

Subject: Barrhaven Light Rail Transit (LRT) – Revised Alignment (Knoxdale Road to the Nepean Sportsplex) to Mitigate Impacts to Tenants of Manor Village and Cheryl Gardens

File Number: ACS2022-PIE-TP-0007

Report to Transportation Committee on 30 May 2022

and Council 8 June 2022

Submitted on May 2, 2022 by Jeff McEwen, Acting Director, Transportation Planning, Planning, Real Estate and Economic Development

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Wards: Collège (8), Knoxdale-Merivale (9)

Objet : Train léger (TLR) à Barrhaven – tracé révisé (du chemin Knoxdale au Sportsplex de Nepean) afin de limiter les répercussions pour les résidents de Manor Village et de Cheryl Gardens

Dossier : ACS2022-PIE-TP-0007

Rapport au Comité des transports

le 30 mai 2022

et au Conseil le 8 juin 2022

Soumis le 2 mai 2022 par Jeff McEwen, Directeur par intérim, directeur par intérim, Planification des transports, Direction générale de la planification, de l'immobilier et du développement économique

Personne ressource : Frank McKinney, gestionnaire de programme, Planification des transports – Évaluation environnementale, Direction générale de la planification, de l'immobilier et du développement économique

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Quartiers : Collège (8), Knoxdale-Merivale (9)

REPORT RECOMMENDATIONS

That the Transportation Committee recommend Council:

1. **Approve the replacement of the previously approved alignment for the Barrhaven LRT for the section between north of Knoxdale Road and the Nepean Sportsplex, with the revised alignment as described in this report, to avoid displacing the tenants of Manor Village and Cheryl Gardens;**
2. **Direct staff to finalize the functional design for the revised alignment, conduct public consultation on the design change, document the process and inform Transportation Committee of the consultation outcome prior to re-initiating the Transit Project Assessment Process with the revised alignment as part of the larger Light Rail Transit project from Baseline Station to the Barrhaven Town Centre.**

RECOMMANDATIONS DU RAPPORT

Que le Comité des transports recommande ce qui suit au Conseil :

1. **Approuver le remplacement du tracé précédemment approuvé du tronçon du TLR de Barrhaven reliant le nord du chemin Knoxdale au Sportsplex de Nepean par un tracé révisé décrit dans le présent rapport, afin d'éviter de devoir déplacer les résidents de Manor Village et de Cheryl Gardens;**
2. **Enjoindre au personnel de finaliser la conception fonctionnelle du tracé révisé, de mener une consultation publique sur le changement de conception, de documenter le processus et d'informer le Comité des transports des résultats de la consultation avant de relancer le processus d'évaluation du projet de transport en commun en tenant compte du tracé révisé, dans le cadre du projet d'ensemble de train léger reliant la station Baseline au centre-ville de Barrhaven.**

EXECUTIVE SUMMARY

Assumptions and Analysis

In November 2020, Council directed staff to assist the tenants of Manor Village and Cheryl Gardens, who were facing permanent relocation due to the impacts of the approved alignment for the Barrhaven LRT. As part of the review of assistance options, the study team revisited a previous alignment which is in the median of Woodroffe Avenue (between Knoxdale Road and Hunt Club Road, approximately 1.3 km). This median option would avoid impact to Manor Village and Cheryl Gardens, but it was not

recommended at that time due to operational and transportation issues, as well as the presence of major utilities in the median.

Given the combined issues of a housing shortage, some of the affected properties are currently low-cost rental units, real estate costs have significantly increased since 2020 and will likely continue for some time, and the timing of LRT implementation is unknown since funding has not been secured, there is concern with the risk of significant project cost increase over time for an alignment that requires property acquisition, which is at risk of getting more expensive if the adjacent properties are renovated or redeveloped. The study team reviewed and revised the earlier median alignment to mitigate some of the key constraints and while there are still trade-offs (mostly technical rather than social), they can be managed with careful design and appropriate construction procedures. The revised alignment is described in this report.

There are still other tasks to complete such as consultation with the public on the new alignment, refinement of project cost, documentation, and re-submitting a report to the Province that includes this change, as part of the Transit Project Assessment Process.

Financial Implications

The study cost to complete this scope change is in the order of \$450 thousand, which can be funded through capital account 910184 2021 Rapid Transit EA Studies. While the refinement of costs to implement the project will be undertaken, early assessment is that it could cost approximately \$35 million to \$50 million more to implement than the originally approved alignment. The new total project cost estimate for the Barrhaven LRT project is \$3.52 billion, in 2022 dollars.

Public Consultation / Input

Consultation will be undertaken with the public and the focus will be on the revised alignment section only. The remainder of the project has had public engagement and had been reported to Transportation Committee and Council in November 2020.

RÉSUMÉ

Hypothèses et analyse

En novembre 2020, le Conseil a chargé le personnel de venir en aide aux résidents de Manor Village et de Cheryl Gardens, qui étaient confrontés en permanence à des déplacements attribuables aux répercussions du tracé approuvé du TLR de Barrhaven. Au moment d'examiner les options d'aide, l'équipe responsable de l'étude s'est penchée sur un tracé antérieur qui se trouve au centre de l'avenue Woodroffe (entre les

chemins Knoxdale et Hunt Club, sur environ 1,3 km). Cette option de ligne médiane permettrait d'éviter les répercussions sur Manor Village et Cheryl Gardens, mais n'a pas été recommandée à l'époque en raison de problèmes opérationnels et de transport, et à cause de la présence de services publics importants aménagés dans le terre-plein central.

Compte tenu des problèmes cumulés du manque de logements, du fait que certaines des propriétés concernées sont actuellement des logements locatifs à prix modique, que les coûts de l'immobilier ont sensiblement augmenté depuis 2020 et continueront sans doute de croître pendant encore un certain temps et que le calendrier de mise en service du TLR est inconnu puisque le financement n'a pas été confirmé, des préoccupations sont soulevées quant au risque d'une hausse importante, au fil du temps, du coût d'un projet de tracé qui nécessite une acquisition de biens-fonds dont le prix est susceptible d'augmenter si les propriétés adjacentes sont restaurées ou réaménagées. L'équipe responsable de l'étude a examiné et révisé le tracé médian précédent afin de réduire certaines des contraintes. Les compromis (davantage techniques que sociaux) qui font toujours l'objet de discussions peuvent être gérés grâce à une conception soignée et à des méthodes de construction appropriées. Le tracé révisé est décrit dans le présent rapport.

D'autres tâches restent à accomplir, comme la consultation des membres du public au sujet du nouveau tracé, le peaufinement du coût du projet, la documentation et la présentation au provincial d'un nouveau rapport tenant compte de ce changement, dans le cadre du processus d'évaluation du projet de transport en commun.

Répercussions financières

Le coût de l'étude requise pour procéder à ce changement de portée est de l'ordre de 450 000 \$, une somme qui peut être financée par le biais du compte d'immobilisation n° 910184 (études d'ÉE du transport en commun rapide de 2021). Bien que le coût à consacrer à la mise en œuvre du projet doivent encore être précisés, une première évaluation le situe entre 35 et 50 millions de dollars de plus que le tracé approuvé au départ. Le nouveau cout total du projet de TLR de Barrhaven est de 3,5 milliards de dollars de 2022.

Consultation publique et commentaires

Une consultation publique sera focalisée sur le tracé révisé uniquement. Les autres volets du projet ont été validés par les membres du public et ont été soumis au Comité des transports et au Conseil en novembre 2020.

BACKGROUND

Recommendations for the functional design of the Barrhaven Light Rail Transit (Baseline Station to Barrhaven Town Centre) and Rail Grade Separations, Planning and Environmental Assessment Study were approved by Transportation Committee on November 2, 2020 and Council on November 25, 2020.

The project has a 0.6 km pinch point where residential units are built close to the sidewalk and are affected by the approved alignment. The rest of the approximately 10 km project is in a corridor that had been set aside for rapid transit through past planning efforts (Figure 1).



Figure 1: Barrhaven LRT Corridor

The approved functional design identified an elevated guideway from Baseline Station to the Nepean Sportsplex. At the pinch-point, the project required a 20-metre wide strip of land, which would affect two properties, specifically 100 residential rental units, out of a total of approximately 180 units. As part of the November Council meeting, staff were

directed to establish a Working Group to examine options on how to assist residents who are facing future relocation because of the rail transit alignment.

This report is in response to the following motion approved by Transportation Committee on November 2, 2020, and Council on November 25, 2020:

“Direct staff to establish a Working Group to examine options on how to assist the residents who are facing a future relocation because of the LRT project and that this working group consist of: General Manager, Planning, Infrastructure and Economic Development, General Manager, Community and Social Services, General Manager, Transportation Services, and/or their respective delegates; Ottawa Community Housing; community representatives from Manor Village and Cheryl Gardens; the ward Councillor; and the Councillor Liaison for Housing and Homelessness.

Direct staff to report back to the Finance and Economic Development Committee by end of 2021 on the Working Group’s recommendations including justifications, and policy and financial implications.”

This report summarizes the efforts of the Working Group, and specifically the change to the LRT alignment that would eliminate the displacement of tenants, and consequently prevent the loss of low-cost housing units. However, to achieve no impact to tenants, there are trade-offs in the design and operations. These trade-offs have been reviewed by senior leaders from the departments of Transit Services, Infrastructure and Water Services, and Community and Social Services. When this project proceeds to the next phase (design), there will be opportunities to refine the design and mitigate the impacts further.

DISCUSSION

The Working Group was formed and met several times to discuss tenants’ concerns and options. Chaired by Councillor Egli, the Working Group included participation from Councillor McKenney (Councillor Liaison for Housing and Homelessness), the Manordale Community Association, representatives for the tenants of Manor Village, and Cheryl Gardens as well as members of ACORN and senior City staff. Through these discussions, the Working Group tenants advised that the property owner of Manor Park Village (Smart Living Properties) had been providing incentives for tenants to relocate in order to facilitate the developer’s future redevelopment plans. Some tenants accepted the incentives and have moved away, allowing Smart Living Properties to renovate these vacated units. Smart Living is moving ahead on other units to exercise

its rights to cancel leases under provincial processes. The City is not aware of any comparable issues on the Cheryl Gardens property.

The City provided tenants at the Working Group meeting, with information on the process of signing up for a waiting list for low-cost housing and offered to meet to discuss this further. To date, no tenant reached out to further discuss this program. In addition, the City investigated alternative sites for potential low-cost housing development and found no suitable sites in the surrounding area. The tenants were further provided with assurance that the City would take no action related to expropriation of these properties for at least five years, given that no funding for the LRT implementation has been secured, and once funding is in place, lead-up time is needed to develop the design and undertake the procurement process. The Working Group's tenant representatives appreciated this assurance as it provided some stability from any effects of decisions by the City for the next few years (although actions by the landlord governed by provincial legislation are not otherwise restricted).

In the last two years since Council's approval of the Barrhaven LRT's functional design, there has been a significant increase in property values and the upward trend is likely to continue for some time. Coupled with the uncertainty of project timing and the increasing cost to acquire property over time, this becomes a major budget risk for the Barrhaven LRT project.

In response to the Council motion, staff revisited an option previously considered during the Environmental Assessment (EA) study – the option that runs down the centre of Woodroffe Avenue from Knoxdale Road to Hunt Club Road, as an elevated LRT facility (Figure 2).

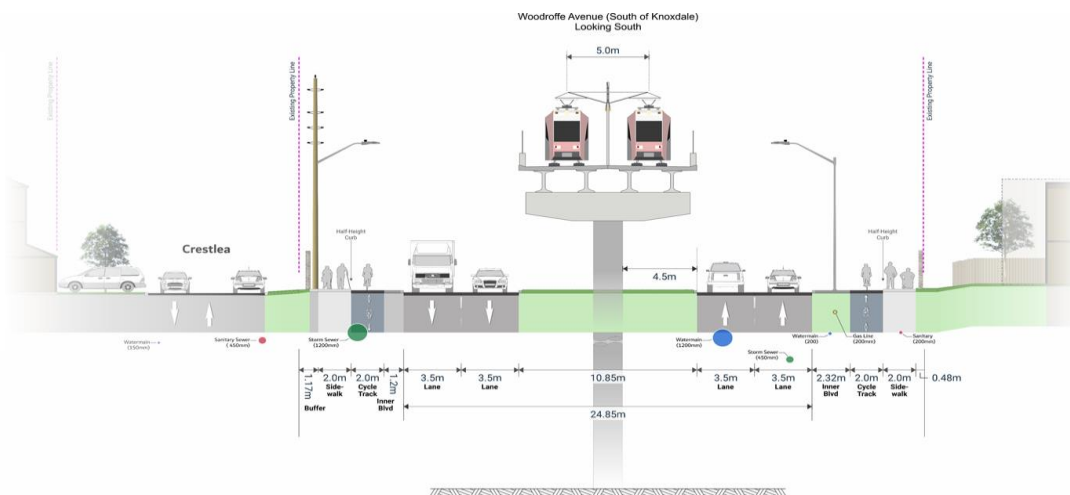


Figure 2: Woodroffe Centreline Median Option (from the EA Study)

Although the median option would have completely avoided impacting Manor Village and Cheryl Gardens, this option was not recommended during the EA Study for the following reasons:

- Back-to-back curves in the track increase wheel noise and result in higher vehicle and track maintenance costs while also impacting passenger ride comfort and reducing train speeds
- Knoxdale Station would need to be located slightly further to the north, increasing walking distances for station access
- Presence of major underground utilities within the Woodroffe Avenue right-of-way (ROW), including a 1200 mm trunk watermain that serves Barrhaven
- Traffic and transit impacts during and post construction
- Impacts to sight lines at intersections would need to be mitigated from the elevated guideway and support piers
- More complex construction and higher construction costs.

Staff and the EA consultant, Parsons, examined how some of the above setbacks could be mitigated with the median option, which are summarized below.

Curves

Shifting the LRT alignment into the Woodroffe Avenue median changes the horizontal and vertical alignment of the LRT and influences the location of the proposed Knoxdale Station.

At the transition points, into and out of the Woodroffe Avenue ROW, back-to-back curves are introduced in the LRT alignment. The geometry of these curves has been optimized from the initial concept plan to reduce potential noise and maintenance impacts while increasing train speed and ride comfort through the curves. Rail Construction Program staff advised that the curve radii (approximately 650 m) are acceptable to meet LRT operational requirements.

Knoxdale Station - Relocation

Knoxdale Station will need to be located approximately 100 m north of the Woodroffe Avenue and Knoxdale Road intersection due to the influence of the LRT geometry in the area (Figure 3). Specifically this is due to the horizontal curves to transition into the Woodroffe ROW, the vertical gradient imposed by the higher (7.6 m) clearance needed

over the CNR rail line to the north and the requirement for a consistent shallow grade through the station area. This means a longer walking distance for those transferring from a local bus route. Mitigating this increased walking distance will be investigated at detailed design, considering options such as moving the station platforms as far south as possible, making the pedestrian path between the platforms and the Woodroffe/Knoxdale intersection as direct as possible, and redesigning the intersection to reduce walking distance to and from the bus stops.

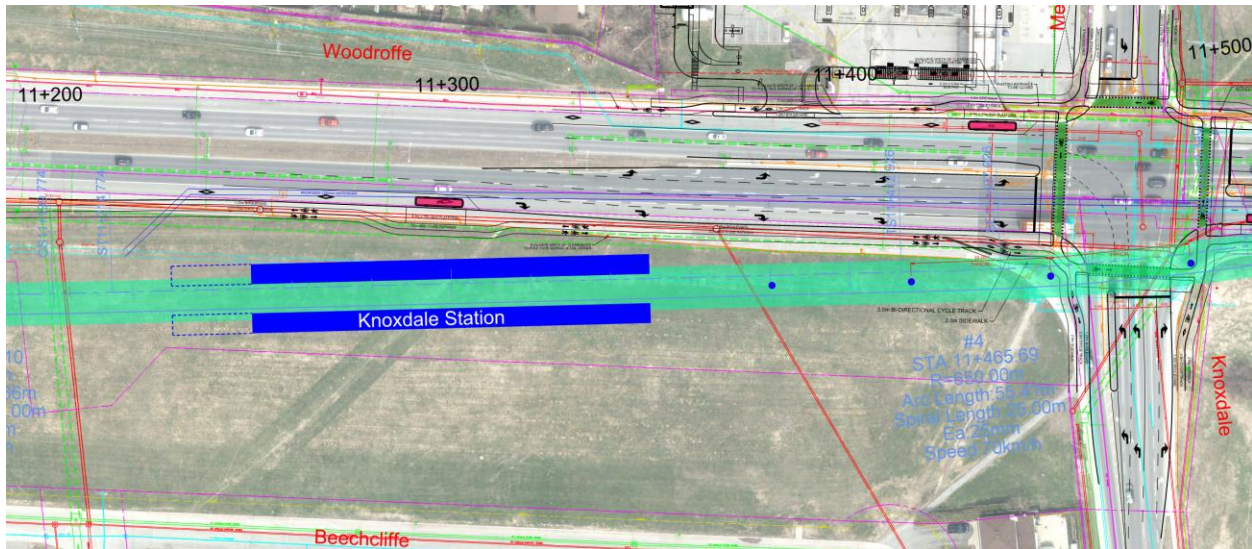


Figure 3: Knoxdale Station (new location)

1200 mm Watermain

The trunk (1200 mm diameter) watermain is a critical piece of infrastructure. Near Knoxdale Road, the watermain is located along and within the western portion of the ROW and would require relocation regardless of whether a median or alignment west of the ROW is pursued. South of Knoxdale Road, the watermain is located generally under the current southbound travel lanes. This places it within the median guideway construction operations zone, very close to where some support piers for the elevated LRT will be built. While the distance is likely sufficient to permit construction, there will be constraints imposed on the contractor's operations to protect the watermain from impacts of heavy equipment and pier construction. A design for renewal and relocation of the watermain has previously been developed by the City; a strategy to integrate the LRT and watermain renewal projects as part of the LRT project should be considered to ensure the two initiatives are conducted with regard for each other.

Traffic Impacts and Sightlines

Construction of the elevated median LRT alignment is estimated to occur over three years. During this time, Woodroffe Avenue between Knoxdale Road and West Hunt Club Road will need to be reduced from three lanes per direction to two lanes per direction, along with turning-lane storage capacity reductions at intersections (Figure 4). It is assumed that one lane per direction will be dedicated to transit to maintain the role and function of this segment of Woodroffe Avenue as a rapid transit corridor (Southwest Transitway) and maintain transit reliability during construction. Existing active transportation facilities can be maintained during construction.

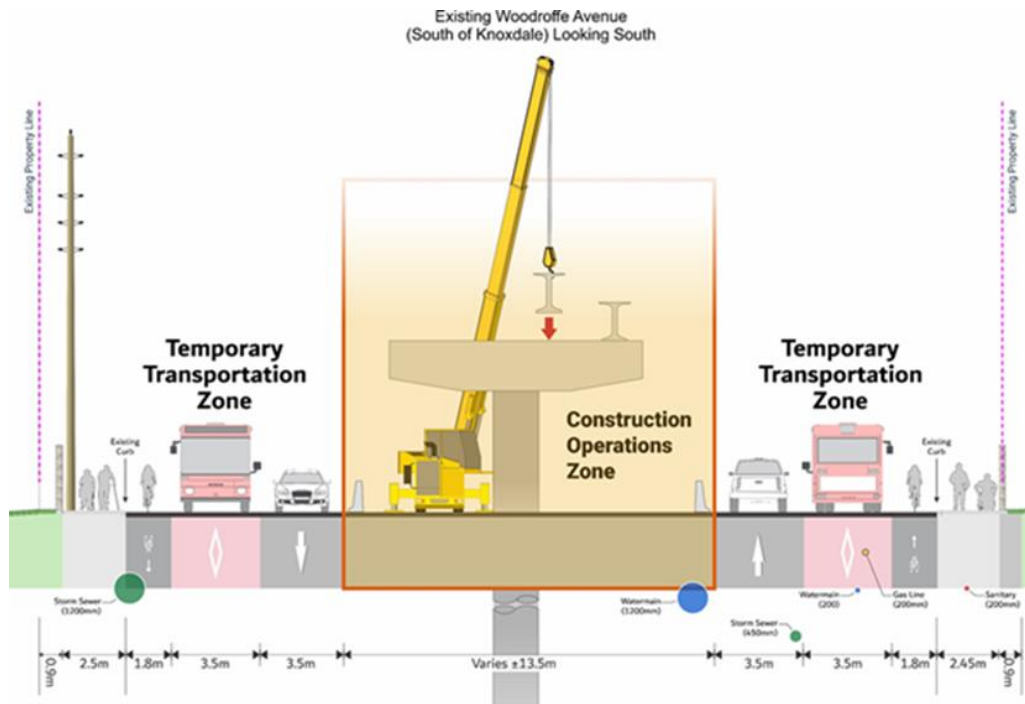


Figure 4: Lane Reduction

Off-peak and overnight closures of roadway lanes for the entire roadway may be required at certain times during construction to accommodate the delivery of materials, or installation of guideway beams using a crane. In addition to lane reductions along Woodroffe Avenue, the construction of a new protected intersection at the Woodroffe Avenue and West Hunt Club Road intersection is also anticipated to require periodic lane reductions on West Hunt Club Road.

From a design perspective, the presence of the guideway within the road ROW impacts sightlines and requires safety measures to protect piers located in median and boulevards such as guardrails or concrete barriers. Traffic signal design at intersections must consider the impact the guideway has on sightlines, and space must be found to

locate traffic signal heads (Figure 5). In some cases, this may require signal heads to be mounted directly on the elevated LRT guideway. Roadway lighting will also need to be considered. Currently, lighting in this segment of Woodroffe Avenue is provided by dual head light standards located in the median of the roadway. These will need to be replaced by roadway lighting located along the curb side of the roadway lanes.



Figure 5: Sample Traffic Signal Design

At intersections, the presence of structural piers may result in increased visual demands, particularly for drivers to be able to see pedestrians and cyclists when making turn movements (Figure 6). Shadows created by the overhead guideway may in some cases result in decreased visibility which will need to be considered in design.



Figure 6: Increased Visual Demand

Complex Construction

Shifting the LRT alignment into the Woodroffe Avenue ROW increases construction complexity due to the interaction between the elevated LRT guideway, the existing roadway, and underground utilities.

The location of structural piers required to support the elevated guideway is dependent on the desired span length of guideway segments, which in turn are impacted by the structural design. A typical span length of 35 m has been assumed based on a “standard” structural design of single piers supporting an elevated guideway comprised of four concrete beams supporting a deck on which the LRT tracks run. This spacing can be adjusted to accommodate minor increases where needed to avoid elements on the ground (e.g. underground utilities, sidewalks, roadways); however, as span length increases, the design of the guideway (e.g. beam thickness) must be adjusted, increasing cost as well as the height and vertical profile of the LRT alignment.

The desired curve radii at the transitions into and out of the Woodroffe Avenue ROW result in significantly increased span lengths to avoid the southbound lanes of Woodroffe Avenue (Figure 7).

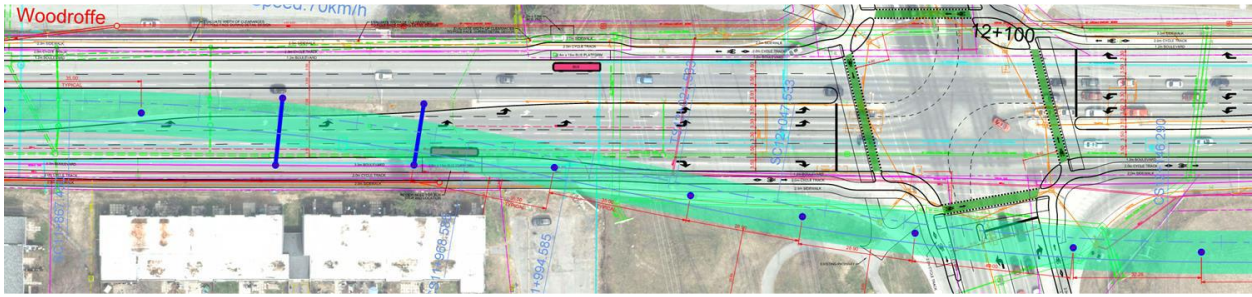


Figure 7: Transition out of Woodroffe Right-of-Way at West Hunt Club Road

Therefore, “straddle bents” are proposed to support the guideway in these locations (Figure 8). Straddle bents will have a slight impact to the vertical alignment (0.8 m) and represent a larger visual footprint for LRT infrastructure within the roadway corridor.



Figure 8: Straddle Bents

Conclusion

Improvements were made to the initial median alignment to mitigate the design setbacks. A wider radius for the curves will mitigate operational noise and improve rider comfort. This solution avoids displacement of tenants, loss of housing stock, and mitigates increasing costs related to property purchases. It leaves fully intact the adjacent residential lands. It should be noted that with the realignment, the guideway will now be in equal proximity to residences on both sides of Woodroffe Avenue.

Cost

The study cost to complete the revised alignment (Knoxdale Road to the Nepean Sportsplex), consultation, and filing of the final environmental study report in accordance with Ontario’s Transit project Assessment Process is approximately \$450K,

This scope change can be funded through capital account # 910184 (2021 Rapid Transit EA Studies).

While the refinement of costs to implement the project will be undertaken, early assessment is that it could cost approximately \$35M to \$50M more to implement than the originally approved alignment. The new total project cost for the Barrhaven LRT is estimated at \$3.52B, in 2022 dollars.

Next Steps

The study team will complete the functional design, and consultation with the general public will be focused on the revised alignment section only. The rest of the project has had public engagement and had been reported to Transportation Committee and Council in 2020.

RURAL IMPLICATIONS

The revised alignment segment is within the City's urban area.

CONSULTATION

The revised alignment proposal was discussed with internal departments and has their support. The Working Group will be informed prior to the presentation of this report at Transportation Committee. Broader public consultation is still required and will be scheduled.

COMMENTS BY THE WARD COUNCILLORS

Ward Councillors Chiarelli and Egli were notified of this report to committee.

Councillor Egli provided the following comments:

"I would like to thank members of the community, staff and Councillor McKenney for their participation and engagement in the working group. Everyone's efforts are greatly appreciated."

ADVISORY COMMITTEE(S) COMMENTS

Consultation with the City's Accessibility Advisory Committee (AAC) will be undertaken as part of the overall consultation on the revised alignment design.

LEGAL IMPLICATIONS

There are no legal impediments to implementing the recommendations as outlined in this report.

RISK MANAGEMENT IMPLICATIONS

This revised design of a median alignment has construction risks due to the presence of underground utilities and a large watermain serving Barrhaven. Construction activities will need to be carefully planned to mitigate any disruption of service, which may include mitigations to the existing watermain network. A relocation of the watermain may be needed to keep it at a manageable distance from the light rail alignment and construction zone. Funding would be required for this work and will be allocated to the LRT project.

ASSET MANAGEMENT IMPLICATIONS

Based on past experience with LRT alignments near large-diameter watermain, staff expects that the watermain may need to be relocated to keep it at a manageable distance from the light rail alignment and construction zone. Although some sections of this watermain have experienced premature failure, the City has an effective asset management strategy in place that can continue for many years into the future – there is a continuous monitoring cable inside the watermain with an early warning system that allows the City to do spot repairs in a timely and cost-effective way. From an asset management perspective, there is no short- or medium-term need to replace the 1220mm watermain. Large diameter watermain replacement over long sections is relatively expensive and not included in the City's long-range financial plan for rate.

FINANCIAL IMPLICATIONS

The study cost to complete this scope change is in the order of \$450 thousand, which can be funded through 910184 2021 Rapid Transit EA Studies.

While the refinement of costs to implement the project will be undertaken, early assessment is that it could cost approximately \$35 million to \$50 million more to implement than the originally approved alignment. The new total project cost estimate for the Barrhaven LRT project is \$3.52 billion, in 2022 dollars.

ACCESSIBILITY IMPACTS

As with the rest of the Barrhaven LRT project (Baseline Station to the Barrhaven Town Centre), the revised alignment segment will be developed to comply with the City's Accessibility Design Standards and other relevant guidelines.

INDIGENOUS GENDER AND EQUITY IMPLICATIONS

There are no gender and equity implications.

Consultation with Indigenous Peoples was carried out in accordance with provincial legislation and is documented in the Consultation section of this report. To date, no concerns have been raised by Indigenous Peoples.

CLIMATE IMPLICATIONS

The Barrhaven LRT will help to reduce greenhouse gas emissions in Ottawa by transitioning from diesel buses to electrified light rail transit vehicles and encouraging transit ridership. Climate implications for the project's alignment are being considered through the Transit Project Assessment Process.

TERM OF COUNCIL PRIORITIES

The recommendation contained herein aims to support the following priority and outcomes of the City of Ottawa Strategic Plan 2019-2022:

Priority: Integrated Transportation

- Integrated Transportation: Enable effective mobility through a sustainable, accessible, and connected city transportation system.
 - An integrated transportation network that incorporates all modes of getting around;
 - Residents have easy access to their preferred transportation choice; and
 - Transportation infrastructure investment is sustainable and meets long-term needs.

DISPOSITION

Following the approval of the report, staff from the Planning, Real Estate and Economic Development Department will action the directions from Transportation Committee and Council pertaining to the revised alignment, consultation, documentation and the Transit Project Assessment Process.