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Item No. 15.1.5
Halifax Regional Council
August 13, 2019

TO: Mayor Savage and Members of Halifax Regional Council

Original Signed by

SUBMITTED BY: Jacques Dubé, Chief Administrative Officer

DATE: July 3, 2019

SUBJECT: Proposed Partnership with Province of Nova Scotia: Active Transportation Infrastructure on Highway 107 Extension

ORIGIN

The September 13, 2011 Council Report – "Provincial Agreement – Burnside Drive Extension" – authorizes the Mayor and Clerk to "*enter into an agreement with the Province to fund the construction of an active transportation corridor within the Highway 107 corridor parallel to the Burnside Drive Extension according to the terms described in the August 5, 2011 report"* and *"Commit $1,000,000 in funding from the 2013-14 Active Transportation Capital Program to the Burnside Drive Extension Active Transportation Corridor according to the Budget Implications section of the August 5, 2011 report*":

The *2014 Active Transportation Priorities Plan* and the *Integrated Mobility Plan* (2017) recommend an active transportation connection between Bedford/Sackville and Dartmouth via the Highway 107 extension (Burnside Expressway) alignment.

LEGISLATIVE AUTHORITY

Halifax Regional Municipality Charter, section **73(c)** The Municipality may enter into and carry out agreements with the Government of the Province with respect to the development, operation or maintenance of trails on land of Her Majesty in right of the Province.

Halifax Regional Municipality Charter, section **318 (2)** In so far as is consistent with their use by the public, the Council has full control over the streets in the Municipality.

Halifax Regional Municipality Charter, section **322 (1)** The Council may design, lay out, open, expand, construct, maintain, improve, alter, repair, light, water, clean, and clear streets in the Municipality.

Recommendation on next page

RECOMMENDATION

It is recommended that the Regional Council direct the Chief Administrative Officer to:

1. Advise the Province of Nova Scotia that the Municipality will not provide funding for Active Transportation infrastructure as part of the Highway 107 extension project;
2. Investigate the potential to implement a multi-modal corridor on Trunk 7 (Magazine Hill), including transit priority and active transportation infrastructure; and
3. Request that the Province of Nova Scotia retain an integrated shared utility / active transportation corridor as part of the detailed design for the Highway 107 project in a location suitable for potential future construction.

BACKGROUND

The provincial government has announced its intention to construct an extension of Highway 107 between Highway 118 (near the Burnside Industrial Park) and Highway 102 in the Bedford/Sackville area (See **Attachment A**), a long-planned project commonly referred to as the 'Burnside Expressway'. The approximately 8km controlled access highway will significantly increase traffic capacity and improve travel time between the Bedford/Sackville area and Dartmouth and will improve access to Burnside Industrial Park from the provincial highway network. The project, which is estimated to cost $210 million, received a funding commitment from the federal government in the amount of $86.5 million in February 2019.

Though the Burnside Expressway project is not a municipal project, HRM does have a major stake in its outcome due to its impact on the regional transportation network. In addition to effectively doubling roadway traffic capacity between Burnside and the Bedford/Sackville areas, the project also includes a proposed multi-use pathway that would run adjacent to the highway. This corridor would enable walking, bicycling, and other active transportation modes, and provide a regional connection between Lower Sackville and the Burnside area of Dartmouth that does not currently exist. In 2011[1], Halifax Regional Council approved a recommendation to partner with the Province to contribute $1 million (in a future year) to support construction costs associated with the multi-use pathway (though the intent to partner with the province was established, a formal agreement was not completed). The proposed multi-use pathway was also added to HRM's 2014 *Active Transportation Priorities Plan* and *Integrated Mobility Plan (2017).*

The Highway 107 Extension did not proceed as per the proposed timelines and alignment as described in the overview of the project in the 2011 Council Report. In 2018, the Province presented a revised timeline and alignment for the project to HRM and advised of the increased cost to the Municipality. They requested that HRM advise whether the Municipality will cost-share the construction of a multi-use pathway alongside the highway extension.

Detailed design and construction of the Burnside Expressway are being completed by the provincial government in phases. At present, Phase 1 design (Burnside Industrial Park to the CN Rail line) is nearing completion and construction tendering is anticipated in 2019. Detailed design for the remaining sections of the Burnside Expressway will reach a critical point late summer / fall 2019, when the Province will require a final decision from HRM as to whether the multi-use pathway is to be included in the design. Agreement to proceed will require a funding commitment from the Municipality that is expected to significantly exceed the $1 million contribution previously assumed for the project. These funds, currently estimated in the $5.5 - $6.9 million range, are not programmed or budgeted at this time. The Province has indicated that a decision on this matter is required from the Municipality before the end of August 2019. Given the time sensitivity of this decision, staff have proceeded directly to Regional Council, as meeting schedules do not

[1] Regional Council Report: *Provincial Agreement – Burnside Drive Extension* (September 13, 2011) (http://legacycontent.halifax.ca/council/agendasc/documents/110913ca1152.pdf)

allow an opportunity to route the item through the Transportation Standing Committee and meet the decision deadline.

Given the impact of the construction of the Highway 107 extension and the request to cost-share active transportation (AT) infrastructure on this new highway corridor, a review of options and their costs was conducted and is described below. A key factor in this analysis is the current direction in the *Integrated Mobility Plan* to provide improved transit service and walking and bicycling facilities within and between HRM communities.

DISCUSSION

Given the significant investment required by HRM to construct a multi-use pathway adjacent to the Burnside Expressway, staff have completed additional investigation to better understand the implications of the project. Key factors that have been considered include:

- Identification of any complementary walking and bicycling infrastructure that may be required to facilitate connections to communities beyond the Akerley Boulevard / Trunk 2 (Rocky Lake Drive) extent of the proposed Burnside Expressway multi-use pathway;
- Review of anticipated operating costs associated with the Burnside Expressway multi-use pathway;
- Review of the potential buried Halifax Water and Heritage Gas utility corridor that could also be built within the Burnside Expressway ROW and identification of how it relates to the multi-use pathway;
- Assessment of the potential for the Burnside Expressway multi-use pathway to encourage more people to travel by walking or cycling, considering factors such as population reach, trip distance, and topography; and
- Review of potential corridors to make the AT connection, specifically focused on the Trunk 7 (Magazine Hill) corridor or portions thereof as an alternative to the Burnside Expressway.

Burnside Expressway Project: Current Status

Detailed design and construction of the Burnside Expressway is being completed by the provincial government in phases, with buildout of the highway anticipated by 2024. At present, detailed design for Phase 1 of the corridor (approximately 2km between Burnside Industrial Park to the CN Rail line) is nearing completion and construction tendering is anticipated in 2019. HRM has entered a contribution agreement with the Province that will provide funding ($13.6 million) to add multi-use pathways adjacent to new extensions to Burnside Drive, Wilkinson Avenue, and Akerley Boulevard, as well as across the Highway 107 interchange structures at Burnside Drive and Wilkinson Avenue. These facilities will provide AT connections to the municipal roads within the Burnside Industrial Park Phase 13 expansion.

Design work for the remaining sections of the Burnside Expressway is ongoing. In 2018, the provincial government approached HRM to initiate discussions around the design and construction costs associated with the multi-use pathway adjacent to the remaining 6km of the corridor (CN Rail line to Duke Street). Based on conceptual design completed by the Province, a construction cost estimate for the HRM portion of the work (the additional costs necessitated by the multi-use pathway – i.e. costs to widen / lengthen bridge structures and pave the surface of the pathway) was identified in the range of $5.5 - $6.9 million. The cost estimate is dependent on factors that have yet to be finalized including the configuration and size of the bridge structures, multi-use pathway routing in the vicinity of interchanges and watercourse crossings, and the extent of work required to grade and surface the multi-use pathway.

Halifax Water and Heritage Gas have expressed interest in developing an underground utility corridor parallel to the Burnside Expressway. Though their need for the corridor is not anticipated in the short-term, they have expressed interest in completing preparatory works (i.e. trench blasting and excavation) at the time of highway construction to take advantage of construction cost synergies.

Potential Trunk 7 (Magazine Hill) Reconfiguration, including Multi-Use Pathway
The Province has indicated that following construction of the Burnside Expressway, there may be interest in a transfer of ownership of the section of Trunk 7 between Akerley Boulevard and the Bedford Bypass (commonly referred to as 'Magazine Hill') to the Municipality, as this section of roadway will become redundant in the provincial 100-series highway network. Staff are reviewing options for how the corridor could be reconfigured to serve municipal needs including conversion of some vehicular traffic capacity to provide bus lanes and/or active transportation facilities. This is consistent with Action 124 of the *Integrated Mobility Plan* (2017), which states: *"Where total corridor road capacity is increased through the construction or expansion of a parallel road, explore opportunities to give higher priority to active transportation or transit within that corridor".*

In December 2018, HRM retained a consulting team (Crandall Engineering Ltd. and GRIFFIN Transportation Group Inc.) to complete a transportation study to enable a better understanding of the implications of the Burnside Expressway on mobility in the region, and to identify opportunities to improve the surrounding transportation network in conjunction with the project. Specifically, this included the development of preliminary design options and cost estimates for the transit and AT infrastructure anticipated to be required to connect the Burnside Expressway to the existing transportation network. It also included preliminary design and cost estimates for options to reconfigure Magazine Hill to include transit and AT infrastructure, as well as the transit and AT infrastructure anticipated to be required to connect Magazine Hill to the existing transportation network. An executive summary of the consultant's findings and recommendations has been included in **Attachment B**. The full study that summarized the findings and recommendations is available upon request.

Magazine Hill appears to offer distinct advantages over the Burnside Expressway in terms of its potential to accommodate transit priority and active transportation:

- Providing the primary outlet to the corridor at Dartmouth Road affords access to a considerably higher population base than the proposed outlet at Duke Street. Population figures indicate that a connection to Bedford via Dartmouth Road reaches approximately 10 times the population within a distance of 1km and 3km, and more than double the population within a distance of 5km, relative to a connection to Lower Sackville via Duke Street (Figure 1).

- It provides a more direct connection – the approximately 3km distance on Trunk 7 between Akerley Boulevard and Dartmouth Road is significantly less than the proposed 7km Burnside Expressway alignment between Burnside Drive and Duke Street. This translates into a substantial reduction in travel distance between Bedford and Dartmouth, which has increased population reach and a travel distance that is more conducive to potential mode shift than the Sackville-Dartmouth connection (Figure 2). Distance and travel time are important determinants in the attractiveness of transit and active transportation. Further, reduced distance has the benefit of lowering operating costs associated with the infrastructure, which the municipality will be responsible for.

- The costs to build infrastructure connections, particularly for active transportation, between Bedford and Trunk 7 (via Dartmouth Road and Bedford Highway) are anticipated to be less than those between Lower Sackville and the Burnside Expressway (via Duke Street and Glendale Avenue) – see Figure 3.

Figure 1: Population Density Comparison - Sackville and Bedford Access

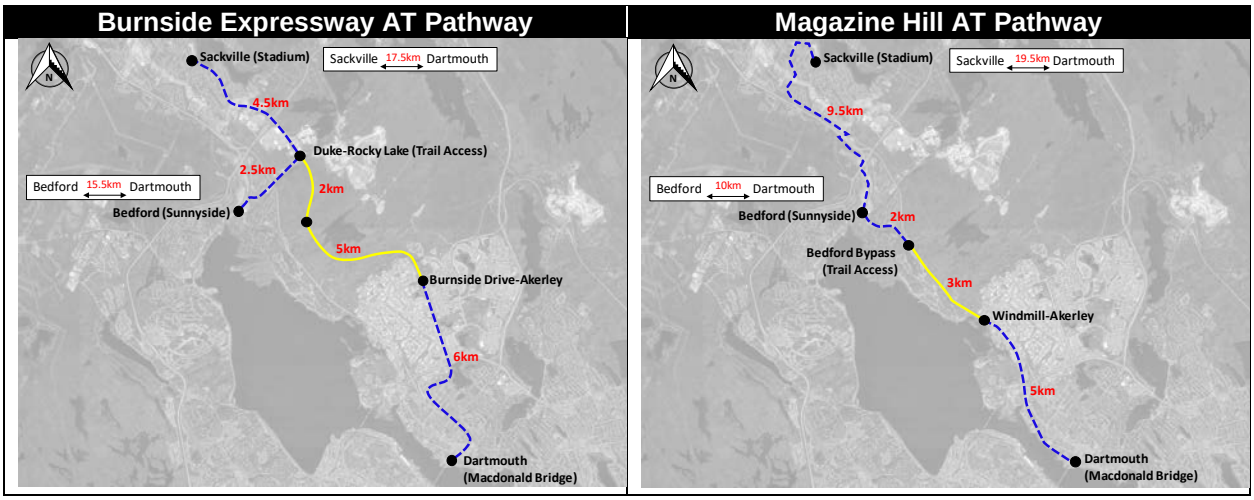
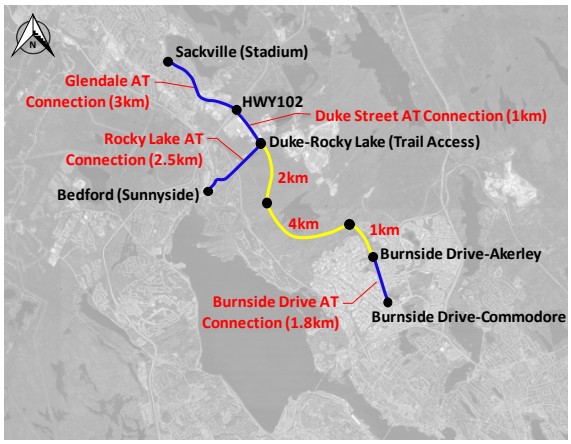
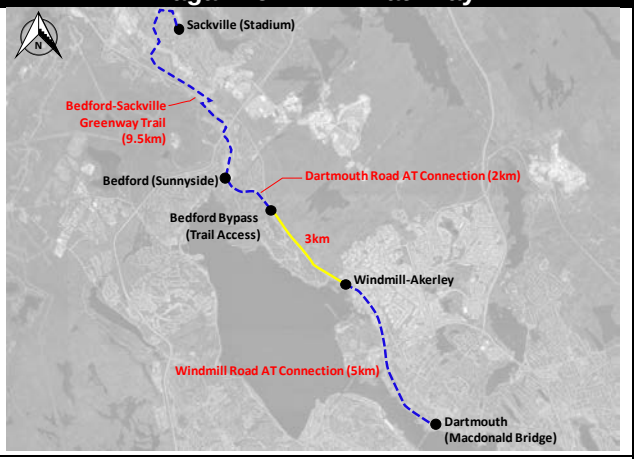


Figure 2: Origin-Destination Distance Comparison - Burnside Expressway and Magazine Hill AT Pathway Options

Burnside Expressway AT Pathway	Magazine Hill AT Pathway
	
Preliminary Cost Estimates[1]:	**Preliminary Cost Estimates[1]:**
Duke Street AT Connection[2]: $0.8 - 1.0M	*Bedford Bypass AT Overpass[4]:* $1.4 - 1.6M
Burnside Drive AT Connection[2]: $0.8 - 1.0M	*Dartmouth Road AT Connection[4]:* $1.1 – 1.3M
Rocky Lake Drive AT Connection[2]: $2.0 – 3.0M	*Bedford-Sackville Greenway Improvements[5]:* $2.0 - 3.0M
Glendale Avenue AT Connection[2]: $2.0 - 2.5M	*Windmill Road AT Connection[4]:* $1.0 - 2.0M
TOTAL Estimate: AT Connections $5.6 – 7.5M	**TOTAL Estimate: AT Connections $5.5 – 7.9M**
Burnside Expressway AT Pathway[3]: $5.5 – 6.9M	*Magazine Hill AT Pathway[4]:* $3.5 – 4.1M
TOTAL Estimate (incl. AT connections): $11.1 – 14.4M	**TOTAL Estimate (incl. AT connections): $9 – 12M**

Notes:
1. Cost estimates are preliminary and for planning purposes only. Estimates do not include costs for any necessary land acquisition, site investigation (including unexploded ordnance surveys), or engineering.
2. Based on HRM estimate of $0.8M per km for multi-use pathway construction adjacent to an existing roadway.
3. Based on NSTIR cost estimates for AT structures and HRM estimate for asphalt pathway surfacing ($0.3M per km)
4. Based on Class D cost estimates in *Burnside Expressway Connectivity Study* (2019). Includes 20% contingency.
5. Assumes upgrades to existing trail sections and connection of gaps.

Figure 3: Infrastructure Cost Comparison - Burnside Expressway and Magazine Hill AT Pathway Options

Despite these apparent advantages, there are important factors that could compromise the feasibility of the use of Magazine Hill for these purposes:

- since the roadway runs adjacent to the Canadian Forces Ammunition Depot (CFAD) Bedford facility, it is likely that unexploded ordnance investigations, security / access provisions, and property acquisition would be required;
- the potential need to widen the roadway and/or modify existing bridges and culverts could represent a significant cost; and
- the costs and responsibilities associated with the project management, design, environmental assessments and permitting, and construction of any reconfiguration of the corridor would be entirely the responsibility of HRM.

Though staff have initiated investigation into these factors, their full extent is not presently understood. Since many of these costs and efforts would be borne by or shared with the Province if the multi-use pathway is pursued now on the Burnside Expressway, there is potentially a significant opportunity cost to consider should the Municipality choose not to partner with the Province at this time. This is particularly relevant if HRM opts at a later date to pursue a multi-use pathway adjacent to the Burnside Expressway (i.e. if a multi-use pathway is ultimately not pursued on Magazine Hill) – the costs to add the pathway in the future would be significantly higher than if pursued now due to the need to modify built structures (or add standalone structures), carry out construction activities adjacent to an active highway, and generally the loss of construction cost synergies.

Review of Options

A summary and evaluation of the options available to HRM are provided in **Attachment C**. The summary table describes each option based on the following categories:

- *Estimated Direct Capital Costs:* The capital costs that HRM are committed to pay to the Province to support the completion of some or all components of the Burnside Expressway multi-use pathway. It is anticipated that these costs will be paid to the Province upon substantial completion of the project, which is anticipated in 2024. These costs are based on information provided by the Province.
- *Estimated Operating Costs*: The costs that HRM will be required to assume in perpetuity following completion of the project for ongoing maintenance. These costs have been estimated by HRM based on current costs for typical pathway maintenance activities including asphalt maintenance, and snow/ice removal.
- *Estimated Indirect Costs*: The capital and operating costs that are anticipated for infrastructure anticipated to be required to facilitate access from adjacent communities to the Burnside Expressway multi-use pathway. These costs have been estimated based on functional design concepts developed by staff and the project consulting team.
- *Risks*: Potential risks that HRM may be exposed to now and into the future.
- *Benefits*: Positive results that are anticipated as a result of the option.
- *Drawbacks*: Negative results that are anticipated as a result of the option.

A key part of this review has been consideration of the two options for their ability to encourage more people to travel by walking or cycling. The factors in this assessment include population reach, trip distance, and topography. Given the lower population densities and relatively long distances, neither option is expected to see significant use as a commuter choice. The direction for walking and bicycling to replace car trips in communities such as Lower Sackville and Bedford is to improve active transportation connections to transit and to local destinations. There are currently plans for such projects in these communities including improvements to the Bedford Highway and new segments of the Sackville Greenway and Cobequid Road pathway. A planning process is also now underway to better connect the existing multi-use pathway between Bedford and Lower Sackville. These other active transportation priorities are all significant capital projects and, given their greater proximity to transit, residences, shopping and services, they align better with current planning objectives.

Proposed Approach:

Staff recommend against the contribution of municipal funds to the proposed Highway 107 Extension multi-use pathway at this time as it requires significant and presently uncertain investment in infrastructure that:

- is not a near-term municipal priority;
- is not expected to have commensurate user demand; and
- appears to have a viable alternative (AT pathway on Magazine Hill) that is preferable in terms of both cost and functionality.

The approach recommended by staff includes the following:

- Inform the Province that HRM will not contribute to funding construction of a multi-use pathway in conjunction with the Highway 107 extension project;
- Continue to engage with the Province to explore opportunities to incorporate elements in the design of the Highway 107 extension, at no expense to HRM, that would provide flexibility to HRM to add a multi-use pathway in the future;
- Initiate a planning process for potential construction of a multi-use pathway along Magazine Hill (at an undetermined future date) and the AT connections required to make it accessible to adjacent communities. The planning process should include consultation with the Province of Nova Scotia, Department of National Defense (DND), community stakeholders, and the public.
- Following completion of the planning process, present Regional Council with an update regarding a potential AT connection along Magazine Hill and/or the Highway 107 extension.

Next Steps

The Province of Nova Scotia are currently completing detailed design for the Highway 107 extension, and the design has reached a stage at which HRM's decision on whether or not to pursue the active

transportation pathway is required. The Municipality must advise the Province of Nova Scotia of its decision before the end of August 2019.

FINANCIAL IMPLICATIONS

The HRM costs associated with investigating the potential of a multi-modal corridor are minimal and can be accommodated within the approved 2019/20 operating budget for R956 – IMP Studies.

Should HRM choose to proceed with the Magazine Hill AT Pathway it would cost an estimated $3.5 to $4.1 million. In addition, the indirect capital cost of the connecting pathways would be an estimated $5.5 to $7.9m for a combined total cost of $9m to $12m. The estimated costs are preliminary in nature and would be revised with any detailed design. Any such project would likely commence after the completion of the Burnside Expressway, currently estimated to be completed in 2023-24. There are currently no funds budgeted or committed for this work. Should Regional Council decide to proceed with any capital projects, staff would provide any updated capital costs, along with their operating implications and a funding plan.

RISK CONSIDERATION

Risks associated with the recommendations of this report include:

- Future design and construction of a multi-use pathway along the Burnside Expressway would be significantly more expensive, potentially to the point of being cost prohibitive, due to the following:
    - The need to modify highway structures to accommodate pathway crossings, the costs for which would be borne solely by the municipality;
    - If HRM decides not to pursue the AT pathway, the Province has indicated there is the potential to locate the utility corridor in proximity to the edge of the proposed highway right-of-way. This alignment would likely be far less desirable for development of an AT pathway than that included in the currently proposed configuration; however, further discussions are pending prior to a final decision;
    - Lack of synergies associated with construction, site investigation, permitting, and project management that are afforded by the current opportunity to partner with the Province; and
    - Additionally, there is no guarantee that the Province will permit future construction of the pathway within the highway ROW.
- There is a possibility that development of a multi-use pathway along the Magazine Hill corridor is not feasible due to the following:
    - The Province may not transfer ownership of Magazine Hill to the Municipality following completion of Highway 107, and may not agree to allow construction of a multi-use pathway along its corridor; and
    - Complications associated with the corridor's proximity to the Canadian Forces Ammunition Depot (CFAD) Bedford facility including property impacts, unexploded ordnances and security / access requirements.

COMMUNITY ENGAGEMENT

Staff engaged with the Sackville Rivers Association, Sackville Lakes and Trails Association, Rocky Lake Cycling Club, Halifax Cycling Coalition, Bicycle Nova Scotia, and Ecology Action Centre. The AT connection options summarized in this report were presented for discussion and feedback. Key points that these stakeholders communicated included:

- Improving walking and bicycling connections between Lower Sackville, Bedford, and destinations in Dartmouth and Halifax is critical. Current barriers include the inability to use Magazine Hill, the incomplete facilities on the Bedford Highway, the need to better connect the Bedford-Sackville Greenway into adjacent communities, and the need for AT connections within each community;

- Both AT corridors being considered have merit and should be pursued. There was a concern that the Magazine Hill option was a disadvantage for Lower Sackville residents because of the increased distance;
- Support for reconfiguring the Magazine Hill-Windmill Road corridor to provide transit priority and AT infrastructure;
- The option to partner with the Province is a unique opportunity and should be pursued. Coming back in future years to add AT infrastructure to the Highway 107 extension would be costly and would not have the same project integration benefits;
- Factors such as recreational value and providing a tourism experience should be considered in considering the benefits of partnering on the project;
- There were concerns that a financial commitment to the highway extension project would result in delays implementing other walking and cycling infrastructure projects that are a higher priority relative to IMP and AT Plan objectives; and
- Some groups suggested that the AT infrastructure should be part of the project regardless of whether HRM provided financial support.

ENVIRONMENTAL IMPLICATIONS

This project aligns with the Council Priority Outcome of building Healthy, Livable communities, as it aims to make it more convenient for residents to choose sustainable transportation options for everyday transportation purposes. Active Transportation enhancements are aimed at encouraging more people to take walk and bike, promoting a shift to non-auto modes (targeted in the Regional Plan and IMP) and a reduction in greenhouse gas (GHG) emissions.

ALTERNATIVES

Halifax Regional Council may recommend that some or all of the recommendations not be approved or be modified. Alternatives are presented below:

1. Regional Council may direct the CAO to enter into an agreement with the Province of Nova Scotia that the Municipality will provide funding for all proposed active transportation infrastructure elements as part of the Highway 107 extension project. This alternative is not recommended for the reasons outlined in this report. (Estimated Direct Capital Costs[2]: $5.5-6.9M, Estimated Operating Cost $11,456/km per year, Estimated Indirect Costs: $5.6-7.5M)

2. Regional Council may direct the CAO to enter into an agreement with the Province of Nova Scotia that the Municipality will provide funding for AT pathway structures as part of the Highway 107 extension project. Specifically, this would include funding to expand the AT pathway structures such that they can accommodate the addition of an AT pathway in future. This alternative is not recommended for the reasons outlined in the report. (Estimated Direct Costs: $3.7-5.1M, Estimated Operating Costs: $5,720/km per year)

3. Regional Council may direct the CAO to advise the Province of Nova Scotia that the Municipality will not provide funding for Active Transportation infrastructure as part of the Highway 107 extension project, and to abandon efforts to further investigate the potential for implementation of a multi-modal corridor on Trunk 7 (Magazine Hill). This alternative is not recommended, as it is inconsistent with the municipal objective identified in the AT Priorities Plan and IMP to provide an AT connection between Bedford/Sackville and Dartmouth, and may result in a missed opportunity

[2] Cost estimates for direct and indirect capital costs are preliminary (for planning purposes only) and are based on conceptual / functional level design. Cost estimates for operating costs are based on current unit costs from HRM Road Operations and Construction.

to make a more cost-effective AT connection relative to the proposed Highway 107 extension pathway option. (No Direct, Operating, or Indirect Costs)

ATTACHMENTS

Attachment A: Map of the Proposed Highway 107 alignment between Highway 118 (near the Burnside Industrial Park) and Highway 102 in the Bedford/Sackville
Attachment B: Burnside Expressway Connectivity Study (Crandall Engineering, 2019) Executive Summary (full study available upon request)
Attachment C: Summary of Options

A copy of this report can be obtained online at halifax.ca or by contacting the Office of the Municipal Clerk at 902.490.4210.

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Attachment A

NOVA SCOTIA
Transportation and Infrastructure Renewal

Highway Engineering Services

Highway 107
Burnside to Bedford

Scale : see bar scale	Date : May, 2018
Produced by : HP and D	File name: 107 B to B business case.dwg

LEGEND

Active Transportation Path

AT Active Transportation Structure

0 500 1000
metres

Rocky Lake
Lake Williams
Exit 4C
102
Bedford Commons
Exit 4
Bedford
2
Municipal
Municipal
Municipal
Municipal
Municipal
Municipal
Municipal
Exit 13
118
Ridgevale Developers ltd
TIR
TIR
Bypass
7
Dexter
Dexter
Dexter
Anderson Lake
DND
DND
HRM
NS Power
Juniper Lake
Orchard Lake
Magazine Hill
7
Bedford Basin
Burnside

Attachment B

Burnside Expressway Connectivity Study

EXECUTIVE SUMMARY

Prepared for:

Halifax Regional Municipality

Prepared by:

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July 15, 2019
Project No. 18104-01

1.0 Executive Summary

The Burnside Expressway is planned to be a four-lane divided highway connecting Highway 102 (near Duke Street) to Burnside Drive. The Expressway is intended to alleviate the significant traffic congestion on Trunk 7 at Magazine Hill by providing an alternative route from Bedford/Sackville to Burnside Industrial Park. Trunk 7 at Magazine Hill currently carries Annual Average Daily Traffic (AADT) volumes of close to 50,000 vehicles per day. A 2011 Traffic Study by Genivar estimated that nearly 30% of the traffic on Trunk 7 would divert to the new Expressway.

There have also been plans to construct a multi-use pathway adjacent to the Burnside Expressway to facilitate a direct Active Transportation (AT) route to Burnside Industrial Park from the Rocky Lake/Bedford Common area. HRM has identified this trail connection in its Active Transportation Priorities Plan. There would be cost efficiencies in constructing this trail at the same time as the highway, but there would still be a significant cost associated with widening any structures to accommodate the trail. NSTIR's preliminary estimate of HRM's contribution for the trail is $8.2 million. HRM has interest in exploring how this trail would connect with the broader AT network and whether there is an alternative route that would be more cost effective, such as within the Trunk 7 corridor.

HRM initiated the *Burnside Expressway Connectivity Study* to determine the implications of the Burnside Expressway on regional mobility and to identify opportunities to improve the multi-modal transportation network in conjunction with the Expressway project with focus on transit connections and active transportation (AT) connections.

The Study Area extended from Highway 102 in the west to Victoria Road in the east and includes key corridors such as Trunk 7, Windmill Road, Dartmouth Road, Akerley Boulevard, Burnside Drive and the new Burnside Expressway corridor.

The following conclusions and recommendations were derived from this Study:

Future Travel Demand on Trunk 7

- In parallel with this Connectivity Study, GRIFFIN Transportation Group completed a travel demand and capacity assessment associated with the Burnside Expressway to determine if there are opportunities to re-purpose Trunk 7 as a result of the traffic shift to the Expressway.
- Traffic projections were prepared for year 2033 with and without the Expressway and assuming 60% growth in traffic demand.
- Based on these projections, the assessment determined that even with the Expressway in place, volume-to-capacity (v/c) ratios of Trunk 7 and the Expressway combined would be approximately 0.8 in the peak directions. This leaves little residual capacity and if one lane were to be removed for other uses, the v/c would exceed 1.0.
- The Travel Demand Assessment recommended that the four lanes on Trunk 7 be maintained for general purpose traffic to serve long term traffic demand.

Transit Connectivity and Opportunities:

- Halifax Transit does not foresee a significant demand for transit on the new Expressway. One or two new routes may be possible, and these would most likely be express routes
- On Trunk 7, Halifax Transit operates 5 routes on Trunk and 28 buses run on Trunk 7 in the AM and PM peak directions.
- The greatest need for transit priority on Trunk 7 is in the inbound (eastbound) direction during the morning peak. Without repurposing one of the lanes to transit, the following options may be considered for inbound transit priority:
    - Extend the existing eastbound queue jump lane further back on Trunk 7 (requiring some widening of Trunk 7); and
    - Widen the eastbound paved shoulder and permit "bus-on-shoulder" operation for permanent, time-of-day, or incident-only use.
- Should more traffic shift to the Expressway than estimated in the Travel Demand Assessment or should growth be less than estimated, there is potential that one of the inbound traffic lanes on Trunk 7 could be converted to a transit lane or transit/HOV lane adjacent to the median. It is recommended that microsimulation modelling be completed to further evaluate the operational impacts of such a transit lane and the optimal length of the lane to bypass inbound queuing on Trunk 7 under various growth scenarios.

Active Transportation Connectivity and Opportunities

- The current plan for the Burnside Expressway includes a roadside multi-use trail that would connect Duke Street to Burnside Drive with the intent of providing an AT facility from Sackville to Burnside Industrial Park. NSTIR's cost estimate for adding this trail to the project is $8.2 million.
- Six alternative trail options were identified that use Trunk 7 and provide combinations of connections between Bedford Commons (via Duke Street), Dartmouth (via Windmill Road), and Bedford (via Dartmouth Road).
- The alignment of each option was reviewed and functional designs were prepared to demonstrate feasibility, facility type, constraints, impacts, and cost estimates. The six options along with the construction cost estimates (excluding HST and property acquisition) are listed below.

Trunk 7 AT Option	Connections	Cost Estimate
Base Option – Burnside Expressway Trail	Duke St, Burnside Dr.	$8.2 million
# 1 – Trunk 7 North Side Shoulder Bikeway	Duke St, Dartmouth Rd, Windmill Rd	$10.2 million
# 2 – Trunk 7 South Side Shoulder Bikeway	Duke St, Dartmouth Rd, Windmill Rd	$11.0 million
# 3 – Trunk 7 South Side Shoulder Bikeway	Dartmouth Rd, Windmill Rd	$7.9 million
# 4A – Trunk 7 North Side Roadside Path	Dartmouth Rd, Windmill Rd	$7.8 million
# 4B – Trunk 7 North Side Roadside Path (with Barrier)	Dartmouth Rd, Windmill Rd	$8.5 million
# 5 – Trunk 7 South Side Roadside Path	Dartmouth Rd, Windmill Rd	$6.1 million

- The options were reviewed in terms of general connectivity and route length, the population being served, grades, property impacts and costs, as outlined previously in this report.
- Based on this assessment, Option 4B is recommended as the most feasible and effective option for the following reasons:
    - A Bedford to Dartmouth connection serves far more people than a Duke Street to Burnside connection. AT options connecting to Duke Street would need to extend another 3km or more to reach a meaningful population of residents, meaning additional costs to those listed above for the Base Option, Option 1, and Option 2;
    - A multi-use trail is a more comfortable cycling experience than a shoulder bikeway and could be constructed at a similar cost;
    - The north side of Trunk 7 has less potential for property constraints than the south side;
    - The bridge connection across Trunk 7 is an added cost to the initial project, but would facilitate a possible future connection north to Duke Street;
    - A trail on the north side of Trunk 7 would connect to the existing trail on the north side of Windmill Road.
- As a next step, it is recommended to engage with CFAD to discuss the property impacts resulting from Option 4B, costs of land acquisition or easements and any requirements for unexploded ordinance investigations.

Attachment C: Summary of Options

	Option 1: Construct Burnside Expressway Multi-Use Pathway (Immediate)	Option 2: Provide Funding for Burnside Expressway Structures Only	Option 3: No Commitment to Burnside Expressway Multi-use Pathway; Focus on Magazine Hill	Option 4: No Immediate Commitment to Burnside Expressway Multi-use Pathway; Preserve Corridor
Description	Commit funds to support construction of the Burnside Expressway multi-use pathway and all supporting elements in conjunction with the construction of the highway and utility corridor.	Commit funds to support construction of the Burnside Expressway structures such that they can accommodate the addition of a future Burnside Expressway multi-use pathway.	Provide no immediate commitment to supporting construction of any components of the Burnside Expressway Pathway. Potential to make an alternate parallel AT connection via Magazine Hill can be explored.	Provide no immediate commitment to supporting construction of any components of the Burnside Expressway Pathway. Potentially add the Burnside Expressway in the future.
Estimated Direct Capital Costs:	Highway 107 Structures: $3.7 – 5.1 million Pathway Surfacing: $1.8 million **TOTAL: $5.5 – 6.9 million**	Highway 107 Structures: $3.7 – 5.1 million **TOTAL: $3.7 – 5.1 million**	No immediate commitments	No immediate commitments
Estimated Operating Costs	Pathway Maintenance: $5,736 / km / year Structures Inspection: $5,720 / km / year **TOTAL: $11,456 / km per year**	Structures Inspection: $5,720 / km / year **TOTAL: $5,720 / km per year**	No immediate commitments	No immediate commitments
Estimated Indirect Costs	Capital and operating costs associated with AT Connections into communities including: • Duke Street, Burnside Drive, Glendale Avenue, Rocky Lake Drive **TOTAL: $5.6 – 7.5 million**	No immediate commitments	No immediate commitments	No immediate commitments
Risks:	• Limited use and return on investment • Future lack of commitment to build secondary AT connections.	• If multi-use pathway is not pursued in future, no return on a significant investment. • If multi-use pathway is pursued in future, potential for significant increase in construction costs due to lack of construction synergies.	• Magazine Hill may have significant costs and constructability issues not fully understood at this time that may make the project infeasible. • There is no guarantee that the Province will permit future construction of the pathway within the highway ROW.	• If Burnside Expressway multi-use pathway is pursued in future, substantial increase in construction costs and efforts may make the project infeasible. • There is no guarantee that the Province will permit future construction of the pathway within the highway ROW. • Utility corridor may not be implemented in a location that makes sense for AT in the future.
Benefits:	• New AT connection between Akerley Boulevard and Rocky Lake Drive within five years; • Construction synergies with Burnside Expressway and utility corridor (significant cost and resource savings); • Consistent with previous Council direction and plans.	• If multi-use pathway is not pursued in future, avoids some capital costs and all operating costs for a facility that may not be well utilized. • Provides flexibility for potential future AT connection between Dartmouth and Sackville (future proofing). If multi-use pathway is pursued in future, avoids major construction costs associated with modifying Burnside Expressway structures.	• Avoids significant capital and operating costs for a facility that may not be well utilized. • Allows for further exploration of an alternate parallel AT connection (i.e. via Magazine Hill) that may be more cost-effective and provide increase AT utility.	• Retains corridor for new AT connection between Akerley Boulevard and Rocky Lake Drive; • Potential construction synergies with Burnside Expressway and utility corridor (less cost saving than option one, but with less risk); • Consistent with previous Council direction and plans. • Avoids significant capital and operating costs for a facility that may not be well utilized
Drawbacks:	• Distance and terrain may limit AT use; • Very limited population reach now and in future; • Requires significant investment in additional AT connections.	• Requires major short-term investment in infrastructure that may never be used; • No immediate AT connection between Dartmouth and Sackville; • Inconsistent with public expectations.	• No immediate AT connection between Dartmouth and Sackville; • Inconsistent with public expectations.	• No immediate AT connection between Dartmouth and Sackville; • Inconsistent with public expectations. • Distance and terrain may limit AT use; • Very limited population reach now and in future; • The Province may not agree to this approach. • Requires significant investment in additional AT connections.