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Memorandum

To: City of Ottawa, The Planning Partnership
Copy: File
From: Kevin McCambley, Senior Municipal Engineer

Date: Revised 20 October 2020
Project: 476906 - 01000

Re: ByWard Market Public Realm Study
Technical Memo: Utility Infrastructure

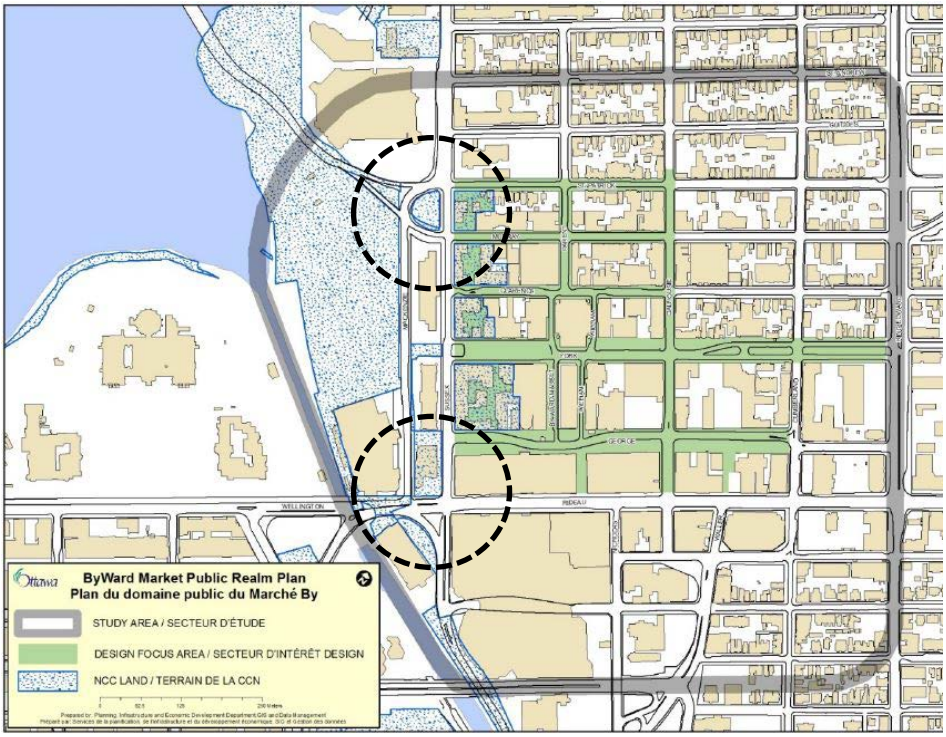
1. INTRODUCTION

1.1. Document Purpose

The purpose of this Memorandum is to provide a review of the existing utility infrastructure (below-grade and above-grade services and utilities) lifecycle status within the ByWard Market study area, more specifically of those streets contained within the "Design Focus Areas" (as described under section 1.2). The memorandum will assist in identifying opportunities and constraints for future urban design treatments.

1.2. Study Area

ByWard Market is identified as a district in Lower Town, located to the east of the government and business district in the City of Ottawa. This public realm study is to focus on the Design Focus Area identified within the broader study area, as illustrated in Figure 1. The Design Focus Area includes the following streets: St Patrick, Murray, Clarence, York, George, ByWard Market Square, William and Dalhousie streets. Two key nodal gateways leading into the ByWard Market area are located at Sussex/Rideau/Colonel By and Sussex/Mackenzie/St. Patrick.



For the purpose of this public realm study, a broader study area was identified. The broader study area includes the adjoining residential neighborhoods and commercial areas, the Rideau Street BIA district as well as the Rideau/Arts precinct. The boundary for the boarder study area includes St. Andrews St. to the north, King Edward Ave. to the east, Mackenzie King Bridge to the south and Confederation Blvd. to the west.

2. UTILITY INFRASTRUCTURE

2.1. Background Information

The following documents have been reviewed as they provide background information for this public realm study:

- City of Ottawa Utility Coordination Committee (UCC) Central Registry Plans;
- City of Ottawa Infrastructure Master Plan 2013;

2.2. Telecommunication/Streetlight/Traffic Signals

The telecommunication infrastructure in the Design Focus Area is predominantly below-grade (ducts, maintenance holes etc.) but includes some above-grade features (pedestals/panels/kiosks). These are owned by a variety of companies including Bell Canada, Rogers Communications (including former Atria Networks), Telus, Allstream.

The City of Ottawa owns and maintains the streetlight and traffic signal infrastructure. The wiring for these assets is contained within below-grade ducts and handholes.

This infrastructure is too extensive to describe in written form however the infrastructure is depicted in the digital utility plan prepared by Parsons.

2.3. Natural Gas

Enbridge Gas Inc. owns and maintains the natural gas distribution network throughout the City of Ottawa. Enbridge has advised that the distribution pipes on the streets within the Design Focus Area are nearing the end of useful life and are slated for renewal in their long-term plans. No specific timetable is currently available, but renewal will not occur in the near term (i.e. not before 2021).

2.4. Electrical Distribution

Hydro Ottawa owns and maintains the electrical distribution network in the urban area. All of the network is below-grade with the exception of a small area at the north end of the Design Focus Area. Above-grade (Overhead) electrical distribution wires are located on St. Patrick St. between Parent St. and Dalhousie St. and on Parent St. from St. Patrick St. to Murray St. Hydro-Ottawa's long-term plans include increasing the distribution voltage in the area from the existing 4kV to 13kV. Depending on Hydro-Ottawa's requirements, above-grade transformers (pad-mount) may be required to replace the existing below-grade (vault) transformers, however this needs to be first discussed and agreed. The transformer locations would be determined in the future as design plans have yet to be prepared. A timetable for this renewal work has not been established either.

2.5. Watermains

Watermains throughout the Design Focus Area are owned and maintained by the City of Ottawa. Despite being the oldest of districts in the city, the watermain network in the Design Focus Area is relatively new. With the exception of two segments on York St. installed in 1874 and 1911, the majority of the network has been renewed since the 1970's (refer to Table 1 for details). Watermains generally have a life span of 100 years therefore the majority of network has more than 50 years of useful life remaining. The City of Ottawa asset management branch is interested in replacing the segments on York St. installed in 1874 and 1911 as well as the segment on Byward Market Sq. installed in 1969 (see the bolded cells in Table 1.). The branch is interested in remaining informed as components of the Public Realm Plan are advanced to detailed design and construction, to identify opportunities to renew assets in an integrated fashion. Furthermore, the location and spacing of fire hydrants must be evaluated during detailed design to ensure protection of buildings/heritage assets and to accommodate/maximize on-street parking opportunities.

Table 1: Watermains

Street	Limits	Attribute	Year Installed
St. Patrick St.	Sussex Dr. to Dalhousie St.		2003
Murray St.	Sussex Dr. to Dalhousie St.		1990
Clarence St.	Sussex Dr. to Dalhousie St		1993
York St.	Sussex Dr. to William St.	**North side**	**1874**
		South side	1974 to 1991
	William St. to Dalhousie St.	North side	1989
		South side	**1911**
	Dalhousie St. to Cumberland St.		1989
	Cumberland St. to King Edward Ave.		1989
George St.	Sussex Dr. to Byward Market Sq.		1982
	Byward Market Sq. to Dalhousie St.		1985
	Dalhousie St. to Cumberland St.		1981
Byward Market Sq.	Clarence St. to York St.	North half	2019
	Clarence St. to York St.	**South half**	**1969**
	York St. to George St.		2000
Parent St.	St. Patrick St. to Clarence St.		1991/1996
William St.	Clarence St. to York St.		1974
	York St. to Rideau St.		1981/2000
Dalhousie St.	St. Patrick St. to Clarence St.		1994
	Clarence St. to Rideau St.		1994
Waller Mall	George St. to Rideau St.		N/A

2.6. Storm & Sanitary Sewers

Storm and Sanitary Sewers throughout the Design Focus Area are owned and maintained by the City of Ottawa. With the exception of segments on George St., York St. and Dalhousie St. (installed in 1874, 1907 and 1934), the majority of the network has been renewed since the 1970's (refer to Tables 2 & 3 for details). Sewers generally have a life span of 100 years, therefore the majority of network has more than 50 years of useful life remaining. While the City of Ottawa is concerned about the older sewer segments identified (see bolded cells in Table 2 and 3) it has no specific renewal schedule It is interested in remaining informed as the Public Realm Plan is advanced to detailed design and construction to identify opportunities to renew these assets in an integrated fashion.

Table 2: Storm Sewers

Street	Limits	Attribute	Year Installed
St. Patrick St.	Sussex Dr. to Dalhousie St.		2003
Murray St.	Sussex Dr. to Dalhousie St.		1990
Clarence St.	Sussex Dr. to Dalhousie St.		1993
York St.	Sussex Dr. to William St.		1991
	William St. to Dalhousie St.		1991
	Dalhousie St. to Cumberland St.		1991
	Cumberland St. to King Edward Ave.	6'6"x4'4"	**1874**
		1200mm	**1934**
George St.	Sussex Dr. to Byward Market Sq.		1991
	Byward Market Sq. to Dalhousie St.		1982
	Dalhousie St. to Cumberland St.		1981
Byward Market Sq.	Clarence St. to York St.		N/A
	York St. to George St.		2000
Parent St.	St. Patrick St. to Clarence St.		1991/1996
William St.	Clarence St. to York St.		N/A
	York St. to Rideau St.		1981/2000
Dalhousie St.	St. Patrick St. to Clarence St.		1994
	Clarence St. to Rideau St.		1994
Waller Mall	George St. to Rideau St.		unknown

Table 3: Sanitary Sewers

Street	Limits	Attribute	Year Installed
St. Patrick St.	Sussex Dr. to Dalhousie St.		2003
Murray St.	Sussex Dr. to Dalhousie St.		1990
Clarence St.	Sussex Dr. to Dalhousie St.		1993
York St.	Sussex Dr. to William St.		1991/1934
	William St. to Dalhousie St.		**1934**
	Dalhousie St. to Cumberland St.		1934/2006
	Cumberland St. to King Edward Ave.		2006
George St.	Sussex Dr. to Byward Market Sq.		1981/1983
	Byward Market Sq. to Dalhousie St.		**1874**
	Dalhousie St. to Cumberland St.		**1874**
Byward Market Sq.	Clarence St. to York St.		N/A
	York St. to George St.		2000
Parent St.	St. Patrick St. to Clarence St.		1991/1996
William St.	Clarence St. to York St.		1973
	York St. to Rideau St.		1981/2000
Dalhousie St.	St. Patrick St. to Clarence St.		**1907**
	Clarence St. to Rideau St.		1994
Waller Mall	George St. to Rideau St.		N/A

3. CONSIDERATIONS AND NEXT STEPS

As the desired urban design treatments and public realm plans are developed, these should be superimposed onto the City of Ottawa utility plans. This superimposition will allow an understanding if the proposal would impact or conflict with existing utilities.

Based on experience during preparation of Functional Plans and Street Renewal projects, it is possible that the location of underground utilities conflict with new above-ground streetscape elements, including sidewalks, bus shelters and curbs. However, the utility constraints can often be managed. The utilities can be protected in-place without significant physical alteration or, occasionally, if the impact is significant, these utilities can be relocated at specific locations to reduce the impact.

The placement of trees and soil cells should be discussed with the City's applicable infrastructure departments to ensure that conflicts between utility ducts, trees and roots can be managed. When conflicts arise, it is best to relocate soil cells where space allows. The total soil volume typically required for a healthy tree ($15m^3$) sometimes can be difficult to accommodate within the right-of-way, therefore trees with smaller calipers or different tree species requiring less soil capacity may be recommended. Some utilities, such as traffic signals or streetlighting, tend to allow their ducts to be in proximity to soil cells if the utility ducts are encased in concrete. In that scenario, the utility ducts are typically at the bottom of the soil cell "area" and the cells are constructed around them. This can be made possible by the modular nature of the individual soil cell. Exact details vary by manufacturer. Other utility providers, such as gas and Hydro Ottawa, have requested specifically that root barriers protect their equipment and that a minimum offset be respected between utility and edge of nearest soil cell.

The opportunities and constraints that utility infrastructure represents for future urban design treatments will continue to evolve with the design of the ByWard Market Public Realm Plan. It is recommended that the Public Realm Plan be distributed to the various utility parties at strategic design milestones. Discussion with these parties is important so that new opportunities and constraints can be identified and refined early on. Opportunities for integrated renewal of utility infrastructure will be more easily determined as the design of surface treatment advances.