

Memorandum

To: Rosa Bustamante, Manager of Policy Planning, Mobility Hubs, City of Burlington

From: David Sajecki, Brook McIlroy

Project Name: Burlington Mobility Hubs

Date: September 15, 2017

Subject: Downtown Burlington Technical Memo – Projected Gross Floor Area, Units, People and Jobs Capacity

Introduction:

The following memo provides a summary of new Gross Floor Area (GFA), the number of residential units, and new people and jobs projected for the Downtown Burlington Mobility Hub.

Calculations for the hub are based on full build out of the Preferred Draft Downtown Precinct Plan. The attached Development Concept Plan (see images following this memo) is designed to full As-Of-Right build out of the Precinct Plan. Additionally, all potential development sites are based on recommended residential and office distribution identified in NBLC's Market Analysis and considers factors such as property depth, underground parking area requirements and allowable floorplates based on setbacks, stepbacks and other direction from the City's Tall Building Design Guidelines. As well, in the absence of formal City design guidelines for mid-rise buildings we have adopted principles from the City of Toronto's Avenues and Mid-Rise Buildings Study to which proposed development adheres.

The following GFA calculations include 33 development blocks with mid (4-11 storeys) to high-rise (12 + storeys) building potential. Including podium heights, buildings range in height from 3 storeys to 25 storeys (see images following memo).

Please note that GFA calculations are Order of Magnitude and will be subject to refinement following completion of the Storm Water Management Assessment.

Assumptions:

The following assumptions have been used as inputs to derive the desired calculations:

1. Average Gross Residential Unit Size = 100 square metres per unit;
2. Population Per Unit = 1.7 persons per unit;
3. GFA Per Employee (Retail) = 42 square metres per person; and
4. GFA Per Employee (Office) = 23 square metres per person.

GFA per employee assumptions for both retail and office are based on Watson's input to the City of Burlington's 2015 Strategic Plan.

Conclusions:

Projected total new GFA for the Downtown Mobility Hub, at full build out of the Draft Preferred Downtown Precinct Plan, is approximately 811,000 square metres or 8,730,000 square feet.

This includes:

- 760,000 square metres (8,200,000 square feet) of residential GFA;
- 25,000 square metres (270,000 square feet) of retail GFA; and
- 9,000 square metres (200,000 square feet) of office space.

Resulting in approximately:

- 7600 new residential units;
- 13,000 new residents;
- 600 retail jobs; and
- 825 office jobs.

Therefore, at full build out the Downtown Mobility Hub is projected to have capacity for 13,000 new people and 1425 new jobs or a total of 14,425 people and jobs.

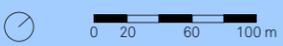
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BURLINGTON DOWNTOWN MOBILITY HUB CONCEPT PLAN

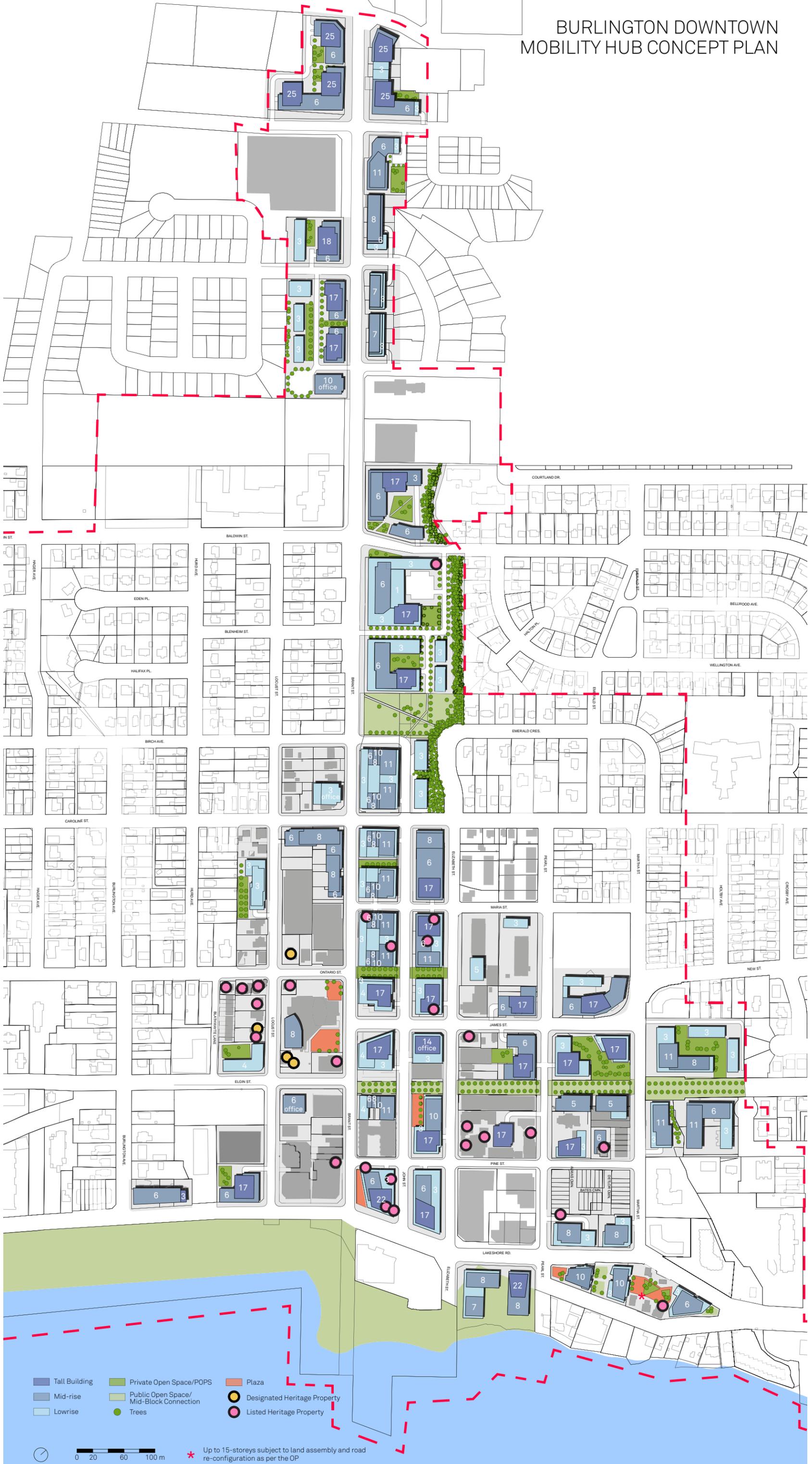


- Tall Building
- Mid-rise
- Lowrise
- Private Open Space/POPS
- Public Open Space/
Mid-Block Connection
- Trees
- Plaza
- Designated Heritage Property
- Listed Heritage Property



Up to 15-storays subject to land assembly and road re-configuration as per the OP

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0 20 60 100 m

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September 15, 2017

City of Burlington
 426 Brant Street,
 Burlington, ON L7R 3Z6

Subject: Traffic Condition Tech Memo, Downtown Mobility Hub

Currently in the downtown, capacity constraints exist along westbound Lakeshore Road and at the intersection of Lakeshore and Maple. With full build out of the Downtown Mobility Hub, Lakeshore, Brant, and James are expected to operate over capacity at several locations, with some intersections operating at a poor Level of Service (LOS) F. All other screenline locations and intersections are operating within capacity and at acceptable Levels of Service under existing and future conditions. **Tables 1 and 2** identify the critical screenlines and intersections in the Downtown Mobility Hub. **Figures 1A through 4B** show the existing and future intersection Levels of Service.

Table 1: Screenline Analysis - Downtown Mobility Hub: Critical Locations

Roadway	Direction	Location	Existing Performance	Future Performance
Lakeshore Road	Westbound	East of Maple Avenue	Over capacity in PM	Over capacity in AM & PM
Lakeshore Road	Westbound	East of Elizabeth Street	Over capacity in PM	Over capacity in AM & PM
Lakeshore Road	Eastbound	East of Maple Avenue		Over capacity in AM
Lakeshore Road	Eastbound	East of Elizabeth Street		Over capacity in AM
Brant Street	Southbound	South of Caroline Street		Over capacity in AM & PM
Brant Street	Northbound	South of Caroline Street		Over capacity in PM
James Street	Westbound	East of Elizabeth Street		Over capacity in PM

All other locations are currently operating within capacity and will continue to operate within capacity under future conditions.

Table 2: Intersection Levels of Service - Downtown Mobility Hub: Critical Locations

Intersection	Existing AM	Existing PM	Future AM	Future PM
Lakeshore/Elizabeth	A	A	F	B
Lakeshore/Brant	B	B	F	F
Lakeshore/Maple	D	E	F	F
Brant/James	B	C	B	F
Brant/Caroline	A	A	D	F

All other intersections are currently operating at acceptable LOS and will continue to operate at acceptable LOS under future conditions.

Parallel routes may provide relief to constrained locations. Those passing through the downtown on major roadways such as Lakeshore may try to avoid the downtown by using alternative travel routes. It is also worthwhile to note that increased traffic congestion encourages drivers to consider other modes of transportation. The City’s Draft Official Plan (April 2017) states that, “At some locations, such as Mixed Use Intensification Areas and Areas of Employment, increased tolerance for at-capacity conditions will be considered and encouraged. LOS “F” shall be deemed to be acceptable for peak hour conditions.”



To accommodate future travel to, from, and within the downtown, a full-spectrum multi-modal transportation system is required.

To support the downtown's 28 percent modal split target and mitigate future transportation impacts from growth, the next steps of the transportation review will provide recommendations for Transportation Demand Management (TDM). Elements to be addressed include transit, active transportation connections, auto and ride share programs, as well as a supportive parking plan.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'GBM'.

Greig Bumstead, PTP
Senior Project Manager, Transportation Planning

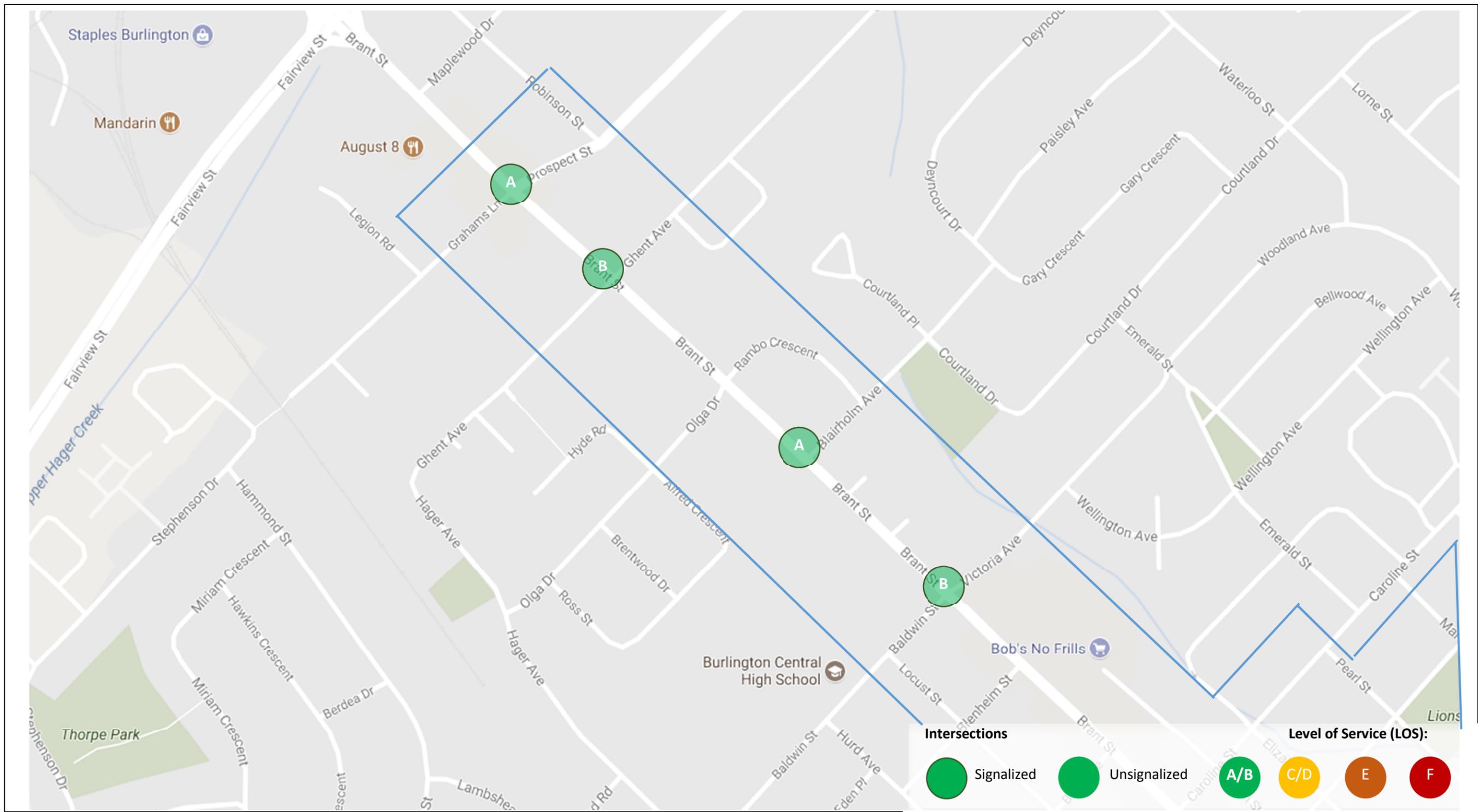


Figure 1B
 Intersection LOS Analysis – AM Peak - Downtown Mobility Hub (North of Victoria Ave)
 Burlington Mobility Hubs Study



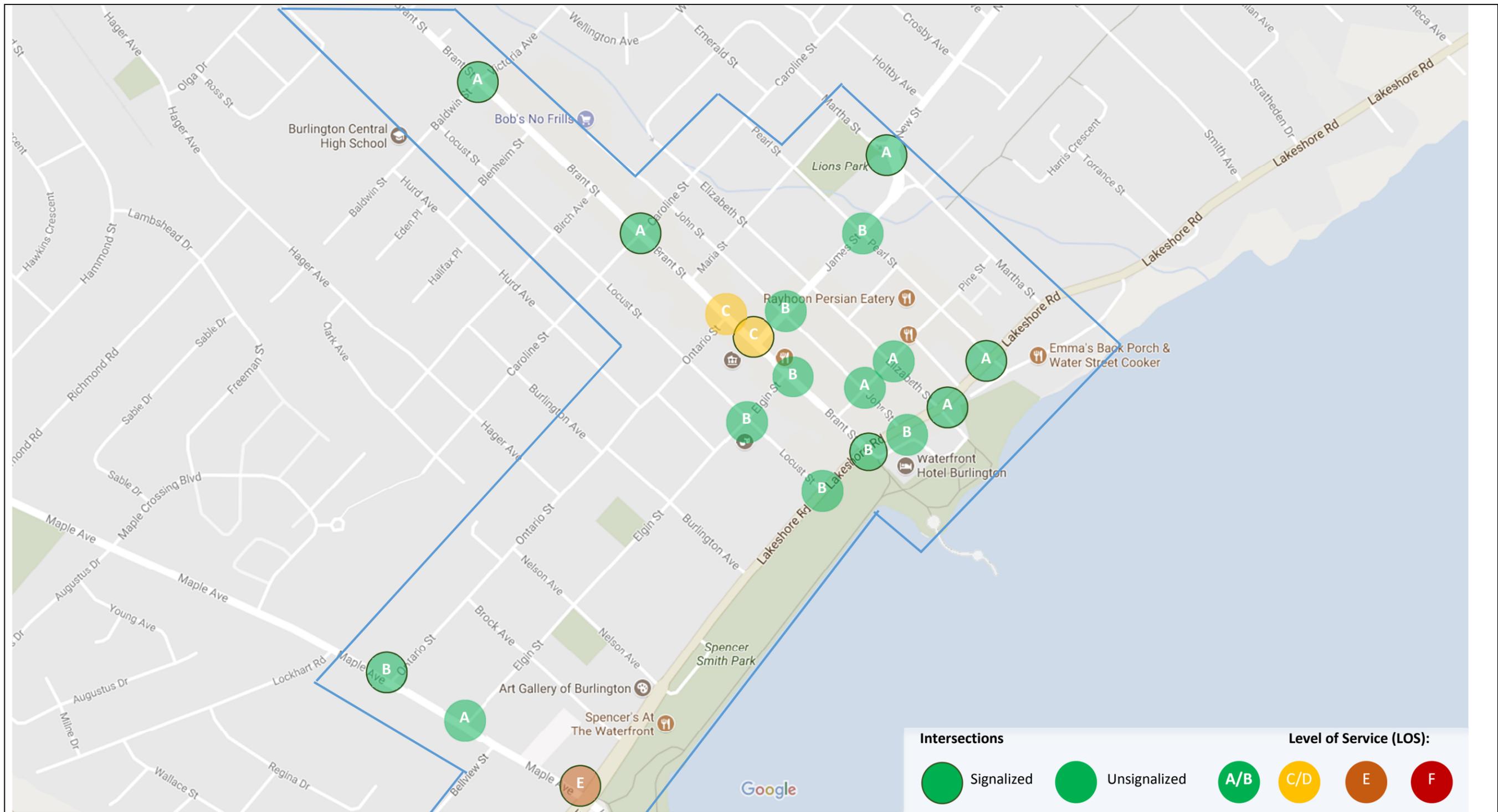


Figure 2A
 Intersection LOS Analysis – PM Peak - Downtown Mobility Hub (South of Victoria Ave)
 Burlington Mobility Hubs Study



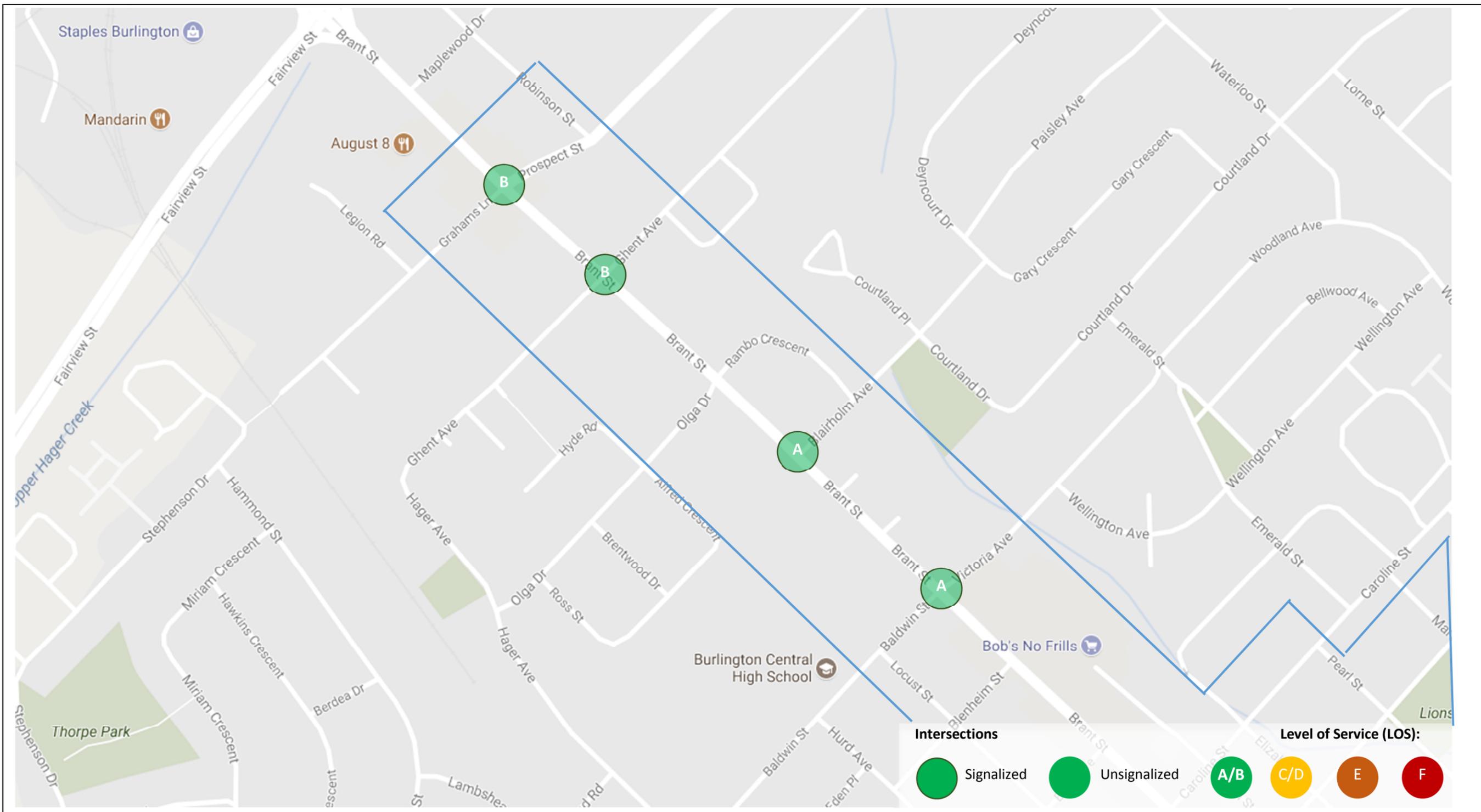


Figure 2B
 Intersection LOS Analysis – PM Peak - Downtown Mobility Hub (North of Victoria Ave)
 Burlington Mobility Hubs Study



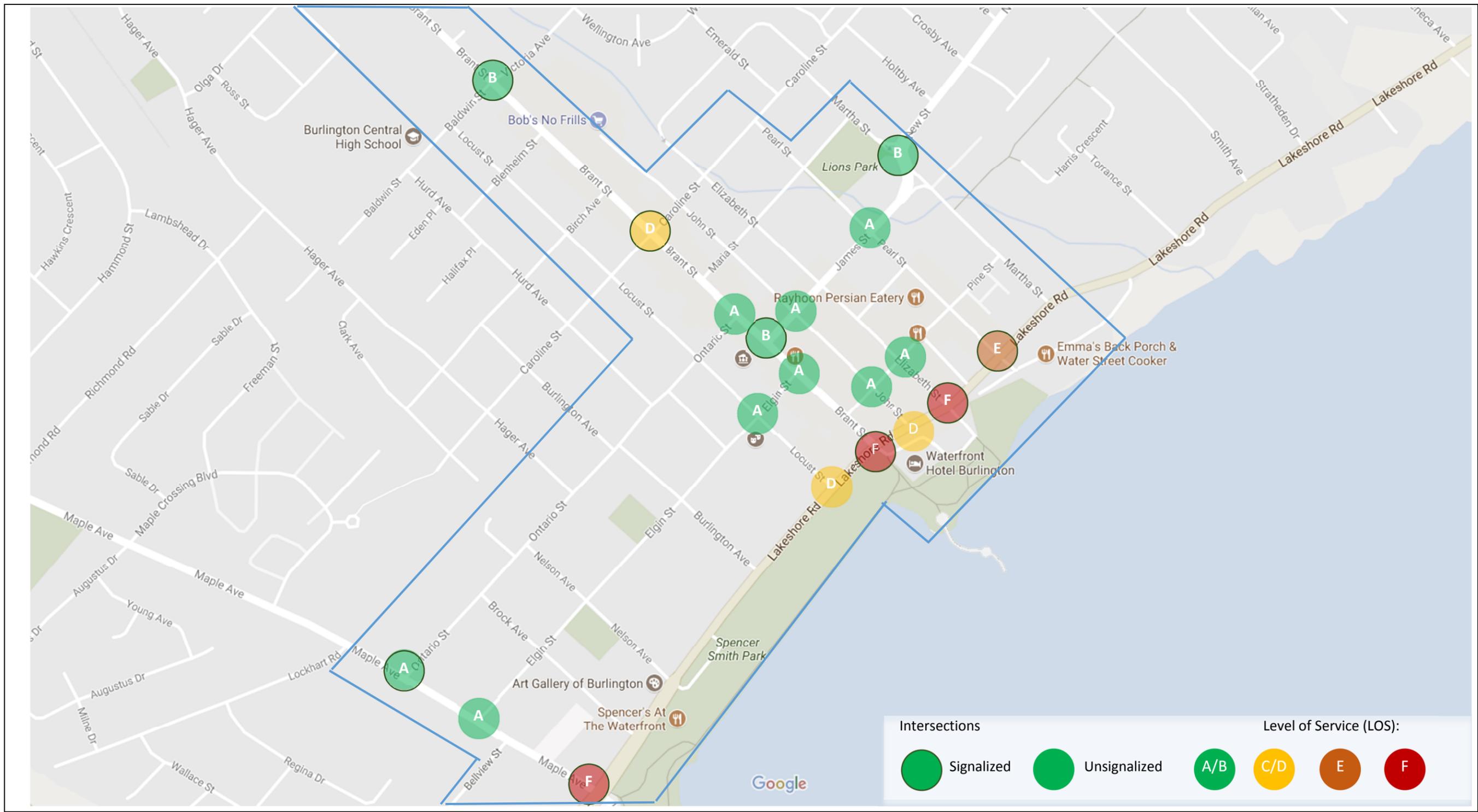


Figure 3A
 Future Intersection LOS Analysis 2031 – AM Peak - Downtown Mobility Hub (South of Victoria Ave)
 Burlington Mobility Hubs Study



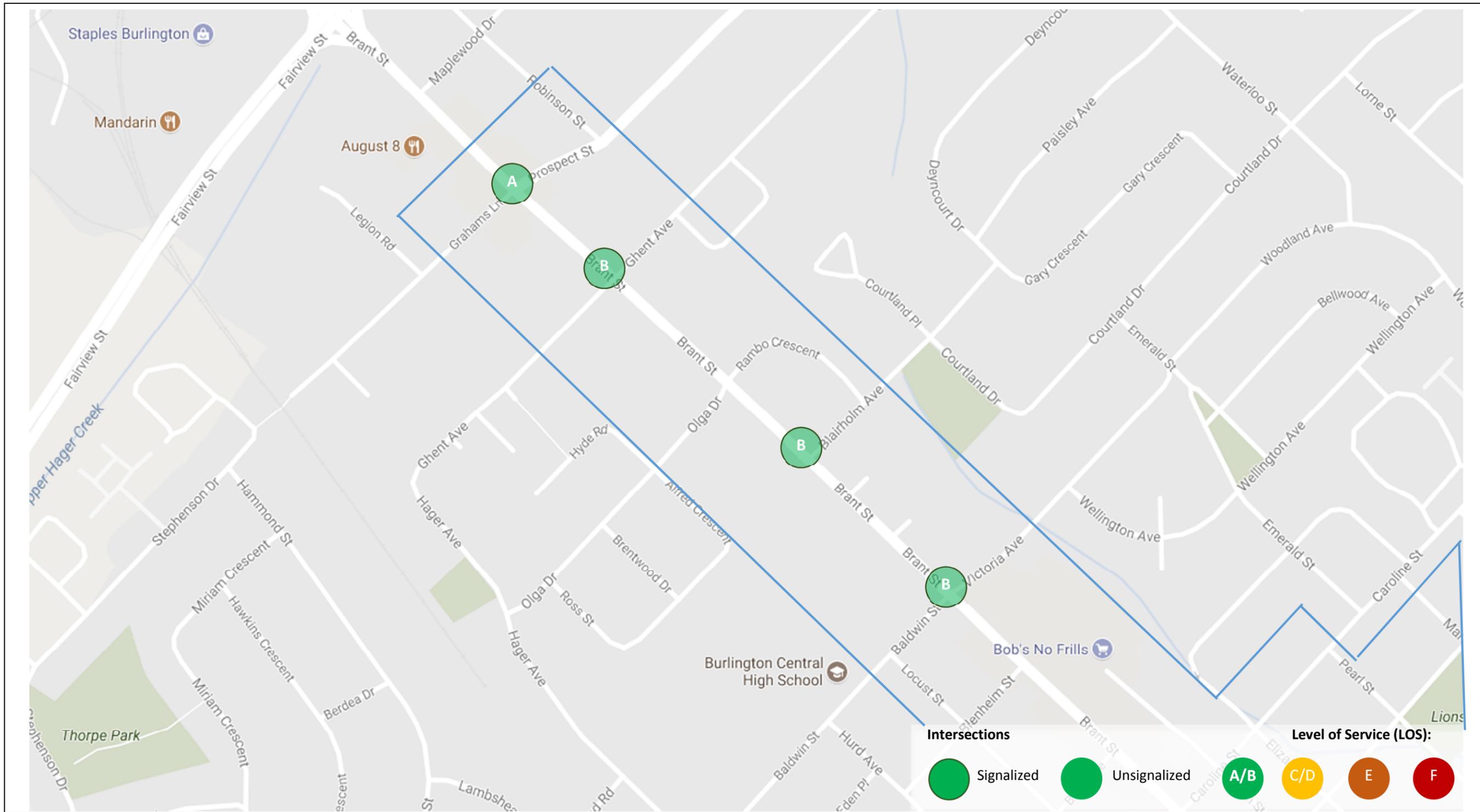


Figure 3B
 Future Intersection LOS Analysis 2031 – AM Peak - Downtown Mobility Hub (North of Victoria Ave)
 Burlington Mobility Hubs Study



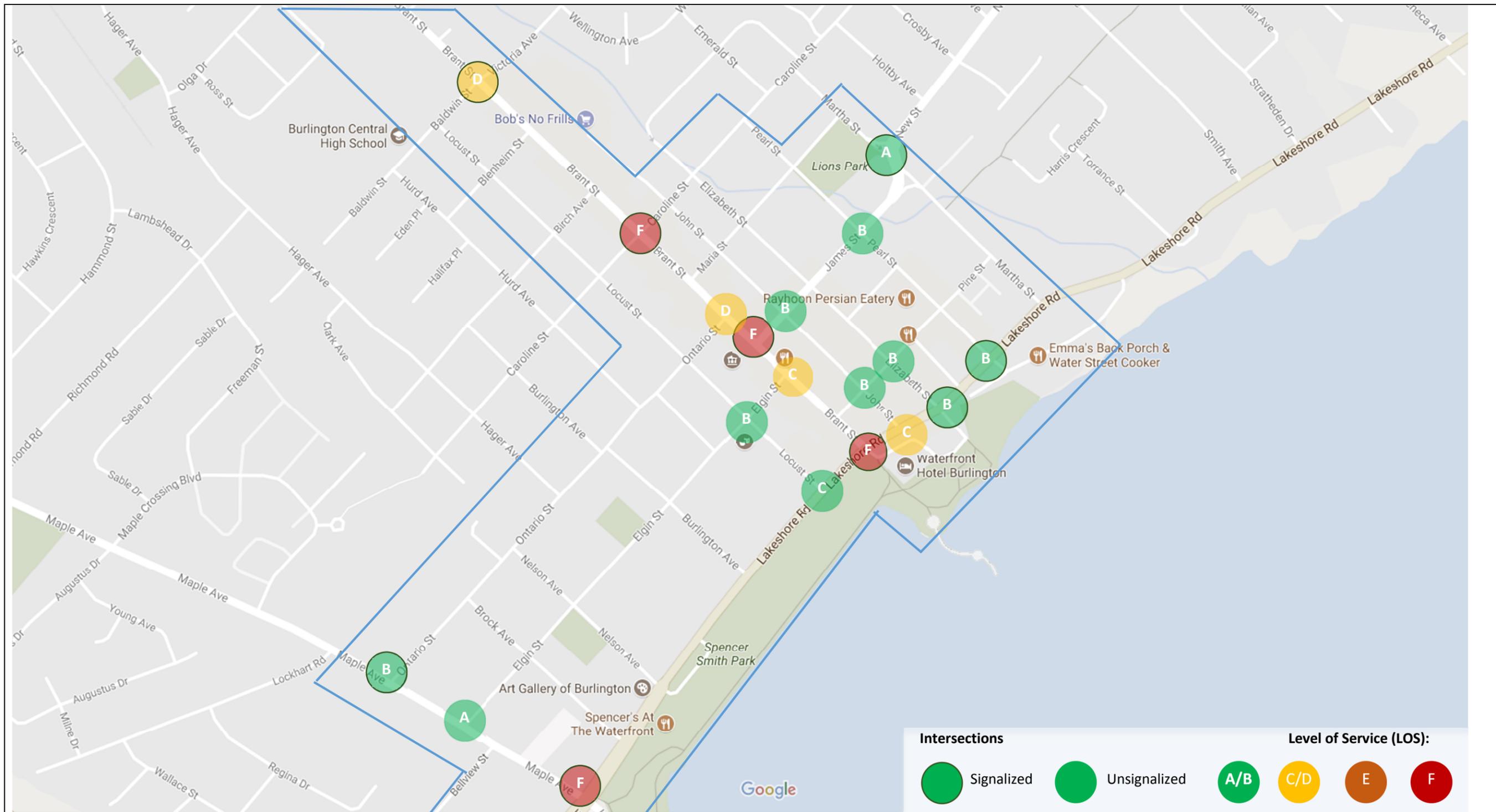


Figure 4A
 Future Intersection LOS Analysis 2031 – PM Peak - Downtown Mobility Hub (South of Victoria Ave)
 Burlington Mobility Hubs Study



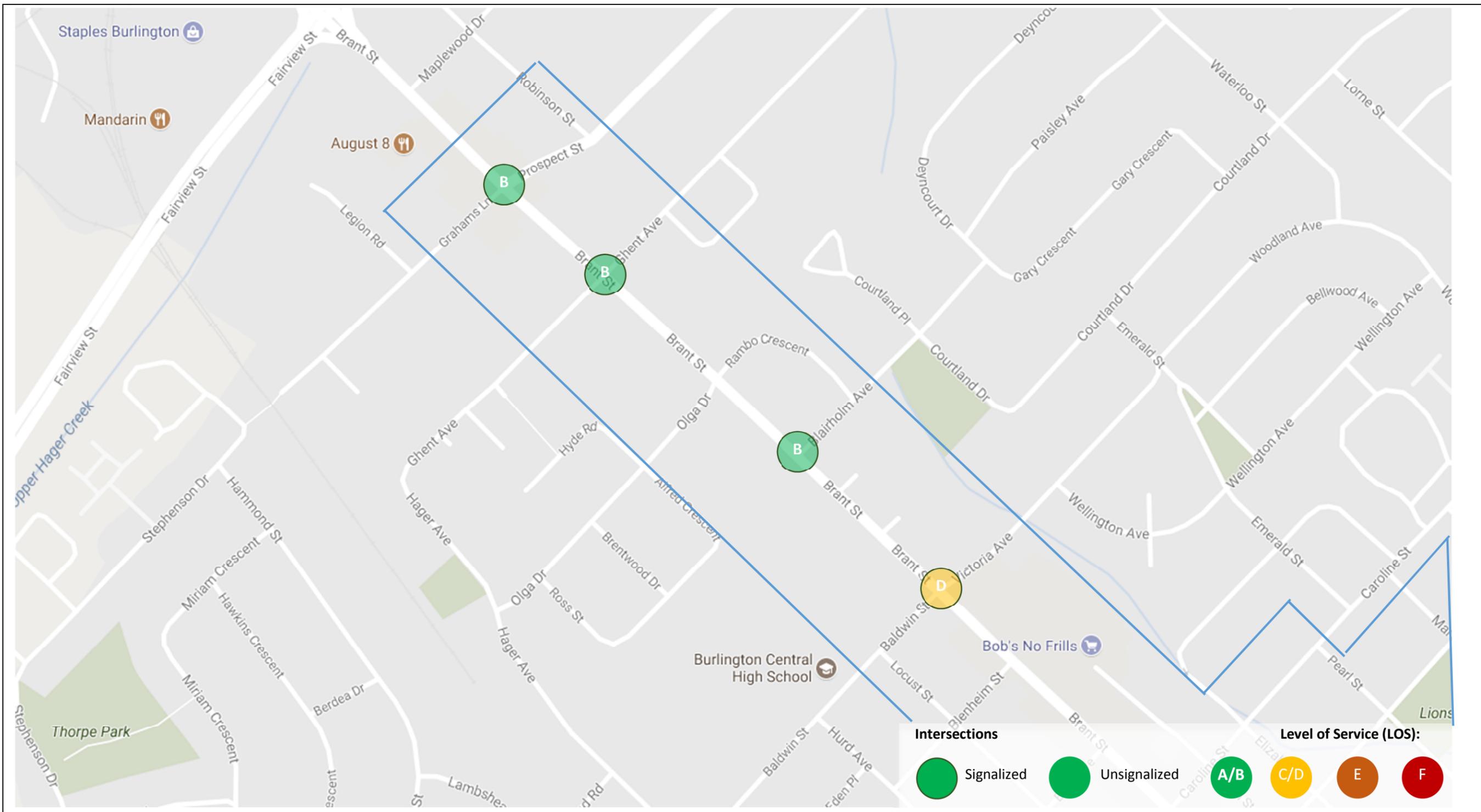


Figure 4B
 Future Intersection LOS Analysis 2031 – PM Peak - Downtown Mobility Hub (North of Victoria Ave)
 Burlington Mobility Hubs Study





Memorandum

To: Mr. David Sajecki

Company: Brook McIlroy

From: N. Barry Lyon Consultants Limited

Phone: (416) 364-4414 **Date:** September 14, 2017

Re: Downtown Burlington Technical Memo – Market Analysis

The following provides a summary of NBLC's market analysis for the Downtown Burlington Mobility Hub Area:

- NBLC believes that the Downtown area will continue to be the primary destination within the City of Burlington for both residents and visitors. The proximity to the waterfront, walkability, and access to services and amenities are all attractive aspects of the Mobility Hub Area and the continued evolution of the Downtown will only enhance these elements.
- Market demand for residential and non-residential investment in the Downtown is being driven by the character and range of available services and amenities more so than access to transit services and the highway system like at the other Mobility Hubs within Burlington.
- Demand for high-density residential housing in condominium format is expected to increase as the Downtown continues to mature.
- The market in the near-term will likely focus on older demographics, but, as we have seen in other municipalities, the appeal of the Downtown, growing employment opportunities, and declining affordability in the low-density housing market will, in the longer term, begin to attract younger groups to the Downtown.
- Having a wider range of pricing for new housing units in the Downtown will be imperative to diversify the buyer groups, and to ensure that the demand for new housing in the Downtown area is captured. The most recent developments have prices that are reflective of their waterfront locations and are typical of a luxury positioning, ensuring that they are not accessible for many first-time buyers. Increased densities in the Downtown may aid in suppressing pricing somewhat, opening the market up to a wider mix of buyers.
- Demand for modern rental housing is present but the economics of development still favour condominium tenure for most developers. The recent extension of rent control



legislation has also taken some momentum out of an emerging rental development market across the GTA.

- Demand for medium density housing forms is also very strong, although opportunities for infill developments are limited. Land assemblies are challenging and expensive. Where opportunities can be found, townhome and stacked townhome projects offer the prospect of attracting a more diversified income and family profile of residents in the Downtown.
- Developing strategies that will attract a more diverse population of buyers and renters, and a mix of age groups, should be an important objective for the Downtown Mobility Hub area.
- As the Downtown's population continues to grow, we expect that demand for retail and service commercial uses will increase and new investment will continue its positive trend.
- Demand for office space is also likely to increase as employers look for unique and high-quality environments to attract staff. However, achievable rental rates for new office investment will need to increase in order to support the economic opportunity for the development of new high-density office construction. In the near term, new non-residential space is likely to be built primarily as part of new mixed-used buildings.

In addition to our market analysis, NBLC also completed an illustrative financial pro forma model to consider whether high-density residential development at heights in the order of six to eight storeys might be viable within current market conditions, or whether additional height is required to support viable pro forma results within the current land market.

The purpose of this financial analysis was to answer questions from City Staff in regards to the impacts of increasing building heights on development viability. This analysis is meant to be illustrative of condominium apartment buildings only, in order to isolate the impact of added residential space that could be achieved through increased building height.

The following were our key findings (**Table 1** illustrates our comparison of results):

- The economics of development at six and eight storeys appear to be viable in the current market context. The models tested in this analysis generated enough revenue to offset all project costs, developer profit expectations, and a residual payment for land. The 6 and 8-storey scenarios were estimated to support land values in the order of \$2.15 to \$2.72 million (for a theoretical 0.5 acre parcel), or about \$23 per square foot of gross floor area.
- The analysis also indicated that a larger scale development would support stronger returns. The results of our model illustrate that a 25-storey building could support higher profit, but also stronger land value on an index basis (approximately \$30 per square foot of gross floor area vs. \$23).
 - In testing this scenario, unit sizing and pricing assumptions were adjusted slightly to recognize the larger number of units and typical character of larger scale apartment development which requires that units are positioned to sell at a quicker pace.
- Recent land transaction activity indicates that the development community may believe, or is speculating, that increases to development heights will be granted through a planning



application or appeals process. With confidence that this can be achieved, land values have begun to escalate as the expectations of both the development community and land owners adjust to this context.

- However, there may also be situations in which added density is required in order to support land values that can outcompete other productive uses. For example, \$2.0 million for 0.5 acres of land would likely be economical for a gas station or even some retail uses.
- A lower height limit in the Downtown – while feasible – comes with the following potential unintended consequences:
 - Encouraging developers to drive pricing higher to compensate for a lack of density, as has occurred in Downtown Oakville. This does not help in diversifying the population base and range of built form in the Downtown;
 - Constraining the viability of new rental housing development– except at the luxury end of the market;
 - Allowing other lower density development forms and land uses to compete for land; and,
 - Limitations in the supply of significant redevelopment opportunities are likely to delay private sector investment.
- If the overarching desire is to encourage redevelopment and intensification within the Downtown, increases to height permissions may provide greater financial flexibility for the development community in their ability to assemble properties and compete with the land values supported by other productive uses. However, if the City were to pursue a regimented and defensible mid-rise approach to building heights in the Downtown through its review of the Official Plan, the land market will likely adjust accordingly, but the pace of redevelopment activity might temper.



Table 1

Illustrative Pro Forma Example - High Density Condominium Apartment Development			
	Scenario 1 6 Storey	Scenario 2 8 Storey	Scenario 3 25 Storey
Market Assumptions			
Average Unit Size (square feet)	725	725	700
Residential Index Price (PSF)	\$600	\$600	\$620
End Price (per residential unit)	\$435,000	\$435,000	\$434,000
Absorption Rate (sales per month)	6.00	6.00	10.00
Discount Rate	7.00%	7.00%	7.00%
Cost & Revenue Inflater	1.50%	1.50%	1.50%
Developer Profit Margin (% of Gross Rev.)	15.00%	15.00%	15.00%
Project Statistics			
Land Area (acres)	0.50	0.50	0.50
Gross Residential Area (GRA, SF)	95,200	116,960	236,000
Net to Gross Efficiency (NGE, %)	83%	83%	83%
Net Saleable Residential Area (SF)	79,016	97,077	195,880
Number of Units	109	134	280
Revenue			
Total Revenue	\$49,477,000	\$60,852,000	\$127,067,000
Development Costs			
Hard Costs	\$25,864,000	\$31,687,000	\$63,870,000
Soft Costs	\$13,312,000	\$16,335,000	\$34,044,000
Total Development Costs	\$39,176,000	\$48,022,000	\$97,914,000
Developer Profit			
Total Profit (Future \$)	\$7,321,000	\$9,004,000	\$18,804,000
Residual Land Value			
Residual Land Value (Present \$)	\$2,152,000	\$2,718,000	\$7,190,000
R.L.V. \$PSF Buildable	\$23	\$23	\$30

Source: N. Barry Lyon Consultants Limited

Memo

To: David Sajecki, Brook McIlroy
From: Matthew Senior and Ron Scheckenberger, Amec Foster Wheeler
Date: September 14, 2017
File: TPB178008
Re: **Scoped EIS and Scoped SWM Assessment – Mobility Hubs
Project Status Update – Downtown Mobility Hub
City of Burlington**

Introduction

A scoped Environmental Impact Study (EIS) is required for each of the City's four (4) Mobility Hubs as part of the overall planning study for the Burlington Mobility Hubs. The purpose of each scoped EIS is to inventory existing conditions of the natural environment (e.g., woodlands, wetlands, valleys, wildlife habitat, watercourses), identify the potential impacts that the proposed Area Specific Plans may have on these features, and develop high-level mitigation plans, where appropriate, focusing on appropriately minimizing or eliminating impacts. The approach for the scoped EIS work focuses on two key objectives:

- i. Identifying lands which are not suitable for development based on their significance or related constraints; and,
- ii. Identifying opportunities for ecological restoration, as a number of the lands around the hub areas are heavily urbanized.

The focus of the current Project Status Update is on the Downtown Mobility Hub, which is considered to be the highest priority hub based on ongoing development pressures.

A summary of the status/findings of the natural systems assessment (as completed by Dillon Consulting) for the Downtown Mobility Hub has been attached. This memorandum provides a summary of Amec Foster Wheeler's work related to the on-going work related to the assessment of the Downtown Mobility Hub, as well as the related work for the Burlington Mobility Hub.

Brook McIlroy
September 14, 2017

Downtown Mobility Hub

Amec Foster Wheeler has been proceeding with the generation of new hydrologic and hydraulic models for the Downtown Mobility Hub, as none currently exist (Lower Hager and Lower Rambo Creeks). To summarize:

- New PCSWMM model has been completed (combined hydrology/hydraulics)
 - Provides the simulated flows for trunk storm sewers, roadways, and creeks for 100-year and Regional Storm (Hurricane Hazel) events
 - Assesses hydraulics for all systems (maximum depths and velocities for trunk storm sewers, roadways, creeks and culverts/enclosures)
- New HEC-GeoRAS model is in process of being finalized for creek hydraulics
 - Approved hydraulics for open watercourses as per CH requirements
 - Provides simulated flood depths and extents for 100-year and Regional Storm (Hurricane Hazel) events
 - Note: to be compared against results from PCSWMM modelling to determine which yields the most conservative results

The next steps for the Downtown Mobility Hub drainage assessment work include:

- Develop riverine (creek) floodplain mapping for the Lower Hager and Lower Rambo Creeks based on the results of the HEC-GeoRAS model for the 100-year and Regional Storm (Hurricane Hazel) events
- Assess overland flow locations of concern from the PCSWMM modelling (roadways) for the 100-year and Regional Storm (Hurricane Hazel) events and develop risk mapping
- Prepare summary reporting outlining methodology and results, including other related graphics (drainage boundaries, etcetera)
- Incorporate potential spill flows from the Burlington Mobility Hub (refer to following section)

Burlington Mobility Hub

As you are aware, a meeting was held between the City of Burlington, Conservation Halton, and Amec Foster Wheeler on August 23, 2017. A memorandum was presented at the meeting which outlined the proposed technical methodology to address concerns related to spills from the Hager-Rambo Diversion channel under the Regional Storm (Hurricane Hazel) event, and its potential impacts to the Downtown Mobility Hub. Comments were received in response to the proposed methodology from Conservation Halton on September 12, 2017. While some technical issues were raised, in general Conservation Halton did not indicate any fundamental concerns with the proposed approach. Based on this, and the direction from City staff, Amec Foster Wheeler is proceeding with the technical analyses accordingly. To summarize the ongoing work:

- Updating and verifying the existing hydrologic model for the Hager-Rambo diversion channel
 - Confirm updated flow rates under various conditions cited by Conservation Halton
 - Assess theoretical impact of removal of upstream flood control facilities (assessment only - not to be used as basis for decision-making, as per direction from City staff)

Brook McIlroy
September 14, 2017

- Updating the hydraulic (creek) model of the Hager-Rambo diversion channel system (HEC-GeoRAS)
 - Incorporating lateral structures within the model to quantify the magnitude (flow rates) of spill from the Hager-Rambo diversion channel during the Regional Storm
 - Updating and extending the extent of the model for the West Rambo Creek, which runs through the Burlington Mobility Hub (modelling is currently only available for the section adjacent to the Walmart plaza, not upstream of the railway tracks)
 - Developing updated floodplain mapping for Burlington Mobility Hub, and assessing areas of higher risk related to proposed development
- Separately, developing a two-dimensional (2D) hydraulic model downstream of the Hager-Rambo diversion channel
 - Assess spill pathways; areas at risk of overland flooding
 - Determine ultimate impact to Downtown Mobility Hub
 - Incorporate spill flows for Regional Storm into hydraulic modelling for Lower Hager and Lower Rambo creeks, and verify resulting impact to estimated floodplains (and associated proposed developments)

Closure and Next Steps

Based on the preceding and attached, Amec Foster Wheeler is advancing the hydrologic/hydraulic modelling for both the Downtown and Burlington Mobility Hubs, using the direction offered by the City and Conservation Halton at the meeting of August 23, 2017 and the correspondence from Conservation Halton of September 12, 2017.

Given the current study focus, a priority will be given to assessing the Downtown Mobility hub first, followed by the impacts of spill from the Hager-Rambo Diversion Channel. Floodplain mapping for the open channels within the Hager-Rambo system (i.e. upper Hager and upper Rambo creeks) would be a relatively lower priority.

Reporting and associated drawings will be prepared for the planned TAC meeting on September 27, 2017. This material will also be used to support any questions or discussion at the subsequent City Council workshop on September 28, 2017.

Assessment of the other two (2) mobility hubs (Aldershot and Appleby) is also ongoing and would be completed following the work for the Downtown and Burlington Mobility Hubs.

Please do not hesitate to contact us should you wish to discuss further.

/Attached Summary of Existing Conditions for Burlington Mobility Hub – Downtown Hub Station (Dillon Consulting, September 13, 2017)



MEMO

TO: Matt Senior, Amec Foster Wheeler Environment & Infrastructure
FROM: Dan Bourassa, Dillon Consulting Limited
cc: Al Benson, Dayna LeClair – Dillon Consulting Limited
DATE: September 13, 2017
SUBJECT: Summary of Existing Conditions for Burlington Mobility Hub - Downtown Hub Station
OUR FILE: File # 17-5015

Results of background review:

- Both Hager and Rambo Creek are highly altered and consists of a series of naturalized, enclosed, concrete or altered channels;
- The largest barrier to fish passage is the Hager-Rambo Diversion Channel as it is very difficult for fish to migrate through the concrete channel;
- As part of Conservation Halton's Long-term Environmental Monitoring Plan, results from 2012 fishing yielded a total of 26 different species consisting of a total of 2,697 individuals
- No natural heritage features were identified during background review;
 - No Non-significant wetlands or PSWs
 - No Woodlands
 - No Valleylands
 - No ANSI
- A total of 37 SAR have the potential to occur within the overall Study Area.

Results of field Investigations:

- One natural vegetation ecological community was observed within the Study Area during the ELC survey.
 - The natural community within the Study Area has been disturbed due to anthropogenic uses (i.e., trails, dumping, etc.) and contains invasive species;
- A total of 14 plant species were documented during 2017 field studies;
 - 50% are listed as native species considered to be common (S4) to very common (S5) in the province of Ontario;
 - 50% are listed as introduced species;
- Rambo Creek was characterized as a permanent creek, observed to be flowing on the day of the assessment and contained direct habitat for fish;
- The Lower Hagar Creek was characterized as a permanent, channelized creek providing direct fish habitat;
 - Bank stability varied throughout this reach from areas of unstable and eroding banks to areas which have received erosion protection in the form of retaining walls;
- The woodland within the Study Area is estimated at 0.76ha
 - It does not contain interior habitat;
 - It is not located within 50 m of a sensitive groundwater discharge;

- It does not contain native woodland species.
 - Therefore the woodland was determined to be Not Significant.
- A total of 14 bird species were observed during breeding bird surveys in 2017;
 - none are considered area sensitive and all are considered common;
- No Butternut trees were identified within the Study Area;
- No other SAR or SAR habitat was identified within the Study Area during 2017 field surveys;
- No incidental wildlife species were observed within the Study Area;



Memo DRAFT

To: David Sajecki, MCIP, RPP, Brooke McIlroy, Project Manager – Burlington Mobility Hubs

From: E. André Poirier, P. Eng. Water & Wastewater Infrastructure Planning Engineer

Date: September 15th 2017

File: TPB178008S

cc: Ron Scheckenberger, P. Eng., Amec Foster Wheeler

Re: **Water and Wastewater Servicing Considerations – Burlington Downtown Mobility Hub**

Background

The Burlington Downtown Mobility Hub is one of four planned mobility hubs in the City of Burlington. The mobility hubs are part of a comprehensive intensification strategy that is integral to Burlington's economic development priorities.

The Downtown Mobility Hub is a 176 ha neighbourhood area located in Downtown Burlington and includes the Lakeshore area from Burlington Beach to Martha Street and centered at Brant Street and James Street. Planning estimated for the overall area have not been finalized. A recent estimate based on the proposed ground floor area and residential units suggests the Downtown Mobility Hub lands will support a population of 20,000. At this time the distribution of the population within the proposed lands is not finalized.

Water and Wastewater infrastructure in Burlington is owned, planned and managed by Halton Region. Halton Region's planning framework to service the growth is through its Master Plan which was last updated in 2011. Infrastructure Planning in Halton has focused on a sustainable regionalized approach in which growth in the Region is serviced by the Lake Based System. In this planning framework, trunk infrastructure for water wastewater infrastructure is designed and planned in the South (near Lake Ontario) and moves up Northward into branches into the primary growth areas in North Oakville, North Burlington, Milton and Halton Hills/Georgetown. Our understanding of the infrastructure is based on the following:

-) Review of the Water & Wastewater Models Provided by Halton Region in 2017;
-) Review of the 2011 Halton Region Water & Wastewater Master Plan;

Additional information and engagement with Halton Region will be undertaken to clarify our understanding of the system as part of the Mobility Hub Infrastructure Planning process.

Wastewater Servicing Considerations

The mobility hub is situated near an 1800 mm trunk sanitary sewer that conveys flows for treatment in the Skyway Wastewater Treatment Plant as shown in Figure 1. This is a large capacity system that is designed to take on flows from most of the Skyway Wastewater Treatment Plant Service Area. This sewer runs through the mobility hub lands and will form the primary outlet to the collection system for the proposed development in the Downtown mobility hub.

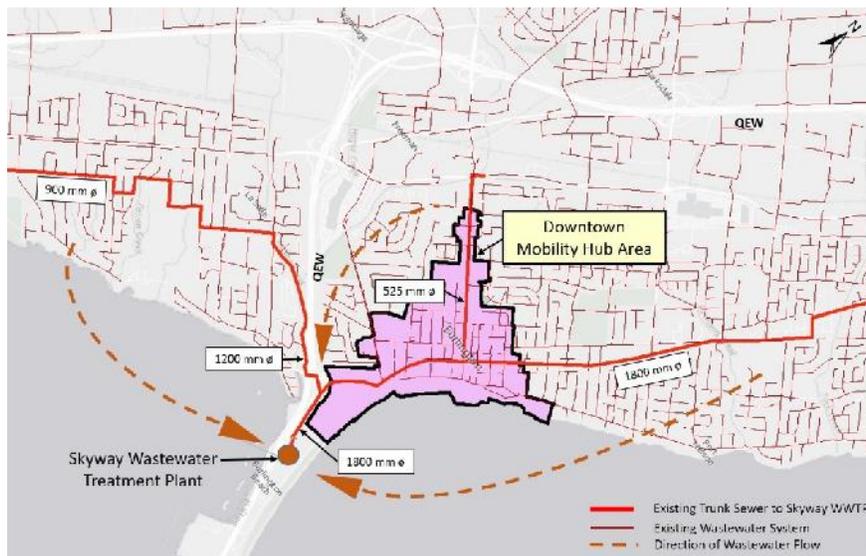


Figure 1 Existing Sanitary Services in and around the Downtown Mobility Hub Planning Area

In general, lands to the North of Lakeshore, can be expected to have gravity sewer services that will connect to the 1800 mm trunk sanitary sewer. Lands to the South of Lakeshore may be too low to be serviced by gravity.

There is an existing sewage pumping station servicing the properties to the South of Lakeshore located near Lakeshore Blvd and the Creek to the West of Torrance Street. The existing local sanitary sewers are shown in Figure 2.

Future Wastewater Servicing Needs

Future services required for intensification in the Downtown Mobility Hub would include:

Local Sewer Conveyance – Local sewers in the downtown mobility hub may need to be upgraded to provide capacity. The local network improvements will be planned when the distribution of the population is given. Conveyance will focus on connection to the 1800 mm trunk sewer.

Pumping Requirements – The lands to the South of Lakeshore may require pumping improvements which could include the replacement of the existing pumping station with another

solution for the entire area. Note that areas in the western Lakefront currently have no local sewers and may require a pumping solution.

Existing and Planned Trunk Collection and Treatment: The existing and planned trunk and wastewater collection and treatment infrastructure in Halton and within the Skyway Wastewater Treatment Plant Service area will benefit the intensification in the Downtown Mobility Hub. Intensification will take up some of the planned and existing capacity in these systems. As such, it is anticipated that development changes will include a life-cycle component for these systems. This is to be determined in consultation with Halton Region.



Figure 2 Existing Sanitary Sewers within the Downtown Mobility Hub Planning Area

Water Servicing Considerations

The Downtown Mobility Hub lands are located within the Burlington Zone 1 (BZ1) Water distribution Zone. This is part of Halton’s Integrated Lake Based Water Supply System. Water supply within BZ1 and the integrated urban system is supplied by the following plants:

-) Burlington Water Treatment Plant (263 ML/d),
-) Burloak Water Treatment Plant (55 ML/d¹), and the
-) Oakville WTP (109 ML/d)

The total water treatment capacity of 432 ML/d within the Lake Based Treatment Systems can easily meet the needs of a population of approximately 800,000. System capacity expansion is reviewed by Halton Region through a Master Planning process where upgrades are triggered by growth in demand and development.

The Integrated Lake Based System in and around the Downtown Mobility Hub is shown in Figure 3. The Downtown Mobility Hub’s location within BZ1 is near the trunk of the Halton Lake

¹ The Burloak WTP was constructed in 2006-2010 with an initial capacity of 55 ML/d and plans to increase capacity to service growth in Halton Region as per the 2011 Master Plan. Confirmation as to the status of the Burlington WTP capacity is being sought at this time from Halton Region.

Based System. An initial review of the water main configuration suggests that the primary source of treated water would be the Burlington WTP, but that there are several interconnection opportunities within Oakville and Burlington Zone 1 that would allow for conveyance of treated water from the other plants to service an increased demand associated with intensification.

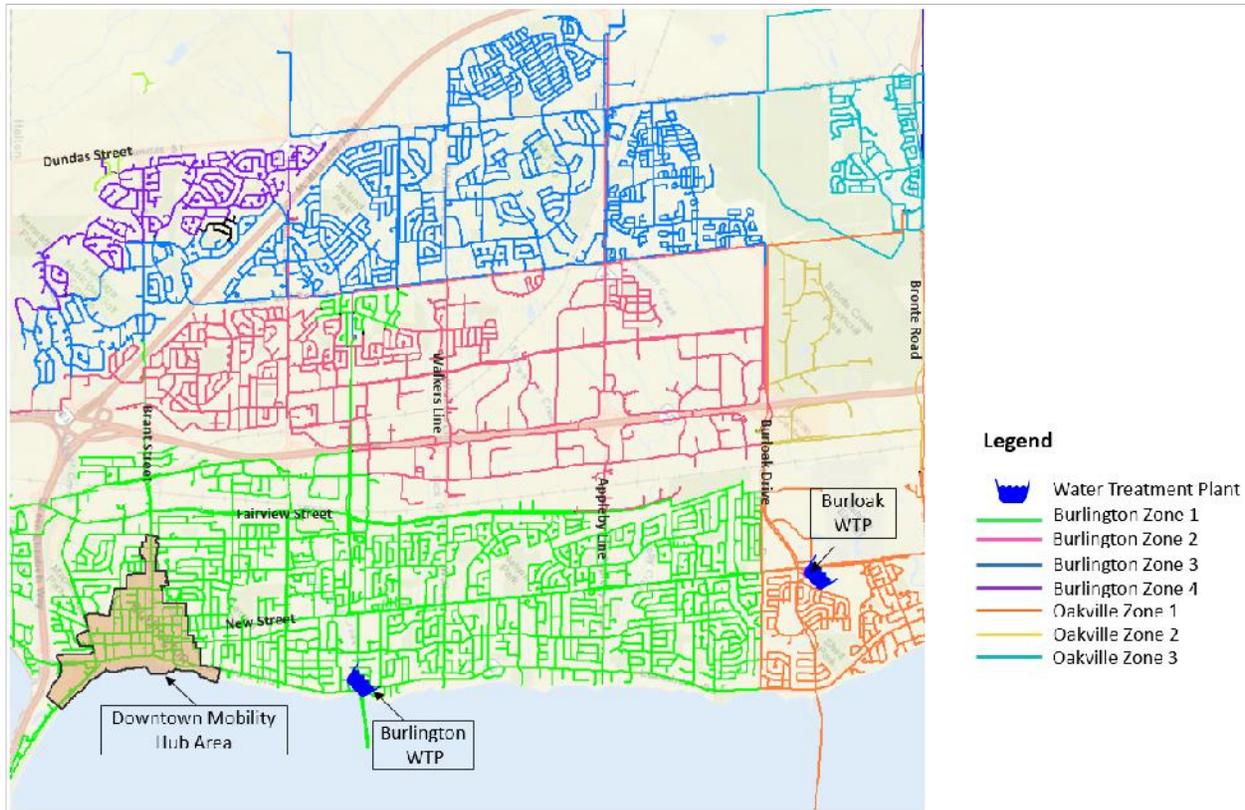


Figure 3 Existing Water System in and around the Downtown Mobility Hub Planning Area

Future Water Servicing Needs

Future services required for intensification in the Downtown Mobility Hub would include:

Local Conveyance System Improvements: The local conveyance system will need to be analyzed to ensure that the system can meet local fire flow requirements can be delivered with the existing pipe system;

Existing and Planned Treatment, Distribution and Storage: The existing and planned trunk and water distribution, treatment and storage infrastructure in Halton's Lake Based System will benefit the intensification in the Downtown Mobility Hub. Intensification will take up some of the planned and existing capacity in these systems. As such, it is anticipated that development charges will include a life-cycle component for these systems. This is to be determined in consultation with Halton Region.



Archaeological & Cultural
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11 September 2017

TO: Brook McIlroy Inc.

**FROM: Eliza Brandy, ASI
Lisa Merritt, ASI**

**RE: Mobility Hub Planning Consulting Services: Downtown
Archaeological Resources Existing Conditions Executive Summary Memorandum**

ASI File: 16EA-342

In advance of Archaeological Services Inc.'s (ASI) Stage 1 Archaeological Assessment reports for each of the four Area Specific Plans (Aldershot, Burlington, Downtown, and Appleby) please find below an executive summary of the key findings of ASI's preliminary review of the existing conditions for archaeological resources captured within the Burlington Mobility Hub: Downtown Study Area. ASI understands that the contents of this memorandum will be used to help inform the project design. ASI will undertake a comprehensive Stage 1 assessment, including a detailed property inspection, once a preferred concept has been chosen.

Memorandum

Executive Summary

The Stage 1 background research indicates that the Study Area has been occupied by Indigenous peoples for thousands of years. It is situated within the traditional territory of the Huron-Wendat First Nation, the Seneca First Nation, and the Mississauga First Nation. The background research also acknowledges that, since the eighteenth century, the Métis have lived in southern Ontario by the nineteenth century. Since 1795, the Study Area has been occupied by Euro-Canadian peoples and is situated within the former Township of Nelson, County of Halton.

The S & G, Section 1.3.1, lists criteria which are indicative of archaeological potential. The Study Area meets the following criteria which are indicative of archaeological potential:

- Proximity to 29 previously registered archaeological sites;
- Proximity to Euro-Canadian settlements (Village of Burlington, farmsteads);
- Proximity to historic transportation routes (Hamilton & North Western Railway; Lakeshore Road and Martha, Pearl, Eliza, Brant, John, Locust, Maple, Caroline, Ontario, Maria, James, and Pine Streets); and,
- Proximity to water sources (Lake Ontario, Rambo Creek)

These criteria are indicative of the Study Area as having potential for the identification of Euro-Canadian and Indigenous archaeological sites, depending on the degree of disturbance and physical features of the Study Area. The Project will require a Stage 1 archaeological assessment, including a property inspection, once a preferred alternative has been determined to further assess archaeological potential as per the Standards and Guidelines for Consultant Archaeologists.

