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CORPORATE REPORT

NO: R138 COUNCIL DATE: July 8, 2019

REGULAR COUNCIL

TO:	**Mayor & Council**	DATE:	**July 4, 2019**
FROM:	**Acting General Manager, Engineering**	FILE:	**8710-20(SR)**
SUBJECT:	**Cost Contribution for the Replacement of Southern Railway of BC's Bridge Crossing of the Serpentine River**		

RECOMMENDATION

The Engineering Department recommends that Council:

1. Authorize the expenditure of $1,750,000 (including GST) to Southern Railway of British Columbia ("SRY") towards the replacement of SRY's bridge crossing of the Serpentine River of which $500,000 has been granted to the City through the Federal Government's Disaster Mitigation Assistance Fund;

2. Set the expenditure authorization limit for the replacement of SRY's bridge crossing of the Serpentine River to $2,000,000 (including GST and contingency); and

3. Authorize the General Manager, Engineering to execute a Purchase Order and release payments to SRY for the replacement of SRY's bridge crossing of the Serpentine River.

INTENT

The purpose of this report is to seek expenditure authorization for the replacement of SRY's bridge crossing of the Serpentine River.

BACKGROUND

In 1997, the City embarked on an ambitious program to address lowland flooding in the Serpentine and Nicomekl floodplains. The intent of the Serpentine and Nicomekl Lowlands Flood Control Project (the "Project") is to control flooding within the agricultural floodplain and establish a set level of service that can support and promote agricultural activities within the floodplain. The standard that has been applied is referred to as the Agri-Food Regional Development Subsidiary Agreement ("ARDSA") Criteria. This criterion seeks to:

- Restrict flooding to a maximum of five days in duration for the 10-year, five-day winter storm (November 1 to February 28); and
- Restrict flooding to a maximum of two days in duration for the 10-year, two-day growing season storm (March 1 to October 31). Maintain a minimum baseflow level of 1.2m below adjacent ground level in ditches between storm events during the growing season.

Since 1997, the City has completed significant improvements to the dyking system along the Serpentine River and Nicomekl River, constructed or improved 17 drainage pump stations, constructed or improved approximately 20 km of ditches, and replaced bridge crossings over the Serpentine River at Fraser Highway and at 88 Avenue. In addition, the Ministry of Transportation and Infrastructure, as part of the Highway 15 improvements, replaced bridge crossings over the Serpentine River at 86 Avenue, 76 Avenue as well as replaced a bridge crossing over the Nicomekl River at 46 Avenue. The Ministry of Transportation and Infrastructure, as part of the Highway 10 improvements, replaced a bridge crossing over the Serpentine River at 164 Street.

Temporary Spillways

To assist in ensuring that no lowland properties were negatively impacted during the construction of the Project, the City was careful to model the drainage conditions at each stage during the construction process and had designed and scheduled the Project works so that floodwaters were equitably dispersed between lowland cells using temporary spillways. In addition to equitably distributing floodwaters, the temporary spillways help to control river water levels until system constraints are removed.

With the various dyking improvements and bridge replacements, all of the system constraints have been removed with the exception of SRY's bridge crossing of the Serpentine River. The SRY rail bridge crossing of the Serpentine River, as illustrated in the map attached as Appendix "I", was constructed in 1909 to facilitate the BC Electric Railway's service to Cloverdale. The rail bridge was replaced by BC Hydro in 1961, and subsequently transferred to SRY in 1988.

DISCUSSION

SRY and the City have been discussing the need to replace the bridge for a number of years; however, SRY recently informed the City that their bridge is in critical need of repair. SRY has estimated the cost to repair the bridge at $1.0 million.

As a repair of the bridge will not remove the system constraint that is limiting the City from realizing the full benefits of the Project, staff have worked with SRY on a design of a replacement bridge that will remove the system constraint and allow the City to remove the temporary spillways and therefore provide the ARDSA Criteria level of service for the agricultural properties within the floodplain. SRY has estimated the cost for the replacement bridge at $2.75 million.

Cost Allocation

The Canadian Transportation Agency ("CTA") regulates SRY, and in reviewing their decision database, staff have found that the CTA has provided opinion on cost allocation for various crossings. Two decisions by the CTA that inform the cost sharing discussion are as follows:

- Order No. 1990-R-684: Canadian Pacific Limited and the City of Oshawa, Ontario; and
- Order No. 1997-R-689: St. Lawrence & Hudson Railway and the City of Gatineau, Quebec.

Order No. 1990-R-684: Canadian Pacific Limited and the City of Oshawa, Ontario

The City of Oshawa was concerned that in a significant storm flooding, would result due to a conveyance constriction caused by the railway's company railway bridge, which was constructed in 1912. The CTA determined that:

- The City of Oshawa should pay the cost of enlarging the waterway opening of the existing railway bridge as part of its responsibility to protect homes, commercial and institutional properties built in the flood plain area; and
- The railway company should pay the cost of reconstructing the existing bridge, which will form the centre span of the proposed bridge, as part of its established responsibility for the existing railway bridge.

Order No. 1997-R-689: St. Lawrence & Hudson Railway and the City of Gatineau, Quebec

The City of Gatineau concluded that an existing culvert needed to be upgraded and reconfigured in an effort to convey flow from a post development 25-year return period rainfall event and that the railway company should contribute to its replacement. The CTA determined that:

- The railway company has the responsibility to provide drainage to meet pre-development 25-year return period event, and therefore the railway company should contribute to the cost of construction of the new culvert;
- The cost of construction of the new culvert should be apportioned on the basis of a structure that can handle the flow of a rainfall with a 25-year return period in a developed area, with the railway company being liable for a structure whose drainage capacity would handle run-off with the approximate flow rate of an undeveloped area, and the City of Gatineau for the additional flow for a developed area;
- The rate of flow of a rainfall with a 25-year return period in an undeveloped area is approximately half of the rate of flow of a rainfall with a 25-year return period in a developed area;
- As such, the cost of construction of the culvert shall be paid equally by the City of Gatineau and the railway company; and
- The cost of configuring the ditch running along the track on the north side shall be paid by the City of Gatineau.

In addition to these decisions, the CTA in 2011 published the Apportionment of Costs of Grade Separations A Resource Toolkit. The guideline notes that:

> *Under the Canada Transportation Act, the Canadian Transportation Agency is responsible for making cost apportionment decisions concerning the construction and reconstruction of grade separations (structures that allow railway and road traffic to cross each other at different elevations), when the parties involved in the project are unable to reach an agreement. The Agency uses this tool in its deliberations for any such decision it is requested to make. It is also designed to assist parties in their negotiations or in the preparation of their submissions to the Agency.*

The toolkit provides three general cost allocation approaches for construction costs for grade separations. They are as follows:

1. On projects due primarily to road development:
    a. 85% road authority; and
    b. 15% railway company.

2. On projects where both road and railway development have contributed largely to the need for the project:
    a. 50% road authority; and
    b. 50% railway company.

3. On projects due primarily to railway development:
    a. 15% road authority; and
    b. 85% railway company.

Recommended Cost Allocation

While many of the CTA decisions and their cost allocation toolkit are for grade separations/crossings related to a highway crossing over a railway, the general principles can be reasonably applied for a railway crossing over a watercourse.

Based on the cost allocation decisions by the CTA, the cost allocation approaches provided in the guideline, the level of investment that SRY is prepared to make to repair the existing crossing, and the unquantifiable benefit that the City and agricultural properties would receive from removing the last system constraint, it is recommended that the City take responsibility to fund the difference in cost between repairing the existing crossing and replacing the existing crossing, which is estimated at $1.75 million.

As outlined in Corporate Report No. R168; 2018 which was presented to Council on July 23, 2018, the City, as part of its Disaster Mitigation Assistance Fund application to the Federal Government, included the replacement of this crossing in its application. The City was successful in its application and has been granted $500,000 towards the replacement of the crossing, therefore reducing the City's obligation from $1.75 million (or 64%) to $1.25 million (or 45%) of the $2.75 million project.

Tendering Process and Cost Management

Tendering is likely to be completed in the month of August when Council is not meeting. As time is of the essence, it is recommended that in order to allow the project to proceed and be completed this Summer during the Provincial instream construction period, it is recommended that the expenditure authority for a payment be set to a maximum upset limit of $2,000,000 towards the replacement of SRY's bridge crossing of the Serpentine River. The expenditure authority provides for a contingency of approximately 10%, which is the standard value of contingency applied on City construction contracts.

Once construction commences, SRY as the delivery agent will be responsible for all cost over runs except for those that can be directly attributed to the City. Staff have not identified any risks that could be expected to be directly attributed to the City.

FUNDING

Funding for this cost contribution is available in the 2019 Utilities Budget, and $500,000 of which, will be reimbursed to the City as part of the City's Disaster Mitigation Assistance Fund grant.

SUSTAINABILITY CONSIDERATIONS

The replacement of SRY's existing rail bridge crossing over the Serpentine River supports the objectives of the City's Sustainability Charter 2.0. In particular, replacement of this bridge relates to the Sustainability Charter 2.0 themes of Public Safety, Economic Prosperity and Livelihoods, and Infrastructure. Specifically, this bridge replacements supports the following Desired Outcomes ("DO"):

- Community Safety and Emergency Services DO5: Surrey is recognized and perceived as a leader in establishing and maintaining collaborative partnerships for community safety and well-being;
- Economy DO10: The Agricultural Land Reserve is maintained, agricultural practices are sustainable, and food production and processing are enhanced; and
- Energy and Climate DO6: The City anticipates changing weather patterns and sea level rise as a result of climate change, and implements appropriate infrastructure, land use planning and emergency response solutions that will be resilient over the long term.

CONCLUSION

The replacement of SRY's existing rail bridge crossing over the Serpentine River will remove the final system constraint that is limiting the City from realizing the full benefits of the Serpentine and Nicomekl Lowlands Flood Control Project, which commenced in 1997.

Jaime Boan, P.Eng.
Acting General Manager, Engineering

JA/cc

Appendix "I" - Map of SRY Rail Bridge Crossing

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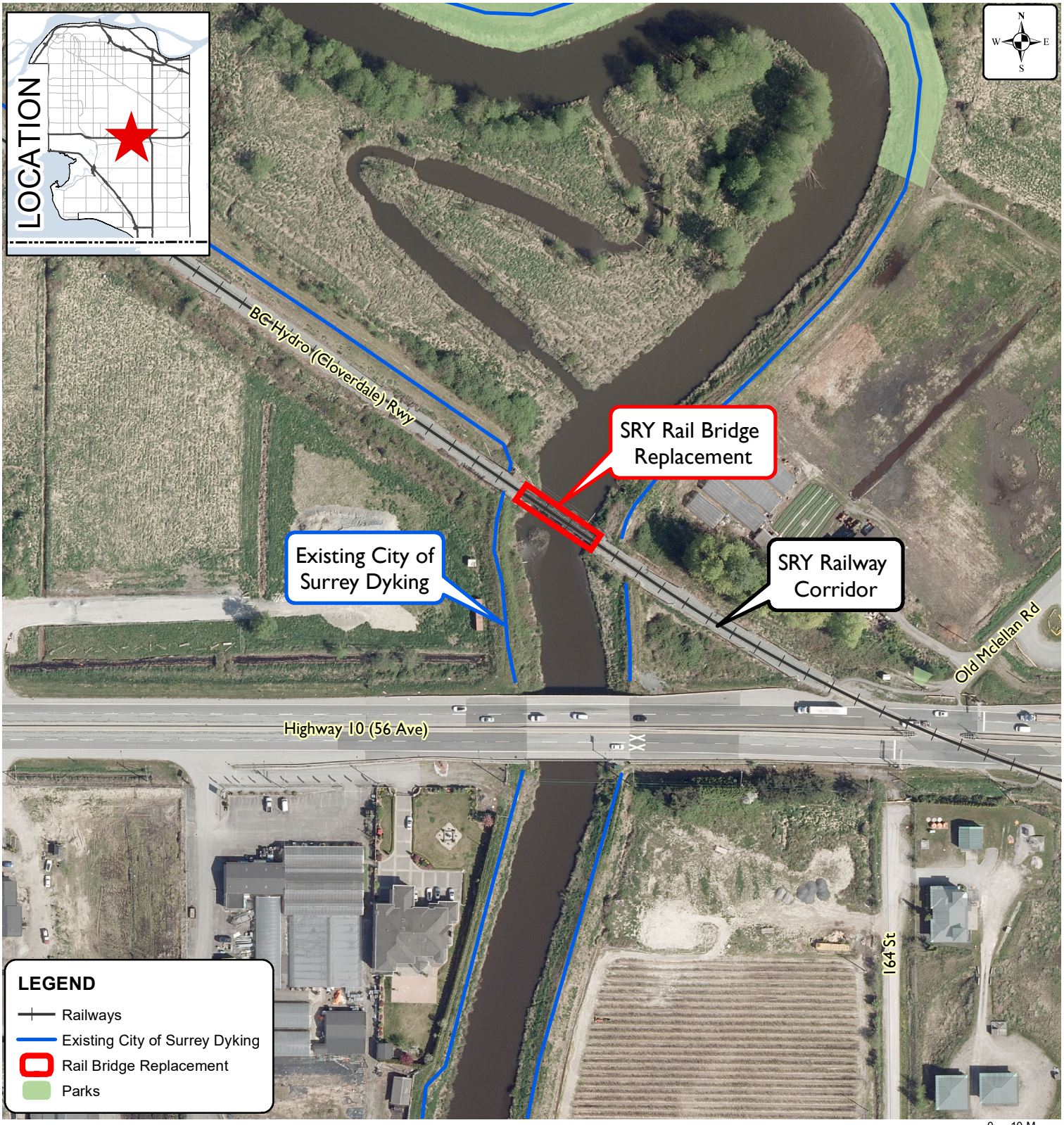
APPENDIX "I"

AERIAL PHOTOGRAPH OF SITE



Produced by GIS Section: 29-Nov-2018, P205934

Date of Aerial Photograph: April 27,2018

Scale: 1:2,000 0 10 M

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Map of SRY Rail Bridge Crossing

ENGINEERING DEPARTMENT

Source: G:\MAPPING\GIS\Maps\CorporateReps\D&C\PS_drnSRYBridgeReplacement.mxd