Pinecrest and Queensview Stations / Stations Pinecrest et Queensview

SECONDARY PLAN - Volume 2
Annex E: Pinecrest-Queensview Transportation Study

PLAN SECONDAIRE - Volume 2
Appendice E: Étude sur les transports Pinecrest-Queensview

MEMORANDUM

To: Payton Hofstetter, City of Ottawa

From: Thaise Mota, P.Eng., Alta Planning + Design Canada, Inc.

CC: Isooda Niroomand, Alta Planning + Design Canada, Inc.

Justin Swan, P.Eng., Alta Planning + Design Canada, Inc

Peter Giles, City of Ottawa

Date: September 29, 2023

Re: **Pinecrest-Queensview Secondary Plan Transportation Review – Technical Report**

Introduction

The City of Ottawa (City) is developing a Secondary Plan for the area surrounding the Pinecrest and Queensview Stage 2 LRT Stations, including consideration of Active Transportation (AT) improvements. Alta Planning + Design Canada, Inc. (Alta) was retained by the City to determine the future transportation demand and develop a design concept that aligns with current policies for the full length of Queensview Drive and Pinecrest Road between Queensview Drive and Dumaurier Avenue (including the signalized intersections). The project also includes the design of a controlled crossing for people walking and biking in the vicinity of St. Stephen's Street and Harwood Avenue in order to provide a safer and more comfortable connection between Queensway Terrace North and Pinecrest Stage 2 LRT Station. Alta developed high-level design alternatives, a traffic analysis, and a Multi-Modal Level of Service (MMLOS) assessment, which were detailed in the Transportation Brief in earlier stages of this project. This report focuses on documenting the design options developed in previous stages and the elements of the final concept design. A Class D cost estimate for the concept design is also presented.

Existing Conditions

Road designations and General-Purpose Lane Configurations - The streets included within the study all have a posted (or unposted) speed limit of 50 km/h and include the following (**Figure 1** illustrates the existing geometric and lane configurations of Pinecrest Road in the study area):

- **Pinecrest Road (from Queensview Drive to Dumaurier Avenue)** – This section is a north-south, four-lane arterial road located just north of Highway 417. Heading northbound from Highway 417, Pinecrest intersects with Queensview Drive followed by Dumaurier Avenue. The short 40 m segment between those two T-intersections includes left-turn lanes in the north and south directions.

- **Dumaurier Avenue (at Pinecrest Road)** – This collector street is a two-lane road with a 20 m eastbound left-turn lane approaching Pinecrest Road.

- **Queensview Drive (at Pinecrest Road)** – This two-lane local street has a 40 m long westbound left-turn lane on its approach to Pinecrest Road.

- **St. Stephen's Street and Harwood Avenue (at Pinecrest Road)** – These streets are low-volume local streets that have stop control on their approaches to Pinecrest Road (north-south traffic on Pinecrest Road is free flowing, with no traffic control at these intersections). These streets intersect Pinecrest Road from opposite sides of the street and are offset from one another, forming two T-intersections separated by a 45 m segment.

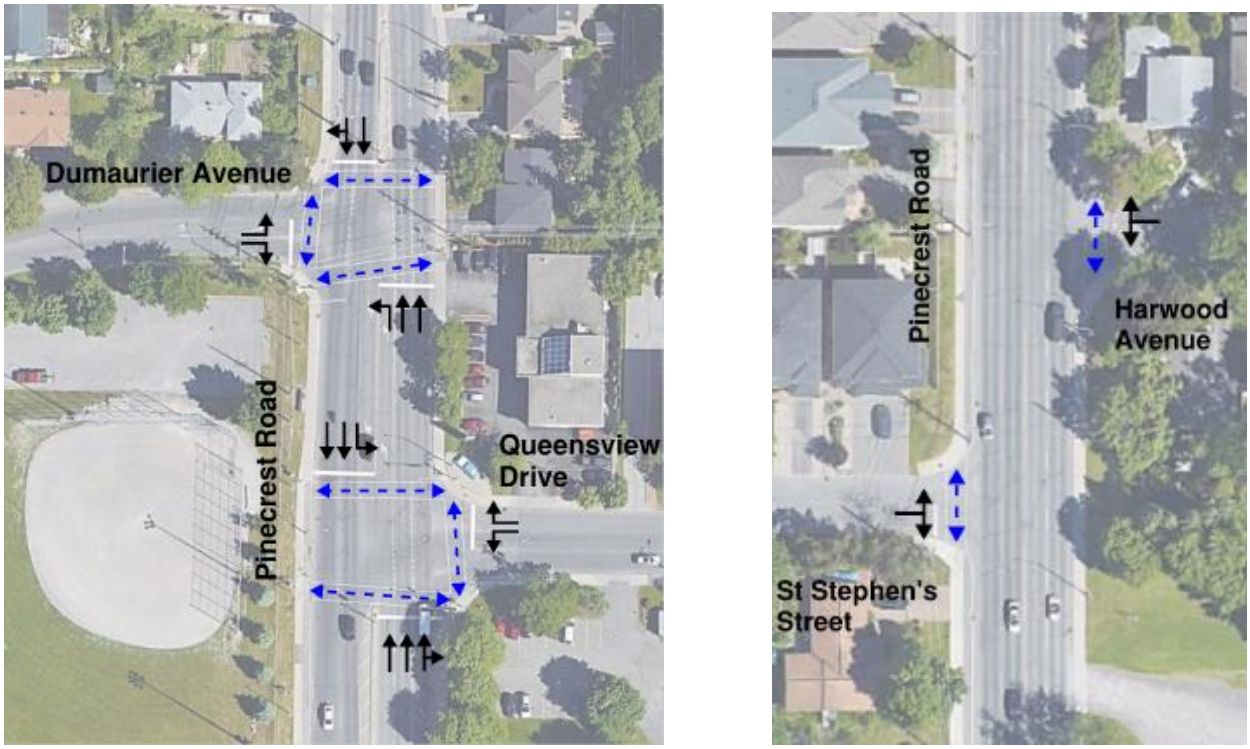


Figure 1: Existing geometric and lane configurations in the study area (black solid lines – general-purpose lane configuration; blue dashed-lines – painted crosswalks)

Street Parking - Parking is not allowed along Pinecrest Road but it is permitted on the north side of Dumaurier Avenue and on the south side of Queensview Drive starting approximately 150 m away from their respective intersections with Pinecrest Road.

Transit - There are no bus stops along Pinecrest Road in the study area. On Queensview Drive, the nearest bus stops in each direction are located approximately 400 m east of Pinecrest Road and they serve bus route #61. On Dumaurier Avenue, there are bus stops in each direction located approximately 40 m from the intersection of Pinecrest Road and they serve bus routes #82, 173, and 691.

Active Transportation (AT) Infrastructure – There are wide sidewalks of approximately 2 m on each side of Pinecrest Road on the segment between Dumaurier Avenue and Queensview Drive. To the north and south of this segment, the sidewalks are substandard with approximately 1.5 m and an asphalt buffer from the curb. On Dumaurier Avenue, there are sidewalks on both sides of the street with the one on the north side being substandard. On Queensview Drive, there is a substandard sidewalk on the south side of the street and none on the north side, with the exception of a short segment near the intersection of Pinecrest Road, which presents 2 m sidewalks on both sides. There are no dedicated cycling facilities on any of the roads in the study area.

Other Right-of-Way (ROW) Considerations - The existing ROW on Dumaurier Avenue and Queensview Drive is 20 m. On Pinecrest Road, the ROW is 40 m up to the intersection of Queensview Drive and 30 m north of it. In most of the study area, there are grassy, narrow boulevards with utility poles and mature trees behind the sidewalks and/or immediately behind the existing property lines.

Design Inputs and Criteria

The following inputs (provided by the City of Ottawa) were used to inform the evaluation of existing conditions presented in the Transportation Brief as well as provide insights into opportunities for consideration in during concept design exercise:

- Aerial base mapping, above-ground utilities and parcel data
- Turning Movement Counts (TMCs) at all the intersections on Pinecrest Road from Highway 417 West Off-Ramp to Harwood Avenue
- Speed study on Queensview Drive from Pinecrest Drive to the east end
- Signal timing at the intersections at Dumaurier Avenue, Queensview Drive, and Highway 417 West Off-Ramp
- TRANS Regional Models (base case AM and PK peak volumes) from 2011 and 2031 for the study area
- Active development applications on Queensview Drive and Dumaurier Avenue
- Pinecrest and Queensview Stations Secondary Plan – Volume 2
    - Schedule A – Preliminary Draft Recommendations
    - Annex A – Long-term Demonstration Plan for lands surrounding Pinecrest Station: potential street network and park locations and maximum building heights
- Stage 2 LRT Confederation West Functional Design – Pinecrest Road Interchange Connectivity
- Anticipated redevelopment type and growth on Queensview Drive and Dumaurier Avenue by 2046

The following are general constraints and directions provided by the city:

- Minimize impacts to utility poles and mature trees on Pinecrest Road
- Minimize impacts to existing street parking
- Connect to Stage 2 LRT project design south of Queensview Drive
- Road space can be reallocated considering the minimum through lane width of 3.5 m and minimum turn lane width of 3.25 m
- Maintain traffic control devices at intersections
- Consider the future ROW of 24 m on Queensview Drive as per the ROW protection in schedule c16 of the City's official plan from November 2022
- Queensview Drive designation will change from Local to Collector
- Queensview Drive typical section to follow the 24A Mixed Frontages cross-section demonstration from Ottawa's Designing Neighbourhood Collector Streets guidelines (2019)
- Design of AT facilities and intersections to follow Ottawa's Protected Intersection Design Guide (PIDG) (2021) recommendations

Concept Design

The following section documents the rationale and discussion around the development of the concept design. The final drawings are presented in **Attachment A**.

Pinecrest Road at Queensview Drive and Dumaurier Avenue

Network Layout Alternatives: Two high-level network layout alternatives were presented to the City for assessment and internal discussions. Both options propose a protected intersection at Queensview Drive and tie into the Stage 2LRT design south of the intersection, but can be differentiated as follows:

- ***Option 1*** **-** This option focuses on the re-alignment of Dumaurier Avenue to meet at the intersection of Queensview Drive and Pinecrest Road. This realignment creates a four-legged intersection at the existing Queensview Drive location and eliminates the existing offset intersection configuration.

- ***Option 2*** **-** This option maintains the existing network configuration (i.e. with Dumaurier Avenue and Queensview Drive intersecting Pinecrest in their current locations), but proposes narrower traffic lanes to accommodate standard AT facilities.

Preferred Network Layout: Option 2 was selected by the City to proceed to traffic analysis, MMLOS assessment (documented in the Transportation Brief) and concept design. Option 1 was screened out due to uncertainty regarding development growth west of Pinecrest Road and how it would impact the realignment of Dumaurier Avenue.

Forecast Analysis: Vehicular Intersection Capacity and Left Turn Lane Considerations - Based on the assumptions provided by the City, the number of auto trips generated by future developments will add over 680 and 400 vehicular trips to Queensview Drive and Dumaurier Avenue respectively during the weekday peak hours by 2046 (AM and PM peak hours combined). This additional vehicular traffic volume would require longer turn bays approaching Pinecrest Road from both Queensview Drive and Dumaurier Avenue if the City wishes to accommodate the forecast 95th percentile queues. Specifically, left-turn bays would need to extend to 80 m on Dumaurier Avenue and 100 m on Queensview Drive to accommodate these forecast queues.

Proposed Design: The following elements were included in the proposed design:

- ***Protected Intersection Concept*** **-** A protected intersection is proposed at the Queensview Drive / Pinecrest Road intersection. Not only would this provide for a protected active transportation enviornment (including crossrides being added for dedicated crossing space for cyclists), but the design would allow for a shorter crosswalk on the east leg and tighter corners which helps reduce vehicle turning speeds. The design also proposes the introduction of bicycle signals and leading pedestrian and bicycle intervals (LPI/LBI) for the north and south legs at this intersection to minimize conflicts between people crossing and left-turning vehicles.

- ***Cycling Improvements*** **-** On the west side of Pinecrest Road, a 3.5 m bidirectional cycle track is proposed. This facility would extend from south of the intersection with Queensview Drive to Dumaurier Avenue. The 30 m ROW between these intersections limits the ability to provide a buffer space between the cycle track and the general-purpose travel lanes without the consideration of removing or narrowing elements to sub-standard widths. South of Queensview Drive, the cycle track is intended to tie into the Stage 2 LRT project design. On the east side, a transition to the northbound general-purpose lane along Pinecrest Drive is provided for cyclists coming from the northeast protected corner at Queensview Drive. However, this connection will be reviewed upon detailed design and may be closed until dedicated cycling facilities are provided north of Dumaurier Avenue. Additionally, the proposed cycling facilities do not address the existing cycling network gap between Dumaurier Avenue and St. Stephen's Street. Therefore, wayfinding considerations should be made at detailed design stages to guide people on bicycles to/from Watson Street.

- ***Pedestrian Improvements*** **-** A 2 m sidewalk and half-height curb separation from the proposed bidirectional cycle track are included in the design on the west side of Pinecrest Road. Pedestrian refuges are included on this side of the road for the north and south leg crossings at the intersection of Queensview Drive. The southwest corner was tightened at the Dumaurier Avenue intersection to reduce right-turning vehicle speed and minimize conflict with pedestrians on the existing crosswalk on the south leg.

Queensview Drive Segment

Proposed Design: The following elements were included in the proposed design:

- ***Active Transportation and Boulevard Cross-Section Layout*** **-** The design of Queensview Drive east of Pinecrest Road was guided by the City's *Designing Neighbourhood Collector Streets* guidelines. The proposed design introduces 2 m sidewalks and 2 m unidirectional cycle tracks on both sides of Queensview Drive. Landscaped buffers of 2 m on the south and 2.5 m on the north are proposed between the cycle tracks and the curb to improve comfort and safety for people on bikes and a better overall experience for all road users. A half-height curb is proposed to separate sidewalks and cycle tracks and facilitate the detection by pedestrians with low vision as recommended in Ottawa's PIDG. These design elements fit within the future 24 m ROW.

- ***Street Parking*** **-** East of the westbound left-turn lane termination, a 2.4 m parking lane is introduced on the north side of the street as demonstrated in cross-section 24A from Ottawa's *Designing Neighbourhood Collector Streets* guidelines. The street parking and curb bulb-outs are recommended to alternate on each side of the street along its full extension to allow for an alignment shift and prevent traffic speeding.

Trade-offs between the AT facilities and existing utility and light standard poles are expected on Pinecrest Road and Queensview Drive, as identified in the functional design drawings. Those trade-offs should be further assessed during the detailed design stage with the use of a topographic survey. The proposed design allows for the realignment of AT facilities and "pinch points" where required to minimize potential conflicts and excessive costs.

Pinecrest Road at St. Stephen's Street and Harwood Avenue

Two high-level alternatives were proposed for the implementation of active transportation facilities on and across Pinecrest Drive in the vicinity of St. Stephen's Street and Harwood Drive to accommodate both pedestrians and cyclists. In both options, bidirectional cycling facilities were proposed on the west side of Pinecrest Road as more constraints were observed on the east side such as steeper grading, utility poles, and trees. For this reason, the potential controlled crossing location was proposed to be near the intersection at Harwood Avenue on the south leg.

- ***Option 1 –*** This option proposed separate spaces for pedestrians and cyclists, including a 2 m sidewalk and a 3 m bidirectional cycle track from St. Stephen's Street to the potential crossing location with a curb extension and slight roadway shift to the east.

- ***Option 2 –*** This option proposed a shared-use, 3.5 m multi-use pathway for the same extension with no curb impact.

Preferred Design - Option 2 was selected by the City to proceed to concept design in order to avoid impacting the existing curb and catch basin and minimize implementation costs.

Proposed Design: The following additional elements were included in the proposed design (beyond what is listed in Option 2 above):

- ***Crossing Control Type*** **-** As detailed in the Transportation Brief, an intersection pedestrian signal (IPS) was recommended to allow people on bikes to ride across Pinecrest Road legally at the controlled crossing. Full signalization at this intersection was not warranted.

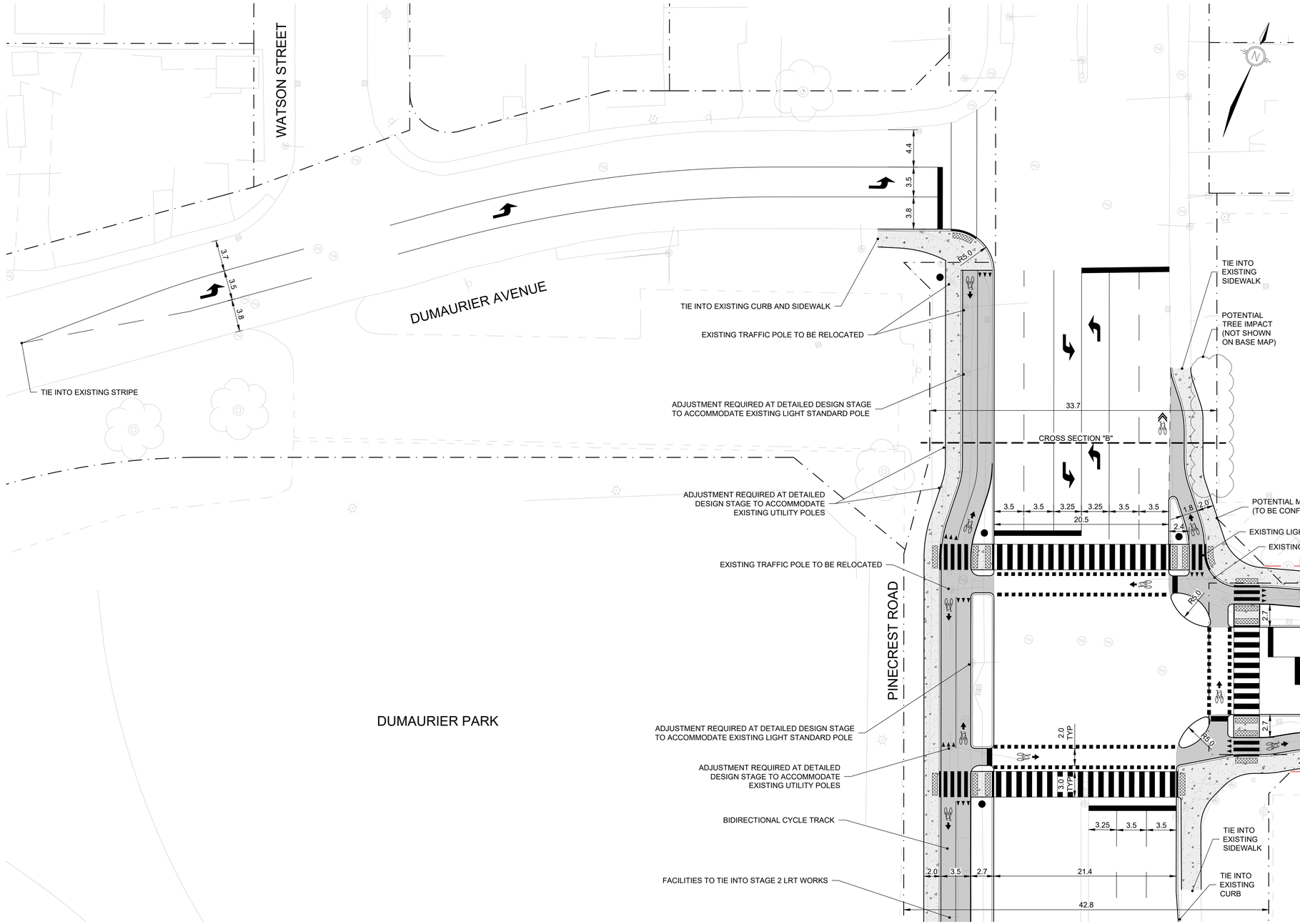
- ***Crossing Arrangement*** **-** Mixed crossrides are proposed at the intersections in the concept design to permit cyclists to access the signalized crossing from St. Stephen's Street and Harwood Avenue. At the signalized crossing, a combined crossride is proposed to connect the mixing area introduced on each end of the crossing. All mixing areas tie into the existing sidewalks.

Cost Estimate

A conceptual level Class 'D' cost estimate was developed for the concept design, totalling approximately $2.9 million. A detailed breakdown is shown in **Attachment B**. The estimate considers the proposed elements within the limits shown in the concept drawings: Pinecrest Road at Dumaurier Avenue and Queensview Drive, part of Queensview Drive, and Pinecrest Road at St. Stephen's Street and Harwood Avenue. This estimate excludes any potential impacts to the Stage 2 LRT project final design and respective tie-ins, which should be further investigated in functional and detailed design stages. The following items have not been considered in the concept design, nor the corresponding cost estimate:

- Street furniture
- Pavement rehabilitation
- Retaining walls
- Major grading works
- Full signalization of Pinecrest Rd at St. Stephen's/Harwood intersections

Attachment A – Concept Design Drawings



PLAN 1 - PINECREST ROAD AT DUMAURIER AVENUE/QUEENSVIEW DRIVE

1:250

PINECREST QUEENSVIEW
SECONDARY PLAN TRANSPORTATION REVIEW

CONCEPT PLAN
PINECREST RD FROM DUMAURIER AVE TO QUEENSVIEW DR

Director | *Project Manager*

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Ottawa

Contract No.	Drawing No.
CPXXXXXX	001

Sheet No. 1 of 3

Asset No.

Asset Group

Des:	Chk'd:
TM	JS
Dwn:	Chk'd:
TM	JS
Utility Circ. No.	Index No.

Construction Inspector:

Scale: 1:250

0m 5 10

NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

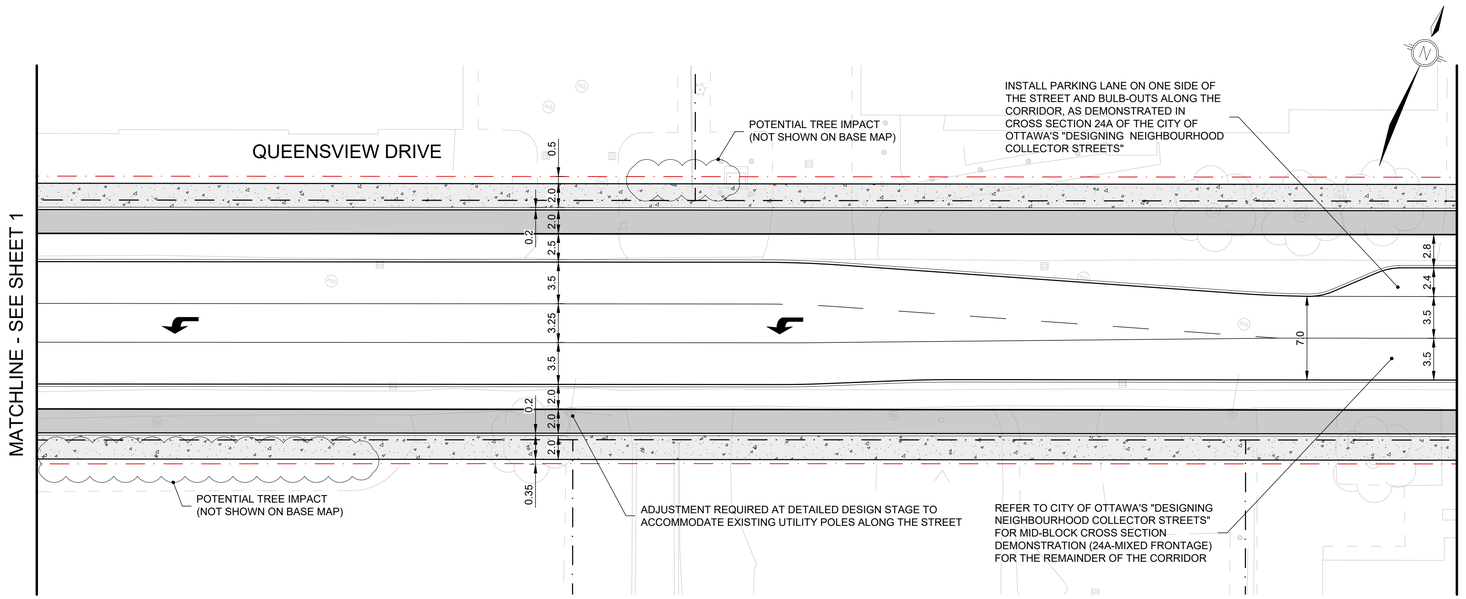
REVISIONS

No.	Description	By	Date (dd/mm/yy)
1	Concept Plan - Final	TM	(28/07/23)

NOT FOR CONSTRUCTION

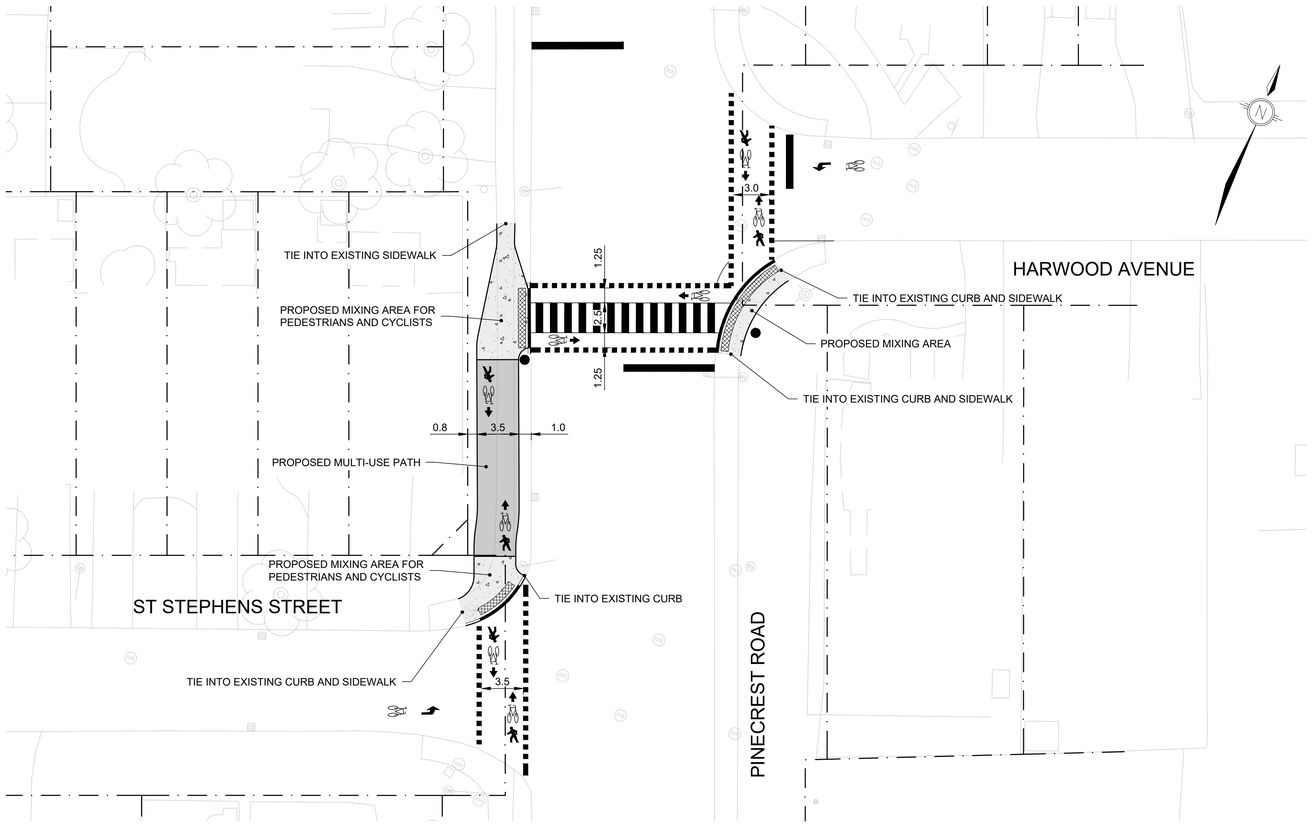
LEGEND:
- PROPERTY LINE
- FUTURE PROPERTY LINE*
- PROPOSED HALF-HEIGHT / FULL-HEIGHT CONCRETE CURB
- PROPOSED DEPRESSED CONCRETE CURB
- PROPOSED 2.0 m CONCRETE SIDEWALK
- PROPOSED CYCLE TRACK
- PROPOSED TACTILE WALKING SURFACE INDICATOR
- PROPOSED TRAFFIC POLE LOCATION

*NOTE: FUTURE PROPERTY LINES DELINEATE THE ROAD ROW OF 24 m AS PER THE ROW PROTECTION IN SCHEDULE C16 OF THE CITY'S OFFICIAL PLAN FROM NOVEMBER 2022.



PLAN 1 - QUEENSVIEW DRIVE (CONTINUATION)

1:250



PLAN 2 - PINECREST ROAD CROSSING AT HARWOOD AVENUE

1:250

PINECREST QUEENSVIEW
SECONDARY PLAN
TRANSPORTATION REVIEW

CONCEPT PLAN
QUEENSVIEW DR AND
PINECREST RD AT HARWOOD AVE

Director | *Project Manager*

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Contract No.	Drawing No.
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Sheet No. 2 of 3

Asset No.

Asset Group

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Dwn:	Chk'd:
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Utility Circ. No.	Index No.

Construction Inspector:

Scale: 1:250

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REVISIONS

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1	Concept Plan - Final	TM	(28/07/23)

NOT FOR CONSTRUCTION

LEGEND:

- PROPERTY LINE
- FUTURE PROPERTY LINE*
- PROPOSED HALF-HEIGHT / FULL-HEIGHT CONCRETE CURB
- PROPOSED DEPRESSED CONCRETE CURB
- PROPOSED 2.0 m CONCRETE SIDEWALK
- PROPOSED CYCLE TRACK
- PROPOSED TACTILE WALKING SURFACE INDICATOR
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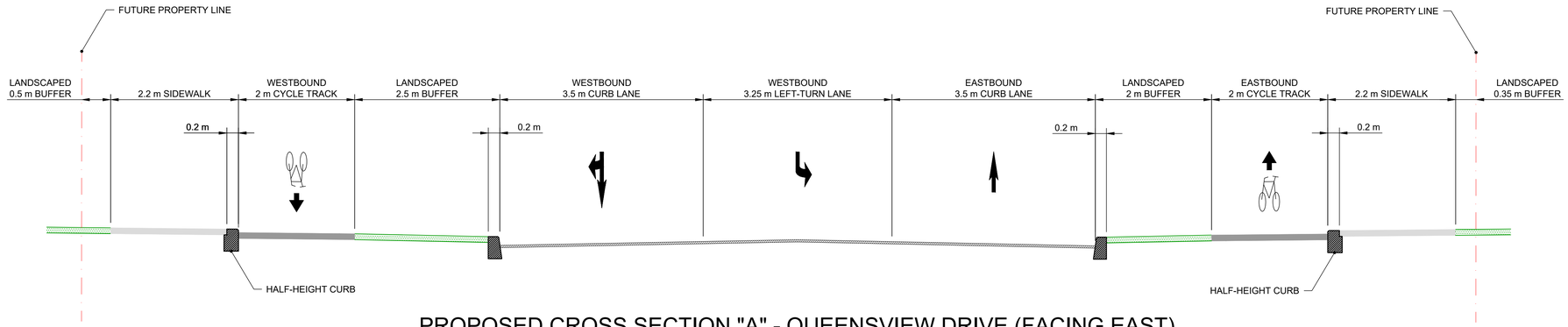
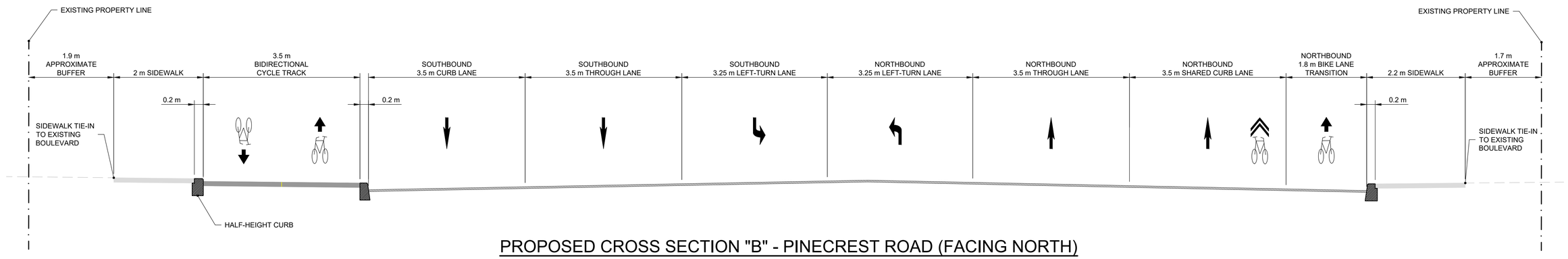


PROPOSED CROSS SECTION "A" - QUEENSVIEW DRIVE (FACING EAST)

N.T.S.



PROPOSED CROSS SECTION "B" - PINECREST ROAD (FACING NORTH)

N.T.S.

PINECREST QUEENSVIEW
SECONDARY PLAN
TRANSPORTATION REVIEW

CONCEPT CROSS SECTIONS
PINECREST RD AND QUEENSVIEW DR

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Contract No.	Drawing No.
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Sheet No. 3 of 3

Asset No.

Asset Group

Des:	Chk'd:
TM	JS
Dwn:	Chk'd:
TM	JS
Utility Circ. No.	Index No.

Construction Inspector:

Scale: N.T.S.

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REVISIONS

No.	Description	By	Date (dd/mm/yy)
1	Concept Cross Sections - Final	TM	(28/07/23)

NOT FOR CONSTRUCTION

Attachment B – Class D Cost Estimate Breakdown

Pinecrest-Queensview Secondary Plan Transportation Review
Cost Estimate - Class D

Feature	Unit	Quantity	Unit Cost	Total Cost	Notes
Removals					
Excavation/Granular B Type II Backfill	m3	500	$ 71	$ 35,500	Assumes 300 mm depth
Clearing and Grubbing	m2	1400	$ 26	$ 36,400	
Remove Concrete Curb and Gutter	m	500	$ 34	$ 17,000	
Remove Concrete Sidewalk	m2	1020	$ 47	$ 47,940	
Remove and Salvage Unit Pavers	m2	60	$ 48	$ 2,880	
Remove Asphalt Pavement - Full Depth	m2	800	$ 50	$ 40,000	
Asphalt saw-cutting and partial depth removal for tie-ins	m	600	$ 43	$ 25,800	Includes asphalt reinstatement
Remove Pavement Marking	m	610	$ 4	$ 2,440	
New Items					
Topsoil	m3	130	$ 109	$ 14,170	Assumes 150 mm depth
Sod	m2	820	$ 23	$ 18,860	
Trees	each	30	$ 527	$ 15,810	Assumes one tree every 10 m on each side
Concrete Curb and Gutter	m	1010	$ 123	$ 124,230	
Asphalt Cycle Track, inc granular base	m2	1120	$ 107	$ 119,840	
Roadway Reconstruction	m2	20	$ 204	$ 4,080	
Concrete Sidewalk, Medians, Islands inc. Granular A Bedding	m2	1150	$ 300	$ 345,000	
Tactile Warning Surface Indicators	m2	38	$ 1,200	$ 45,600	
Pavement Marking	LS	1	$ 15,100	$ 15,100	
Intersection Signals Update	each	1	$ 200,000	$ 200,000	At Queensview Drive. Inc. bike heads, signal poles, push buttons, wiring, controller update
Pedestrian Signal Installation	each	1	$ 50,000	$ 70,000	At Harwood Avenue. Inc. bike heads, signal poles, push buttons, wiring, controller install
Signage	LS	1	$ 2,800	$ 2,800	
Pedestrian or Traffic Control Plans	LS	1	$ 12,000	$ 12,000	
Erosion and Sediment Control Plan	LS	1	$ 3,000	$ 3,000	
Police Assistance	LS	1	$ 25,000	$ 25,000	
			Sum (items)	$ 1,230,000	
			Engineering (25%)	$ 307,500	Includes engineering design
			Miscellaneous (5%)	$ 61,500	
			Utilities (20%)	$ 246,000	Includes utility and lighting pole and catch basin relocations
			Internal Costs (10%)	$ 123,000	
			Sub-total	**$ 1,968,000**	
			Contingency (40%)	$ 788,000	
			HST (1.76% of Sub-total+Contingency)	$ 49,000	
			Contract Initiation (2% of Sub-total+Contingency)	$ 56,000	
			Total Cost	**$ 2,861,000**	

Prepared: Monday, September 25, 2023

GENERAL ASSUMPTIONS:

Typical environmental conditions are assumed

Road repaving is not included in the cost estimate

Cost estimate includes only the area within the project limits as shown in the Concept Plans and does not extend to the east end of Queensview Drive