (TLoS)		Truck (TkLoS)		Vehicles (LoS)	
	PLoS	Target	BLoS	Target	TLoS	Target	TkLoS	Target	TkLoS	Target
March/Klondike	F	C	F	B	D	No target	C	No target	A	D

The letters identified in red text in Table 10 do not meet the MMLoS targets for their designated area (general urban area). Within the study area there are no existing transit priority measures, as such, there is no target TLoS for this intersection. Klondike Road does not form part of the truck route and is a local roadway, as such, there is no TkLoS target for the March/Klondike intersection. At the study area intersection, the pedestrian and bicycle target levels of service are not met. The following discussion regarding these modes is provided:

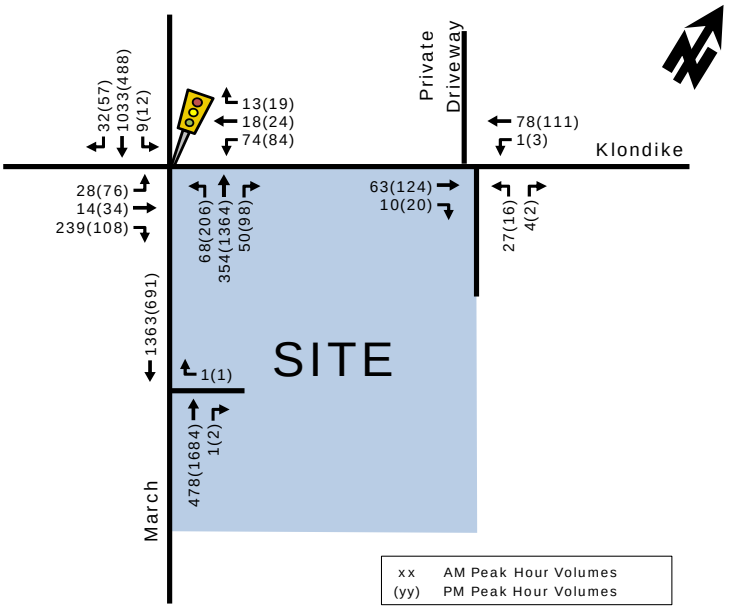
- Pedestrian – At the March/Klondike intersections, pedestrians cross 7 to 9 lanes of traffic across March Road. Removing the channelized southbound and eastbound right-turn lanes (or providing 'smart channel' right-turn lanes) will slightly increase the pedestrian level of service. Providing high-vis crosswalk markings or advance pedestrian walk phases will also help to improve the pedestrian experience but may decrease the transit and vehicle levels of service. However, these methods will not increase the PLoS as the limiting factor is the width of March Road.
- Bicycles – Curbside bike lanes are provided along the north and south legs of the March/Klondike intersection and a bi-directional cycle track is provided on the south side of the east leg of the intersection. Providing left-turn boxes on all legs and a pocket bike lane on the west leg of the intersection would improve the overall BLoS to 'B', which meets the target.

Given there are limited potential improvements for pedestrians and cyclists at the March/Klondike intersection and given the future plans to reconstruct the corridor to provide transit priority, no modifications to the March/Klondike intersection are recommended as part of this development.

4.9.2. TOTAL PROJECTED 2021 CONDITIONS – PHASE 1 BUILD-OUT

The total projected 2021 traffic volumes were derived by superimposing the Phase 1 site-generated traffic volumes (Figure 10) onto background traffic volumes (Figure 13). The resulting total projected 2021 traffic volumes are illustrated in Figure 16.

Figure 16: Total Projected 2021 Traffic Volumes



The following Table 11 provides a summary of the total projected operations at the study area intersection based on the SYNCHRO (V10) traffic analysis software for Phase 1 build-out year 2021. The SYNCHRO model output of 2021 projected conditions is provided within Appendix H.

Table 11: Total Projected 2021 Performance at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
March/Klondike	A(A)	0.51(0.60)	EBT(NBL)	19.0(23.8)	A(A)	0.42(0.35)
Klondike/Site	A(B)	9.4(10.0)	NBL(NBL)	1.6(0.7)	-	-
Note: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.						

The March/Klondike intersection is projected to operate similar to existing conditions, with slight increases in v/c and delays due to site-generated trips and background traffic. The intersection is projected to continue to operate 'as a whole' with a LoS 'A'. Critical movements at this intersection are projected to operate at a LoS 'A'. These results indicate that there is considerable spare vehicle capacity at this intersection.

With regard to the site's driveway connection to Klondike Road, the delays for vehicles exiting the site are projected to be approximately 10 seconds, with minimal delays and queues for vehicles entering the site.

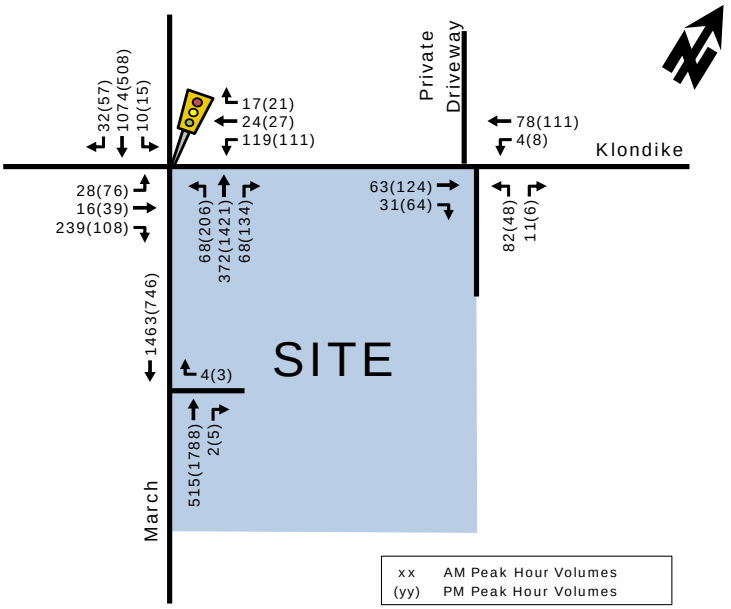
Multi-Modal Level of Service – Projected 2021 Phase 1 Build-Out Conditions

Given there are no significant proposed geometric changes to the March/Klondike intersection for the 2021 conditions, the multi-model level of service for this intersection remains the same as existing conditions, outlined in Table 10.

4.9.3. TOTAL PROJECTED 2023 CONDITIONS – FULL SITE BUILD-OUT

The total projected 2023 traffic volumes were derived by superimposing the total Phase 1 and Phase 2 site-generated traffic volumes (Figure 11) onto 2023 background traffic volumes (Figure 14). The resulting total projected 2023 traffic volumes are illustrated in Figure 17.

Figure 17: Total Projected 2023 Traffic Volumes



The following Table 12 provides a summary of the total projected operations at the study area intersection based on the SYNCHRO (V10) traffic analysis software at full-site build out. The SYNCHRO model output of 2023 projected conditions is provided within Appendix H.

Table 12: Total Projected 2023 Performance at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
March/Klondike	B(B)	0.67(0.61)	WBL(WBL)	21.3(24.9)	A(A)	0.46(0.38)
Klondike/Site	A(B)	9.9(10.5)	NBL(NBL)	3.5(1.8)	-	-
Note: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.						

The March/Klondike intersection is projected to operate similar to the existing conditions, with slight increases in v/c and delays due to site-generated trips and background traffic. The intersection is projected to continue operating 'as a whole' with a LoS 'A'. The critical westbound left-turn movement is projected to decrease to an LoS 'B' compared to the existing LoS 'A' during both peak hours.

With regard to the site's driveway connection to Klondike Road, the delays for vehicles exiting the site are projected to be approximately 10 seconds, with minimal delays and queues for vehicles entering the site.

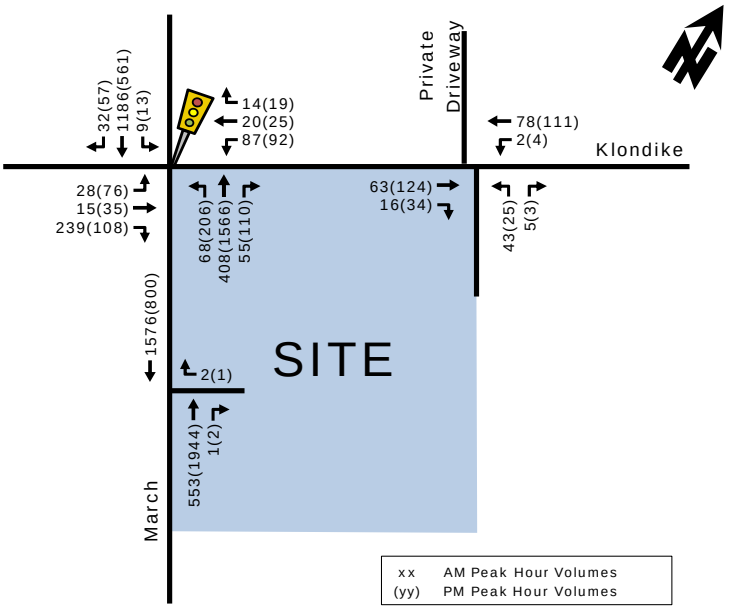
Multi-Modal Level of Service – Projected 2023 Phase 2 Build-Out Conditions

Given there are no significant proposed geometric changes to the March/Klondike intersection for the 2023 conditions, the multi-model level of service for these intersections remains the same as existing conditions, outlined in Table 10.

4.9.4. TOTAL PROJECTED 2028 CONDITIONS – 5 YEARS BEYOND FULL BUILD-OUT

The total projected 2028 traffic volumes were derived by superimposing the 2028 projected site-generated traffic volumes (Figure 12) onto 2028 background traffic volumes (Figure 15). The resulting total projected 2028 traffic volumes are illustrated in Figure 18.

Figure 18: Total Projected 2028 Traffic Volumes



The following Table 13 provides a summary of the total projected operations at the study area intersection based on the SYNCHRO (V10) traffic analysis software. The SYNCHRO model output of 2028 projected conditions is provided within Appendix H. For the purposes of this analysis, the functional design of March Road, as provided in Figure 7, is assumed (however the timing of the March Road Transitway construction is unknown). As such, the passenger vehicle travel lanes along March Road were reduced to two-lanes in each direction.

Table 13: Total Projected 2028 Performance at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
March/Klondike	B(D)	0.67(0.88)	SBT(NBT)	22.9(30.6)	B(D)	0.62(0.82)
Klondike/Site	A(A)	9.5(9.8)	NBL(NBL)	2.3(2.2)	-	-
Note: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.						

The March/Klondike intersection 'as a whole' is projected operate at a LoS 'B' in the morning peak hour and a LoS 'D' in the afternoon peak hour. Regarding critical movements, the southbound through movement is projected to operate at a LoS 'B' in the morning peak hour and the northbound through movement is projected to operate at a LoS 'D' in the critical afternoon peak hour.

With regard to the site's driveway connection to Klondike Road, the delays for vehicles exiting the site are projected to be approximately 10 seconds, with minimal delays and queues for vehicles entering the site.

Multi-Modal Level of Service –Projected Conditions at March Road Transitway Construction

As mentioned previously, the EA for the March Road Transitway was completed in 2012 and the functional design for the March/Klondike intersection is provided as Figure 7. As the timing for the construction of the transit priority along March Road is unknown, for the purposes of this MMLoS analysis, the functional design was assumed. The following Table 14 outlines the multi-model level of service for the March/Klondike intersection with the planned Transitway facility. The projected 2028 MMLoS analysis is provided as Appendix F.

Table 14: MMLOS – March/Klondike Intersection, Projected Conditions

Intersection	Level of Service									
	Pedestrian (PLoS)		Bicycle (BLoS)		Transit (TLoS)		Truck (TkLoS)		Vehicle (LoS)	
	PLoS	Target	BLoS	Target	TLoS	Target	TkLoS	Target	LoS	Target
March/Klondike	F	A	F	B	B	C	C	No target	D	D

As shown in Table 14, the vehicle, transit and truck levels of service targets are met for the future planned condition. The following can be providing regarding the pedestrian and bicycle levels of service:

- Pedestrian – As stated above in Section 4.9.1, the limiting measure is the 9-lane cross section of March Road at Klondike Road. While measures such as zebra-stripe cross-walks and advance pedestrian walk phases will improve pedestrian comfort, the PLoS will not increase.
- Bicycles – Based on the EA functional design of the March Road Transitway, there are curb bike lanes planned along the north and south legs, however there are no cross-rides or bike boxes. Given the MMLoS guidelines the City is implementing improved facilities for cyclists through intersections as part of City road works. As such, it is likely that cycle tracks, cross-rides or bike-boxes would be included in the detail design of March Road when it is completed.

5. FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis herein, the following conclusions are provided:

Proposed Site

- The proposed development will consist of two phases, with the build-out year assumed to be 2021 for Phase 1 and 2023 for Phase 2. Phase 1 of the residential development is proposed to include 95 units with 124 underground residential parking spaces and 19 visitor parking spaces. Phase 2 of the residential development is proposed to include 101 additional units with 111 additional underground residential parking spaces and 16 additional visitor parking spaces;
- Bicycle parking is proposed within the underground parking structure and a total of 99 bicycle parking spaces are proposed. In addition, there are 88 storage lockers proposed in the underground parking garage;
- Phase 1 of the proposed development is projected to generate 'new' two-way vehicle volumes of approximately 45 veh/h during the weekday morning and afternoon peak hours at build-out year 2021;
- The proposed Phases 1 and 2 of the development are projected to generate 'new' two-way vehicle volumes of approximately 90 veh/h during the weekday morning and afternoon peak hours at build-out year 2023;
- With the construction of the March Road transit priority planned adjacent to the site, the modal shares for residents are expected to shift and the site is projected to generate 'new' two-way vehicle volumes of approximately 70 veh/h during the weekday morning and afternoon peak hours at approximately five years beyond build-out year, 2028; and,
- Vehicle access to the development is proposed via a new full-movement driveway to Klondike Road for the underground parking garage and a new right-in/right-out access on March Road, which provides access to the surface visitor parking.

Existing and Background Conditions

- The existing March/Klondike study area intersection is currently operating at an excellent level of service 'A' during peak hours. The pedestrian and cycling facilities at this location result in levels of service 'F' for both pedestrians and cyclists. Given the current geometry and the width of March Road, there are limited opportunities to improve the PLoS and BLoS;

- Along the boundary streets, the MMLoS targets are met with the exception of the pedestrian and cycling levels of service along March Road. A MUP is provided along the south side of Klondike Road and cycle lanes and sidewalks are provided along both sides of March Road;
- Based on the future growth to the north of the proposed site, a 2% traffic growth factor per annum was applied along March Road to account for future Kanata North development; and,
- Transit priority is planned along March Road adjacent to the site. The EA functional plan shows median bus lanes along March Road and a reduced number of general purpose travel lanes from 6-lanes to 4-lanes.

Projected Conditions

- Based on the forecasted conditions, the signalized March/Klondike intersection at build out years of Phase 1 and 2 is projected to continue to operate with an acceptable level of service for vehicles during peak hours;
- The levels of service for pedestrians, bicycles, transit and trucks are projected to remain the same as existing given there are no proposed changes to the signalized intersection's geometry; and,
- Beyond site build out, when the transit priority is implemented, the target MMLoS levels of service are projected to be met, with the exception of the pedestrian and cycling levels of service. Due to the width of the signalized intersection, there are limited opportunities to improve the pedestrian level of service. As part of the transit construction, cycle track and/or cross-rides will likely be recommended at this intersection, which would improve the BLoS to 'A'.

Site Plan

- The number of vehicle and bicycle parking spaces meets the City's minimum By-Law requirement for residents, however, the visitor vehicle parking is deficient by 4 spaces;
- There are two proposed site driveways. One full-movement driveway to Klondike Road will provide access to the underground parking garage and is located approximately 45 m east of March Road. There is an existing transit shelter at the proposed driveway location that is planned to be relocated as part of this development. A right-in/right-out driveway is proposed to March Road providing access to a surface visitor parking lot, which is located 85 m south of the March/Klondike intersection;
- Garbage loading is proposed at the entrance to the parking garage (bottom of the ramp). Trucks will have to reverse from the driveway onto Klondike Road. Alternatively, trucks could stay on Klondike Road and the bins would have to be wheeled up to the roadway;
- Cycling facilities are provided on March Road in the form of on-street cycle lanes and on Klondike Road in the form of a MUP along the south side of the street, east of March Road; and
- Pedestrian facilities include public sidewalks along March Road. Pedestrian facilities are currently provided on Klondike Road in the form of a MUP along the south site of the roadway. As part of this development, the MUP is planned to be urbanized between March Road and the site's driveway connection to Klondike Road.

Based on the foregoing, the proposed development fits well into the context of the surrounding area. Therefore, approval from a transportation perspective of the proposed 788 March Road development is recommended.

Prepared By:

Rani Nahas E.I.T.
Transportation Analyst

Reviewed By:

André Sponder, P.Eng.
Transportation Engineer

Appendix A

Screening Form and Comments

PARSONS

1223 Michael Street, Suite 100, Ottawa, Ontario, K1J 7T2
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City of Ottawa 2017 TIA Guidelines

TIA Screening Form

Date	12-Jun-18
Project	788 March Road
Project Number	4764760-01000

Results of Screening	Yes/No
Development Satisfies the Trip Generation Trigger	Yes
Development Satisfies the Location Trigger	Yes
Development Satisfies the Safety Trigger	Yes

Module 1.1 - Description of Proposed Development	
Municipal Address	788 March Road
Description of location	Southeast quadrant of the March/Klondike intersection
Land Use	Residential
Development Size	196 residential units
Number of Accesses and Locations	Parking garage access to Klondike Road (full-movement) approximately 45 m from the March/Klondike intersection. Drop-off area and surface parking access to March Road (right-in/right-out) approximately 70 m from the March/Klondike intersection
Development Phasing	2 phases - Phase 1 - 95 units and Phase 2 - 101 units
Buildout Year	Assume 2021 for Phase 1, and 2023 for Phase 2
Sketch Plan / Site Plan	See Figure 2

Module 1.2 - Trip Generation Trigger		
Land Use Type	Townhomes or Apartments	
Development Size	196	Units
Trip Generation Trigger Met?	Yes	

Module 1.3 - Location Triggers	
Development Proposes a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit, or Spine Bicycle Networks (See Sheet 3)	Yes
Development is in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone. (See Sheet 3)	Yes
Location Trigger Met?	Yes

Module 1.4 - Safety Triggers		
Posted Speed Limit on any boundary road	>80	km/h
Horizontal / Vertical Curvature on a boundary street limits sight lines at a proposed driveway	No	
A proposed driveway is within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions) or within auxiliary lanes of an intersection;	Yes	
A proposed driveway makes use of an existing median break that serves an existing site	No	
There is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development	No	
The development includes a drive-thru facility	No	
Safety Trigger Met?	Yes	

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Re: 788 March Road
Transportation Impact Assessment – Addendum #1

1. INTRODUCTION

The following transportation-related comments were received by the City (10 September 2018) in response to the 788 March Road Transportation Impact Assessment submitted as a draft in August 2018. Responses to these city comments are provided herein.

2. CITY COMMENTS

2.1. TRAFFIC SIGNALS

Comment 1 : No comments to this TIA for this circulation

Response 1: Noted.

2.2. STREET LIGHTING

Comment 1 :

1. No comments with initial TIA for this circulation. Street Lighting reserves the right to make future comments based on subsequent submissions.
2. Future considerations are as follows:
    a. If there are any proposed changes to the existing roadway geometry, the City of Ottawa Street Light Asset Management Group is required to provide a full street light design. Upon completion of proposed roadway geometry design changes, please submit digital Micro Station drawings with proposed roadway geometry changes to the Street Lighting Department, so that we may proceed with the detailed street light design and coordination with the Street Light maintenance provider and all necessary parties. Be advised that the applicant will be 100% responsible for all costs associated with any Street Light design as a result of the roadway geometry change.
    b. Alterations and/or repairs are required where the existing street light plant is directly, indirectly or adversely affected by the scope of work under this circulation, due to the proposed road reconstruction process. All street light plant alterations and/or repairs must be performed by the City of Ottawa's Street Light maintenance provider.
    c. Be advised that the applicant will be 100% responsible for all costs associated with any relocations/modifications to the existing street light plant.
3. Due to the proposed street light relocation the City of Ottawa Street Lighting Asset Management Group is required review the lighting and provide a street light design. Please send hard copy & digital drawings so that we may proceed with the detailed street light design. Be advised that the applicant will be 100% responsible for all costs associated with any relocations/modifications to the existing street light plant. Please contact Isak Wall (City of Ottawa) 613-580-2424 ext. 32593.

Response 1: Noted and the proponent has been advised.

2.3. TRANSIT

Comment 1 : No outstanding comment regarding analysis or forecasting in this TIA Strategy report. Pedestrian connectivity to transit service is briefly touched upon in the document. OC Transpo would like some content regarding suggested transit infrastructure, such as bus pads and shelters.

Response 1: As mentioned in the TIA report, the existing bus pad is proposed to be re-located from its existing position to a location further west (closer to March Road) to accommodate the proposed location of the site's driveway to Klondike Road. The pathway is planned to be urbanized between March Road and the site's Klondike Road driveway, which will provide improved pedestrian and cycling connections to this bus shelter.

2.4. TRANSPORTATION ENGINEERING SERVICES

Comment 1 : The BLOS target is C for March Road and the measured BLOS is E. Considering this is identified as a spine route in the ultimate cycling plan, provide recommendations to reach this target within the City ROW.

Response 1: This has been updated in the TIA in Section 4.3 and detailed below:

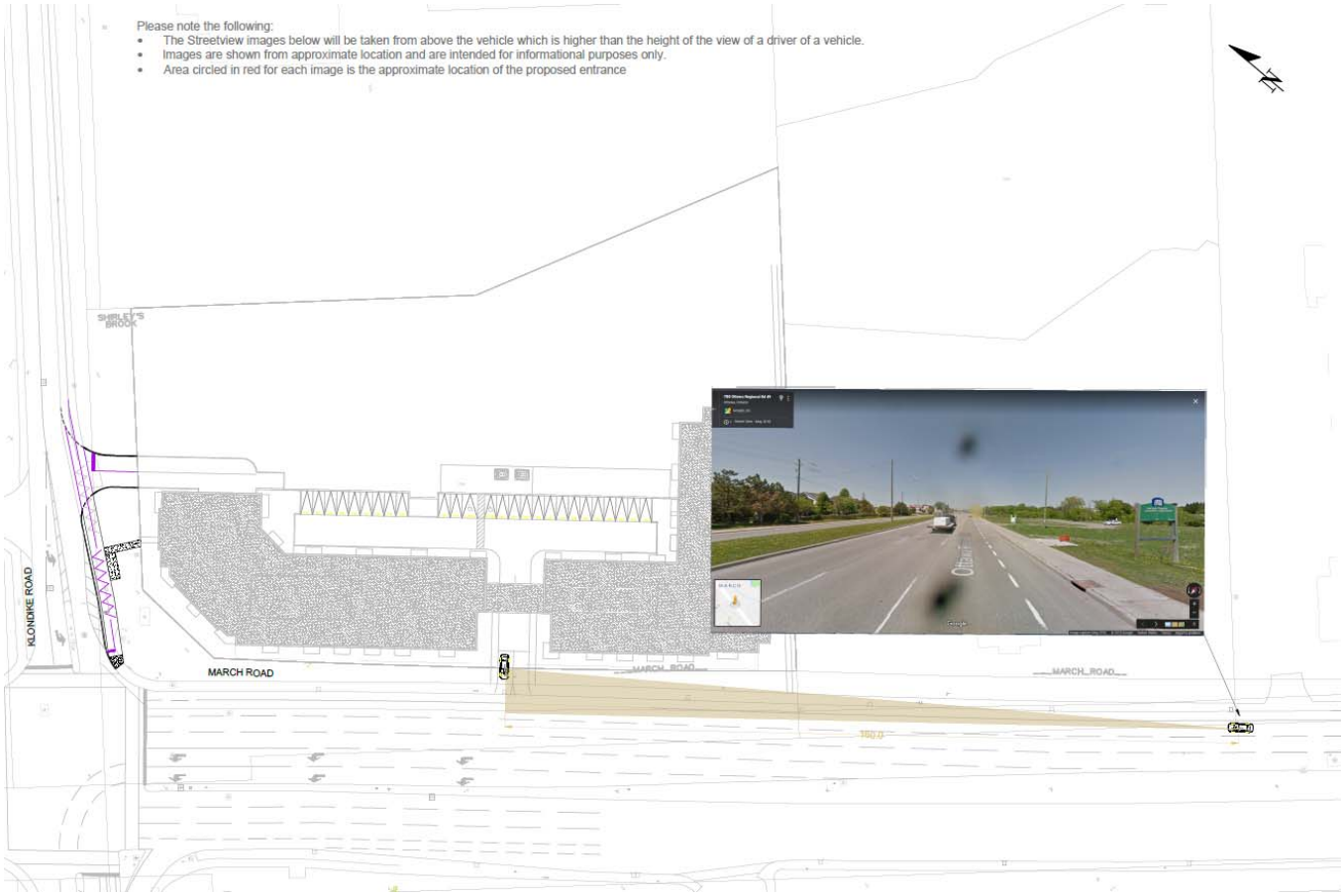
Given the vehicle speeds and number of lanes on March Road, to achieve the target BLoS, cycle tracks would have to be implemented along March Road. This is not recommended as part of this development project, however may be implemented with the future BRT March Road plans.

Comment 2: According to TAC guidelines (Table 9.9.6), the stopping sight distance required from the proposed access on March Road is 160m. Verify that this distance is available. In addition, drivers exiting the access may choose to cross the straight through lanes to access the dual left turn lanes. The distance available to negotiate this move is very short. If possible relocate the access to the south as far as possible on March Road. As the projected volumes using the right-in right-out access is so low, consider if these vehicles would be better served from the Klondike Road access.

Response 2: The volume of traffic is low at this driveway for two reasons; during peak hours visitor traffic is expected to be low (given visitors generally travel later in the evening), and there are only 26 parking spaces serving this lot.

There is no space to provide visitor parking in the underground parking lot and given the on-site space constraints, the visitor parking lot cannot be accessed from the Klondike Road access. Given the site's design, the location of this access cannot be re-located further south.

Please see figure below (larger image attached in Appendix A) showing the stopping 160m sight lines.



Comment 3: Review the sight distance for vehicles exiting the underground parking onto Klondike Road.

Response 3: Noted. Sight distances to be included in attached draft functional package.

Comment 4: Provide the anticipated delay for vehicles exiting the site onto Klondike Road.

Response 4: This is updated in Sections 4.9.2, 4.9.3, and 4.9.4 of the TIA report.

Comment 5: Through site plan, ensure that the underground parking access provides the appropriate vertical design when exiting the garage.

Response 5: Noted and the project's architect has been advised.

Comment 6: Incorporate the cycling facility on Klondike Road into the proposed site frontage as an off road facility. Provide a review of any potential safety issues with regard to the cycling facility at this access.

Response 6: The MUP is proposed to be urbanized adjacent to the site as shown in the drawing attached to the TIA as Appendix E

Comment 7: Review the feasibility of the garbage truck using the Klondike access.

Response 7: The truck turn templates are provided as Appendix E of the updated TIA.

Comment 8: Provide a site plan that clearly shows the cycling and pedestrian pathway proposed through the site and detail the proposed accesses.

Response 8: Noted and the project architect has been advised.

2.5. DEVELOPMENT REVIEW – TRANSPORTATION ENGINEERING SERVICES

Comment 1: Remove draft water mark

Response 1: Noted, removed.

Comment 2: Section 4.1.1 last paragraph (Also within section 4.3 and 5) – sidewalk on Klondike should be constructed along the full frontage of the property, not just to the access.

Response 2: The Klondike MUP is being urbanizes along the site's frontage from March Road to the site's driveway. East of the site's driveway there is a structure across Shirley's Brook, which is an environmentally protected area (flood plain) that must not be impacted. As such, there is no space to provide sidewalks further east of the site, however, the existing at-grade MUP provides a facility for pedestrians and cyclists across the bridge.

Comment 3: Provide turning templates for garbage truck at the Klondike access, and for the move-in and delivery trucks at the visitor parking area

Response 3: Truck turning templates are provided as Appendix E of the updated TIA.

Comment 4: Section 4.4.1 Paragraph 1 – See attached for appropriate bike facility pavement marking treatment at the accesses.

Response 4: Noted, these have been incorporated into the proposed drawings, attached to the updated TIA as Appendix E.

Comment 5: Section 4.4.2 – Please justify the use of stop control at the accesses. This will impact the treatment of the sidewalk and cycle track as per SC 7.1, attached.

Response 5: STOP control is required at a T-intersection. This is the most appropriate type of control at a minor access and the cycle track will be considered in the design, as shown in the Appendix E drawing.

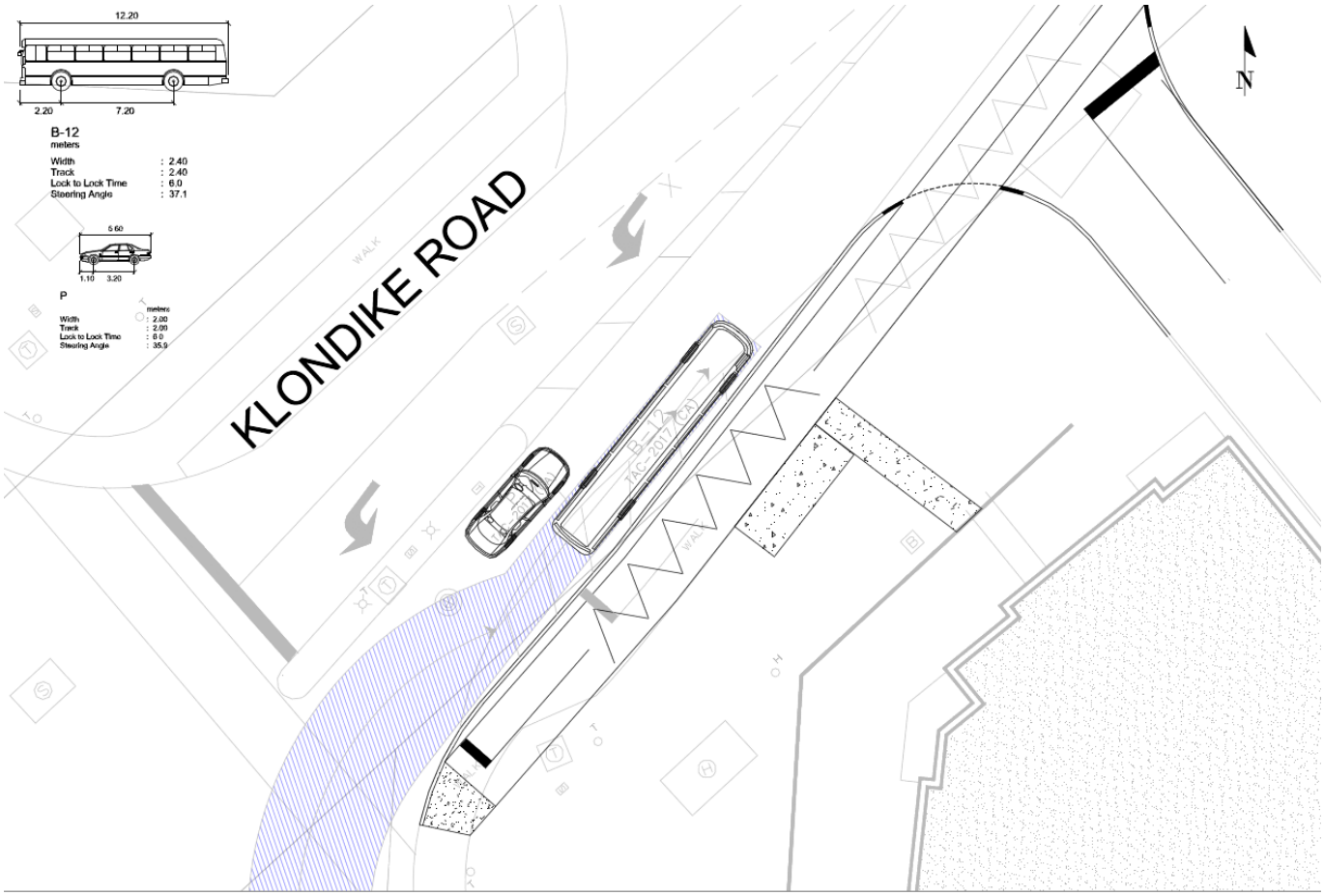
Comment 6: An RMA will be required for the urbanization of the Klondike frontage.

Response 6: Agreed, an RMA has been prepared.

2.6. OTHER

Comment 1: Show bus stopping at unloading/loading area and review if passenger vehicle can pass the stopped bus.

Response 1: Noted, the image below shows a bus at the unloading/loading area. Upon review, there is barely sufficient width for a passenger vehicle to pass the stopped bus on the left (depending on the position of the bus relative to the curb and median). As such, the speed of any passing vehicle at this location is anticipated to be slow, and therefore the configuration is considered acceptable.


12.20
2.20
7.20
B-12
meters
Width : 2.40
Track : 2.40
Lock to Lock Time : 6.0
Steering Angle : 37.1
5.60
1.10
3.20
P
meters
Width : 2.00
Track : 2.00
Lock to Lock Time : 6.0
Steering Angle : 35.9
KLONDIKE ROAD
N

Please note the following:

- The Streetview images below will be taken from above the vehicle which is higher than the height of the view of a driver of a vehicle.
- Images are shown from approximate location and are intended for informational purposes only.
- Area circled in red for each image is the approximate location of the proposed entrance

SHIRLEY'S BROOK

KLONDIKE ROAD

MARCH ROAD

MARCH ROAD

MARCH ROAD

160.0

Appendix B

Traffic Count Data

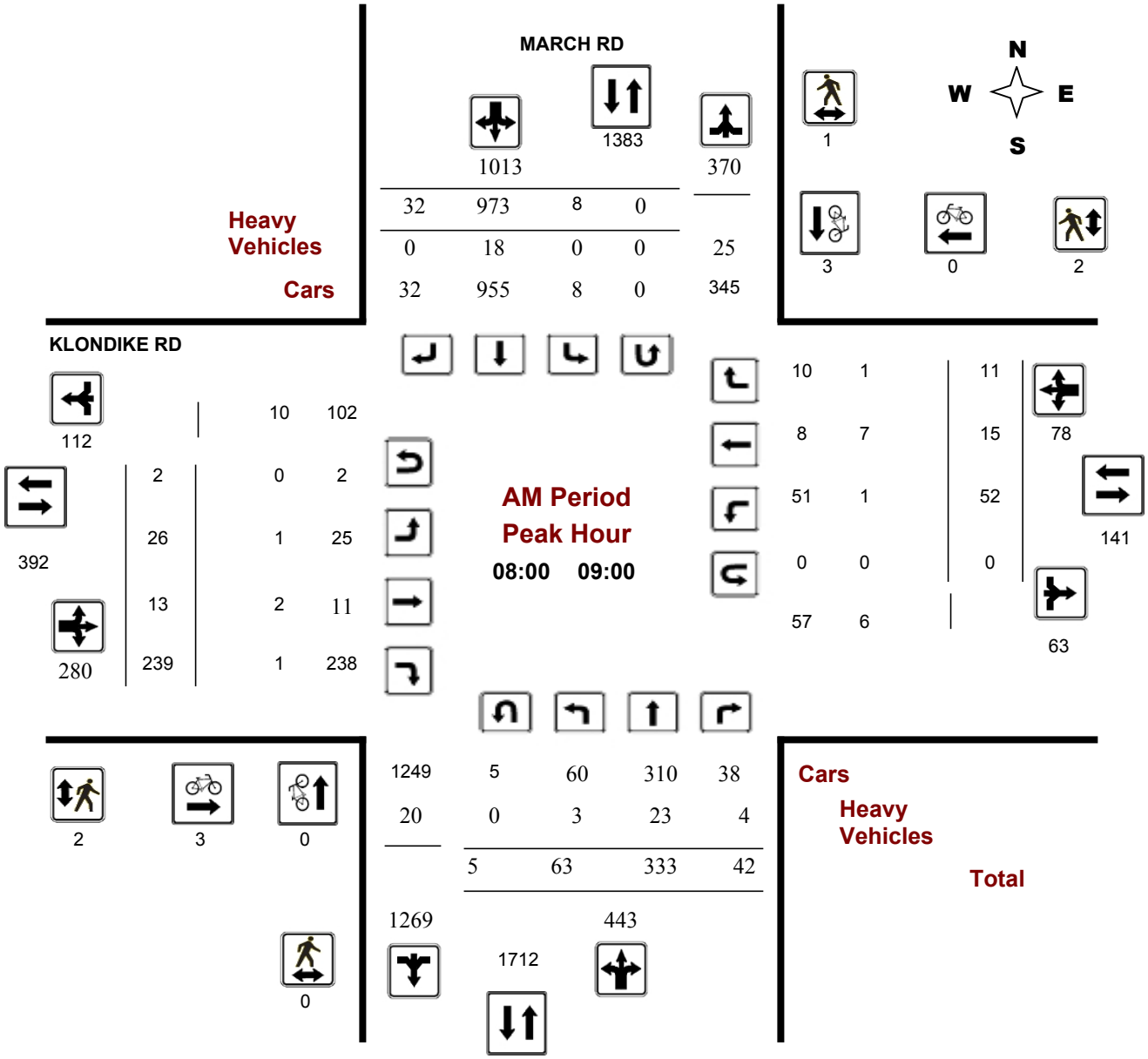
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

KLONDIKE RD @ MARCH RD

Survey Date: Wednesday, August 10, 2016 **WO No:** 36151

Start Time: 07:00 **Device:** Miovision



Comments

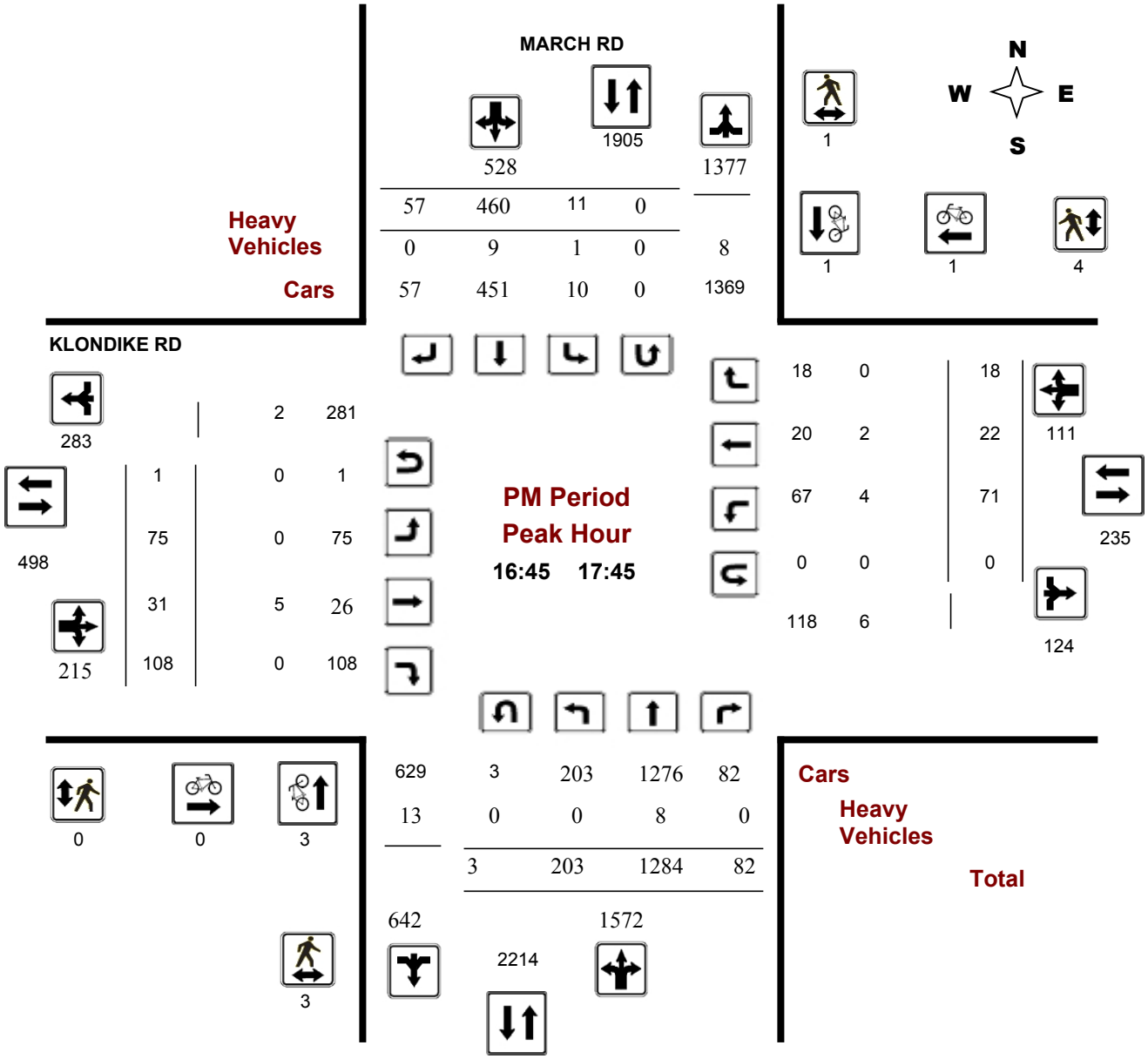
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

KLONDIKE RD @ MARCH RD

Survey Date: Wednesday, August 10, 2016 **WO No:** 36151

Start Time: 07:00 **Device:** Miovision



Comments

Appendix C

Collision Data and Analysis

Total Area

Classification of Accident	*Rear End*	*Turning Movement*	*Sideswipe*	*Angle*	*Approaching*	*Single Vehicle (other)*	*Single vehicle (Unattended vehicle)*	*Other*	*Total*	
P.D. only	16	4	1	4	0	2	0	0	27	77%
Non-fatal injury	4	1	1	1	0	1	0	0	8	23%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	20	5	2	5	0	3	0	0	**35**	
	57%	14%	6%	14%	0%	9%	0%	0%		

Classification of Accident	*Rear End*	*Turning Movement*	*Sideswipe*	*Angle*	*Approaching*	*Single Vehicle (other)*	*Single vehicle (Unattended vehicle)*	*Other*	*Total*	
P.D. only	14	4	1	4	0	2	0	0	25	81%
Non-fatal injury	4	1	0	1	0	0	0	0	6	19%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	18	5	1	5	0	2	0	0	**31**	
	58%	16%	3%	16%	0%	6%	0%	0%		

City Operations - Transportation Services

Collision Details Report - Public Version

From: January 1, 2012 **To:** December 31, 2016

Location: KLONDIKE RD @ MARCH RD

Traffic Control: Traffic signal

Total Collisions: 31

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2012-Mar-12, Mon,14:30	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2012-May-11, Fri,09:52	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Pick-up truck	Other motor vehicle	
2012-May-12, Sat,07:47	Clear	Angle	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2012-Jun-04, Mon,14:15	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Pick-up truck	Other motor vehicle	
2012-Jun-17, Sun,13:50	Clear	Rear end	Non-fatal injury	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle	
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2012-Jul-05, Thu,13:42	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	Passenger van	Other motor vehicle	

					North	Going ahead	Automobile, station wagon	Other motor vehicle
2012-Jul-07, Sat,15:05	Clear	Rear end	Non-fatal injury	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					North	Turning left	Pick-up truck	Other motor vehicle
					North	Turning left	Automobile, station wagon	Other motor vehicle
2012-Dec-13, Thu,10:00	Clear	Turning movement	P.D. only	Wet	East	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Passenger van	Other motor vehicle
2013-Jan-06, Sun,17:43	Snow	Rear end	P.D. only	Loose snow	North	Turning left	Automobile, station wagon	Other motor vehicle
					North	Turning left	Automobile, station wagon	Other motor vehicle
					North	Turning left	Automobile, station wagon	Other motor vehicle
2013-Jan-24, Thu,07:17	Clear	Rear end	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle
					East	Turning right	Pick-up truck	Other motor vehicle
2013-Feb-04, Mon,13:56	Clear	Rear end	P.D. only	Dry	East	Turning right	Pick-up truck	Other motor vehicle
					East	Turning right	Automobile, station wagon	Other motor vehicle
2013-Mar-09, Sat,17:51	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle

2013-Apr-06, Sat,18:17	Clear	Rear end	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					North	Turning left	Automobile, station wagon	Other motor vehicle
2013-Jun-25, Tue,21:02	Clear	Rear end	Non-fatal injury	Dry	North	Turning right	Pick-up truck	Other motor vehicle
					North	Turning right	Pick-up truck	Other motor vehicle
2013-Oct-02, Wed,16:05	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Pick-up truck	Other motor vehicle
2013-Oct-31, Thu,17:20	Rain	Rear end	P.D. only	Wet	West	Going ahead	Pick-up truck	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Dec-04, Wed,17:19	Clear	Rear end	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2014-Jan-06, Mon,07:19	Rain	Rear end	Non-fatal injury	Wet	East	Turning right	Automobile, station wagon	Other motor vehicle
					East	Turning right	Automobile, station wagon	Other motor vehicle
2014-Feb-25, Tue,09:15	Clear	Rear end	P.D. only	Dry	South	Going ahead	Passenger van	Other motor vehicle
					South	Stopped	Passenger van	Other motor vehicle

2014-Mar-27, Thu,13:27	Clear	Angle	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Turning right	School bus	Other motor vehicle
2014-Sep-26, Fri,13:45	Rain	Rear end	P.D. only	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Pick-up truck	Other motor vehicle
2014-Dec-31, Wed,14:20	Clear	Rear end	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle
					East	Turning left	Delivery van	Other motor vehicle
2015-Jan-07, Wed,10:00	Clear	SMV other	P.D. only	Ice	South	Turning right	Pick-up truck	Skidding/sliding
2015-Jul-05, Sun,12:12	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2015-Dec-08, Tue,06:46	Clear	Rear end	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle
					West	Turning left	Automobile, station wagon	Other motor vehicle
2015-Dec-23, Wed,16:18	Rain	Turning movement	P.D. only	Wet	South	Turning left	Unknown	Other motor vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle
2016-Jan-05, Tue,10:48	Clear	Angle	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle

2016-Feb-16, Tue,09:08	Snow	SMV other	P.D. only	Loose snow	North	Making "U" turn	Automobile, station wagon	Skidding/sliding
2016-Sep-10, Sat,14:55	Clear	Angle	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Dec-13, Tue,10:43	Snow	Rear end	P.D. only	Ice	North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2016-Dec-17, Sat,10:39	Snow	Sideswipe	P.D. only	Loose snow	North	Changing lanes	Pick-up truck	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle

Location: KLONDIKE RD btwn MARCH RD & SANDHILL RD

Traffic Control: No control

Total Collisions: 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2013-Apr-23, Tue,17:30	Clear	Rear end	P.D. only	Dry	South	Turning left	Passenger van	Other motor vehicle	
					South	Turning left	Passenger van	Other motor vehicle	

Location: MARCH RD btwn KLONDIKE RD & MORGAN'S GRANT WAY

Traffic Control: No control

Total Collisions: 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Jan-04, Sat,13:35	Clear	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	

2015-Sep-22, Tue,08:44	Clear	SMV other	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Ran off road
2016-Feb-11, Thu,07:32	Snow	Sideswipe	Non-fatal injury	Slush	North	Changing lanes	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle

Appendix D

Background Traffic Analysis

March / Terry Fox
8 hrs

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2010	Tuesday 10 August	6957	7204	8518	7885	2270	2544	2061	2173	39612
2012	Wednesday 20 June	6097	7118	7997	6501	1816	3511	4170	2950	40160
2016	Wednesday 10 August	7754	8205	8599	8492	3318	3611	4381	3744	48104

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2010	7204	6957	14161	39612				
2012	7118	6097	13215	40160	-1.2%	-12.4%	-6.7%	1.4%
2016	8205	7754	15959	48104	15.3%	27.2%	20.8%	19.8%

Regression Estimate	2010	7024	6475	13499
Regression Estimate	2016	8115	7513	15628
Average Annual Change		**2.44%**	**2.51%**	**2.47%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2010	2061	2173	4234	39612				
2012	4170	2950	7120	40160	102.3%	35.8%	68.2%	1.4%
2016	4381	3744	8125	48104	5.1%	26.9%	14.1%	19.8%

Regression Estimate	2010	2633	2282	4915
Regression Estimate	2016	4667	3798	8466
Average Annual Change		**10.01%**	**8.87%**	**9.49%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2010	2544	2270	4814	39612				
2012	3511	1816	5327	40160	38.0%	-20.0%	10.7%	1.4%
2016	3611	3318	6929	48104	2.8%	82.7%	30.1%	19.8%

Regression Estimate	2010	2806	1926	4732
Regression Estimate	2016	3742	3146	6888
Average Annual Change		**4.91%**	**8.52%**	**6.46%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2010	8518	7885	16403	39612				
2012	7997	6501	14498	40160	-6.1%	-17.6%	-11.6%	1.4%
2016	8599	8492	17091	48104	7.5%	30.6%	17.9%	19.8%

Regression Estimate	2010	8283	7205	15488
Regression Estimate	2016	8482	8152	16634
Average Annual Change		**0.40%**	**2.08%**	**1.20%**

March / Terry Fox
AM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2010	Tuesday 10 August	1387	442	675	1360	116	545	372	203	5100
2012	Wednesday 20 June	1155	569	656	1194	121	927	996	238	5856
2016	Wednesday 10 August	1376	523	790	1359	186	912	826	384	6356

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2010	442	1387	1829	5100				
2012	569	1155	1724	5856	28.7%	-16.7%	-5.7%	14.8%
2016	523	1376	1899	6356	-8.1%	19.1%	10.2%	8.5%

Regression Estimate	2010	485	1289	1774
Regression Estimate	2016	544	1327	1872
Average Annual Change		**1.95%**	**0.48%**	**0.90%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2010	372	203	575	5100				
2012	996	238	1234	5856	167.7%	17.2%	114.6%	14.8%
2016	826	384	1210	6356	-17.1%	61.3%	-1.9%	8.5%

Regression Estimate	2010	575	192	767
Regression Estimate	2016	927	379	1306
Average Annual Change		**8.30%**	**11.97%**	**9.28%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2010	545	116	661	5100				
2012	927	121	1048	5856	70.1%	4.3%	58.5%	14.8%
2016	912	186	1098	6356	-1.6%	53.7%	4.8%	8.5%

Regression Estimate	2010	656	108	764
Regression Estimate	2016	968	182	1150
Average Annual Change		**6.69%**	**9.07%**	**7.04%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2010	675	1360	2035	5100				
2012	656	1194	1850	5856	-2.8%	-12.2%	-9.1%	14.8%
2016	790	1359	2149	6356	20.4%	13.8%	16.2%	8.5%

Regression Estimate	2010	650	1289	1939
Regression Estimate	2016	778	1324	2101
Average Annual Change		**3.02%**	**0.44%**	**1.34%**

March / Terry Fox
PM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2010	Tuesday 10 August	675	1609	1683	893	508	265	271	370	6274
2012	Wednesday 20 June	608	1592	1679	685	505	286	485	714	6554
2016	Wednesday 10 August	751	1904	1822	1015	859	288	558	783	7980

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2010	1609	675	2284	6274				
2012	1592	608	2200	6554	-1.1%	-9.9%	-3.7%	4.5%
2016	1904	751	2655	7980	19.6%	23.5%	20.7%	21.8%

Regression Estimate	2010	1560	635	2195
Regression Estimate	2016	1879	731	2611
Average Annual Change		**3.16%**	**2.37%**	**2.93%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2010	271	370	641	6274				
2012	485	714	1199	6554	79.0%	93.0%	87.1%	4.5%
2016	558	783	1341	7980	15.1%	9.7%	11.8%	21.8%

Regression Estimate	2010	322	458	780
Regression Estimate	2016	583	827	1411
Average Annual Change		**10.43%**	**10.34%**	**10.37%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2010	265	508	773	6274				
2012	286	505	791	6554	7.9%	-0.6%	2.3%	4.5%
2016	288	859	1147	7980	0.7%	70.1%	45.0%	21.8%

Regression Estimate	2010	271	457	727
Regression Estimate	2016	291	833	1124
Average Annual Change		**1.20%**	**10.55%**	**7.53%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2010	1683	893	2576	6274				
2012	1679	685	2364	6554	-0.2%	-23.3%	-8.2%	4.5%
2016	1822	1015	2837	7980	8.5%	48.2%	20.0%	21.8%

Regression Estimate	2010	1661	786	2448
Regression Estimate	2016	1811	962	2773
Average Annual Change		**1.45%**	**3.41%**	**2.10%**

Appendix E

Proposed Urbanized MUP Drawing and Truck Turning Templates

Page Setup: ----

Drawing Frame: 790mm x 534mm City of Ottawa 2008 (Rev.0)

Plot Date: Thursday, October 11, 2018 11:33:24

Last Saved: Thursday, October 11, 2018 11:17:04

Consultant's Information: \\XCCAN57PS01\Data\ISO\476760\1000\DWGS\788_March_ROAD_10-010-2018.dwg

788 March Road

Truck Turning Plan

PARSONS

746760	Dwg. No. 003
Sheet 3 of 4	
Des.	Chk'd.
Dwn.	Chk'd.
CIRC NO.	INDEX NO.
INSPECTOR	

Scale: HORIZONTAL
0m 2.5 5 10

NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

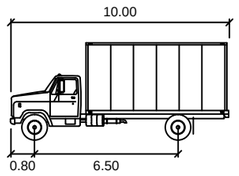
REVISIONS

No.	Description	By	Date (dd/mm/yy)
01	Conceptual Plan	DM	11/09/18

MSU

	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.2

Sketch: Garbage Truck Reversing In



MSU

	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.2

KLONDIKE ROAD

Garbage
Pick up
Area

Appendix F

MMLoS Analysis

Multi-Modal Level of Service - Intersections Form

Consultant	**Parsons**	**Project**	**788 March**
Scenario	**Existing and Future**	**Date**	**Jul-18**
Comments			

INTERSECTIONS		March/Klondike - Existing				March/Klondike - Future 2028			
	Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	7	9	3	5	7	9	3	5
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	Median > 2.4 m	Median > 2.4 m	No Median - 2.4 m	No Median - 2.4 m
	Conflicting Left Turns	Protected/ Permissive	Permissive	Protected	Protected	Protected/ Permissive	Permissive	Protected	Protected
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	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	RTOR allowed	RTOR allowed
	Ped Signal Leading Interval?	No	No	No	No	No	No	No	No
	Right Turn Channel	No Channel	Conv'tl without Receiving Lane	No Channel	Conv'tl without Receiving Lane	No Channel	Smart Channel	No Channel	Smart Channel
	Corner Radius	5-10m	5-10m	10-15m	10-15m	5-10m	5-10m	10-15m	10-15m
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings
	PETSI Score	**5**	**-24**	**78**	**49**	**11**	**-13**	**78**	**51**
	Ped. Exposure to Traffic LoS	**F**	**#N/A**	**B**	**D**	**F**	**F**	**B**	**D**
	Cycle Length	120	120	120	120	120	120	120	120
	Effective Walk Time	7	20	16	16	7	20	16	16
	Average Pedestrian Delay	**53**	**42**	**45**	**45**	**53**	**42**	**45**	**45**
	Pedestrian Delay LoS	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**
	Level of Service	**F**	**#N/A**	**E**	**E**	**F**	**F**	**E**	**E**
		#N/A				**F**			
	Approach From	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Bicycle	Bicycle Lane Arrangement on Approach	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic
	Right Turn Lane Configuration				≤ 50 m				≤ 50 m
	Right Turning Speed				≤ 25 km/h				≤ 25 km/h
	Cyclist relative to RT motorists	**Not Applicable**	**Not Applicable**	**Not Applicable**	**D**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**D**
	Separated or Mixed Traffic	**Separated**	**Separated**	**Separated**	**Mixed Traffic**	**Separated**	**Separated**	**Separated**	**Mixed Traffic**
	Left Turn Approach	≥ 2 lanes crossed	≥ 2 lanes crossed	No lane crossed	One lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	No lane crossed	One lane crossed
	Operating Speed	≥ 60 km/h	≥ 60 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	≥ 60 km/h	≥ 60 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h
	Left Turning Cyclist	**F**	**F**	**B**	**D**	**F**	**F**	**B**	**D**
	Level of Service	**F**	**F**	**B**	**D**	**F**	**F**	**B**	**D**
		F				**F**			
Transit	Average Signal Delay			≤ 30 sec	≤ 20 sec	≤ 10 sec	≤ 10 sec		
	Level of Service	**-**	**-**	**D**	**C**	**B**	**B**	**-**	**-**
		D				**B**			
Truck	Effective Corner Radius	> 15 m	> 15 m	10 - 15 m	10 - 15 m	> 15 m	> 15 m	10 - 15 m	10 - 15 m
	Number of Receiving Lanes on Departure from Intersection	≥ 2	1	≥ 2	≥ 2	≥ 2	1	≥ 2	≥ 2
	Level of Service	**A**	**C**	**B**	**B**	**A**	**C**	**B**	**B**
		C				**C**			
Auto	Volume to Capacity Ratio					0.81 - 0.90			
	Level of Service	**-**				**D**			

Multi-Modal Level of Service - Segments Form

Consultant	PARSONS	**Project**	788 March Rd TIA
Scenario	Existing	**Date**	July 11,2018
Comments			

SEGMENTS		Street A	March Road, South Leg	Klondike Road, East Leg	Section
			1	2	3
Pedestrian	Sidewalk Width Boulevard Width	-	1.8 m 0.5 - 2 m	no sidewalk n/a	
	Avg Daily Curb Lane Traffic Volume		> 3000	≤ 3000	
	Operating Speed On-Street Parking		> 60 km/h no	> 30 to 50 km/h no	
	Exposure to Traffic PLoS		**E**	**F**	-
	Effective Sidewalk Width				
	Pedestrian Volume				
	Crowding PLoS		-	-	-
	Level of Service		-	-	-
Bicycle	Type of Cycling Facility	A	Curbside Bike Lane	Physically Separated	
	Number of Travel Lanes		≥ 3 each direction		
	Operating Speed		> 70 km/h		
	# of Lanes & Operating Speed LoS		**E**	-	-
	Bike Lane (+ Parking Lane) Width		≥ 1.8 m		
	Bike Lane Width LoS		**A**	-	-
	Bike Lane Blockages		Rare		
	Blockage LoS		**A**	-	-
	Median Refuge Width (no median = < 1.8 m)				
	No. of Lanes at Unsignalized Crossing				
	Sidestreet Operating Speed				
	Unsignalized Crossing - Lowest LoS		-	~~A~~	-
	Level of Service		-	**A**	-
Transit	Facility Type	D	Mixed Traffic	Mixed Traffic	
	Friction or Ratio Transit:Posted Speed		Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8	
	Level of Service		**D**	**D**	-
Truck	Truck Lane Width	C	≤ 3.3 m	≤ 3.5 m	
	Travel Lanes per Direction		> 1	1	
	Level of Service		**C**	**C**	-

Appendix G

TDM Checklist

TDM-Supportive Development Design and Infrastructure Checklist:
Residential Developments (multi-family or condominium)

Legend

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

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☐
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☐
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☑
	1.2	**Facilities for walking & cycling**	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)*	☐
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	☑

TDM-supportive design & infrastructure measures: *Residential developments*			Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	☑
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☑
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☐
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☑
	1.3	**Amenities for walking & cycling**	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☑
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☐

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑ *Bicycle parking provided underground*
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑ *96 bicycle parking spaces provided*
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☐
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☑
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	☐
	2.3	**Bicycle repair station**	
BETTER	2.3.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☑
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐ *Not Applicable*
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐ *Not Applicable*

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☑
	5.	**CARSHARING & BIKE SHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses *(see Zoning By-law Section 94)*	☐ *Site zoned as GM*
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☐
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☑
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐ *Not Applicable, site features one use*
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	☑ *Visitor parking lot separate from resident parking lot*

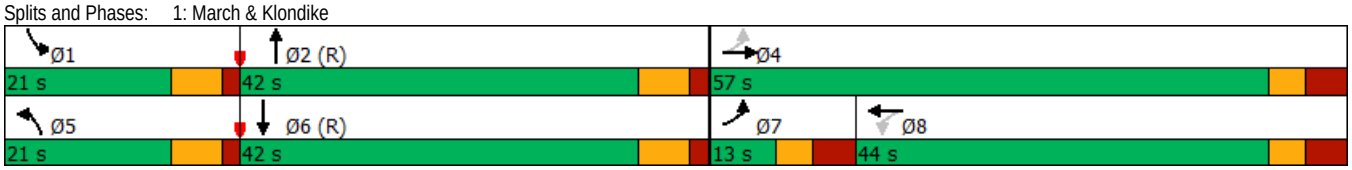
Appendix H

Synchro Analysis

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	28	13	52	15	68	333	8	973
Future Volume (vph)	28	13	52	15	68	333	8	973
Lane Group Flow (vph)	29	266	55	28	72	395	8	1058
Turn Type	pm+pt	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	7	4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	7	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	12.1	44.1	44.1	44.1	11.2	32.5	11.2	32.5
Total Split (s)	13.0	57.0	44.0	44.0	21.0	42.0	21.0	42.0
Total Split (%)	10.8%	47.5%	36.7%	36.7%	17.5%	35.0%	17.5%	35.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	4.6	4.6	4.6	4.6
All-Red Time (s)	3.8	3.8	3.8	3.8	1.6	1.9	1.6	1.9
Lost Time Adjust (s)	-3.1	-3.1	-3.1	-3.1	-2.2	-2.5	-2.2	-2.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	27.4	27.4	19.6	19.6	10.2	81.9	8.4	72.8
Actuated g/C Ratio	0.23	0.23	0.16	0.16	0.08	0.68	0.07	0.61
v/c Ratio	0.10	0.49	0.34	0.10	0.26	0.12	0.07	0.36
Control Delay	30.2	7.2	46.6	25.2	53.1	10.0	53.0	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.2	7.2	46.6	25.2	53.1	10.0	53.0	16.0
LOS	C	A	D	C	D	A	D	B
Approach Delay		9.5		39.3		16.6		16.3
Approach LOS		A		D		B		B
Queue Length 50th (m)	5.4	2.6	12.2	3.4	8.2	9.3	1.8	45.7
Queue Length 95th (m)	9.4	16.8	19.3	9.1	15.3	29.5	6.7	89.3
Internal Link Dist (m)		157.1		124.5		226.3		114.7
Turn Bay Length (m)			20.0		125.0		65.0	
Base Capacity (vph)	294	808	336	561	465	3262	240	2939
Starvation Cap Reductn	0	0	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	0.10	0.33	0.16	0.05	0.15	0.12	0.03	0.36

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 16.3	Intersection LOS: B
Intersection Capacity Utilization 63.8%	ICU Level of Service B
Analysis Period (min) 15	

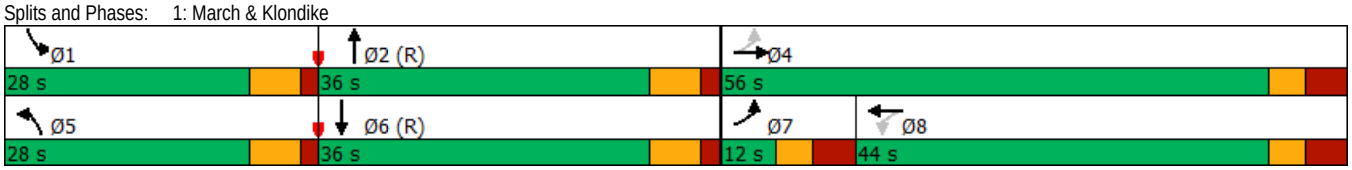
Splits and Phases: 1: March & Klondike



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	76	31	71	22	206	1284	11	460
Future Volume (vph)	76	31	71	22	206	1284	11	460
Lane Group Flow (vph)	80	147	75	42	217	1438	12	544
Turn Type	pm+pt	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	7	4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	7	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	1.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	8.1	44.1	44.1	44.1	16.2	32.5	16.2	32.5
Total Split (s)	12.0	56.0	44.0	44.0	28.0	36.0	28.0	36.0
Total Split (%)	10.0%	46.7%	36.7%	36.7%	23.3%	30.0%	23.3%	30.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	4.6	4.6	4.6	4.6
All-Red Time (s)	3.8	3.8	3.8	3.8	1.6	1.9	1.6	1.9
Lost Time Adjust (s)	-3.1	-3.1	-3.1	-3.1	-2.2	-2.5	-2.2	-2.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	29.9	29.9	20.3	20.3	15.5	78.9	12.2	62.6
Actuated g/C Ratio	0.25	0.25	0.17	0.17	0.13	0.66	0.10	0.52
v/c Ratio	0.26	0.31	0.38	0.14	0.51	0.45	0.07	0.22
Control Delay	33.5	9.9	46.7	24.4	52.7	14.4	50.0	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	9.9	46.7	24.4	52.7	14.4	50.0	18.1
LOS	C	A	D	C	D	B	D	B
Approach Delay		18.2		38.7		19.4		18.8
Approach LOS		B		D		B		B
Queue Length 50th (m)	15.2	6.1	16.6	4.8	24.9	47.4	2.6	22.6
Queue Length 95th (m)	20.8	16.4	24.4	11.6	35.9	129.6	8.6	45.8
Internal Link Dist (m)		157.1		124.5		117.7		114.7
Turn Bay Length (m)			20.0				65.0	
Base Capacity (vph)	311	740	393	563	657	3170	339	2506
Starvation Cap Reductn	0	0	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	0.26	0.20	0.19	0.07	0.33	0.45	0.04	0.22

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green		
Natural Cycle: 105		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.51		
Intersection Signal Delay: 20.0	Intersection LOS: C	
Intersection Capacity Utilization 69.2%	ICU Level of Service C	
Analysis Period (min) 15		

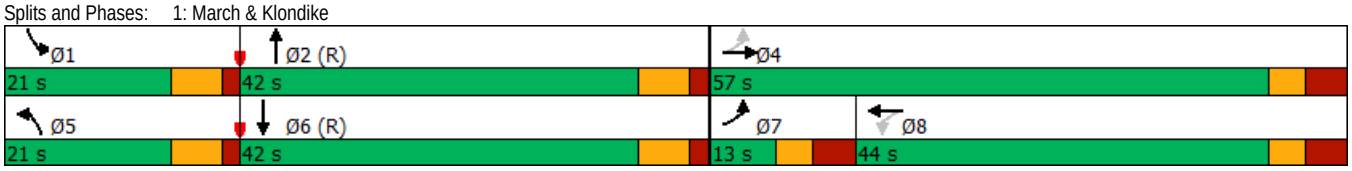
Splits and Phases: 1: March & Klondike



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	28	14	74	18	68	354	9	1033
Future Volume (vph)	28	14	74	18	68	354	9	1033
Lane Group Flow (vph)	29	267	78	33	72	426	9	1121
Turn Type	pm+pt	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	7	4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	7	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	12.1	44.1	44.1	44.1	11.2	32.5	16.2	32.5
Total Split (s)	13.0	57.0	44.0	44.0	21.0	42.0	21.0	42.0
Total Split (%)	10.8%	47.5%	36.7%	36.7%	17.5%	35.0%	17.5%	35.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	4.6	4.6	4.6	4.6
All-Red Time (s)	3.8	3.8	3.8	3.8	1.6	1.9	1.6	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	6.2	6.5	6.2	6.5
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	25.7	25.7	17.9	17.9	8.0	77.5	10.0	68.9
Actuated g/C Ratio	0.21	0.21	0.15	0.15	0.07	0.65	0.08	0.57
v/c Ratio	0.12	0.51	0.49	0.13	0.33	0.14	0.06	0.40
Control Delay	31.6	7.9	54.6	26.5	56.9	11.9	52.0	18.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.6	7.9	54.6	26.5	56.9	11.9	52.0	18.6
LOS	C	A	D	C	E	B	D	B
Approach Delay		10.2		46.3		18.4		18.9
Approach LOS		B		D		B		B
Queue Length 50th (m)	5.4	2.8	17.7	4.1	8.5	11.9	2.0	55.0
Queue Length 95th (m)	9.9	17.8	26.7	10.7	15.6	33.9	7.2	99.2
Internal Link Dist (m)		157.1		124.5		117.7		114.7
Turn Bay Length (m)			20.0				65.0	
Base Capacity (vph)	238	775	326	520	405	3081	209	2782
Starvation Cap Reductn	0	0	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	0.12	0.34	0.24	0.06	0.18	0.14	0.04	0.40

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 19.0	Intersection LOS: B
Intersection Capacity Utilization 72.7%	ICU Level of Service C
Analysis Period (min) 15	

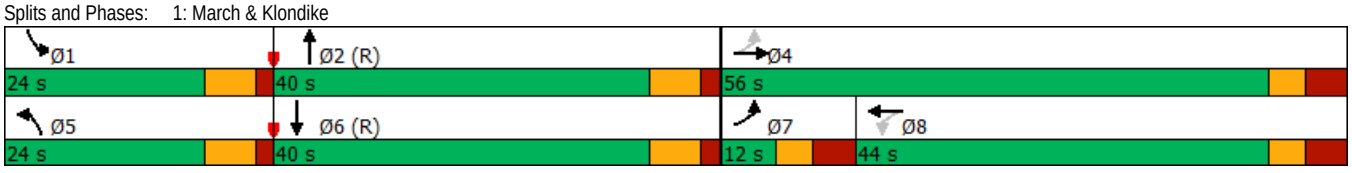
Splits and Phases: 1: March & Klondike



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	76	34	84	24	206	1364	12	488
Future Volume (vph)	76	34	84	24	206	1364	12	488
Lane Group Flow (vph)	80	150	88	45	217	1539	13	574
Turn Type	pm+pt	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	7	4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	7	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	12.1	44.1	44.1	44.1	11.2	32.5	16.2	32.5
Total Split (s)	12.0	56.0	44.0	44.0	24.0	40.0	24.0	40.0
Total Split (%)	10.0%	46.7%	36.7%	36.7%	20.0%	33.3%	20.0%	33.3%
Yellow Time (s)	3.3	3.3	3.3	3.3	4.6	4.6	4.6	4.6
All-Red Time (s)	3.8	3.8	3.8	3.8	1.6	1.9	1.6	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	6.2	6.5	6.2	6.5
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	27.6	27.6	18.0	18.0	13.2	72.3	10.0	59.4
Actuated g/C Ratio	0.23	0.23	0.15	0.15	0.11	0.60	0.08	0.50
v/c Ratio	0.33	0.34	0.50	0.17	0.60	0.53	0.09	0.24
Control Delay	36.8	11.0	53.9	26.2	57.7	19.0	52.5	20.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.8	11.0	53.9	26.2	57.7	19.0	52.5	20.1
LOS	D	B	D	C	E	B	D	C
Approach Delay		20.0		44.5		23.7		20.8
Approach LOS		B		D		C		C
Queue Length 50th (m)	15.5	6.8	20.0	5.3	25.5	58.9	2.9	26.0
Queue Length 95th (m)	21.8	17.9	29.3	12.8	36.8	#156.0	9.2	50.0
Internal Link Dist (m)		157.1		124.5		117.7		114.7
Turn Bay Length (m)			20.0				65.0	
Base Capacity (vph)	245	704	362	522	487	2905	251	2381
Starvation Cap Reductn	0	0	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	0.33	0.21	0.24	0.09	0.45	0.53	0.05	0.24

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 23.8	Intersection LOS: C
Intersection Capacity Utilization 80.4%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

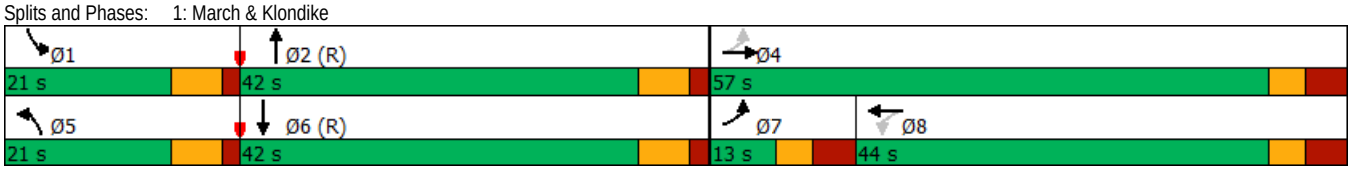
Splits and Phases: 1: March & Klondike



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	28	16	119	24	68	372	10	1074
Future Volume (vph)	28	16	119	24	68	372	10	1074
Lane Group Flow (vph)	29	269	125	43	72	464	11	1165
Turn Type	pm+pt	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	7	4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	7	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	12.1	44.1	44.1	44.1	11.2	32.5	11.2	32.5
Total Split (s)	13.0	57.0	44.0	44.0	21.0	42.0	21.0	42.0
Total Split (%)	10.8%	47.5%	36.7%	36.7%	17.5%	35.0%	17.5%	35.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	4.6	4.6	4.6	4.6
All-Red Time (s)	3.8	3.8	3.8	3.8	1.6	1.9	1.6	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	6.2	6.5	6.2	6.5
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	29.0	29.0	21.2	21.2	8.0	74.6	6.4	65.5
Actuated g/C Ratio	0.24	0.24	0.18	0.18	0.07	0.62	0.05	0.55
v/c Ratio	0.11	0.48	0.67	0.14	0.33	0.16	0.12	0.44
Control Delay	28.9	7.1	61.2	25.0	56.9	12.5	56.6	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.9	7.1	61.2	25.0	56.9	12.5	56.6	20.9
LOS	C	A	E	C	E	B	E	C
Approach Delay		9.2		52.0		18.5		21.2
Approach LOS		A		D		B		C
Queue Length 50th (m)	5.1	3.0	28.3	5.1	8.5	14.8	2.5	64.2
Queue Length 95th (m)	9.9	18.1	40.9	12.6	15.6	35.3	8.5	103.9
Internal Link Dist (m)		157.1		124.5		117.7		114.7
Turn Bay Length (m)			20.0				65.0	
Base Capacity (vph)	271	776	325	523	405	2955	209	2650
Starvation Cap Reductn	0	0	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	0.11	0.35	0.38	0.08	0.18	0.16	0.05	0.44

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 21.3	Intersection LOS: C
Intersection Capacity Utilization 72.8%	ICU Level of Service C
Analysis Period (min) 15	

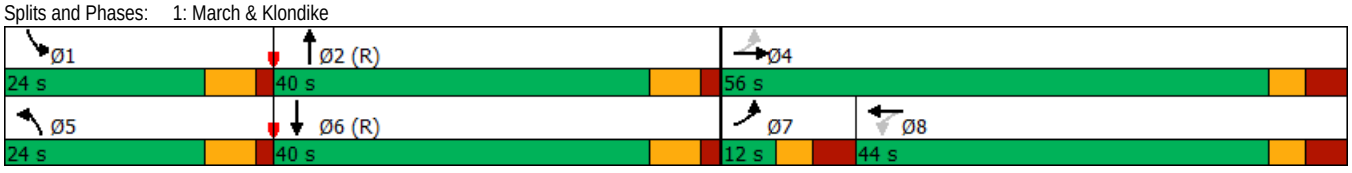
Splits and Phases: 1: March & Klondike



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	76	39	111	27	206	1421	15	508
Future Volume (vph)	76	39	111	27	206	1421	15	508
Lane Group Flow (vph)	80	155	117	50	217	1637	16	595
Turn Type	pm+pt	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	7	4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	7	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	12.1	44.1	44.1	44.1	11.2	32.5	11.2	32.5
Total Split (s)	12.0	56.0	44.0	44.0	24.0	40.0	24.0	40.0
Total Split (%)	10.0%	46.7%	36.7%	36.7%	20.0%	33.3%	20.0%	33.3%
Yellow Time (s)	3.3	3.3	3.3	3.3	4.6	4.6	4.6	4.6
All-Red Time (s)	3.8	3.8	3.8	3.8	1.6	1.9	1.6	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	6.2	6.5	6.2	6.5
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	29.4	29.4	19.8	19.8	13.2	71.3	6.7	57.6
Actuated g/C Ratio	0.24	0.24	0.16	0.16	0.11	0.59	0.06	0.48
v/c Ratio	0.30	0.33	0.61	0.17	0.60	0.57	0.17	0.26
Control Delay	34.7	11.1	57.4	25.3	57.7	20.0	57.3	21.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.7	11.1	57.4	25.3	57.7	20.0	57.3	21.3
LOS	C	B	E	C	E	B	E	C
Approach Delay		19.1		47.8		24.4		22.3
Approach LOS		B		D		C		C
Queue Length 50th (m)	15.0	7.5	26.5	5.8	25.5	70.5	3.7	28.7
Queue Length 95th (m)	21.8	18.9	37.6	13.9	36.8	#168.6	10.8	52.0
Internal Link Dist (m)		157.1		124.5		117.7		114.7
Turn Bay Length (m)			20.0				65.0	
Base Capacity (vph)	263	707	360	524	487	2854	251	2310
Starvation Cap Reductn	0	0	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	0.30	0.22	0.33	0.10	0.45	0.57	0.06	0.26

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 24.9	Intersection LOS: C
Intersection Capacity Utilization 78.5%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

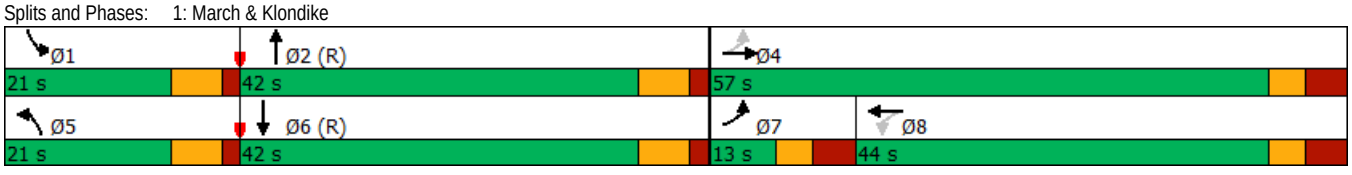
Splits and Phases: 1: March & Klondike



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	28	15	87	20	68	408	9	1186
Future Volume (vph)	28	15	87	20	68	408	9	1186
Lane Group Flow (vph)	29	268	92	36	72	487	9	1282
Turn Type	pm+pt	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	7	4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	7	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	12.1	44.1	44.1	44.1	16.2	32.5	16.2	32.5
Total Split (s)	13.0	57.0	44.0	44.0	21.0	42.0	21.0	42.0
Total Split (%)	10.8%	47.5%	36.7%	36.7%	17.5%	35.0%	17.5%	35.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	4.6	4.6	4.6	4.6
All-Red Time (s)	3.8	3.8	3.8	3.8	1.6	1.9	1.6	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	6.2	6.5	6.2	6.5
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	26.7	26.7	18.9	18.9	8.0	77.0	6.3	67.9
Actuated g/C Ratio	0.22	0.22	0.16	0.16	0.07	0.64	0.05	0.57
v/c Ratio	0.12	0.50	0.55	0.13	0.33	0.23	0.10	0.67
Control Delay	30.8	7.6	56.7	26.2	56.9	13.1	56.2	25.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.8	7.6	56.7	26.2	56.9	13.1	56.2	25.0
LOS	C	A	E	C	E	B	E	C
Approach Delay		9.9		48.1		18.7		25.2
Approach LOS		A		D		B		C
Queue Length 50th (m)	5.3	2.9	20.9	4.4	8.5	22.4	2.1	116.1
Queue Length 95th (m)	9.9	18.0	30.7	11.2	15.6	58.6	7.3	#228.2
Internal Link Dist (m)		157.1		124.5		117.7		114.7
Turn Bay Length (m)			20.0				65.0	
Base Capacity (vph)	247	776	325	521	405	2133	209	1911
Starvation Cap Reductn	0	0	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	0.12	0.35	0.28	0.07	0.18	0.23	0.04	0.67

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 22.9	Intersection LOS: C
Intersection Capacity Utilization 77.7%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: March & Klondike



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	76	35	92	25	206	1566	13	561
Future Volume (vph)	76	35	92	25	206	1566	13	561
Lane Group Flow (vph)	80	151	97	46	217	1764	14	651
Turn Type	pm+pt	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases	7	4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	7	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	1.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	8.1	44.1	44.1	44.1	16.2	32.5	16.2	32.5
Total Split (s)	12.0	56.0	44.0	44.0	24.0	40.0	24.0	40.0
Total Split (%)	10.0%	46.7%	36.7%	36.7%	20.0%	33.3%	20.0%	33.3%
Yellow Time (s)	3.3	3.3	3.3	3.3	4.6	4.6	4.6	4.6
All-Red Time (s)	3.8	3.8	3.8	3.8	1.6	1.9	1.6	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	6.2	6.5	6.2	6.5
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	28.2	28.2	18.6	18.6	13.3	71.8	10.0	58.7
Actuated g/C Ratio	0.24	0.24	0.16	0.16	0.11	0.60	0.08	0.49
v/c Ratio	0.32	0.33	0.53	0.17	0.60	0.88	0.10	0.40
Control Delay	36.1	11.0	54.9	26.2	57.4	30.1	52.7	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.1	11.0	54.9	26.2	57.4	30.1	52.7	23.3
LOS	D	B	D	C	E	C	D	C
Approach Delay		19.7		45.7		33.1		24.0
Approach LOS		B		D		C		C
Queue Length 50th (m)	15.4	6.9	22.1	5.5	25.5	144.1	3.1	48.0
Queue Length 95th (m)	21.8	18.2	31.7	13.0	36.8	#350.8	9.7	90.8
Internal Link Dist (m)		157.1		124.5		117.7		114.7
Turn Bay Length (m)			20.0				65.0	
Base Capacity (vph)	251	705	361	523	487	2005	251	1640
Starvation Cap Reductn	0	0	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	0.32	0.21	0.27	0.09	0.45	0.88	0.06	0.40

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 30.6	Intersection LOS: C
Intersection Capacity Utilization 99.8%	ICU Level of Service F
Analysis Period (min) 15	
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