

## College Street Underpass Rehabilitation

Presented To:	City Council
Meeting Date:	November 26, 2024
Type:	Managers' Reports
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Recommended by:	General Manager of Growth and Infrastructure

## Report Summary

This report provides a recommendation regarding the design alternatives for the College Street Underpass Rehabilitation and summarizes efforts to secure funding for the project.

## Resolution

THAT the City of Greater Sudbury approves Option A: Full Bridge Rehabilitation with Roundabout and Active Transportation Improvements, subject to pursuing funding from senior levels of government, and that the project is not issued for tender until August 1, 2025, as outlined in the report entitled “College Street Underpass Rehabilitation” from the General Manager of Growth & Infrastructure, presented at the City Council meeting on November 26, 2024.

## Relationship to the Strategic Plan, Health Impact Assessment and Climate Action Plans

Rehabilitating the College Street Underpass is in line with Council's Strategic Plan Goal Area of Asset Management and Service Excellence by effectively optimizing and extending the useful service life of the City's oldest bridge, which is a critical component of both the national railway route and local transportation network.

Transportation is the single largest source of emissions in Greater Sudbury, accounting for approximately 32% of total GHG emissions (CEEP 2021). Reducing the time that vehicles sit idling at traffic signals, by introducing a roundabout can lead to reduced local transportation-related emissions in the short-term. Emissions reductions would also be realized elsewhere in the network, such as at the Elm Street CPKA crossing, where queuing may be reduced. Further, providing more active transportation facilities and opportunities for residents to choose to bike or walk to their destinations would also reduce emissions in the community.

## Financial Implications

The College Street Underpass project was approved during 2024-2027 capital budget deliberations with a budget of \$25 million. This budget is funded by external debt, with repayments funded from the special capital levy.

Council deferred spending on this project until staff returned with a report with further details on the project for Council's consideration. The estimated total project cost of the recommended Option A: Full Bridge Rehabilitation with Roundabout and Active Transportation Improvements remains at \$25 million.

Should Council select another option, the following financial implications would apply:

Option B - \$13 million capital costs

Option C - \$9 million capital costs

Option D – To be determined.

If option B, C or D is approved, then the external debt of up to \$25 million could be redirected to another capital project with the debt payment of \$1.6 million continuing to be funded by the special capital levy.

If a cost sharing agreement or grant funding is secured, a portion of the debt could be redirected to another capital project.

## **Background**

During the 2024 Budget deliberations, resolution (FA2023-76-A1) was passed at the Finance & Administration Committee Meeting on December 19, 2023, that the College Street Underpass Rehabilitation project "be deferred pending a new or updated report be presented for Council's consideration in 2024 and that the money allocated for this project be held in reserves pending Council's further direction."

The College Street Underpass is the City of Greater Sudbury's oldest bridge, originally constructed in 1949 to accommodate vehicular traffic crossing under three Canadian Pacific Kansas City (CPKC) railway tracks. Given the age and condition of the structure, the low bridge clearance and lack of active transportation facilities, rehabilitation or replacement of the structure is recommended in the short-term and is currently proposed for construction in 2025, as part of the City's Capital Budget Program.

## **Bridge Inspections**

Ontario Regulation 104/97: Standards for Bridges outlines requirements for the structural integrity, safety, and condition of every bridge in Ontario to be determined through at least one inspection in every second calendar year under the direction of a professional engineer. The regular inspection of these structures ensures that they are maintained to a specific standard and are not posing an imminent risk to the public.

The last biennial bridge inspections in Greater Sudbury were completed in 2022 and included a visual assessment of the condition of the College Street Underpass (Figure 1). Comments included in that specific report indicated that the structure has restricted clearances, poor visibility, and is in poor condition. The recommended capital work from the 2022 inspection was to replace the bridge. As part of the proposed capital project to rehabilitate the bridge, a detailed structural review was completed to prepare contract documents for this work. The proposed options associated with this work are detailed below.

The College Street Underpass is also inspected following any incidents where it is subjected to vehicle impacts and spalling concrete has been observed. In 2018, scaling of loose concrete and the installation of wire mesh on the bridge soffit was completed to prevent concrete from falling onto the roadway and sidewalk.



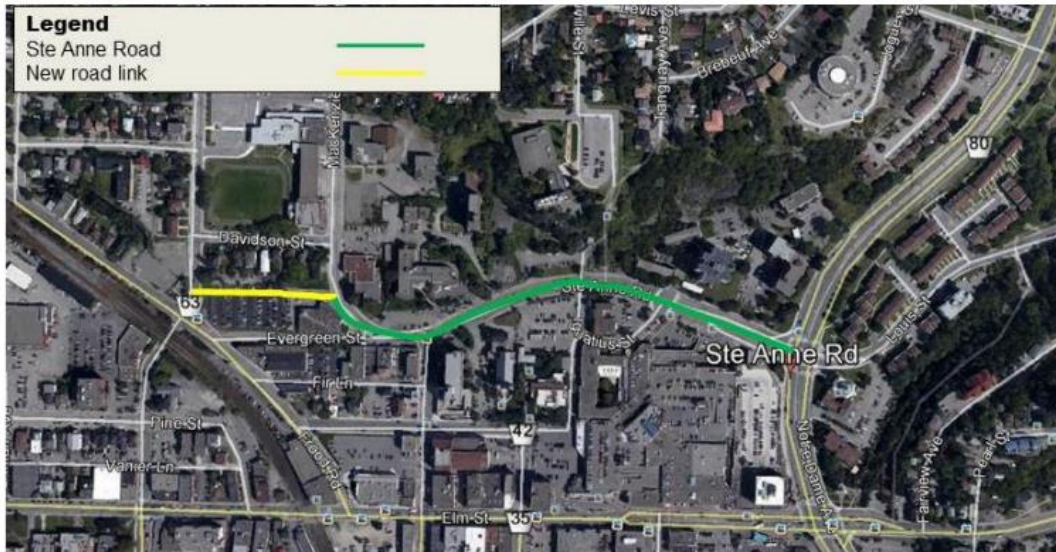
**Figure 1. College Street Underpass, looking southbound (from 2022 Inspection Report)**

### **Transportation Master Plan (2018)**

The College Street Underpass plays a critical role in the local area transportation network and cannot be examined in isolation, due to its proximity to the City's downtown area and other strategically important transportation links.

The Ste. Anne Road Extension is recommended as part of the 2031 Road Network presented in the approved Transportation Master Plan (2018). It is recommended that this link be constructed by 2031 to meet the growing transportation demand in the City's core, by providing a convenient by-pass of the central business district for vehicles not needing to access that area for a specific purpose. An extension of this road from its current terminus at the intersection of Mackenzie and Davidson Streets, underneath the railroad tracks via College Street, to connect to Pine Street, was also previously considered in the 1992 and 2005 Transportation Master Plans.

The existing underpass of the railroad tracks at College Street is shown in green, while the proposed new road link is shown in yellow on Figure 2. This extension has been planned to be coordinated with the rehabilitation of the College Street Underpass and requires the subsequent transformation of the signalized intersection of College Street and Froid Road to a five-point, single lane roundabout to accommodate the connection with the Ste. Anne Road Extension.



**Figure 2. Recommended Ste. Anne Road Extension (Transportation Master Plan 2018, p.161)**

### **Environmental Assessment: College Street Underpass and Ste. Anne Road Extension**

The City of Greater Sudbury through their consultant AECOM, is in the final stages of completing a Municipal Class Environmental Assessment (MCEA) Schedule C study to identify, evaluate and determine the best long-term rehabilitation or replacement alternatives for the College Street Underpass and the best alignment for the Ste. Anne Road Extension. A Schedule 'C' project typically includes the construction of new facilities or major expansions to existing facilities with significant environmental impacts, and for this project class, consultation with the public is mandatory.

The concurrent review and design of both the College Street Underpass and the Ste. Anne Road Extension projects will assist in ensuring the vertical and horizontal alignments of the two projects are compatible while also improving active transportation opportunities in the area. Three alternative solutions were presented and evaluated for each project and are presented within this report.

Through the MCEA process, the proposed solutions and alternative designs were reviewed with Canadian Pacific Kansas City (CPKC) railway, who stipulated that the City is required to maintain all three rail lines on the bridge open during any planned construction work on the underpass. The cost to construct a three-rail temporary detour, such that all lines can remain open during a potential reconstruction, was estimated to cost upwards of \$40 million (detour only). This constraint limited potential preferred alternatives for the project to revisit the rehabilitation of the existing structure which extends the useful life of the bridge for 25 years.

The Environmental Study Report (ESR) for these two projects was issued on June 24, 2024, with the question period ending July 24, 2024. Consultation with Provincial ministries is ongoing, and it is anticipated that the MCEA will be concluded shortly.

#### **Alternative Solutions Considered for College Street Underpass:**

The College Street Underpass is a two-span concrete slab with embedded steel girders bridge constructed in 1949 to accommodate three lanes of vehicular traffic crossing under the CPKC railroad tracks (two northbound, one southbound). Currently, there is a sidewalk on the west side of the structure and no other active transportation facilities.

In determining how best to improve and modernize the College Street Underpass in a cost-effective way that considers the future transportation needs of the community, several alternative design concepts were considered:

## Option A: Full Bridge Rehabilitation with Roundabout and Active Transportation Improvements

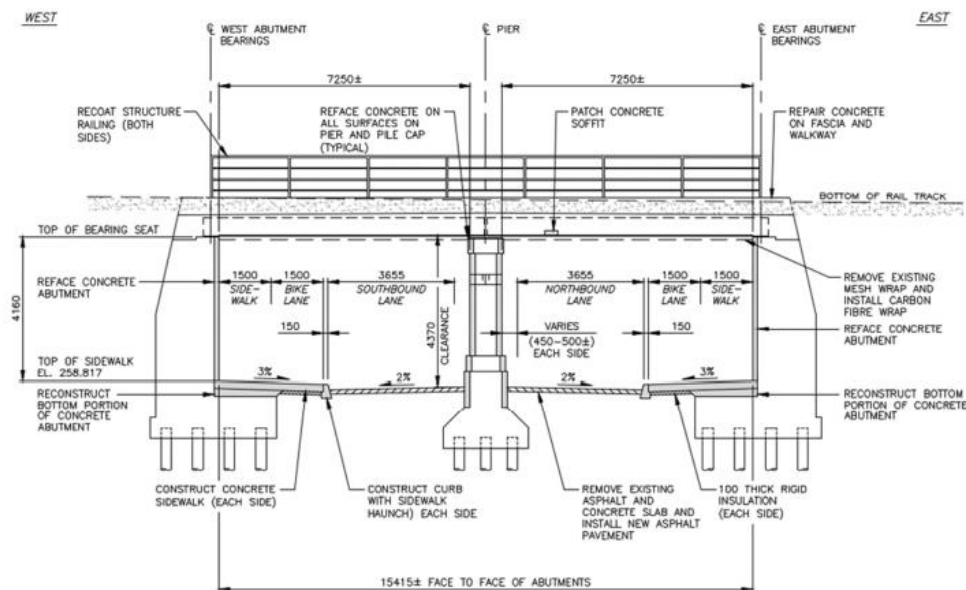
The recommended design option approved during 2024-2027 capital budget deliberations considers the rehabilitation of the College Street Underpass, while also introducing new active transportation within the existing right of way. This option would see the underpass rehabilitated, providing a safe structure, with an increased life cycle of approximately 25 to 30 years.

Here, the existing three-lane cross section would be reconfigured to accommodate one vehicular travel lane, along with space for sidewalks and cycling facilities, in both directions to provide a link to the existing and planned active transportation network (Figure 3). The addition of cycling infrastructure to the College Street Underpass, and to the section of College Street from Frood Road to Elm Street, would provide a safe and connected route between Elm Street and the West End, through the Donovan and Flour Mill neighbourhoods, to Notre Dame Avenue and the Paris-Notre Dame Bikeway. Installing cycling infrastructure on this 220-meter segment of College Street will require utility relocations, and the removal of historical streetcar tracks that remain embedded beneath the asphalt in the intersection of College Street and Pine Street. In addition, watermain, sanitary sewer and street lighting improvements are also included in this option.

The northbound left-turn lane from College Street onto Frood Road, will not be required with the installation of a single-lane roundabout at the intersection. Despite removal of the left-turn lane, the introduction of a roundabout would improve the Level of Service of the intersection, by enabling more efficient vehicle turning movements and unimpeded traffic flow. The proposed roundabout will be constructed to connect with the future Ste. Anne Road extension. To accommodate the construction of the proposed roundabout, adjacent property at the northeast and northwest corners of the intersection are required to be purchased and have been considered in project costs. Discussions with the affected property owner have been ongoing in anticipation of this project.

The provision of the Ste Anne Road Extension provides a by-pass around the Downtown core, potentially reducing the vehicular traffic volume on Elm Street, and further enabling the City to deliver on other strategic priorities for the core. Additionally, removing vehicular volume from the Elm Street corridor may reduce the potential for serious instances to occur at the level CPKC crossing on Elm Street, to the west of Frood Road, where vehicles are regularly observed queuing over the tracks. Completing the Ste Anne Road Extension would also provide additional redundancy in the City's transportation network in the core in the event of any nearby road closures.

**Total estimated project cost: \$25 million**



**Figure 3. Recommended College Street Underpass Design**

## **Option B: Bridge Rehabilitation with Clearance Improvements Only**

This option includes the rehabilitation of the College Street Underpass structure, along with vehicle clearance improvements and some minor work to the intersection to ensure the alignment of the intersection continues to function.

Generally, this option would reduce the overall project cost for 2025 capital work, however it would introduce additional project costs in the future of approximately \$1 million in re-work that would be required to add active transportation facilities and transform the intersection into a roundabout in anticipation of a connection with the Ste. Anne Road Extension.

**Total estimated project cost: \$13 million**

## **Option C: Bridge Rehabilitation Only**

This option considers the rehabilitation of the College Street Underpass while retaining the existing cross section and vertical clearance on College Street. There are no new accommodations for active transportation or improvements to the College Street and Frood Road intersection included in this option.

This option would include rehabilitation of the underpass only, to provide a safe structure with an extended lifecycle of an estimated 25 to 30 years. Improvements to the intersection or existing roadway, including how best to connect to the planned Ste Anne Road Extension are not considered.

**Total estimated project cost: \$9 million**

## **Option D: Defer Bridge Rehabilitation Project for up to 5 Years**

Deferral of the project would result in increased annual maintenance costs of the bridge structure and would likely lead to higher rehabilitation construction costs in the future, or depending on the level of deterioration, could lead to the requirement for a complete replacement of the bridge structure. Historically, capital budget increases have not kept pace with inflation and therefore in the future, this project would likely require a larger proportion of the capital budget than if the project is delivered as part of the 2025 Capital Program.

As the concrete structure continues to deteriorate through spalling and delamination over the short term, localized removal of loose concrete will be necessary to safeguard the public. This additional maintenance work would commence in 2025 and be completed twice annually.

In addition, the City would need to retain a consultant to conduct detailed inspections of the bridge structure biannually, to review performance, structural integrity, and overall condition of the bridge. These inspections would identify any areas of potential distress and movement, which would inform maintenance practices. This also could potentially prompt further preventative measures to ensure public safety. Additional measures that may be recommended because of the biannual inspections potentially include:

- Additional, or supplemental steel wire mesh on concrete surfaces.
- Temporary shoring of walls or structure for areas of structural distress.
- Installation of movement monitoring devices.
- Reduced service levels such as reduction of vehicle lanes, reduction of lane widths, closing the sidewalk or potentially also closing the road to vehicular traffic altogether.

Should the rehabilitation of the College Street Underpass structure be deferred, it is recommended that funding be provided for replacement of the existing sidewalk rail system.



## Summary of Options:

	A	B	C	D
Bridge structure rehabilitation	●	●	●	
Vertical clearance improvements	●	●		
Utility relocations (\$ required in advance of project tender)	●	●		
Active transportation facilities	●			
Roundabout	●			
Watermain and sanitary sewer improvements	●			
Street lighting improvements	●			
Property acquisition	●			
<b>Total Estimated Project Cost</b>	<b>\$25 million</b>	<b>\$13 million</b>	<b>\$9 million</b>	<b>Variable</b>

## Rail Crossings in Greater Sudbury:

The City of Greater Sudbury has 78 level rail crossings, nine grade-separated vehicular crossings and seven additional pedestrian/cyclist-only, grade-separated crossings. The number of level crossings per capita is approximately double the average for comparable cities in Ontario. Over the last five years, the City has invested approximately \$2.3 million to rehabilitate 10 level crossings and further spends an additional \$250,000 annually in general maintenance of crossings throughout the community. CPKC flagging and engineering fees, as well as insurance requirements associated with overpass rehabilitation projects can also represent significant proportions of project budgets. An ongoing capital project to rehabilitate the Paris Street Bridge of Nations, requires approximately \$550,000 in CPKC engineering, flagging and insurance costs, which represents approximately 6.5% of the project construction cost alone.

The City is responding to an increasing number of inquiries from industrial businesses seeking property with rail access, demonstrating the importance of the maintaining the rail network within the community. Greater Sudbury plays a critical role north of the Greater Toronto Area when it comes to rail access for both inbound and outbound freight movements to support industrial and other growth. Both CPKC and CNR's class 1 main lines run through the city, and both connect to the Huron Central (HCR) and Ottawa Valley (OVR) railways within the city limits, running west and east respectively. Furthermore, local mining company, Vale owns and operates considerable rail infrastructure within the city and with various connections to the CNR, CPR, HCR and OVR lines.

## Potential Funding Opportunities:

The City of Greater Sudbury is actively seeking an opportunity to cost share the rehabilitation of the College Street Underpass, a critical link in both the local transportation and national CPKC rail networks. Engineering Services staff will continue to provide support to the Mayor's Office in advocacy efforts to secure funding from other levels of government for this project.

Of note, the original construction of the College Street Underpass in 1949, with a total project cost of just under \$400,000, was funded in part by both the Provincial (25%) and Federal (25%) governments, with the remainder of the project funded by the City (50%). The Canadian Pacific Railway Company declined to contribute financially to the project at the time citing that there would be no additional benefits to railway operations from the construction of the underpass at the existing (at the time) level crossing.

The project is directly in line with two of the Ontario Ministry of Infrastructure's nine priority investment areas, including Roads and Bridges and Northern Communities. The rehabilitation of the College Street Underpass in Northern Ontario's largest city and economic centre will continue to support the efficient movement of goods and people both within the community and on a broader scale, across the province and country.

Rehabilitating a critical link in Northern Ontario's network of transportation infrastructure also supports the realization of the vision of the Growth Plan for Northern Ontario by ensuring that the Greater Sudbury area continues to be a growing, vibrant, and highly productive region, with a diverse and globally competitive economy. Reliable access to national and international rail networks further provides Greater Sudbury with a competitive advantage that supports economic development strategies for existing and emerging priority economic sectors, including the minerals sector and mining supply and services.

## **Resources Cited**

1. City of Sudbury Minutes, Regular Meeting, March 7, 1949 (provided in PDF format from City Archives)
2. City of Sudbury Minutes, Regular Meeting, April 11, 1949 (provided in PDF format from City Archives)
3. City of Sudbury Minutes, Regular Meeting, January 30, 1951 (provided in PDF format from City Archives)
4. City of Sudbury Minutes, Special Meeting, October 10, 1951 (provided in PDF format from City Archives)
5. City of Sudbury Minutes, Regular Meeting, April 22, 1952 (provided in PDF format from City Archives)
6. Elm Street – On Street Parking, report presented to the Operations Committee of the City of Greater Sudbury, April 2, 2013, accessed online: <https://pub-greatersudbury.escribemeetings.com/filestream.ashx?documentid=18878>