

expansion
lands SECONDARY
PLAN

PLAN
SECONDAIRE **pour les**
terrains qui ont
été ajouté à
l'aire urbaine

EXISTING CONDITIONS & CONSTRAINTS REPORT

August 9, 2018



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ROCKLAND EXPANSION LANDS SECONDARY PLAN: EXISTING CONDITIONS AND CONSTRAINTS REPORT

Prepared for the City of Clarence-Rockland

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August 9, 2018

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QUALITY CONTROL

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1.0 INTRODUCTION



1.1 PROJECT OVERVIEW

The United Counties of Prescott and Russell (UCPR) Official Plan Review, completed in 2015 and adopted by the Ministry of Municipal Affairs in 2016, identified a localized shortage of residential land supply in the City of Clarence-Rockland. To address the shortage, the UCPR Official Plan identified approximately 133.5 hectares of lands to be added to the Rockland Urban Policy Area. These lands became known as the “Expansion Lands”.

Following the addition of the lands to the Urban Policy Area designation, the City of Clarence-Rockland rezoned the lands to “Special Study Area (SSA)”. The intent of the SSA zone is that lands will be developed in accordance with the results and recommendations of a Secondary Plan. In the interim, existing uses are permitted to continue, but no new uses are permitted.

In 2017, the City of Clarence-Rockland issued a Request for Proposals for the preparation of a Secondary Plan and Zoning By-law Amendment for the Expansion Lands to guide the future land uses, urban design, and infrastructure in the area. The intent of this Secondary Planning process is to create a vibrant community that features a mix of uses and a range of housing options in an urban village context.

The Secondary Planning exercise will include a land use plan, built form policies, design guidelines and a phasing strategy, and will be supported by studies and plans from relevant disciplines including a Master Servicing Study, a Community Transportation Study, an Environmental Management Plan, and a Commercial Market Research Report.



The Secondary Planning process will be integrated with the Municipal Class Environmental Assessment (EA) process. EA approval is required for municipal infrastructure such as water, sanitary and storm sewers, and roads. The integrated process allows approvals, reviews, and public consultations to be coordinated and to meet the requirements of both the EA Act and the Planning Act.

1.2 PURPOSE OF THE EXISTING CONDITIONS & CONSTRAINTS REPORT

This report is intended to provide an overview of the Expansion Lands that comprise the planning area of the Secondary Plan (the “study area”), including the policy framework, relevant studies completed to-date,

and the existing physical and environmental conditions. The document also provides an evaluation of the opportunities and constraints related to transportation and infrastructure, and the local development market.

The report will be used to inform the Secondary Plan, as appropriate. Where the final study recommendations deviate from the information provided within, the report will be used as a basis to identify required updates and amendments to City policies and processes.

1.3 THE STUDY AREA

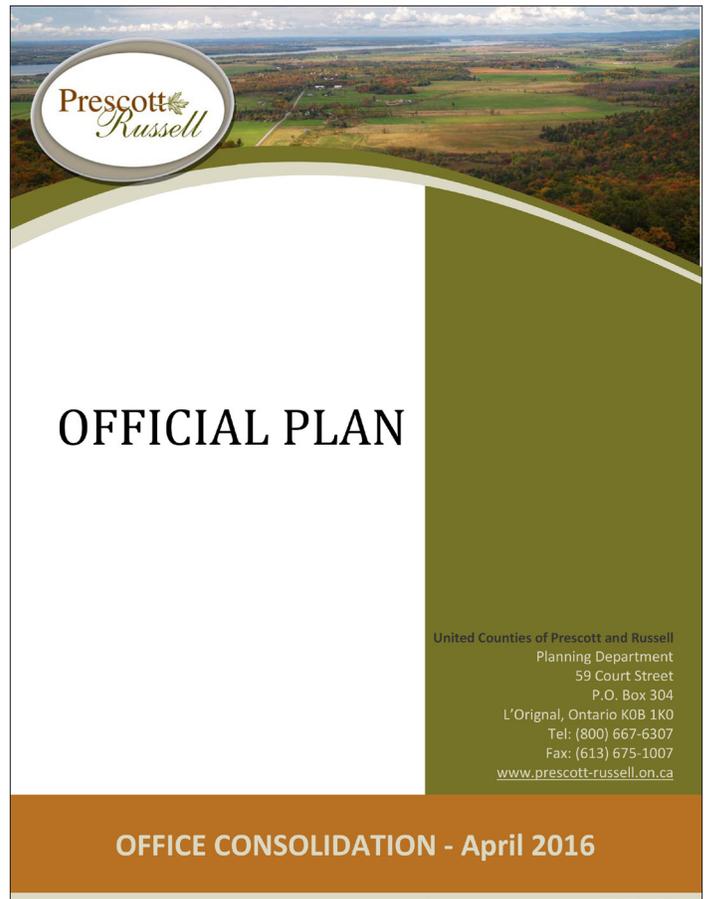
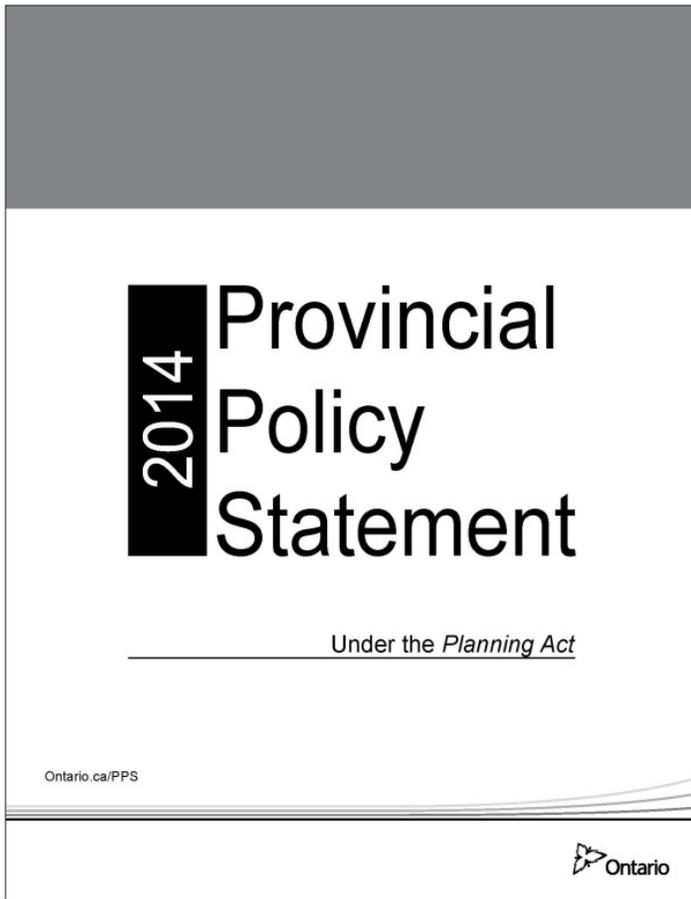
The Study Area is irregularly shaped, comprising 133.5 hectares of land southeast of Rockland's existing Urban Area Boundary. The study area includes lands south of David Street and west of Clarence Creek. It is situated mostly to the east of Caron Street, with the exception of an area of approximately 23 hectares on the west side of Caron Street in the southwest of the study area.

North of the study area is the residential neighbourhood of Rockland East and the Rockland Golf Club. Across Caron Street to the west is a future residential neighbourhood. Surrounding lands to the southwest, south, and east are used for agricultural purposes or vacant.





2.0 POLICY REVIEW



2.1 PROVINCIAL POLICY STATEMENT (PPS)

The Provincial Policy Statement (PPS) provides policy direction on matters of provincial interest related to land use planning and development. Municipalities are required to “be consistent with” the PPS with respect to any planning decisions.

Section 1.1.1 states that healthy, liveable and safe communities are sustained by:

- a. Promoting efficient development and land use patterns which sustain the financial well-being of the Province and municipalities over the long term;
- b. Accommodating an appropriate range and mix of residential (including second units, affordable housing and housing for older persons), employment (including industrial and commercial), institutional (including places of worship, cemeteries and long-term care homes), recreation, park and open space, and other uses to meet long-term needs;
- c. Avoiding development and land use patterns which may cause environmental or public health and safety concerns;
- d. Avoiding development and land use patterns that would prevent the efficient expansion of settlement areas in those areas which are adjacent or close to settlement areas;
- e. Promoting cost-effective development patterns and standards to minimize land consumption and

- f. servicing costs;
- f. Improving accessibility for persons with disabilities and older persons by identifying, preventing and removing land use barriers which restrict their full participation in society;
- g. Ensuring that necessary infrastructure, electricity generation facilities and transmission and distribution systems, and public service facilities are or will be available to meet current and projected needs; and
- h. Promoting development and land use patterns that conserve biodiversity and consider the impact of climate change.

Policy 1.1.2 requires that sufficient land shall be made available to accommodate an appropriate range and mix of land uses to meet projected needs for a time horizon of up to 20 years. Within settlement areas, sufficient land shall be made available through intensification and redevelopment and, if necessary, designated growth areas.

Section 1.1.3 requires that settlement areas shall be the focus of growth and development, and their vitality and regeneration shall be promoted. Land use patterns within settlement areas shall be based on:

- a. Densities and a mix of land uses which:
 - a) Efficiently use land and resources;
 - b) Are appropriate for, and efficiently use, the infrastructure and public service facilities which are



OFFICIAL PLAN of THE URBAN AREA
of THE CITY of CLARENCE-ROCKLAND



THE CORPORATION OF THE
CITY OF CLARENCE-ROCKLAND
ZONING BY-LAW NO. 2016-10

May 16, 2016

Prepared by



in collaboration with the
Planning Department of the
City of Clarence-Rockland
Rockland, Ontario
K4K 1P7

JLR-27025

- planned or available, and avoid the need for their unjustified and / or uneconomical expansion;
- c) Minimize negative impacts to air quality and climate change, and promote energy efficiency;
 - d) Support active transportation;
 - e) Are transit-supportive, where transit is planned, exists, or may be developed; and
 - f) Are freight supportive.

Policy 1.1.3.6 states that new development taking place in designated growth areas should occur adjacent to the existing built-up area and shall have a compact form, mix of uses and densities that allow for the efficient use of land, infrastructure and public service facilities.

Policy 1.1.3.8 stipulates that a planning authority may identify a settlement area or allow the expansion of a settlement area boundary only at the time of a comprehensive review.

Policy 1.4.3 requires that planning authorities provide for an appropriate range and mix of housing types and densities to meet projected requirements of current and future residents of the regional market area by:

- a. Establishing and implementing minimum targets for the provision of housing which is affordable to low and moderate income households.
- b. Permitting and facilitating:
 - a) all forms of housing required to meet the social,

- health and well-being requirements of current and future residents, including special needs requirements; and
- b) All forms of residential intensification, including second units, and redevelopment in accordance with policy 1.1.3.3.
- c. Directing the development of new housing towards locations where appropriate levels of infrastructure and public service facilities are or will be available to support current and projected needs;
- d. Promoting densities for new housing which efficiently use land, resources, infrastructure and public service facilities, and support the use of active transportation and transit in areas where it exists or is to be developed; and
- e. Establishing development standards for residential intensification, redevelopment and new residential development which minimize the cost of housing and facilitate compact form, while maintaining appropriate levels of public health and safety.

Policy 1.5.1 states that healthy, active communities should be promoted by:

- a. Planning public streets, spaces and facilities to be safe, meet the needs of pedestrians, foster social interaction and facilitate active transportation and community connectivity;
- b. Planning and providing for a full range and equitable distribution of publicly-accessible built and natural

settings for recreation, including facilities, parklands, public spaces, open space areas, trails and linkages, and, where practical, water-based resources.

Section 1.6 requires that infrastructure be provided in a coordinated, efficient and cost-effective manner that considers impacts from climate change while accommodating projected needs. Planning authorities should promote green infrastructure to complement infrastructure.

Policy 1.6.6.1 requires that planning for sewage and water services shall:

- a. Direct and accommodate expected growth or development in a manner that promotes the efficient use and optimization of existing municipal sewage services and municipal water services.

Policy 1.6.6.7 states that planning for stormwater management shall:

- a. Minimize, or, where possible, prevent increases in contaminant loads;
- b. Minimize changes in water balance and erosion;
- c. Not increase risks to human health and safety and property damage;
- d. Maximize the extent and function of vegetative and pervious surfaces; and
- e. Promote stormwater management best practices, including stormwater attenuation and re-use and low-impact development.

Section 1.6.7 stipulates that transportation systems should be provided which are safe, energy efficient, facilitate the movement of people and goods, and are appropriate to address projected needs. Transportation and land use considerations shall be integrated at all stages of the planning process.

2.2 COUNTY OF PRESCOTT-RUSSELL OFFICIAL PLAN (OCTOBER 2017 OFFICE CONSOLIDATION)

The Official Plan for the United Counties of Prescott and Russell provides guidance for development, while stimulating economic growth and protecting the environment and public health. As the Upper-Tier municipality, all land use planning decisions in the City of Clarence-Rockland are required to be consistent with the County Official Plan.

The Plan anticipates a total of 11,893 households in the City of Clarence-Rockland by 2035, representing an increase of 3,253 households from 2011.

Section 2.1.3 contains Sustainable Communities Objectives:

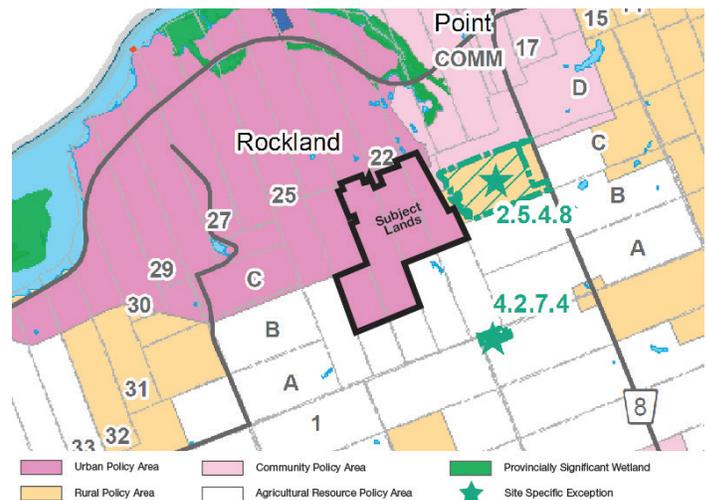
- 1. We will strengthen our communities by directing

growth and development to areas with existing or planned water and sewer infrastructures.

- 3. A three-year supply of serviced land will be maintained at all times as part of the ten-year supply of land designated for residential development.
- 4. A broad range of housing types will be permitted in order to meet the requirements of a growing population.
- 9. The distinct character of our towns, villages, hamlets and rural areas will be maintained.
- 10. Significant natural heritage sites and areas will be protected from incompatible land uses.

The expansion lands are identified as Urban Policy Area on Schedule A (Land Use Designations). The designation applies to City, Towns, and Villages with populations of 1,000 or more and which have been developed primarily on the basis of municipal water and sewer systems. The Urban Policy Area is intended to absorb a significant part of future growth in the United Counties.

Urban Policy Areas shown on Schedule A reflect the boundaries of settlement areas, as rationalized by local municipalities, to accommodate residential growth pressure focused in the western portion of the County and along the major transportation routes providing access to employment opportunities in the Ottawa area.



Schedule A - County of Prescott-Russell Official Plan

Section 2.2.5 stipulates that lot creation and development will only be permitted if there is confirmation of sufficient reserve sewage system capacity and reserve water system capacity within municipal sewage services and municipal water services, or private communal sewage and water services. Partial services are generally discouraged.

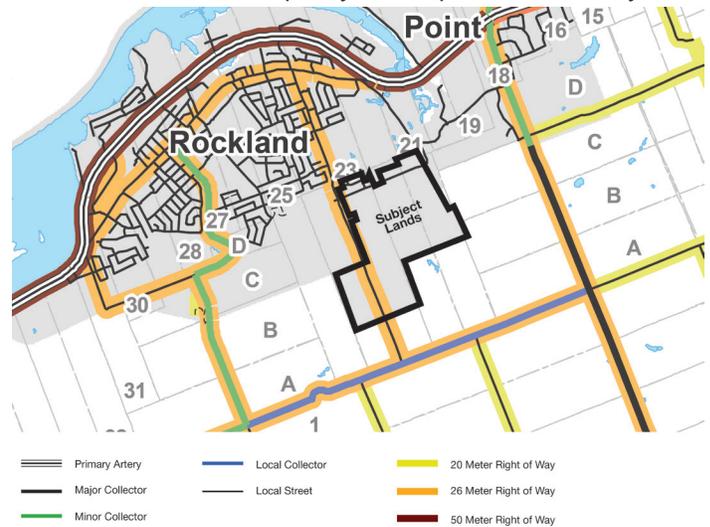
The policies of Section 2.2.6 apply to residential uses in the Urban Policy Area. Policy 1 outlines Council’s objectives for residential uses:

- a. To ensure the provision of an adequate supply of residential land;
- b. To provide for a range and mix of low-, medium- and high-density housing types to satisfy a broad range of residential requirements and ensure that affordable housing is available, but low-rise and low-density housing forms such as single-detached and semi-detached dwellings shall continue to dominate;
- c. To provide for neighbourhood facilities and amenities which are appropriate to a residential living environment;
- d. To ensure the provision of roads and other municipal services necessary to the development of functional neighbourhood areas;
- e. To encourage the addition of housing above commercial uses in and near the downtown, in residential transition areas, and in other main commercial areas;
- f. To support the development, at appropriate locations and densities, of residential facilities that meet the housing needs of persons requiring specialized care;
- g. To manage the rate of growth and the amount of residential development within the urban centre in order to maintain and enhance the small town character;
- h. To encourage residential developments which incorporate innovative and appropriate design principles which contribute to public safety, affordability, energy conservation, and that protect, enhance and properly manage the natural environment;
- i. To monitor the housing supply by reviewing new development, demolitions, intensification, and the number of affordable housing units brought on stream.

Policy 4 of Section 2.2.6 requires that zoning regulations be designed to provide for a mix of 70% low-density residential development, 20% medium density residential development and 10% high-density residential development in the Urban Policy Area. Low-density development is defined as up to 35 units per net hectare, medium-density development should not exceed 55 units per net hectare for townhouses, and apartment should represent a density of 75 units per net hectare.

A 26-metre Local Street right-of-way is shown over Caron Street on Schedule D. Local roads consist of local collectors and local streets which are publicly maintained on a year-round basis, seasonal roads, and private roads. Local roads shall generally have a minimum right-of-way width of 20 metres. However, reduced right-of-way widths may be accepted through the subdivision or condominium review process, provided that the right-of-way widths can

accommodate all of the required servicing infrastructures for the proposed development and provided that the approval authority is satisfied that the reduced widths will not result in lower quality development. Generally



Schedule D - County of Prescott-Russell Official Plan

Policies in Section 3.4.1 stipulate that development will not be encouraged where such development would result in, or could lead to, unplanned expansions to existing water and wastewater infrastructures. Development shall generally be directed to communities which can reasonably provide or extend full water and wastewater services.

Stormwater management will be required for all new development in the United Counties in accordance with guidelines which may be developed by the Ministry of Environment and Climate Change, the Ministry of Natural Resources and Forestry, the South Nation Conservation, the County, or local municipalities. Careful consideration shall be given to the use of low impact development (LID) practices for stormwater management, including the design of impervious surfaces and other factors that impact on stormwater management. Stormwater management facilities and LID practices shall be designed, where possible, to be linked with the natural heritage and open space system.

Policy 8 of Section 3.4.1 requires that the establishment of new water and wastewater servicing facilities shall be subject to Ministry of Environment and Climate Change guidelines and provincial regulations.

Lands to the immediate west, and to a limited extent the immediate east, are designated Bedrock Resources. Section 4.3.7 of the Official Plan states that the incompatible development within 500 metres of Bedrock Resource Areas shall only be permitted subject to the following criteria:

1. Adjacent to areas intended or utilized for a licensed quarry operation, a hydrogeological investigation is required to demonstrate that the proposed non-extraction development can be adequately serviced by water and sewer services in a manner which will not impede continued existing and proposed extraction operations.
2. Any other investigation as required by the development approval authority such as traffic studies, noise studies, vibration studies, slope stability studies, and air quality impact studies are carried out and demonstrate that the proposed development can proceed without impeding the continued operation of the licensed extraction operation existing licensed operations and future operations on reserves. Such studies are to be carried out by qualified professionals.

Appendix 1 of the Official Plan identifies two forested areas within the expansion lands as High Potential Hazardous Fuel Types for Wildland Fire. Section 6.10 requires that development shall generally be directed to areas outside of lands that are unsafe for development due to the presence of hazardous forest types for wildland fire. Development may be permitted in lands with hazardous forest types for wildland fire where risk is mitigated in accordance with the wildland fire assessment and mitigation standards, as identified by the Ministry of Natural Resources and Forestry.

Section 7.6 requires that local Councils provide for affordable housing by enabling a full range of housing types and densities to meet projected demographic and market requirements of current and future residents of the United Counties. Policies include:

- Ensuring a minimum 10-year supply of residential land at all times.
- Making provision for alternative housing types such as garden suites and accessory dwelling units.
- Within the Urban Policy Area, encouraging cost-effective development standards and densities for new residential development to reduce the cost of housing.
- Support regional targets by developing policies which contribute to an adequate mix of housing, including tenure and type.
- Consider building small lot singles, linked bungalows, maisonettes, quad / six-plexes, and other affordable housing forms.
- Reviewing the affordable housing component in any new development where 25 or more single and / or semi-detached dwelling units or 50 or more multi-

family dwelling units are proposed. The County will ensure that new subdivision development will provide a variety of housing types and densities to support the County housing targets.

- Implementing through the local municipality's Comprehensive Zoning By-law accessory apartments as a permitted as-of-right use in new and existing development areas as appropriate.
- Supporting the development, at appropriate locations, or residential facilities that meet the housing needs of persons requiring specialized care.

Section 7.6.3.2 of the Official Plan clarifies that the County encourages the permission of second residential units within all single detached, semi-detached, and townhouses dwelling units.

2.3 CLARENCE-ROCKLAND OFFICIAL PLAN (2014)

The City of Rockland Official Plan came into full force and effect on September 30, 2014, and is intended to direct the future development of the Urban Area of the City of Clarence-Rockland for a period of approximately 20 years to 2033.

The expansion lands are located outside of the urban area of Clarence-Rockland, as shown on Schedule A (Land Use). Accordingly, rural lands outside of the urban boundary are governed by the policies of the United Counties of Prescott Russell Official Plan. As the intention of the Secondary Plan is to include the lands inside the urban boundary, this section summarizes the policies for lands under urban designations.

Section 4.20 of the Official Plan contains policies pertaining to servicing requirements. It specifies that looping of the water distribution system shall be a priority of Council in order to ensure sufficient pressure and flow in all areas of Rockland.

Policy 1 of Section 4.20.3 stipulates that future development within Rockland must proceed on the basis of full municipal services. Council will only approve applications for development within Rockland when it is satisfied that there is sufficient capacity in both municipal piped systems to service the proposed development. The following additional services shall also be required as a condition to the approval of any development proposal in Rockland, unless otherwise indicated:

- Paved streets
- Storm sewers
- Street lighting
- Underground wiring (electricity, telephone, cablevision)
- Curbs
- Sidewalks (on one side of minor collector roads and on both sides of major collector roads)

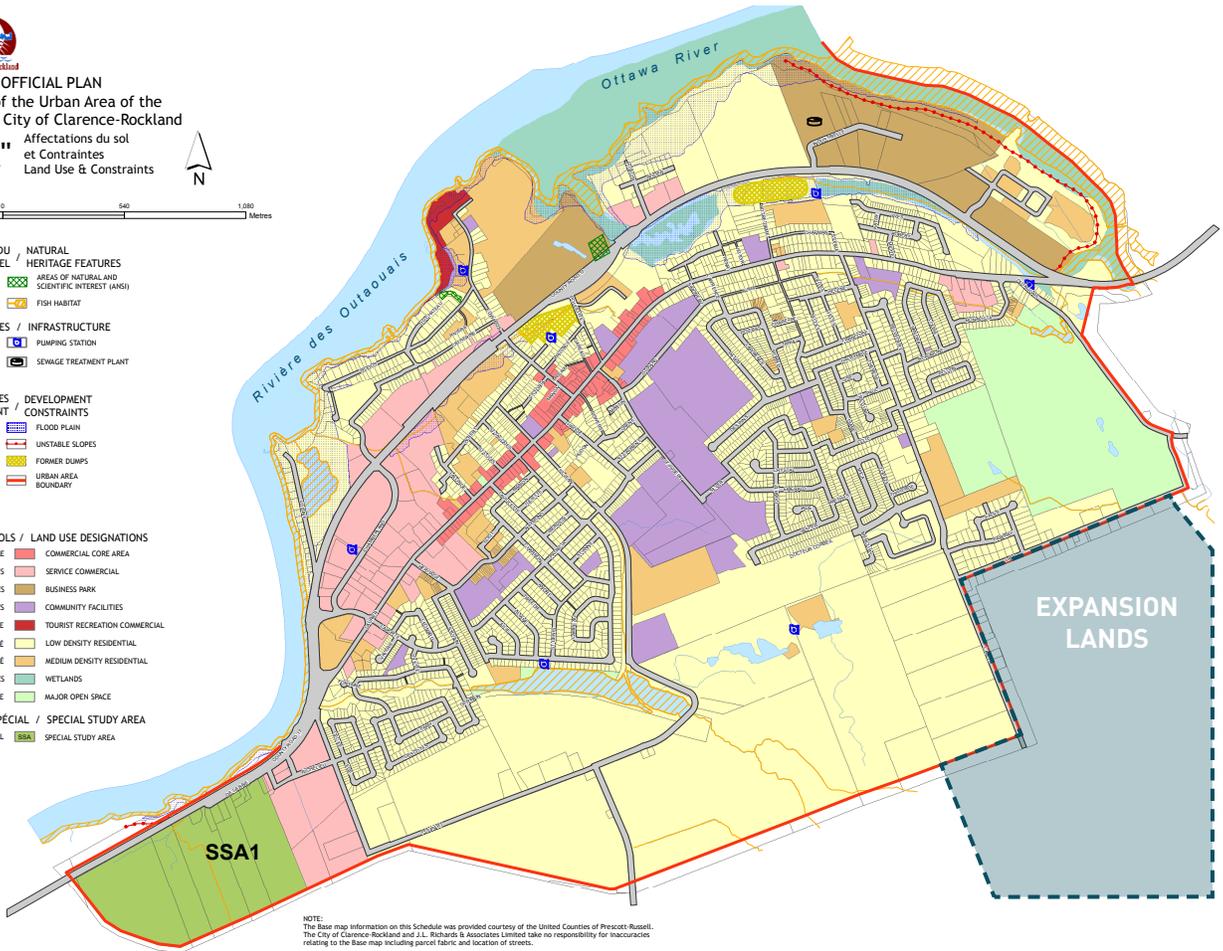


PLAN OFFICIEL / OFFICIAL PLAN
de l'aire urbaine de la / of the Urban Area of the
Cité de Clarence-Rockland / City of Clarence-Rockland
Cédule "A" Affectations du sol
et Contraintes
Land Use & Constraints

Échelle / Scale 1:7,500



ÉLÉMENTS DU PATRIMOINE NATUREL / ZONE D'INTÉRÊT NATUREL ET SCIENTIFIQUE (ZINS)	NATURAL HERITAGE FEATURES / AREAS OF NATURAL AND SCIENTIFIC INTEREST (ANSI)
HABITAT DE POISSON	FISH HABITAT
INFRASTRUCTURES / STATION DE POMPAGE DES EAUX USÉES	INFRASTRUCTURE / PUMPING STATION
	USINE D'ÉPURATION DES EAUX USÉES / SEWAGE TREATMENT PLANT
CONTRAINTES D'AMÉNAGEMENT / PLANE INONDABLE	DEVELOPMENT CONSTRAINTS / FLOOD PLAIN
	PENTES INSTABLES / UNSTABLE SLOPES
	ANCIENS DÉPÔTIS / FORMER DUMPS
	LIMITE DU SECTEUR URBAIN / URBAN AREA BOUNDARY
AFFECTATIONS DES SOLS / SECTEUR COMMERCIAL CENTRE-VILLE	LAND USE DESIGNATIONS / COMMERCIAL CORE AREA
	COMMERCE DE SERVICES / SERVICE COMMERCIAL
	PARC D'AFFAIRES / BUSINESS PARK
	INSTALLATIONS COMMUNAUTAIRES / COMMUNITY FACILITIES
	COMMERCE RÉCRÉATIF / TOURIST RECREATION COMMERCIAL
	RESIDENTIELLE À FAIBLE DENSITÉ / LOW DENSITY RESIDENTIAL
	RESIDENTIELLE À MOYENNE DENSITÉ / MEDIUM DENSITY RESIDENTIAL
	TERRES HUMIDES / WETLANDS
	ESPACE OUVERT DE GRANDE ÉTENDUE / MAJOR OPEN SPACE
SECTEUR D'ÉTUDE SPÉCIAL / SECTEUR D'ÉTUDE SPÉCIAL	SPECIAL STUDY AREA / SPECIAL STUDY AREA



NOTE:
The Base map information on this Schedule was provided courtesy of the United Counties of Prescott-Russell. The City of Clarence-Rockland and J.L. Richards & Associates Limited take no responsibility for inaccuracies relating to the Base map including parcel fabric and location of streets.

JLR No. 12011
Préparé: NOVEMBRE 19, 2011
Révisé: NOVEMBRE 19, 2011

Schedule A - Clarence-Rockland Official Plan

- Bicycle paths
- Natural gas
- Bus shelters
- Landscaping

Council will establish and implement the proper phasing policies in order to ensure the timely provision of infrastructure and public service facilities.

Section 4.27 notes that stormwater management plans are required for draft plan approval of subdivision and site plan approvals in the municipality to foster sustainability of urban watersheds and provide opportunities for the enhancement of watercourses.

Section 5.6 contains policies for the Residential land use designations, which are anticipated to apply to the majority of the expansion lands. The designation encourages a mix of housing types and tenures, such as single ownership, cooperatives, condominiums and rental. Some complementary non-residential uses are also permitted.

The Plan states that the residential portion of Rockland is planned in neighbourhoods. In each neighbourhood, low density residential is the predominant use, but there could also be medium density residential components, local convenience commercial uses and neighbourhood parks.

The Official Plan requires a range of housing types throughout Rockland. The purpose of the policy is to avoid uniformity of housing types in new development areas. When reviewing development applications that proceed by plans of subdivision, Council shall require a variety of housing types. All major subdivisions are expected to have medium density residential units comprise at least 10 percent of the proposed units. In order to promote energy conservation, the Plan suggests that new subdivisions should consider solar orientation of streets, lots and buildings.

The Low Density Residential land use policy designation permits single-detached dwellings, semi-detached dwellings, doubles and duplex dwellings to a maximum of 16 units per net hectare. Small-scale commercial, park, school, place of worship and / or community facilities serving a local residential area. A variety of lot sizes are encouraged.

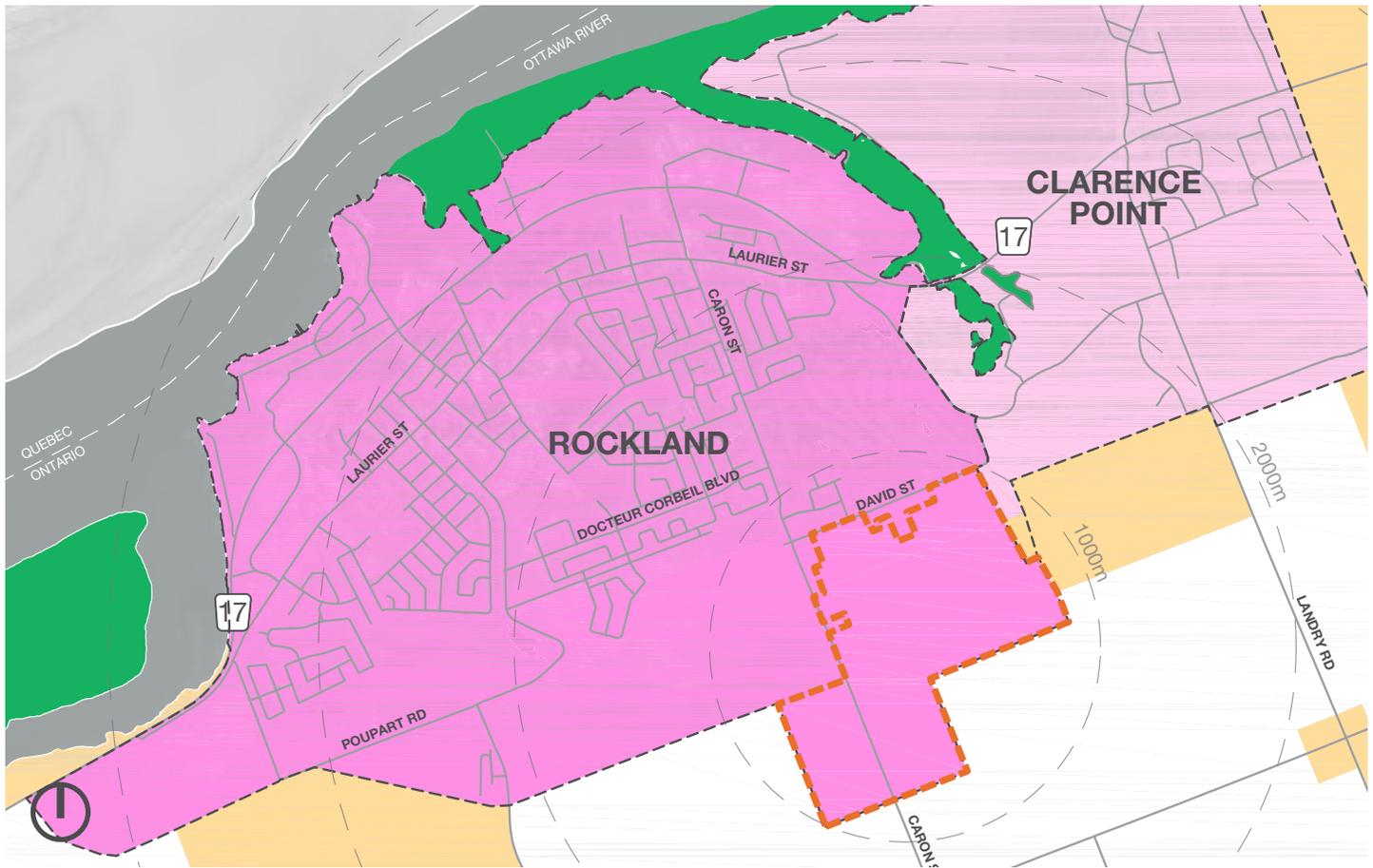
The Medium-Density Residential designation permits multiple-unit residential uses such as townhouses and small apartment buildings no more than five storeys in height, to a maximum of 30 units per net hectare.



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3.0 STUDY AREA ANALYSIS



Land Use

3.1 LAND USE

The majority of the expansion lands are currently used for agricultural activities. These agricultural properties front onto David Street to the north and Caron Street to the west, and are used for the growing of crops.

The smaller properties along the north and west perimeter of the expansion lands are developed with low-density detached residential dwellings. The sizes and configurations of the lots accommodating these residential uses vary, but are generally narrow and rectangular.

Immediately adjacent to the expansion lands across David Street to the north is the Rockland East residential subdivision with approximately 50-60 residential properties. A more extensive residential subdivision is located northwest of the expansion lands on the west side of Caron Street.

North and east of the expansion lands is the Rockland Golf Club. The club features 27 holes and extends from Highway 17 in the north to east of David Street northeast of the expansion lands.

The lands west of the expansion lands are designated for low-density residential development in the Official Plan, and are anticipated to be developed in the future.

3.2 NEIGHBOURHOOD CONTEXT

The expansion lands are located adjacent to a predominantly residential area, but nearby a range of community amenities including:

- Rockland District High School
- Carrefour Jeunesse
- École secondaire catholique L'Escale
- École élémentaire catholique Sainte-Trinité
- St. Patrick Catholic School
- Simon Park

LEGEND

- STUDY AREA / ZONE À L'ÉTUDE 
- URBAN POLICY AREA
SECTEUR DES POLITIQUES URBAINES 
- COMMUNITY POLICY AREA
SECTEUR DES POLITIQUES COMMUNAUTAIRES 
- RURAL POLICY AREA
SECTEUR DES POLITIQUES RURALES 
- PROVINCIALY SIGNIFICANT WETLAND
TERRE HUMIDE D'IMPORTANCE PROVINCIALE 
- AGRICULTURAL RESOURCE POLICY AREA
SECTEUR DES POLITIQUES DES RESSOURCES AGRICOLES 



Nearby Amenities

- Club de Golf Rockland
- Clarence-Rockland YMCA-YWCA
- Jean-Marc Lalonde Arena
- Commercial shopping areas

3.3 TRANSPORTATION

CIMA+ has prepared a Transportation Memo summarizing existing conditions for the expansion lands. The Memo summarizes existing infrastructure for pedestrian, cycling, and vehicular transportation in the community.

The expansion lands are bordered by David Street to the north and Caron Street to the west. David Street is a two-lane road running east from Caron Street and terminating at Tucker Road/Montée Outaouais. Caron Street is a two-lane north-south road connecting to Highway 17 in the north and to Baseline Road in the south. Caron Street has an urban cross-section north of the Expansion Lands before transitioning to a rural cross-section at David Street.

Highway 17 is a County road that provides a major transportation link to both Ottawa and Montreal, as well as other areas of the United Counties of Prescott and Russell. The highway is a two-lane east-west arterial road

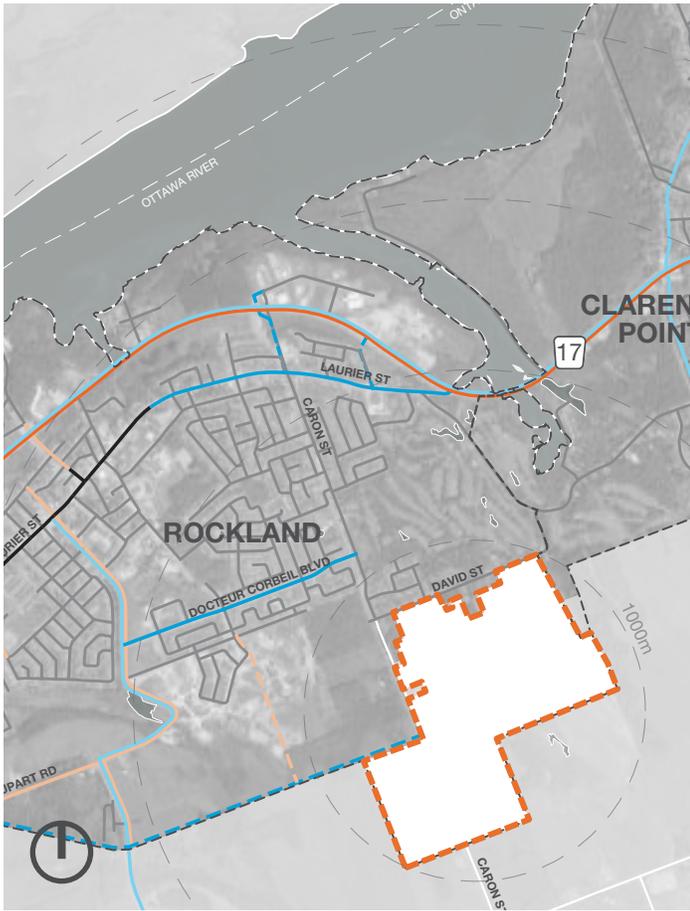
however an Environmental Assessment completed in 2016 recommended the widening of this roadway from Highway 417 in the City of Ottawa in the west, to Landry Road, east of Rockland in the east.

Baseline Road, located south of the expansion lands, is a two-lane collector with a rural cross section.

Some local roads within the city are identified as potential candidates for widening in the Official Plan. For example, a right-of-way widening is contemplated for David Street.

LEGEND

- SITE
- RECREATIONAL SPACE
- EDUCATION
- MEDICAL
- INSTITUTION
- SPIRITUAL
- COMMUNITY
- HOSPITALITY
- COMMERCIAL
- MUSEUM/GALLERY
- GOLF COURSE



Street Hierarchy

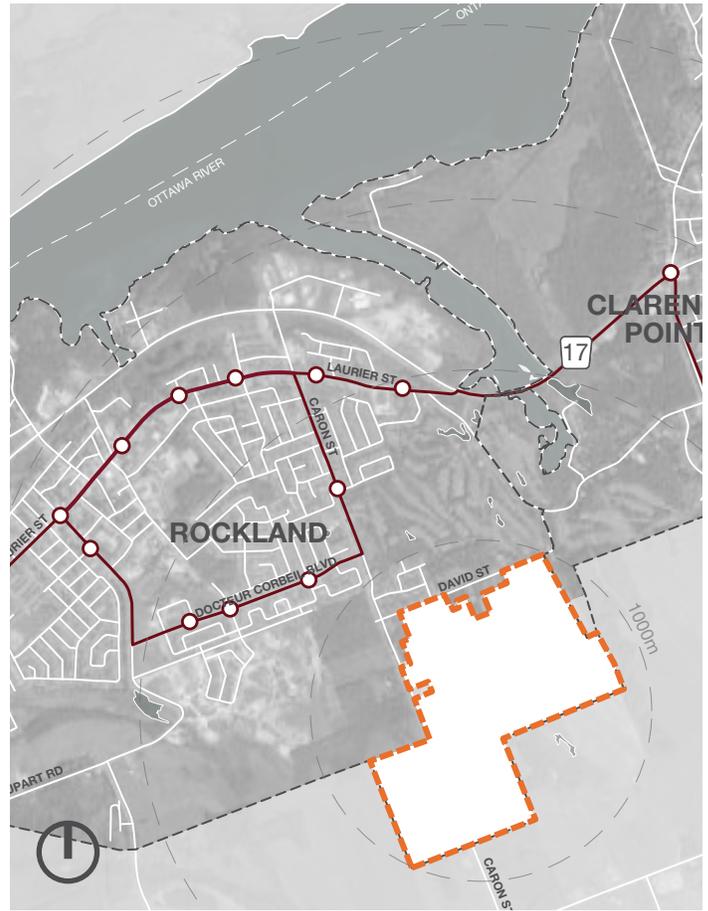
As established in the Official Plan, the incorporation of dedicated pedestrian facilities may be considered at the time of road reconstruction.

While capacity varies with time of day, the majority of intersections in the vicinity of the expansion lands have a Level of Service (LOS) of A or B, signifying “Very Good” or “Good.”

Limited public transportation is available in Clarence-Rockland, but is not currently provided in the vicinity of the expansion lands. The bus service links Clarence-Rockland with Ottawa and Gatineau.

Pedestrian facilities are generally not provided along local streets or roads with rural cross-sections. However, crosswalks are provided at major intersections such as Caron Street at Highway 17, and Caron Street at Laurier Street. Along major arterials, pedestrians and cyclists will be accommodated by multi-use pathways, paved shoulders and service roads along the corridors. Some local streets have midblock crossings and / or pedestrian refuge boulevards.

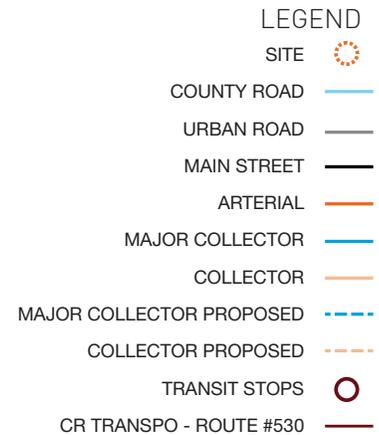
A paved asphalt path is provided along the east side of Caron Street, extending from Highway 17 in the north to David Street in the south. The City has designated this

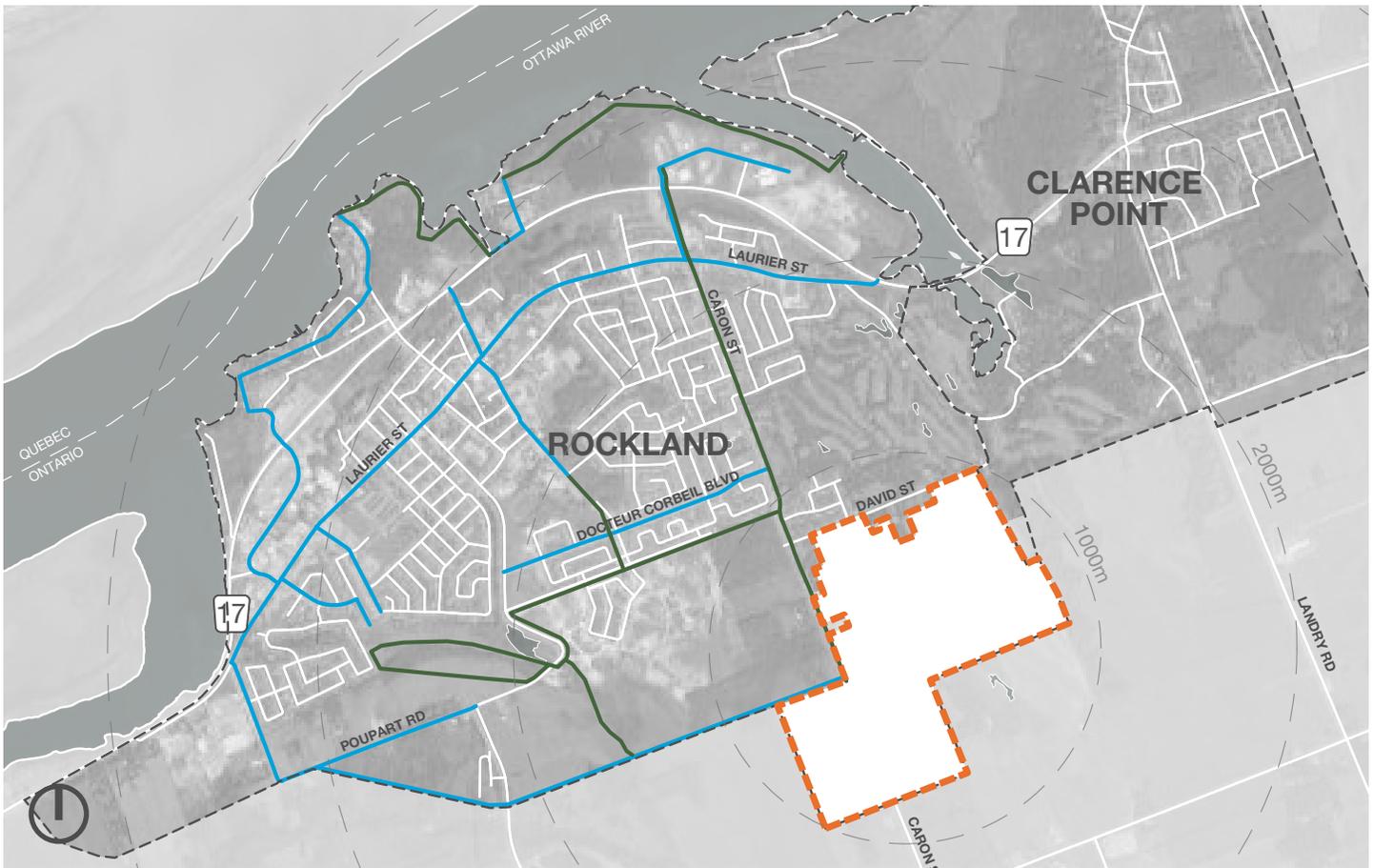


Existing Commuter Transit Service

path as a multi-use pathway, and bicycle symbols are indicated on the pavement. An east-west bicycle corridor is located along Docteur Corbeil Boulevard north of the expansion lands. “Sharrow” markings are indicated on the pavement where on-street parking is provided.

The City of Clarence-Rockland is currently undertaking a Transportation Master Plan (TMP) and Active Transportation Plan (ATP) to meet the anticipated growth and demand of the transportation network by all road users, including vehicles, cyclists and pedestrians. Both plans will inform the update to the Strategic Transportation Plan for the Urban Area.





Pedestrian and Cyclist Connections

3.4 SERVICING AND INFRASTRUCTURE

CIMA+ has prepared an Existing Conditions Analysis for civil servicing for the expansion lands examining water, sanitary sewer, and stormwater management for the expansion lands.

The analysis notes that the capacity of the water treatment plant exceeds current normal usage. Initial information suggests that an additional 4,676.6 cubic metres per day of treated water can be produced by the water treatment plant in support of the expansion area.

It is anticipated that the expansion lands can be serviced by the Caron Street Booster Station and the Bouvier Water Tower according to the Serviceability Study for Morris Village Stage 5 (October 2017). While initial information confirms that the Caron Street Booster Station currently has excess capacity of 3,975 cubic metres per day, further information for existing boundary conditions and the dedicated watermain booster line to the Bouvier Water Tower is required for additional analysis. Capacity for fire flow has not yet been determined.

Sanitary flows from development on the expansion lands will be directed to the wastewater treatment plant for the Clarence-Rockland serviced area. As the existing plant

does not allow for adequate retention time for chlorination during peak flow periods, the City will be undertaking appropriate upgrades to the headworks and equalization tank infrastructure.

A total of seven pump stations serve the sanitary system, with an eighth currently being designed. Improvements to Pumping Station No. 1, the largest in the city, are also proposed, which are anticipated to create sufficient capacity to allow for development on the expansion lands. Capacity in the surrounding sanitary system, including along Caron Street, has yet to be confirmed.

A portion of the expansion lands fall within the catchment area of the catch basin and storm sewer system on Caron Street. The balance of the expansion lands drain to Clarence Creek or Lafontaine Creek along the path of least resistance. A dual drainage system will be implemented in the expansion lands, with a minor piped

LEGEND

- SITE 
- MULTI-USE PATH (OFF-STREET) 
- MULTI-USE PATH (SIDEWALK) 
- BIKE LANE 



Natural Features

system and a major overland flow system. Further analysis and detailed design details will become available as the project progresses.

3.5 ENVIRONMENTAL FEATURES

CIMA+ has prepared an Existing Conditions Analysis for environmental features on the expansion lands. The purpose of the study is to identify the site's general ecological features and constraints and to assist in future analyses of development options.

The study was performed using various public sources as part of a desktop study, as well as direct correspondence with Staff from the Natural Heritage Information Centre (NHIC). Additional requests for information have been submitted to the South Nation Conservation Authority (SNCA) and the Ministry of Natural Resources and Forestry (MNR). Field investigations by trained environmental technicians and biologists will be undertaken at a time of year appropriate for proper identification of flora and fauna.

The expansion lands are underlain by a combination of till, fine-textured glaciomarine, organic and alluvial deposits,

as well as overlaying Paleozoic bedrock. Typical soils in these units are comprised of clay, sand, and silt.

Clarence Creek, a tributary to the Ottawa River, flows north along the eastern edge of the site. Several wetlands are located on and adjacent to the expansion lands, including Clarence Creek Swamp, South Rockland Swamp, Estates Swamp, and Rockland Marsh. Rockland Marsh is a provincially significant wetland land, as evaluated in 1999. There are no Areas of Natural and Scientific Interest (ANSI) within, or in proximity to, the expansion lands.

There is the potential for Species at Risk (SAR) to be present on the expansion lands, to be confirmed during field investigations.

Environmental features will be examined in greater detail as the project progresses.

LEGEND

- SITE 
- WETLAND 
- WOODLAND 
- FISH HABITAT 

3.6 MARKET OVERVIEW

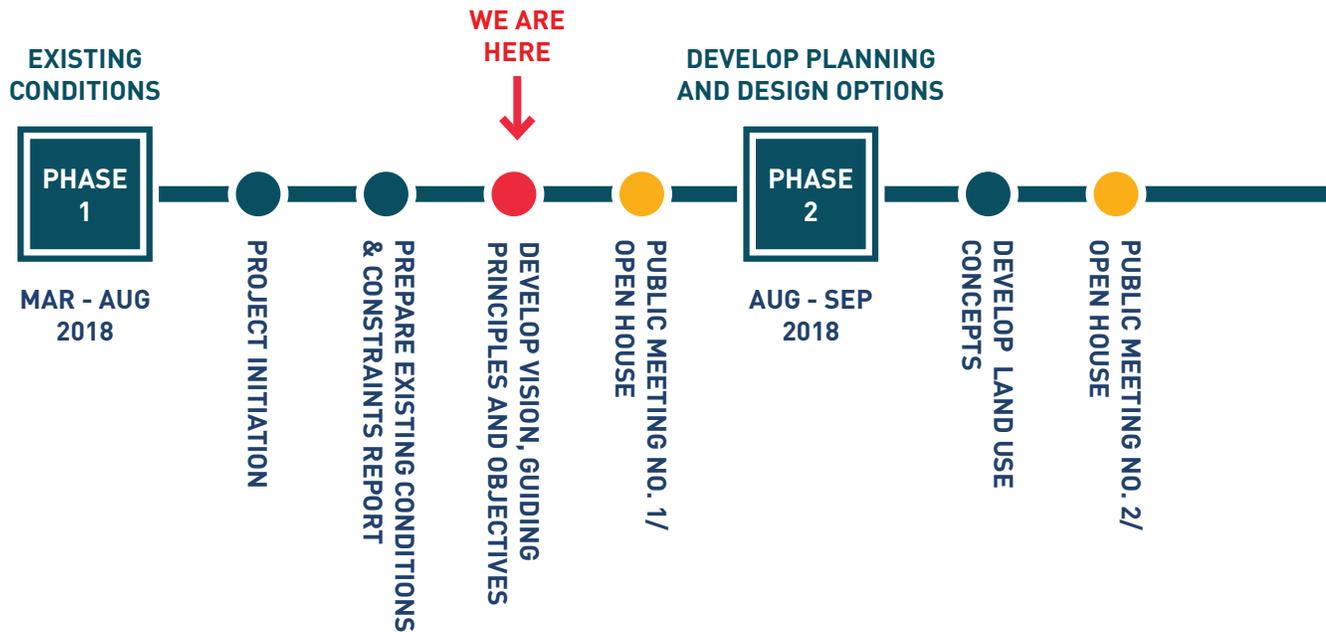
Shore Tanner & Associates (“Shore Tanner”) has prepared a Retail Market Demand Study for Clarence-Rockland to determine the scope of market demand for retail, service, and small office businesses within the expansion lands area.

Based on knowledge of the area, Shore Tanner defines the City of Clarence-Rockland as the Primary Trade Area, which typically accounts for 50% of total sales. The United Counties of Prescott and Russell would be considered a Secondary Trade Area, accounting for the balance of sales in a given business.

The study outlines current trends in retail markets, including shopping patterns and store types. It notes that contemplation of retail uses in the expansion lands must consider critical trends, such as: targeted use of social media, online services, a better understanding of the retail market trends, more awareness of competition from shopping centres and districts, and better recognition of the needs, preferences, and desires of the Trade Area residents.

The study suggests that the most market-viable types of office businesses in the expansion lands would be those that serve the residents of the broader area. While government, corporate, or any specialty-type office developments are possible, they are not a reliable market segment for office tenants.

4.0 SUMMARY OF CONSIDERATIONS



The above analysis of existing conditions provides an important baseline for the preparation of the Secondary Plan for the expansion lands. Specific items for consideration going forward include:

- Area land uses;
- UCPR Official Plan target for 70% low-density, 20% medium-density and 10% high-density residential development in the Urban Policy Area designation;
- Rockland Official Plan target of 10% medium density residential within new subdivisions;
- Rockland Official Plan defines low density as up to 16 units per net hectare, and medium density as up to 30 units per net hectare;
- Upgrades potentially required to the potable water service network to support development on the expansion lands;
- Timing of upgrades to the existing wastewater treatment plant;
- Capacity related to the sanitary transmission lines to service the expansion lands development area
- Future widening/modification of Highway 17;
- Limited pedestrian and cycling network connections to the existing urban area and major destinations;
- Potential widening of Caron Street and David Street;
- Adjacency of Clarence Creek and other water courses;

- Potential for species at risk habitat on-site;
- Existing wooded areas; and,
- Anticipated market community-serving retail uses.

These items will remain critical matters for consideration during the development of the Secondary Plan and the preferred land use concept.

**PREPARATION OF
SECONDARY PLAN**

**PHASE
3**

OCT - NOV
2018

PREFERRED CONCEPT PLAN AND
DETAILED DESIGN GUIDELINES

DRAFT SECONDARY PLAN

PREPARE SUPPORTING SERVICING,
TRANSPORTATION, AND ENVIRONMENTAL
MANAGEMENT PLANS

INITIATE OFFICIAL PLAN AMENDMENT
PROCESS

PUBLIC MEETING NO. 3/
OPEN HOUSE

IMPLEMENTATION

**PHASE
4**

DEC 2018 -
JAN 2019

STATUTORY PUBLIC
MEETING NO. 4

ADOPTION OF EXPANSION LANDS
SECONDARY PLAN AMENDMENT

APPENDIX A: TRANSPORTATION ANALYSIS

MEMO

TO: City of Clarence-Rockland
CC: Paul Black, MCIP RPP - FOTENN
FROM: Matthew Radaelli, Dipl.T. - CIMA+
REVIEWED BY: Gordon Scobie, P.Eng. - CIMA+
DATE: 13 July 2018
SUBJECT: Expansion Lands Existing Conditions Analysis - Transportation

1 Background

The purpose of this report is to assess the existing network capacities for vehicles, cyclists, and pedestrians and to highlight the existing transportation and traffic related conditions in the surrounding area of the subject Expansion Lands within the City of Clarence-Rockland.

It is understood that the City is also concurrently undertaking a Transportation Master Plan (TMP), as well as an Activate Transportation Plan (ATP) in order to meet the anticipated growth and demand of the transportation network by all road users, including vehicles, cyclists and pedestrians in the near future. Both plans will serve as an update to the Strategic Transportation Plan for the Urban Area of the City of Clarence-Rockland, which was completed in 2005.

1.1 Study Area

The City of Clarence-Rockland is located within the United Counties of Prescott and Russell, and is situated along Highway 17 (HWY 17), approximately 40 km east of the City of Ottawa's downtown. The Ottawa River is located immediately north while the United Counties of Stormont, Dundas, and Glengarry are located further south. An interprovincial connection between Ontario and Quebec is provided via a seasonal ferry (does not operate during winter months), which provides a link between Thurso, Quebec and Clarence-Rockland. Alternative interprovincial connections are provided via a bridge connection in the east (linking Hawkesbury, Ontario and Grenville, Quebec) or a four season ferry in the west (linking Cumberland, Ontario and Masson-Angers, Quebec), which operates 24 hours a day, 7 days a week.

The location of the Secondary Plan Expansion Lands, in relation to the greater City of Clarence-Rockland is illustrated in **Figure 1**.



Figure 1: Study Area

As depicted in **Figure 1**, the subject expansion lands include area south of David Street and west of Clarence Creek. It is situated mostly to the east of Caron Street, with the exception of an area of approximately 23 hectares on the west side of Caron Street in the southwest of the study area. The Rockland Golf Club and the residential neighbourhood of Rockland East are located to the north of the study area. A future residential neighbourhood is projected to be developed in the lands located west of the study area, as the lands are designated for low density residential develop as per the Clarence-Rockland Official Plan (OP).

The foregoing further describes the existing transportation network within the City of Clarence-Rockland.



2 Existing Transportation Network

2.1 Study Area Road Network

The roads within the greater study area are under a combination of jurisdictions, including the Counties of Prescott and Russell, and the City of Clarence-Rockland. The following is a summary of the roads within the greater study area of the proposed Secondary Plan boundaries, and the role these roadways play in the greater road network.

HWY 17: is a 2-lane east-west arterial road with a posted speed limit of 70 km/h designated under the Counties of Prescott and Russell's jurisdiction that is continuous between the County limits. HWY17 provides a major transportation link between the Ottawa region and the Greater Montreal area community, as well as providing direct access within the Counties of Prescott and Russell.

Caron Street: is a 2-lane north-south major collector road. A posted speed limit of 50 km/h is present from the north extension of the road at its intersection with HWY 17 to 500 metres south of David Street. South of David Street, Caron Street extends to Baseline Road with a posted speed limit of 80 km/h. A centre two-way-left-turn lane is currently provided along Caron Street between HWY 17 and David Street, which provides refuge for left-turn movements to/from a number of local roads and adjacent land uses.

Docteur Corbeil Boulevard: is a 2-lane east-west major collector road with a posted speed limit of 50 km/h. In the west, Docteur Corbeil Boulevard extends from St. Jean Street (as a 'T' intersection) and terminates at Caron Street in the east (as a 'T' intersection).

Laurier Street: is a 2-lane east-west major collector road with a posted speed limit of 50 km/h. In the west, Laurier Street extends from Popuart Road to HWY 17 in the east (as an unsignalized 'T' intersection). On-street parking is provided on both the north and south sides of Laurier Street where residential housing is provided.

David Street: is a 2-lane east-west local street with a posted speed limit of 50 km. In the west, David Street extends from Caron Street (as a 'T' intersection) to Tucker Road/Montée Outaouais in the east (as a 'T' intersection). David Street primarily serves a small residential and agricultural land uses.

Baseline Road: is a 2-lane local collector with a posted speed limit of 80 km/h and a rural cross section. In the west, Baseline Road extends from Canaan Road to Division Road in the east.



2.2 Study Area Intersections

Caron Street at HWY 17 is a four legged signalized intersection. Auxiliary left-turn lanes are provided in all directions, and auxiliary right-turn lanes are provided in the eastbound and westbound directions. A single lane is provided for through movements in all directions, with northbound and southbound through movements shared with right-turns.

Crosswalks with pedestrian actuated signals are provided for all crossing directions.



Caron Street at Laurier Street is a slightly skewed, four legged signalized intersection. Auxiliary left-turn lanes are provided in all directions. A single shared through/right-turn lane is provided in all directions.

Crosswalks with pedestrian actuated signals are provided for all crossing directions.



Caron Street at Hélène Street is a three legged sidestreet stop-controlled intersection. An auxiliary northbound left turn lane is provided as an extension of the continuous left-turn lane along Caron Street.

No pedestrian crosswalks are provided at the intersection. This intersection is similar to most local residential roads intersecting with Caron Street within the study area.



Caron Street at Docteur Corbeil Boulevard is a three legged side street stop-controlled intersection. A continuous centre left-turn lane is provided through the intersection along Caron Street.

A pedestrian crossing is provided on the west side of the intersection. Bicycle lanes are provided along Docteur Corbeil Boulevard.



Caron Street at David Street is a three legged all-way stop controlled intersection. An auxiliary southbound left-turn lane is provided as an extension of the continuous left-turn lane along Caron Street.

No Pedestrian crosswalks are provided at the intersection.



Caron Street at Baseline Road is a three legged side street stop controlled intersection, with southbound vehicles along Caron Street required to stop. No auxiliary lanes are provided at the intersection.

No pedestrian crosswalks are provided at the intersection.



2.3 Planned Network Modifications

An Environmental Study Report was prepared by AECOM in June of 2016 for the proposed widening of HWY 17¹. Within the City of Clarence-Rockland, the proposed improvements included widening the existing HWY 17 as well as potentially widening/improving Baseline Road outside of the City Urban Boundary.

The recommended plan is to widen the highway from one lane in each direction to two lanes in both directions from east of the Trim Road interchange in the City of Ottawa, for a distance of approximately 21.5 km to Landry Road in the City of Clarence-Rockland. The speed limit within the segment would vary between 60 – 80 km/h. A conceptual design of the cross-section within the urban area of the City is illustrated in **Figure 2**.

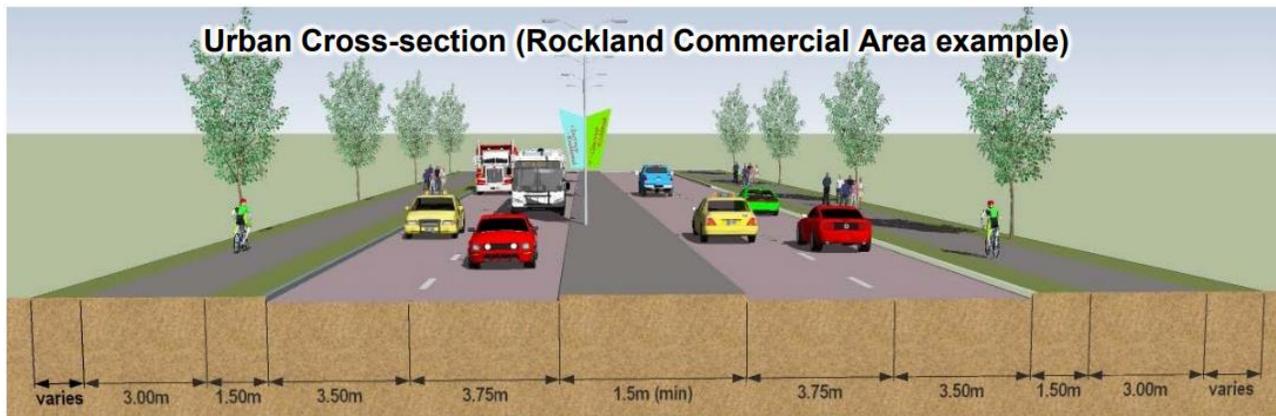


Figure 2: Conceptual Urban Cross-Section within the City of Clarence-Rockland

Pedestrians and cyclists will be accommodated by multi-use pathways, paved shoulders and service roads along the corridor. Pedestrian crossing treatments are proposed to be used within the commercial zone in the City.

2.4 Existing Active Transportation

Active transportation facilities were reviewed to gain an understanding of existing pedestrian and cycling facilities within the greater City area. The City acknowledges that protecting and expanding the existing pedestrian and bicycle network in the City is essential to creating quality of place. Existing policies within the City's Official Plan are anticipated to be expanded with the future TMP and ATP currently being updated.

Pedestrian Facilities

A sidewalk, approximately 2.2 m in width is provided along the west side of Caron Street, while a paved asphalt path approximately 3.0 m in width along the east side of this roadway, both extending from HWY 17 in the north and terminating at David Street in the south. The asphalt path is recognized as an 'off-street multi-use path' according to the Clarence-Rockland Official Plan; however, there is no signage is present along the asphalt path (based on Google Streetview imagery) to indicate its use as a 'multi-use' path which is typically associated with wide paved asphalt pathways.

¹ Environmental Study Report Ottawa Road 174 / County Road 17 Environmental Assessment Study, AECOM, June 2016

Two (2) midblock crossing treatments are present along Caron Street connecting to local trails, as illustrated in **Figure 3**. Midblock crossing treatments have 'zebra' type pavement markings, side-mounted pedestrian crossover signs (Ra-5LR) on both sides of the road facing both directions, and pedestrian refuge islands. These midblock crossing treatments offer the only opportunity for pedestrians to cross Caron Street, with the exception of the east-west crosswalk provided at the signalized HWY 17/Caron and Laurier/Caron intersections.



Figure 3: Midblock Pedestrian Crossing (Caron Street north of Hélène Street)

Sidewalks are primarily located along collector roadways within the City, such as Laurier Street, St. Joseph Street, St. Jean Street, Heritage Drive, etc. Most local residential streets within the City do not have pedestrian facilities. An example of absent sidewalks along local roadways is depicted in **Figure 4**.

Some local roads within the City are identified as potential candidates for road widening as per the Official Plan (e.g. David Road is a candidate for widening). As defined in the City's Official Plan², the addition of dedicated pedestrian facilities should be considered at the time when road reconstruction projects are being undertaken within the City's urban area.

² Official Plan of the Urban Area of the City of Calrence-Rockland, Section 7.11 Pedestrian Policies



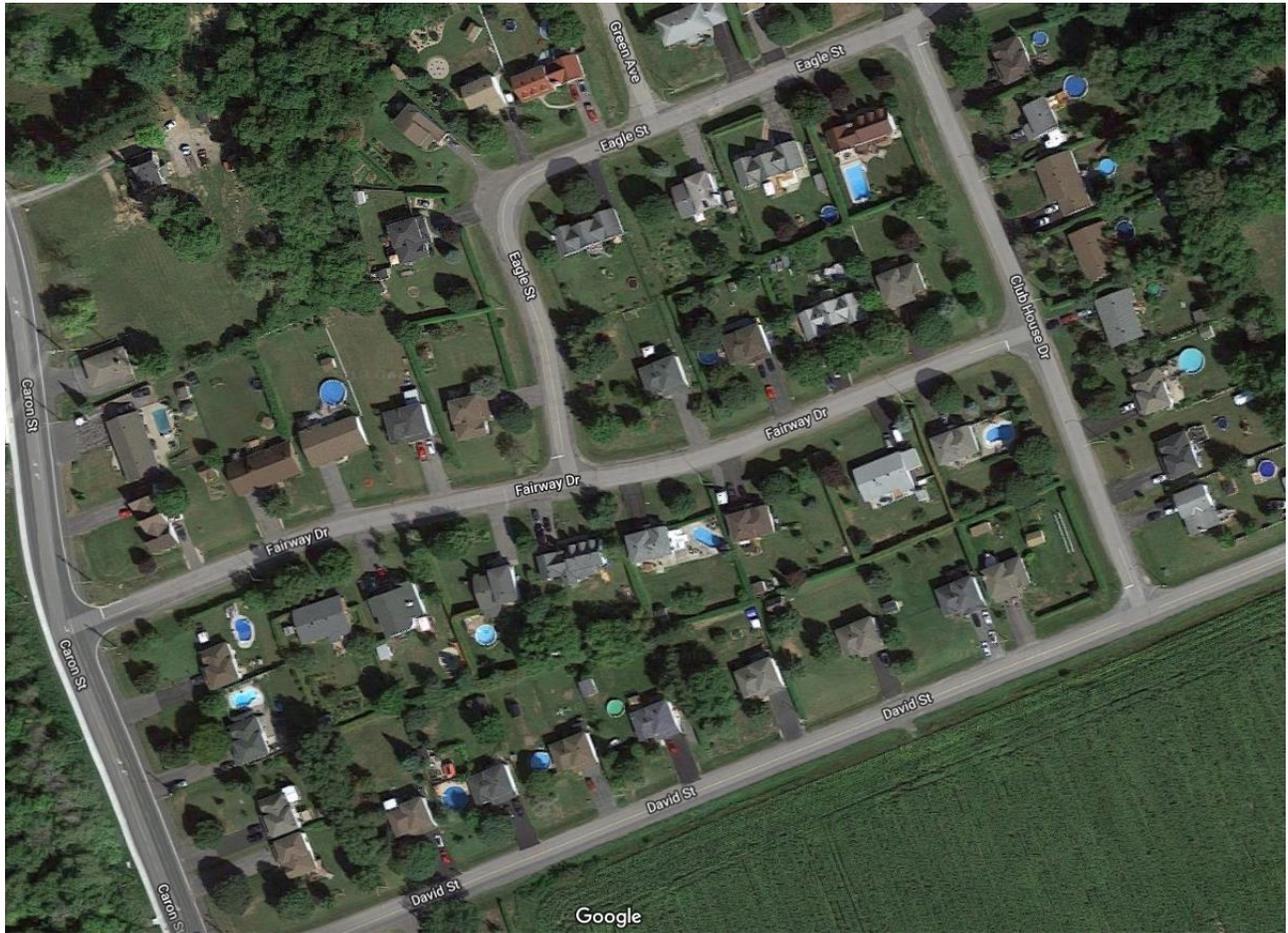


Figure 4: Absence of sidewalks north of David Rd

Cycling Facilities

As mentioned previously, a paved asphalt path is provided along the east side of Caron Street, extending from HWY 17 in the north and terminating at David Street in the south. The City has designated this path as a 'multi-use' facility; however, the elements attributed to it are more recognizable with a dedicated cycling facility, such as a two-way cycle-track. The width of the asphalt path is approximately 3.0 metres, with a solid yellow centre-line running down the centre. Bicycle lane pavement markings are provided in both directions, as illustrated in **Figure 5**.





Figure 5: Paved Asphalt Pavement Markings – Caron Street South of HWY 17

Cyclist crossing facilities are also provided in multiple locations along Caron Street. Crossing facilities have custom double-sided bicycle crossing signage present on both sides of the road to alert oncoming vehicles. Dashed pavement markings as well as directional arrows are present, which provide positive guidance for crossing cyclists, as illustrated in **Figure 6**.



Figure 6: Cyclist Crossing Facilities – Caron Street

Bicycle lanes are provided in the east and westbound directions along Docteur Corbeil Boulevard. As depicted in **Figure 7**, bicycle lanes are shown to terminate when on-street parking is provided for the adjacent residential units, and 'Sharrow' pavement markings are provided within the centre of the travel lane to guide cyclists as to where they should ride within a travel lane, shared by both motorists and cyclists.



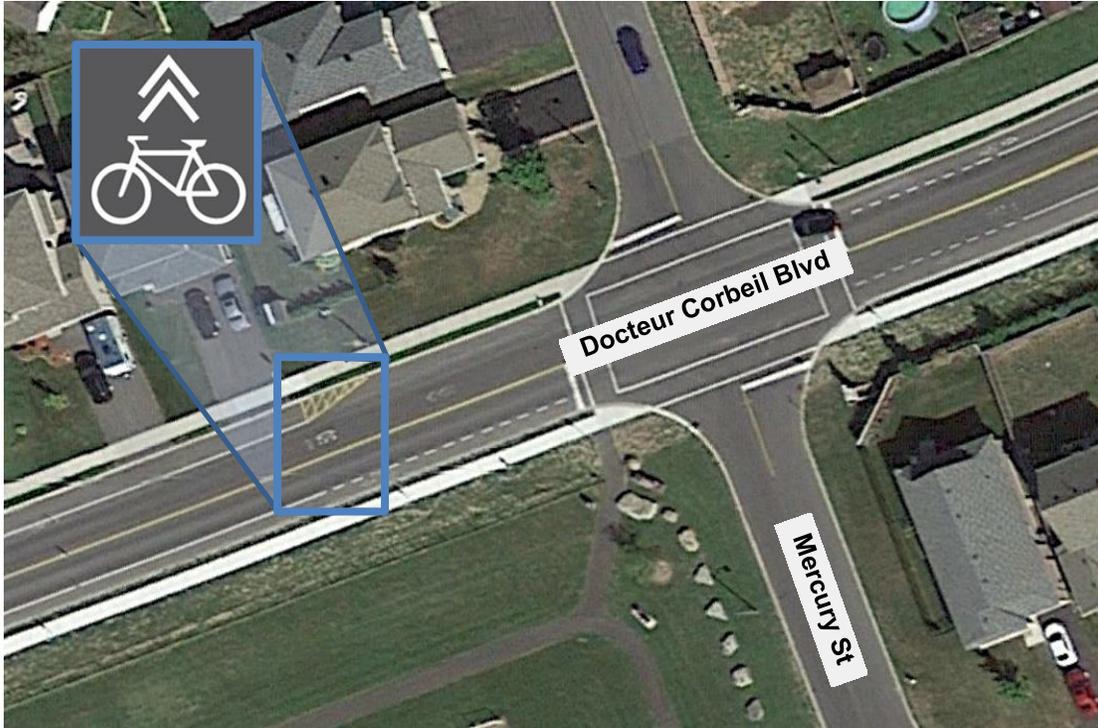


Figure 7: Bicycle Lane & 'Sharrow' Cyclist Pavement Markings (Docteur Corbeil Blvd 350m west of Caron St)

2.5 Existing Transit

Clarence-Rockland Transpo (CRT) operates three bus routes (No. 530, 530A and 535), which connect the City of Clarence-Rockland and downtown Ottawa, with some services continuing on to Gatineau (Hull). Route 530 directly serves the study area, while route 535 provides service to/from Bourget along Russell Road and Highway 417.

Within the City of Clarence-Rockland, route 530 and 530A are understood to be a commuter-oriented express service operating inbound to Ottawa in the morning and outbound to Clarence-Rockland in the afternoon. In 2012, 11 daily trips were provided on Route 530, with an average daily ridership of 355 people using the service (per direction). Within Clarence-Rockland, this route is understood to travel on Laurier Street and Docteur Corbeil Boulevard (to/from Clarence Creek). Both routes and their respective bus stop locations are illustrated in **Figure 8** and **Figure 9**.



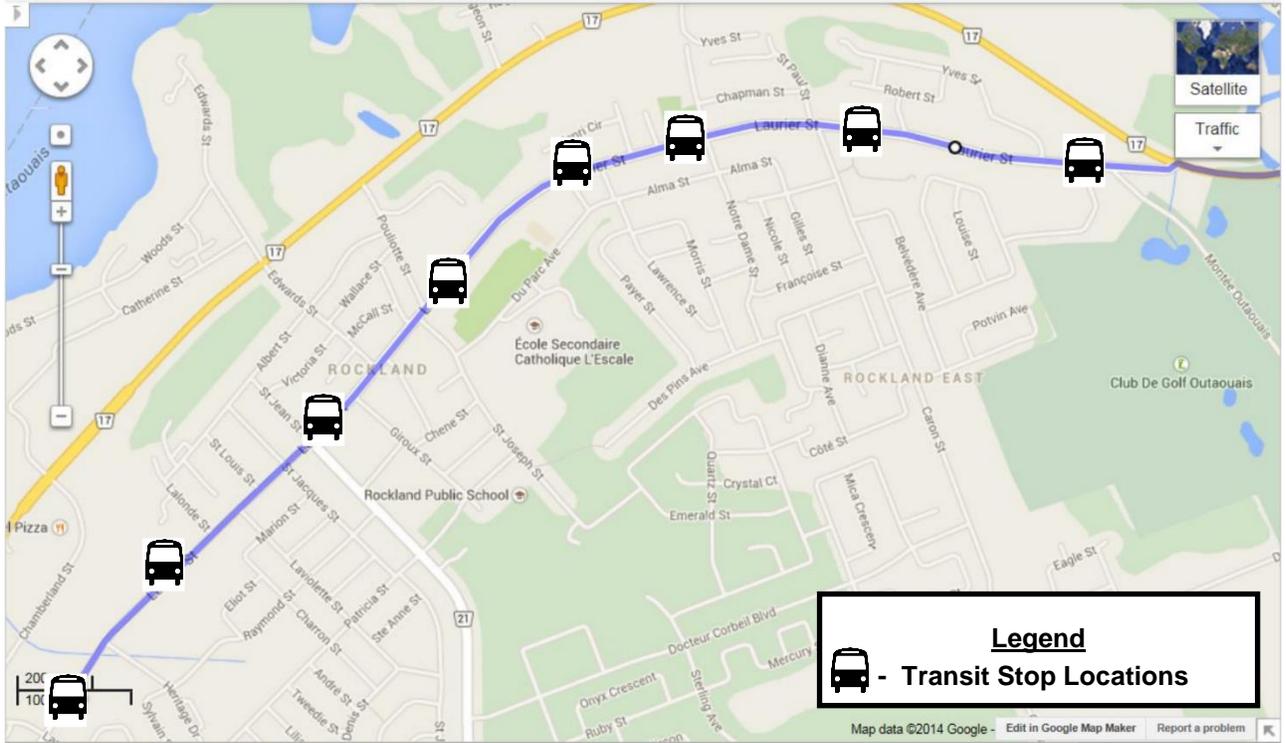


Figure 8: CRT Route 530

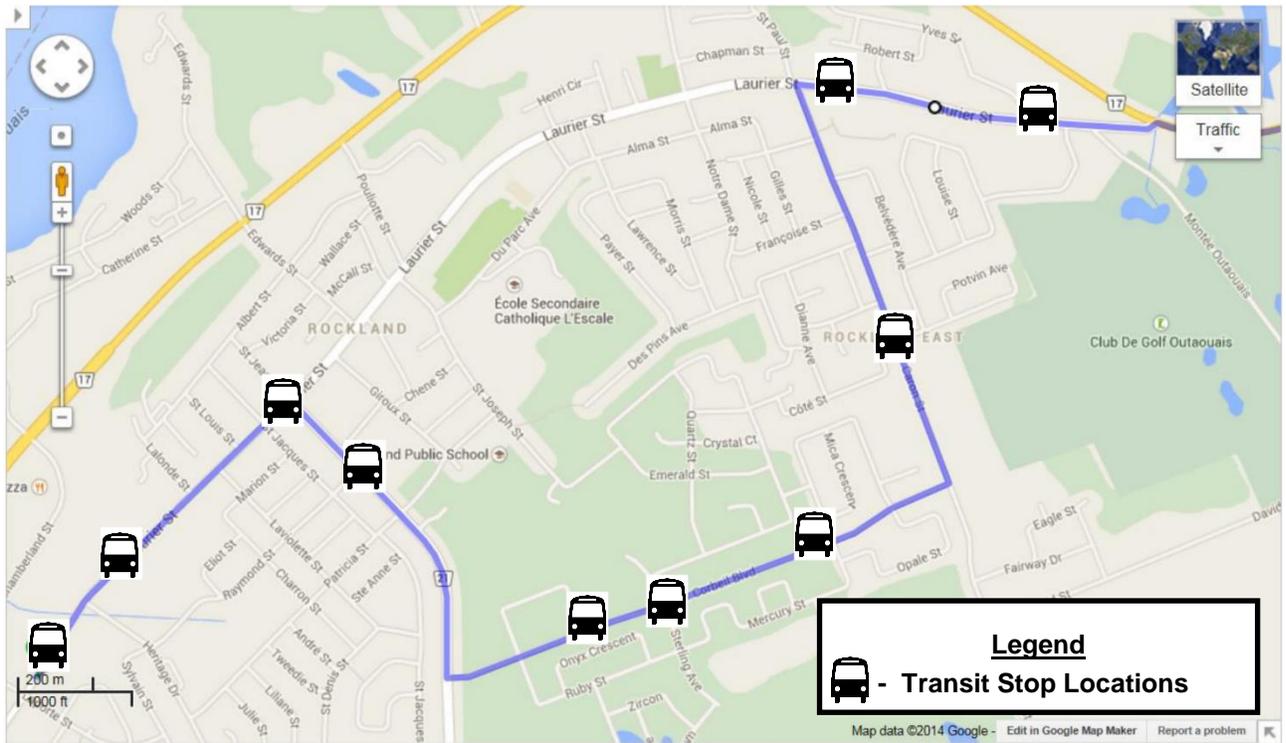


Figure 9: CRT Route 530A



3 Existing Network Operations

3.1 Methodology

Intersection capacity analysis was undertaken using procedures described in the Highway Capacity Manual (HCM). The analysis primarily focuses on performance measures such as level-of-service (LOS), volume to capacity (v/c) ratio, and 95th percentile queues. Additionally, delays reported with HCM methodology were compared to delays reported in SimTraffic simulation in certain cases where simulated results vary from reported results. LOS is a qualitative measure of operational performance and is based on control delay. The LOS criteria for signalized and unsignalized intersections are shown in **Table 1**.

Table 1: LOS Criteria for Signalized and Unsignalized Intersections

LOS	Control Delay (seconds/vehicle)		Traffic Flow Characteristics
	Signalized Intersections	Unsignalized Intersections	
A	0 – 10	0 – 10	Very Good
B	> 10 – 20	> 10 – 15	Good
C	> 20 – 35	> 15 – 25	Typically preferred planning objective
D	> 35 – 55	> 25 – 35	Typically acceptable
E	> 55 – 80	> 35 – 50	Undesirable; potentially unstable traffic flow
F	> 80	> 50	Failing movements may impede traffic flow

The v/c ratio is the ratio between traffic volume and the theoretical capacity of an intersection or movement. A v/c ratio greater than 1.0 indicates that an intersection or movement is operating over capacity. A 95th percentile queue is a queue length that has a 5% probability of being exceeded during the analysis period (i.e. during peak hours). It is common industry practice to use 95th percentile queues for design purposes. Additionally, the review of intersection operations follow industry best practices which indicate that the analysis should identify intersections where:

- + v/c ratios for overall intersection operations, through movements or shared through/turning movements are 0.90 or above;
- + v/c ratios for exclusive movements are above 1.00; and
- + 95th percentile queue lengths for individual movements exceed available lane storage.

The operational performance of signalized and stop-controlled intersections within the study area were reviewed using Synchro/SimTraffic 9 software.



3.2 Traffic Analysis

Turning movement counts (TMCs) were collected during the week of April 5th to April 12th 2018 during both AM and PM peak periods. Some TMCs at unsignalized intersections were estimated based on counts at similar locations throughout the study area. Link volume between intersections was balanced appropriately in the north-south direction along Caron Street, to minimize volume discrepancies between counts conducted on different days. Turning movement counts are illustrated in **Figure 10** and full turning movement counts are provided in **Appendix A**.

Intersection operational analysis was undertaken for the two (2) signalized and seven (7) unsignalized intersections within the study area using Synchro/SimTraffic 9 software to assess existing conditions. A signal timing plan was provided by the City of Clarence-Rockland for the intersection of Caron Street & HWY 17 and used in the existing conditions Synchro model. The signal timing at the intersection of Caron Street & Laurier Street was not provided and was measured in the field on April 10, 2018. The measured signal timing was compared with OTM Book 12 Signal Timing guidelines based on the roadway conditions and modified accordingly. The existing conditions analysis is summarized in **Table 2** and the detailed Synchro/SimTraffic output results are provided in **Appendix B**.



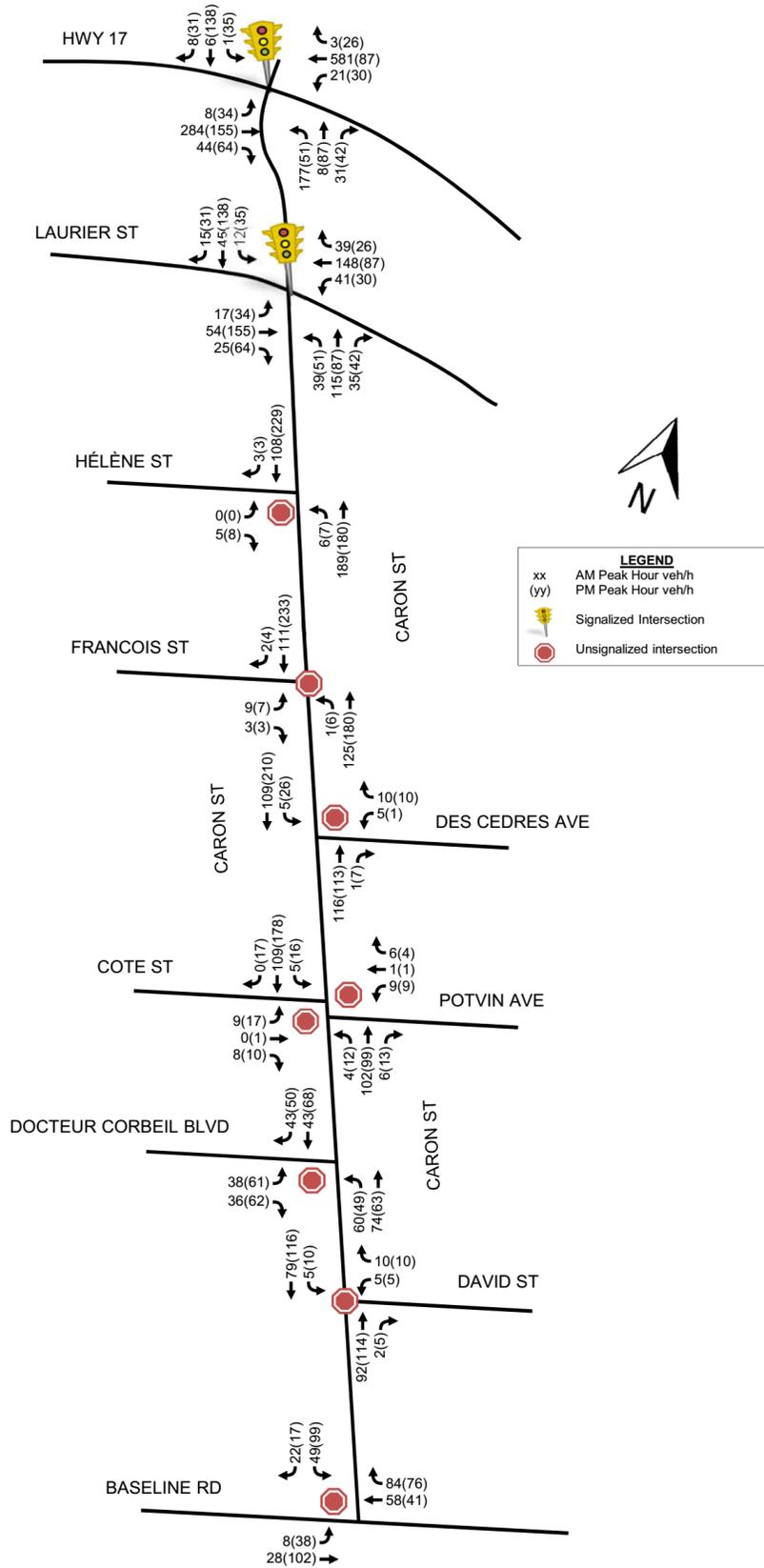


Figure 10: 2018 Existing Turning Movement Volume



Table 2: 2018 Existing Intersection Operations

Direction	Mov.	Storage Length (m)	AM Peak Hour				PM Peak Hour			
			v/c	Delay (s)	LOS	Queue (m)	v/c	Delay (s)	LOS	Queue (m)
Caron Street at HWY 17 (Signalized)										
EB	L	90	0.03	10	A	7	0.06	12	B	12
	T	-	0.33	12	B	34	0.20	16	B	26
	R	85	0.03	9	A	9	0.05	14	B	14
WB	L	60	0.04	8	A	8	0.05	12	B	12
	T	-	0.65	17	B	51	0.11	15	B	19
	R	56	0.00	9	A	2	0.02	14	B	9
NB	L	60	0.72	41	D	44	0.23	32	C	23
	T/R	-	0.07	35	C	12	0.42	39	D	35
SB	L	40	0.02	43	D	2	0.15	34	C	21
	T/R	-	0.26	48	D	8	0.64	46	D	49
Overall			0.70	20	B	-	0.29	27	C	-
Caron Street at Laurier Street (Signalized)										
EB	L	35	0.04	13	B	6	0.07	11	B	12
	T/R	-	0.10	14	B	12	0.32	16	B	30
WB	L	60	0.08	11	B	10	0.07	12	B	9
	T/R	-	0.26	14	B	23	0.17	15	B	16
NB	L	55	0.15	23	C	13	0.23	25	C	15
	T/R	-	0.44	28	C	34	0.42	29	C	31
SB	L	50	0.06	26	C	6	0.14	24	C	14
	T/R	-	0.18	28	C	19	0.59	32	C	42
Overall			0.32	20	B	-	0.38	22	C	-
Caron Street at Hélène Street (Unsignalized)										
EB	L/R	-	0.01	9	A	6	0.01	10	A	8
NB	L	15	0.00	1	A	2	0.01	8	A	4
	T	-	0.12	-	-	-	0.12	-	-	-
SB	T/R	-	0.07	-	-	-	0.15	-	-	-
Overall			0.21	1	A	-	0.23	1	A	-
Caron Street at Françoise Street (Unsignalized)										
EB	L/R	-	0.02	8	A	10	0.02	8	A	10
NB	L	15	0.00	7	A	2	0.01	8	A	6
	T	-	0.18	8	-	17	0.26	-	-	19
SB	T/R	-	0.15	8	A	17	0.31	8	A	24
Overall			0.17	8	A	-	0.23	9	A	-
Caron Street at Des Cèdres Avenue (Unsignalized)										
WB	L/R	-	0.02	9	A	10	0.01	9	A	9
NB	T/R	-	0.08	-	-	-	0.08	-	-	-
SB	L	15	0.00	1	A	2	0.02	8	A	6
	T	-	0.07	-	-	-	0.14	-	-	-



Direction	Mov.	Storage Length (m)	AM Peak Hour				PM Peak Hour			
			v/c	Delay (s)	LOS	Queue (m)	v/c	Delay (s)	LOS	Queue (m)
Overall			0.17	1	A	-	0.22	1	A	-
Caron Street at Cote Street/Potvin Avenue (Unsignalized)										
EB	L/T/R	-	0.02	8	A	11	0.04	8	A	14
WB	L/T/R	-	0.02	8	A	10	0.02	8	A	10
NB	L	15	0.01	7	A	5	0.02	7	A	9
	T/R	-	0.16	-	-	18	0.16	-	-	16
SB	L	15	0.01	7	A	4	0.03	7	A	7
	T/R	-	0.16	-	-	15	0.17	-	-	14
Overall			0.16	7	A	-	0.18	7	A	-
Caron Street at Docteur Corbeil Boulevard (Unsignalized)										
EB	L/R	-	0.10	10	A	14	0.16	10	B	15
NB	L	15	0.04	8	A	8	0.04	8	A	8
	T	-	0.05	-	-	-	0.04	-	-	-
SB	T/R	-	0.06	-	-	-	0.08	-	-	-
Overall			0.21	4	A	-	0.24	5	A	-
Caron Street at David Street (Unsignalized)										
WB	L/R	-	0.02	7	A	10	0.02	7	A	10
NB	T/R	-	0.12	8	A	17	0.15	8	A	17
SB	L	40	0.01	7	A	6	0.02	7	A	10
	T	-	0.11	7	-	16	0.17	7	-	15
Overall			0.15	7	A	-	0.17	8	A	-
Caron Street at Baseline Road (Unsignalized)										
EB	L/T	-	0.01	2	A	3	0.03	2	A	6
WB	T/R	-	0.09	-	-	12	0.08	-	-	16
SB	L/R	-	0.09	10	A	-	0.18	11	B	-
Overall			0.20	3	A	-	0.28	4	A	-

As shown in **Table 2**, all movements at signalized intersections are operating with a v/c ratio below 0.72 (i.e. with a LOS D or better). With regard to 95th percentile queues, the existing storage at signalized intersections is also noted as being sufficient (i.e. left-turn vehicle queues are not spilling back into and blocking adjacent through lanes). All movements at unsignalized intersections are operating with a v/c ratio below 0.31, (i.e. with a LOS B or better) and 95th percentile queues ranging between 1-3 vehicles in length.

Overall, there are no existing issues from a transportation perspective along Caron Street.

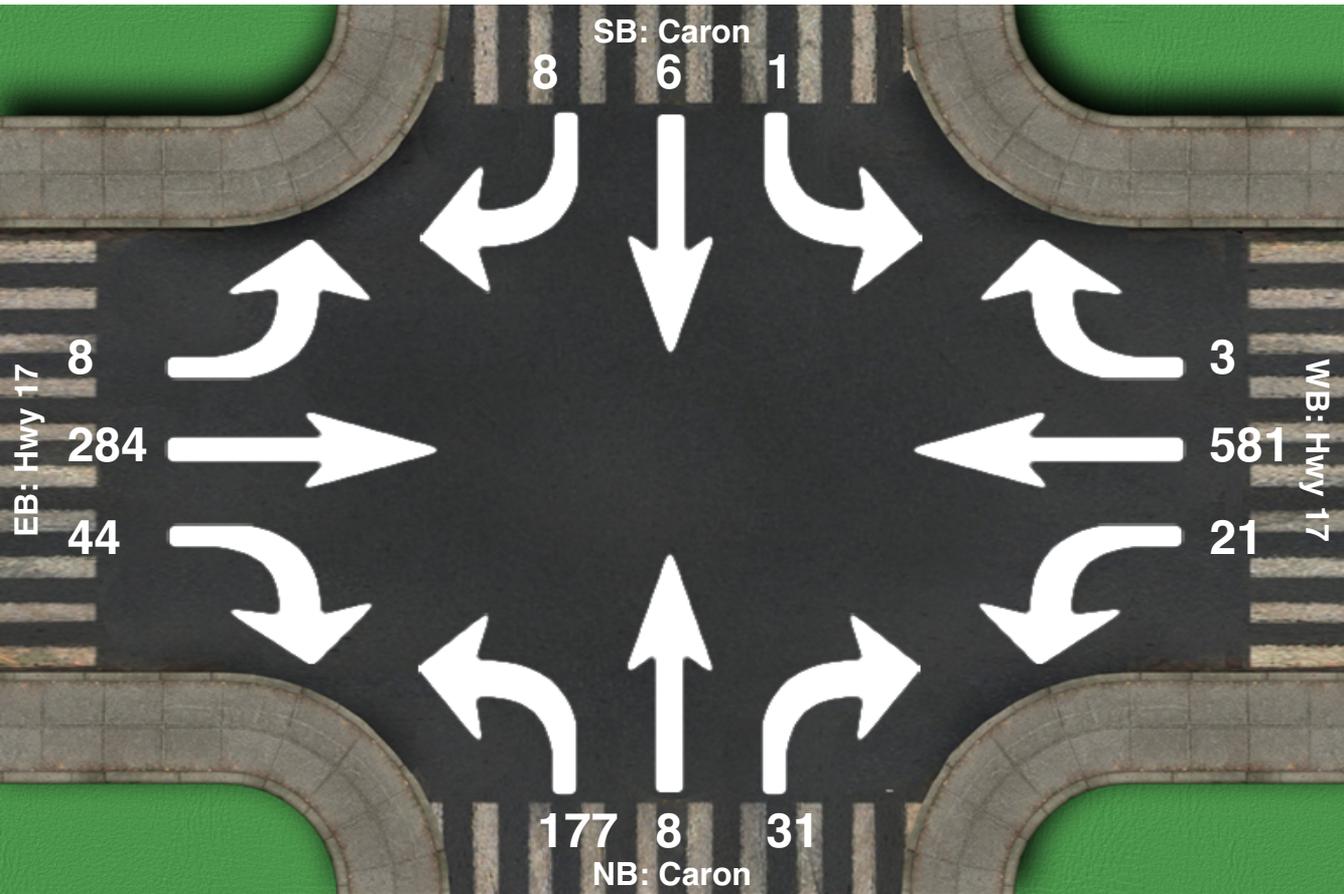
Attachments



Appendix A

Intersection Peak Hour

Location: Caron at Hwy 17, Rockland, On
GPS Coordinates: Lat=45.432940, Lon=-75.598433
Date: 2018-04-05
Day of week: Thursday
Weather:
Analyst: Ben Tardioli



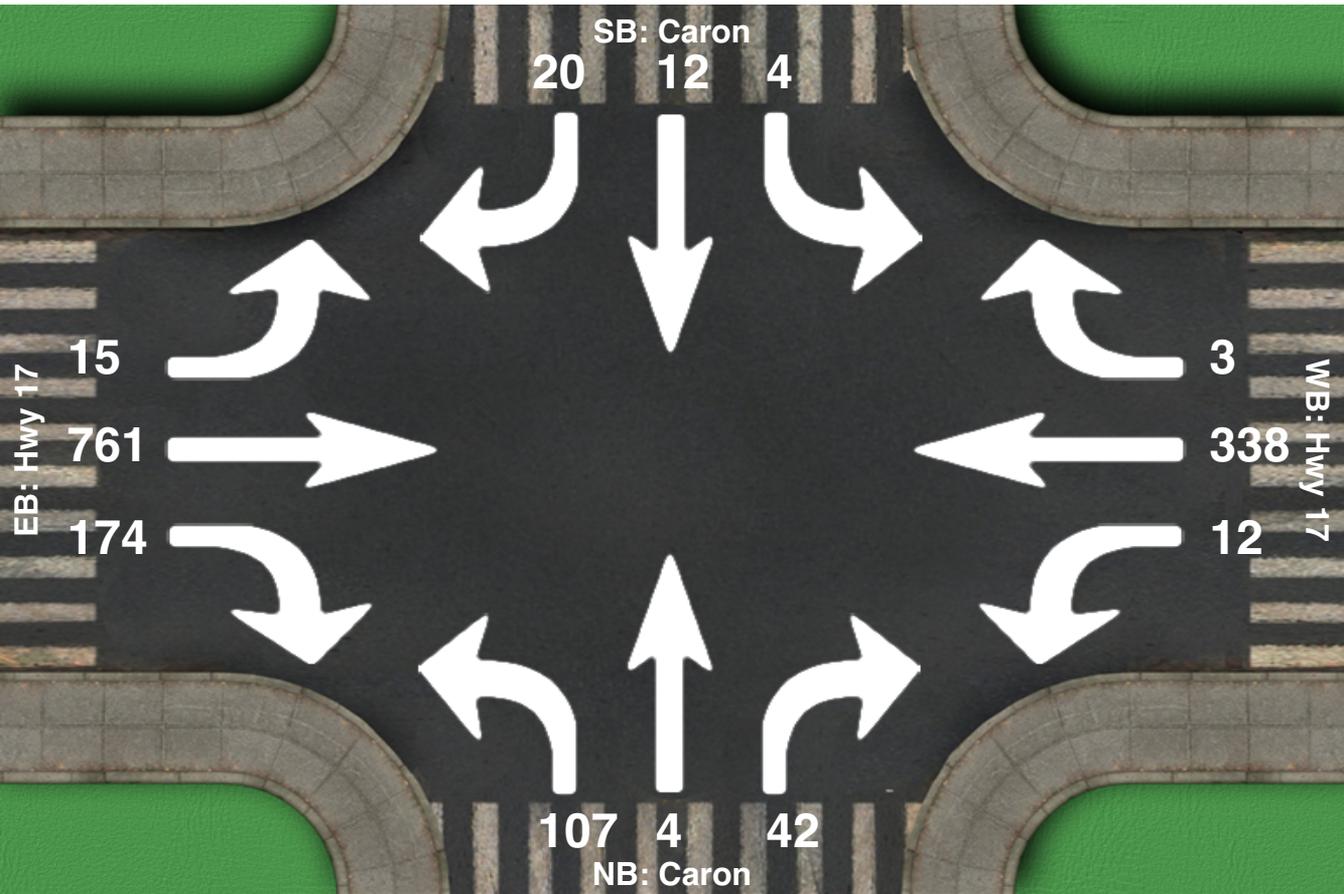
Intersection Peak Hour

07:30 - 08:30

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	1	6	8	21	581	3	177	8	31	8	284	44	1172
Factor	0.25	0.75	0.67	0.58	0.92	0.25	0.85	0.50	0.78	0.67	0.86	0.79	0.90
Approach Factor	0.94			0.92			0.82			0.87			

Intersection Peak Hour

Location: Caron at Hwy 17, Rockland, On
GPS Coordinates: Lat=45.557294, Lon=-75.279173
Date: 2018-04-05
Day of week: Thursday
Weather:
Analyst: Ben Tardioli



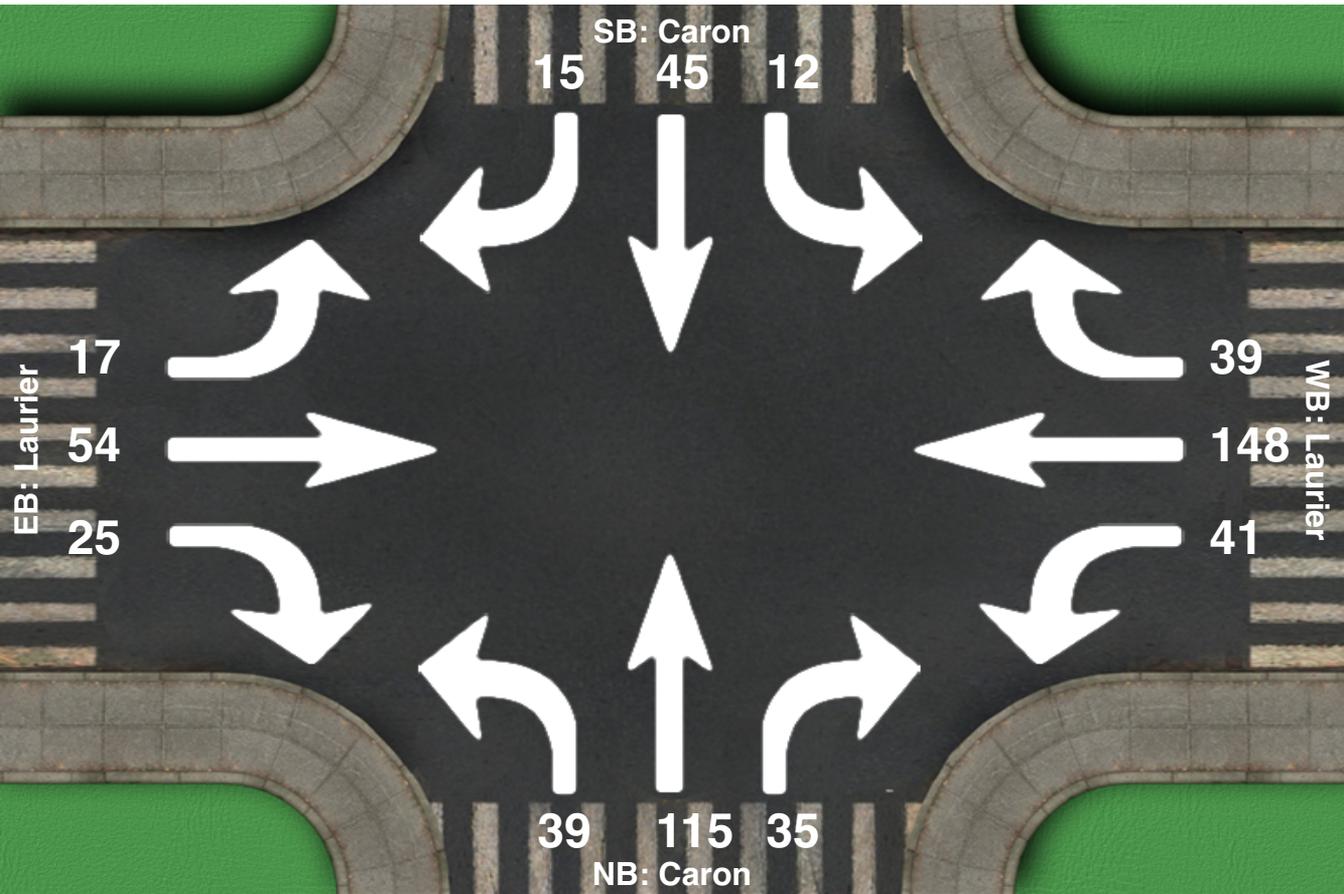
Intersection Peak Hour

16:00 - 17:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	4	12	20	12	338	3	107	4	42	15	761	174	1492
Factor	0.50	0.75	0.71	0.50	0.85	0.75	0.81	0.50	0.70	0.62	0.96	0.97	0.94
Approach Factor	0.75			0.83			0.78			0.97			

Intersection Peak Hour

Location: Caron at Laurier, Rockland, On
GPS Coordinates: Lat=45.555171, Lon=-75.276541
Date: 2018-04-09
Day of week: Monday
Weather:
Analyst: Ben Tardioli



Intersection Peak Hour

07:30 - 08:30

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	12	45	15	41	148	39	39	115	35	17	54	25	585
Factor	0.60	0.75	0.47	0.73	0.86	0.70	0.81	0.80	0.88	0.71	0.71	0.69	0.90
Approach Factor	0.75			0.92			0.86			0.71			

Turn Count Summary

Location: Caron at Laurier, Rockland, On

GPS Coordinates: Lat=45.554743, Lon=-75.276561

Date: 2018-04-09

Day of week: Monday

Weather:

Analyst: Ben Tardioli

Total vehicle traffic

Interval starts	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
16:00	16	34	6	7	20	8	10	18	8	9	40	14	190
16:15	4	41	8	7	23	7	13	18	14	8	42	15	200
16:30	7	32	11	8	24	6	14	24	8	8	34	23	199
16:45	8	31	6	8	20	5	14	27	12	9	39	12	191

Car traffic

Interval starts	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
16:00	16	34	6	7	20	8	10	18	8	9	40	14	190
16:15	4	41	8	7	23	7	13	18	14	8	42	15	200
16:30	7	32	11	8	24	6	14	24	8	8	34	23	199
16:45	8	31	6	8	20	5	14	27	12	9	39	12	191

Bicycle traffic

Interval starts	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0

Pedestrian volumes

Interval starts	NE			NW			SW			SE			Total
	Left	Right	Total										
16:00	2	0	2	0	0	0	0	1	1	0	0	0	3
16:15	0	2	2	0	0	0	0	0	0	0	0	0	2
16:30	0	0	0	2	0	2	0	0	0	2	0	2	4
16:45	1	0	1	0	1	1	0	1	1	1	0	1	4

Intersection Peak Hour

16:00 - 17:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	35	138	31	30	87	26	51	87	42	34	155	64	780
Factor	0.55	0.84	0.70	0.94	0.91	0.81	0.91	0.81	0.75	0.94	0.92	0.70	0.97
Approach Factor	0.91			0.94			0.85			0.97			

Peak Hour Vehicle Summary

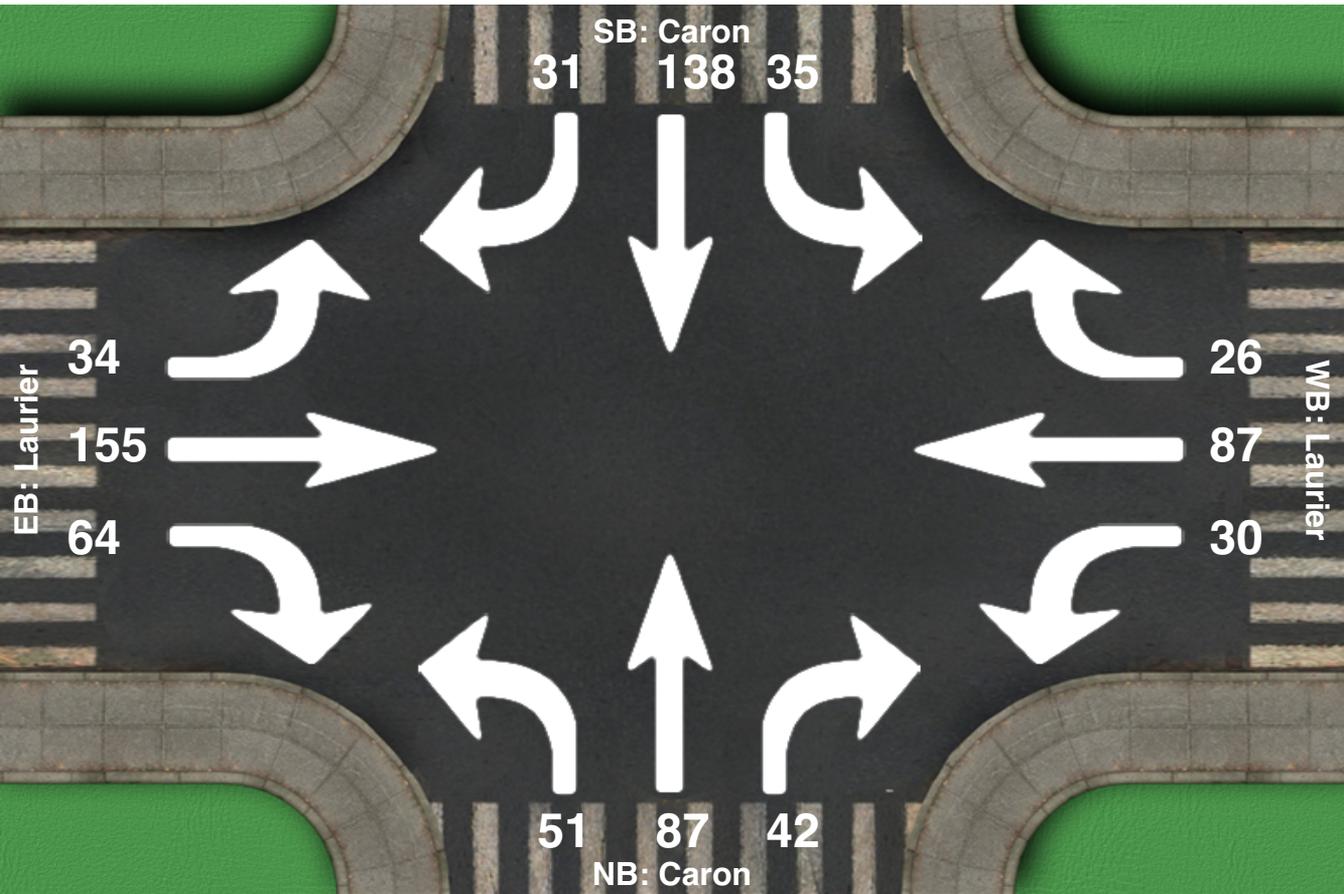
Vehicle	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Car	35	138	31	30	87	26	51	87	42	34	155	64	780
Bicycle	0	0	0	0	0	0	0	0	0	0	0	0	0

Peak Hour Pedestrians

	NE			NW			SW			SE			Total
	Left	Right	Total										
Pedestrians	3	2	5	2	1	3	0	2	2	3	0	3	13

Intersection Peak Hour

Location: Caron at Laurier, Rockland, On
GPS Coordinates: Lat=45.554743, Lon=-75.276561
Date: 2018-04-09
Day of week: Monday
Weather:
Analyst: Ben Tardioli



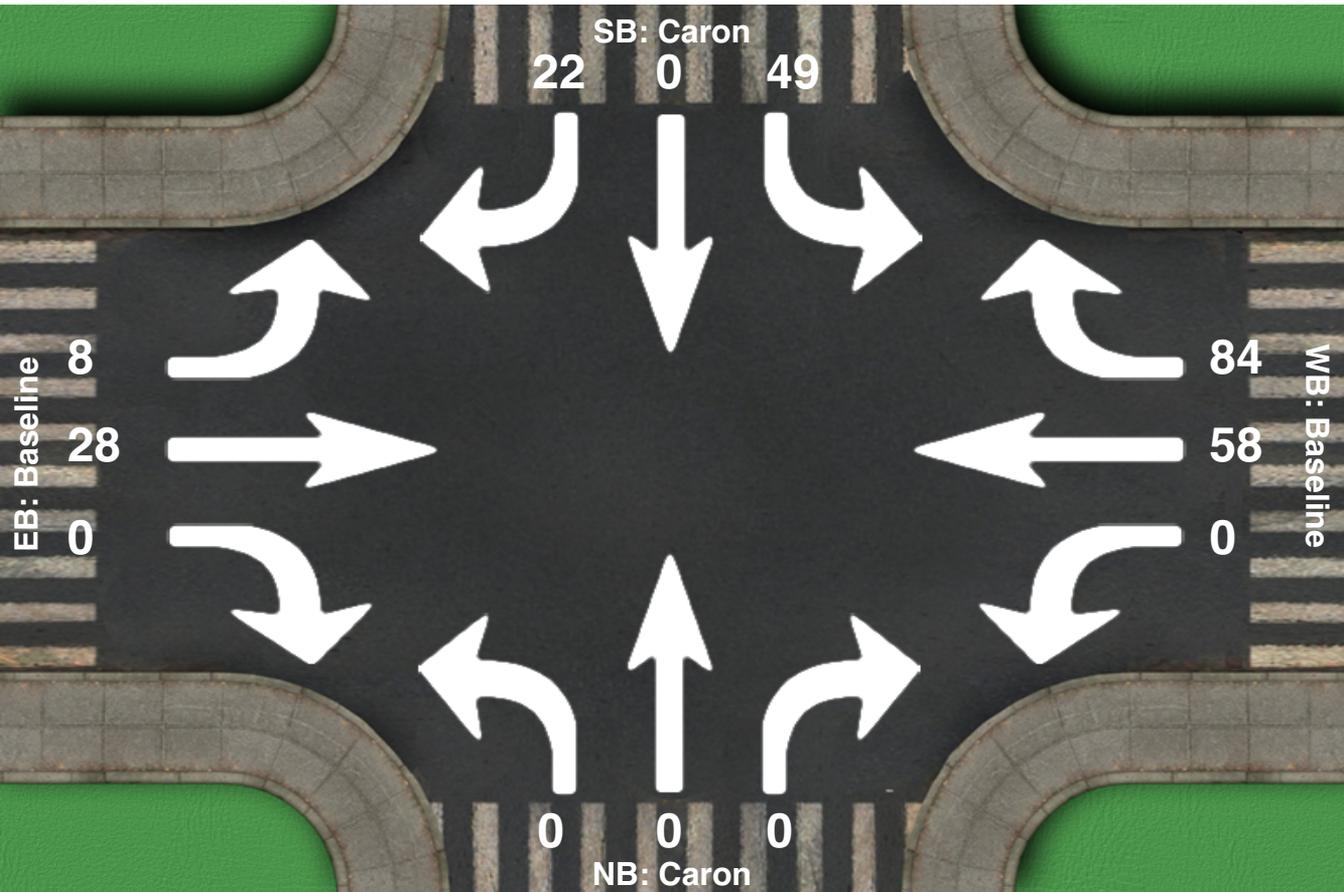
Intersection Peak Hour

16:00 - 17:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	35	138	31	30	87	26	51	87	42	34	155	64	780
Factor	0.55	0.84	0.70	0.94	0.91	0.81	0.91	0.81	0.75	0.94	0.92	0.70	0.97
Approach Factor	0.91			0.94			0.85			0.97			

Intersection Peak Hour

Location: Caron at Baseline , Rockland, On
GPS Coordinates: Lat=45.525226, Lon=-75.259189
Date: 2018-04-10
Day of week: Tuesday
Weather:
Analyst: Ben Tardioli



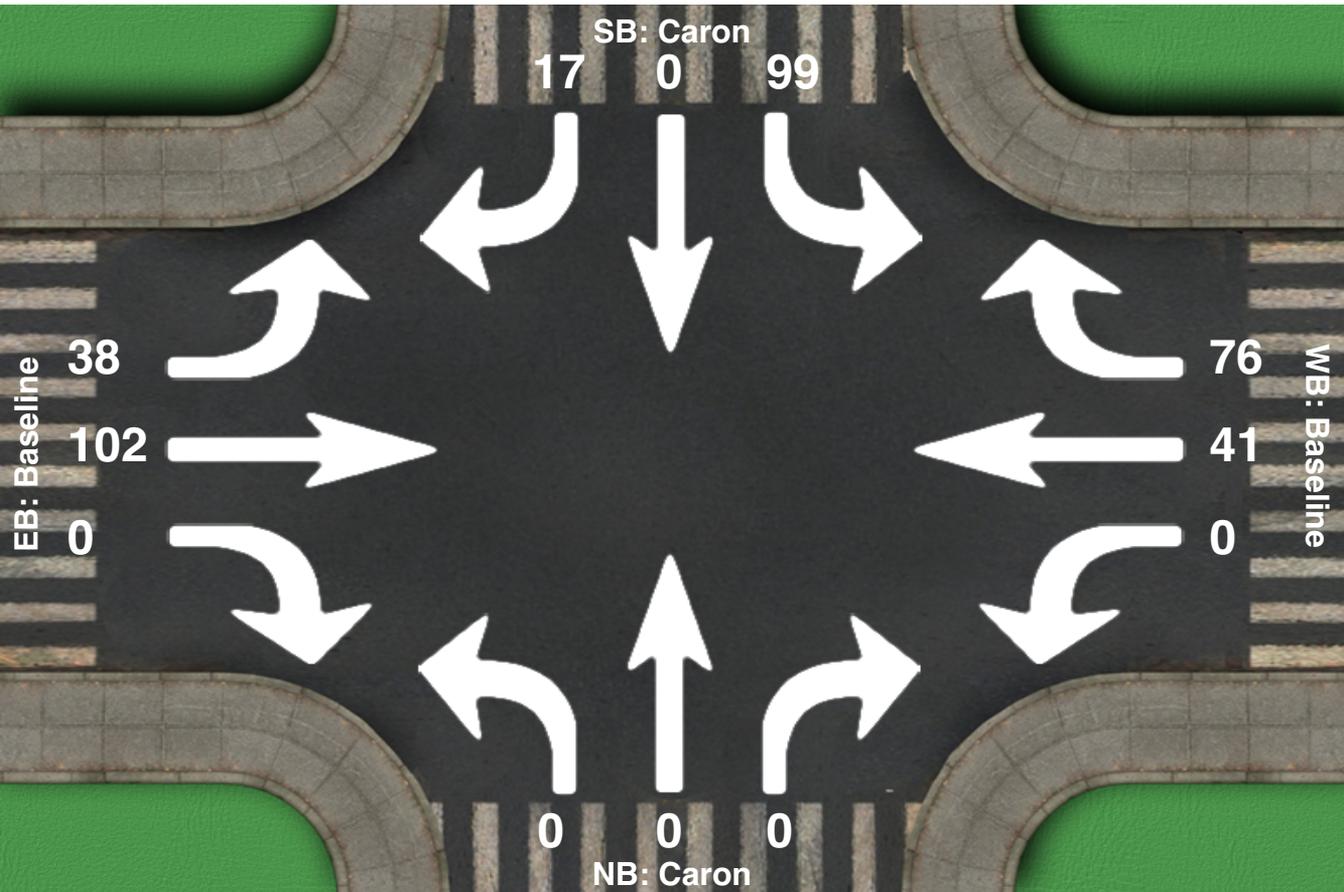
Intersection Peak Hour

07:30 - 08:30

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	49	0	22	0	58	84	0	0	0	8	28	0	249
Factor	0.77	0.00	0.69	0.00	0.91	0.81	0.00	0.00	0.00	0.50	0.47	0.00	0.82
Approach Factor	0.85			0.87			0.00			0.47			

Intersection Peak Hour

Location: Caron at Baseline , Rockland, On
GPS Coordinates: Lat=45.525226, Lon=-75.259189
Date: 2018-04-10
Day of week: Tuesday
Weather:
Analyst: Ben Tardioli



Intersection Peak Hour

16:00 - 17:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	99	0	17	0	41	76	0	0	0	38	102	0	373
Factor	0.92	0.00	0.53	0.00	0.79	0.76	0.00	0.00	0.00	0.73	0.82	0.00	0.95
Approach Factor	0.88			0.84			0.00			0.81			

Intersection Peak Hour

07:30 - 08:30

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	0	43	43	0	0	0	60	74	0	38	0	36	294
Factor	0.00	0.90	0.60	0.00	0.00	0.00	0.62	0.84	0.00	0.79	0.00	0.64	0.75
Approach Factor	0.80			0.00			0.73			0.74			

Peak Hour Vehicle Summary

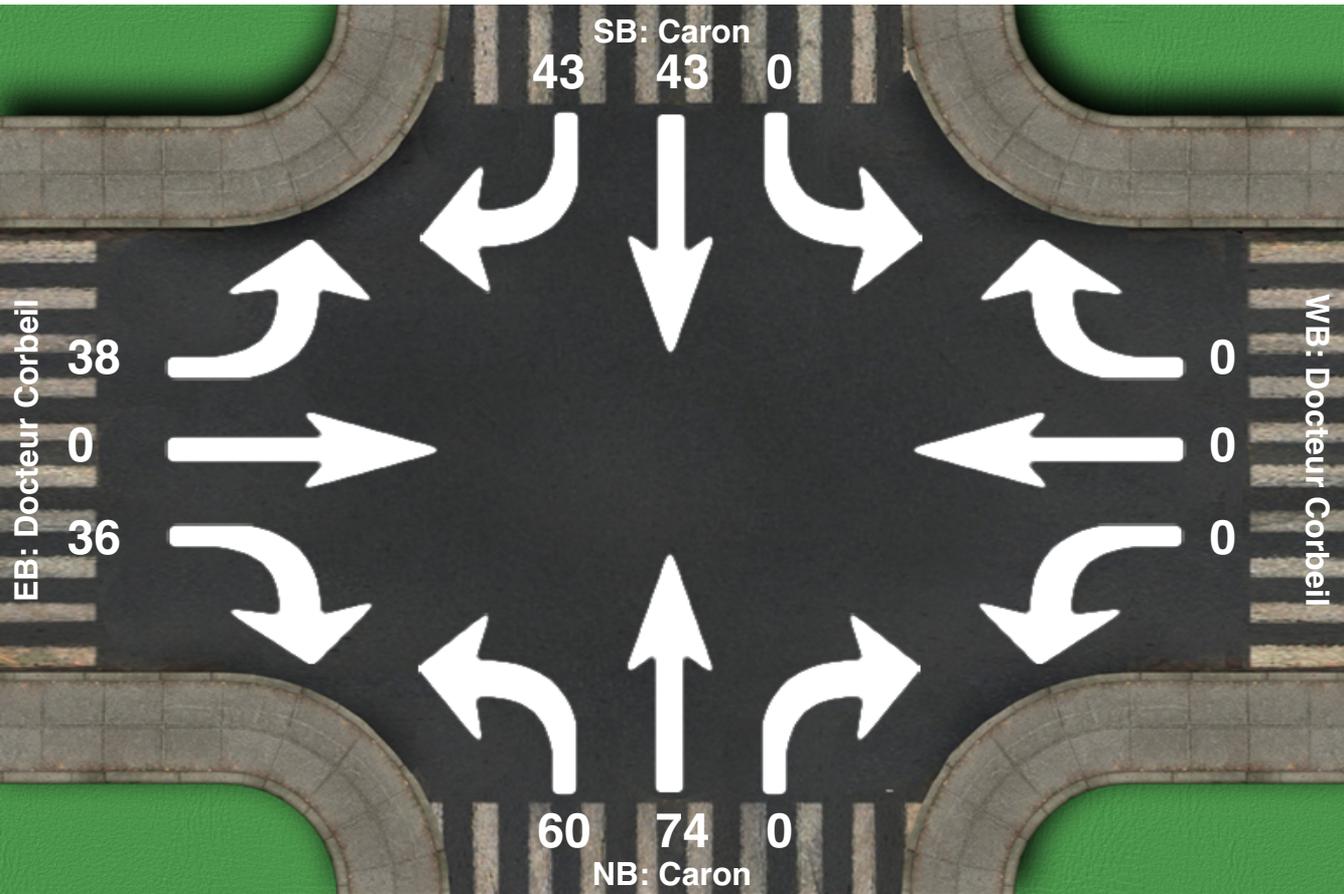
Vehicle	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Car	0	43	43	0	0	0	59	74	0	38	0	36	293
Bicycle	0	0	0	0	0	0	1	0	0	0	0	0	1

Peak Hour Pedestrians

	NE			NW			SW			SE			Total
	Left	Right	Total										
Pedestrians	0	3	3	0	1	1	1	1	2	0	0	0	6

Intersection Peak Hour

Location: Caron at Docteur Corbeil, Rockland, On
GPS Coordinates: Lat=45.544293, Lon=-75.271567
Date: 2018-04-11
Day of week: Wednesday
Weather:
Analyst: Ben Tardioli



Intersection Peak Hour

07:30 - 08:30

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	0	43	43	0	0	0	60	74	0	38	0	36	294
Factor	0.00	0.90	0.60	0.00	0.00	0.00	0.62	0.84	0.00	0.79	0.00	0.64	0.75
Approach Factor	0.80			0.00			0.73			0.74			

Intersection Peak Hour

16:00 - 17:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	0	68	50	0	0	1	49	63	0	61	0	62	354
Factor	0.00	0.94	0.78	0.00	0.00	0.25	0.72	0.72	0.00	0.76	0.00	0.74	0.87
Approach Factor	0.89			0.25			0.72			0.83			

Peak Hour Vehicle Summary

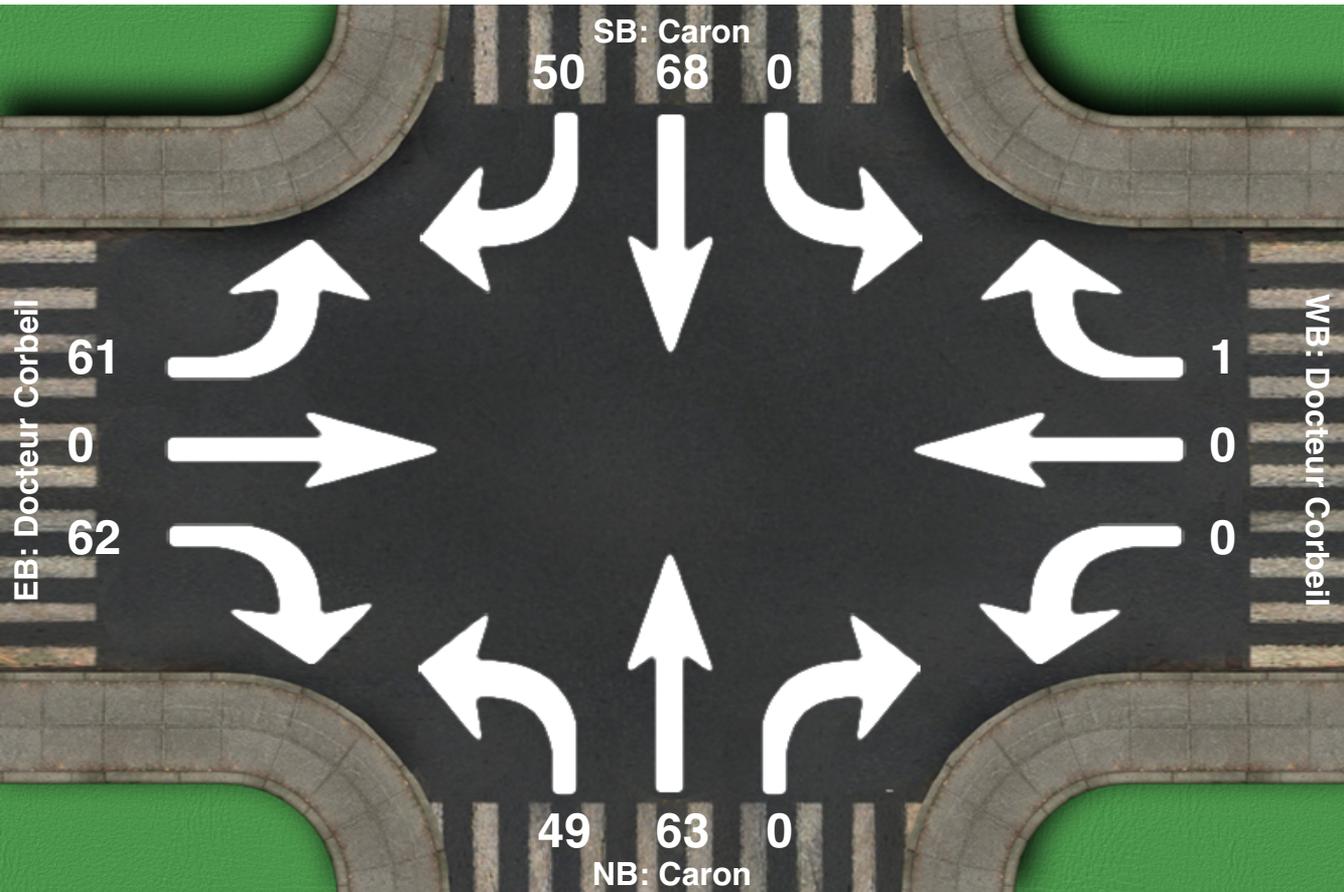
Vehicle	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Car	0	68	49	0	0	1	49	63	0	60	0	62	352
Bicycle	0	0	1	0	0	0	0	0	0	1	0	0	2

Peak Hour Pedestrians

	NE			NW			SW			SE			Total
	Left	Right	Total										
Pedestrians	0	0	0	3	0	3	1	0	1	0	0	0	4

Intersection Peak Hour

Location: Caron at Docteur Corbeil, Rockland, On
GPS Coordinates: Lat=45.544176, Lon=-75.271704
Date: 2018-04-11
Day of week: Wednesday
Weather:
Analyst: Ben Tardioli



Intersection Peak Hour

16:00 - 17:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	0	68	50	0	0	1	49	63	0	61	0	62	354
Factor	0.00	0.94	0.78	0.00	0.00	0.25	0.72	0.72	0.00	0.76	0.00	0.74	0.87
Approach Factor	0.89			0.25			0.72			0.83			

Appendix B

HCM Signalized Intersection Capacity Analysis
1: Rue Caron/Rue Industrielle & HWY 17

Existing Conditions
Timing Plan: AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	284	44	21	581	3	177	8	31	1	6	8
Future Volume (vph)	8	284	44	21	581	3	177	8	31	1	6	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.9	6.9	6.9	6.9	6.9	6.9	5.9	6.3		5.9	6.3	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1765	1500	1676	1765	1500	1676	1555		1676	1616	
Flt Permitted	0.30	1.00	1.00	0.54	1.00	1.00	0.53	1.00		1.00	1.00	
Satd. Flow (perm)	536	1765	1500	944	1765	1500	941	1555		1765	1616	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	9	316	49	23	646	3	197	9	34	1	7	9
RTOR Reduction (vph)	0	0	22	0	0	1	0	30	0	0	9	0
Lane Group Flow (vph)	9	316	27	23	646	2	197	13	0	1	7	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	50.5	49.5	49.5	53.1	50.8	50.8	18.0	11.2		2.5	1.6	
Effective Green, g (s)	50.5	49.5	49.5	53.1	50.8	50.8	18.0	11.2		2.5	1.6	
Actuated g/C Ratio	0.56	0.55	0.55	0.59	0.57	0.57	0.20	0.12		0.03	0.02	
Clearance Time (s)	6.9	6.9	6.9	6.9	6.9	6.9	5.9	6.3		5.9	6.3	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	313	971	825	576	997	847	274	193		48	28	
v/s Ratio Prot	0.00	0.18		c0.00	c0.37		c0.08	0.01		0.00	0.00	
v/s Ratio Perm	0.02		0.02	0.02		0.00	c0.06			0.00		
v/c Ratio	0.03	0.33	0.03	0.04	0.65	0.00	0.72	0.07		0.02	0.26	
Uniform Delay, d1	9.7	11.1	9.2	7.7	13.4	8.5	32.7	34.7		42.5	43.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.9	0.1	0.0	3.3	0.0	8.7	0.2		0.2	4.8	
Delay (s)	9.8	12.0	9.3	7.7	16.7	8.5	41.4	34.9		42.7	48.4	
Level of Service	A	B	A	A	B	A	D	C		D	D	
Approach Delay (s)		11.6			16.3			40.2			48.0	
Approach LOS		B			B			D			D	

Intersection Summary

HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	89.9	Sum of lost time (s)	26.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

2: Caron St/Rue Caron & Laurier St

Existing Conditions
Timing Plan: AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	54	25	41	148	39	39	115	35	12	45	15
Future Volume (vph)	17	54	25	41	148	39	39	115	35	12	45	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.5	6.5		6.5	6.5		6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.97		1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1680		1676	1710		1676	1703		1676	1698	
Flt Permitted	0.63	1.00		0.66	1.00		0.62	1.00		0.65	1.00	
Satd. Flow (perm)	1109	1680		1161	1710		1086	1703		1150	1698	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	19	60	28	46	164	43	43	128	39	13	50	17
RTOR Reduction (vph)	0	15	0	0	8	0	0	14	0	0	14	0
Lane Group Flow (vph)	19	73	0	46	199	0	43	153	0	13	53	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	33.7	32.8		37.9	34.9		19.2	16.0		14.8	13.8	
Effective Green, g (s)	33.7	32.8		37.9	34.9		19.2	16.0		14.8	13.8	
Actuated g/C Ratio	0.43	0.42		0.49	0.45		0.25	0.21		0.19	0.18	
Clearance Time (s)	6.5	6.5		6.5	6.5		6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	485	706		583	765		291	349		224	300	
v/s Ratio Prot	0.00	0.04		c0.00	c0.12		c0.01	c0.09		0.00	0.03	
v/s Ratio Perm	0.02			0.04			0.03			0.01		
v/c Ratio	0.04	0.10		0.08	0.26		0.15	0.44		0.06	0.18	
Uniform Delay, d1	12.7	13.7		10.6	13.5		22.8	27.1		25.8	27.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.3		0.1	0.8		0.2	0.9		0.1	0.3	
Delay (s)	12.8	14.0		10.7	14.3		23.0	28.0		25.9	27.6	
Level of Service	B	B		B	B		C	C		C	C	
Approach Delay (s)		13.8			13.6			27.0			27.3	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	78.0	Sum of lost time (s)	25.2
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 3: Caron St & Hélène St

Existing Conditions
 Timing Plan: AM Peak



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	5	6	189	108	3
Future Volume (Veh/h)	0	5	6	189	108	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	6	7	210	120	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL	TWLTL		
Median storage veh			2	2		
Upstream signal (m)			169			
pX, platoon unblocked						
vC, conflicting volume	346	122	123			
vC1, stage 1 conf vol	122					
vC2, stage 2 conf vol	224					
vCu, unblocked vol	346	122	123			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	759	930	1464			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	6	7	210	123		
Volume Left	0	7	0	0		
Volume Right	6	0	0	3		
cSH	930	1464	1700	1700		
Volume to Capacity	0.01	0.00	0.12	0.07		
Queue Length 95th (m)	0.1	0.1	0.0	0.0		
Control Delay (s)	8.9	7.5	0.0	0.0		
Lane LOS	A	A				
Approach Delay (s)	8.9	0.2		0.0		
Approach LOS	A					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			20.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 4: Caron St & Francois St

Existing Conditions
 Timing Plan: AM Peak



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	9	3	1	125	111	2
Future Volume (vph)	9	3	1	125	111	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	3	1	139	123	2

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	13	1	139	125
Volume Left (vph)	10	1	0	0
Volume Right (vph)	3	0	0	2
Hadj (s)	0.05	0.53	0.03	0.02
Departure Headway (s)	4.5	5.1	4.6	4.2
Degree Utilization, x	0.02	0.00	0.18	0.15
Capacity (veh/h)	735	686	762	848
Control Delay (s)	7.6	7.0	7.5	7.9
Approach Delay (s)	7.6	7.5		7.9
Approach LOS	A	A		A

Intersection Summary			
Delay		7.7	
Level of Service		A	
Intersection Capacity Utilization	16.9%		ICU Level of Service A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Caron St & Des Cedres Ave

Existing Conditions
Timing Plan: AM Peak



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	10	116	1	5	109
Future Volume (Veh/h)	5	10	116	1	5	109
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	11	129	1	6	121
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh	2			2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	262	130			130	
vC1, stage 1 conf vol	130					
vC2, stage 2 conf vol	133					
vCu, unblocked vol	262	130			130	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			100	
cM capacity (veh/h)	817	920			1455	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	17	130	6	121
Volume Left	6	0	6	0
Volume Right	11	1	0	0
cSH	881	1700	1455	1700
Volume to Capacity	0.02	0.08	0.00	0.07
Queue Length 95th (m)	0.4	0.0	0.1	0.0
Control Delay (s)	9.2	0.0	7.5	0.0
Lane LOS	A		A	
Approach Delay (s)	9.2	0.0	0.4	
Approach LOS	A			

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		16.5%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
6: Caron St & Cote St/Potvin Ave

Existing Conditions
Timing Plan: AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	0	8	9	1	6	4	102	6	5	109	0
Future Volume (vph)	9	0	8	9	1	6	4	102	6	5	109	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	0	9	10	1	7	4	113	7	6	121	0
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	19	18	4	120	6	121						
Volume Left (vph)	10	10	4	0	6	0						
Volume Right (vph)	9	7	0	7	0	0						
Hadj (s)	-0.14	-0.09	0.53	-0.01	0.53	0.03						
Departure Headway (s)	4.4	4.4	5.2	4.7	5.2	4.7						
Degree Utilization, x	0.02	0.02	0.01	0.16	0.01	0.16						
Capacity (veh/h)	778	759	675	755	673	749						
Control Delay (s)	7.5	7.5	7.0	7.3	7.1	7.4						
Approach Delay (s)	7.5	7.5	7.3		7.4							
Approach LOS	A	A	A		A							
Intersection Summary												
Delay			7.4									
Level of Service			A									
Intersection Capacity Utilization			16.1%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
7: Caron St & Docteur Corbeil Blvd

Existing Conditions
Timing Plan: AM Peak



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	38	36	60	74	43	43
Future Volume (Veh/h)	38	36	60	74	43	43
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	42	40	67	82	48	48
Pedestrians	2					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type			TWLTL	TWLTL		
Median storage veh			2	2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	290	74	98			
vC1, stage 1 conf vol	74					
vC2, stage 2 conf vol	216					
vCu, unblocked vol	290	74	98			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	96	96			
cM capacity (veh/h)	752	986	1493			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	82	67	82	96		
Volume Left	42	67	0	0		
Volume Right	40	0	0	48		
cSH	851	1493	1700	1700		
Volume to Capacity	0.10	0.04	0.05	0.06		
Queue Length 95th (m)	2.2	1.0	0.0	0.0		
Control Delay (s)	9.7	7.5	0.0	0.0		
Lane LOS	A	A				
Approach Delay (s)	9.7	3.4	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			4.0			
Intersection Capacity Utilization			21.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 8: David St & Caron St

Existing Conditions
 Timing Plan: AM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop		Stop	Stop
Traffic Volume (vph)	5	10	92	2	5	79
Future Volume (vph)	5	10	92	2	5	79
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	11	102	2	6	88
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total (vph)	17	104	6	88		
Volume Left (vph)	6	0	6	0		
Volume Right (vph)	11	2	0	0		
Hadj (s)	-0.28	0.02	0.53	0.03		
Departure Headway (s)	4.1	4.2	5.1	4.6		
Degree Utilization, x	0.02	0.12	0.01	0.11		
Capacity (veh/h)	842	850	684	762		
Control Delay (s)	7.1	7.7	7.0	7.0		
Approach Delay (s)	7.1	7.7	7.0			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.4			
Level of Service			A			
Intersection Capacity Utilization			15.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 9: Baseline Rd & Caron St

Existing Conditions
 Timing Plan: AM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	28	58	84	49	22
Future Volume (Veh/h)	8	28	58	84	49	22
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	9	31	64	93	54	24
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	157				160	110
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	157				160	110
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				93	97
cM capacity (veh/h)	1423				826	943
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	40	157	78			
Volume Left	9	0	54			
Volume Right	0	93	24			
cSH	1423	1700	859			
Volume to Capacity	0.01	0.09	0.09			
Queue Length 95th (m)	0.1	0.0	2.1			
Control Delay (s)	1.7	0.0	9.6			
Lane LOS	A		A			
Approach Delay (s)	1.7	0.0	9.6			
Approach LOS			A			
Intersection Summary						
Average Delay			3.0			
Intersection Capacity Utilization		19.8%		ICU Level of Service		A
Analysis Period (min)		15				

Intersection: 1: Rue Caron/Rue Industrielle & HWY 17

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	TR	L	TR
Maximum Queue (m)	8.5	43.7	12.6	8.3	65.3	4.6	53.8	14.3	4.1	11.0
Average Queue (m)	1.9	16.5	2.7	2.4	27.7	0.2	25.0	4.9	0.1	2.5
95th Queue (m)	7.3	33.6	9.2	8.3	51.4	1.9	43.7	11.7	1.7	8.1
Link Distance (m)	833.3		805.3		415.2		113.3			
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	90.0	85.0		60.0	56.0		60.0	40.0		
Storage Blk Time (%)	0					0				
Queuing Penalty (veh)	0					0				

Intersection: 2: Caron St/Rue Caron & Laurier St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (m)	8.3	16.8	15.0	34.4	15.8	44.0	8.2	27.3
Average Queue (m)	1.7	4.4	3.4	9.8	4.9	17.9	1.4	9.6
95th Queue (m)	6.3	12.1	10.4	23.2	12.7	34.0	5.8	19.1
Link Distance (m)	928.0		698.5		142.0		415.2	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)	35.0	60.0		55.0		50.0		
Storage Blk Time (%)	0						0	
Queuing Penalty (veh)	0						0	

Intersection: 3: Caron St & Hélène St

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (m)	8.2	5.1
Average Queue (m)	1.2	0.2
95th Queue (m)	5.8	2.1
Link Distance (m)	266.6	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)	15.0	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Caron St & Francois St

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (m)	10.7	5.2	20.2	18.9
Average Queue (m)	3.1	0.2	11.1	11.2
95th Queue (m)	10.4	2.2	17.2	17.1
Link Distance (m)	343.3		122.7	232.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)		15.0		
Storage Blk Time (%)			1	
Queuing Penalty (veh)			0	

Intersection: 5: Caron St & Des Cedres Ave

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (m)	8.7	3.4
Average Queue (m)	3.0	0.1
95th Queue (m)	9.7	1.8
Link Distance (m)	109.3	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		15.0
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Caron St & Cote St/Potvin Ave

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (m)	9.1	8.9	8.7	22.5	5.5	17.6
Average Queue (m)	3.7	3.2	0.9	11.2	0.7	9.2
95th Queue (m)	10.9	10.1	5.3	18.2	3.7	14.6
Link Distance (m)	73.6	115.9		507.4		263.8
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			30.0		40.0	
Storage Blk Time (%)				0		
Queuing Penalty (veh)				0		

Intersection: 7: Caron St & Docteur Corbeil Blvd

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (m)	15.7	10.1
Average Queue (m)	8.1	1.7
95th Queue (m)	14.4	7.6
Link Distance (m)	486.3	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)	15.0	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 8: David St & Caron St

Movement	WB	NB	SB	SB
Directions Served	LR	TR	L	T
Maximum Queue (m)	9.1	21.9	9.2	19.4
Average Queue (m)	3.2	10.2	1.1	9.5
95th Queue (m)	10.1	17.0	6.1	16.1
Link Distance (m)	509.7	82.9	518.2	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	40.0			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: Baseline Rd & Caron St

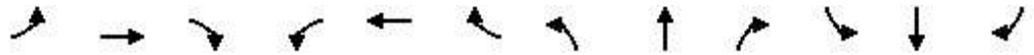
Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	7.5	14.2
Average Queue (m)	0.4	7.3
95th Queue (m)	3.2	12.2
Link Distance (m)	763.0	1938.3
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

HCM Signalized Intersection Capacity Analysis
 1: Rue Caron/Rue Industrielle & HWY 17

Existing Conditions
 Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	155	64	30	87	26	51	87	42	35	138	31
Future Volume (vph)	34	155	64	30	87	26	51	87	42	35	138	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.9	6.9	6.9	6.9	6.9	6.9	5.9	6.3		5.9	6.3	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1765	1500	1676	1765	1500	1676	1678		1676	1717	
Flt Permitted	0.69	1.00	1.00	0.65	1.00	1.00	0.44	1.00		0.67	1.00	
Satd. Flow (perm)	1223	1765	1500	1144	1765	1500	774	1678		1174	1717	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	38	172	71	33	97	29	57	97	47	39	153	34
RTOR Reduction (vph)	0	0	36	0	0	15	0	15	0	0	7	0
Lane Group Flow (vph)	38	172	35	33	97	14	57	129	0	39	180	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	55.8	51.9	51.9	55.6	51.8	51.8	26.1	19.5		21.7	17.3	
Effective Green, g (s)	55.8	51.9	51.9	55.6	51.8	51.8	26.1	19.5		21.7	17.3	
Actuated g/C Ratio	0.53	0.49	0.49	0.53	0.49	0.49	0.25	0.18		0.21	0.16	
Clearance Time (s)	6.9	6.9	6.9	6.9	6.9	6.9	5.9	6.3		5.9	6.3	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	662	867	737	621	865	735	247	309		262	281	
v/s Ratio Prot	c0.00	c0.10		0.00	0.05		c0.01	0.08		0.01	c0.11	
v/s Ratio Perm	0.03		0.02	0.03		0.01	0.04			0.02		
v/c Ratio	0.06	0.20	0.05	0.05	0.11	0.02	0.23	0.42		0.15	0.64	
Uniform Delay, d1	12.0	15.1	14.0	12.1	14.5	13.8	31.2	38.0		34.1	41.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.5	0.1	0.0	0.3	0.0	0.5	0.9		0.3	4.9	
Delay (s)	12.1	15.6	14.1	12.1	14.8	13.9	31.6	39.0		34.4	46.2	
Level of Service	B	B	B	B	B	B	C	D		C	D	
Approach Delay (s)		14.8			14.1			36.9			44.2	
Approach LOS		B			B			D			D	

Intersection Summary

HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	105.6	Sum of lost time (s)	26.0
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

2: Caron St/Rue Caron & Laurier St

Existing Conditions
Timing Plan: PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	→		↰	→		↰	→		↰	→	
Traffic Volume (vph)	34	155	64	30	87	26	51	87	42	35	138	31
Future Volume (vph)	34	155	64	30	87	26	51	87	42	35	138	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.5	6.5		6.5	6.5		6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.97		1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	1675		1672	1694		1674	1665		1673	1709	
Flt Permitted	0.66	1.00		0.61	1.00		0.58	1.00		0.67	1.00	
Satd. Flow (perm)	1153	1675		1070	1694		1030	1665		1172	1709	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	38	172	71	33	97	29	57	97	47	39	153	34
RTOR Reduction (vph)	0	14	0	0	10	0	0	22	0	0	10	0
Lane Group Flow (vph)	38	229	0	33	116	0	57	122	0	39	177	0
Confl. Peds. (#/hr)	4		4	4		4	2		2	2		2
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	35.3	32.4		33.3	31.4		16.5	13.4		16.5	13.4	
Effective Green, g (s)	35.3	32.4		33.3	31.4		16.5	13.4		16.5	13.4	
Actuated g/C Ratio	0.46	0.43		0.44	0.41		0.22	0.18		0.22	0.18	
Clearance Time (s)	6.5	6.5		6.5	6.5		6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	555	714		483	699		249	293		274	301	
v/s Ratio Prot	c0.00	c0.14		0.00	0.07		c0.01	0.07		0.01	c0.10	
v/s Ratio Perm	0.03			0.03			0.04			0.03		
v/c Ratio	0.07	0.32		0.07	0.17		0.23	0.42		0.14	0.59	
Uniform Delay, d1	11.2	14.5		12.2	14.1		24.1	27.8		23.8	28.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.2		0.1	0.5		0.5	1.0		0.2	2.9	
Delay (s)	11.2	15.7		12.3	14.6		24.6	28.8		24.1	31.7	
Level of Service	B	B		B	B		C	C		C	C	
Approach Delay (s)		15.1			14.1			27.6			30.4	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	76.0	Sum of lost time (s)	25.2
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

3: Caron St & Hélène St

Existing Conditions
Timing Plan: PM Peak



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	8	7	180	229	3
Future Volume (Veh/h)	0	8	7	180	229	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	9	8	200	254	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL	TWLTL		
Median storage veh			2	2		
Upstream signal (m)					169	
pX, platoon unblocked	0.95	0.95	0.95			
vC, conflicting volume	472	256	257			
vC1, stage 1 conf vol	256					
vC2, stage 2 conf vol	216					
vCu, unblocked vol	421	195	196			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	99			
cM capacity (veh/h)	707	807	1312			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	9	8	200	257		
Volume Left	0	8	0	0		
Volume Right	9	0	0	3		
cSH	807	1312	1700	1700		
Volume to Capacity	0.01	0.01	0.12	0.15		
Queue Length 95th (m)	0.2	0.1	0.0	0.0		
Control Delay (s)	9.5	7.8	0.0	0.0		
Lane LOS	A	A				
Approach Delay (s)	9.5	0.3	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			22.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
4: Caron St & Francois St

Existing Conditions
Timing Plan: PM Peak



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	7	3	6	180	233	4
Future Volume (vph)	7	3	6	180	233	4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	8	3	7	200	259	4

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	11	7	200	263
Volume Left (vph)	8	7	0	0
Volume Right (vph)	3	0	0	4
Hadj (s)	0.02	0.53	0.03	0.02
Departure Headway (s)	5.0	5.2	4.7	4.3
Degree Utilization, x	0.02	0.01	0.26	0.31
Capacity (veh/h)	656	674	748	825
Control Delay (s)	8.0	7.1	8.2	9.2
Approach Delay (s)	8.0	8.2		9.2
Approach LOS	A	A		A

Intersection Summary			
Delay		8.7	
Level of Service		A	
Intersection Capacity Utilization	23.2%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
5: Caron St & Des Cedres Ave

Existing Conditions
Timing Plan: PM Peak



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	10	113	7	26	210
Future Volume (Veh/h)	1	10	113	7	26	210
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	11	126	8	29	233
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage veh			2		2	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	421	130			134	
vC1, stage 1 conf vol	130					
vC2, stage 2 conf vol	291					
vCu, unblocked vol	421	130			134	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			98	
cM capacity (veh/h)	701	920			1451	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	12	134	29	233		
Volume Left	1	0	29	0		
Volume Right	11	8	0	0		
cSH	896	1700	1451	1700		
Volume to Capacity	0.01	0.08	0.02	0.14		
Queue Length 95th (m)	0.3	0.0	0.4	0.0		
Control Delay (s)	9.1	0.0	7.5	0.0		
Lane LOS	A		A			
Approach Delay (s)	9.1	0.0	0.8			
Approach LOS	A					
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			21.7%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
6: Caron St & Cote St/Potvin Ave

Existing Conditions
Timing Plan: PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	1	10	9	1	4	12	99	13	16	99	17
Future Volume (vph)	17	1	10	9	1	4	12	99	13	16	99	17
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	19	1	11	10	1	4	13	110	14	18	110	19
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	31	15	13	124	18	129						
Volume Left (vph)	19	10	13	0	18	0						
Volume Right (vph)	11	4	0	14	0	19						
Hadj (s)	-0.06	0.01	0.53	-0.05	0.53	-0.07						
Departure Headway (s)	4.5	4.6	5.3	4.7	5.2	4.6						
Degree Utilization, x	0.04	0.02	0.02	0.16	0.03	0.17						
Capacity (veh/h)	741	727	669	753	667	758						
Control Delay (s)	7.7	7.7	7.2	7.4	7.2	7.4						
Approach Delay (s)	7.7	7.7	7.3		7.3							
Approach LOS	A	A	A		A							
Intersection Summary												
Delay			7.4									
Level of Service			A									
Intersection Capacity Utilization			17.6%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
7: Caron St & Docteur Corbeil Blvd

Existing Conditions
Timing Plan: PM Peak



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	61	62	49	63	68	50
Future Volume (Veh/h)	61	62	49	63	68	50
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	68	69	54	70	76	56
Pedestrians	4					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type			TWLTL	TWLTL		
Median storage veh			2	2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	286	108	136			
vC1, stage 1 conf vol	108					
vC2, stage 2 conf vol	178					
vCu, unblocked vol	286	108	136			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	93	96			
cM capacity (veh/h)	775	943	1443			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	137	54	70	132		
Volume Left	68	54	0	0		
Volume Right	69	0	0	56		
cSH	851	1443	1700	1700		
Volume to Capacity	0.16	0.04	0.04	0.08		
Queue Length 95th (m)	4.0	0.8	0.0	0.0		
Control Delay (s)	10.0	7.6	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	10.0	3.3	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			4.5			
Intersection Capacity Utilization			23.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 8: David St & Caron St

Existing Conditions
 Timing Plan: PM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop		Stop	Stop
Traffic Volume (vph)	5	10	114	5	10	116
Future Volume (vph)	5	10	114	5	10	116
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	11	127	6	11	129
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total (vph)	17	133	11	129		
Volume Left (vph)	6	0	11	0		
Volume Right (vph)	11	6	0	0		
Hadj (s)	-0.28	0.01	0.53	0.03		
Departure Headway (s)	4.2	4.2	5.2	4.7		
Degree Utilization, x	0.02	0.15	0.02	0.17		
Capacity (veh/h)	798	843	681	759		
Control Delay (s)	7.3	8.0	7.0	7.4		
Approach Delay (s)	7.3	8.0	7.4			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.6			
Level of Service			A			
Intersection Capacity Utilization			17.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 9: Baseline Rd & Caron St

Existing Conditions
 Timing Plan: PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	38	102	41	76	99	17
Future Volume (Veh/h)	38	102	41	76	99	17
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	42	113	46	84	110	19
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	130				285	88
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	130				285	88
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				84	98
cM capacity (veh/h)	1455				685	970
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	155	130	129			
Volume Left	42	0	110			
Volume Right	0	84	19			
cSH	1455	1700	716			
Volume to Capacity	0.03	0.08	0.18			
Queue Length 95th (m)	0.6	0.0	4.6			
Control Delay (s)	2.2	0.0	11.1			
Lane LOS	A		B			
Approach Delay (s)	2.2	0.0	11.1			
Approach LOS			B			
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization		28.1%		ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 1: Rue Caron/Rue Industrielle & HWY 17

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	TR	L	TR
Maximum Queue (m)	16.5	31.9	17.1	16.6	27.7	11.2	36.4	46.0	37.0	59.7
Average Queue (m)	3.8	13.3	5.0	3.8	6.5	2.5	9.7	17.9	7.7	26.5
95th Queue (m)	12.3	26.3	13.7	11.8	18.7	8.7	23.2	34.9	21.2	48.5
Link Distance (m)	833.3				805.3				415.2	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	90.0	85.0		60.0	56.0		60.0	40.0		
Storage Blk Time (%)								0	0	4
Queuing Penalty (veh)								0	0	1

Intersection: 2: Caron St/Rue Caron & Laurier St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (m)	19.5	38.5	13.3	21.0	18.3	37.4	20.2	50.0
Average Queue (m)	3.9	14.3	2.9	6.4	6.7	17.6	5.3	22.9
95th Queue (m)	12.2	30.4	9.2	16.4	14.9	30.9	13.7	41.8
Link Distance (m)	928.0		698.5		142.0		415.2	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)	35.0	60.0		55.0		50.0		
Storage Blk Time (%)	1						0	
Queuing Penalty (veh)	0						0	

Intersection: 3: Caron St & Hélène St

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (m)	8.3	7.1
Average Queue (m)	2.4	0.5
95th Queue (m)	8.3	3.7
Link Distance (m)	266.6	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)	15.0	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Caron St & Francois St

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (m)	9.3	9.1	21.5	27.8
Average Queue (m)	2.7	1.3	12.4	16.0
95th Queue (m)	9.5	6.4	19.2	24.4
Link Distance (m)	343.3		122.7	232.6
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)		15.0		
Storage Blk Time (%)		0	1	
Queuing Penalty (veh)		0	0	

Intersection: 5: Caron St & Des Cedres Ave

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (m)	8.7	9.1
Average Queue (m)	2.4	1.1
95th Queue (m)	8.8	5.8
Link Distance (m)	109.3	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		15.0
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 6: Caron St & Cote St/Potvin Ave

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (m)	16.0	8.9	8.8	18.1	5.6	16.8
Average Queue (m)	5.8	3.1	2.5	10.4	2.2	8.8
95th Queue (m)	13.6	10.0	8.9	16.1	6.6	13.5
Link Distance (m)	73.6	115.9		507.4		263.8
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			30.0		40.0	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: Caron St & Docteur Corbeil Blvd

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (m)	17.9	13.1
Average Queue (m)	10.0	1.7
95th Queue (m)	15.1	8.2
Link Distance (m)	486.3	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)	15.0	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 8: David St & Caron St

Movement	WB	NB	SB	SB
Directions Served	LR	TR	L	T
Maximum Queue (m)	9.1	18.7	9.3	16.7
Average Queue (m)	3.3	10.7	2.7	10.1
95th Queue (m)	10.2	16.6	9.5	14.5
Link Distance (m)	509.7	82.9	518.2	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	40.0			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: Baseline Rd & Caron St

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	12.2	18.3
Average Queue (m)	1.1	9.7
95th Queue (m)	6.1	15.6
Link Distance (m)	763.0	1938.3
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 2

**APPENDIX B:
PRELIMINARY
ENVIRONMENTAL
ANALYSIS**

MEMO

TO: City of Clarence-Rockland
CC: Paul Black, MCIP RPP - FOTENN
FROM: Kai Markvorsen, Environmental Specialist - CIMA+
REVIEWED BY: Nicholas Bertrand, B.Sc. - CIMA+
DATE: 17 April 2018
SUBJECT: Expansion Lands Existing Conditions Analysis - Environment

1 Introduction

CIMA+ was mandated by FOTENN Planning + Design, on behalf of the City of Clarence-Rockland, to undertake an Environmental Impact Statement (EIS) on the proposed expansion lands to the southeast of the existing Urban Area Boundary of the City of Rockland. The study area is irregularly shaped, consisting of 133.5 ha on the south side of David Street and bounded by Clarence Creek to the east. It is situated primarily to the east of Caron street with the exception of an approximately 23 ha area to the southwest of the study area.

Figure 1 presents the location of the site with its surroundings.

This study was undertaken to identify the site's general ecological features and constraints and to assist in future development option analyses. The mandate objectives are to:

- + Describe the existing natural conditions of the study site based on consultations, available documentation and field surveys;
- + Identify any potentially significant environmental features and functions present at the site;

Following the completion of field assessments, recommendations for environmental impact avoidance and mitigation measures will be developed for inclusion in the site development plans.

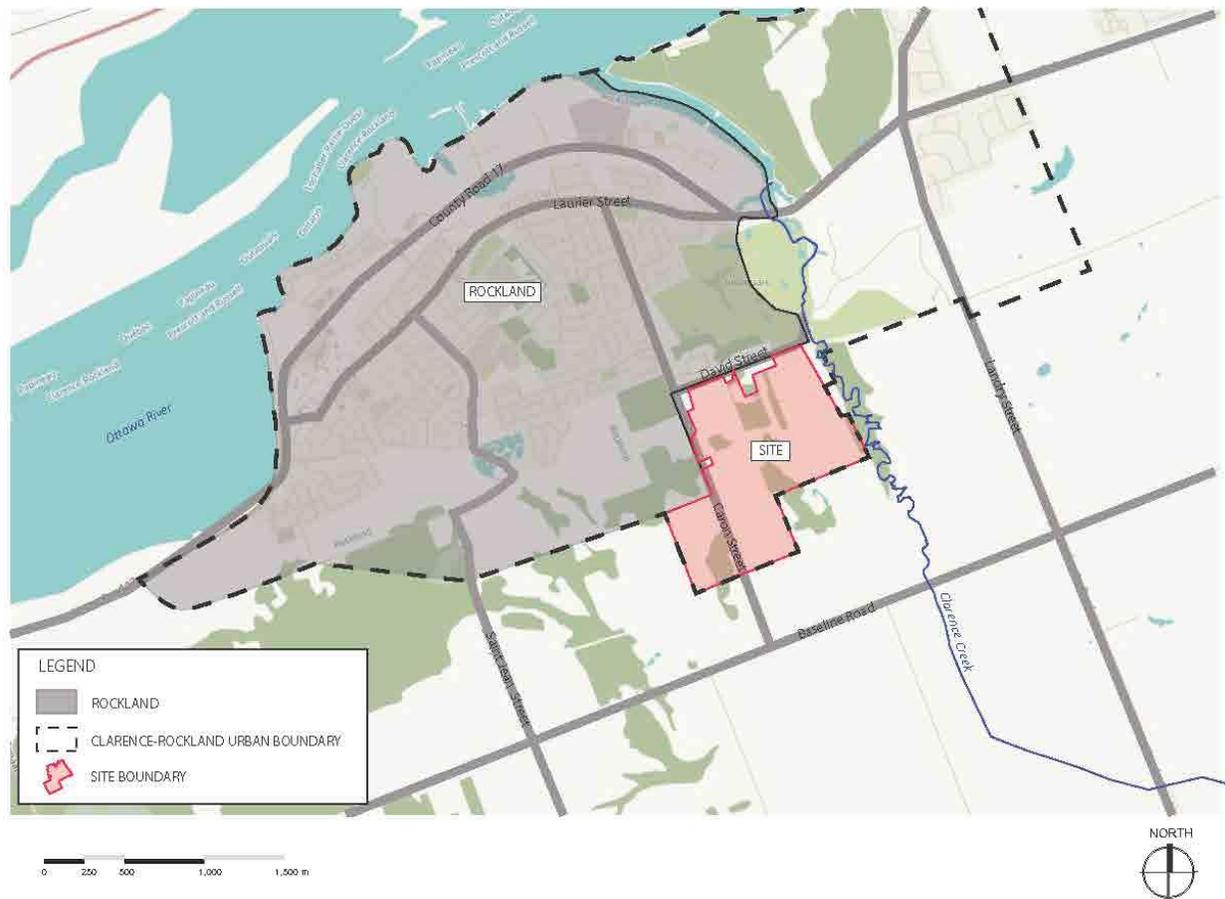


Figure 1. Site Location Map

2 Methodology

2.1 Documentation and Desktop Research

The following public sources were consulted as part of our desktop research:

- + Aerial imagery (current and historic) Google Earth;
- + Geographic information from Land Information Ontario;
- + Crown Land Use Policy Atlas;
- + The Ecosystems of Ontario, Part 1 Ecozones and Ecoregions, Ministry of Natural Resources, 2009;
- + Atlas of Breeding Birds of Ontario;
- + Ontario Nature Reptile and Amphibian Atlas;
- + Ontario Geological Survey (OGS Earth – Surficial and Bedrock mapping).

The desktop study also included the consultation of various other sources to identify potential Species at Risk (SAR) that could be encountered on the site.



2.2 Consultations

Information requests were submitted to the Natural Heritage Information Center (NHIC) The South Nation Conservation Authority (SNCA) and the Ministry of Natural Resources and Forestry - Kemptville District (MNRF) to obtain relevant information concerning the property. Correspondence is included in Appendix A. At this time, only information has been received from the NHIC.

2.3 Field Investigations

The field investigations/assessments will be conducted and overseen by a team of trained environmental technicians and biologists from CIMA+ and will include on-site investigation of flora and fauna during a time of year that allowed for identification and observation of all various possible species applicable to the site and during appropriate weather conditions.

3 Landscape Features and Designations

3.1 Ecoregion

The Study Area is located within Ecoregion 6E (Lake Simcoe-Rideau), the second most densely populated ecoregion in Ontario. This ecoregion is part of the Mixedwood Plains Ecozone of Southern Ontario, characterized by relatively diverse vegetation.

3.2 Surficial Geology

Surficial geology mapping from the Ontario Geological Survey indicates that the Study Area is underlain by a combination of till, fine-textured glaciomarine, organic and alluvial deposits as well overlaying Paleozoic bedrock. Typical soils in this units are comprised of clay, sand and silt. Surficial geology of the Study Area is shown in Figure 2.





Figure 2. Surficial Geology

3.3 Watershed and Watercourses

The Study Area is within the middle reaches of the Lower Ottawa – South Nation watershed. The Ottawa River is located approximately 2.5 km north of the property. Clarence Creek, a tributary to the Ottawa River, flows north along the eastern edge of the site. A detailed description of watercourses will be provided following the completion of field assessments. Depending on the species present, in-water work timing restrictions will likely apply to any development work in order to avoid impacts to fish and fish habitat.

3.4 Wetlands

A number of wetlands are located on and adjacent to the site including Clarence Creek Swamp, South Rockland Swamp, Estates Swamp and Rockland Marsh. Rockland Marsh is a provincially significant wetland land (wetland evaluation completed on November 18, 1999). A detailed description of wetlands will be provided following the completion of field assessments.

3.5 Uplands

Uplands in the Study Area consist primarily of agricultural fields and woodlands. Several developed residential properties are located along Caron Street on the west side of the project area as well as two



farms within the Study Area limits. In this area, natural cover is punctuated with buildings and maintained green spaces. A detailed description of upland habitats, including the assessment of potentially affected woodlands for significance, will be provided following the completion of field assessments.

3.6 Provincial Designations

There are no Areas of Natural and Scientific Interest (ANSI) within, or in proximity to, the Study Area. Rockland Marsh is a Provincially Significant Wetland that is located downstream of the project site along Clarence Creek.

Key Site Features and designated areas are identified on Figure 3.

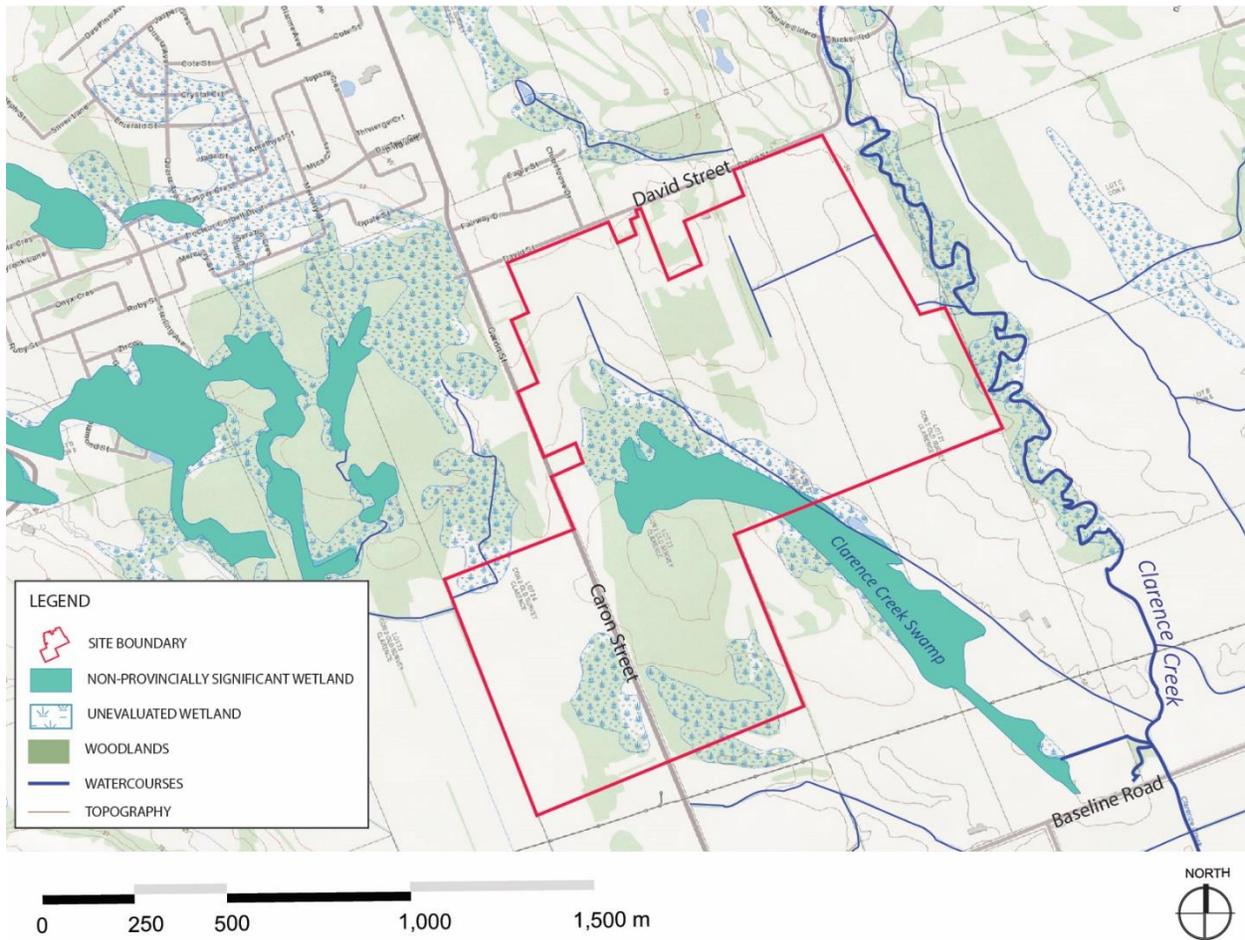


Figure 3. Existing Landscape Features and Designations

3.7 Conservation Authority Designations

At this time, no information has been received from the SNCA.



3.8 Municipal Planning Designations

The Study Area is located within the municipality of Clarence Rockland to the south of the City of Rockland's Urban Area Boundary.

3.9 Existing and Historic Land Uses

Aerial photographs from 2005, 2008, 2013 and 2017 show little change or development of the site over the period. At some point between 2008 and 2013 a significant portion of the woodlands in the central portion of the site were cleared. Significant clearing and subdivision development has also occurred to the west of the site since 2008.

4 Biological Community Characterization

4.1 General Approach

Characterization of the biological community in the Study Area will be completed by compiling data from published resources, data provided by local agencies, and by conducting a visual assessment of natural heritage features, with particular focus on vegetation composition and the presence of Species at Risk (SAR).

4.2 Vegetation

A vegetation survey will be conducted and habitat classified in accordance with the Ecological Land Classification for Southern Ontario (ELC). ELC Polygons will be delineated using aerial photograph interpretation supplemented by field identification of plant species within the Study Area limits.

4.3 Birds

The Atlas of Breeding Birds of Ontario (Atlas Squares 18VR74 and 18VR84) was consulted to determine which bird species are likely to occur in the general vicinity of the Study Area.

The ABBO indicated that had the potential for 180 bird species to be present within approximately 1km of the site. The presence of these species in the Study area and their habitat will be verified through field observations.

4.4 Amphibians and Reptiles

The Ontario Nature Reptile and Amphibian Atlas (Atlas Squares 18VR74 and 18VR84) was consulted to determine which amphibian and reptile species are likely to occur in the general vicinity of the Study Area. These records will be augmented with onsite observations.

Species identified by the Atlas as being potentially present at the site include: American Bullfrog (*Lithobates catesbeianus*), American Toad (*Anaxyrus americanus*), Eastern Newt (*Notophthalmus viridescens*), Eastern Gartersnake (*Thamnophis sirtalis*), Eastern Red-backed Salamander (*Plethodon cinereus*), Four-toed Salamander (*Hemidactylium scutatum*), Green Frog (*Rana clamitans*), Jefferson/Blue-spotted Salamander Complex (*Ambystoma jeffersonianum*), Midland Painted Turtle (*Chrysemys picta*), Mudpuppy (*Necturus maculosus*), Northern Leopard Frog (*Lithobates pipiens*), Red-bellied Snake (*Storeria*



occipitamaculata), Snapping Turtle (*Chelydra serpentine*), Spotted Salamander (*Ambystoma maculatum*), Spring Peeper (*Pseudacris crucifer*), Wood Frog (*Lithobates sylvaticus*).

4.5 Mammals

The presence of mammals will be noted as part of field surveys. Species will be identified through both direct and indirect (i.e. tracks, droppings, etc.) observation.

4.6 Fish and Fish Habitat

At this time, no fisheries information has been received from the MNRF/SNCA for Clarence Creek. The evaluation and characterization of watercourses for fish and fish habitat will be conducted as part of field assessments.

4.7 Species at Risk

The MNRF and the NHIC identified the following Species at Risk or their habitats as being potentially present within the Study Area.

Table 1. Threatened and/or Endangered Species Potentially Present within the Study Area

Common Name Scientific Name Rarity Rankings	Comments
American Eel <i>Anguilla rostrata</i> Federal = Threatened (TH) Provincial = Endangered (EN)	In Ontario, American Eels can be found as far inland as Algonquin Park. Once the eels mature (10-25 years) they return to the Sargasso Sea to spawn.
Barn Swallow <i>Hirundo rustica</i> Federal = Not Listed Provincial = Threatened (TH)	Open or semi-open lands: farms, field, marshes.
Eastern Meadowlark <i>Sturnella magna</i> Federal = Threatened (TH) Provincial = Threatened (TH)	Meadowlarks require open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches.
Butternut <i>Juglans cinerea</i> Federal = Endangered (EN) Provincial = Endangered (EN)	Variety of sites, grows best on well-drained fertile soils in shallow valleys and on gradual slopes
Little Brown Bat <i>Myotis lucifugus</i> Federal = Endangered (EN) Provincial = Endangered (EN)	During the day they roosts in trees and buildings. They often select attics, abandoned buildings and barns for summer colonies where they can raise their young. They hibernate most often in caves or abandoned mines that are humid and remain above freezing.



Common Name Scientific Name Rarity Rankings	Comments
<p>Tri-colored Bat <i>Perimyotis subflavus</i> Federal = Endangered (EN) Provincial = Endangered (EN)</p>	<p>During the summer, the Tri-colored Bat is found in a variety of forested habitats. It forms day roosts and maternity colonies in older forest and occasionally in barns or other structures. They forage over water and along streams in the forest. Tri-colored Bats eat flying insects and spiders gleaned from webs. At the end of the summer they travel to a location where they swarm; it is generally near the cave or underground location where they will overwinter. They overwinter in caves where they typically roost by themselves rather than part of a group.</p>
<p>Northern Long-eared Bat <i>Myotis septentrionalis</i> Federal = Endangered (EN) Provincial = Endangered (EN)</p>	<p>Northern long-eared bats are associated with boreal forests, choosing to roost under loose bark and in the cavities of trees.</p>

All endangered and threatened species receive individual protection under Section 9 of the *Endangered Species Act* (ESA) and receive general habitat protection under Section 10 of the ESA. Field investigations will be conducted in order to confirm whether these SAR or their habitat are present in the proposed development area.

The MNRF also identified the potential presence of a species of special concern, Brook Lamprey (*Lampetra planeri*). Species listed as special concern are not protected under the ESA; however, these species may receive protection under other legislation (e.g. the *Fish and Wildlife Conservation Act*). The habitat of special concern species may also be considered significant wildlife habitat.

Attachments



Appendix A

Kai Markvorsen

From: NHIC-Requests (MNRF) <nhicrequests@ontario.ca>
Sent: Wednesday, April 4, 2018 5:16 PM
To: Kai Markvorsen
Subject: RE: Information Request to Support EIS for Clarence Rockland Urban Expansion

Hello Kai,

EO_ID 111923 represents an element occurrence for Eastern Meadowlark. This is an extant element occurrence. The most recent observations are from 2004.

EO_ID 111919 represents an element occurrence for Eastern Meadowlark. This is an extant element occurrence. The most recent observations are from 2004.

I also queried the Provincially Tracked Species Observations layer (Ontario's provincial record for observations for species of conservation concern) and did not find any newer observations for Eastern Meadowlark for your project site. I did find one observation for Least Bittern (made in 2016) that intersects your project site; the location was reported as the "pond" area in Morris Village, Rockland and we mapped it as a circle with a 1 km radius because we don't know where exactly the species was seen. The observer of the Least Bittern was not a naturalist or birder and reported having some trouble identifying the species. The observer did not have photos to share with us, so we could not confirm the identity of the species.

I queried our natural areas data and could not find reports for:

- Clarence Creek Swamp (Area ID 19089)
- Rockland Marsh (Area ID 19053) – this is a provincially significant wetland (wetland evaluation completed on November 18, 1999, total score: 479)
- South Rockland Swamp (Area ID 19057)

You can download spatial data for these wetlands from <https://www.ontario.ca/data/wetlands>.

Since your project area falls completely within the jurisdiction of the [Ministry of Natural Resources and Forestry Kemptville District Office](#), I recommend contacting them to see if they have additional information or can offer you any guidance.

If you have any questions, or if there is anything else the Natural Heritage Information Centre can help you with, please let us know.

Best regards,
Martina



Martina Furrer
Biodiversity Information Biologist
Ontario Natural Heritage Information Centre
Ontario Ministry of Natural Resources and Forestry
300 Water St, Peterborough, ON, K9J 3C7
705.755.2192 | martina.furrer@ontario.ca

<http://www.ontario.ca/environment-and-energy/natural-heritage-information-centre>

From: Kai Markvorsen [mailto:Kai.Markvorsen@cima.ca]
Sent: April 4, 2018 12:31 PM
To: NHIC-Requests (MNRF) <nhicrequests@ontario.ca>
Subject: Information Request to Support EIS for Clarence Rockland Urban Expansion

Hello,

We're looking for data on the following grid squares (with associated area ID references). Information request is supporting Environmental Impact Statement for the Urban Expansion of Clarence Rockland.

Grid Square	ID Reference
18VR7843	areaid=19057
18VR7943	areaid=19053
18VR8043	nhic_eo_id=111923
18VR7842	areaid=19057
18VR7942	areaid=19057
18VR8042	areaid=19089
18VR7941	nhic_eo_id=111919
18VR8041	nhic_eo_id=111919

Please let us know if more information is required.

Regards,

Kai

Kai Markvorsen
Environment Professional
Environment

CIMA+
Partners in Excellence

240 Catherine Street, Suite 110
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CANADA
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Kai Markvorsen

From: Kai Markvorsen
Sent: Wednesday, April 11, 2018 1:10 PM
To: 'Inforequest, Kemptville (MNRF)'
Subject: Information Request supporting EIS for Clarence Rockland Urban Boundary Expansion
Attachments: Location Map.pdf; Clarence Rockland MNRF Info Request 2018-04-11.pdf

Hello,

Please find attached an information request, and location map, for available SAR and natural heritage information.

The study area is irregularly shaped, consisting of 133.5 ha on the south side of David Street and bounded by Clarence Creek to the east. It is situated primarily to the east of Caron street with the exception of an approximately 23 ha area to the southwest of the study area.

Please let me know if more information is required to support this request.

Regards,

Kai

Kai Markvorsen
Environment Professional
Environment

CIMA+
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Kemptville District

District de Kemptville

10 Campus Drive
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Tel.: 613 258-8204
Fax: 613 258-3920

10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Télééc.: 613 258-3920

Fri. Apr 13, 2018

Kai Markvorsen
CIMA+
240 Catherine Street, Suite 110
Ottawa, Ontario
K2P 2G8
(613) 860-2462
kai.markvorsen@cima.ca

Attention: Kai Markvorsen

Subject: Information Request - Developments
Project Name: EIS for Clarence Rockland Urban Boundary Expansion
Site Address:
Our File No. 2018_CLA-4511

Natural Heritage Values

The Ministry of Natural Resources and Forestry (MNRF) Kemptville District has carried out a preliminary review of the above mentioned area in order to identify any potential natural resource and natural heritage values.

The following Natural Heritage values were identified for the general subject area:

- Evaluated Wetland, Clarence Creek Swamp (Evaluated-Other)
- Evaluated Wetland, Estates Swamp (Evaluated-Other)
- Evaluated Wetland, South Rockland Swamp (Evaluated-Other)
- River, Clarence Creek

Municipal Official Plans contain information related to natural heritage features. Please see the local municipal Official Plan for more information, such as specific policies and direction pertaining to activities which may impact natural heritage features. For planning advice or Official Plan interpretation, please contact the local municipality. Many municipalities require environmental impact studies and other supporting studies be carried out as part of the development application process to allow the municipality to make planning decisions which are consistent with the Provincial Policy Statement (PPS, 2014).

The MNRF strongly encourages all proponents to contact partner agencies and appropriate municipalities early on in the planning process. This provides the proponent with early knowledge regarding agency requirements, authorizations and approval timelines; Ministry of the Environment and Climate Change (MOECC) and the local Conservation Authority may require approvals and permitting where natural values and natural hazards (e.g., floodplains) exist.

As per the Natural Heritage Reference Manual (NHRM, 2010) the MNRF strongly recommends that an ecological site assessment be carried out to determine the presence of natural heritage features and species at risk and their habitat on site. The MNRF can provide survey methodology for particular species at risk and their habitats.

The NHRM also recommends that cumulative effects of development projects on the integrity of natural heritage features and areas be given due consideration. This includes the evaluation of the past, present and possible future impacts of development in the surrounding area that may occur as a result of demand created by the presently proposed project.

Wildland Fire

MNRF woodland data shows that the site contains woodlands. The lands should be assessed for the risk of wildland fire as per PPS 2014, Section 3.1.8 "*Development shall generally be directed to areas outside of lands that are unsafe for development due to the presence of hazardous forest types for wildland fire. Development may however be permitted in lands with hazardous forest types for wildland fire where the risk is mitigated in accordance with wildland fire assessment and mitigation standards*". Further discussion with the local municipality should be carried out to address how the risks associated with wildland fire will be covered for such a development proposal. Please see the Wildland Fire Risk Assessment and Mitigation Guidebook (2016) for more information.

Significant Woodlands

Section 2.1.5 b) of the PPS states: *Development and site alteration shall not be permitted in significant woodlands unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.* The 2014 PPS directs that significant woodlands must be identified following criteria established by the Ontario Ministry of Natural Resources and Forestry, i.e. the Natural Heritage Reference Manual (NHRM), 2010. Where the local or County Official Plan has not yet updated significant woodland mapping to reflect the 2014 PPS, all wooded areas should be reviewed on a site specific basis for significance. The MNRF Kemptville District modelled locations of significant woodlands in 2011 based on NHRM criteria. The presence of significant woodland on site or within 120 metres should trigger an assessment of the impacts to the feature and its function from the proposed development.

Significant Wildlife Habitat

Section 2.1.5 d) of the PPS states: *Development and site alteration shall not be permitted in significant wildlife habitat unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.* It is the responsibility of the approval authority to identify significant wildlife habitat or require its identification. The MNRF has several guiding documents which may be useful in identification of significant wildlife habitat and characterization of impacts and mitigation options:

- Significant Wildlife Habitat Technical Guide, 2000
- The Natural Heritage Reference Manual, 2010
- Significant Wildlife Habitat Mitigation Support Tool, 2014
- Significant Wildlife Habitat Criteria Schedule for Ecoregion 5E and 6E, 2015

The habitat of special concern species (as identified by the Species at Risk in Ontario list) and Natural Heritage Information Centre tracked species with a conservation status rank of S1, S2 and S3 may be significant wildlife habitat and should be assessed accordingly.

Water

The Ministry of Natural Resources and Forestry (MNRF) has established timing window guidelines to restrict in-water work related to an activity during certain periods. These restricted periods are identified in order to protect fish from impacts of works or undertakings in and around water during spawning and other critical life stages. A suite of appropriate measures should be taken for projects involving in-water works to minimize and mitigate impacts to fish, water quality and fish habitat, and include:

- avoiding in-water works during the timing guidelines;
- installation of sediment/erosion control measures;
- avoiding the removal, alteration, or covering of substrates used for fish spawning, feeding, over-wintering or nursery areas; and
- debris control measures to manage falling debris (e.g. spalling).

Timing guidelines are based on species* presence and are therefore subject to change if new information becomes available. Timing guidelines in Kemptville District are:

Waterbody (and applicable geography or Fisheries Management Zone)	Timing Guidelines (no in-water works)
○ St. Lawrence River (FMZ 20)	March 15 – July 15 (Spring spawning species)
○ Ottawa River – Lac Des Chats (FMZ 12)	October 1 to July 15 (Spring and fall spawning species, including Lake Trout and Lake Whitefish)
○ Ottawa River – Lac Deschenes (FMZ 12)	October 15 to July 15 (Spring and fall spawning species, including Cisco)
○ Ottawa River – Lac Dollard des Ormeaux (FMZ 12)	January 1 to July 15 (Winter and spring spawning species, including Burbot)
○ Big Rideau Lake (South Burgess, North Burgess, Bastard and South Elmsley Twps) ○ Charleston Lake (Lansdowne and Escott Twps) ○ Crow Lake (South Crosby Twp)	October 1 to June 30 (Spring and fall spawning species, including Lake Trout)
○ Bass Lake (South Elmsley Twp) ○ Lower Rideau Lake (South Elmsley Twp) ○ Bob’s Lake (South Sherbrooke Twp) ○ Christie Lake (South Sherbrooke Twp) ○ Dalhousie Lake (Dalhousie Twp) ○ Davern Lake (South Sherbrooke Twp) ○ Farren Lake (South Sherbrooke Twp) ○ Grippen Lake (Leeds Twp) ○ Indian Lake (South Crosby Twp) ○ Little Long Lake (Lansdowne Twp) ○ Millpond Lake (South Burgess) ○ Otter Lake (South Elmsley, South Burgess and Bastard Twps) ○ Otty Lake (North Burgess and North Elmsley Twps)	October 15 to June 30 (Spring and Fall spawning species, including Lake Whitefish and Cisco)

<ul style="list-style-type: none"> ○ Pike Lake (North Burgess Twp) ○ Silver Lake (South Sherbrooke Twp) ○ Redhorse Lake (Lansdowne Twp) ○ Tay River (South Sherbrooke, Bathurst, Drummond and North Elmsley Twps) ○ Wolfe Lake (North Crosby Twp) 	
<ul style="list-style-type: none"> ○ Bennett Lake (Bathurst Twp) ○ Crosby Lake (North Crosby Twp) ○ Gananoque River (Leeds Twp) ○ Lac Georges (Plantagenet and Alfred Twps) ○ Gillies Lake (Lanark Twp) ○ Little Crosby Lake (North Crosby Twp) ○ McLaren Lake (North Burgess Twp) ○ Mississippi Lake (Drummond, Beckwith and Ramsay Twps) ○ Mississippi River (Beckwith, Ramsay, Pakenham and Fitzroy Twps) ○ Raisin River below Martintown dam (Charlottenburgh Twp) ○ Rideau River (Wolford, Oxford, Montague, Marlborough, South Gower, North Gower, Osgood, Nepean and Gloucester Twps) ○ South Lake (Leeds Twp) ○ South Nation River below Plantagenet weir (Plantagenet Twp) ○ Upper Rideau Lake (North Crosby Twp) ○ Westport Sand Lake (North Crosby Twp) 	<p>January 1 – June 30 (Winter and spring spawning species, including Burbot)</p>
<ul style="list-style-type: none"> ○ Small rivers and streams (denoted on 1:50,000 National Topographic System maps as being one lined) ○ All other waterbodies in FMZ 18 	<p>March 15 to June 30 (Spring spawning species)</p>

**Please note: Additional timing restrictions may apply as they relate to endangered and threatened species for works in both water and wetland areas. Timing restrictions are subject to change, depending on species found in a given waterbody.*

In addition to adhering to the above timing guidelines, a work permit from the MNRF may be required depending on the nature and scope of work. No encroachment on the bed or banks of a waterbody/watercourse (e.g. abutments, embankments, etc.) is permitted without MNRF approval. Additional information regarding work permits may be found online at <https://www.ontario.ca/page/crown-land-work-permits#section-2>.

The MNRF does not have any water quality or quantity data available. We recommend that the Ministry of the Environment and Climate Change be contacted for such data along with the local Conservation Authority. For further information regarding fish habitat and protocols, please refer to the following interagency, document, *Fish Habitat Referral Protocol for Ontario* at: http://www.web2.mnr.gov.on.ca/mnr/ebr/fish_hab_referral/protocol_en.pdf.

Additional approvals and permits may be required under the Fisheries Act and the Species at Risk Act; please contact Fisheries and Oceans Canada to determine requirements and next steps. There may also be approvals required by the local Conservation Authority or Transport Canada, and these agencies should be contacted directly to determine requirements. As the MNRF is responsible for the management of provincial fish populations, we request ongoing involvement in such discussions in order to ensure population conservation.

Species at Risk

A review of the Natural Heritage Information Centre (NHIC) and internal records indicate that there is a potential for the following threatened (THR) and/or endangered (END) species on the site or in proximity to it:

- American Eel (END)
- Barn Swallow (THR)
- Butternut (END)
- Eastern Meadowlark (THR)
- Little Brown Bat (END)
- Northern Long-eared Bat (END)
- Tri-Colored Bat (END)

All endangered and threatened species receive individual protection under section 9 of the ESA and receive general habitat protection under Section 10 of the ESA, 2007. Thus any potential works should consider disturbance to the individuals as well as their habitat (e.g. nesting sites). General habitat protection applies to all threatened and endangered species. Note some species in Kemptville District receive regulated habitat protection. The habitat of these listed species is protected from damage and destruction and certain activities may require authorization(s) under the ESA. For more on how species at risk and their habitat is protected, please see: <https://www.ontario.ca/page/how-species-risk-are-protected>.

If the proposed activity is known to have an impact on any endangered or threatened species at risk (SAR), or their habitat, an authorization under the ESA may be required. It is recommended that MNR/Kemptville be contacted prior to any activities being carried out to discuss potential survey protocols to follow during the early planning stages of a project, as well as mitigation measures to avoid contravention of the ESA. Where there is potential for species at risk or their habitat on the property, an Information Gathering Form should be submitted to Kemptville MNR/Kemptville at sar.kemptville@ontario.ca.

The Information Gathering Form may be found here:

<http://www.forms.ssb.gov.on.ca/mbs/ssb/forms/ssbforms.nsf/FormDetail?OpenForm&ACT=RDR&T AB=PROFILE&ENV=WWE&NO=018-0180E>

For more information on the ESA authorization process, please see:

<https://www.ontario.ca/page/how-get-endangered-species-act-permit-or-authorization>

One or more special concern species has been documented to occur either on the site or nearby. Species listed as special concern are not protected under the ESA, 2007. However, please note that some of these species may be protected under the Fish and Wildlife Conservation Act and/or Migratory Birds Convention Act. Again, the habitat of special concern species may be significant wildlife habitat and should be assessed accordingly. Species of special concern for consideration:

- Northern Brook Lamprey (SC)

If any of these or any other species at risk are discovered throughout the course of the work, and/or should any species at risk or their habitat be potentially impacted by on site activities, MNR/Kemptville should be contacted and operations be modified to avoid any negative impacts to species at risk or their habitat until further direction is provided by MNR/Kemptville.

Please note that information regarding species at risk is based largely on documented occurrences and does not necessarily include an interpretation of potential habitat within or in proximity to the site in question. Although this data represents the MNRF's best current available information, it is important to note that a lack of information for a site does not mean that additional features and values are not present. It is the responsibility of the proponent to ensure that species at risk are not killed, harmed, or harassed, and that their habitat is not damaged or destroyed through the activities carried out on the site.

The MNRF continues to strongly encourage ecological site assessments to determine the potential for SAR habitat and occurrences. When a SAR or potential habitat for a SAR does occur on a site, it is recommended that the proponent contact the MNRF for technical advice and to discuss what activities can occur without contravention of the Act. For specific questions regarding the Endangered Species Act (2007) or SAR, please contact MNRF Kemptville District at sar.kemptville@ontario.ca.

The approvals processes for a number of activities that have the potential to impact SAR or their habitat have recently changed. For information regarding regulatory exemptions and associated online registration of certain activities, please refer to the following website: <https://www.ontario.ca/page/how-get-endangered-species-act-permit-or-authorization>.

Please note: The advice in this letter may become invalid if:

- The Committee on the Status of Species at Risk in Ontario (COSSARO) re-assesses the status of the above-named species OR adds a species to the SARO List such that the section 9 and/or 10 protection provisions apply to those species; or
- Additional occurrences of species are discovered on or in proximity to the site.

This letter is valid until: Sat. Apr 13, 2019

The MNRF would like to request that we continue to be circulated on information with regards to this project. If you have any questions or require clarification please do not hesitate to contact me.

Sincerely,

Dom Ferland
Management Biologist
dominique.ferland@ontario.ca

Encl.\
-ESA Infosheet
-NHIC/LIO Infosheet

Natural. Valued. Protected.

Endangered Species Act, 2007 & Species At Risk in Ontario

Background

Endangered Species Act: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statues-07e06_e.htm

Species at Risk in Ontario List: www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/246809.html

The Endangered Species Act (ESA) 2007 protects both species and habitat. Section 9 of the ESA “prohibits killing, harming, harassing, capturing, possessing, collecting, buying, selling, trading, leasing or transporting species that are listed as threatened, endangered or extirpated”. Section 10 of the ESA, 2007 prohibits damaging or destroying habitat of endangered or threatened species. Protected habitat is either based on general definition in the Act or prescribed through a regulation. The ESA 2007 defines general habitat as an area on which the species depends, directly or indirectly, to carry on its life processes, including reproduction, rearing, hibernation, migration or feeding.

It is important to be aware that changes may occur in both species and habitat protection. The ESA applies to listed species on the Species at Risk in Ontario List (SARO). The Committee on the Status of Species in Ontario (COSSARO) meets regularly to evaluate species for listing and/or re-evaluate species already listed. As a result, species’ designations may change that could in turn change the level of protection they receive under the ESA 2007. Also, habitat protection provisions for a species may change e.g. if a species-specific habitat regulation comes into effect. The regulation would establish the area that is protected as habitat for the species.

Information with respect to SAR can be found in the online database at the Natural Heritage Information Centre (NHIC) - <http://nhic.mnr.gov.on.ca/nhic.cfm> . The NHIC compiles, maintains and distributes information on species at risk and updates its information on a regular basis. We encourage you to routinely check the NHIC database to obtain the most up to date SAR information for proposed work locations. However, while the NHIC database is the best available source of data, even when there are no known occurrences documented at a site, there is a possibility that SAR may occur at a proposed work location.

All data represents the MNR’s best current available information, it is important to note that a lack of occurrence at a site does not mean that there are no Species at Risk (SAR) at the location. The MNR continues to encourage ecological site assessments to determine the potential for other SAR occurrences. When a SAR does occur on a proposed site, it is recommended that the proponent contact the MNR for technical advice and to discuss what activities can occur without contravention of the Act. If an activity is proposed that will contravene the Act (such as Section 9 or 10), the proponent must contact the MNR to discuss the potential for application of certain permits (Section 17) or agreement (Regulation 242/08). For specific questions regarding the Endangered Species Act (2007) or species at risk, please contact a district Species at Risk Biologist at sar.kemptville@ontario.ca.

Natural. Valued. Protected.

Natural Heritage Information Centre

Land Information Ontario

Natural Heritage Information Centre: <http://nhic.mnr.gov.on.ca/>

Biodiversity Explorer (mapping): <https://www.biodiversityexplorer.mnr.gov.on.ca/nhicWEB/main.jsp>

Land Information Ontario: <http://www.mnr.gov.on.ca/en/Business/LIO/index.html>

Ontario Geospatial Data Exchange: http://www.mnr.gov.on.ca/en/Business/LIO/2ColumnSubPage/STEL02_167959.html

LIO Make-a-Map: http://www.mnr.gov.on.ca/en/Business/LIO/2ColumnSubPage/STDPROD_068999.html

Ontario Maps: http://www.mnr.gov.on.ca/en/Business/LIO/2ColumnSubPage/STDPROD_068512.html

The **Natural Heritage Information Centre** (NHIC) compiles, maintains and distributes information on natural species, plant communities and spaces of conservation concern in Ontario. This information is stored in a spatial database used for tracking this information. The Centre also has a library with conservation-related literature, reports, books, and maps, which are accessible for conservation applications, land use planning, and natural resource management. The NHIC website makes much of this information available through the internet.

Natural Heritage Information Centre

300 Water Street, 2nd Floor, North Tower
P.O. Box 7000, Peterborough, ON, K9J 8M5
Tel.:(705) 755-2159 Fax:(705) 755-2168

Land Information Ontario (LIO) manages key provincial datasets. LIO makes these and hundreds of other data sets available to registered users at no charge. LIO also coordinates public and private sector organizations to collect high resolution satellite imagery for Ontario providing significant cost savings for all partners. Technical bulletins, newsletters and more are available online. More details regarding Ontario imagery and data can be searched, ordered and accessed online.

LIO's Ontario Geospatial Data Exchange (OGDE) allows more than 400 public sector organizations to easily share and use digital geographic information under a single legal agreement. Membership is available to eligible public organizations at no costs.

Through the website, Maps & Map Tools are made available, including online mapping software: LIO Make-a-Map.

Land Information Ontario

lio@ontario.ca

LIO Support Team: (705) 755-1878

Or for specifics, see online at:

http://www.mnr.gov.on.ca/en/Business/LIO/2ColumnSubPage/STDPROD_068510.html

Additional Information pertaining to NHIC, LIO and other Natural Heritage and Data and Information tools is available in the **MNR Kemptville Information Request Guide (2012)**.

**APPENDIX C:
CIVIL SERVICING
ANALYSIS**

MEMO

TO: City of Clarence-Rockland
CC: Paul Black, MCIP RPP - FOTENN
FROM: Brian O’Dell, EIT - CIMA+
PEER REVIEWED AND APPROVED BY: Christopher Lyon, M.Eng., P.Eng - CIMA+
DATE: 11 May 2018
SUBJECT: Expansion Lands Existing Conditions Analysis - Civil Servicing

1 Existing Conditions

The proposed growth area of the urbanized area for the City of Clarence-Rockland is located southeast of the urban area, immediately adjacent to Caron Street as illustrated on **Figure 1**. The area is comprised of approximately 133.5 hectares (ha) of land held under multiple ownerships in blocks of land that are currently undeveloped or in use for agricultural purposes.



Figure 1 - Study Area provided in Request For Proposal Number F18-INF-2017-019.

1.1 Potable Water Supply and Major Transmission

Water Treatment and Potable Water Capacity

Based on the information provided to CIMA+ for the Clarence-Rockland Water Treatment Plant (WTP), the following current capacities have been identified:

- + Existing Clarence-Rockland WTP capacity is 13,500 m³/day; and the
- + Existing Clarence-Rockland WTP high lift pumping capacity is 13,500 m³/day.

These values represent the largest (maximum) sustained amount of treated (filtered and Chlorinated water) that the municipal water treatment plant can produce using existing equipment and processes. Water exiting the plant is also known as potable water. Once produced, potable water is piped to reservoir systems that are designed to ensure that a minimum amount of potable water is stored and available for regular daily uses (washing, drinking, toilet flushing, etc.) and also for fire protection.

To estimate the maximum flow of water that is required to support fully developed lands in the urban growth area (Expansion Lands), we will utilize water usage data that is collected by the City's SCADA system. Standard consumption rates are compiled into an annual Summary Report by Ontario Clean Water Agency (OCWA). OCWA is a quasi-private sector corporation that operates the urban water system under contract with the City of Clarence-Rockland. The 2016 Summary Report of water consumption is provided in Appendix A. Key items drawn from this report include:

- + The highest value of the Daily Flow Maximums for 2016 was 8,823.4 m³/day. This represents the highest water demand day during the year
- + The value of the Daily Flow Averages for 2016 was 6,170.51 m³/day. This represents an average day of water consumption over the year.

Based on this information, it is evident that water treatment plant capacity (13,500 cm³/day) exceeds current average usage (6,170 cm³/day). It also exceeds peak water consumption as recorded in 2016 (8,823 cm³/day). Information available suggests that an additional 4,676.6 m³/day of treated water can be produced by the WTP in support of Expansion Lands development.

Once the preferred land use scenario has been established for the Expansion Lands, CIMA+ will calculate the required flow of water needed to support this urban growth, and will determine whether or not the water treatment plant can currently meet this new projected supply or whether it requires modifications to meet higher water flows that cannot be supported by current plant infrastructure. It should be noted, that we will work with City officials and OCWA to verify 2018 baseline consumption maximums, and will assess future demand growth based on both Expansion Lands development and the additional town-wide infill development during similar timelines.

Finally, in regard to existing capacity restrictions associated with municipal water treatment supply, the Draft Report for the Clarence-Rockland and Limoges Water Servicing Study, confirmed that no capacity updates are required for the existing system to meet current service area demands (to 2017). The report also confirms that as the City experiences growth it will have to take the following actions to support future demands:



- + Acquire land adjacent to the existing WTP to expand the WTP;
- + Increase the WTP treatment capacity;
- + Increase the WTP high lift pumping capacity;
- + Increase the clearwell storage volume at the WTP; and
- + Increase Caron Booster Station capacity.

CIMA+ analysis of the water requirements of the Expansion Lands, is expected to clarify which, if any, of these improvements must be in effect to support partial or full development of the Expansion Lands.

Potable Water Transmission Mains and Reservoir Systems

The proposed Expansion Lands area is currently not served by the municipal potable water system. As indicated by **Figure 2** below, the proposed Expansion Lands are identified as being supported in the future by the municipal services sub-area known as 'Pressure Zone 2', see the green highlighted area. To ensure a good supply of potable water to this growth area, the City of Clarence-Rockland must ensure that adequate water transmission lines and reservoir systems are in place to move large quantities of water under pressure, such that containment systems are filled daily.

Two types of potable water reservoir systems are regularly used in Eastern Ontario. These include 'elevated storage' in what is commonly called a water tower. The Water pressure in the local watermain distribution pipes around a water tower is directly associated with the fact that the water is storage well above-grade. The higher the water storage area – the higher the potential water pressure in the watermains.

The second type is below-ground or at-grade reservoirs. These reservoirs offer little water pressure to the adjacent watermain systems, and so they are paired with electric motors that boost the pressure of water leaving the reservoirs. These 'booster stations' offer a similar service to a water tower, as each of these systems increase water pressure and flow capacity in the watermain distribution system.

The Municipality of Clarence-Rockland uses both water towers and booster stations to supply good water flow and pressure to the urban service area. Based on earlier engineering studies, at this time it is expected that the Expansion Lands can be serviced by the Caron Street Booster Station (BS) and the Bouvier Water Tower (Serviceability Study for Morris Village – Stage 5 (October 2017)). To confirm this preliminary assessment, additional information on the current water transmission lines (water pressure and flow capacity), and engineering analysis is required to determine the water distribution system current capacity from the Clarence-Rockland WTP to the Expansion Lands.

As the development plans for the Expansion Lands are developed during this study, it is expected that localized water modelling will be used in conjunction with available data on water (pressure and flow capacities) to develop an engineered approach to supply water to the proposed development area.



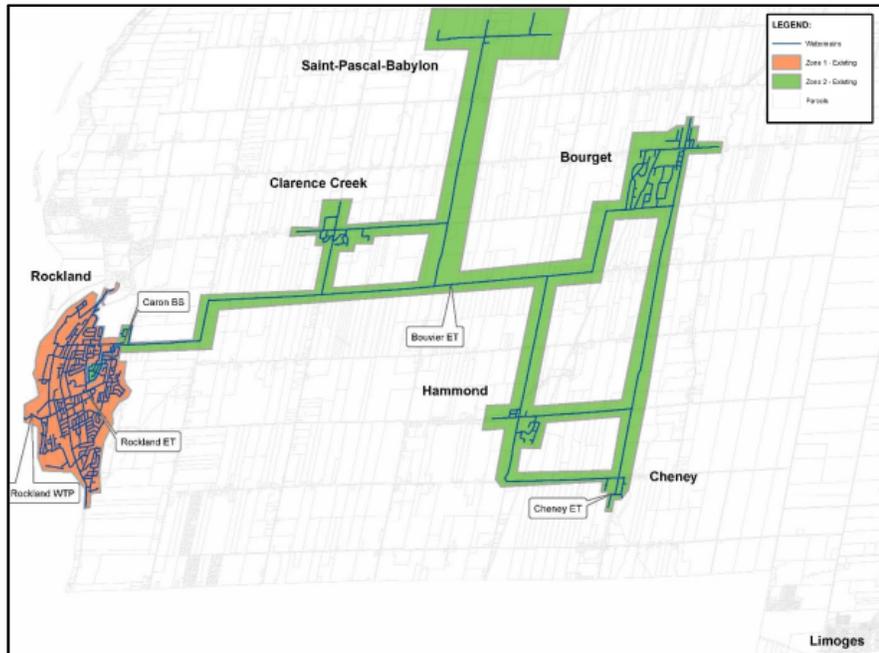


Figure 2 - Existing Drinking Water System Layout provided in Report for Clarence-Rockland and Limoges Water Servicing Study (Draft, January 19, 2018).

Potable Water Reservoir Storage Systems

The Expansion Lands require engineered volumes of potable water to be held in reservoirs to ensure that adequate water is on-hand to meet consumption and fire-fighting needs. The amount of water to be held in reservoirs is guided by standards published by the Ontario Ministry of the Environment and Climate Change.

Based on current City studies¹, it is understood that the City has adequate reservoir capacity to support growth needs until the year 2027. This analysis assumes that City growth will continue in a manner that is keeping with approved growth rates provided under the City Official Plan.

To clarify the impacts of this finding on the development of the Expansion Lands, additional analysis on reservoir capacity will be conducted when preferred development plans are finalized for the Expansion Lands area.

1.2 Expansion Lands Water Distribution Network

The distribution of treated water from reservoirs and booster stations to the planned new development in the Expansion Lands is supported by a system of watermains that are looped around and through the

¹ Draft Report for the Clarence-Rockland and Limoges Water Servicing Study dated January 19, 2017



Expansion Lands. Earlier engineering studies, confirm a number of specialized watermain systems that are expected to be instrumental in serving the growth area are expected to include:

- + Existing 150 mm diameter watermain on David Street;
- + High pressure 300 mm diameter watermain on Caron Street;
- + Caron Street Booster Station Improvements; and
- + Dedicated watermain booster line to the Bouvier Water Tower.

The above information has been drawn from as-built drawings and the Draft Report for the Clarence-Rockland and Limoges Water Servicing Study dated January 19, 2017. Based on the initial information received, the existing capacity of the Caron Street Booster Station (3,975 m³/day) exceeds the normal usage (2,563 m³/day). It is estimated that the available capacity is the Caron Street Booster Station is 1,412 m³/day. Our analysis of servicing the Expansion Lands will assess whether future maximum demand will exceed capacity. This analysis will use additional information on existing watermain conditions (e.g.: boundary conditions) to determine whether the proposed dedicated watermain booster line to the Bouvier Water Tower is required to meet projected maximum demand.

1.3 Fire Protection and Reservoir Capacity

The amount of potable water needed for human consumption is small by contrast to the flow and pressure of potable water needed to fight fires. In general, municipalities generally adopt minimum volumetric flow rates (litres per second or gallons per minute) that will be available to fight fires in their community. The availability of water to fight fires has a direct impact on the insurance rates paid by local building owners.

The existing fire flow targets adopted in the City of Clarence-Rockland for the new development area are 125 L/s in pressure zone PZ-1 (Rockland), with lower supply rates have been adopted for outlying village areas (67 L/s for PZ-2 (Villages)).

The detailed engineering analysis to be performed for the proposed development area will confirm available and required water supply (pressure, flow and reservoir capacity) for the preferred development scenario. These modelled fire flow capabilities will be confirmed against the municipal standard and will be verified against the findings of the Fire Underwriters Survey.

1.4 Sanitary Sewers System and Wastewater Treatment

The City of Clarence-Rockland is served by a comprehensive sanitary sewer system. This system is designed to support sanitary sewerage flows from all lands within the urban service area. It is proposed that the Expansion Lands area under review in this study, will be fully supported by sanitary sewer system, and that localized septic systems will not be permitted in this growth area.

Wastewater Treatment Plant

This system of sanitary sewers and pumping stations collectively direct sewage flows to a single wastewater treatment plant (WWTP) that supports the Clarence-Rockland serviced area. Under relevant Provincial regulations, municipalities must have pumping stations and WWTP systems rated and given a maximum capacity in Cubic Meters/Day or Liters/Second.



The Clarence-Rockland WWTP is a secondary treatment facility based on sequencing batch reactor technology. Disinfection is provided by chlorination prior to discharge to the Ottawa River. Sludge is stabilized through an aerobic digestion process prior to storage on site and land application.

The current rated capacity of the Clarence-Rockland WWTP is as follows:

- + Rated Average Daily Flow Capacity of 6,800 m³/day;
- + Rated Maximum Daily Flow Capacity of 17,340 m³/day; and a
- + Rated Peak Flow Capacity of 20,400 m³/day.

Under existing peak flow conditions, the WWTP does not provide sufficient retention time for chlorination prior to discharging to the Ottawa River.

As of 2018, to address the capacity issues and provide for future growth, the City of Clarence-Rockland is undertaking upgrades to the WWTP, including:

- + Construction of a new headworks facility, complete with fine screening and grit removal system to improve both pre-treatment and secondary treatment effectiveness; and,
- + Design and construction of an equalization tank, as previously identified within the long-term plan for the WWTP, to normalize peak flows from inflow and infiltration.

It is anticipated that these changes will address several WWTP deficiencies.

Sanitary Pump Stations

While the City's sanitary sewer system has been designed to rely on gravity to support natural flows toward a centralized Waste Water Treatment Plant, it has not been feasible to use gravity alone in all situations. Therefore, the City has constructed a number of sewage pumping stations in the existing urban area to pump sewage flows towards the WWTP. At this time, a total of seven (7) existing sewage pumping stations are in operation which use pumps to pressurize and 'lift' sewage to higher gravity-fed sewers. An eighth sewage pumping station is under design.

Pumping Station No. 1 is the City's largest pumping station, as it transfers collected sewage from the full urban service area to the Clarence-Rockland WWTP. It is located south of Highway 17, next to Caron Street. In regard to known critical sanitary sewer infrastructure at this stage of our review, below is key planning information with respect to Pumping Station No. 1, which will be used to pump sewage flows from the Expansion Lands:

- + Existing average daily flow is 44.14 L/s (estimated 2013 flows from 2005 data);
- + Existing maximum daily flow is 82.19 L/s (estimated 2013 flows from 2005 data);
- + Existing firm rated capacity is 200 L/s;
- + Existing peak instantaneous sewage flow is 203.91 L/s (estimated 2013 flows from 2005 data); and
- + Flows in excess of 200L/s from Pumping Station No. 1 have been reported by O.W.C.A. in the past 5 years (Pumping Station No. 1 Technical Memorandum dated December 18, 2013).

MOECC design guidelines require that all pumping stations be able to pump peak instantaneous sewage flows based on its firm capacity. Firm capacity is defined as the station capacity with the largest pump out of commission. For Pumping Station No. 1, this is 200 L/s. Based on the current status of Pumping Station



No. 1 and the MOECC design guidelines, it would suggest that Pumping Station No. 1 is currently operating at or even beyond its firm capacity.

The City of Clarence-Rockland has identified possible future improvements to Pumping Station No. 1, including:

- + Increase the pumping capacity and conveyance capacity of Pumping Station No. 1 to 400 L/s; and
- + Twinning the forcemain to convey an ultimate peak flow capacity of 850 L/s and for operation redundancy.

It is anticipated that the above modifications to Pumping Station No. 1 will address the existing capacity issues and provide available capacity for future growth.

As part of this study mandate the system of sewers and pump station from the Expansion Lands to the WWTP, will be reviewed and capacities / deficiencies assessed. In the event that additional pump stations are required, this requirement will be identified.

Sanitary Sewers

As noted above, the planned Expansion Lands development will rely on an existing system of urban area sanitary sewers and pumping stations to convey flows from the Expansion Lands to the Wastewater Treatment Plant. Our review of existing conditions is focused on ensuring that there is adequate additional capacity in the downstream sanitary sewer system to meet the added growth of the Expansion Lands plus approved development elsewhere in the urban service area.

Key issues under investigation, include:

- + Existing use and capacity of a constructed 450 mm diameter forcemain on Caron St from David St to 100 m south of Corbel Blvd;
- + Existing use and capacity of a 250 mm diameter sanitary sewer from Caron St, heading east on David St (until capped);
- + Existing use and capacity of a 300 mm diameter sanitary sewer from intersection of Caron St and David St, southbound on Caron St (terminating at an existing maintenance hole);
- + The Ultimate Servicing Map, SK1.1 in Appendix B, shows a sub-area of the Expansion Lands which is on the west side of Caron Street. This area is expected to be serviced by Pumping Station No. 8 (located in Morris Village Stage 5, Pumping Station No. 9, in the Serviceability Study for Morris Village – Stage 5);
 - Pumping Station No. 8 has a total area of 103.08 ha and a population of 6,786 capita allocated for future sites. The new pumping station will service a total of 219.53 ha and a total population of 14,665 capita for a total peak flow of 227.10 L/s;
 - Sewage from Pumping Station No. 8 will be pumped to the deep sanitary sewer on Caron Street and then gravity flow to Pumping Station No. 1;
 - Existing use and capacity of this pumping station and downstream receiving sewers is to be confirmed.
- + The Ultimate Servicing Map, SK1.1 in Appendix B, shows the sub-area of the Expansion Lands which is on the east side of Caron Street, that will be serviced by Pumping Station South of David



St (as identified in Table 3-7 from the Sewage Pumping Station Capacity and Condition Assessment & Sanitary Treatment Facility Capacity and Capital Investment Report dated June 9, 2014).

- It is assumed this pumping station will pump sewage through the existing 450 mm diameter forcemain to a maintenance hole upstream of Pumping Station No. 1, at which point it will transition to gravity flow to Pumping Station No. 1.
 - Existing use and capacity of this pump station and downstream receiving sewers is to be confirmed.
- + In 2015, Caron Street was reconstructed and new underground infrastructure was installed. The Sanitary Sewer Calculation Sheet in Appendix B, and associated Sketch SK1.23, indicate that the new sanitary sewers have approximately 13% available capacity when taking into account existing and proposed contributing sanitary areas.

1.5 Storm Sewer and Storm Water Management

The pre-development condition of the proposed Expansion Lands is rolling cultivated fields which drain to low areas and eventually to adjacent ditches and creeks. The major creeks adjacent to the Expansion Lands are Clarence Creek and Lafontaine Creek, both creeks are tributaries to the Ottawa River. The Expansion Lands are approximately 3 to 3.5 km upstream from the confluence of the creeks with the Ottawa River.

Caron Street (north of David Street) has an urban cross section and handles runoff from the roadway by catch basins and storm sewers. Appendix C shows the catchment areas for the storm sewers, along with the associated storm sewer calculation sheet for sizing the piping network. Some of the catchment areas identified in Appendix C fall within the proposed Expansion Lands.

Currently Caron Street (south of David Street) and David Street have a rural cross section and handle runoff from the roadway by roadside ditches and culverts until a stormwater outfall is reached. Runoff from the cultivated lands follows the path of least resistance until Clarence Creek or Lafontaine Creek is reached.

It is assumed that as the Expansion Lands develop, a dual drainage system will be adopted. This dual drainage system will consist of a minor piped storm sewer system and a major overland flow system. Based on consultation with the municipality and the South Nation Conservation Authority, the stormwater system for quality and quantity sizing will be designed to address the following:

- + Pre-to-Post development control;
- + Storm sewers will be designed using the rational formula for the 5 year design storm using an inlet time of 10 minutes for roads and 15 minutes for rear yards;
- + The March 2003 Ministry of the Environment Stormwater Management Planning and Design Manual will be used for any studies and required design;
- + Where feasible, rear yard and roadway catchbasins will be equipped with inlet control devices restricting flows to appropriate limits;
- + The hydraulic grade line (HGL) in the storm sewer will be designed to allow a clearance of at least 0.3 m between the underside of footing and the 100 year HGL;



- + Maximum ponding in road sags will be 0.3 m;
- + Minor system and Major system flow will be directed to an appropriately sized stormwater management facility which will be designed to meet quality and quantity requirements.

Further analysis is required and design details will be available as the project progresses. The proposed Expansion Lands are outside the boundaries for the South Nation Conservation Authority (SNCA) and the Rideau Valley Conservation Authority. From previous project experience, it is anticipated consultation with SNCA and the Ministry of Natural Resources and Forestry will be required to validate quantity and quality requirements as the design progresses.

Attachments

Appendix A – 2016 Summary Report for Water Consumption

Appendix B – Sanitary Sewer Calculation Sheet for Caron Street by WSP, Sanitary Servicing Areas and Pump Station Catchment Areas by Genivar

Appendix C – Storm Sewer Calculation Sheet and Storm Catchment Areas by WSP/Genivar



Appendix A

February 27th 2017

Mr. Denis Longpré
The City of Clarence-Rockland
1560, Laurier Street
Rockland, ON
K4K 1P7

Dear Mr. Longpré,

Attached is the 2016 Summary Report for the Rockland Water System. This report is completed in accordance with Schedule 22 of O. Reg. 170/03, under the Safe Drinking Water Act, which requires a Summary Report to be prepared not later than March 31st of each year for the preceding calendar year.

This Summary Report is to be provided to the members of the municipal council. Please ensure this distribution.

Furthermore we recently forwarded you a copy of the 2016 Section 11 Annual Report for the Rockland Water System. Section 12 of O. Reg. 170/03, requires that both the Summary Report and the Annual Report be made available for inspection by any member of the public during normal business hours, without charge. The reports should be made available for inspection at the office of the municipality, or at a location that is reasonably convenient to the users of the water system.

Sincerely

Patrick Lalonde
(A) Process Compliance Technician
OCWA, Alfred Hub

SUMMARY REPORTS FOR MUNICIPALITIES

Introduction:

Schedule 22 of O. Reg. 170/03 requires the preparation by the water system owner of a "Summary Report for Municipalities". This requirement is applicable only to large and small municipal residential water systems.

The Summary Report for the preceding year is to be issued by March 31st of the following year.

Distribution of the Summary Report is a function of ownership. If the water supply is owned by a municipality then all members of council are to receive the report. If owned by a municipal service board established under Section 195 of the Municipal Act, 2001 then all members of that board are to receive the report. Where a corporation owns the water supply, then the board of directors is to receive the report. And finally, where the water supply provides water to another municipality under a contract then the water supply owner shall give by March 31st 2017 a copy of the Summary Report to the municipality being supplied

The contents of the Summary Report for Municipalities must include the following:

1. A list of the requirements of the Safe Drinking Water Act and it's Regulations that the water system failed to meet during the report's time frame including the duration of the failure
2. A list of the requirements of the water system's Certificate of Approval that the water system failed to meet during the report's time frame including the duration of the failure
3. A list of any Orders that the water system failed to meet during the report's time frame including the duration of the failure
4. For each of the above failures, a description of the measures taken to correct the failures
5. A summary of the quantities and flow rates of the water supplied "including monthly average and maximum daily flows and daily instantaneous peak flow rates."
(Information is to enable the owner to assess the capability of the water system to meet existing and future uses.)
6. A statement that captures the comparison of the flow information above to the rated capacity and flow rates approved in the water supply's approval.

SUMMARY REPORTS FOR MUNICIPALITIES

Report

This report is a summary of water quality information for the Rockland WTP, published in accordance with Schedule 22 of Ontario's Drinking-Water Systems Regulation for the reporting period of January 1st, 2016 to December 31st, 2016. The Rockland WTP is categorized as a Large Municipal Residential Drinking Water System.

This report was prepared by The Ontario Clean Water Agency on behalf of the Corporation of the City of Clarence-Rockland.

Who gets a copy of the Report:

- in the case of a drinking-water system owned by a municipality, the members of the municipal council;
- in the case of a drinking-water system owned by a municipal service board established under section 195 of the *Municipal Act, 2001*, the members of the municipal service board; or
- in the case of a drinking-water system owned by a corporation, the board of directors of the corporation.

What must the Report contain?

The report must,

- (a) list the requirements of the Act, the regulations, the system's approval and any order that the system **failed to meet** at any time during the period covered by the report and specify the duration of the failure; and
- (b) for each failure referred to in clause (a), describe the measures that were taken to correct the failure.

The following table lists the requirements that the system failed to meet and the measures taken to correct the failure:

Drinking Water Legislation	List the requirement(s) the system failed to meet	Specify the duration of the failure (i.e. date(s))	Describe the measures taken to correct the failure	Status (complete or outstanding)
Safe Drinking Water Act	N/A			
Ontario Regulations (eg. O.Reg 170/03, O.Reg 128/04, O.Reg 903)	N/A			
Municipal Drinking Water Licence#175-101 System Drinking Water Works Permit #175-201 PTTW#2563-7H9QE8	Section 1.4 of the MDWL. Failed to meet the Suspended Solids Criteria listed in table 3 for residue management	Month of December 2016	Backwash supernatant tank valve to storm sewer has been shut off and diverted to sanitary, Tank will be scheduled for cleaning and inspection in 2017	Complete
Provincial Officer's Order #	N/A			

What else must the Report contain?

The report must also include the following information for the purpose of enabling the owner of the system to assess the capability of the system to meet existing and planned uses of the system:

1. A summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows and daily instantaneous peak flow rates.
2. A comparison of the summary referred to in paragraph 1 to the rated capacity and flow rates approved in the system's approval.

Attached please find a copy of the Annual Record of Water Taking for the Rockland WTP, which contains all required flow information.

When Does the Report Get Submitted?

If a report is prepared for a system that supplies water to a municipality under the terms of a contract, the owner of the system shall give a copy of the report to the municipality by March 31 2017.

End

Annual Record Of Surface Water Taking Relevé annuel des prises d'eau de surface

Personal information contained on this form is collected under the authority of the Ontario Water Resources Act, Section 20. The Purpose of the form is to record details and information about the taking of water annually. Questions should be directed to the respective hub office in your area.

Les renseignements personnels qui figurent dans le présent formulaire sont recueillis en vertu de l'article 20 de la Loi sur les ressources en eau de l'Ontario. Ce formulaire sert à dossiers les détails et les renseignements concernant la prise d'eau annuelle. Prière d'adresser toutes questions au personnel du bureau régional de votre secteur.

Year(Année): **2016**

Permit No.(N° de permis):**2563-7H9QE8**

Source: **Ottawa River**

Name of Permittee: **Corporation of the City of Clarence** Mailing Address: **1560 rue Laurier, Rockland ,Ontario,K4P 1P7**
 Nom du titulaire du permis Adresse postale

Concession: I Lot: 27
 Concession: Lot:

Location Of Taking: **Rockland WTP** Twp. or Municipality: **City of Clarence-Rockland**
 Lieu de la prise d'eau Canton ou municipalité

Month	Monthly Flow Total (m3/month)	Daily Flow Average (m3/day)	Daily Flow Maximum (m3/day)	Daily Flow Peak Flow Rate (L/min)	Daily Flow Peak Flow Rate (L/sec)	Number of Days of Water Taking	Maximum Daily Run Time (hr)
Jan	143,884.2	4,641.43	5,477.8	4,798.8	69.24	31	24.0
Feb	133,453.5	4,601.84	5,407.7	4,611.3	69.23	29	22.0
Mar	142,111.8	4,584.25	5,439.7	8,481.3	70.28	31	22.7
Apr	136,936.1	4,564.54	5,537.0	8,695.0	69.9	30	23.0
May	170,584.9	5,502.74	8,823.4	9,211.3	106.18	31	23.9
Jun	185,115.2	6,170.51	7,810.6	9,166.3	112.17	30	23.3
Jul	166,299.4	5,364.50	7,171.8	9,217.5	114.09	31	21.9
Aug	176,702.5	5,700.08	8,246.5	9,313.8	111.67	31	21.2
Sep	156,914.0	5,230.47	6,972.3	9,263.8	112.63	30	18.6
Oct	153,298.2	4,945.10	6,151.3	9,232.5	112.71	31	16.7
Nov	141,775.3	4,725.84	5,391.9	9,192.5	113.27	30	14.2
Dec	147,531.3	4,759.07	6,727.2	9,933.8	116.07	31	16.1
Total	1,854,606.4					366	
Avg	154,550.5	5,067.23			98.12		
Max	185,115.2	6,170.51	8,823.4	9,933.8	116.07		24.0
Criteria			14,500	10,089		366	24.0

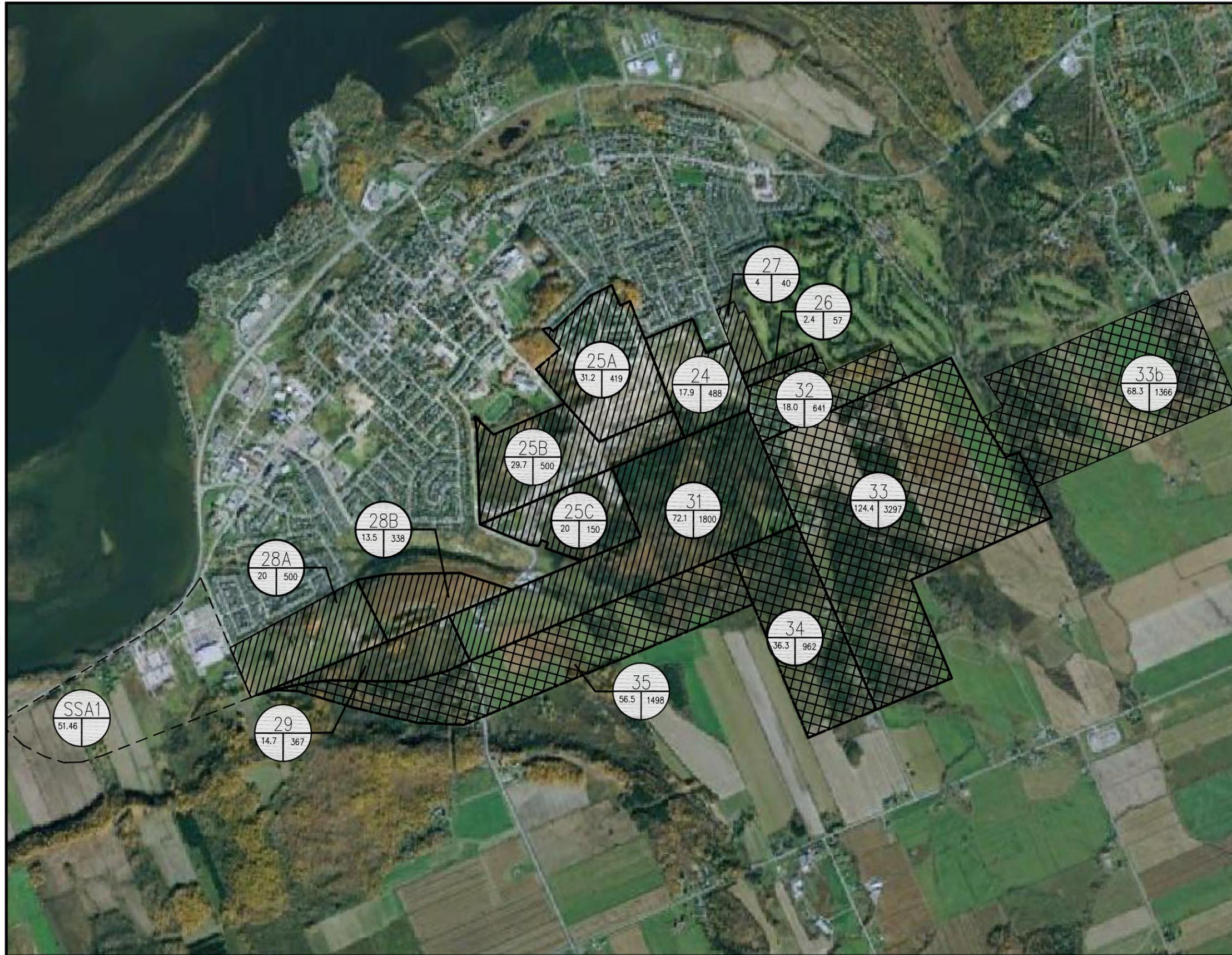
Appendix B

Sanitary Sewer Calculation Sheet



DRAINAGE AREA DESCRIPTION														OUTLET PIPE DATA																					
LOCATION	MANHOLE	MANHOLE	No.	Ha	CONTRIBUTING AREAS	POPULATION				q	M	Peak Flow	Σ	IA	Q (INCOMING FROM SIDE STREET)	Q	SIZE	Slope	CAP	Q/Qfull	VEL	LENGTH	FALL												
	FROM	TO				Ppha	P	P(1000)	P(1000)	l/cap/d		(l/s)	AREA (ha)	(l/s)	(l/s)	(mm)	(%)	(l/s)		(m/s)	(m)	(m)													
Caron St	SAM250	SAM251	26	2.40		67.50	162	0.162	0.162	400	4.00	3.00	2.4	0.67	-	3.83	200	2.10%	47.53	0.08	1.51	22.8	0.479												
Caron St	SAM251	SAM252	32	24.20	26.32	67.50	1633.5	1.6335	1.7955	400	3.62	30.11	26.6	7.45	-	38.97	250	1.16%	64.05	0.61	1.30	55.5	0.644												
Caron St	SAM252	SAM253			26.32				1.7955	400	3.62	30.11	26.6	7.45	-	38.97	250	1.29%	67.54	0.58	1.38	33.8	0.436												
Caron St	SAM253	SAM254			26.32				1.7955	400	3.62	30.11	26.6	7.45	-	38.97	250	0.60%	46.06	0.85	0.94	62.5	0.375												
Caron St	SAM254	SAM255			26.32				1.7955	400	3.62	30.11	26.6	7.45	-	38.97	300	0.40%	61.16	0.64	0.87	96.7	0.387												
Caron St	SAMH201	SAMH202	26,32,33,33b,34,35	312.10		67.50	21066.8	21.0668	21.06675	400	2.63	256.49	312.1	87.39	-	343.88	750	0.15%	431.17	0.80	0.98	95.1	0.143												
Caron St	SAMH202	SAMH203	Refer to CH2MHILL Master Sanitary Servicing Plan for the South Development Area for respective calculations													241.00	584.88	750	0.40%	704.10	0.83	1.59	100.2	0.401											
Caron St	SAMH203	SAMH204														0.00	584.88	750	0.40%	704.10	0.83	1.59	100.2	0.401											
Caron St	SAMH204	SAMH205														0.00	584.88	750	0.40%	704.10	0.83	1.59	99.9	0.400											
Caron St	SAMH205	SAMH206														0.00	584.88	750	0.40%	704.10	0.83	1.59	99.8	0.399											
Caron St	SAMH206	SAMH207														0.00	584.88	750	0.50%	787.20	0.74	1.78	100.1	0.501											
Caron St	SAMH207	SAMH208														0.00	584.88	750	0.50%	787.20	0.74	1.78	100.1	0.501											
Caron St	SAMH208	SAMH209														16.00	600.88	750	0.50%	787.20	0.76	1.78	100.2	0.501											
Caron St	SAMH209	SAMH210														1.00	601.88	750	0.50%	787.20	0.76	1.78	75.8	0.379											
Caron St	SAMH210	SAMH211														8.00	609.88	750	0.50%	787.20	0.77	1.78	105.0	0.525											
Caron St	SAMH211	SAMH212														1.00	610.88	750	0.50%	787.20	0.78	1.78	99.8	0.499											
Caron St	SAMH212	SAMH213														0.00	610.88	900	0.20%	809.59	0.75	1.27	102.3	0.205											
Caron St	SAMH213	SAMH214														92.00	702.88	900	0.20%	809.59	0.87	1.27	70.7	0.141											
Caron St	SAMH214	SAMH215														21.00	723.88	675	1.00%	840.59	0.86	2.35	93.3	0.933											
EXISTING PIPE	SAMH215	EX SAMH216														Existing Pipes (Covered Under Seperate ECA)																			
EXISTING PIPE	EX SAMH216	EX SAMH217																																	
EXISTING PIPE	EX SAMH217	MH608																																	
Caron St	MH608	PS1													732.80	675	1.00%	840.59	0.87	2.35	94.9	0.949													

DESIGN PARAMETER				Designed By:	PROJECT:
Mannings n =	0.0130			Matt Scanlan, EIT	Caron St. Reconstruction
Average Daily Flow (q)=	400 l/cap/d			Checked By:	LOCATION:
Infiltration Rate (I) =	0.28 l/s/ha			Matt Morkem, P.Eng	Rockland, Ontario
				Dwg. Reference:	Project Number:
				SK1-23rev1 -Sanitary Area	65038
					Date:
					29-Apr-13



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CITY OF CLARENCE-ROCKLAND

CLIENT REF. #:
 PROJECT:
CARON STREET RECONSTRUCTION

ISSUED FOR - REVISION:

NO.	DATE	DESCRIPTION
1	2013/01/23	ISSUED FOR ECA

IS	RE	DATE	DESCRIPTION

PROJECT NO: **065038** DATE: **MAY, 2010**

ORIGINAL SCALE: **1:20000**

DESIGNED BY: **MS**

DRAWN BY: **MF/MS**

CHECKED BY: **MM**

IF THIS BAR IS NOT 1" LONG, ADJUST YOUR PLOTTING SCALE.

DISCIPLINE: **CIVIL**

TITLE:
PROPOSED SANITARY SERVICING AREAS

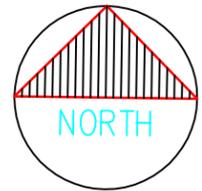
SHEET NUMBER: **SK1.23**

SHEET #: **--** OF **--**

ISSUE: **ISSUED FOR ECA** REV # **0**
 DATE OF: **JANUARY 23, 2013**

LEGEND

-  COMMERCIAL CORE AREA
-  SERVICE COMMERCIAL
-  HIGHWAY COMMERCIAL
-  COMMUNITY FACILITIES
-  TOURIST RECREATION COMMERCIAL
-  LOW DENSITY RESIDENTIAL
-  MEDIUM DENSITY RESIDENTIAL
-  MAJOR OPEN SPACE
-  SPECIAL STUDY AREA 1
-  SANITARY DRAINAGE AREAS



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CLIENT REF. #:
 PROJECT:
**CLARENCE-ROCKLAND
 PUMPING STATION EVALUATION**

ISSUED FOR - REVISION:

NO.	DATE	DESCRIPTION

IS	RE	DATE	DESCRIPTION

PROJECT NO: 121-20569-00	DATE: MAY 2013
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DESIGNED BY: MS	
DRAWN BY: STR	
CHECKED BY: MM/MS	

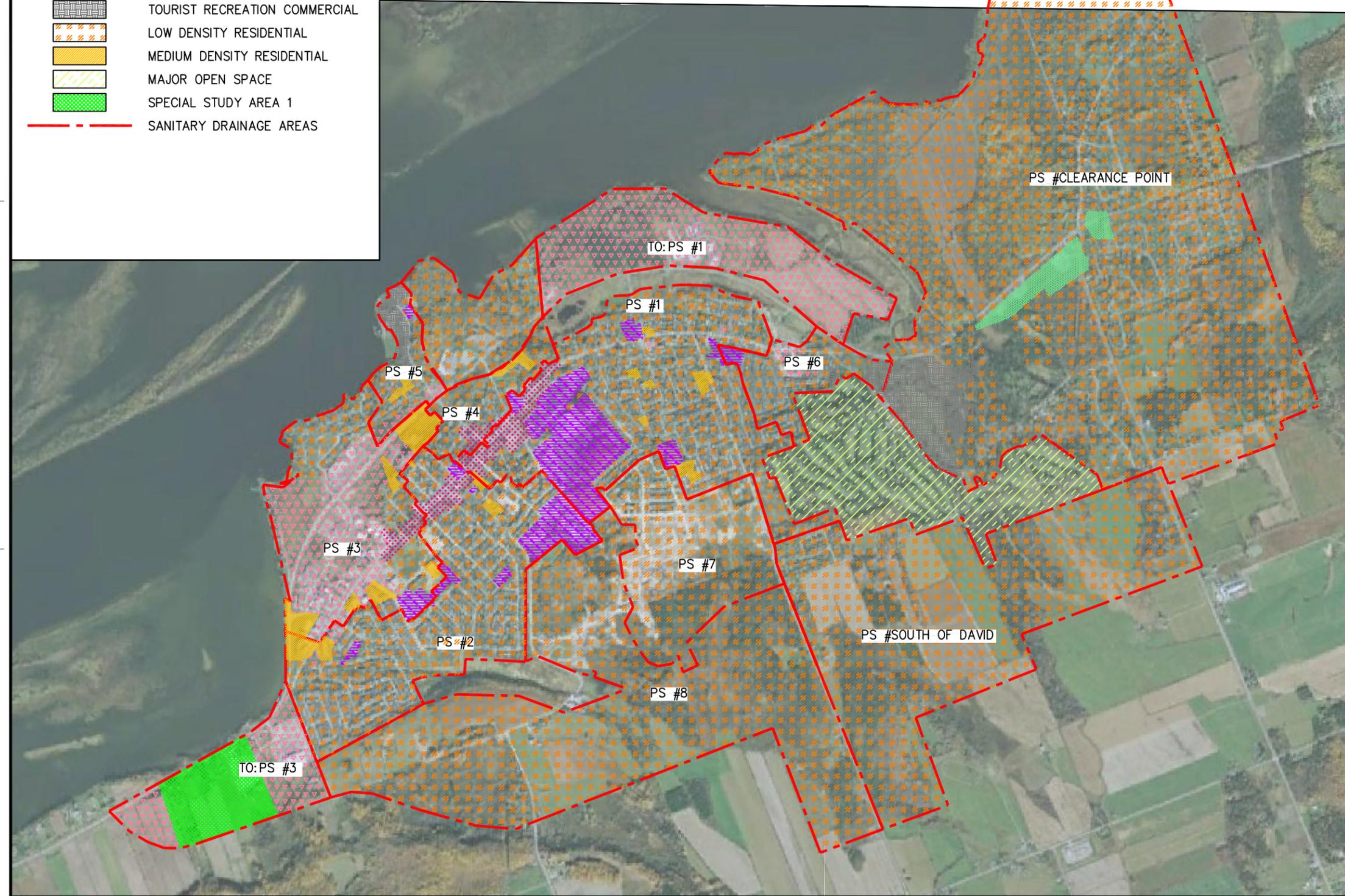
DISCIPLINE: **CIVIL**

TITLE:
**PUMP STATION CATCHMENT
 AREA PLAN**

SHEET NUMBER: **SK1.1**
 SHEET # OF

ISSUE: **ISSUED FOR REVIEW**
 DATE OF: **MAY 22, 2013**

REV #
0



Appendix C

Storm Sewer Calculation Sheet



Caron Street Reconstruction

STREET	MANHOLE					CONTRIBUTING AREAS	RUNOFF DATA						PIPE DATA							
	From		To		No		Ha	C	AC	Σ AC	Tc (min.)	I (mm/hr)	Q (L/s)	Size (mm)	Slope (%)	Capacity (L/s)	Q/Q _{full}	Velocity (m/s)	Length (m)	FALL (m)
CARON ST	STM300	STM304	S1	0.220		S1	0.75	0.165	0.165	15.000	83.56	38.33	300	0.50%	68.4	0.56	0.97	65.92	0.330	
CHAPMAN ST	-	STM304																		
CARON ST	STM304	STM305																		
ATREL ST CUL DE SAC EAST	-	STM305																		
CARON ST	STM305	STM306																		
ATREL ST	STM103	STM306																		
CARON ST	STM306	STM307																		
CARON ST	STM307	STM309																		
CARON ST	STM308	STM309	S6	0.240		S6	0.75	0.180	0.180	15.000	83.56	41.81	300	0.50%	68.4	0.61	0.97	44.04	0.220	
CARON ST	STM307	STM309	-	-		A1,A2,A3,S1,S2,S3,S4,S5	-	-	4.041	18.228	74.40	835.67	900	0.40%	1144.9	0.73	1.80	41.59	0.166	
CARON ST	STM309	OUTLET	-	-		A1,A2,A3,S1,S2,S3,S4,S5,S6	-	-	4.221	18.613	73.45	861.80	900	0.35%	1071.0	0.80	1.68	20.00	0.070	
CARON ST	MH101	MH102	G	1.308		G	0.40	0.523	0.523	15.0	84	122.45	375	0.70%	146.7	0.83	1.33	82.53	0.578	
CARON ST	MH102	MH103	F	0.915		F,G	0.40	0.366	0.889	15.8	81	201.86	450	0.70%	238.5	0.85	1.50	72.3	0.506	
CARON ST	MH103	MH104	F			F,G		0.000	0.889	16.5	79	196.77	450	0.70%	238.5	0.82	1.50	62.7	0.439	
CARON ST	MH104	MH105	E	1.039		E,F,G	0.40	0.416	1.305	17.0	78	283.44	525	0.60%	333.1	0.85	1.54	47.5	0.285	
	MH105	MH106						0.000	1.305	17.5	76	278.40	525	0.60%	333.1	0.84	1.54	47.5	0.285	
	MH106	MH107						0.000	1.305	18.0	75	274.08	525	0.60%	333.1	0.82	1.54	42.2	0.253	
CARON ST	MH107	MH108				E,F,G		0.000	1.305	18.5	74	269.73	525	0.55%	318.9	0.85	1.47	42.2	0.232	
CARON ST	MH108	MH109	C+D	20.296		C,D,E,F,G	0.40	8.118	9.423	19.1	72	1906.36	1200	0.35%	2306.5	0.83	2.04	80	0.280	
CARON ST	MH109	MH110	B	1.671		B,C,D,E,F	0.40	0.668	10.092	20.2	70	1974.94	1200	0.35%	2306.5	0.86	2.04	128.1	0.448	
CARON ST	MH110	MH111	A	0.979		A,B,C,D,E,F,G	0.40	0.392	10.483	21.1	68	1991.48	1200	0.35%	2306.5	0.86	2.04	119.32	0.418	
CARON ST	MH111	MH112				A,B,C,D,E,F,G		0.000	10.483	21.2	68	1989.28	1050	1.00%	2730.7	0.73	3.15	7	0.070	
CARON ST	MH150	MH151	H	4.038		H	0.40	1.615	1.615	15.0	84	377.94	750	0.40%	704.1	0.54	1.59	70.96	0.284	
CARON ST	MH151	MH152	I	1.553		H,I	0.40	0.621	2.237	16.0	80	503.21	750	0.45%	746.8	0.67	1.69	105.0	0.473	
CARON ST	MH152	MH153	J	1.460		H,I,J	0.40	0.584	2.821	16.9	78	615.60	750	0.50%	787.2	0.78	1.78	90.0	0.450	
CARON ST	MH153	MH155	K	1.843		H,I,J,K	0.40	0.737	3.558	17.8	75	751.44	825	0.40%	907.8	0.83	1.70	96.1	0.384	
CARON ST	MH155	MH156				H,I,J,K		0.000	3.558	18.7	73	728.86	825	0.39%	896.4	0.81	1.68	91.7	0.358	
CARON ST	MH156	MH157	L	2.905		H,I,J,K,L	0.40	1.162	4.720	19.5	71	944.59	825	0.60%	1111.9	0.85	2.08	89.8	0.539	
CARON ST	MH158	MH157	M	4.338		M	0.40	1.735	1.735	15.0	84	406.00	750	0.20%	497.9	0.82	1.13	54	0.108	
	MH157	HEADWALL				H,I,J,K,L,M						1350.59	1200	0.20%	1743.6	0.77	1.54	14	0.028	

DESIGN PARAMETER

Mannings n = 0.013
 Infiltration Rate (I) = 0.28 l/s/ha

Designed By: Matt Scanlan	PROJECT: Caron St. Reconstruction	
Checked By: Matt Morkem	LOCATION: Rockland, Ontario	
Dwg. Reference: SK1-6rev1 - Storm Area North Caron SK.32rev1 - Storm Areas South Caron	Project Number: 65038	Date: 20-Jun-13



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CLIENT:
CITY OF CLARENCE-ROCKLAND

CLIENT REF. #:
 PROJECT:
CARON STREET RECONSTRUCTION

ISSUED FOR - REVISION:

IS	RE	DATE	DESCRIPTION
1		2013/01/22	ISSUED FOR ECA

PROJECT NO: 065038	DATE: MAY, 2013
ORIGINAL SCALE: 1:7500	IF THIS BAR IS NOT 1" LONG, ADJUST YOUR PLOTTING SCALE.
DESIGNED BY: MS	
DRAWN BY: MF/MS	
CHECKED BY: MM	 1"

DISCIPLINE: **CIVIL**

TITLE:
PROPOSED STORM CATCHMENT AREAS

SHEET NUMBER: **SK1.32**
 SHEET #: -- OF --
 ISSUE: **ISSUED FOR ECA**
 DATE OF: **JANUARY 22, 2013**

REV #
0

**APPENDIX D:
RETAIL MARKET
DEMAND STUDY**

RETAIL MARKET DEMAND
STUDY: CLARENCE-ROCKLAND
ONTARIO
FINAL REPORT

Prepared for:
City of Clarence-Rockland

Prepared by:
Shore-Tanner & Associates

October 17, 2018

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Page number

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I. EXECUTIVE SUMMARY

On behalf of the City of Clarence-Rockland, and as a member of a multi-disciplinary team of consultants under the direction of Fotenn Planning & Design, this study has been carried out by Shore-Tanner & Associates. Its purpose is to determine the scope of market demand for retail, service, and small office businesses in a new part of Rockland. The main findings of the study are summarized below, followed by more detailed substantiation in the main body of the report.

A. Subject Site

The Subject Site is approximately 133.5 hectares (320 acres) in size, located southeast of Rockland's existing Urban Area Boundary. It is proposed to be added to the City of Rockland through an Expansion Lands Secondary Plan.

For the purposes of this study, we estimated a total of approximately 3,200 housing units, and associated population of 8,000 on the Subject Site when fully developed.

B. Major Socio-Demographic Findings

1. Rockland is a major commercial hub in the United Counties of Prescott and Russell (UCPR) and its businesses attract customers from within this area and beyond.
2. The total population of Clarence-Rockland increased by an average of 372 or 1.8%, and in UCPR by 915 or 1.1% per year from 2006 to 2016 (Table 3.1).
3. The 2018 population of Clarence-Rockland is estimated at 26,746 and that of UCPR at 91,500. Their estimated average annual growth to the year 2028 is 598 or 2.4% and 1,620 or 1.8% respectively (Table 3.3).
4. Considering that an overall average annual population growth of 1% represents a growing and balanced economy, the past and future growth of both of these areas have exceeded this generally accepted growth standard.
5. Due to the development of many housing units over \$300,000 and attracting affluent families, including from Ottawa, incomes in both areas have significantly increased recently. As shown in Table 3.4, the 2016 **median** household incomes were:

- Clarence-Rockland \$88,823
- UCPR \$78,748
- City of Ottawa \$85,981

This is particularly important since the City of Ottawa's household incomes are often among the top three to five cities in Canada.

C. Retail Spending

1. On average, each resident of Clarence-Rockland is estimated to spend \$18,110, and those of UCPR as a whole, \$17,380 in 2018 at all retail and service businesses within and outside these areas (Table 5.1).
2. The total spending of UCPR residents is estimated at \$1.590 **billion** in 2018, and expected to increase by \$28.1 million or 1.8% annually by the year 2028, to \$1.871 **billion** (Table 5.2).
3. The estimated spending portion of the residents of Clarence-Rockland from UCPR's total is \$484.4 million in 2018, and \$592.6 million in 2028 (i.e., average annual growth in spending of \$10.82 million or 2.2% (Table 5.3).
4. At present, some of the spending of UCPR residents takes place at businesses in Ottawa and elsewhere. This leakage-out is due to the following factors:
 - a) Some of the UCPR residents work in Ottawa and spend some of their retail dollars there.
 - b) There are no senior department stores (i.e., Simons, The Bay, Nordstrom) or other new and popular/trendy stores (e.g., J. Crew, Michael Kors) within UCPR. These stores exist in Ottawa, and attract customers from UCPR and other cities and towns within 1-2 hours drive.
5. There are, as well, customers from outside UCPR who shop at businesses there, especially at those in Rockland (i.e., leakage-in).

As more, especially new, businesses are attracted to Rockland, the leakages of UCPR's shopping dollars to Ottawa will decrease, and the leakages into UCPR will increase.

D. Demand Estimation

1. The spending of the residents of Clarence-Rockland is estimated to support a minimum total of 967,000 sq. ft. of floor space in 2018, increasing by an average of 21,700 sq. ft. annually, to 1.184 million sq. ft. by 2028 (Table 6.1).

2. The supportable increase by time frame is (Table 6.1):
 - 2018-2020 45,000 sq. ft.
 - 2020-2023 64,000 sq. ft.
 - 2023-2028 108,000 sq. ft.
 - 2018-2028 217,000 sq. ft.
3. At present, some of the total supportable space is outside Clarence-Rockland since its residents do not spend 100% of their shopping dollars at Rockland businesses.

E. Inventory of Existing Businesses

As of May 2018, there were 146 retail and service businesses in Rockland, and they occupied an estimated total of 538,000 sq. ft. of floor space.

Including the limited number of such businesses in the Clarence part, the overall average floor space per capita in Clarence-Rockland is estimated to be 22 sq. ft.

Based on the industry standard of 30 to 40 sq. ft. of floor space per capita, **the City of Clarence-Rockland is under-stored for retail and service businesses.**

Of the 146 existing stores, a total of 14 with a combined size of 29,200 sq. ft. or **5.4% were vacant, and this rate is within the industry range of 4% to 8%.**

F. Recommendations For the Expansion Lands

An overall average of up to 40 sq. ft. of retail and service floor space is generally supportable on a per capita basis.¹ Due to leakages in and out, however, it is not always possible to accurately calculate the actual floor space supported by each resident by location of shopping.

At full development, the Subject Expansion Land is estimated to have approximately 8,000 residents. What would be most needed in this community of 8,000 residents are

¹ At a total population of 26,746 in Clarence-Rockland, the total supportable floor space of 967,000 in 2018 represents 36 sq. ft. per capita at businesses within, but also outside this city.

locally-oriented food, convenience, and service businesses in the first few years. Other businesses will also be in demand, but the risk of over-storing should be avoided. Based on these considerations, we recommend the businesses and sizes identified in Table 1.1 for the Subject Expansion Lands. Briefly, they include:

- 1. Total of approximately 100,000 sq. ft. of floor space.**
- 2. Food, convenience, personal services: approximately 60,000 sq. ft. of above.**
- 3. Specialty retail, fashion, gifts, others: approximately 40,000 sq. ft. of above.**
- 4. No businesses offering durable or semi-durable products which already exist in Rockland.**
- 5. Review of the supply-demand dynamics in the entire expanded Rocklands once every five years in order to revise 1-4 above based on market forces.**

Table 1.1 Recommended Businesses To Select For the Expansion Lands		
Business Type	No.	Approximate Size (sq. ft.)
Supermarket	1	40,000-50,000
Convenience Stores	3	5,000-6,000
Specialty Food Stores	3	4,000-6,000
Pharmacies	2	8,000-12,000
Computer Supply & Services	1	1,000-2,000
Hardware Store	1	3,000-8,000
Fashion Stores	2	3,000-8,000
Specialty Retail	3	3,000-7,000
Table Service Restaurants	3	5,000-7,000
Coffee Shops	2	3,000-4,000
Fast Food Eateries	3	5,000-8,000
Banks & Other Financial	3	6,000-10,000
Beauty Salons, Barber, Spa	3	4,000-6,000
Miscellaneous	5	5,000-8,000
Office	5	5,000-8,000
Total: Up to 40 Businesses		100,000-150,000

II. SUBJECT SITE AND ENVIRONS

A. Subject Site

The Subject Site is approximately 133.5 hectares (320 acres) in size, located southeast of Rockland's existing Urban Area Boundary. It is proposed to be added to the City of Rockland through an Expansion Lands Secondary Plan.

For the purposes of this study, we estimated total approximately 3,200 housing units, and associated population of 8,000 on the Subject Site when fully developed.

The expansion land is currently vacant and is owned by six private-sector individuals and companies. Its boundary at present is:

David Street to the north, Clarence-Creek to the east, close to Baseline Road to the south, and Carson Street to the west.

North of David Street is the residential neighbourhood of Rockland East and Rockland Golf Club. Along all other sides of the Subject Site are vacant lands, farms, and open spaces.

B. Development Potential

At present, the Subject Site is being considered for low-density residential development, and locally-oriented commercial businesses. Based on discussions with the study's Project Manager at Fotenn Planning and Design, the likely development densities on the Subject Site would be in the order of 10 to 12 units per acres, or an overall average of 11 units per acre. The estimated total number of units on the Subject 320 acres is thus approximately 3,200 units at full development. At the 2016 average household size of

2.63 persons (Table 3.2), the total number of residents associated with 3,200 housing units would be 8,416.

Some of the future residents on the expansion lands would be first-time buyers/renters, or otherwise consist of two persons. As well, the average household size has been on a declining trend and this trend is expected to continue. Therefore, to avoid over-estimation of population, we assume that the overall household size on the Subject Site would be 2.5 persons, or a total of 8,000. **For the purposes of this study, therefore, we have used a total population of 8,000 (rounded) on the Subject Expansion Lands when fully developed.**

III. SOCIO-DEMOGRAPHIC ANALYSIS

A. Trade Area

Based on the retail industry standards and practices, capture, market or trade area is one from which customers can be attracted for the purchase of the goods and services offered by the area's businesses. Primary Trade Area (PTA) typically provides at least 50% of the total sales of the businesses within. The rest of the area(s) which provide the balance of the total sales is called Secondary Trade Area (STA). There can also be Tertiary Trade Areas (TTA) for businesses which attract/capture at least 10% of their total sales from outside the PTA and STA combined.

Based on field research, our knowledge of the area, and past studies, we have defined the following as the effective Trade Area for the recommended businesses on the Subject Site:

The City of Clarence-Rockland as the Primary, and the rest of the United Counties of Prescott & Russell (UCPR) as the Secondary Trade Area.

Trade areas are not rigid, and change over time based on growth, transportation, competitive facilities, lifestyle, and other such changes and trends. A somewhat larger or smaller Trade Area would also be valid for the purposes of this study. However, we believe what we have defined is quite reasonable for the objectives of this study.

B. Total Population: 2006-2016

1. The City of Clarence-Rockland and the rest the UCPR have continued to grow. For the 10-year period 2006-2016, their average annual growth was (Table 3.1):

- Clarence-Rockland 372 or 1.8%
- UCPR 915 or 1.1%

2. As of mid-2016, Statistics Canada's Census data show total populations of:

- Clarence-Rockland 24,512
- UCPR 89,333

C. Households

1. The City of Clarence-Rockland has continued to experience higher growth rates and be more family-dominated than the rest of the UCPR.
2. In 2016, the median age of the residents of Clarence-Rockland was 42.2 years (44.3 in UCPR), its overall average household size was 2.63 (2.52 in UCPR), and 5.8 in 10 of its households (6.2 in UCPR) consisted of only one or two persons (Table 3.2).

D. Growth Forecasts

Since 2014-2015, residential and thus population growth have significantly accelerated in Clarence-Rockland, and to a lesser extent, in the rest of UCPR. Based on the actual growth since 2014, under construction, planned, and proposed housing developments, the City of Clarence-Rockland, and Hemson Consulting Ltd. Have provided population forecasts for both areas. Based on these forecasts, we have prepared **Table 3.3, which demonstrates the following average annual population increases for the period 2018-2028:**

- | | |
|-----------------------------|----------------------|
| 1. Clarence-Rockland | 598 or 2.4% |
| 2. UCPR | 1,620 or 1.8% |

Compared to the actual annual growth from 2006 to 2016, the figures in Table 3.3 appear to be too optimistic. However, for infrastructure planning purposes, it is prudent to use somewhat generous forecasts. As well, the actual 2016 population of UCPR was 89,333 (Table 3.3), whereas Hemson report's estimate was 88,700 (i.e., 633 or 0.7% lower than actual). Above all, as the City of Ottawa continues to expand eastward, and its housing costs continue to be much lower than in Rockland, growth in Rockland/UCPR will only further intensify. From this perspective, the forecasts in Table 3.3 seem quite reasonable, and may even be somewhat too low for the period 2023-2028.

Table 3.1 Historical Population Data		
Year	Clarence-Rockland	Prescott and Russell United Counties (UCPR)
2006	20,790	80,184
2011	23,185	85,381
2016	24,512	89,333
Average Annual Change: 2006-2016:		
Numeric	372	915
%	1.8	1.1

Notes:

¹ In 2016, the median age of the residents was 42.2 in Clarence-Rockland, and 44.3 in UCPR.

² Generally, economists and planners consider an average annual population growth of 1.0% to represent an economically growing area.

Source: Shore-Tanner & Associates based on Statistics Canada's census data.

Table 3.2 Households By Size: 2016				
Household Size	Clarence-Rockland		Prescott and Russell United Counties (UCPR)	
	No.	%	No.	%
Single Person	1,810	19.4	8,125	23.0
Two Persons	3,635	40.0	13,880	39.2
Three Persons	1,590	17.0	5,665	16.0
Four or More Persons	2,295	24.6	7,720	21.8
Total	9,330	100.0	35,390	100.0
Average Size	2.63	–	2.52	–
Single and Two Persons Combined	5,445	58.4	22,005	62.2

Source: Shore-Tanner & Associates based on Statistics Canada's census data.

Year	Clarence-Rockland		Prescott and Russell United Counties (UCPR)	
	No.	%	No.	%
2016	24,512		89,333	
2018	26,746		91,500	
2020	27,955		96,500	
2021	28,524		99,000	
2023	29,746		101,500	
2028	32,723		107,700	
Average Annual Change: 2018-2028:				
Numeric	598		1,620	
%	2.4		1.8	

Sources:

1. City of Clarence-Rockland for Clarence-Rockland
2. Shore-Tanner & Associates for UCPR based on the mid-estimates of population growth in *Growth Forecast and Land Needs Analysis*, by Hemson Consulting Ltd., December 2015. Population growth from about 2023 and thereafter is expected to be higher than 598 per years.

Income Class (\$)	Clarence-Rockland		Prescott and Russell United Counties (UCPR)	
	No.	%	No.	%
Under 40,000	1,460	15.6	7,825	22.1
40,000-59,999	1,315	14.1	5,250	14.8
60,000-79,999	1,355	14.5	4,925	13.9
80,000-99,999	1,200	12.9	4,445	12.6
100,000-124,999	1,375	14.7	4,550	12.9
125,000-149,999	1,025	11.0	3,210	9.1
150,000 & over	1,600	17.1	5,185	14.6
Total	9,330	100.0	35,390	100.0
Median Household	88,823	–	78,748	–
Median Per Capita	33,773	–	31,249	–

Note: The 2016 median income for the City of Ottawa was \$85,981 and for the Province of Ontario it was \$74,287.

Source: Shore-Tanner & Associates based on Statistics Canada's census data.

IV. RETAIL MARKET TRENDS

This section presents a number of major trends and changes in shopping habits, patterns, and new retail facilities. While our recommended businesses for the Subject Site are mostly for the day to day local and convenience shopping, the knowledge of the retail industry trends provides additional understanding for this ever-changing and highly competitive industry.

A. Retail Stores

A number of new types of shopping facilities, most of which have their origins in the U.S., were introduced into the Canadian market in the late 1990s. The major new shopping facilities in this regard are:

1. **Box Stores:** Costco, Walmart, and The Home Depot fall into this category. These are often referred to as big-box stores, since they are typically larger than 100,000 sq. ft. There are also medium-sized box stores, such as Winner's (clothing), Staples (office products), and Globo shoes, which are typically between 20,000 to 50,000 sq. ft.;
2. **Large Format Stores** such as Canadian Tire and the Great Canadian Super Stores. These are mostly new versions of the same stores, but significantly larger (often between 70,000 to 150,000 sq. ft.), offering a much wider assortment of products and services;
3. **Dollar Stores** which are typically between 1,000 to 5,000 sq. ft., specializing in mostly low-cost imports priced at up to \$5.00 per item (e.g., Dollarama, A Buck or Two, The Dollar Store);
4. **Power Centres** are typically between 200,000 to 1,000,000 sq. ft., consist of a variety of box and traditional stores in open malls, with each store having its own pad and parking in front to the extent possible;
5. **Specialty Stores** such as Starbucks (coffee shop), Mountain Equipment Coop (outdoors store), Lululemon (Yoga wear), Sassy Beads (jewellery, craft), and Brio (shoes, clothing, accessories);

6. De-Malling

Another recent trend in the retail industry is the conversion of old and small enclosed shopping malls into open, uncovered shopping centres (referred to as de-malling). Malls which are over 20 years old and up to about 300,000 sq. ft. in size are usually targets for being de-malled. A de-malled shopping centre is less costly to operate since there are no indoor areas to be heated, cooled, cleaned or supervised. As well, the corridors and other public spaces are converted to leasable floor space.

7. Store Enlargements

Another significant trend in the retail industry is the enlargement of existing stores at the same or a new location. Large stores are in a much better position than small and medium-sized stores to offer one-stop-shopping opportunities. Many supermarkets, hardware, furniture, electronics, department, and home improvement stores have in recent years expanded their size in the same or a new location within the National Capital Region and elsewhere. In some cases, new stores from the same chain are built much larger.

8. Walmart Supercentres

In the early 2000s, the Walmart chain stores finally won the right to offer food products at their stores. Called Supercentres, these new Walmart stores have the equivalent of a 50,000 sq. ft. supermarket within them, including produce, fresh meat, deli, dairy, as well as general merchandise (i.e., canned and boxed food products). The food section is usually on one side of these huge stores, and clothing, furniture, and other non-food products on the other side.

At these stores, the cost of food and other products are generally lower, but more importantly, perceived to be lower due to effective advertising, than at competitive stores.

9. Recent Entries Into the Ottawa Market

Since many residents of the Trade Area shop at businesses in Ottawa, it is helpful to identify significant recent changes in the Ottawa market.

In September 2013, several (American) Target stores were opened in Ottawa in previously Zellers stores, and more were planned. Soon after, however, they were all closed down and to this date, some of them are still vacant. An H&M store was opened in Bayshore Shopping Centre in October 2013 and more since then elsewhere in Ottawa.

In February 2012, a Marshall's department store was opened in the Train Yards Shopping Centre, there are four of them now in Ottawa, and more are planned to open. In November 2011, the new and expanded IKEA store at approximately 410,000 sq. ft. was opened in Pinecrest Centre. In early 2011, a Forever 21 store was opened at the Rideau Centre. Since then, it has expanded and attracted a large number of luxury stores such as Michael Kors, Tiffany & Co., and Kate Spade.

A Whole Foods Supermarket and a large number of other retail and restaurants have opened at Lansdowne Park as part of its major redevelopment plan since 2014. Nordstrom, Topman, Simons and a few other American and European stores have also come to Ottawa in the last five years.

In addition to these new facilities, new methods of conducting business have been created. Purchasing through the Internet is one example. Twinning is another example which makes it possible for two businesses to complement each other, while saving on insurance, utilities, taxes, staff, and other costs. Examples in this regard include Chapter's book stores and Starbucks, Walmart and McDonald's restaurants, The Home Depot and Harvey's restaurants. **Online shopping has been growing very rapidly in the last five years, and is expected to grow further from its estimated total market share of approximately 4% of total spending in Ottawa.**

B. Reasons For Success of the New Store Types

There are many reasons for the introduction and successful operation of these new stores, as well as the new merchandising formats. Chief among these are:

1. Population growth, affluence, and especially ethnic and economic diversity, create demand for new products, services, and methods of buying and selling.
2. Many retail markets in Canada including in Ottawa are considered to be still offering a limited variety of shopping facilities with primarily average quality products at or above average prices. Choices at discount/value, as well as at upscale/high-quality ends of the shopping spectrum in particular, are still limited.
3. Power centres and stand-alone box stores have lower operating costs (e.g., little or no common-area charges compared to enclosed malls), provide ample parking situated very close to their entrances, offer one-stop-shopping opportunities, their prices are and/or are perceived to be lower than conventional stores, and they are very successful at selling large quantities of products.

4. For a wide variety of economic, demographic, and lifestyle reasons, many people seem to prefer shopping at these large, new-format and specialty stores.

C. Present Shopping Patterns and Habits

Based on knowledge, experience, observations, and **hundreds** of consumer research surveys, we believe that shopping patterns and habits are solidifying, as follows:

1. Power centres, big-box and other discount-oriented shopping facilities are here to stay. Their main advantages are real and/or perceived value, choice, and large quantities of products. Shoppers tend to go to these stores about once a month, and for the specific and pre-determined purpose of actual shopping (for household and/or office products), rather than for browsing, window shopping, socializing or just passing time. Typically, they prepare a list of what they want to buy ahead of time, follow it through, buy and bring home large quantities of products.

This type of shopping is rather arduous, especially for older people, those who do not have or wish to spend lots of time for shopping, and those who are affluent enough for whom discount/value is not that important. The amount of time, planning, and the energy required are the main reasons why shopping at these facilities is generally infrequent (although there are customers from all socio-economic classes who only or mostly shop at these stores).

2. **Shopping at regional, community shopping centres, and especially in downtown and on other pedestrian-friendly streets, is often for fashion, specialty products and services, meeting, dining, socializing, entertainment and cultural activities.** There is frequently comparison-shopping, browsing, and cross-shopping at these facilities, especially during holidays and for special occasions (birthdays, anniversaries, etc.). Trips to these facilities do not necessarily always result in purchases due to the entertainment/socializing/dining factors, and also for purposes of comparison shopping. **Thus, the fun and multi-purpose functions of these trips, combined with the far more diverse, attractive, and comfortable atmospheres of these facilities, attract shoppers there more frequently than power centres and big-box stores do.**
3. Shopping at **highway commercial** facilities is also destination oriented and closer in function to shopping at power centres and big-box stores, than to shopping at regional and community shopping centres, or on main streets. Furniture,

electronics, appliances, automotive, box stores, restaurants, and other services often dominate highway commercial strips. Shoppers typically go to these establishments for specific products and/or services, based on pre-determined shopping plan. While there may be comparison shopping, there is usually no window-shopping, socializing, browsing, or cross-shopping. Other than for restaurants, banks, gasoline, and other services, shopping at highway commercial stores is infrequent (furniture, electronics, appliances, and major auto repairs are normally needed less than once a year by most households).

4. The retail industry is dynamic and rapidly evolving. Shoppers demand choice, variety, convenience, value, and fun. In a healthy market, there is a balance between the traditional main street retail stores, suburban shopping centres, and the new and emerging retail facilities as described above.
5. **In the competitive environment of today, maintaining market share, and especially increasing it, is a major challenge for all shopping facilities and districts, requiring new thinking and approaches to merchandising and customer relationship. Targeted use of social media, online services, better understanding of the retail market trends, more awareness of competition from shopping centres and districts, and better recognition of the needs, preferences, and desires of the Trade Area residents are among the key elements of new thinking and approaches, which have to be considered for the planned retail market on the Subject Site in Rockland.**

V. EXPENDITURE ANALYSIS

Spending at retail and service businesses depends on numerous socio-demographic, lifestyle, and locational factors. Based on hundreds of retail market studies by our firm and other research organizations, income is the most influential factor. Often, the higher their income, the more people shop, spend, and thus support the continuation and/or expansion of businesses.

The estimation of demand for supportable floor space is highly analytical and therefore numerically oriented. The detailed results of the analytical part of the demand estimation are presented in the next chapter, after the estimation of expenditure potentials below.

A. Per Capita Expenditures

Statistics Canada is the primary source for expenditure data at retail and service stores across Canada. For this study's Trade Area, the data are estimated based on income comparisons, since they are not available for Clarence-Rockland.

The overall median per capita income in 2016 of Trade Area residents was \$33,773 and this was higher than Ontario's which was \$28,572 in 2016. Incomes in both areas are higher now.

In Table 5.1, we have provided estimates of per capita expenditures by the residents of the Trade Area for a number of trade groups which are standard in the retail industry. As noted, **we estimate the overall average per capita spending of the TA residents to be \$17,386 in 2018**. Of course, due to mortgages, family size and other factors, some individuals and families spend less, and others more than these averages, depending on their disposable income.

B. Total Retail and Service Expenditures

The estimated total expenditures of the residents of UCPR and Clarence-Rockland are provided in Tables 5.2 and 5.3.

Table 5.1		
Estimated Per Capita Retail and Service Spending: 2018		
Trade Group	UCPR Spending (\$)	Clarence-Rockland Spending (\$)
A. Retail Product Stores		
Supermarkets	2,290	2,400
Convenience Stores	220	235
Specialty Food	195	205
Beer, Wine & Liquor	670	700
Drugs & Patent Medicine*	1,105	1,160
Clothing	820	860
Shoes, Jewellery & Accessories	235	250
Home Furnishings	125	130
Electronics & Appliances	495	520
Furniture	285	300
Building Materials, Hardware & Garden Supplies	850	890
Sporting Goods, Hobbies, Music & Books	300	315
Used, Recreation & Other Vehicles	470	490
New Car Sales	2,800	2,900
Auto Parts & Accessories	190	200
Gasoline & Service Stations	1,410	1,400
General Merchandise	960	980
Department Stores	720	750
Other Retail Stores	350	370
Subtotal: Retail Products	14,490	15,055
B. Retail Service Businesses		
Restaurants, Bars & Other Eateries*	1,220	1,300
Personal Care Businesses*	215	225
Sports, Recreation & Entertainment*	1,455	1,530
Subtotal: Service Businesses	2,890	3,055
Grand Total: All Stores & Businesses	17,380	18,110

* Estimated

1. Online spending is **not** included.

Source: Shore-Tanner & Associates based on CANSIM Tables 080-0030 and other relevant Statistics Canada data.

Table 5.2						
Estimates of Total Spending By UCPR Residents						
Trade Group	2018 (\$M)	2020 (\$M)	2021 (\$M)	2023 (\$M)	2028 (\$M)	Average Annual Change: 18-28
Population	91,500	96,500	99,000	101,500	107,700	Numeric %
A. Retail Product Stores						
Supermarkets	209.5	221.0	226.7	232.4	246.6	3.7 1.8
Convenience Stores	20.1	21.2	21.8	22.3	23.7	0.36 1.8
Specialty Food	17.8	18.8	19.3	19.8	21.0	0.32 1.8
Beer, Wine & Liquor	61.3	64.6	66.3	68.0	72.1	1.1 1.8
Drugs & Patent Medicine*	101.1	106.6	109.4	112.1	119.0	1.8 1.8
Clothing	75.0	79.1	81.2	83.2	88.3	1.3 1.8
Shoes, Jewellery & Accessories	21.5	22.7	23.3	23.8	25.3	0.4 1.8
Home Furnishings	11.4	12.1	12.4	12.7	13.5	0.2 1.8
Electronics & Appliances	45.3	47.8	49.0	50.2	53.3	0.8 1.8
Furniture	26.1	27.5	28.2	28.9	30.7	0.5 1.8
Building Materials, Hardware & Garden Supplies	77.8	82.0	84.1	86.3	91.5	0.8 1.8
Sporting Goods, Hobbies, Music & Books	27.4	29.0	29.7	30.4	32.3	1.4 1.8
Used, Recreation & Other Vehicles	43.0	45.3	46.5	47.7	50.6	0.5 1.8
New Car Sales	256.2	270.2	277.2	284.2	301.6	0.8 1.8
Auto Parts & Accessories	17.4	18.3	18.8	19.3	20.5	4.5 1.8
Gasoline & Service Stations	129.0	136.1	139.6	143.1	151.8	2.3 1.8
General Merchandise	87.8	92.6	95.0	97.4	103.4	1.6 1.8
Department Stores	65.9	69.5	71.3	73.1	77.5	1.2 1.8
Other Retail Stores	32.0	33.8	34.6	35.5	37.7	0.57 1.8
Subtotal: Retail Products	1,325.8	1,398.3	1,434.5	1,470.7	1,560.6	23.5 1.8

* Estimated

1. Online spending is **not** included.

Table 5.2, continued							
Estimates of Total Spending By UCPR Residents							
Trade Group	2018 (\$M)	2020 (\$M)	2021 (\$M)	2023 (\$M)	2028 (\$M)	Average Annual Change: 18-28	
						Numeric	%
B. Retail Service Businesses							
Restaurants, Bars & Other Eateries*	111.6	117.7	120.8	123.8	131.4	2.0	1.8
Personal Care Businesses*	19.7	20.7	21.3	21.8	23.1	0.3	1.8
Sports, Recreation & Entertainment*	133.1	140.4	144.0	147.7	156.7	2.4	1.8
Subtotal: Service Businesses	264.4	278.9	286.1	293.3	311.2	4.7	1.8
Grand Total: All Stores & Businesses	1,590.3	1,677.2	1,720.6	1,764.1	1,871.8	28.1	1.8

* Estimated

1. Online spending is **not** included.

Note: The average annual percentage increases in spending are identical to the estimated population growth of 1.8% in Table 3.3. The dollar figures above are all in the constant value of the Canadian dollar in 2018. In other words, neither inflation, nor actual growth are included in order to avoid possible over-estimation.

Source: Shore-Tanner & Associates.

Trade Group	2018 (\$M)	2020 (\$M)	2021 (\$M)	2023 (\$M)	2028 (\$M)	Average Annual Change: 18-28	
Population	26,746	27,955	27,524	29,746	32,723	Numeric	%
A. Retail Product Stores							
Supermarkets	64.2	67.1	68.4	71.4	78.5	1.4	2.2
Convenience Stores	6.3	6.6	6.7	7.0	7.7	0.14	2.2
Specialty Food	5.5	5.7	5.8	5.9	6.7	0.12	2.2
Beer, Wine & Liquor	18.7	19.6	20.0	20.8	22.9	0.42	2.2
Drugs & Patent Medicine*	31.0	32.4	33.1	34.5	38.0	0.70	2.2
Clothing	23.0	24.0	24.5	25.6	28.1	0.51	2.2
Shoes, Jewellery & Accessories	6.7	7.0	7.1	7.4	8.2	0.15	2.2
Home Furnishings	3.5	3.6	3.7	3.9	4.2	0.07	2.2
Electronics & Appliances	13.9	14.5	14.8	15.5	17.0	0.31	2.2
Furniture	8.0	8.4	8.6	8.9	9.8	0.18	2.2
Building Materials, Hardware & Garden Supplies	23.3	24.9	25.4	26.5	29.1	0.53	2.2
Sporting Goods, Hobbies, Music & Books	8.4	8.8	9.0	9.4	10.3	0.19	2.2
Used, Recreation & Other Vehicles	13.1	13.7	14.0	14.6	16.0	0.29	2.2
New Car Sales	77.6	81.1	82.7	86.3	94.9	1.73	2.2
Auto Parts & Accessories	5.3	5.6	5.7	5.9	6.5	0.13	2.2
Gasoline & Service Stations	37.4	39.1	40.0	41.6	45.8	0.84	2.2
General Merchandise	26.2	27.4	27.9	29.1	32.1	0.59	2.2
Department Stores	20.0	21.0	21.4	22.3	24.5	0.45	2.2
Other Retail Stores	9.9	10.3	10.6	11.0	12.1	0.22	2.2
Subtotal: Retail Products	402.3	420.9	429.4	447.8	492.6	9.03	2.2

* Estimated

1. Online spending is **not** included.

Table 5.3, continued							
Estimates of Total Spending By Clarence-Rockland Residents							
Trade Group	2018 (\$M)	2020 (\$M)	2021 (\$M)	2023 (\$M)	2028 (\$M)	Average Annual Change: 18-28	
						Numeric	%
B. Retail Service Businesses							
Restaurants, Bars & Other Eateries*	34.8	36.3	37.1	38.7	42.5	0.77	2.2
Personal Care Businesses*	6.0	6.3	6.4	6.7	7.4	0.14	2.2
Sports, Recreation & Entertainment*	40.9	42.8	43.6	45.5	50.1	0.92	2.2
Subtotal: Service Businesses	81.7	85.4	87.1	90.9	100.0	1.83	2.2
Grand Total: All Stores & Businesses	484.4	506.3	516.6	538.7	592.6	10.82	2.2

* Estimated

1. Online spending is **not** included.

Note: The average annual percentage increases in spending are identical to the estimated population growth of 1.8% in Table 3.3. The dollar figures above are all in the **constant** value of the Canadian dollar in 2018. In other words, neither inflation, nor actual growth are included in order to avoid possible over-estimation of demand for additional floor space.

Source: Shore-Tanner & Associates.

VI. DEMAND ESTIMATION

A. Productivity Rates

In Tables 5.1-5.3, we have provided estimates of the available spending by Trade Area residents and employees. The next steps involve the estimation of how much floor space these expenditures can support. For these steps, productivity rates or sales per sq. ft. are needed.

Based on over 100 retail studies in the last 15 years, including in-person confidential meetings and surveys of at least 2,000 business managers and/or owners, we have obtained actual and closely estimated sales data. Many of these studies have included presentations at the Ontario Municipal Board hearings where actual sales data were presented by opposing parties and analyzed. Based on these studies, ongoing research, and review of retail trends, we have provided realistic ranges of annual sales per sq. ft. for the types of retail and service businesses most likely to be viable on the Subject Site. As shown in Table 6.1, the average annual sales per sq. ft. at food stores, for example, is estimated to be between \$500 and \$700.

B. Total Supportable Floor Space

Table 6.1 presents the total supportable floor space for each business for the years 2018-2028. As demonstrated, **Clarence-Rockland's spending is estimated to be supporting a total of 967,000 to 1.277 million sq. ft. of retail and service business floor space in 2018, at businesses within, but also outside this area.** The total supportable space will, of course, increase each year, based on population growth and affluence.

In Table 6.2, we have identified the increase in supportable demand for each business. As demonstrated, **the supportable increase in the total floor space is as follows by time periods by the residents of Clarence-Rockland:**

- | | | | |
|----|-----------|-----------------|---------|
| 1. | 2018-2020 | 45,000-81,000 | sq. ft. |
| 2. | 2020-2023 | 64,000- 87,000 | sq. ft. |
| 3. | 2023-2028 | 108,000-144,000 | sq. ft. |
| 4. | 2018-2028 | 217,000-312,000 | sq. ft. |

In other words, the available spending potential of Clarence-Rockland is estimated to generate demand for 217,000 to 312,000 sq. ft. of additional retail and floor space by the year 2028.

The demand generated from the residents of UCPR is, of course, much larger. As in the past, many residents of UCPR outside the City of Clarence-Rockland are expected to do much of their shopping at businesses in Rockland. It is therefore necessary to address their spending, in addition to the spending of the Clarence-Rockland residents.

As demonstrated in Table 5.1, the overall average spending of each resident of UCPR is estimated to be \$17,380 in 2018. At this rate, the total spending of UCPR is estimated at \$1.59 **billion** in 2018, increasing by an average of \$28.1 million annually, to a total of 1.817 **billion** in 2028 (Table 5.2).

In view of the relative abundance of retail and service businesses in Rockland, and also in the City of Ottawa, much of the total spending of UCPR residents happens in these two cities. Regardless of where their spending takes place, it is necessary to first determine how much floor space can their spending support. Table 6.1 provides this answer by individual retail and service groups. As demonstrated in Table 6.1, the total spending of residents of Clarence-Rockland is estimated to support a total of at least 967,000 sq. ft. or 36 sq. ft. per capita within and outside this city (the spending of UCPR residents of course supports much more than 967,000 sq. ft.).

Table 6.1						
Estimates of Total Supportable Floor Space in Clarence-Rockland: Square Feet						
Trade Group	2018	2020	2021	2023	2028	Average Annual Change: 18-28
A. Retail Product Stores						
Supermarkets						
• At \$700/sq. ft.	91,700	95,900	97,700	102,200	112,100	2,140
• At \$500/sq. ft.	128,400	134,200	136,800	142,800	157,000	2,860
Convenience Stores						
• At \$300/sq. ft.	21,000	22,000	22,300	23,300	25,700	470
• At \$250/sq. ft.	25,200	26,400	26,800	28,000	30,800	560
Specialty Food						
• At \$450/sq. ft.	12,200	12,700	12,900	13,100	14,900	270
• At \$350/sq. ft.	15,700	16,300	16,600	16,900	19,100	340
Beer, Wine & Liquor						
• At \$700/sq. ft.	26,700	28,000	28,600	29,700	32,700	600
• At \$500/sq. ft.	37,400	39,200	40,000	41,600	45,800	840
Drugs & Patent Medicine*						
• At \$1,000/sq. ft.	31,000	32,400	33,100	34,500	38,000	700
• At \$700/sq. ft.	44,300	46,300	47,300	49,300	54,300	1,000
Clothing						
• At \$350/sq. ft.	65,000	68,600	70,000	73,100	80,300	1,530
• At \$250/sq. ft.	92,000	96,000	98,000	102,400	112,400	2,040
Shoes, Jewellery & Accessories						
• At \$400/sq. ft.	16,700	17,500	17,700	18,500	20,500	380
• At \$300/sq. ft.	22,300	23,300	23,700	24,700	27,300	500

Table 6.1, continued						
Estimates of Total Supportable Floor Space In Clarence Rockland:						
Square Feet						
Trade Group	2018	2020	2021	2023	2028	Average Annual Change: 18-28
Home Furnishings						
• At \$350/sq. ft.	10,000	10,300	10,600	11,100	12,000	200
• At \$250/sq. ft.	14,000	14,400	14,800	15,600	16,800	280
Electronics & Appliances						
• At \$700/sq. ft.	19,900	20,700	21,100	22,100	24,300	440
• At \$500/sq. ft.	27,800	29,000	29,600	31,000	34,000	620
Furniture						
• At \$300/sq. ft.	26,700	28,000	28,700	29,700	32,700	600
• At \$250/sq. ft.	32,000	33,600	34,400	35,600	39,200	720
Building Materials, Hardware & Garden Supplies						
• At \$250/sq. ft.	95,200	99,600	101,600	106,000	116,400	2,120
• At \$175/sq. ft.	136,000	142,300	145,100	151,400	166,300	3,030
Sporting Goods, Hobbies, Music & Books						
• At \$300/sq. ft.	28,000	29,300	30,000	31,300	34,300	630
• At \$225/sq. ft.	37,300	39,100	40,000	41,800	45,800	850
Used, Recreation & Other Vehicles						
• At \$1,000/sq. ft.	13,100	13,700	14,000	14,600	16,000	290
• At \$700/sq. ft.	18,700	19,600	20,000	20,900	22,900	420
New Car Sales						
• At \$2,000/sq. ft.	38,800	40,000	41,300	43,200	47,500	870
• At \$1,400/sq. ft.	55,400	57,900	59,100	61,600	67,800	1,240

Table 6.1, continued						
Estimates of Total Supportable Floor Space In Clarence-Rockland:						
Square Feet						
Trade Group	2018	2020	2021	2023	2028	Average Annual Change: 18-28
Auto Parts & Accessories						
• At \$1,500/sq. ft.	3,500	3,600	3,800	3,900	4,300	80
• At \$1,000/sq. ft.	5,300	5,600	5,700	5,900	6,500	120
Gasoline & Service Stations						
• At \$1,200/sq. ft.	31,200	32,600	33,300	34,700	38,200	700
• At \$800/sq. ft.	46,700	48,900	50,000	52,000	57,200	1,050
General Merchandise						
• At \$350/sq. ft.	74,900	78,300	79,700	83,100	91,700	1,680
• At \$250/sq. ft.	104,800	109,600	111,600	116,400	128,000	2,320
Department Stores						
• At \$250/sq. ft.	80,000	84,000	85,600	89,200	98,000	1,800
• At \$200/sq. ft.	100,000	105,000	107,000	111,500	122,500	2,250
Other Retail Stores						
• At \$300/sq. ft.	33,000	34,300	35,300	36,700	40,300	730
• At \$250/sq. ft.	39,600	41,200	42,400	44,000	48,400	880
Subtotal: Retail Products	719,000	752,000	767,000	800,000	880,000	16,100
(rounded)	961,000	1,027,000	1,049,000	1,093,000	1,202,000	24,100

Table 6.1, continued						
Estimates of Total Supportable Floor Space In Clarence-Rockland: Square Feet						
Trade Group	2018	2020	2021	2023	2028	Average Annual Change: 18-28
B. Retail Service Businesses						
Restaurants, Bars & Other Eateries						
• At \$600/sq. ft.	58,000	60,500	61,800	64,500	70,800	1,280
• At \$450/sq. ft.	77,300	80,700	82,400	86,000	94,400	1,710
Personal Care Businesses						
• At \$225/sq. ft.	26,700	28,000	28,400	29,800	32,900	620
• At \$175/sq. ft.	34,300	36,000	36,600	38,300	42,300	800
Sports, Recreation & Entertainment ¹						
• At \$250/sq. ft.	163,600	171,200	174,400	182,000	200,400	3,680
• At \$200/sq. ft.	204,500	214,000	218,000	227,500	250,500	4,600
Subtotal: Retail Services	248,000	260,000	265,000	276,000	304,000	5,600
(rounded)	316,000	331,000	337,000	352,000	387,000	7,100
Grand Total:	967,000	1,012,000	1,032,000	1,076,000	1,184,000	21,700
All Stores & Businesses	1,277,000	1,358,000	1,386,000	1,445,000	1,589,000	31,200

¹ Includes cinemas, theatres, arenas and sports fields.

Source: Shore-Tanner & Associates.

Table 6.2	
Estimated Demand For Additional Floor Space By the Spending of Clarence-Rockland Residents	
Time Period	Floor Space (sq. ft.)
2018-2020	45,000-81,000
2020-2021	20,000-28,000
2021-2023	44,000-59,000
2023-2028	108,000-144,000
2018-2028	217,000-312,000

Source: Table 6.1.

VII. SUMMARY OF EXISTING BUSINESSES

A. Scope of Research

Several days in May 2018 we carried out extensive field research in Rockland. Every retail and service business was visited, its name and type identified, and its size visually estimated.

The field research was started at the Smart Centre, then continued on Laurier Street in the eastern direction to Highway 17. From there, all businesses in the western direction to Laurier Street were visited. There are a few scattered businesses on the intersecting roadways which were also visited and their names, types, and estimated sizes recorded. The details of this research are presented in Appendix A.

B. Major Findings

As of May 2018, there was a total of 146 retail and service businesses in Rockland occupying an estimated 538,000 sq. ft. of floor space.

With the 2018 population of 26,746 in Clarence-Rockland, the overall average floor space per resident is 20.1 sq. ft. However, some of this space is supported by the spending of the other residents of the UCPR. Therefore, the effective floor space per resident is lower than 20.1 sq. ft. There are as well, a number of retail and service businesses in the Clarence part of the City of Clarence-Rockland and they may increase the per capita floor space to 21 or 22 sq. ft.

Based on the industry standard of 30 to 40 sq. ft. of floor space per capita, it is evident that the City of Clarence-Rockland is currently under-stored for retail and service businesses.

If the residents of Clarence-Rockland spend 100% of their shopping dollars at businesses within the City, at least 802,000 sq.ft. or 262,000 sq. ft. more floor space could be supported in 2018, and more in future years. Due to the proximity of Ottawa and its variety of businesses, there will always be some shopping there by the residents of Clarence-Rockland. However, as its population grows, more retail and service businesses

can be supported and will be attracted to Clarence-Rockland (as it has been the case in the 10-15 years).

At present, a total of 14 stores with a combined floor space of 29,200 sq. ft. or 5.4% of the total space of 538,000 sq. ft., are vacant in Rockland (industry standard vacancy rate is within 4% and 8%). .

VIII. OFFICE MARKET AND DEMAND

A. Overview of Office Market

In Clarence-Rockland, as in similar cities in size close to a major urban area, there is little office space, and not much data available. The existing space is almost entirely for local needs such as medical, insurance, and financial. To better address the supportable office space on the Subject Site, we have first analyzed Ottawa's rich office market.

Due to the presence of the Federal Government, the City of Ottawa's office market is unique. The various Federal Departments, Crown Corporations, and other government agencies own and occupy approximately 30 million sq. ft. of office space.

The privately-owned office space in the City of Ottawa is approximately 40 million sq. ft., most of which is also rented to and occupied by different Federal Government organizations. There are, as well, some 300 associations, major legal, accounting, auditing and consulting firms, most of whose work is government related.

At a total population of almost one million, the City of Ottawa is the fourth largest in Canada, but its total office floor space of approximately 70 million sq. ft. is the third largest after Toronto and Montreal.

The Ottawa office market has historically been strong and stable. In the last five years, a number of new, large office towers have been developed, pushing its overall total vacancy rate close to 11%.

B. Types of Office Space

Generally speaking, office spaces fall into the following categories:

- Government/Public Sector
- Corporate
- Professional
- Business

There is some overlap in the bottom three types.

A **Corporate** office is usually large, high quality, located in a Class A building in a prime location, and occupied by banks, insurance companies, other major and often national and/or international corporations. Prestige, visibility, luxury, access, status, and image are important for corporate occupants of this type of office space.

A **Professional** office can be of various sizes and locations, and mostly in a Class B or C building. Legal, accounting, medical, high technology, artificial intelligence, associations, and consultancies are typical occupants of this type of space. In terms of prestige, status, visibility, and access, this type of office is often between the corporate and the business types.

A **Business** office is typically small, occupied by locally-oriented companies, located in affordable areas, including business parks, and in Class B, C or lower buildings. Engineering, architectural, accounting, development, construction, transportation, retail, and other such businesses, mostly with up to about 10 employees, are typical occupants of this type of office space.

C. Most Viable Office Space on the Subject Site

Government, and to some extent, Corporate offices, are not dependent on the economy or population of a city. Most professional and business office enterprises, however, serve the residents and local economy of a given area. **We believe that for the Subject Site, the most market viable types of office businesses would be those that serve the larger area residents.** While government, corporate, or any specialty type office developments are also possible, they cannot be counted on.²

² The need for them is not locally or even city-wide generated. However, elected officials, business leaders, and/or connections may be able to influence the locational decisions of government and corporate officials.

D. Demand Analysis

Of the approximately 40 million sq. ft. of privately-owned office space in the City of Ottawa, we estimate that up to 8 million sq. ft. or 20.0% are used by professional and business tenants who primarily serve the residents and the local economy.³ These tenants, furthermore, are in Class B, C or lower buildings. The rest are occupied by various levels of governments, corporate, and prestigious professional/high technology tenants.

At 8 million sq. ft. of office space and a total City of Ottawa population of almost one million, the overall average office space associated per resident is about 8 sq. ft. Of course, parts of Ottawa have much higher, and others much lower averages.

In Clarence-Rockland, the total inventory of office space is now almost 0.3 million sq. ft., or approximately 12 sq. ft. per resident, based on a total population of over 26,000 (Table 3.1). Due to the mostly rural and agricultural characteristics of UCPR, its need for office space per capita is much less, and office businesses in Rockland tend to be used by its residents and employees. We have, therefore, used an estimate of 6 sq. ft. for UCPR. **The Trade Area is, therefore, concluded to generate average annual demand for total additional office space of 7,170 sq. ft. in Clarence-Rockland, and 9,700 sq. ft. in UCPR, including the 7,170 sq. ft. for Clarence-Rockland (Table 7.1).**

³ In other words, the combination of population and economic factors generate demand for 8 million sq. ft. of locally-oriented office floor space.

Table 7.1 Estimates of Total Supportable Office Space				
Year	Population		Office Space (sq. ft.)	
	Clarence-Rockland	UCPR	Clarence-Rockland (12 per resident)	UCPR (4 per resident)
2016	24,512	89,333	294,000	536,000
2018	26,746	91,500	321,000	549,000
2020	27,955	96,500	335,500	579,000
2021	28,524	99,000	342,300	594,000
2023	29,746	101,500	357,000	609,000
2028	32,723	107,700	392,700	646,200
Average Annual Increase: 2018-2028:				
Numeric	598	1,620	7,170	9,700
%	2.4	1.8	2.2	1.8

Note: UCPR's figures include the figures for Clarence-Rockland.

Source: Shore-Tanner & Associates

APPENDIX A

List of Retail and Service Businesses In Rockland		
Business Name	Type	Approximate Size (sq. ft.)
Smart Centre¹		
Rona	Hardware	40,000
Walmart	Department Store	110,000
• Quizno Subs		
• Hair Salon		
• Pharmacy		
• Garden Supplies		
• Grocery		
• Fashion		
Source	Electronics	2,000
Bulk Barn	Specialty Food	3,000
Boston Pizza	Table Service Restaurant	4,000
Dollarama	General Merchandise	6,000
LBCO	Liquor Store	3,000
Laurier Street		
Ford Dealership	Automotive	6,000
Snap Fitness	Fitness	3,000
Tim Horton's	Coffee Shop	1,800
Royal Plaza (on Laurier St.)		
Vapeking	Smoke Shop	2,000
Aqua Life	Sporting Goods	2,000
Rosalynn's	Table Service Restaurant	2,000
New Wave (pool accessories)	Sporting Goods	2,500
RBC	Financial	3,000
Vacant (2)	Vacant	4,000

¹ Started from this shopping centre, walked and/or drove eastward on Laurier Street to Highway 17, then westward on Laurier Street

List of Retail and Service Businesses In Rockland, continued		
Business Name	Type	Approximate Size (sq. ft.)
Laurier Street, continued		
First Choice	Barber	1,000
Rockland Sports	Sporting Goods	3,000
M&M Foods Market	Specialty Foods	1,500
Shawarma Rockland	Table Service Restaurant	1,500
Youngster Salon	Beauty Salon	1,500
Hitices	Clothing	1,500
La Bella Salon	Beauty Salon	1,500
Accent	Furniture	8,000
Touch of Distinction	Flooring Supplies	2,000
Rising Sun	Martial Arts	2,000
Vitrierie Glass & Mirror	Furnishings	2,000
Derma Skin Care	Beauty Salon	1,500
Vacant	Vacant	1,500
Domino's Pizza	Pizza Shop	1,500
Mortgage Intelligence	Financial	1,500
Chiro Fashion	Specialty Retail	1,500
Rockland Pharmacy	Pharmacy	3,000
Pronature Sporting	Sporting Goods	2,000
Tiny Hopper	Daycare	2,500
Salon Tete O Pieds	Beauty Salon	1,500
Shoppers Drug Mart	Pharmacy	4,000
Ultramar	Gas Station & Car Wash	2,000
Your Independent Grocer	Supermarket	50,000
Spartas	Mediterranean Restaurant	1,500
Scotiabank	Financial	3,000
Beer Store	Beer Store	3,000
Napa Auto	Automotive	2,500
McDonald's	Fast Food	2,200
Sullyteck	Phone Repair	600
Bytown Lumber	Building Supplies	10,000
The Thimble	Tailor	800
Envy	Spa	2,000
Vacant	Vacant	3,000
Jumbo Pizza	Pizza Shop	2,000

List of Retail and Service Businesses In Rockland, continued		
Business Name	Type	Approximate Size (sq. ft.)
Laurier Street, continued		
Dunn's Deli	Table Service Restaurant	2,500
Rama	Martial Arts	1,200
Royal Photo	Photo Shop	1,500
Rockland Music	Specialty Retail	1,500
Anne Travel	Travel Agency	1,500
Martel Mortgage	Financial	1,000
Sublime Salon	Beauty Salon	1,000
Christine Raymond Salon	Beauty Salon	1,000
Auto Morin	Automotive	3,000
Sienna Faming	Specialty Retail	2,000
Sacred Art	Tattoo Shop	1,000
The Brunet Funeral	Funeral Services	3,000
L'Atelier Salon	Beauty Salon	2,000
Vacant (several stores)	Vacant	5,000
Rockland Pizza	Pizza Shop	1,200
H & R Block	Financial	1,200
Rockland Variety	Convenience Store	1,500
Vacant	Vacant	1,500
Jean Coutu	Pharmacy	4,500
Post Office	Specialty Retail	2,000
Vacant	Vacant	1,500
Rockland Marine	Boating Supplies	3,000
Giant Tiger	General Merchandise	11,000
Fashion Sports	Clothing	2,000
New Ruby	Chinese Restaurant	3,000
Second Hand Centre	Clothing	1,500
Modelo Salon	Beauty Salon	1,500
Dalrymple Salon	Beauty Salon	1,500
Subway	Fast Food	1,500
Marie-Jo	Table Service Restaurant	2,000
RDS Laundromat	Laundromat	1,200
Chamberland Garage	Automotive	5,000
Rockland Optometry	Specialty Retail	2,000

List of Retail and Service Businesses In Rockland, continued		
Business Name	Type	Approximate Size (sq. ft.)
Laurier Street, continued		
Rockland Barber	Beauty Salon	600
Bourbonnais Electric	Electronic Shop	1,500
Vacant	Vacant	1,200
Friendly Restaurant	Table Service Restaurant	2,000
Big Boss Burgers	Table Service Restaurant	1,600
Vacant	Vacant	1,500
Sonx Plus	Electronics	1,500
National Bank	Financial	3,000
QV Spa	Beauty Salon	1,500
DCV Heating/Cooling	Heating/Cooling Supplies	2,000
Lavolette	Flower Shop	1,500
Café Joyeux	Table Service Restaurant	1,500
Desjardins	Financial	4,000
Maison de Xin	Table Service Restaurant	4,000
Spa Mauve	Beauty Salon	1,500
Extravadance	Specialty Fashion	2,000
Chez L'Bonlanger	Bakery	2,000
Studio Aqua (bronzage)	Beauty Salon	1,500
Main Street Pizza	Pizza Shop	1,500
Vacant	Vacant	1,500
Le Mieux	Convenience Store	1,500
GAB Sports Bar	Table Service Restaurant	2,000
Beautiful Clinic	Beauty Salon	1,500
QV Spa, Nails	Beauty Salon	1,000
Café La Roche	Table Service Restaurant	2,000
Espada	Tattoo Shop	500
Ryan's Auto	Automotive	2,000
SS Chip Wagon	Eatery	200
Vacant	Vacant	2,000
Vacant	Vacant	2,000
Belanger Dodge Dealer	Automotive	2,000
Vacant	Vacant	3,000
Harmony Hyundai	Automotive	2,000
Mr. Gas	Gas Station	100
Tim Horton's	Coffee Shop	1,000
Canadian Tire Station	Gas Station	100
TD	Financial	2,000
Shell Station	Gas Station	100
Circle K	Convenience Store	2,000

List of Retail and Service Businesses In Rockland, continued		
Business Name	Type	Approximate Size (sq. ft.)
Plaza Rockland		
Top Mode Depot	Fashion	11,000
A & W	Fast Food	1,800
Pet Valu	Specialty Retail	2,500
Brown Cleaner	Dry Cleaning	1,200
Super Cut	Barber Shop	1,200
Pop Shoes	Shoe Store	2,500
Gabriel Pizza	Pizza Shop	1,200
Broadway Bar & Grill	Table Service Restaurant	2,500
Subway	Fast Food	1,500
Vacant	Vacant	1,500
Dollar Tree	General Merchandise	5,000
TSC	General Merchandise	25,000
Mark's	Clothing	10,000
St. Hubert	Table Service Restaurant	3,000
Oil Changer	Automotive	4,000
Speedy Glass	Automotive	4,000
Benson Auto Parts	Automotive	3,000
Grand Total	146	538,000

Source: Shore-Tanner & Associates based on field research and visual estimates in late May 2018.

expansion
lands PLAN
SECONDARY
PLAN

PLAN
SECONDAIRE **pour les**
terrains qui ont
été ajouté à
l'aire urbaine



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