

# E&N TRAIL

DOWNTOWN SOUTH ALIGNMENT &  
COSTING STUDY

**STUDY SUMMARY - FINAL**  
APRIL 2016



This page intentionally left blank to facilitate double-sided printing.





TABLE OF CONTENTS

1.0 PROJECT OVERVIEW ..... 1

    1.1 Introduction .....1

    1.2 Background .....3

    1.3 Study Process .....4

2.0 EXISTING CONDITIONS ..... 5

    2.1 Study Sections .....5

    2.2 Project Challenges .....6

3.0 REGULATIONS ..... 7

    3.1 Overview of Current Regulations .....7

    3.2 Key Standards & Regulations .....9

    3.3 Roles & Responsibilities .....9

4.0 ALIGNMENT OPTION DEVELOPMENT ..... 11

    4.1 Trail design .....11

    4.2 Crossings .....12

    4.3 Alignment Options .....15

    4.4 Public & Stakeholder Feedback on Alignment Options .....17

5.0 RECOMMENDED ALIGNMENT ..... 20

    5.1 Alignment Overview .....20

    5.2 Summary .....21

        Recommended Alignment Section 1: Franklyn to Albert .....23

        Recommended Alignment Section 2: Albert to Hecate / Kennedy ..24

        Recommended Alignment Section 3: Hecate / Kennedy to Fifth .....25

        Recommended Alignment Section 4: Fifth to Seventh .....26

    5.3 Cost Estimate Summary .....27

    5.4 Additional Design Considerations .....29

    5.5 Phasing .....30

6.0 CLOSING .....31

APPENDIX A: SUMMARY OF ALIGNMENT OPTIONS A & B

APPENDIX B: CONSULTATION RESULTS SUMMARY

APPENDIX C: CLASS “D” COST ESTIMATE

APPENDIX D: RECOMMENDED CONCEPT ALIGNMENT DRAWINGS





The E&N Corridor is an important link through south and downtown Nanaimo. Its route through the central city makes it an ideal trail; however, this section presents some of the greatest challenges for safety, efficiency, and cost. The E&N Downtown South Alignment Study was completed to identify a feasible alignment for future development this important connection.





On March 20, 2014, City of Nanaimo Council supported development of the E&N Trail south from downtown to Seventh Street and allocated funding to undertake preliminary design starting in 2014 including route identification work and cost estimating in 2015.

# 1.0 PROJECT OVERVIEW

## 1.1 INTRODUCTION

The E&N Rail Corridor is a key multi-modal transportation corridor for the City of Nanaimo. The City of Nanaimo's long term goals include the construction of a multi-use trail along the corridor for the full length of the City. This also supports the larger long-term vision of a complete Vancouver Island trail corridor.

The City has made significant progress developing the E&N Trail, with 8 km complete between Caledonia Street and Mostar Road, connecting downtown to the north end of the City and a 250 m section between Fitzwilliam Street and Franklyn Street (see **Figure 1**, next page). The completed portions of the E&N Trail are a popular amenity, appealing to a growing population that uses alternative transportation, as well as people seeking fitness and outdoor recreation opportunities.

As a first step towards extending connectivity to the south, the City is undertaking this study of alignment options for the downtown section of the route between Franklyn Street and Seventh Street – a length of just under 2 km.

This report summarizes the findings of the Study and presents a recommended alignment for the trail from Franklyn Street to Seventh Street, including:

- ▶ An introduction to and overview of the Study and process;
- ▶ An overview of current related rail standards and guidelines and how these guidelines affect planning for this section of rail trail;
- ▶ Two preliminary alignment options that were considered in the Study;
- ▶ Outcomes of public and stakeholder consultation about the alignment options;
- ▶ A recommended alignment based on technical review and public feedback; and
- ▶ Preliminary cost estimates and phasing options for the recommended alignment.



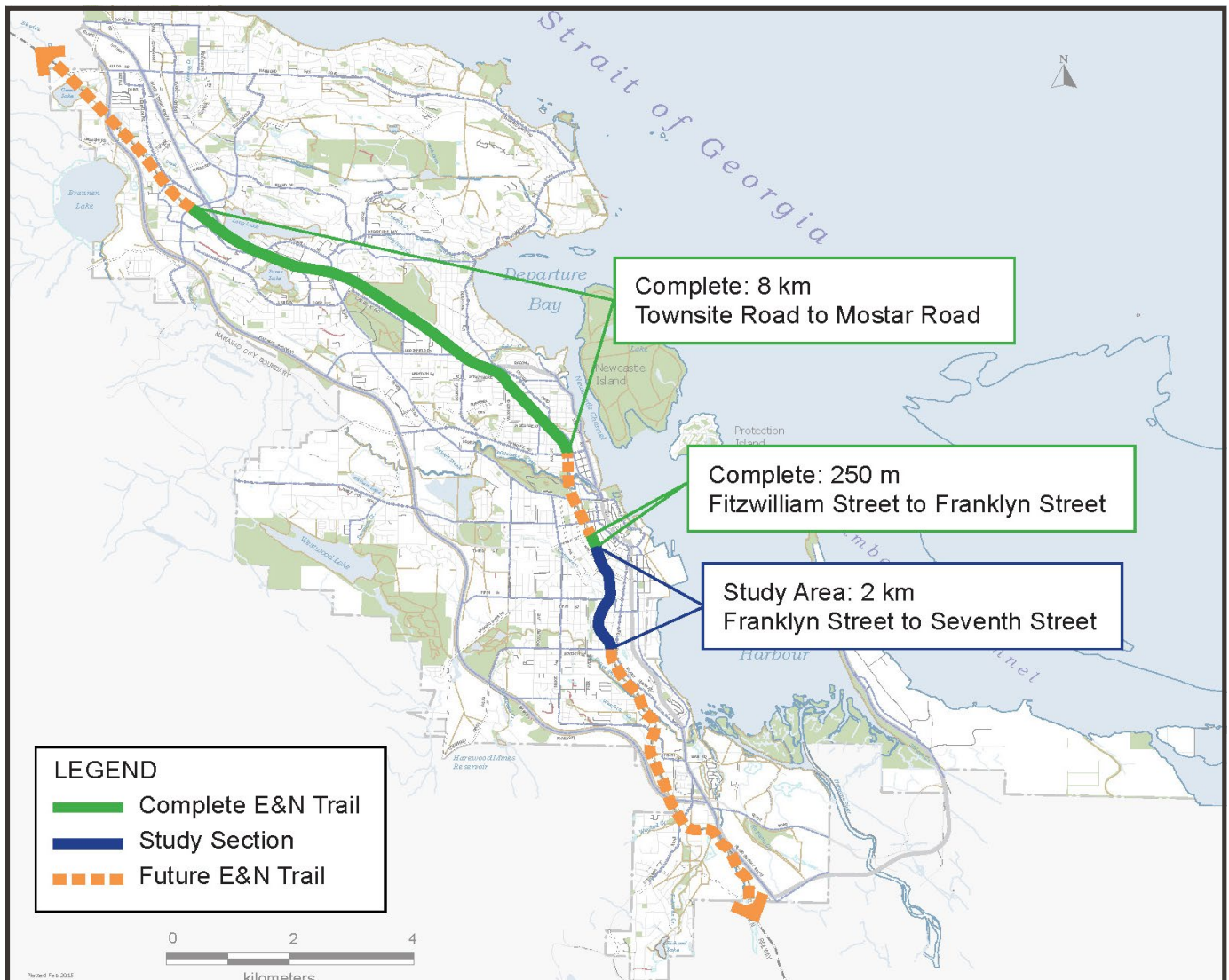


Figure 1: E&N Trail within the City of Nanaimo





## 1.2 BACKGROUND

Development of the E&N Trail in Nanaimo's downtown has been a long-time community goal. It is identified in the City planning documents outlined in **Table 1**.

Table 1: City Documents Supporting E&N Trail Development

Document	Date	Reference
Parks, Recreation, and Culture Master Plan	2004	"Extend the trail along the Esquimalt-Nanaimo rail right-of-way as a trail / cycle path connecting the City from south to north."
Trail Implementation Plan	2007	Identifies extension of the E&N Trail as a long-term goal.
planNanaimo Official Community Plan	2008	<b>Map 2: Mobility</b> shows the E&N corridor as a Trailway.
South End Neighbourhood Plan	2010	"The City will continue to work with the Island Corridor Foundation to develop the E&N Trail through the neighbourhood as an important cycling and walking corridor connection to / from Downtown and beyond. The corridor will integrate into the neighbourhood through connections to adjacent pedestrian cycling linkages, consistent with the City's Trail Implementation Plan, Bicycle Network Plan, and Map 2: Pedestrian Connectivity and Road Classification."
Harewood Neighbourhood Plan	2013	"The City will work with and support the Island Corridor Foundation in continued development of the E&N Trail as a vital link between the neighbourhood and the downtown area."
Nanaimo Transportation Master Plan	2014	"Provide several high quality north-south multiuse pathways as mobility spines, focusing on enhancing the existing E&N Trail, Harbourfront Pathway, and Parkway Trail. Extending these over time across the full length of the City and at key points to provide east-west linkages between them. Mobility spines should be paved, illuminated, and have high quality intersection treatments."

### 1.3 STUDY PROCESS

The outcome of this study is a recommended alignment that balances safety, economy, and quality of experience. Class D cost estimating and phasing information is provided along with future potential sequencing options to construct the trail.

**Figure 2** outlines the Study process.

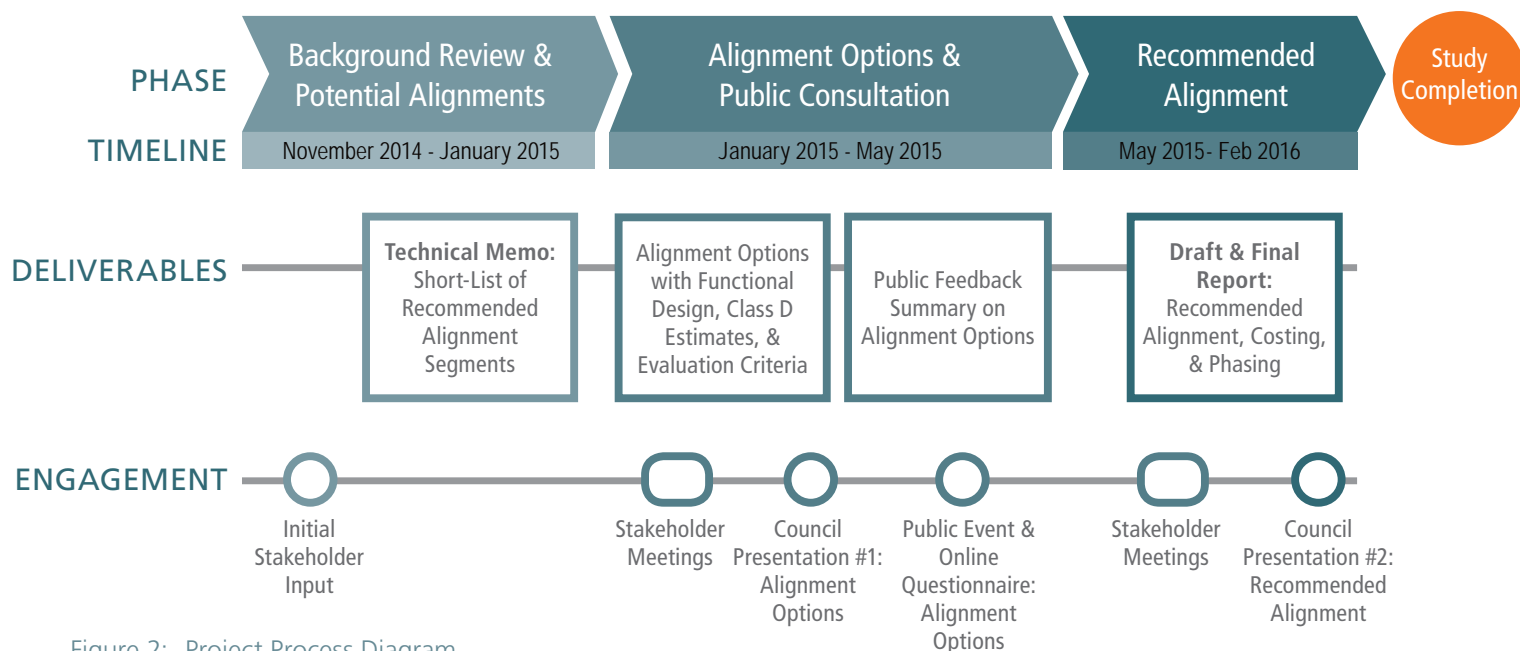


Figure 2: Project Process Diagram

**Figure 3** provides an overview of how the options were developed and refined through technical analysis and community and stakeholder engagement. A key component of the Study process was engagement with public and stakeholders including the Island Corridor Foundation, Southern Rail, Nanaimo Regional Rail Trail Partnership, Greater Nanaimo Cycling Coalition, South End Community Association, and Council to review and discuss potential alignment options. The input received was used to develop the recommended alignment.

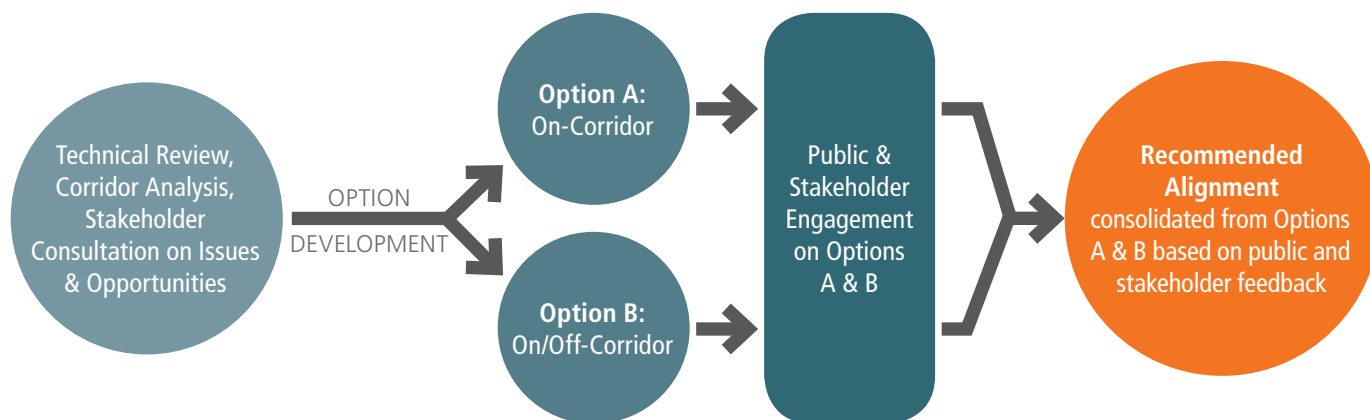


Figure 3: Option Development & Refinement Diagram





## 2.0 EXISTING CONDITIONS

### 2.1 STUDY SECTIONS

The study area is just under two kilometres in length from Franklyn Street south to Seventh Street. During the Study, the corridor was studied in four sections as outlined in **Figure 4**.

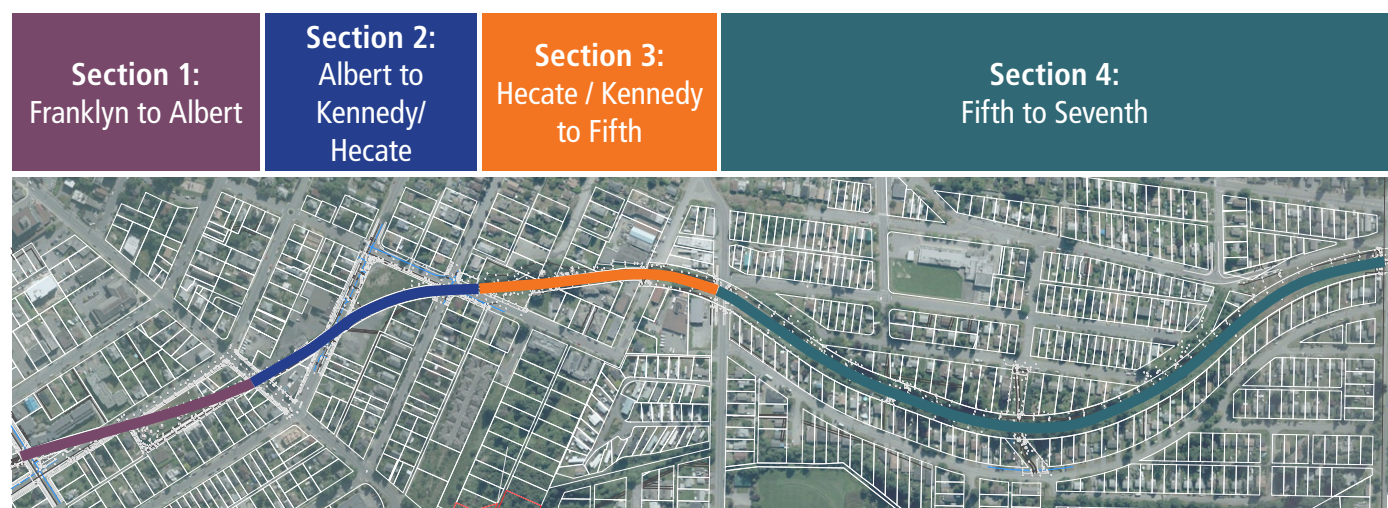


Figure 4: Study Sections



## 2.2 PROJECT CHALLENGES

Nanaimo's downtown core presents both a unique opportunity and a challenge for providing integrated multi-modal transportation. In the past decade, downtown and South Nanaimo have steadily increased in popularity as a place to live, work, and shop. With this success comes an increased demand for transportation options. However, the downtown section of trail is a challenging section of the E&N Trail due to three key issues:



- 1 The rail corridor narrows to 15 m (50'), or less in some locations, from its typical 30 m (100') width, making it more challenging to "fit" the trail within the corridor.



- 2 There are steep side slopes and low spots in several locations of the corridor which may require regrading and/or potential retaining walls.



- 3 The downtown core has short blocks, meaning there are a number of locations where the trail crosses the road next to an existing road / rail grade crossing. These crossings are the most costly part of a rail-with-trail network.

This project also must consider current safety regulations (see **Section 3.0**). Achieving current design standards can be costly, especially at grade crossings where road and rail intersect.

This study weighed the benefits versus the costs of alignment options both on and off the rail corridor to identify a solution that provides a high quality alignment, while being cost conscious.

For more information about existing conditions, refer to the **Technical Memo: Short List of Alignment Segments Recommended for Further Consideration** dated February 23, 2015.



## 3.0 REGULATIONS

### 3.1 OVERVIEW OF CURRENT REGULATIONS

Railway operations adhere to federal and provincial standards. When a trail is located adjacent to an active railway, as the E&N Trail is, the railway operator must review and support the design as providing a sufficient level of public safety. This section provides a brief overview of standards and regulations that may be applicable to the E&N Trail.

The Canadian rail system includes both federal and provincial railways. Railways that cross provincial boundaries are governed by federal legislation, while railways that operate only within the boundaries of a province are governed by provincial legislation. The E&N Rail is a provincially regulated railway, operated by Southern Rail Vancouver Island (SVI).

Recent federal legislation has been developed by Transport Canada to help reduce the frequency and severity of accidents at Canada's federally-regulated grade crossings. The new legislation is intended to improve consistency in the approach to grade crossings and will be applicable to all federal grade crossings across the country. While the E&N is

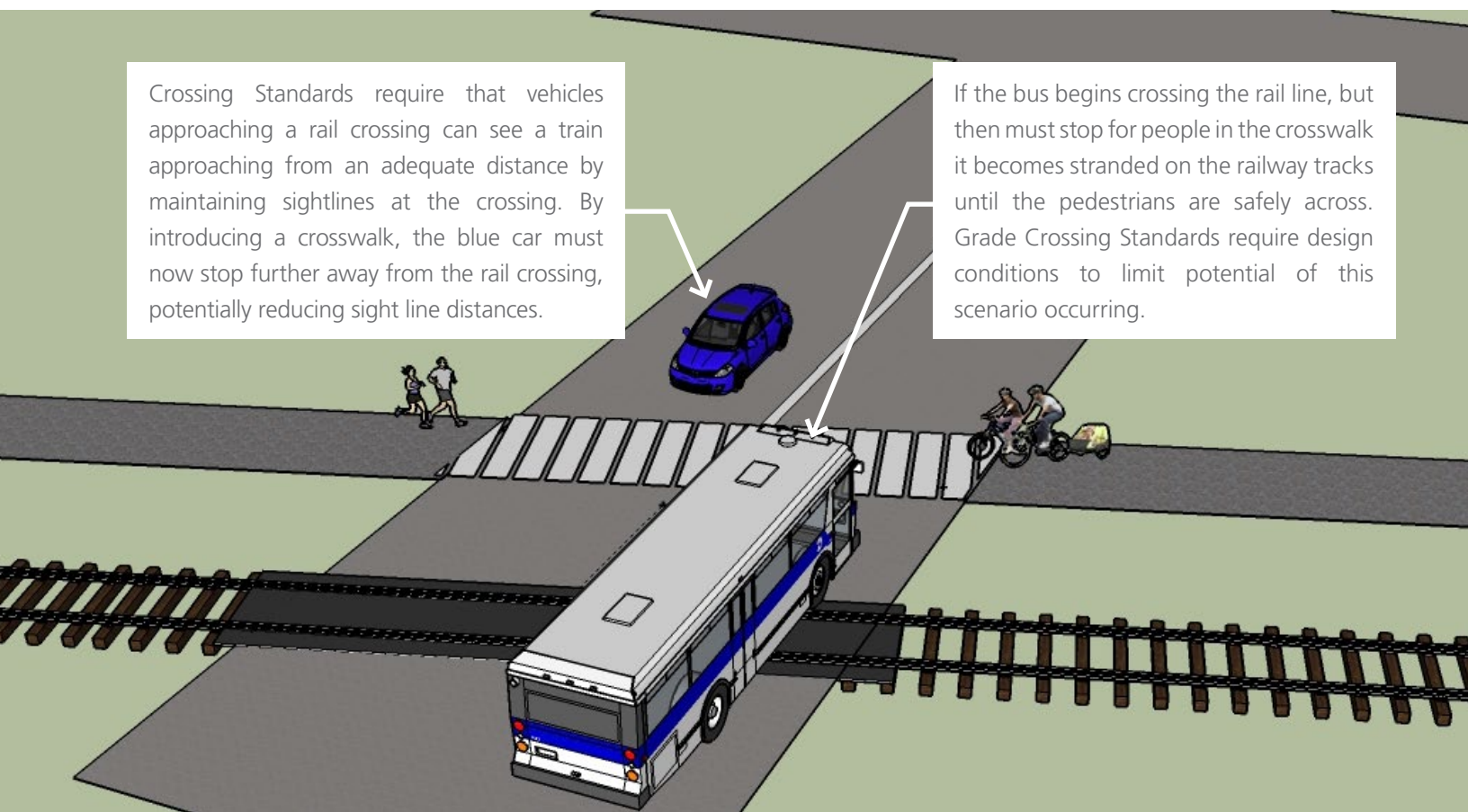
not a federally-regulated grade crossing, BC's Railway Safety Act refers to federal standards for design of grade crossings. To date, the 2014 Federal Grade Crossing Regulations have not been formally adopted in BC; however, operators may adhere to the federal standards in anticipation that future adoption could occur.

**Figure 5** outlines two key challenges that must be addressed when introducing a trail to an existing grade crossing. **Figure 6**, on the following page, summarizes the current regulations that were considered in this Study.

**Grade Crossing:** A road crossing where a road passes across a line of railway at grade.

In this study, grade crossings have the most influence on cost of the trail as they often require upgraded, coordinated signals to manage train, vehicle, and trail traffic.

Figure 5: The Relationship between Rail, Road, and Trail at Grade Crossings



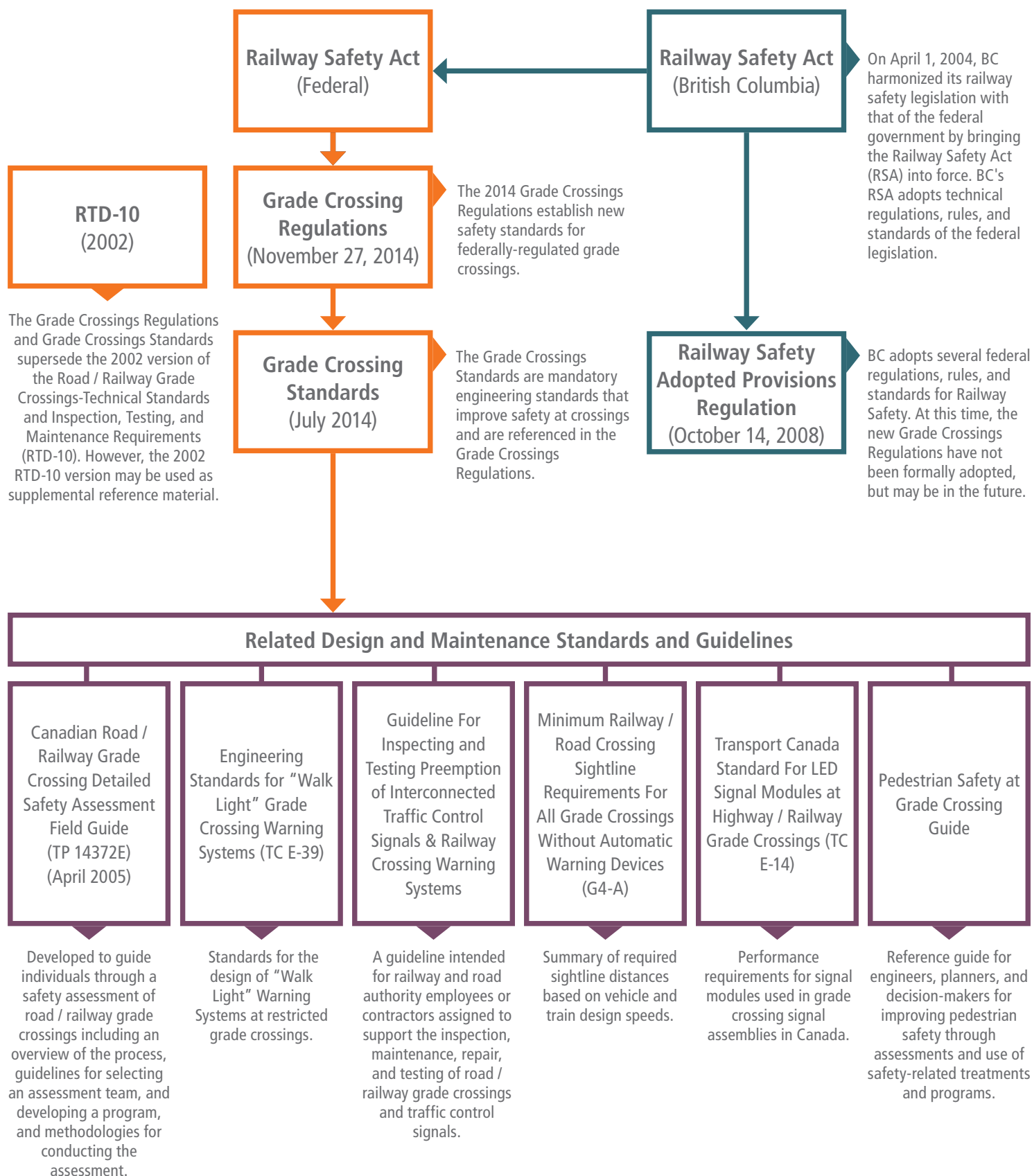


Figure 6: Overview of Relevant Acts, Regulations, Standards, and Guidelines (at the time of this Study)

## 3.2 KEY STANDARDS & REGULATIONS

### RAILWAY SAFETY ACT

Detailed design for the E&N Trail will be guided by the policies set out in the **British Columbia Railway Safety Act**, which adopts regulations, standards, and rules of the Federal Railway Safety Act. The Act provides the regulatory framework for railway safety, security, and some environmental impacts of railway operation.

### GRADE CROSSINGS REGULATION

The purpose of the federal **Grade Crossings Regulation** is to increase safety at Canada's federally regulated grade crossings by establishing enforceable safety standards for grade crossings, clarifying the roles and responsibilities of railway companies, road authorities, and private authorities, and promoting collaboration between railway companies and road authorities. At this time, BC has not formally adopted the federal Grade Crossings Regulation that came into force November 14, 2014.

### GRADE CROSSINGS STANDARDS

The **Grade Crossing Standards** provide additional detail about the engineering standards required in the design of grade crossings. The new standards provide similar, but updated information to the 2002 DRAFT RTD-10 Road / Railway Grade Crossings Standards. At the detailed design phase of a trail crossing, evaluation should be undertaken in accordance with the Grade Crossing Standards.

To develop a recommended alignment and Class "D" cost estimate for this Study, a high level review of potential crossings against the following sections of the Grade Crossing Standards were completed:

- ▶ Section 7 – Sightlines
- ▶ Section 9 – Warning System Specification
- ▶ Section 10 – Design Considerations
- ▶ Section 11 – Location of Grade Crossings

This review allowed the Study team to identify the warning system that would likely be required at each crossing location. While this preliminary assessment is sufficient to determine general crossing design, full assessment will be required during detailed design for each crossing.

## 3.3 ROLES & RESPONSIBILITIES

Grade crossings are a multi-jurisdictional piece of infrastructure. The two main jurisdictions involved in development of grade crossings include:

**Railway Company:** A railway company that owns or operates a railway line at a grade crossing is responsible for:

- ▶ the part of the road surface that lies between the rails of the track and the road surface up to the ends of the railway ties;
- ▶ the elevation of the railway tracks in relation to the road;
- ▶ sightlines along the railway right of way;
- ▶ drainage along the railway right of way;
- ▶ railway crossing signs; and
- ▶ grade crossing warning systems including signs, lights, and/or gates.

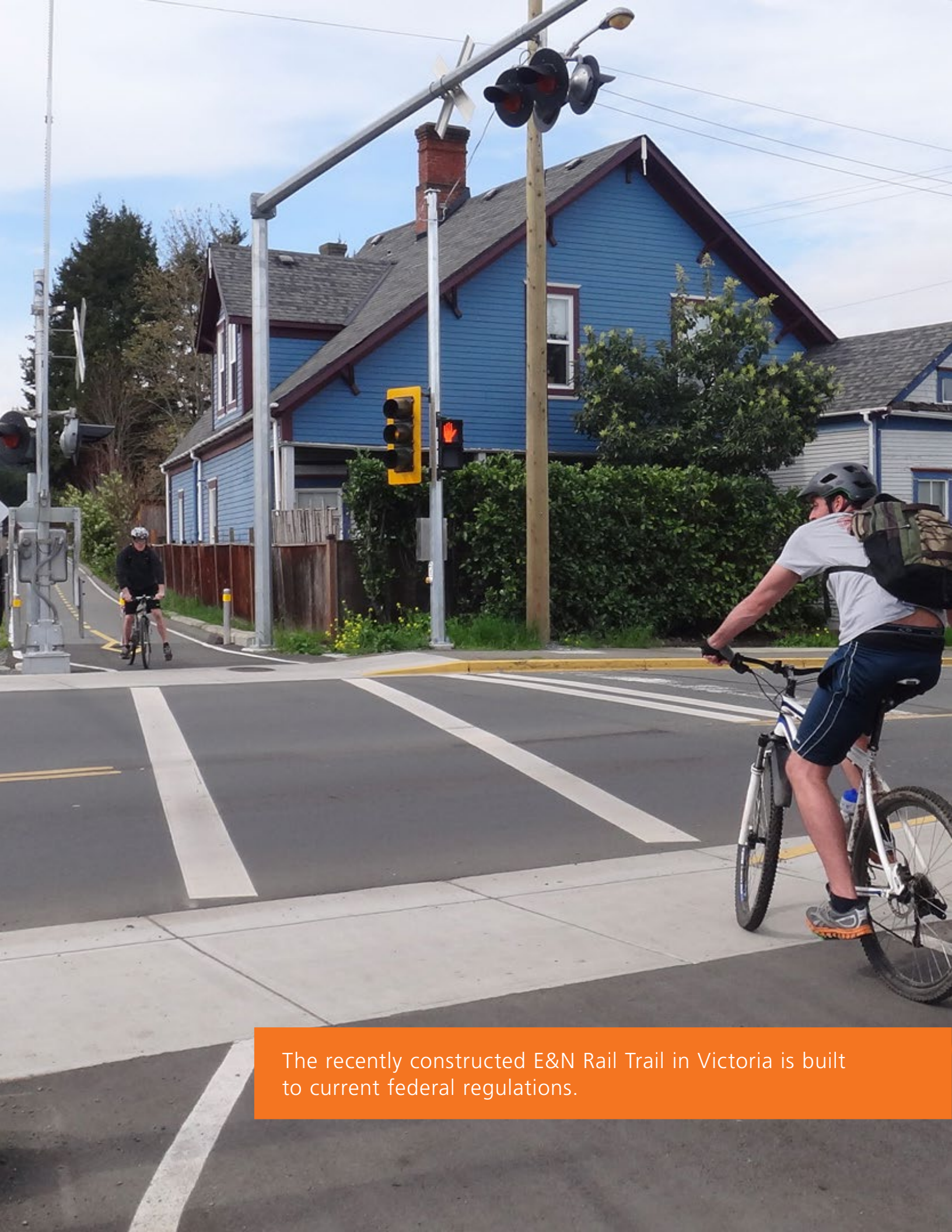
For the E&N, the Railway Company is **Southern Rail Vancouver Island**.

**Road Authority:** The road authority that maintains a road that passes across a railway line at grade is responsible for:

- ▶ the road approaches, including the elevation of the road in relation to the railway track;
- ▶ sightlines along the road right of way;
- ▶ drainage along the road right of way;
- ▶ traffic control devices on road approaches and stop signs at grade crossings, including devices that interconnect with grade crossing warning systems;
- ▶ lighting devices to illuminate trains, engines, and other railway equipment occupying grade crossings to ensure that they are clearly visible to pedestrians and drivers of vehicles; and
- ▶ the removal of snow from the road for the safe passage of vehicles, bicycles, pedestrians, and persons using assistive devices over the grade crossing

For the E&N within Nanaimo, the Road Authority is **City of Nanaimo**. During detailed design of the E&N Trail, coordination on the design of grade crossings between SVI and City of Nanaimo will be essential.





The recently constructed E&N Rail Trail in Victoria is built to current federal regulations.

# 4.0 ALIGNMENT OPTION DEVELOPMENT

## 4.1 TRAIL DESIGN

To study potential alignment options for the E&N Trail, the Study team considered how a typical profile for the E&N Trail would “fit” within the potential alignments. The following figures show the components of typical trail sections for a narrow (15 m / 50’) corridor ROW and for a wide (30 m / 100’) corridor ROW.

Figure 7: Typical Trail Components within a narrow (15 m / 50’) Corridor ROW

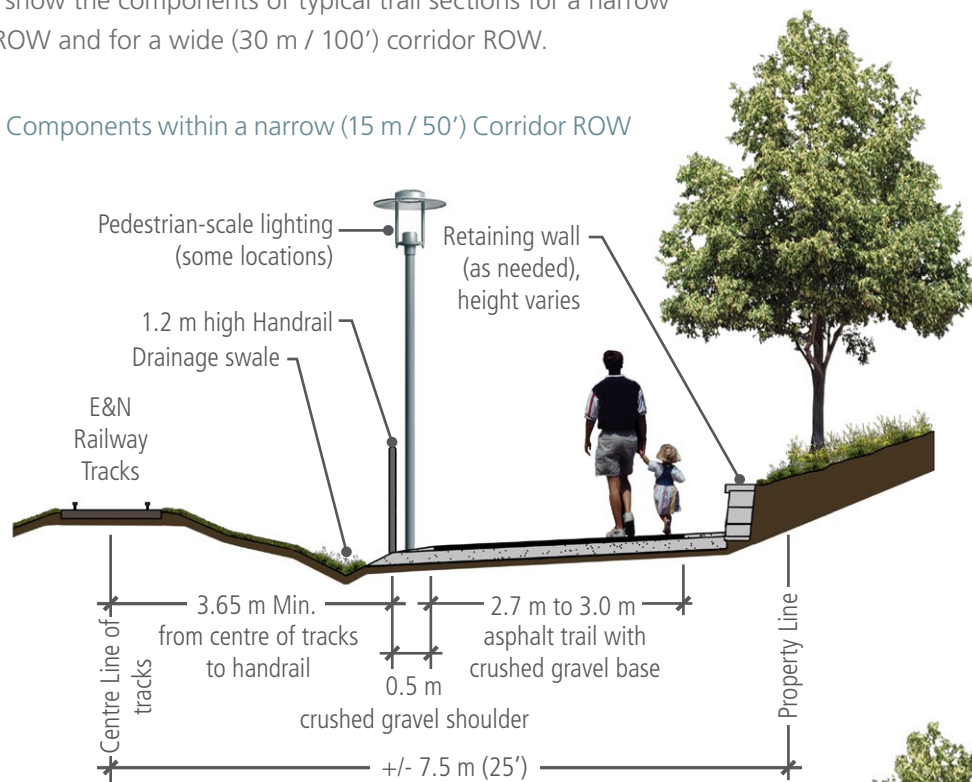
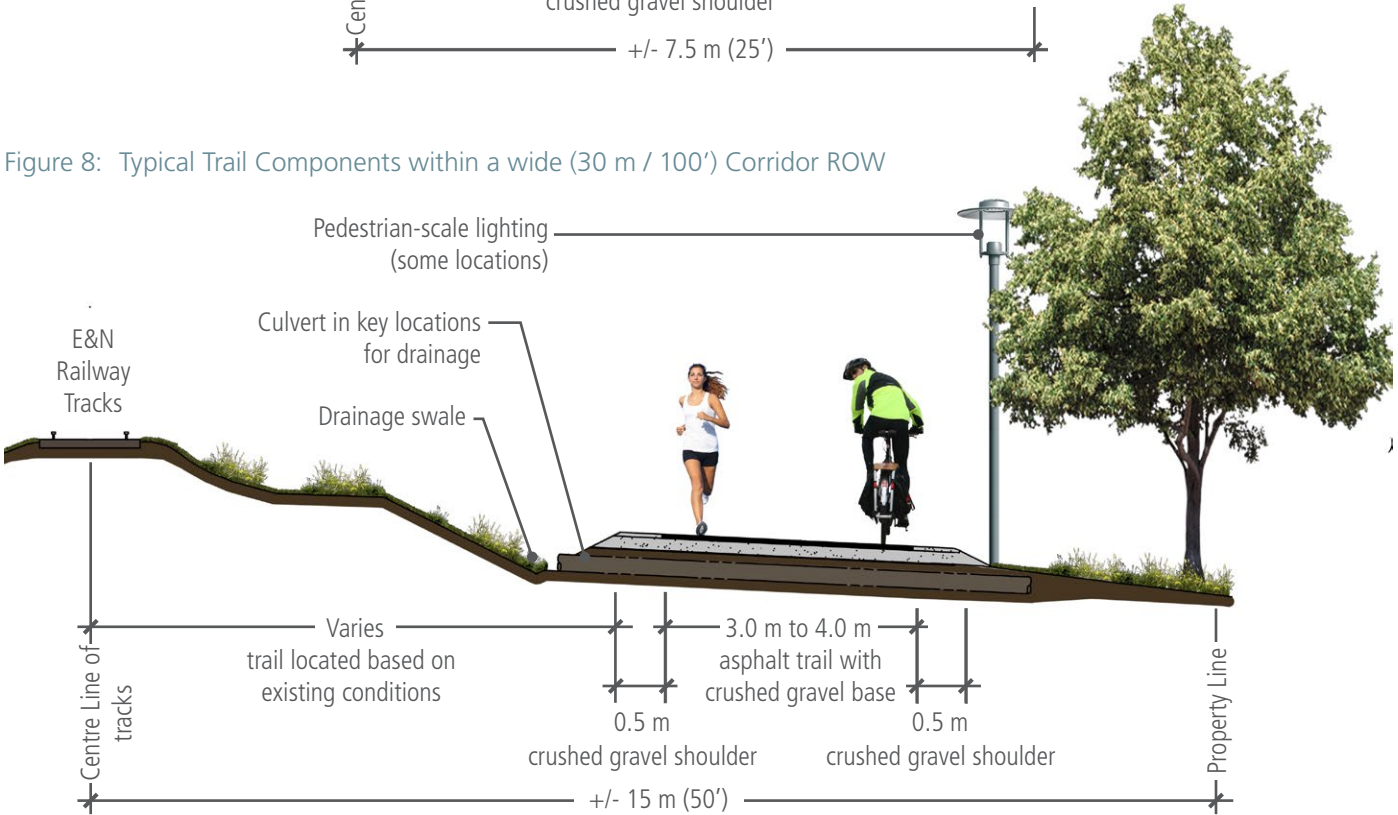


Figure 8: Typical Trail Components within a wide (30 m / 100’) Corridor ROW





## 4.2 CROSSINGS

As one of the key components of the alignment, the Study analyzed different crossing conditions. The following figures show the components of typical crossing conditions.

Figure 9: Typical Grade Crossing Requiring Upgrades to Signals and Gates

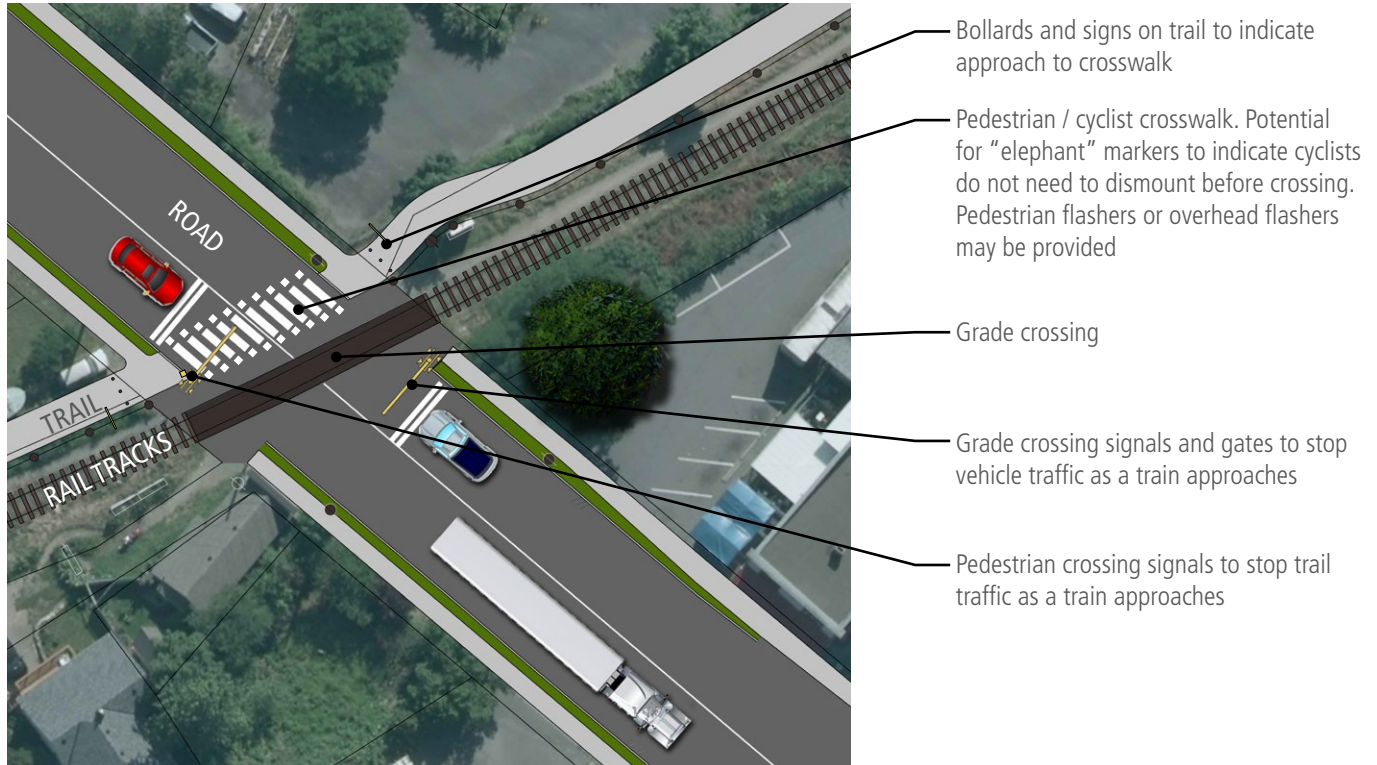


Figure 10: Components of a Grade Crossing Requiring Upgrades to Signals and Gates



When a trail crosses the road adjacent to a grade crossing, the following key components are typically required:

- 1 As a train approaches, a sensor on the tracks signals the crossing signals and gates.
- 2 A pedestrian signal stops all pedestrians and cyclists from proceeding through the intersection.
- 3 Once pedestrians are stopped, a signal and gates stop all vehicle traffic from crossing the tracks.

After the train has cleared, pedestrians and vehicles may resume travel.

Figure 11: Typical Grade Crossing Not Requiring Upgrades to Signals and Gates

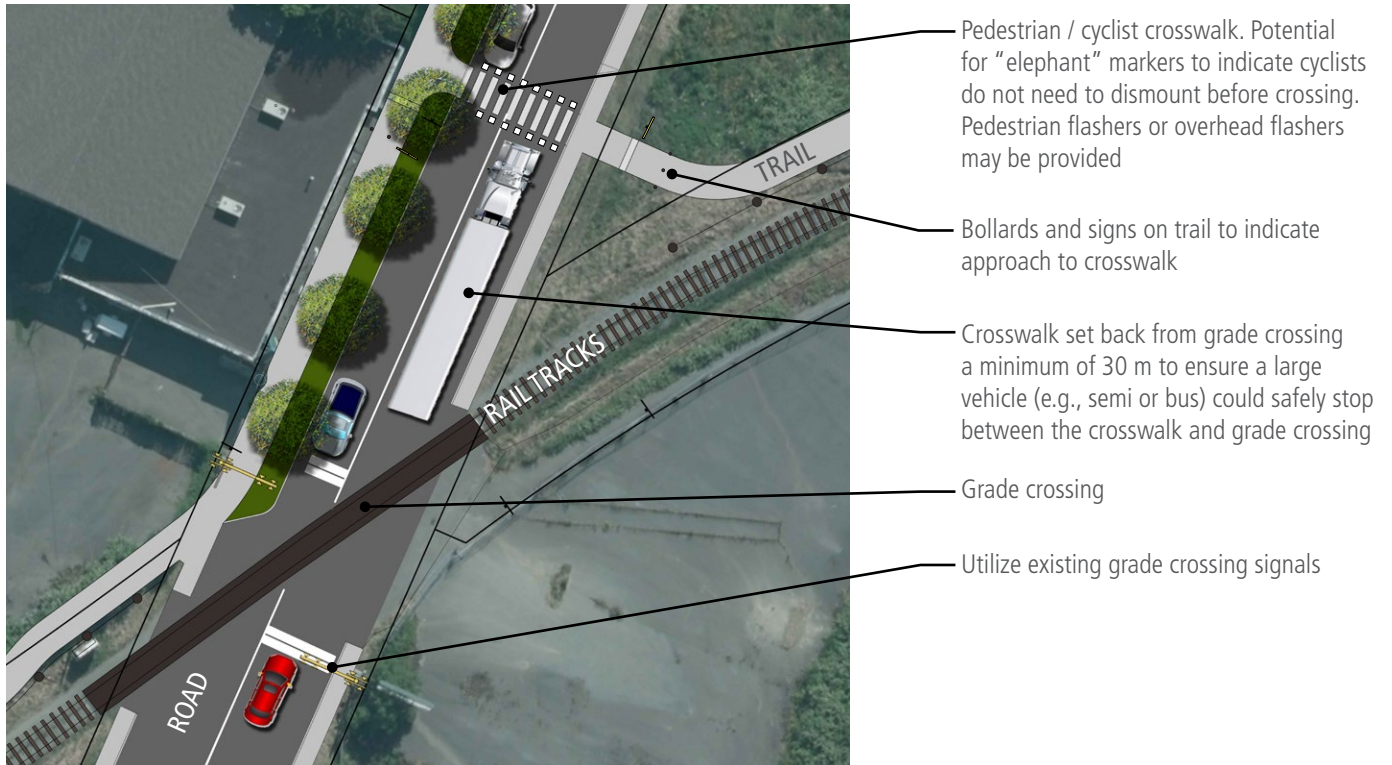


Figure 12: Pedestrian / Cyclist Crossing with painted crosswalk and "Elephant Feet"







The alignment options analyzed and costed the components of trail alignment options.



### 4.3 ALIGNMENT OPTIONS

The Study looked at alternatives to identify an alignment that balances cost, experience, safety, and function. Because the E&N is an active rail corridor, review of safety requirements at grade crossings was a key part of this process. Estimated costs to meet these grade crossings account for approximately 50% of overall trail costs. Alignment options were considered to identify potential cost reductions, while maintaining trail function.

- **Alignment A: On-Corridor** follows the corridor as closely as possible. Most of this alignment is on the west side of the track and has more grade crossings and associated costs.
- **Alignment B: On/Off-Corridor** includes a combination of on and off-corridor sections to reduce costs by avoiding some grade crossings. Most of this alignment is on the east side of the track.

**Figure 12** provides an overview of each alignment option. Section summaries with further details are available in **Appendix A**.



Figure 13: Alignment Options Overview





Section 4:  
Fifth to Seventh





A public open house was held to obtain public feedback on the alignment options. This feedback, combined with input from an online public questionnaire, stakeholder feedback, and technical review, was used to develop the recommended alignment.

## 4.4 PUBLIC & STAKEHOLDER FEEDBACK ON ALIGNMENT OPTIONS

### PARTICIPATION

- ▶ A stakeholder meeting with the Island Corridor Foundation and Southern Rail was completed at the options development phase to identify significant issues or concerns early in the process.
- ▶ A public open house was held on June 3, 2015 from 4 pm to 7 pm at the Nanaimo Train Station Patio. It was an interactive, drop-in format where participants were encouraged to provide feedback on display boards and alignment maps and complete a questionnaire. 92 participants signed into the open house.
- ▶ A public questionnaire was open between June 3 and July 8, 2015 online and in hard copy at the open house and at the City of Nanaimo Services and Resource Centre. 130 participants completed a questionnaire.
- ▶ A neighbourhood meeting was held on Columbia Street on June 27, 2015 in response to requests from residents of the area for additional input on the options, partly related to identification of Columbia Street as a potential link in one of the alignment options. 28 participants signed into the meeting.
- ▶ A small group meeting was held June 18, 2015 from 4 pm to 5 pm to provide representatives of community organizations to review the proposed options. Participants from Harewood Neighbourhood Association, Greater Nanaimo Cycling Coalition, and Neighbours of Nob Hill participated.
- ▶ A stakeholder meeting with the Island Corridor Foundation and Southern Rail was held January 12, 2016 to review the recommended alignment and identify outstanding issues or concerns.
- ▶ A small group meeting with community representatives was held January 12, 2016 to share the recommended alignment. Representatives from the Greater Nanaimo Cycling Coalition and South End Neighbourhood Association attended the meeting.
- ▶ The recommended alignment was presented to the South End Community Association at their regular meeting on February 4, 2016.

## KEY FINDINGS

### Priority criteria for evaluating the alignment options:

- Participants were asked to identify their priorities for evaluating the E&N Trail alignment options. A key finding was that cost was prioritized lower (sixth overall) than criteria related to function of the alignment (i.e., ease of use was identified as most important criterion). Safety and directness were also recognized as priorities. **Figure 14** summarizes public input on potential evaluation criteria.

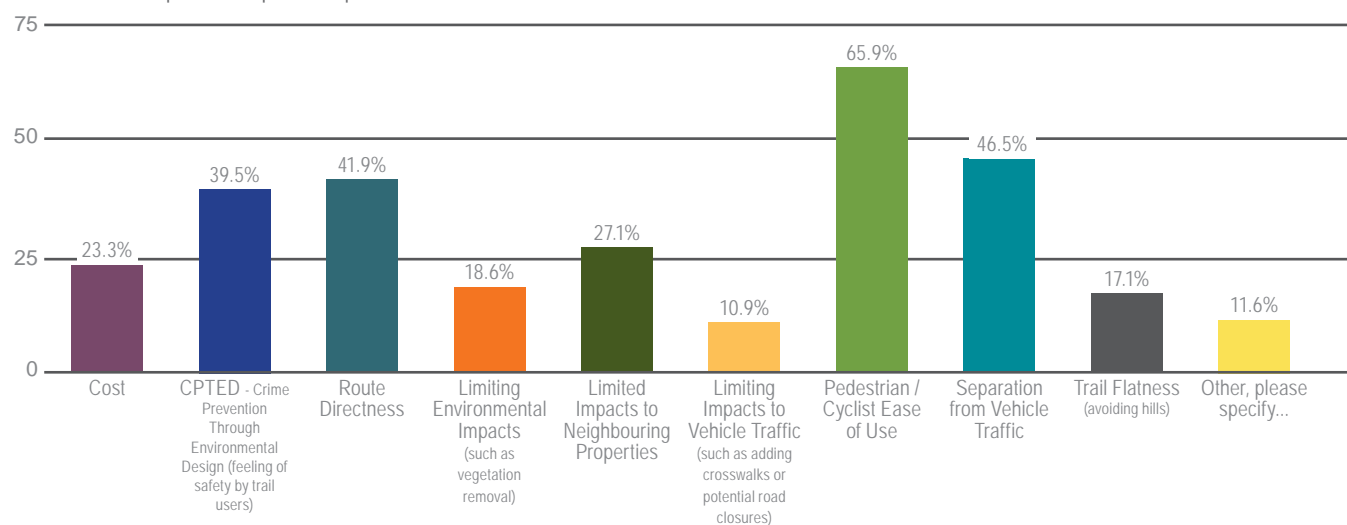


Figure 14: Public Feedback on Evaluation Criteria

### Feedback on Section 1: Franklyn to Albert

Questionnaire Preferences	A	B	Either Option
	52.9%	35.5%	11.6%
Rationale	<ul style="list-style-type: none"> <li>► Directness of A (B moves too far from corridor)</li> <li>► Flatter grades of A (B includes a hill between Prideaux and the Albert grade crossing)</li> <li>► Current use (wear patterns show many people use the corridor today)</li> </ul>		
Potential Alternatives / Revisions Identified	<ul style="list-style-type: none"> <li>► Start following Option B, then cross the tracks at a pedestrian crossing on the ICF lands. Follow the east side of the rail corridor to Albert and cross Albert at a gated grade crossing</li> <li>► Advantages: <ul style="list-style-type: none"> <li>» Avoids hill between Prideaux and corridor at Albert (Option B)</li> <li>» Reduces potential property impacts</li> <li>» Recognizes existing desire line between Albert and Prideaux</li> <li>» Avoids gated crossing at Franklyn (cost reduction over Option A)</li> <li>» Avoids issues on the west side of the tracks (Option A), including proximity of an existing house at Albert and the existing slope and tree adjacent to the Superette</li> </ul> </li> <li>► Disadvantages / challenges: <ul style="list-style-type: none"> <li>» People may shortcut between Franklyn and Prideaux</li> <li>» Costs of the gated grade crossing at Albert</li> <li>» Potential property impacts to meet setback requirements</li> <li>» Potential need for retaining near Albert Street</li> <li>» Mid-block lane access to Prideaux would need to be closed (required in all options)</li> </ul> </li> </ul>		
Recommended Alignment	Revised alignment described above		

**Feedback on Section 2: Albert to Hecate / Kennedy**

Questionnaire Preferences	A	B (on corridor)	B (on street)	Any Option
	60.8%	18.3%	6.7%	14.2%
Rationale	<ul style="list-style-type: none"> <li>▶ Option A avoids the hill between Prideaux and Albert grade crossing</li> <li>▶ Preference to be on the corridor between Milton and Hecate, rather than following the street network</li> <li>▶ Works better with Option A in Section 1</li> </ul>			
Potential Alternatives / Revisions Identified	▶ None identified			
Recommended Alignment	B – provided the revised alignment for Section 1, that remains closer to the rail corridor and avoids the hill at Albert is followed			

**Feedback on Section 3: Hecate / Kennedy to Fifth**

Questionnaire Preferences	A	B	Either Option
	54.5%	13.2%	32.2%
Rationale	<ul style="list-style-type: none"> <li>▶ Option A may be more cost effective and result in less tree removal and retaining</li> <li>▶ General feedback to build on whichever side offers the best connection to the north and south</li> </ul>		
Potential Alternatives / Revisions Identified	<ul style="list-style-type: none"> <li>▶ Consideration for a grade-separated crossing at Fifth Street (tunnel or overhead crossing)</li> <li>▶ Public feedback showed both support and non-support for grade separated crossings:               <ul style="list-style-type: none"> <li>» Benefits: Reduced vehicle / pedestrian cyclist conflicts, convenience of tunnel</li> <li>» Challenges: Cost, isolation / CPTED issues, potential utility conflicts</li> </ul> </li> </ul>		
Recommended Alignment	B – based on alignment selected for Sections 1 and 2		

**Feedback on Section 4: Fifth to Seventh**

Questionnaire Preferences	A	B (Columbia St)	B (on corridor)	Any Option
	49.6%	26.0%	9.4%	15.0%
Rationale	<ul style="list-style-type: none"> <li>▶ Comments on Option A:               <ul style="list-style-type: none"> <li>» Stays truer to the E&amp;N alignment</li> <li>» Potential CPTED concerns</li> </ul> </li> <li>▶ Comments on Option B:               <ul style="list-style-type: none"> <li>» Feedback during the Columbia St. meeting did not support the shared roadway option</li> <li>» Challenging grades between Columbia and View Street</li> </ul> </li> </ul>			
Potential Alternatives / Revisions Identified	<ul style="list-style-type: none"> <li>▶ Trail starts on the east side of the rail corridor, crossing the tracks at the existing Bing Kee crossing</li> <li>▶ Benefits of this alignment:               <ul style="list-style-type: none"> <li>» Fewer grade challenges than the Columbia St. shared roadway</li> <li>» Remains along the rail corridor</li> <li>» Avoids the large ravine on the east side of the railway tracks</li> </ul> </li> </ul>			
Recommended Alignment	A – with minor revisions			





The recommended alignment is provided to support future planning and costing for the trail. Detailed design of the alignment will be required to confirm assumptions and estimates made during the Study.

## 5.0 RECOMMENDED ALIGNMENT

### 5.1 ALIGNMENT OVERVIEW

Based on public and stakeholder feedback on the alignment options, a recommended alignment that combines elements from alignment options A and B, has been developed. **Figure 15** provides a map of the recommended alignment. **Table 2** summarizes each section of the alignment and identifies high-level components and challenges that will need to be addressed during detailed design.

Additional details of each trail section are summarized on the subsequent pages.



5.2 SUMMARY

Table 2: Summary of Recommended Alignment Sections

No.	NAME	TYPE	NOTES
A	Franklyn Street Trail	Multi-use Trail	<div>▶ 3.0 m width</div> <div>▶ Curb replacement likely required</div>
1	Prideaux Street Crossing	Road Crossing	<div>▶ Prideaux is stop controlled</div> <div>▶ Standard crosswalk with accommodation for pedestrians and cyclists</div> <div>▶ Curb extensions to reduce crossing width</div>
2	Franklyn Street Crossing	Road Crossing	<div>▶ Franklyn is not stop controlled</div> <div>▶ Consideration for pedestrian warning flashers at crossing</div> <div>▶ Curb extensions to reduce crossing width</div>
B	Prideaux Street Trail	Multi-use Trail	<div>▶ 2.7 m min. width</div> <div>▶ Prideaux curb to be maintained</div> <div>▶ Potential removal of boulevard trees required</div> <div>▶ Potential impacts to adjacent properties</div>

No.	NAME	TYPE	NOTES
3	E&N Grade Crossing	Rail Crossing	<div>▶ Standard pedestrian grade crossing of tracks</div> <div>▶ Align crossing to reduce skew</div> <div>▶ ICF property on both sides of crossing</div>
C	Prideaux to Albert Trail	Multi-use Trail	<div>▶ 3.0 m width</div> <div>▶ Potential impacts to adjacent properties</div> <div>▶ Retaining near Albert likely required</div> <div>▶ Lighting consideration</div>
4	Albert Street	Road Crossing	<div>▶ Signalized crossing with gates required</div> <div>▶ Consideration for pedestrian warning flashers at crossing</div> <div>▶ Curb extensions to reduce crossing width</div>
D	Albert to Milton Trail	Multi-use Trail	<div>▶ 3.0 m width</div> <div>▶ Potential impacts to adjacent properties</div> <div>▶ Potential impacts to signal boxes</div> <div>▶ Lighting consideration</div>

No.	NAME	TYPE	NOTES
E	Milton Street Trail - Preferred	Multi-use Trail	<div>▶ 3.0 m width</div> <div>▶ Curb replacement likely required</div> <div>▶ Potential for boulevard development</div> <div>▶ Loss of on-street parking on one side of Milton (between grade crossing and crosswalk)</div>
5a	Milton Street - Preferred	Road Crossing	<div>▶ Mid-block pedestrian crossing</div> <div>▶ Min. 30 m from tracks</div> <div>▶ Consideration for pedestrian warning flashers at crossing</div> <div>▶ Curb extensions to reduce crossing width</div>
F	Milton to Hecate Trail - Preferred	Multi-use Trail	<div>▶ 3.0 m width</div> <div>▶ Coordination with development site required</div> <div>▶ Lighting consideration</div>

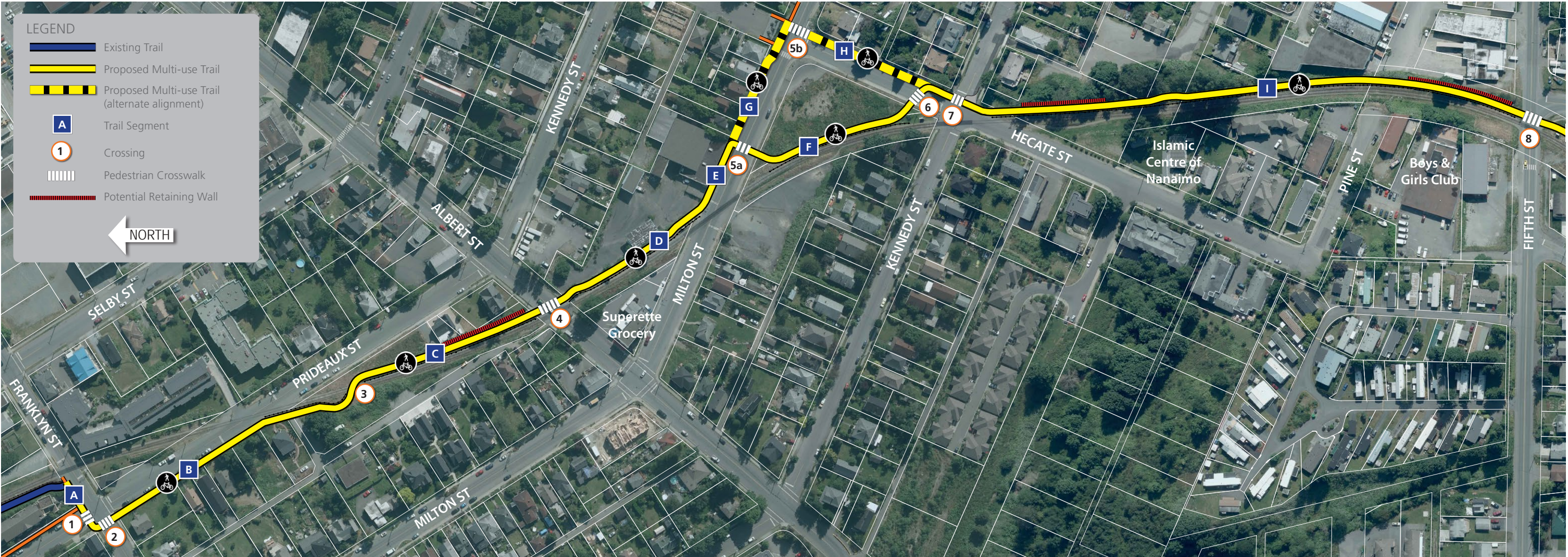


Figure 15: Recommended Alignment Overview



No.	NAME	TYPE	NOTES
<b>G</b>	Milton Street Trail - Alternate	Multi-use Trail	<div><div>▶ 3.0 m width</div><div>▶ Curb replacement likely required</div><div>▶ Potential for boulevard development</div><div>▶ Loss of on-street parking on one side of Milton</div></div>
<b>5b</b>	Milton Street - Alternate	Road Crossing	<div><div>▶ Pedestrian / cyclist mid-block crossing</div><div>▶ Consideration for pedestrian warning flashers</div><div>▶ Curb extensions to reduce crossing width</div></div>
<b>H</b>	Hecate Street Trail - Alternate	Multi-use Trail	<div><div>▶ 3.0 m trail</div><div>▶ Curb relocation required</div><div>▶ Potential for boulevard development</div><div>▶ Loss of on-street parking on one side of Hecate</div></div>
<b>6</b>	Hecate Street Crossing - Preferred	Road Crossing	<div><div>▶ Mid-block pedestrian crossing</div><div>▶ Min. 30 m from tracks</div><div>▶ Curb extensions to reduce crossing width</div></div>

No.	NAME	TYPE	NOTES
<b>7</b>	Kennedy Street Crossing	Road Crossing	<div><div>▶ Kennedy is stop controlled</div><div>▶ Consider changing Kennedy to exit only (closure of southbound lane to entry) - would require reopening of Kennedy at Victoria</div></div>
<b>I</b>	Hecate to Fifth Trail	Multi-use Trail	<div><div>▶ 3.0 m width</div><div>▶ New u/g drainage likely required</div><div>▶ Retaining likely near Hecate and near Fifth</div><div>▶ Tree removal likely required near Hecate</div><div>▶ Lighting consideration</div><div>▶ Potential to adjust route to west side of tracks during detailed design if unforeseen challenges are identified</div></div>
<b>8</b>	Fifth Street Crossing	Road Crossing	<div><div>▶ Signalized crossing with gates</div><div>▶ Consideration for pedestrian warning flashers at crossing</div><div>▶ Curb extensions to reduce crossing width</div></div>

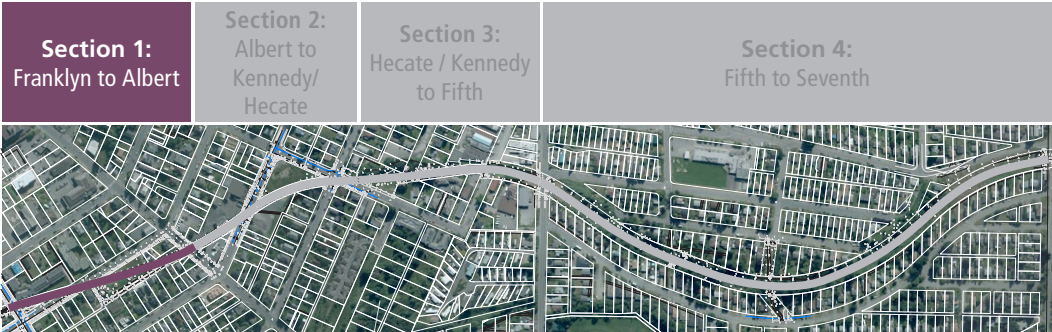
No.	NAME	TYPE	NOTES
<b>J</b>	Fifth to Bing Kee Trail	Multi-use Trail	<div><div>▶ 3.0 m width with base that supports potential for future expansion to 4.0 m</div><div>▶ Potential for tree impacts</div><div>▶ Lighting consideration</div><div>▶ Potential to adjust route to west side of tracks during detailed design if unforeseen challenges are identified</div></div>
<b>9</b>	Bing Kee Crossing	Rail Crossing	<div><div>▶ Existing crossing</div><div>▶ No upgrades anticipated</div></div>
<b>K</b>	Bing Kee to Seventh Trail	Multi-use Trail	<div><div>▶ 3.0 m width with base that supports potential for future expansion to 4.0 m</div><div>▶ Some infill and grading required in low point mid-way between Bing Kee &amp; Seventh</div><div>▶ Potential for tree impacts</div><div>▶ Lighting consideration</div></div>





RECOMMENDED ALIGNMENT SECTION 1: FRANKLYN TO ALBERT

LOCATION



NARRATIVE

The recommended alignment starts at the existing E&N Trail and follows Franklyn Street west to Prideaux Street. The trail crosses Prideaux and Franklyn at pedestrian crosswalks before continuing along the west side of Prideaux Street. The trail crosses the rail corridor at a pedestrian grade crossing then follows the east side of the corridor to Albert. At Albert, a gated grade crossing with pedestrian flashers is located on the east side of the tracks.

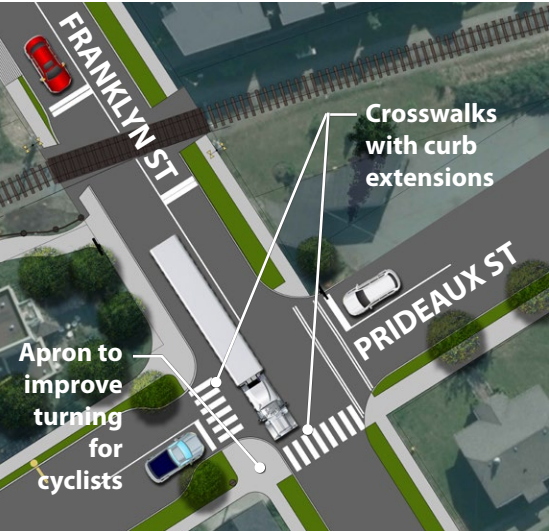
RECOMMENDED ALIGNMENT



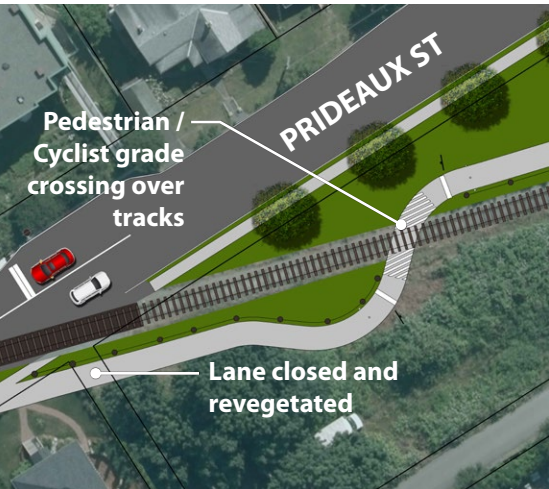
IMAGES



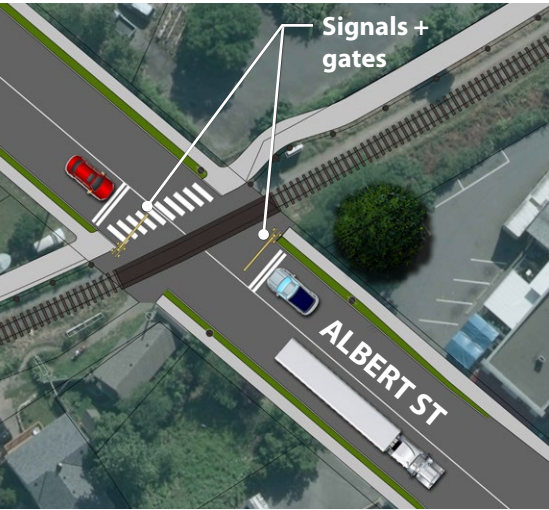
CROSSINGS



Crossings 1 & 2: Franklyn / Prideaux Intersection



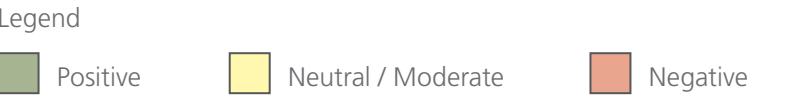
Crossing 3: Pedestrian Grade Crossing of Railway Tracks



Crossing 4: Albert Grade Crossing

EVALUATION SUMMARY

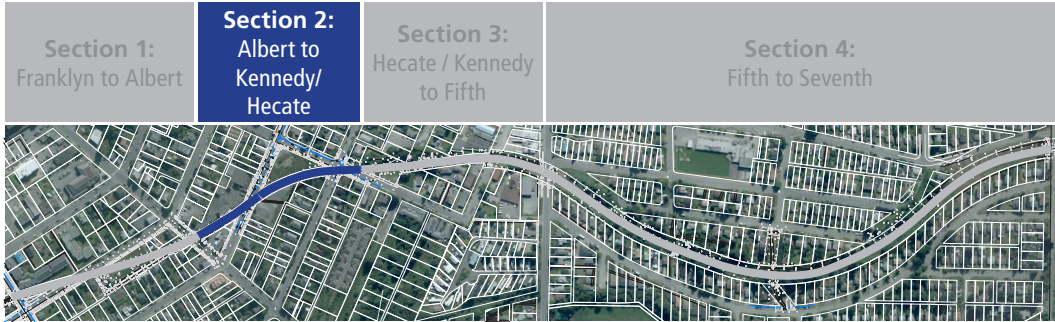
Evaluation Criteria	Recommended Alignment
Trail Capital Cost Estimate	Moderate \$815,000
Grade Crossing Capital Cost Estimates	Albert Grade Crossing: Moderate \$876,000
Pedestrian/Cyclist Benefits	Good Mostly direct, well travelled route
Vehicle Impacts	High Closure of lane access to Prideaux; new pedestrian crosswalks at Franklyn, Prideaux, Albert
Trail Grade	Moderate Mostly Flat - 0% to 3%; 3% to 5% near rail crossing
Retaining Requirements	Moderate Potential retaining near Albert Street
Drainage	Moderate Some relocation of CBs for curb extensions and curb relocation
Directness	Moderate Moves away from corridor about 30 m at Franklyn and Prideaux
User Experience	Moderate Good function, minor diversion from corridor
CPTED	Good Passive surveillance, well lit
Environmental Impacts	Good Minimal tree impacts
Compatibility with Neighbouring Land Use	Moderate Three properties likely affected
Railway Impacts	Moderate Closure of lane crossing at Prideaux; new pedestrian crossing at mid-block





RECOMMENDED ALIGNMENT SECTION 2: ALBERT TO HECATE / KENNEDY

LOCATION



NARRATIVE

The recommended alignment follows the east side of the corridor from Albert to Milton. There are two options for crossing Milton. The preferred alignment crosses Milton 30 m back of the rail line and follows the rail corridor before crossing Hecate / Kennedy. This alignment requires coordination with the adjacent development site. The alternate alignment follows Milton Street to Hecate, crossing and following Hecate to the rail corridor. The Hecate / Kennedy crossing is complicated due to the diagonal alignment of the tracks. With both options, it is anticipated that gated crossing will be required; however, the possibly of closing Kennedy westbound between Hecate St. and Victoria Rd. may warrant exploration to eliminate the need for a costly gated crossing in this location. This would require re-opening Kennedy at Victoria. It is recommended that this option be explored further at the detailed design stage.

RECOMMENDED ALIGNMENT



IMAGES



Looking north near Milton



Looking south near Hecate



Hecate / Kennedy Crossing

CROSSINGS



Crossing 5: Milton Street (Preferred)



Crossing 5a: Milton Street (Alternate)

EVALUATION SUMMARY

Evaluation Criteria	Recommended Alignment
Trail Capital Cost Estimate	Moderate \$639,000
Grade Crossing Capital Cost Estimates	Hecate / Kennedy With Gates: \$1,205,000 Hecate / Kennedy Without Gates: \$427,000
Pedestrian/Cyclist Benefits	Good Mostly direct, well travelled route
Vehicle Impacts	Moderate to High Pedestrian crossings at Milton and Hecate / Kennedy; potential closure of one lane on Kennedy
Trail Grade	Good Mostly Flat - 0% to 3%
Retaining Requirements	Good Significant retaining not anticipated
Drainage	Moderate Some relocation of CBs for curb extensions and curb relocations
Directness	Good to Moderate Preferred alignment follows corridor; Alternative alignment moves away from corridor about 125 m
User Experience	Good to Moderate Alternative alignment has minor diversion from corridor
CPTED	Good Passive surveillance, well lit
Environmental Impacts	Good Minimal tree impacts
Compatibility with Neighbouring Land Use	Moderate Two properties potentially impacted
Railway Impacts	Good No rail impacts

Legend

Positive

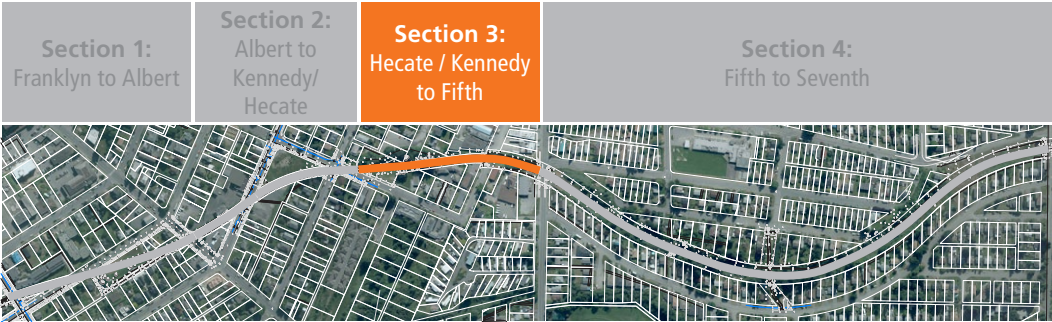
Neutral / Moderate

Negative



RECOMMENDED ALIGNMENT SECTION 3: HECATE / KENNEDY TO FIFTH

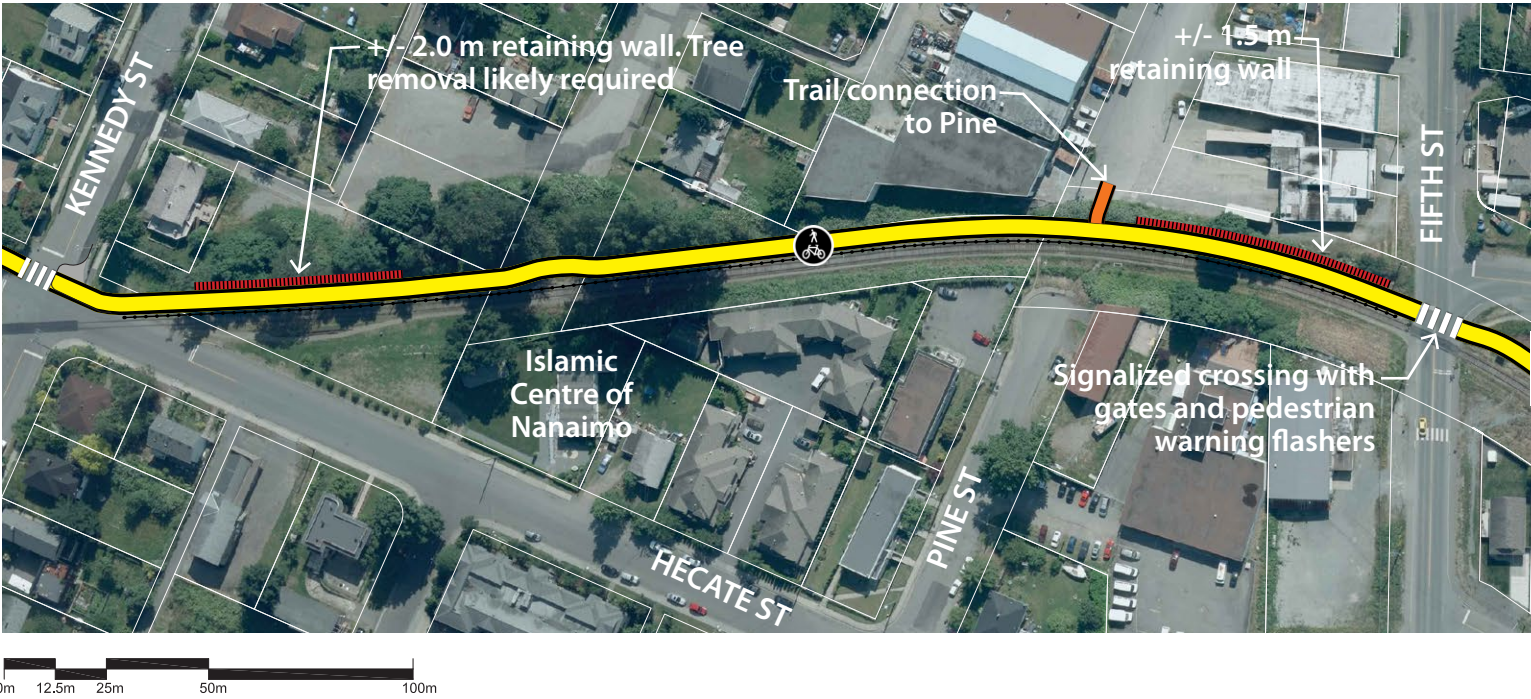
LOCATION



NARRATIVE

There is an evident desire line for a pedestrian / cyclist connection between Hecate / Kennedy and Fifth. The alignment would be a 3.0 m multi-use trail on the east side of the rail tracks within the ROW. Through this section, retaining would likely be needed at the north and south ends of the alignment. Grading requirements will likely require removal of existing mature trees and need for naturalized landscape restoration. The ROW is lower than adjacent land uses, which limits passive surveillance and ambient light – design will need to address CPTED issues. Currently there is a drainage ditch on the corridor and because of the narrow ROW, underground drainage will likely be required. If this section of trail is completed prior to Section 2, completion of the Hecate / Kennedy grade crossing will likely be required at the same time as trail development. This alignment is recommend because it fits best with Section 2; however, if significant challenges are discovered during detailed design, moving the trail to the west side of the corridor could be considered.

RECOMMENDED ALIGNMENT



IMAGES



Looking south near Hecate

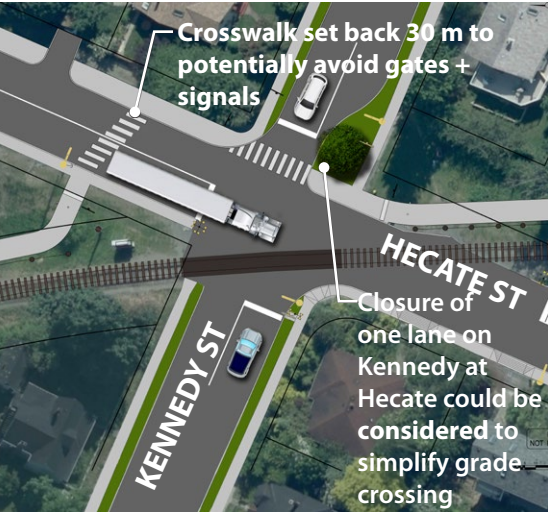


Looking south near Pine

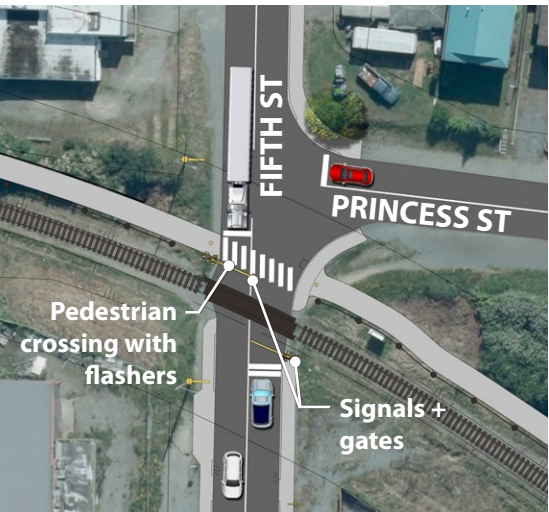


Fifth Street Crossing

CROSSINGS



Crossing 6/7: Hecate / Kennedy



Crossing 8: Fifth

EVALUATION SUMMARY

Evaluation Criteria	Recommended Alignment
Trail Capital Cost Estimate	Moderate \$782,000
Grade Crossing Capital Cost Estimates	Fifth Grade Crossing: Poor \$1,123,000
Pedestrian/Cyclist Benefits	Good Direct, well travelled route
Vehicle Impacts	Moderate Pedestrian crossing at Fifth
Trail Grade	Good Flat - 0% to 3%
Retaining Requirements	Poor Two retaining walls likely required
Drainage	Poor Underground drainage likely required
Directness	Good Follows corridor
User Experience	Moderate Follows corridor, dumping backs of buildings, poor quality vegetation
CPTED	Poor Little passive surveillance, poorly lit
Environmental Impacts	Moderate Some tree impacts near Hecate / Kennedy
Compatibility with Neighbouring Land Use	Good Little impact to neighbouring properties
Railway Impacts	Good No rail impacts

Legend

Positive

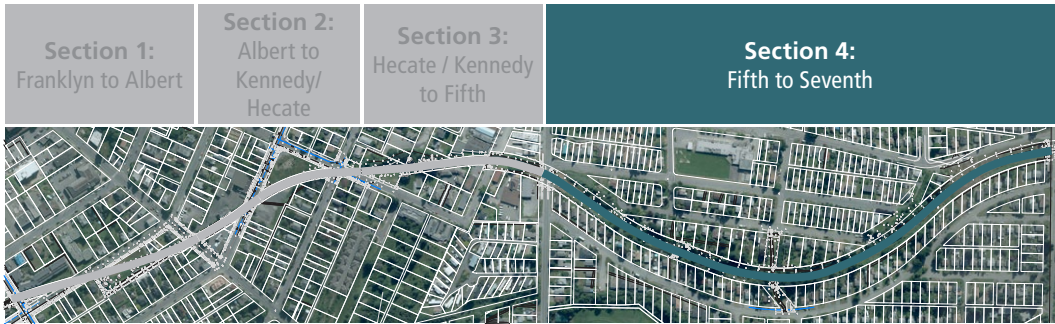
Neutral / Moderate

Negative



RECOMMENDED ALIGNMENT SECTION 4: FIFTH TO SEVENTH

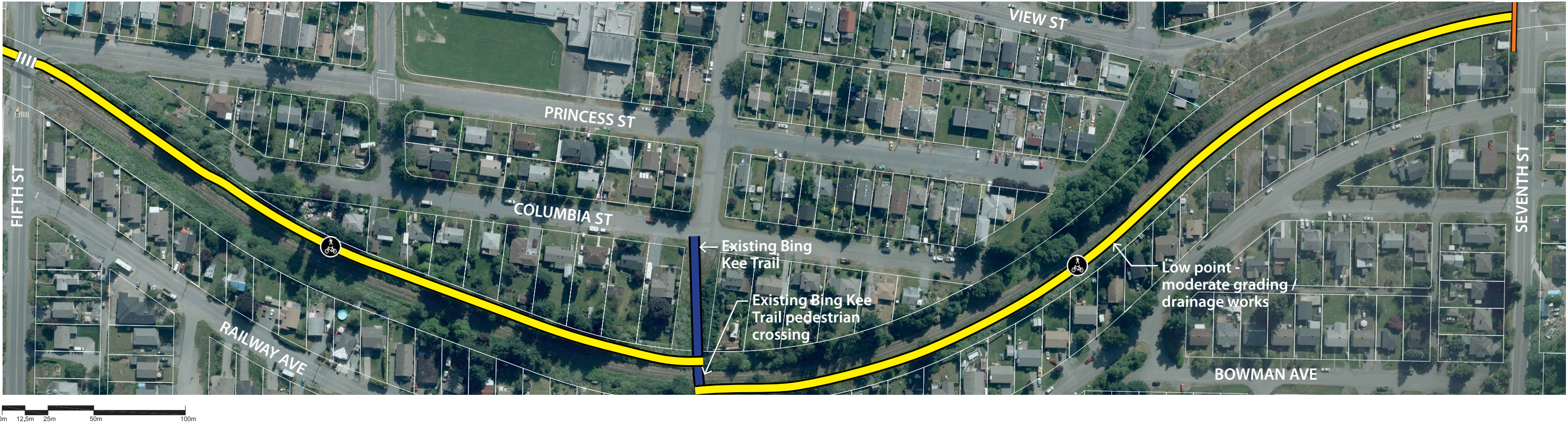
LOCATION



NARRATIVE

Between Fifth and Seventh there are no road crossings. The trail is recommended to start on the east side of the tracks with a 3.0 m trail. The ROW is 30 m (100') wide for this section, so there is potential to plan for future expansion to a 4.0 m trail. The trail should be sited to avoid existing trees and incorporate a drainage swale. At the existing Bing Kee crossing, the trail crosses to the west side of the corridor. A low point mid-way between Bing Kee and Seventh will need to be addressed through a combination of filling and grading. As the trail approaches Seventh, there are rocky outcrops and the trail will need to be aligned minimize grading costs. If significant challenges are discovered during detailed design, alternatives move the trail between Fifth and Bing Kee to the west side of the corridor could be considered.

RECOMMENDED ALIGNMENT



IMAGES



Looking south Fifth



Looking north near Seventh



Bing Kee Crossing

EVALUATION SUMMARY

Evaluation Criteria	Recommended Alignment
Trail Capital Cost Estimate	High \$1,790,000
Grade Crossing Capital Cost Estimates	Good Bing Kee crossing already complete
Pedestrian/Cyclist Benefits	Good Direct, stays on rail corridor
Vehicle Impacts	Good No pedestrian crossings
Trail Grade	Moderate Generally flat - 0% to 3%; low point between Bing Kee & Seventh, avoids ravine on west side of corridor
Retaining Requirements	Good Significant retaining not anticipated
Drainage	Moderate Drainage swales required

Evaluation Criteria	Recommended Alignment
Directness	Good Follows corridor
User Experience	Good Pleasant views, some dumping
CPTED	Poor Limited passive surveillance, ambient light, isolated, limited escape points
Environmental Impacts	Moderate Potential tree removal in key locations
Compatibility with Neighbouring Land Use	Moderate Adjacent residential properties, 30 m (100') ROW
Railway Impacts	Good No rail impacts

Legend

Positive

Neutral/Moderate

Negative



## 5.3 COST ESTIMATE SUMMARY

Through this process, a Class “D” cost estimate<sup>1</sup> for the recommended alignment was developed to provide guidance for planning and budgeting. **Table 3** summarizes the total estimate for the recommended alignment. **Table 4** identifies potential alternative scope items that could reduce the recommended alignment estimate. **Table 5** (next page) provides a summary of costs for each section of the recommended alignment. Refer to **Appendix C** for detailed cost estimates and cost assumptions.

Table 3: Recommended Alignment Estimate (Class “D”)

<b>\$7.24 M</b>	Cost estimate for total recommended alignment, including 30% Contingency and 20% Detailed Design.
-----------------	---

Table 4: Potential Alternative Scope Items (Class “D” Estimate)

The following table outlines potential cost reductions that could be achieved through alternative scope items. These directions should be considered further at the detailed design phase.

<b>-\$0.78 M</b>	Potential cost savings if existing Hecate / Kennedy grade crossing and signals can be retained. Preliminary review suggests that a gated crossing may not be required if reconfiguration of the Hecate / Kennedy intersection is completed. Reconfiguration would require further public consultation and detailed design development to determine feasibility.
<b>-\$0.85 M</b>	Lighting has been included along sections of the trail that are not adjacent to streets that would provide ambient lighting. Lighting will improve usability of the trail during the winter and support pedestrian safety. If lighting is not included in these areas, cost reductions may be attainable.
<b>-\$0.07 M</b>	Difference in cost between Preferred and Alternate alignment for Section 2. Cost for alternate route is slightly lower because it follows the road network, reducing the requirement for trail lighting.

<sup>1</sup> Estimates are developed using costs and quantities based on conceptual routing and historical construction cost data from similar projects and are provided to assist with planning. Costs for infrastructure can vary widely depending on site constraints, design, market forces, and other variables. Cost information should be updated during the detailed design process.

Rail signal hardware is purchased from the USA. Costs for rail materials are calculated at an exchange rate of 1.00 Canadian dollar = 0.70 US dollars based on January 2016 exchange rates.

Estimates are rounded to the nearest \$10,000.

Table 5: Summary of Estimates for each Section of the Recommended Alignment

SEG. No.	SEGMENT NAME	DIST. (m)	ESTIMATE (incl. 30% contingency + 20% detailed design)
<b>SECTION 1: FRANKLYN STREET TO ALBERT STREET</b>			
A	Franklyn Street Trail	25	\$23,000
1/2	Prideaux/Franklyn Street Crossings	20	\$146,000
B	Prideaux Street Trail	160	\$255,000
3	E&N Pedestrian Grade Crossing	17	\$72,000
C	Prideaux to Albert Trail	115	\$319,000
<b>SUBTOTAL: FRANKLYN STREET TO ALBERT STREET TRAIL</b>			<b>\$815,000</b>
<b>ALBERT GRADE CROSSING</b>			
4	Albert Street Grade Crossing	15	\$876,000
<b>SUBTOTAL: ALBERT GRADE CROSSING</b>			<b>\$876,000</b>
<b>SECTION 2: ALBERT STREET TO HECATE / KENNEDY STREET (PREFERRED ALIGNMENT)</b>			
D/E	Albert to Milton / Milton Street Trail	150	\$251,000
5a	Milton Street Crossing	15	\$103,000
F	Milton to Hecate Trail	110	\$204,000
6	Hecate Street Crossing	15	\$81,000
<b>SUBTOTAL: ALBERT STREET TO HECATE / KENNEDY STREET TRAIL</b>			<b>\$639,000</b>
<b>SECTION 2: ALBERT STREET TO HECATE / KENNEDY STREET (ALTERNATIVE ALIGNMENT)</b>			
D/G	Albert to Milton / Milton Street Trail	225	\$338,000
5b	Milton Street Crossing	15	\$103,000
H	Hecate Street Trail	95	\$130,000
<b>SUBTOTAL: ALBERT STREET TO HECATE / KENNEDY STREET TRAIL</b>			<b>\$571,000</b>
<b>HECATE / KENNEDY GRADE CROSSING (gates)</b>			
7	Hecate / Kennedy Street Crossing (gated)	45	\$1,205,000
<b>SUBTOTAL: HECATE / KENNEDY GRADE CROSSING (gates)</b>			<b>\$1,205,000</b>
<b>HECATE / KENNEDY GRADE CROSSING (no gates)</b>			
7	Hecate / Kennedy Street Crossing (not gated)	45	\$427,000
<b>SUBTOTAL: HECATE / KENNEDY GRADE CROSSING (no gates)</b>			<b>\$427,000</b>
<b>SECTION 3: HECATE / KENNEDY TO FIFTH</b>			
I	Hecate / Kennedy to Fifth Trail	345	\$782,000
<b>SUBTOTAL: HECATE / KENNEDY STREET TO FIFTH</b>			<b>\$782,000</b>
<b>FIFTH GRADE CROSSING</b>			
8	Fifth Street Grade Crossing	11	\$1,123,000
<b>SUBTOTAL: HECATE / KENNEDY STREET TO FIFTH STREET</b>			<b>\$1,123,000</b>
<b>SECTION 4: FIFTH STREET TO SEVENTH STREET</b>			
J	Fifth to Bing Kee Trail	415	\$749,000
9	Bing Kee Pedestrian Crossing (existing)	60	\$11,000
K	Bing Kee to Seventh Trail	520	\$1,030,000
<b>SUBTOTAL: FIFTH STREET TO SEVENTH STREET</b>			<b>\$1,790,000</b>

## 5.4 ADDITIONAL DESIGN CONSIDERATIONS

During the Study, several design directions and ideas were identified. These ideas are included as part of the Study report to consider in further during detail design phases:

- ▶ **Trail Standards:** The Study has assumed that trails within the Study area will be built to an urban standard with a paved surface.
- ▶ **Amenities:** In the downtown area, there may be rationale to consider minor additional investment in user amenities such as seating, waste bins, aesthetic fencing, planting, etc. These small investments have potential to substantially increase the user experience of the trail.
- ▶ **Cyclist Crossings:** Input from cycling stakeholders identified that the E&N Trail should function as a cycling spine in the City. At standard crosswalks, cyclists are typically required to dismount before crossing a pedestrian crossing. Use of “elephant feet” markings (see **Figure 12** for an example image) along the E&N trail are recommended to indicate that cyclists may ride through the crosswalk.

## 5.5 PHASING

The E&N Downtown South Trail will likely require a phased approach for implementation.

The phasing framework in **Table 6** outlines a recommended sequence of projects to completing trail development in the four sections shown in **Figure 16**. Phasing recommendations are based on function, cost, public feedback, and practicality.

Figure 16: Potential Phasing Framework



Table 6: Potential Phasing Framework

Phase	Sec No.	Name	Map Segments	Summary	Estimated Costs (incl. contingency + detailed design)
A	3	Kennedy / Hecate Street to Fifth Street	7, I	<ul style="list-style-type: none"> <li>► Evidence of high use</li> <li>► Second priority identified during consultations</li> <li>► Poor street network (limited alternatives for pedestrian and cyclists)</li> <li>► Likely to include one gated crossing: Hecate / Kennedy. Potential for cost reduction of Hecate / Kennedy if intersection reconfiguration eliminates need for gated crossing</li> </ul>	\$1.99 M
B	1 / 2	Franklyn Street to Hecate / Kennedy Street	A, 1/2, B, 3, C, 4, D/E, 5a, F, 6 (or D/G, 5b, H)	<ul style="list-style-type: none"> <li>► Evidence of moderate to high use</li> <li>► Top priority identified during consultations</li> <li>► Good street network (several alternatives for pedestrians and cyclists)</li> <li>► Two alignment options</li> </ul>	\$2.33 M
C	4	Fifth Street to Seventh Street	8, J, 9, K	<ul style="list-style-type: none"> <li>► Further from downtown</li> <li>► Lower priority identified during consultations</li> <li>► Includes Fifth grade crossing</li> <li>► Moderate street network (some alternatives for pedestrians and cyclists)</li> </ul>	\$2.91 M





## 6.0 CLOSING

Throughout the process, public input showed support for extending the E&N Trail south of downtown. The challenges of this section are complex and will require careful detailed design development as each section is developed. This report outlines a process for a staged implementation of trail development over time as funding permits.

### LANARC 2015 CONSULTANTS LTD.

A blue ink signature, likely of Jana Zelenski, written in a cursive style.

Jana Zelenski, M.L.A., BCSLA, LEED AP, IAP2  
Principal, Project Manager

A black ink signature, likely of David Reid, written in a cursive style.

David Reid, B.L.A., FCSLA  
Principal

This page intentionally left blank to facilitate double-sided printing.





## APPENDICES

APPENDIX A: SUMMARY OF ALIGNMENT OPTIONS A & B

APPENDIX B: CONSULTATION RESULTS SUMMARY

APPENDIX C: CLASS "D" COST ESTIMATE

APPENDIX D: RECOMMENDED CONCEPT ALIGNMENT DRAWINGS



This page intentionally left blank to facilitate double-sided printing.

# APPENDIX A

## SUMMARY OF ALIGNMENT OPTIONS A & B



### ALIGNMENT OPTION OVERVIEW

The two preliminary rail alignment options (A & B) that were developed and presented for public consideration are summarized on the following pages. For each section, the summary includes:

- ▶ **Location:** Context diagram showing the location of the alignment within the Study Area
- ▶ **Highlights:** A summary of key characteristics of the section
- ▶ **Photos:** Photos of the existing rail corridor
- ▶ **Option A/B Plans:** Plan drawings showing the features of each alignment being considered
- ▶ **Options Summary:** A written summary of each option
- ▶ **Evaluation Overview:** A table summary of key evaluation criteria for each option, including a colour indication of positive, moderate, or negative effects for each criterion
- ▶ **Intersection Details:** Zoomed-in overview for key intersections included in that section



This page intentionally left blank to facilitate double-sided printing.



ALIGNMENT OPTIONS - SECTION 1: FRANKLYN TO ALBERT - OVERVIEW

LOCATION

Section 1:  
Franklyn to Albert

Section 2:  
Albert to Kennedy/  
Hecate

Section 3:  
Hecate / Kennedy  
to Fifth

Section 4:  
Fifth to Seventh

OVERVIEW

Length = 340 m

ROW\* Width = 15 m (50')

# of Grade Crossings:  
Option A = 1 to 3  
Option B = 0

IMAGES



OPTIONS NARRATIVE

This section will extend the existing E&N Trail at Franklyn Street to Albert Street.

**Option A** is 3.0 m multi-use trail on the west side of the rail tracks, within the rail ROW. The alignment includes a grade crossing at Franklyn, then crosses Prideaux 30 m from the tracks, potentially avoiding the need for signals + gates at this location. Near Albert the corridor becomes too narrow to fit the trail, so the trail joins with an existing lane for a short period. At Albert, a grade crossing with signals + gates would be required.

**Option B** is a 2.4 m to 3.0 m multi-use trail that follows the street grid crossing at the corner of Franklyn and Prideaux. The trail then follows Prideaux to Albert. A pedestrian/cyclist grade crossing mid-block is required over the tracks at mid-block.

Both options would require mid-block closure of the existing lane at Prideaux to avoid full signals + gates at the Prideaux crossing. Lane access / egress would be at Franklyn.

EVALUATION OVERVIEW

Evaluation Criteria	Option A	Option B
Cost Estimate - Trail	Moderate \$762,000	Moderate \$520,000
Cost Estimate - Grade Crossings <small>* There is potential to avoid a grade crossing at Prideaux by moving the crossing 30 m from the tracks. ** The grade crossing at Albert could be built with Section 1 or 2, depending on which is built first.</small>	Franklyn - High \$820,000 (required)	Good No grade crossings
	Prideaux - High \$1.14 M*	
	Albert - High \$940,000**	
Pedestrian Experience	Good Flat grades, direct route	Moderate Mostly flat grades, departure from corridor
Cyclist Experience	Good Flat grades, direct route	Moderate Mostly flat grades, requires 90° turns
Railway Impacts	Minimal	Moderate New mid-block pedestrian crossing
CPTED <small>(Crime Prevention Through Environmental Design)</small>	Good Passive surveillance, well lit	
Infrastructure Requirements <small>(retaining, drainage, utilities)</small>	Good No retaining needed; relocation of a few CBs	
Environmental Impacts	Good Minimal tree impacts	
Compatibility with Neighbouring Land Use	Poor Narrow corridor means close proximity to private properties	Moderate Existing road corridor is tight in places

Legend

Positive

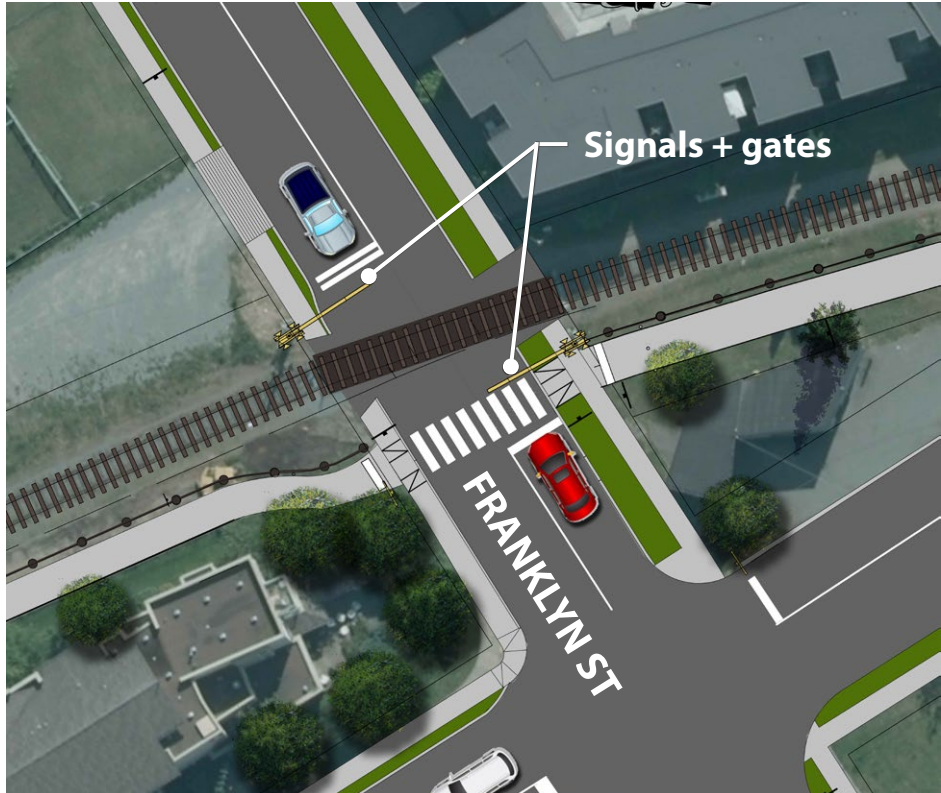
Neutral / Moderate

Negative

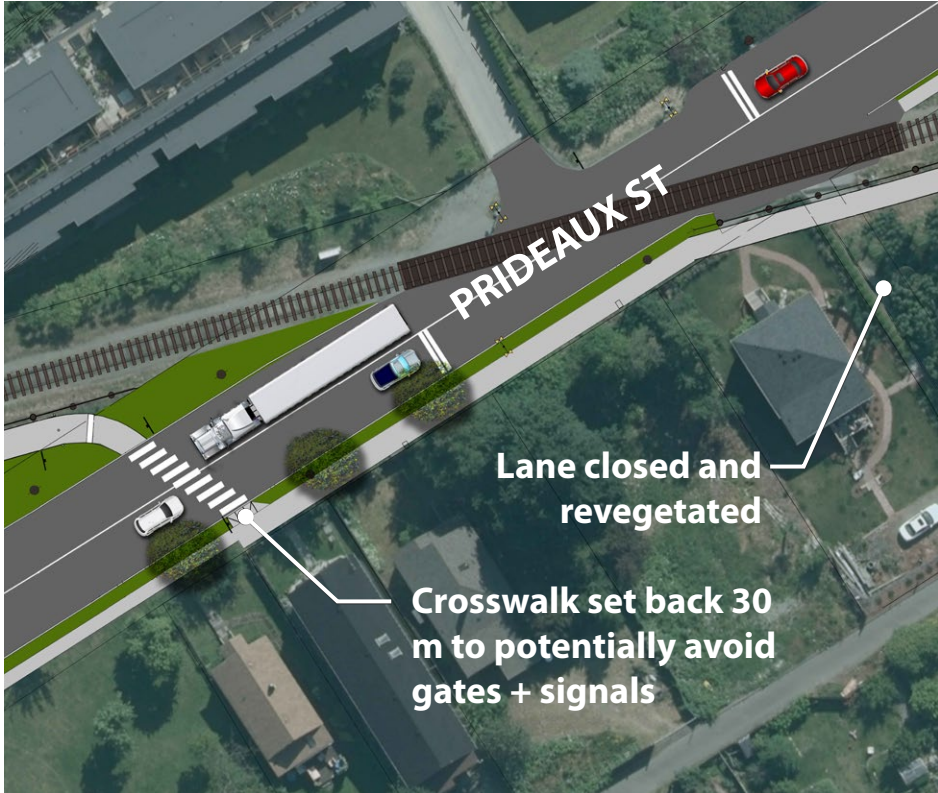


ALIGNMENT OPTIONS - SECTION 1: FRANKLYN TO ALBERT - DETAILS

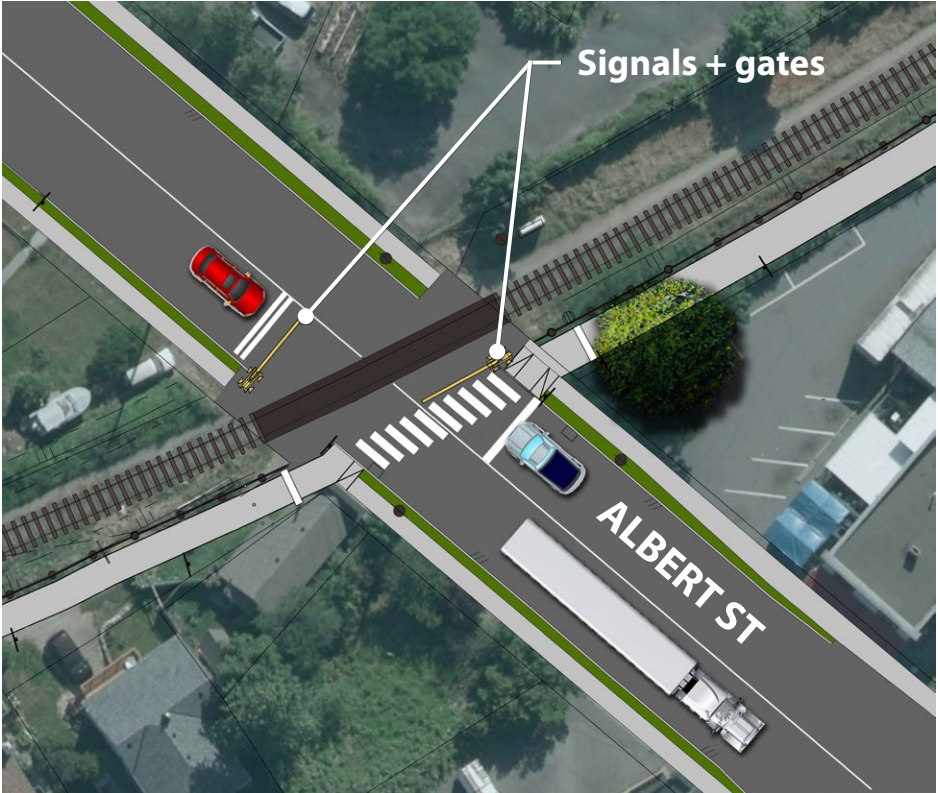
OPTION A



Option A: Franklyn Street Crossing

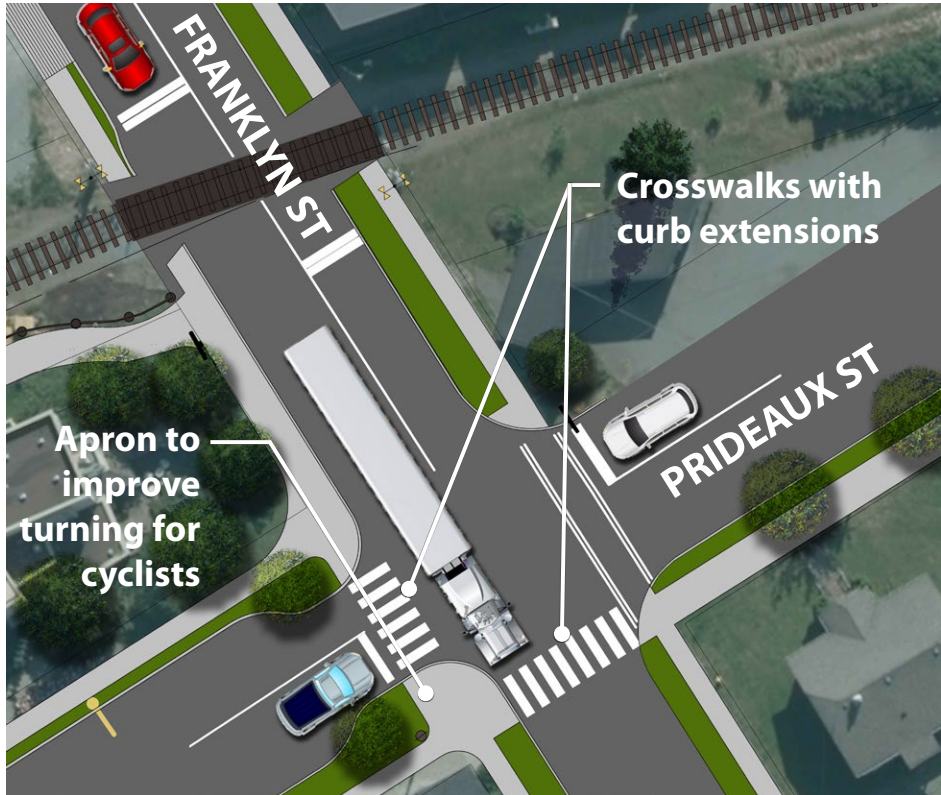


Option A: Prideaux Street Crossing

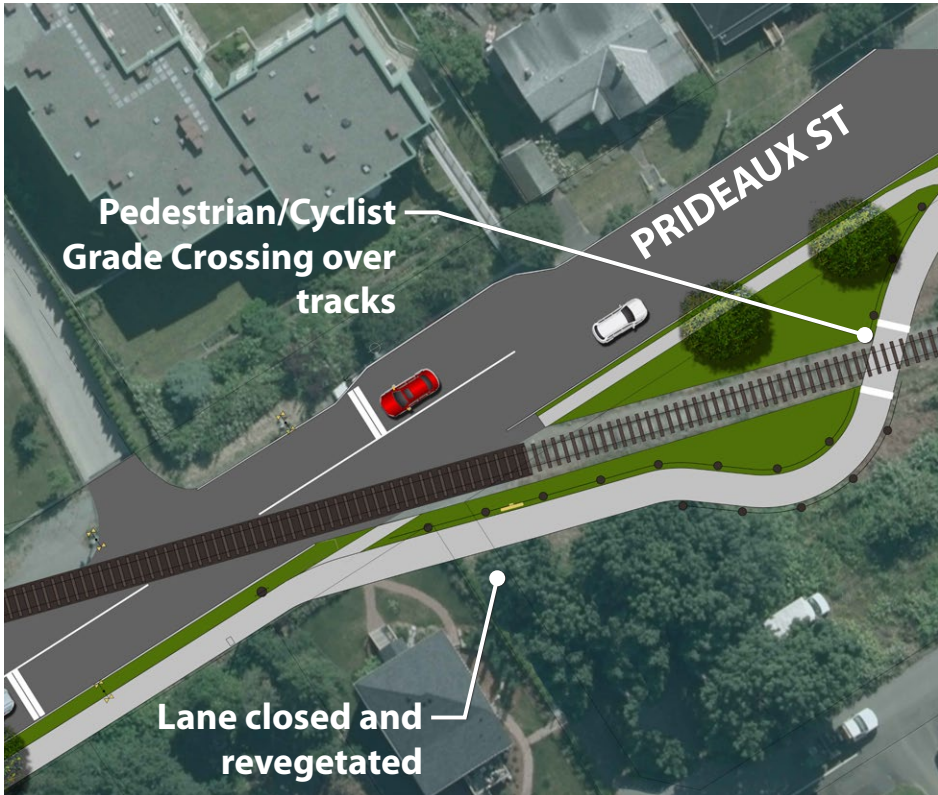


Option A: Albert Street Crossing

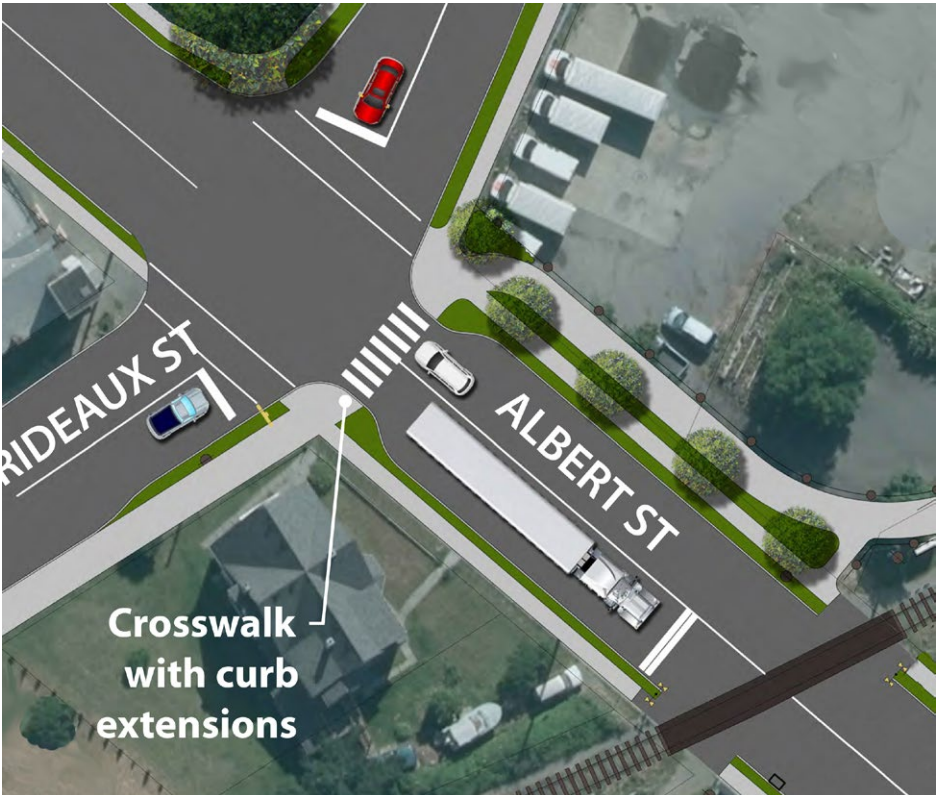
OPTION B



Option B: Franklyn Street Crossing



Option B: Rail-line Mid-Block Crossing



Option B: Albert Street Crossing



ALIGNMENT OPTIONS - SECTION 2: ALBERT TO HECATE / KENNEDY - OVERVIEW

LOCATION

Section 1:  
Franklyn to Albert

Section 2:  
Albert to  
Kennedy/  
Hecate

Section 3:  
Hecate / Kennedy  
to Fifth

Section 4:  
Fifth to Seventh



OVERVIEW

Length = 280 m

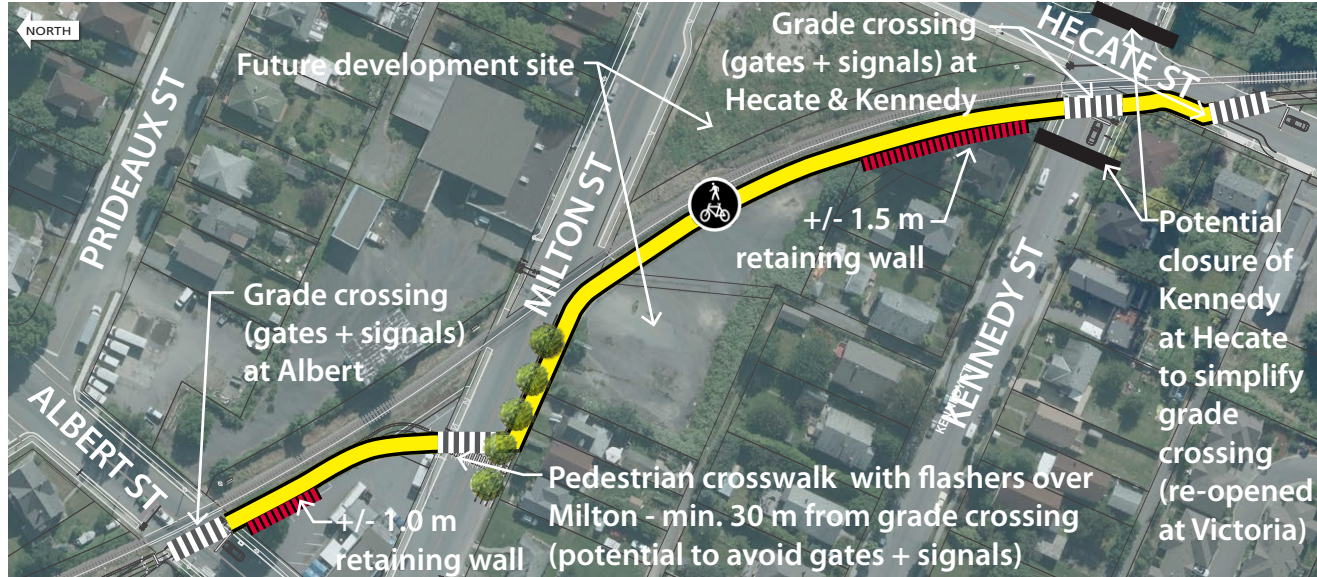
ROW Width = 15 m (50')

# of Grade Crossings:  
Option A = 0 to 3  
Option B = 0 to 1

IMAGES



OPTION A



Grade crossing (gates + signals) at Hecate & Kennedy

Future development site

Grade crossing (gates + signals) at Albert

MILTON ST

HECATE ST

KENNEDY ST


Potential closure of Kennedy at Hecate to simplify grade crossing (re-opened at Victoria)

+/- 1.5 m retaining wall

Pedestrian crosswalk with flashers over Milton - min. 30 m from grade crossing (potential to avoid gates + signals)

+/- 1.0 m retaining wall

OPTION B



Pedestrian crosswalk with flashers over Milton

Future development site

Pedestrian crosswalk with flashers over Milton - min. 30 m from grade crossing (potential to avoid gates + signals)

Pedestrian crosswalk with flashers over Albert

HECATE ST

MILTON ST

HECATE ST

KENNEDY ST

Potential closure of Kennedy at Hecate to simplify grade crossing (re-opened at Victoria)

Grade crossing (gates + signals) at Hecate & Kennedy

Alternate alignment

0m 12.5m 25m 50m 100m

OPTIONS NARRATIVE

This section includes three potential grade crossings at Albert, Milton, and Hecate / Kennedy.

**Option A** is 3.0 m multi-use trail that follows the west side of the tracks. It includes a grade crossing with signals + gates at Albert. A large existing tree and steep slopes at the Superette Grocery parking lot will be challenges. The trail crosses Milton at a pedestrian crossing with flashers set 30 m from the tracks, potentially avoiding the need for signals + gates. The trail then follows the street for a short distance before rejoining the corridor to Hecate / Kennedy where there is a complicated diagonal grade crossing requiring signals + gates.

**Option B** is a 3.0 m multi-use trail that starts at a pedestrian crosswalk with flashers at the corner of Albert and Prideaux. From Prideaux, there is a steep climb up to the rail corridor that connects to Milton. At Milton there are two options. The first is continuation of a multi-use trail to Hecate that would replace the existing on-street parking on the east side of Milton. At Hecate, the trail turns and carries on to the Hecate / Kennedy intersection. The second option is a mid-block pedestrian crosswalk with flashers over Milton and a trail along the corridor through the future development site to Hecate / Kennedy.

Both options consider closure of Kennedy Street at Hecate (and reopening of Kennedy at Victoria) to reduce the complications and potential costs of the Hecate / Kennedy grade crossing.

EVALUATION OVERVIEW

Evaluation Criteria	Option A	Option B
Cost Estimate - Trail	Moderate \$570,000	Moderate \$670,000
Cost Estimate - Grade Crossings <small>* Grade crossing at Albert could be built with Section 1 or 2, depending on which is built first. ** Potential to avoid a grade crossing at Milton by moving the crossing 30 m from the tracks. This potential would be confirmed at the detailed design stage. *** Grade crossing at Hecate / Kennedy could be built with Section 2 or 3, depending on which is built first.</small>	Albert - High \$940,000*	Hecate / Kennedy - Moderate \$1.24 M***
	Milton - High \$1.41 M**	
	Hecate / Kennedy - High \$1.14 M***	
Pedestrian Experience	Good Flat grades, direct route	Moderate Albert hill, corridor departure
Cyclist Experience	Good Flat grades, direct route	Moderate Hill at Albert, 90° turns
Vehicle Impacts	Moderate Signalized pedestrian crossings	High Signalized pedestrian crossings; loss of on-street parking
Railway Impacts	Minimal	
Infrastructure Requirements (retaining, drainage, utilities)	Poor Retaining likely; changes to curb line and relocation of CBs	Moderate Changes to curb line and relocation of a CBs
CPTED (Crime Prevention Through Environmental Design)	Good Good sightlines, passive surveillance, well lit	
Environmental Impacts	Moderate Potential tree removals	Good Minimal vegetation impacts
Compatibility with Neighbouring Land Use	Moderate Proximity to private properties	Moderate Proximity to private properties

Legend

Positive

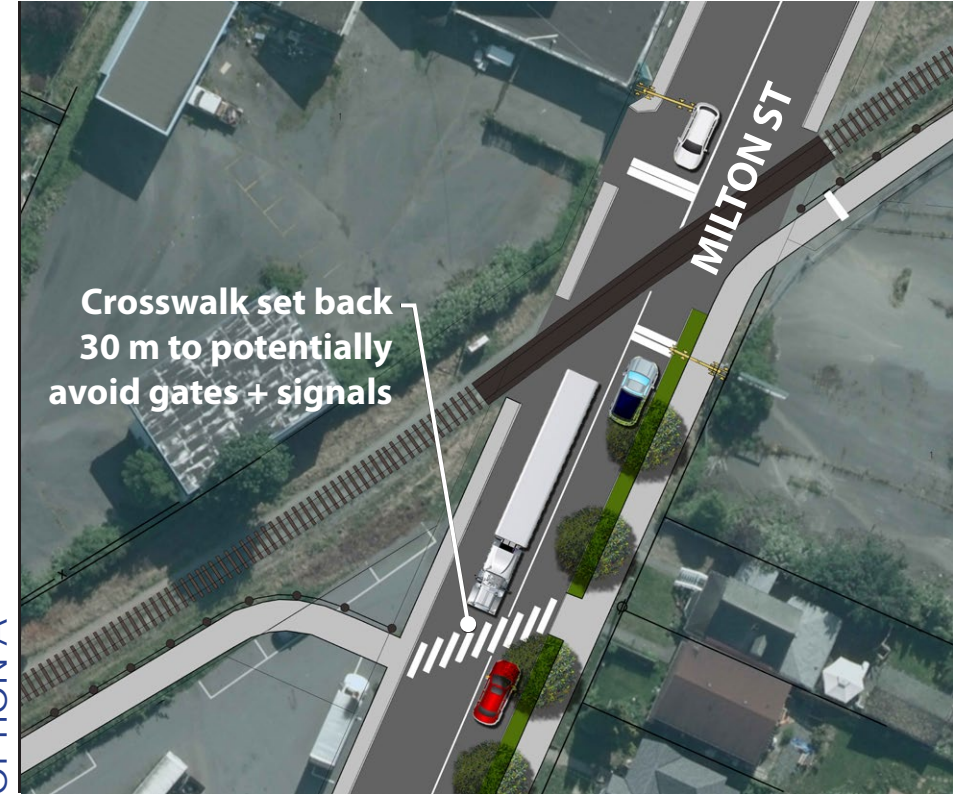
Neutral / Moderate

Negative

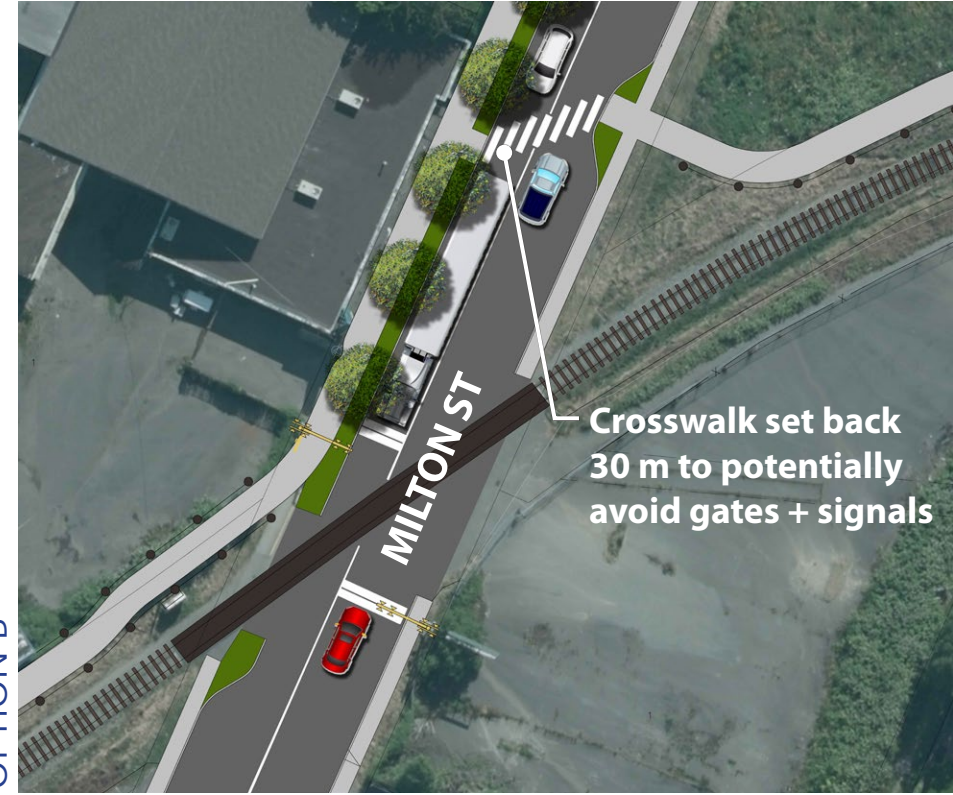
39



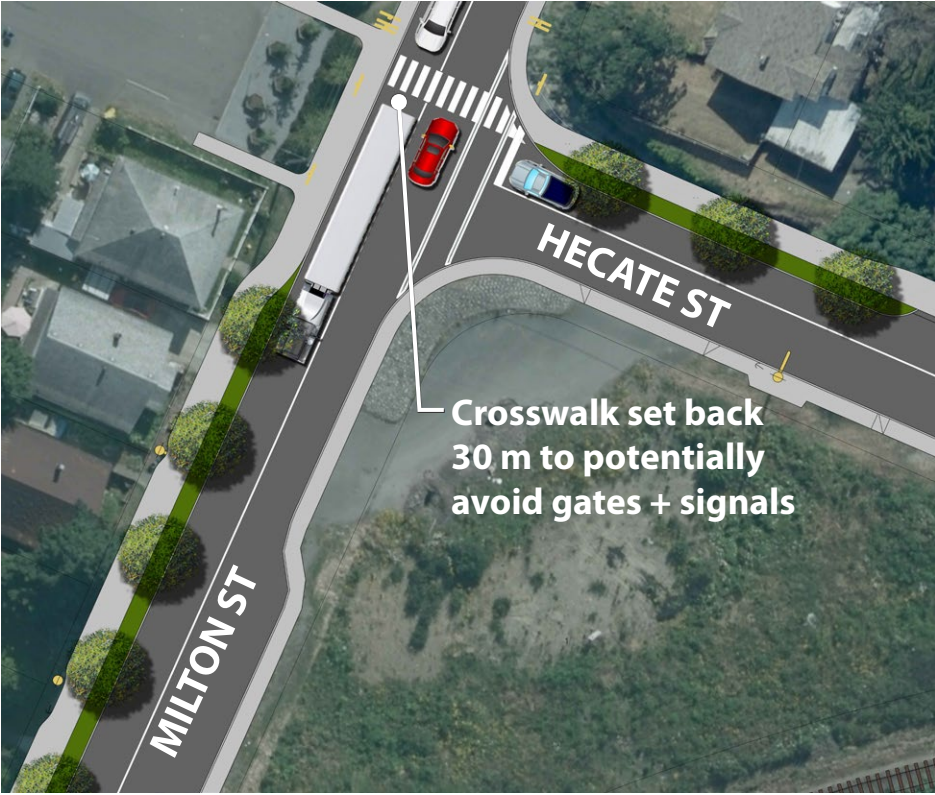
ALIGNMENT OPTIONS - SECTION 2: ALBERT TO HECATE / KENNEDY - DETAILS



Option A: Milton Street Crossing



Option B: Milton Street Crossing (Option 1)



Option B: Milton Street Crossing (Option 2)



ALIGNMENT OPTIONS – SECTION 3: HECATE / KENNEDY STREET TO FIFTH STREET - OVERVIEW


LOCATION

Section 1:  
Franklyn to Albert

Section 2:  
Albert to Kennedy/  
Hecate

Section 3:  
Hecate / Kennedy  
to Fifth

Section 4:  
Fifth to Seventh





OVERVIEW

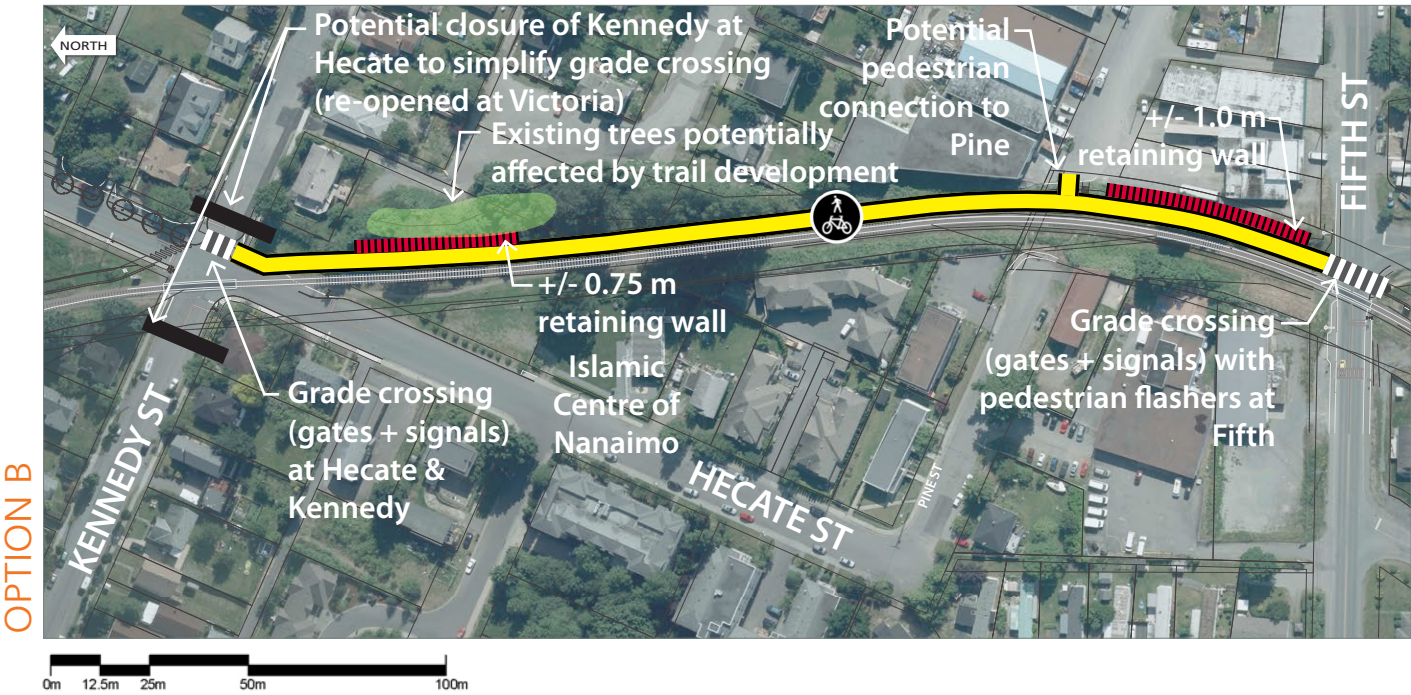
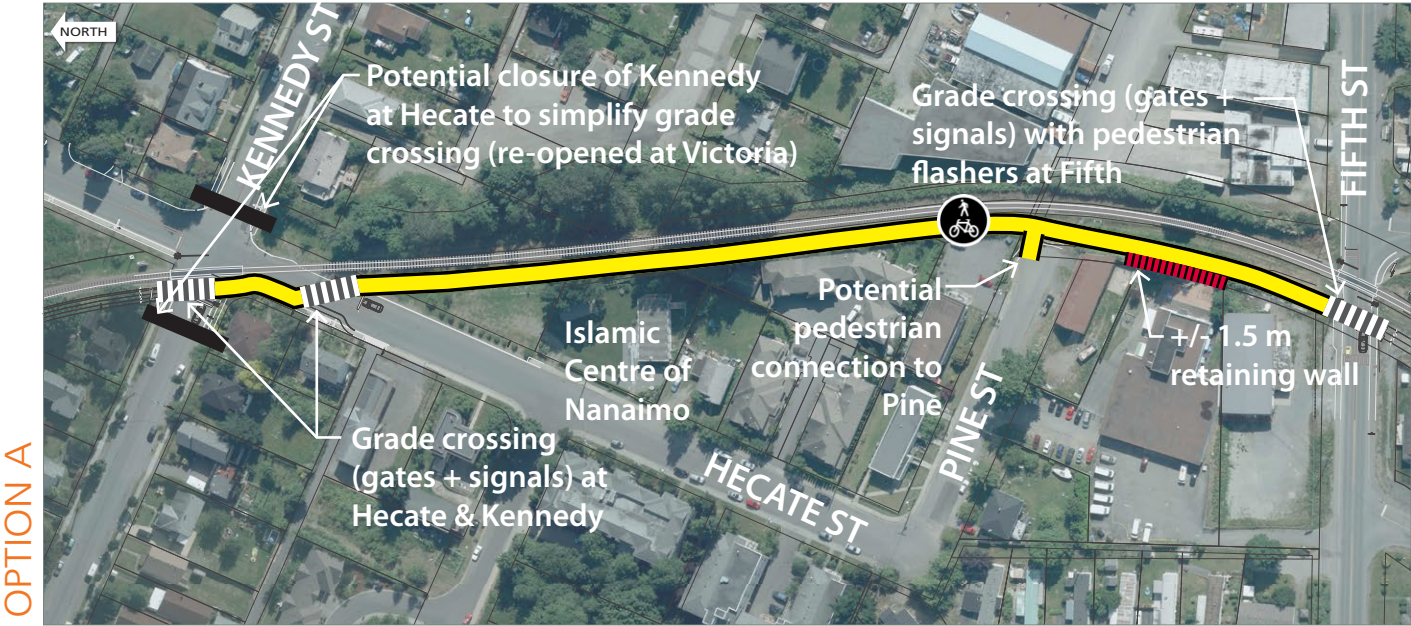
Length = 335 m

ROW Width:  
15 m (50') Kennedy to Pine  
30 m (100') Pine to Fifth

# of Grade Crossings:  
Option A = 0 to 2  
Option B = 0 to 2

IMAGES





OPTIONS NARRATIVE

Both options for this section are within the rail corridor and face similar challenges including CPTED (i.e., low visibility, limited ambient light), steeper slide slopes and existing drainage ditches that would need to be converted to underground pipes if a trail is added in the corridor. The options in this section have similar costs and would likely require gates + signals at the grade crossings at Hecate / Kennedy and at Fifth.

**Option A** is 3.0 m multi-use trail located on the west side of the tracks, following an existing desire line. Steep existing side slopes will likely require retaining (near the Boys and Girls Club). Existing vegetation includes bramble and blackberries, so no significant vegetation removal is likely required.

**Option B** is a 3.0 m multi-use trail located on the east side of the tracks. This alignment has steep side slopes near Hecate and again near Fifth that could require retaining. Near Hecate, there are existing trees that may be affected by trail development.

EVALUATION OVERVIEW

Evaluation Criteria	Option A	Option B
Cost Estimate - Trail	Moderate \$650,000	Moderate \$700,000
Cost Estimate - Grade Crossings	High \$1.14 M - Hecate / Kennedy*	High \$1.24 M - Hecate / Kennedy*
	High \$1.09 M - Fifth**	High \$1.08 M - Fifth**
Pedestrian Experience	Good Flat grades, direct route	
Cyclist Experience	Good Flat grades, direct route	
Vehicle Impacts	Moderate Signalized pedestrian crossing at Fifth	
Railway Impacts	Minimal	
Infrastructure Requirements (retaining, drainage, utilities)	Poor Retaining needed; underground drainage infrastructure needed	
CPTED (Crime Prevention Through Environmental Design)	Poor Limited passive surveillance and ambient light, isolated, high adjacent banks limit potential "escape" routes	
Environmental Impacts	Good Minimal tree impacts	Moderate Some tree removal required near Hecate
Compatibility with Neighbouring Land Use	Moderate Proximity to private properties	Good Little impact on adjacent lands

Legend

Positive

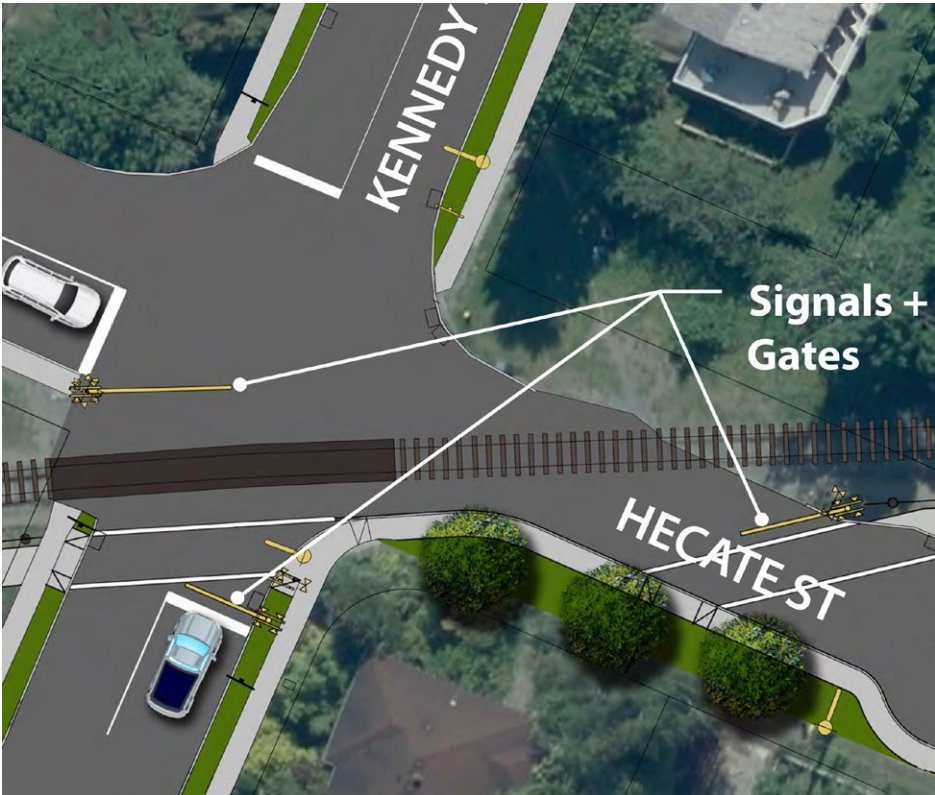
Neutral/Moderate

Negative



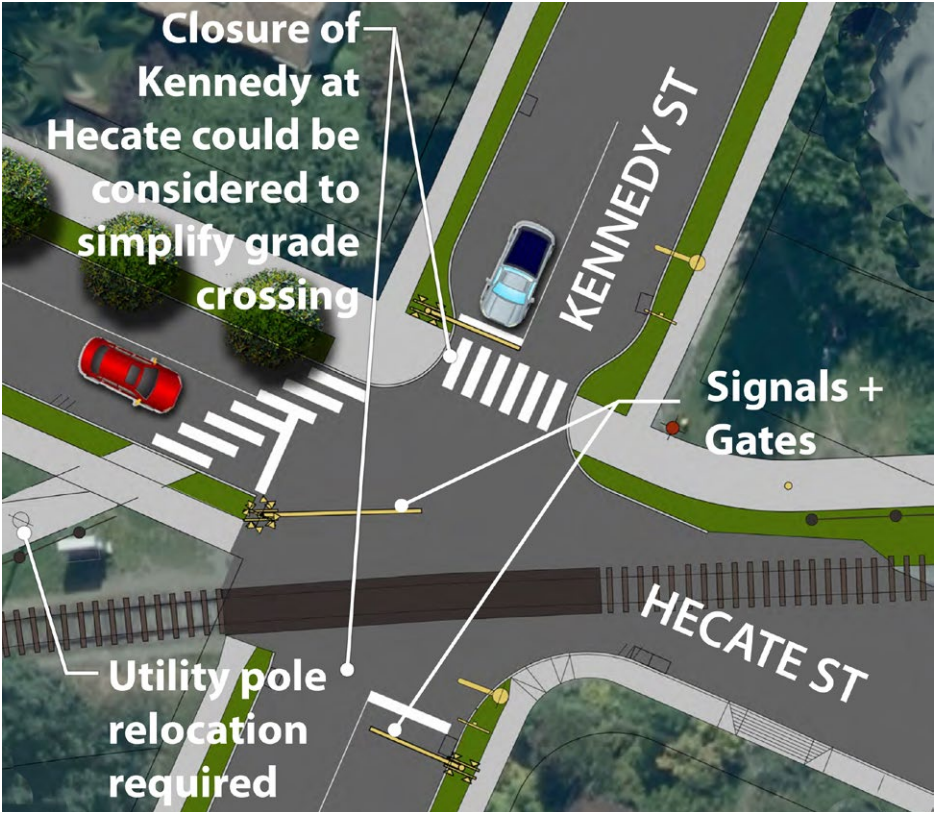
ALIGNMENT OPTIONS - SECTION 3: HECATE / KENNEDY STREET TO FIFTH STREET - DETAILS

OPTION A



Option A: Hecate / Kennedy Crossing

OPTION B



Option B: Hecate / Kennedy Crossing



ALIGNMENT OPTIONS - SECTION 4: FIFTH STREET TO SEVENTH STREET - OVERVIEW

LOCATION

Section 1:  
Franklyn to Albert

Section 2:  
Albert to  
Kennedy/  
Hecate

Section 3:  
Hecate / Kennedy  
to Fifth

Section 4:  
Fifth to Seventh



OVERVIEW

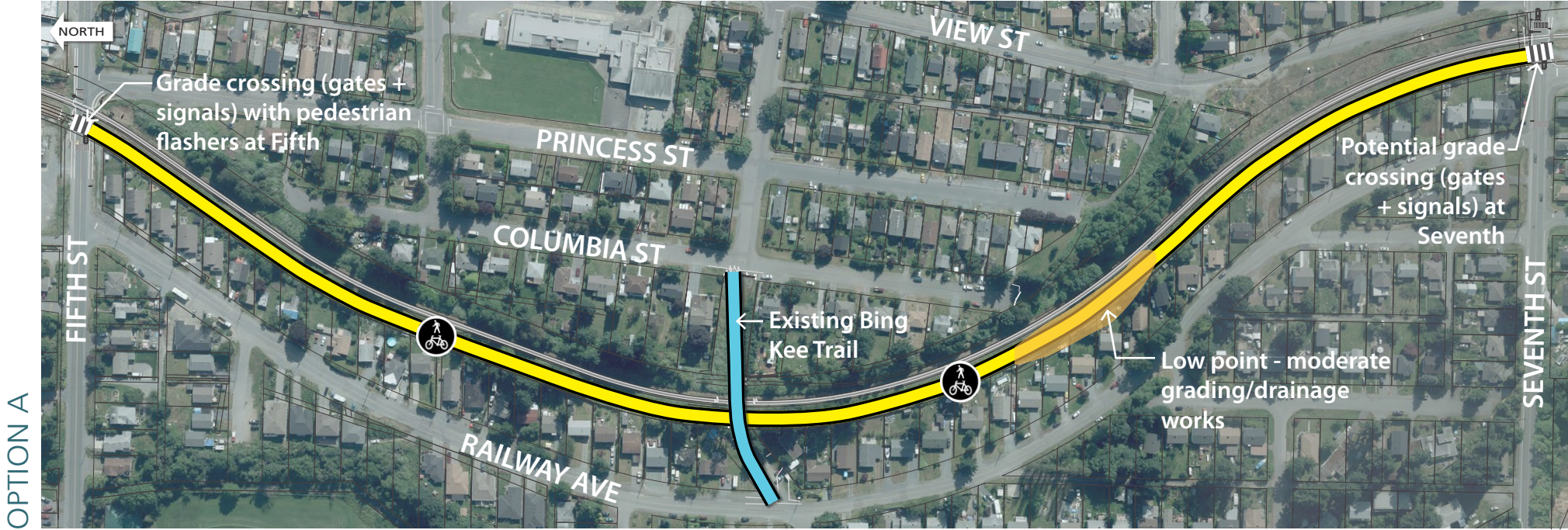
Length = 950 m

ROW Width: 30 m (100')

# of Grade Crossings:  
Option A = 0 to 2  
Option B = 0 to 2

IMAGES





OPTIONS NARRATIVE

Between Fifth and Seventh there is a 1 km stretch of corridor without crossings. The Bing Kee pedestrian crossing is mid-way through this section. For both options a grade crossing with signals + gates would be required at Fifth.

**Option A** is 3.0 m to 4.0 m multi-use trail located on the west side of the tracks. Because the corridor is 30 m (100') there is opportunity to locate the trail to manage grades, vegetation and drainage. The low point between Bing Kee and Seventh would need to be addressed.

**Option B** has two options. The first option follows the tracks to Columbia where it joins the street as a bicycle boulevard with speed humps and a traffic circle. At the end of Columbia, trail users are directed down a City ROW to View before traversing ICF land to connect back with the corridor at Seventh. The second option is a 3.0 m to 4.0 m multi-use trail located on the east side of the tracks. Layout, vegetation and grading issues would be similar to those described in Option A.

EVALUATION OVERVIEW

Evaluation Criteria	Option A	Option B
Cost Estimate - Trail	High \$1.68 M	Columbia - Good \$750,000
		On Rail - High \$1.56 M
Cost Estimate - Grade Crossings <small>* The grade crossing at Fifth could be built with Section 3 or 4, depending on which is built first. ** Confirmation of the need to build the grade crossing at Seventh with this section or with future trail extension would be confirmed at detailed design.</small>	Fifth - High \$1.09 M*	Fifth - High \$1.08 M*
	Seventh - Moderate \$820,000**	Seventh - Moderate \$820,000**

continued on next page

Legend

Positive

Neutral / Moderate

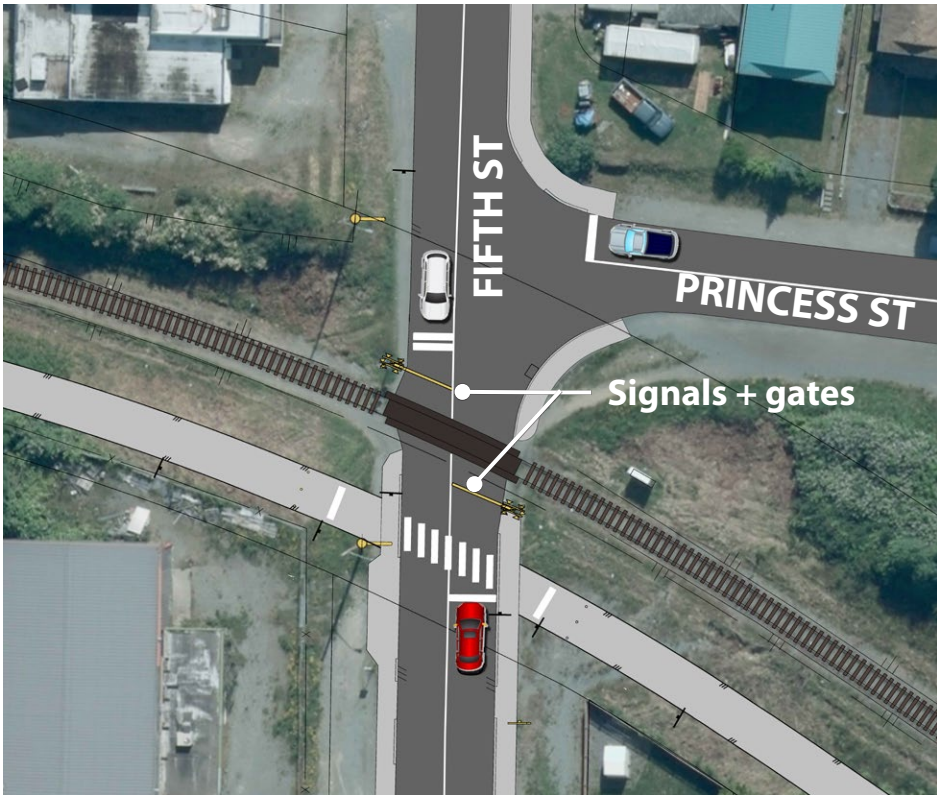
Negative



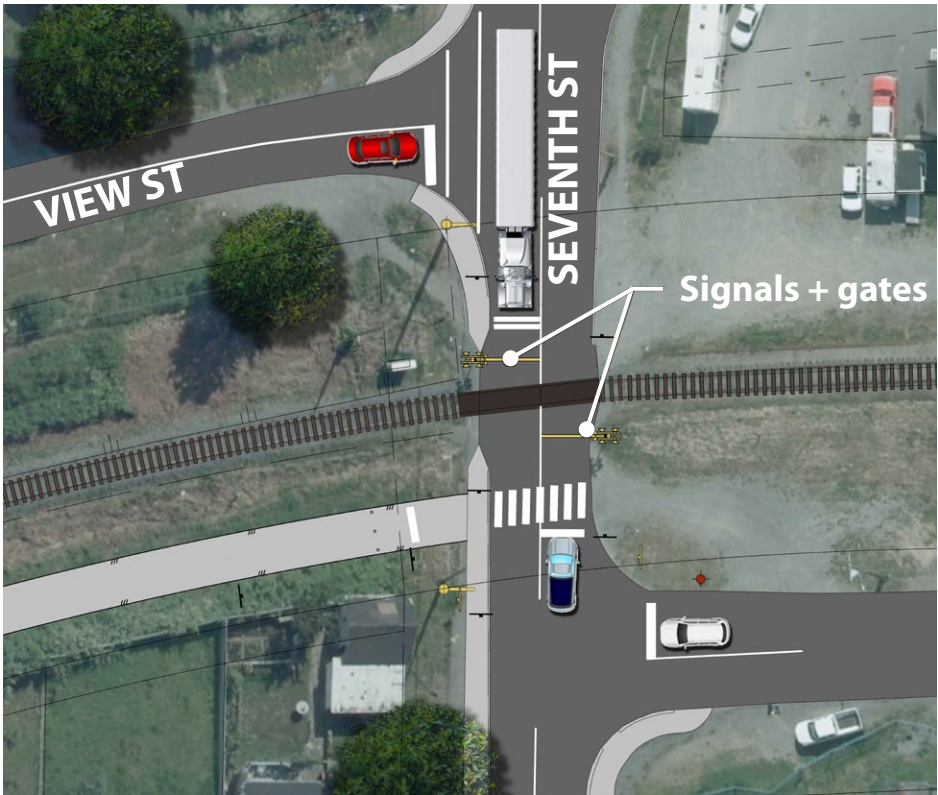
ALIGNMENT OPTIONS - SECTION 4: FIFTH STREET TO SEVENTH STREET - DETAILS

Evaluation Criteria	Option A	Option B
Pedestrian Experience	Good Manageable grades, direct alignment; low point between Bing Kee and Seventh	Columbia - Moderate Manageable grades, direct alignment; pathway on Columbia
		On Rail - Good Manageable grades, direct alignment; low point between Bing Kee and Seventh
Cyclist Experience	Good Flat grades, direct alignment; low point between Bing Kee and Seventh	Columbia - Moderate Direct alignment; grade challenges between Columbia and View; uses street network
		On Rail - Moderate Direct alignment; ravine between Bing Kee and Seventh
Vehicle Impacts	Good Minimal traffic impacts	Columbia - High Traffic calming on Columbia for bicycle boulevard
		On Rail - Good Minimal traffic impacts
Railway Impacts	Minimal	
Infrastructure Requirements (retaining, drainage, utilities)	Moderate Drainage swales and culverts required; grade improvements in ravine between Bing Kee and Seventh	
CPTED (Crime Prevention Through Environmental Design)	Poor Limited passive surveillance and ambient light, isolated, swales and fences limit potential "escape" routes	Columbia - Good Passive surveillance and street lighting
		On Rail - Poor Limited passive surveillance and ambient light, isolated, swales and fences limit "escape" routes
Environmental Impacts	Moderate Some trees possibly affected by grading at low point and sight lines	Columbia - Good Minimal tree impacts
		On Rail - Moderate Some trees possibly affected by grading at low point and sight lines
Compatibility with Neighbouring Land Use	Good Little impact on adjacent properties	Moderate Increased trail traffic on Columbia
		Good Little impact on adjacent properties

OPTION A

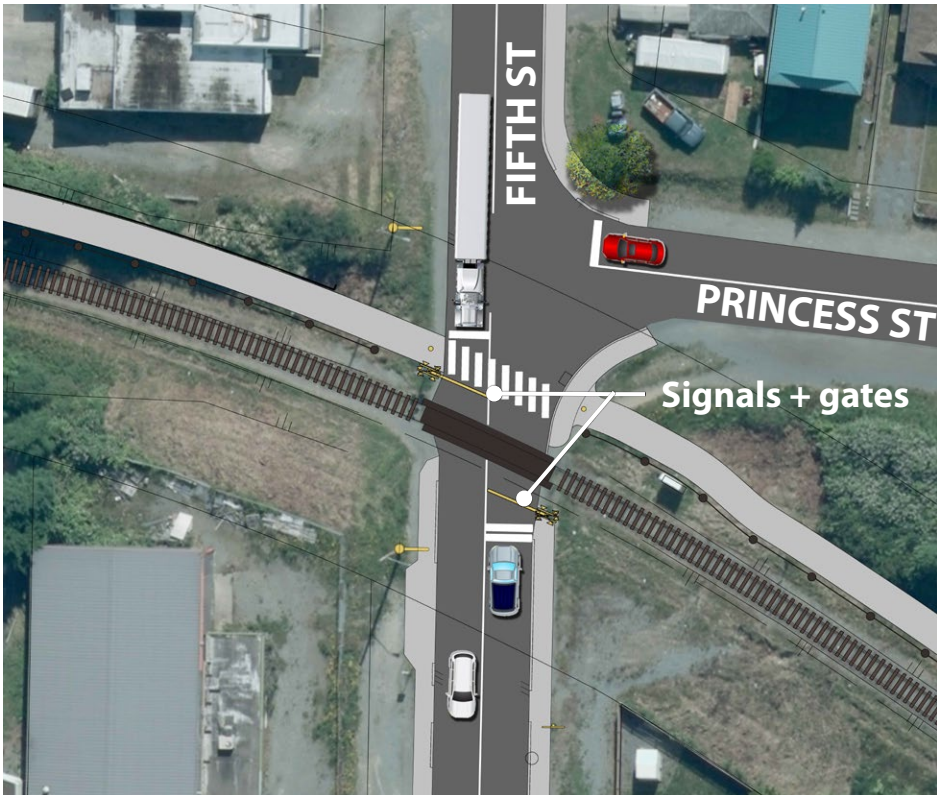


Option A: Fifth Street Grade Crossing

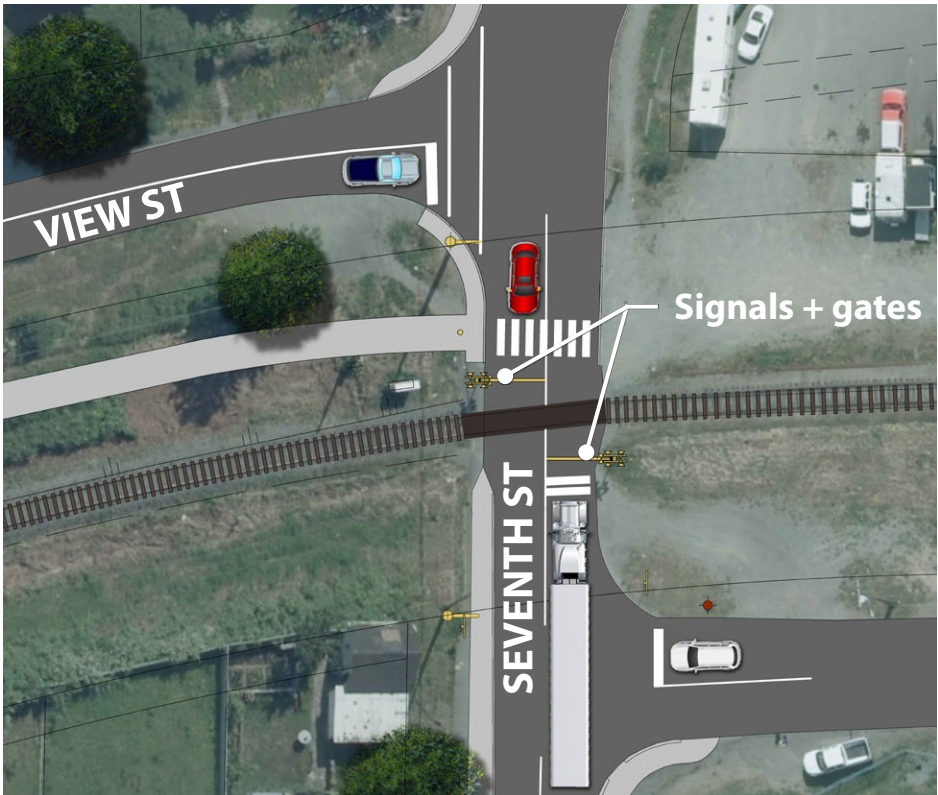


Option A: Seventh Street Grade Crossing (future)

OPTION B



Option B: Fifth Street Grade Crossing



Option B: Seventh Street Grade Crossing (future)



# APPENDIX B

## CONSULTATION RESULTS SUMMARY



The following summary documents the feedback from the consultations on the alignment options (A & B) from the summer of 2015.



This page intentionally left blank to facilitate double-sided printing.



**DATE** July 27, 2015**PROJECT No.** 1414989**TO** Gordon Foy, Manager of Transportation  
City of Nanaimo**CC** Scott Lewis, Newcastle Engineering**FROM** Jana Zelenski**EMAIL** jana\_zelenski@golder.com**E&N TRAIL DOWNTOWN SOUTH ALIGNMENT STUDY PUBLIC CONSULTATION SUMMARY**

---

**1.0 BACKGROUND**

The E&N is a key multi-modal transportation corridor. The City of Nanaimo's long term goals include the construction of a multi-use trail along the corridor for the full length of the City, supporting the vision of a complete Vancouver Island trail corridor. To date, 8 km of the E&N Trail in Nanaimo has been built between Caledonia Street and Mostar Road, connecting downtown and the north end of the City.

To continue this connection south, the City is studying alignments for the Downtown South section between Franklyn and Seventh Streets – a section just under 2 km in length. The outcome of this study will be a recommended alignment based on technical analysis and public input. Project work was initiated in November 2014.

**2.0 DISCUSSION & RECOMMENDATIONS FOR CONSIDERATION**

This section provides an overview of key public consultation feedback and a recommended approach for advancing the concepts identified. This information has been summarized from information contained in the subsequent sections of this report and readers are encouraged to review the full document for additional details.

**2.1 Evaluation Criteria**

In the questionnaire, participants were asked to identify their priorities for evaluating E&N Trail route alternatives. An interesting outcome was that cost was prioritized substantially lower (sixth overall) than criteria related to function (ease of use was identified as most important). Safety and directness were also recognized as priorities. See Question 6, p.24 for additional details.

Substantial discussion at the open house focused on building a “great” trail – many people identified that while they would like to see the trail built quickly, building it “right” should be the priority.

Based on this feedback, it is recommended that trail function be a priority when evaluating options.





## 2.2 Section Summaries

Section summaries are provided to note the key issues / opportunities identified about each section of the trail. See Section 3.4.2: Comments on Alternatives (pp. 13-19) for graphics of each alternative and Questions 7 through 14 (pp.25-28) for more information about feedback received.

### 2.2.1 Section 1: Franklyn to Albert

#### Discussion

Participants who provided feedback on Section 1 showed a strong preference for Option A over Option B. The main reasons indicated for this preference was doubt that trail users would leave the existing rail corridor even if a trail was available; the corridor is more direct, with flatter grades and a well-established goat track through this section.

A potential revised alignment for Option B was identified during public consultation. The route could follow the Option B alignment between Franklyn and Prideaux, then cross the tracks at the mid-block pedestrian crossing and following the rail corridor to Albert on the east side of the tracks (rather than staying on Prideaux). See Figure 1 below.

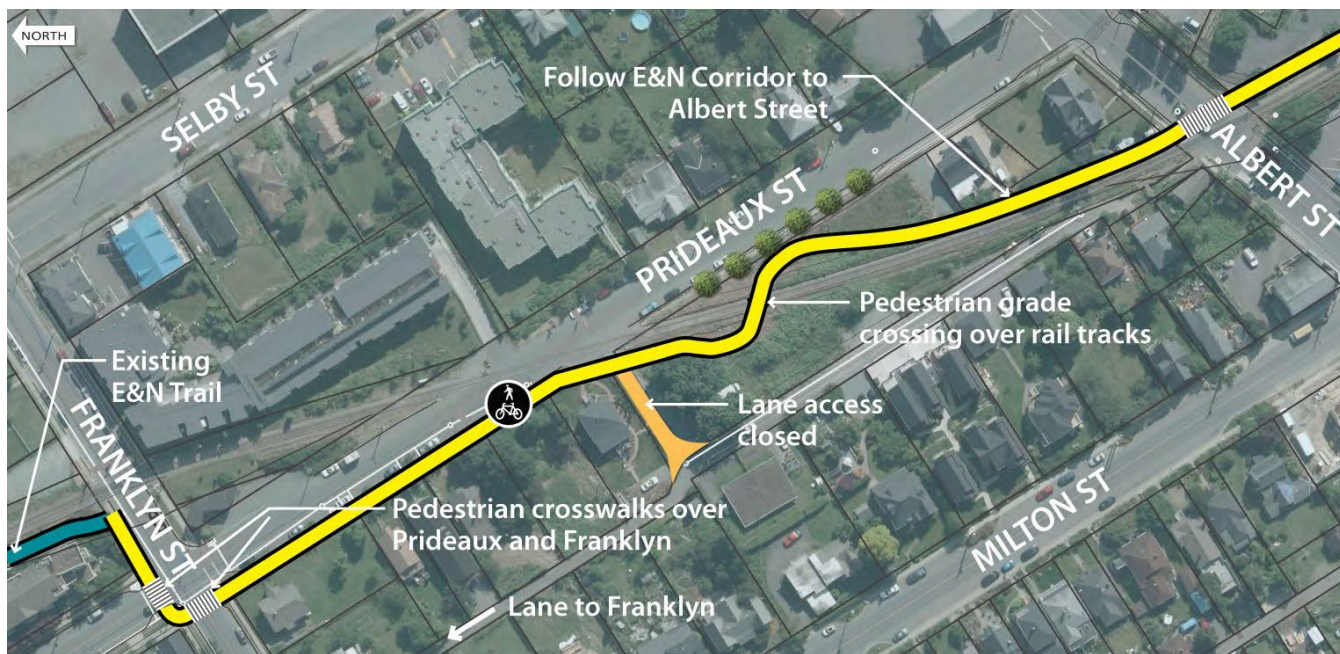


Figure 1: Potential Revised Alignment Option B

Advantages to the revised route include:

- Elimination of the hill between Prideaux and the corridor at Albert (shown on original Option B Alignment). This hill was a key concern identified by participants. The routing change would also eliminate the need for property acquisition at 501 Prideaux.
- Recognition of an existing desire line and travel path between Albert and Prideaux.
- Potential elimination of the Franklyn Street crossing if the street network is followed along Franklyn and Prideaux to the Prideaux Street Crossing (shown on original Option B Alignment and Figure 1).
- Sufficient space for a mid-block pedestrian crossing over the rail tracks.



- Elimination of issues encountered on the west side of the tracks (Option A), including the proximity of the existing house at 660 Albert Street to the corridor and the existing slope / tree adjacent to the Superette that would require tree removal, regrading and retaining structures.

Disadvantages / challenges to the revised route include:

- Potential that people could choose to remain on the corridor between Franklyn and Prideaux, reducing the effectiveness of the off-rail routing.
- Costs of the grade crossing at Albert Street.
- Setback requirements would result in property impacts at 626 Albert Street and 453 Milton Street. While built structures are sufficient distance not to be affected, property acquisition would be required.
- Potential need for minor retaining structure near Albert Street.
- Mid-block lane access would still need to be closed (as per both original options).

### **Recommended Approach to Section 1**

Based on public input, the hill at Albert Street was identified as a key issue, along with a strong desire to follow the existing route along the rail corridor through this section. For these reasons, there is a chance that the original Option B alternative that moves the alignment away from the corridor would not be fully adopted by trail users, resulting in continued trespass along the rail corridor.

It is recommended that Option A, or a revised Option B (see Figure 1 above), be considered moving forward.

## **2.2.2 Section 2: Albert to Hecate / Kennedy**

### **Discussion**

Participants' comments on Section 2 showed a strong preference for Option A over Option B, again with most comments related to the hill at Albert Street (see Section 1 discussion). Several participants felt the climb between Prideaux Street and the grade crossing at Albert would provide a barrier to all ages and abilities.

Outside the Albert Street incline issue, there was not a strong preference for being on the east or west side of the tracks. Most participants felt there was an advantage to being adjacent to the tracks between Milton and Hecate, rather than following the street network.

### **Recommended Approach to Section 2**

Option B (east side of the tracks alignment) is slightly more desirable as it eliminates the need for retaining and tree removal near the Superette and near Hecate / Kennedy; however, both options A and B are generally comparable in function and cost. It is recommended that the alignment remain along the corridor through the development property site (between Milton and Hecate / Kennedy), rather than following the street network along Milton and Hecate, unless the Milton crossing has significant cost implications. There is good potential for trail development through this section to occur concurrent with development of the property.

For this section, it is recommended that Option B be considered, if the revised alignment for Section 1 is achievable. If not, Option A should be pursued.



### **2.2.3 Section 3: Hecate / Kennedy to Fifth**

#### **Discussion**

Public comments identified relatively few advantages of one side over the other for this section. Option B was considered to be slightly less favourable due to potential tree impacts near Hecate / Kennedy and potential need for more retaining structures than the Option A. There was general consensus that it would be best to build this section on whichever side offers the best connection to the north and south.

Several public comments also suggested that if grade separation were to be considered in the future, the Fifth Street crossing would be the most important location in this section due to the vehicle traffic volume and sight line distances on Fifth Street. There is potential for a grade separated crossing in this location, as the ROW has sufficient width to accommodate construction. However, the cost of grade separation would be significantly higher than an at-grade crossing. Public comments also identified mixed opinions on grade separated crossings, notably safety concerns related to isolation of tunnels.

#### **Recommended Approach to Section 3**

Section 3 should be aligned based on the alignment selected for Sections 1 and 2.

### **2.2.4 Section 4: Fifth to Seventh**

#### **Discussion**

Section 4 of the route alignment garnered a significant amount of discussion. Generally, public opinion was evenly divided – with about half of participants preferring the on-rail option (Option A) and half preferring the Columbia Street Option (Option B). Based on concern expressed by the residents of Columbia Street, an on-site session was held June 27, 2015. Residents from the Columbia Street area indicate their preference to be the on-rail option (Option A), rather than the Columbia Street route (see Section 5.0, p.30 for more information).

Routing choice for this section of trail has significant impact on cost, which generated much discussion.

#### **Recommended Approach to Section 4**

In the long-term, it is recommended that Option A be pursued for the E&N Trail through Section 4 – either on the west side of the tracks for the entire route, or following the east side of the tracks between Fifth and Bing Kee, changing sides at the existing Bing Kee crossing and following the west side to Seventh to avoid the large ravine on the west side of the tracks.

In the short-term, pending further consultation with Columbia Street residents, an interim route along Columbia is recommended for consideration.

## **2.3 Priorities**

At the open house and in the questionnaire, participants were asked about their priorities for phasing the Downtown South section of the E&N Trail. Public feedback indicates that the top priority is development of Section 1: Franklyn to Albert. Many people believed this was the next logical step in trail development, building on the trail that has been completed between Fitzwilliam and Franklyn, supported by evidence of high corridor use along this section.



The second priority identified through public feedback is development of Sections 3 and 4. Technical review and input from stakeholders suggest that Section 3: Hecate / Kennedy to Fifth should continue to be considered a priority due the absence of other north / south connections for cyclists and pedestrians through this area.

## **2.4 General Public Feedback**

A large amount of feedback was generated through public consultation for this project. It should be noted that participation in this process was voluntary and responses indicate that participants, in general, are trail users and trail supporters. Generally those who participated indicated they were encouraged by this project and supportive of initiatives to advance the E&N Trail. See questions 16/17, p. 29 for more information.

## **3.0 PUBLIC OPEN HOUSE**

### **3.1 Overview and Purpose of the Open House**

An open house for E&N Trail Downtown South Alignment Study was held on June 3, 2015 from 4:00pm to 7:00pm at the Nanaimo Train Station Patio. The purpose of this open house was to present route options for the E&N Trail and provide an opportunity for trail users, residents and stakeholders to review and comment on the trail options they prefer and talk about their priorities for the route.

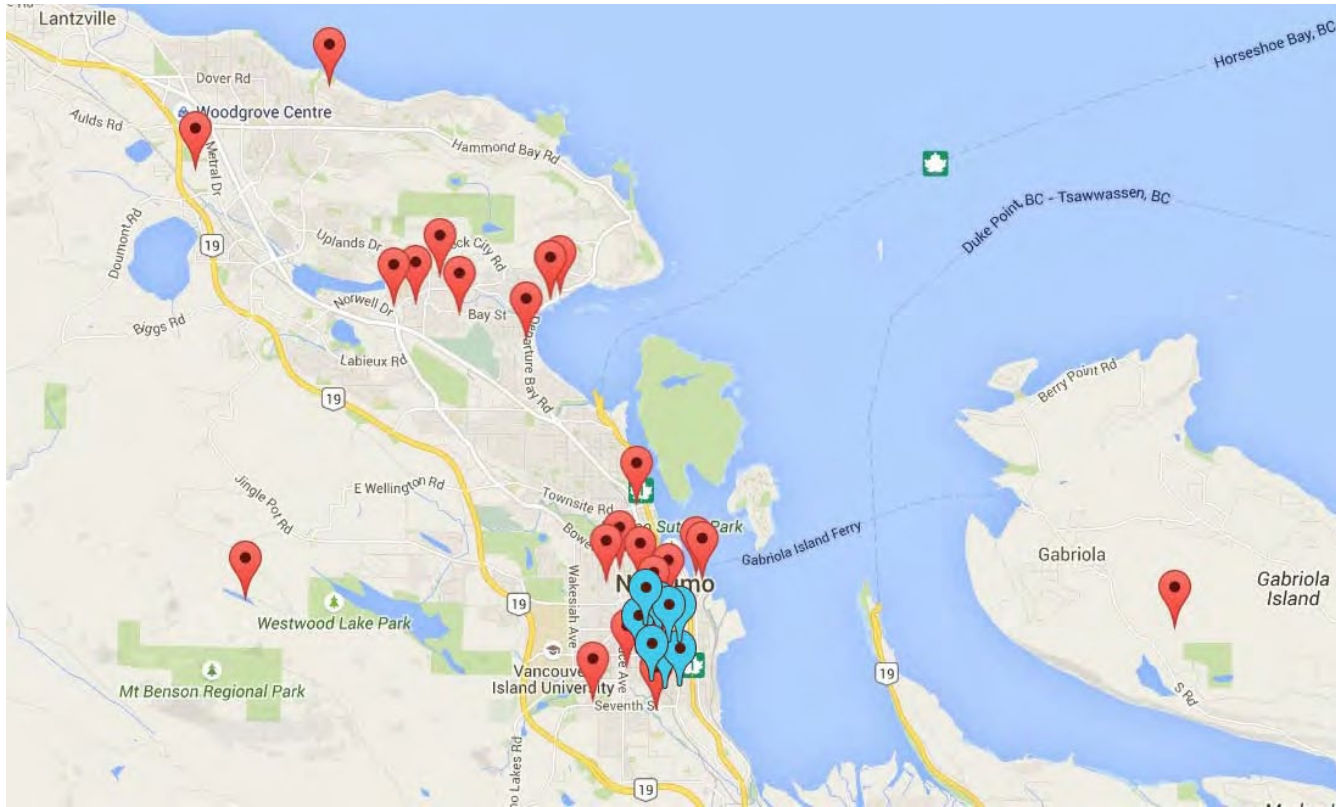
### **3.2 Open House Format**

The event was held as an interactive, drop-in format where participants were encouraged to provide input directly on the display boards (see **Appendix A** for the display boards). Participants were also encouraged to complete a questionnaire at the open house in hard copy or online through online survey software.

### **3.3 Participation**

Ninety-two participants signed into the open house. Figure 2 shows the location of open house participants based on postal codes provided on the sign-in sheet. Note that dual postal codes (ie. two people living at the same postal code) are indicated by a single marker. A large portion of open house participants live in the downtown south area of the City, but attendees from throughout the City participated.





*Figure 2: Postal Code Map of June 3, 2015 Open House Participants (red) and June 27, 2015 Columbia Street Meeting Participants (blue)*

### 3.4 Open House Feedback

Feedback at the Open House was gathered through:

- The feedback form to capture detailed feedback on the options (see Section 3.0)
- Sticky notes and dots on the display boards and large maps to document public comments and obtain a snapshot of participants' opinions.
- Staff and consulting team conversations with participants.

#### 3.4.1 Large Route Maps

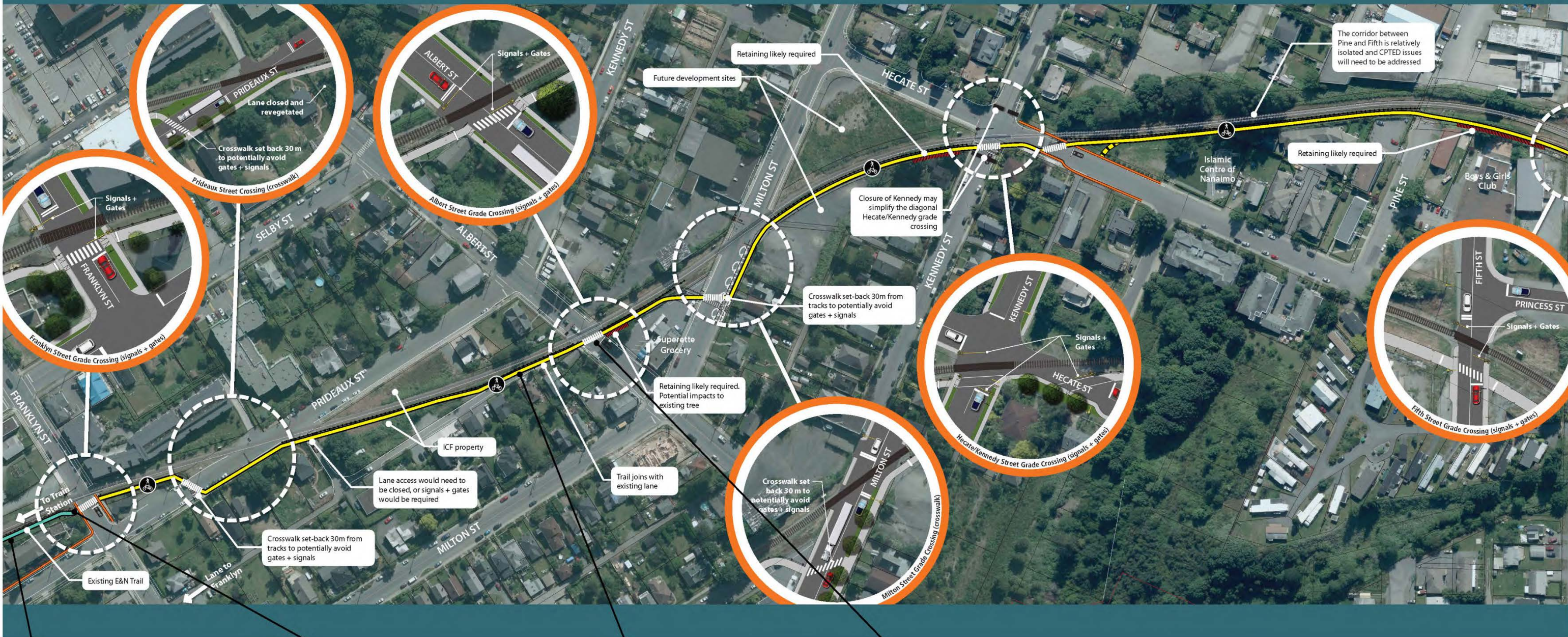
Two large route maps, one showing Option A: On-Corridor and one showing Option B: On-Off Corridor were displayed on tables at the open house to capture people's comments on the alignment options being considered.

Participants were asked to review and discuss the route options with the facilitators and other participants and use sticky notes to record their comments and observations about each route. The following pages show the comments recorded for each route.



# E&N TRAIL | DOWNTOWN SOUTH ALIGNMENT & COSTING STUDY

## Overview Map - Alignment A: On-Corridor



PUBLIC COMMENTS

A trail over the Millstone would be Awesome!

I second this whole heartedly (related to above comment). I use the railway along these ways and it cuts my travel time and vertical climbing. Perhaps if the City digs a tunnel to link parking at Caledonia to downtown waterfront then that would be a good time to upgrade bridge infrastructure to permit a bike lane.

How do cyclists get on/off Fitzwilliam?

Fitzwilliam is a main route downtown. Route is to connect downtown to south end.

First 30 yards should be a trail/road.

Consider tunnels.

Most people do not like tunnels anywhere.

LOVE tunnels. Way more safe than intersection.



What are your thoughts, questions or ideas about this trail route? Tell us by writing them on a sticky note and attaching it to the plan.

Add your comment...



The recently completed Bing Kee Trail provides a mid-way connection across the tracks

The corridor has a low point in this area that would require fill and drainage works to support trail development

End of study area

**LEGEND**

- Existing Trail
- Proposed Multi-Use Trail
- Sidewalk
- Proposed Fence
- Potential Retaining Location
- Proposed Crosswalk

PUBLIC COMMENTS

Sight lines for westbound traffic limited by steep hill @ Fifth and Pine

Consider a tunnel like on existing E&N

Would tunnel or bridge be more cost effective and not have trail users stop for trains?

What about an overpass instead of a tunnel?

Don't like tunnels – people urinate, smells collect, some loiterers harass passers by, generally feel unsafe

LOVE tunnels. Safer by far than any road crossing. Would take urine smell any time over less safe. Travel tunnel by Brooks Landing all the time, no problem.

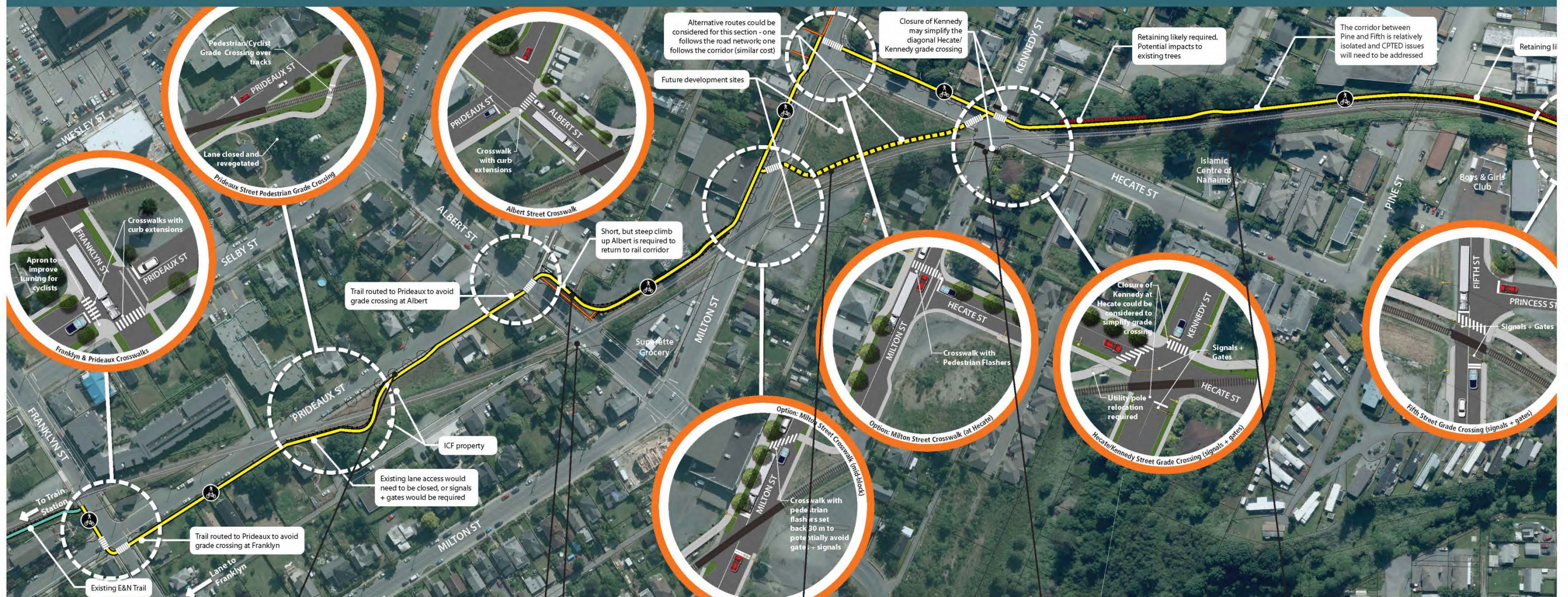
How about from Seventh along View trail to Princess then to Fifth?

How many trains per day? 1 or 2 at most. The crossing equipment, etc. seems like overkill.



# E&N TRAIL | DOWNTOWN SOUTH ALIGNMENT & COSTING STUDY

## Overview Map - Alignment B: On/Off-Corridor



### PUBLIC COMMENTS

Hecate - Franklyn is priority.

I would not like this hill.

This is a hill (Albert Street) – so the route does not cut out the hills.

Agreed. People will skip the hill and follow the tracks or road.

Lane should be reopened at Albert as it used to be.

People will use the shorter route.

The shorter, more direct route looks like a better alignment.

Following the existing trail is more likely even if the street is improved.

Like rail option by Milton lumber mill.

Support using existing crosswalks at Kennedy.

This is an important section - lots of people use this (either the north or south side).

Think about connection to Pine.



What are your thoughts, questions or ideas about this trail route? Tell us by writing them on a sticky note and attaching it to the plan.

Add your comment...



**LEGEND**

- Existing Trail
- Proposed Multi-Use Trail
- Proposed Multi-Use Trail - Alternate Route
- Sidewalk
- Proposed Bicycle Boulevard
- Proposed Fence
- Potential Retaining Location
- Proposed Crosswalk

PUBLIC COMMENTS

Take the cheap option!

This is a nice neighbourhood and people ride it already.

Long term it can still go on rail.

Railway as an alternative to Columbia (+2).

Railway not Columbia.

Trail should be separated from road.

Support on street if physically separated from road.

Support off rail trail that is separated from road with green blvd.

What will the separation look like? Cement barrier? Plantings?

Plan this with curb/gutter/sidewalk for Bayview Elementary pedestrian traffic.

Instead of proposed traffic circle apply CityRepair.org intersection. Repair gathering space/village centre

Access from Columbia (at end of Columbia back to rail corridor).

End trail on View just north of 7th Street to avoid gated crossing of 7th.

End at 7th intersection.

ROW for 5th to 7th is cheaper and an easy walk or cycle.

Having a designated bike lane all along the bike pathway will reduce garbage dumping (maybe no quick throw away).



### 3.4.2 Display Boards



In addition to the large maps, ten display boards provided details about the project to obtain participant feedback. Key feedback from the open house display boards is summarized below.

#### ***General Comments about E&N Trail South Alignment***

Overall, responses show that participants are encouraged about the potential to extend the E&N Trail and value the opportunity to enhance community connectivity.

General comments about the overall route included:

- A preference for pursuing the “highest quality” project (indicating a preference for Option “A”).
- Need for a complete corridor for effective use.
- Request for lighting considerations, especially for use during the evening commute.
- Concerns about headlights of traffic adjacent to the trail affecting users. Recommendation that a painted line on the trail be used to separate opposing cycling traffic to reduce potential collisions.
- Discussion on the high costs of rail-related safety infrastructure and potential savings if the E&N was no longer an active train corridor.
- General support for the route.



## Evaluation Criteria



Figure 3: Suggested Evaluation Criteria

Evaluation criteria that will be used to assess the potential route alternatives were presented to the public as shown in Figure 3. Participants were asked:

### ***Do you have other suggestions for evaluation criteria?***

Responses included: (a (✓) indicates agreement by another respondent)

- Ease of use by all (kids, adults, seniors, strollers, cyclists and wheelchairs).
- Since south side of town / Harewood has such poor routes for public transportation – trails, safe walkways and cycle paths are absolutely critical (consider needs of low income).
- Look at life cycle costs. Capital is only 20% of total long term costs. (✓)
- Which will better suit users? Higher cost sometimes worth it for higher quality. (✓)
- Can we consider the savings if we remove the tracks?
- Comparatively there has not been much spent on cycling in Nanaimo. Build the better one NOT the cheaper one.
- By investing in this plan we encourage sustainable transport, saving us far more \$ and improving health and sense of community. (✓)

### ***General Comments about Nanaimo Trails***

In addition, comments were received that relate to trails in general, but not necessary to the E&N Trail South Alignment Study. These are captured for information and future trail planning for the City:

- Identified concern about safety along Hammond Bay Road in the vicinity of the Prince John Way intersection.
- Suggestion for improved signage on the waterfront walkway north of Millstone.
- Suggestion for a crossing over the Millstone at Caldonia.



## Comments on Options

### Section 1: Franklyn to Albert

The following two alternative concepts were provided for Section 1 of the Study.

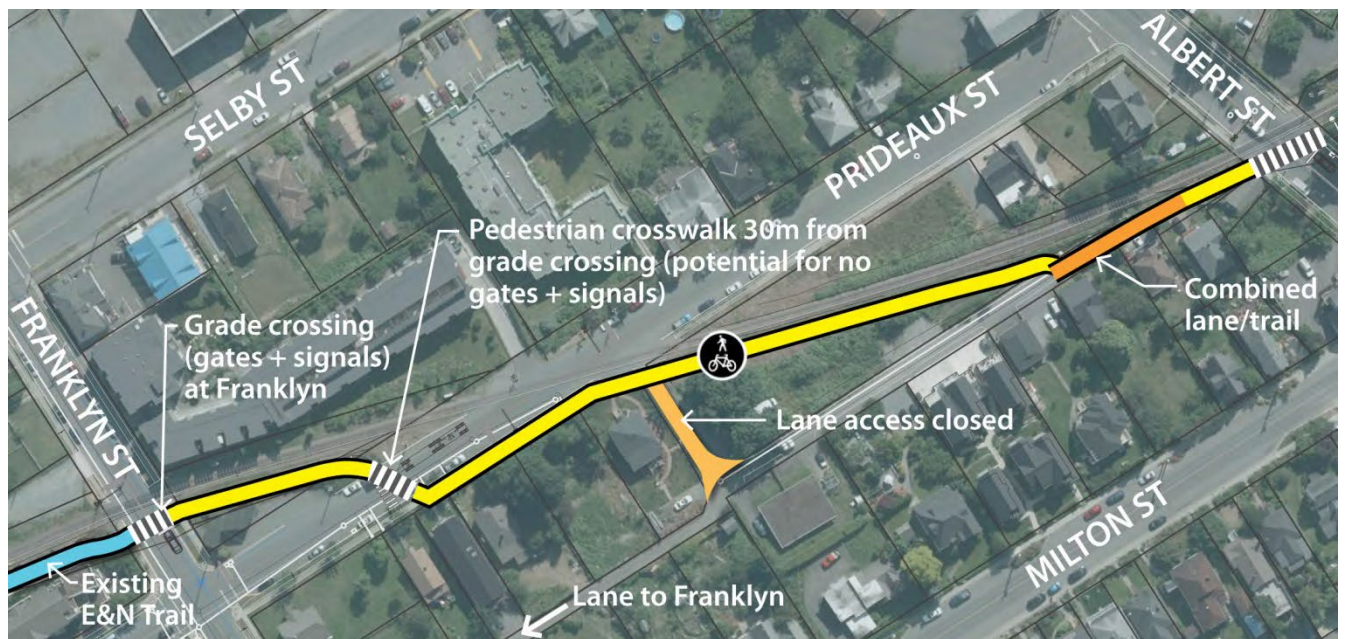


Figure 4: Section 1 - Option A

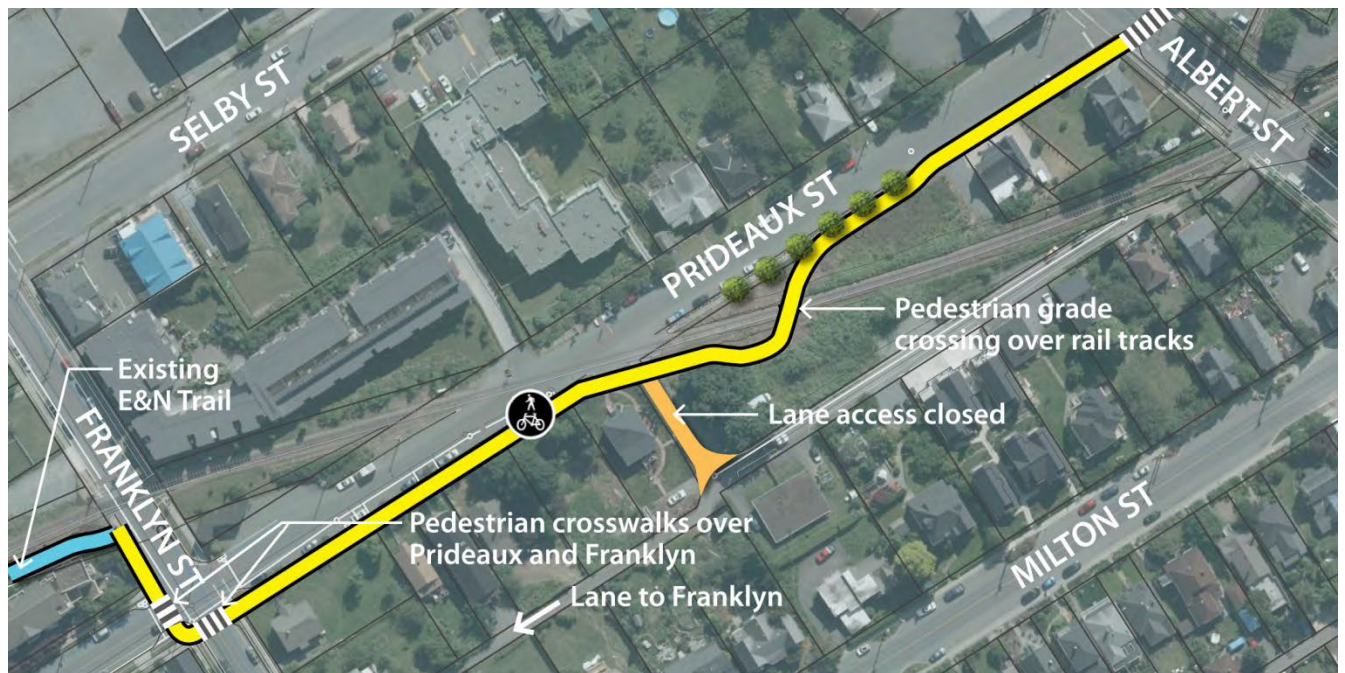


Figure 5: Section 1 - Option B



## Section 2: Albert to Kennedy/Hecate

The following two concept options were provided for Section 2 of the Study.

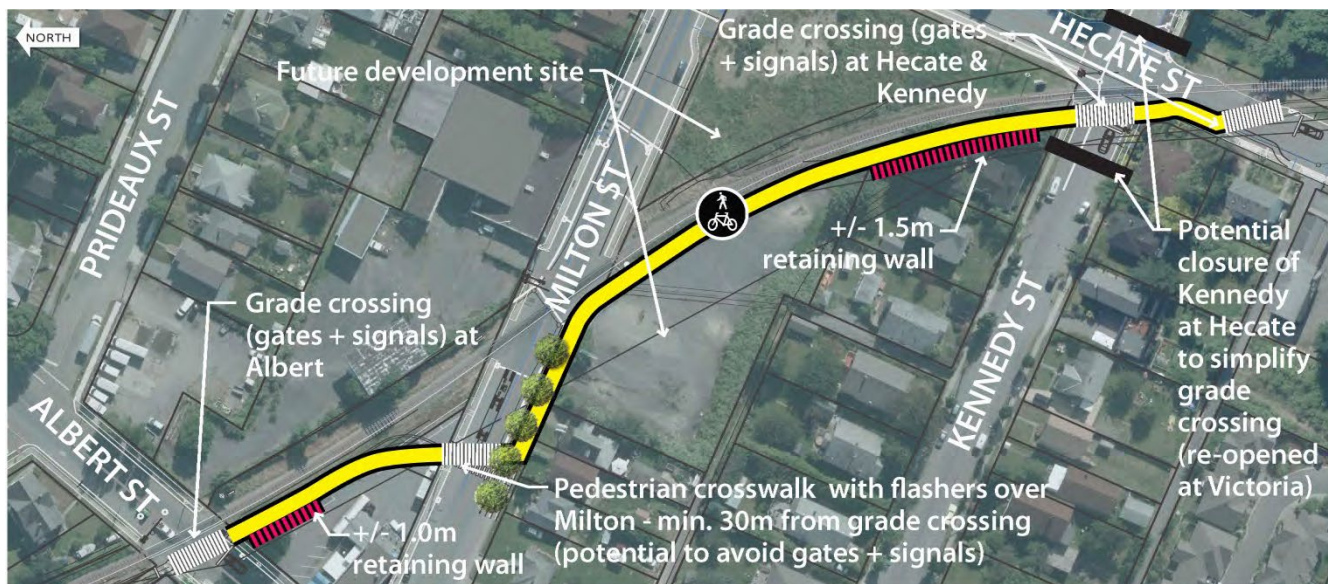


Figure 6: Section 2 - Option A



Figure 7: Section 2 - Option B



**Public Opinion – Which option is the better route for Section 2?**

	Option A	Option B (solid)	Option B (dashed)	Either Option
Number of Dots	24	4	8	0

**Option B: Comments**

- Coming up hill towards Suprette not ideal
- I prefer Option A
- Albert Hill grade - negative
- (A) no need for moderate hills



Section 3: Kennedy/Hecate to Fifth

The following two concept options were provided for Section 3 of the Study.

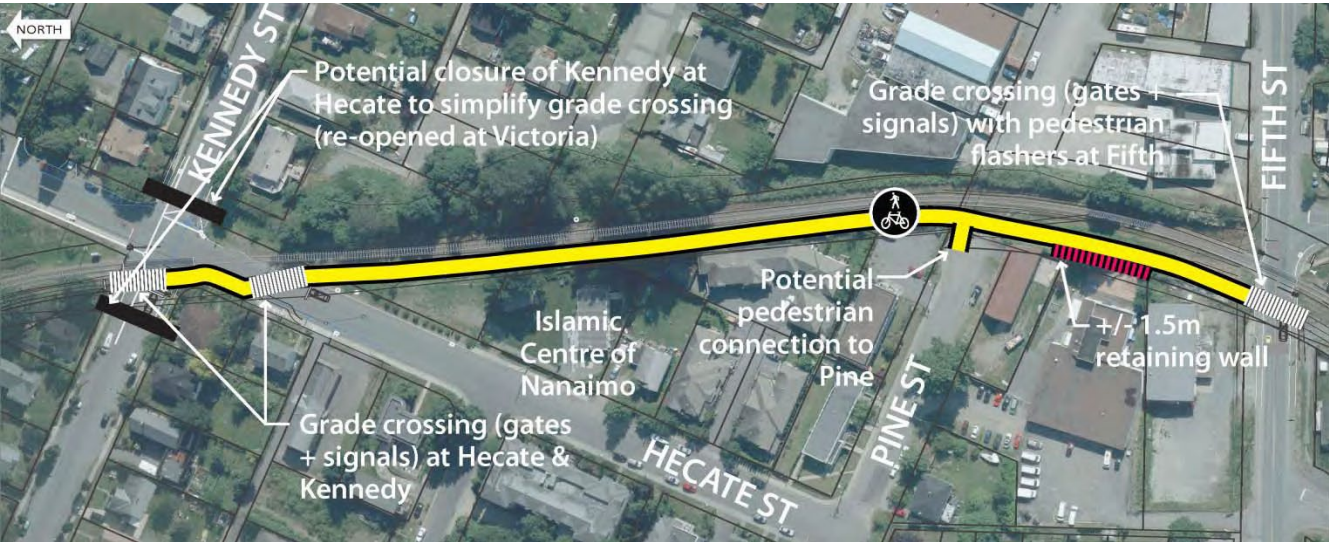


Figure 8: Section 3 - Option A

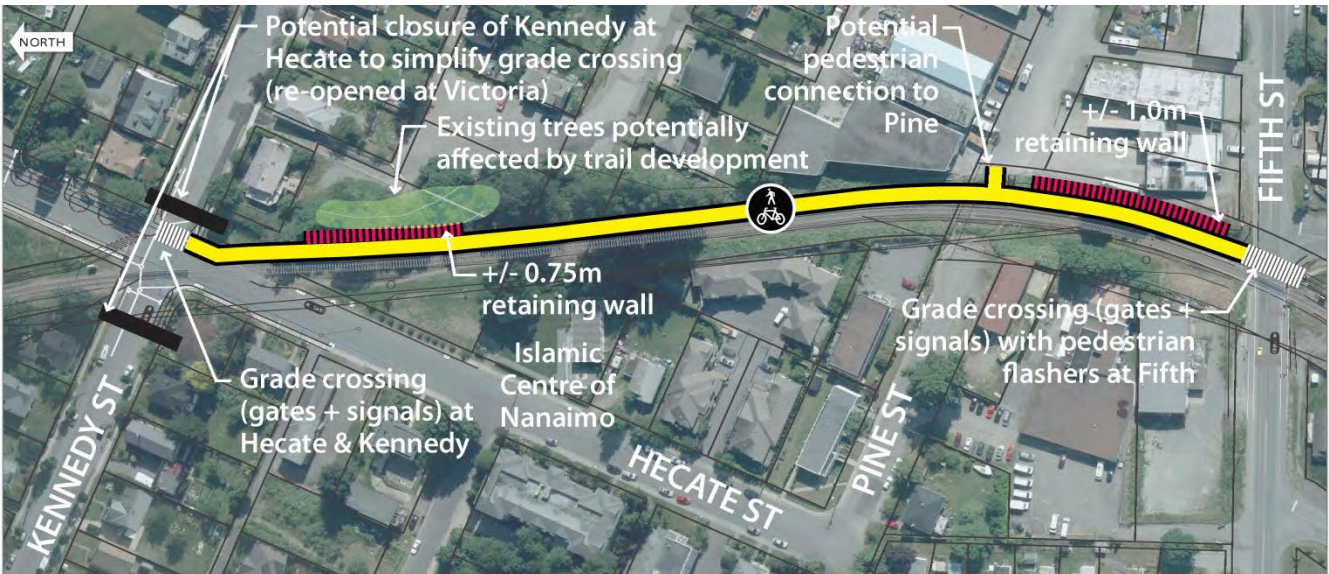


Figure 9: Section 3 - Option B

Public Opinion – Which option is the better route for this section?

	Option A	Option B	Either Option
Number of Dots	26	7	2

General Comments

- Suggestion for a connection to the ROW at Pine for either option



## Section 4: Fifth to Seventh

The following two concept options were provided for Section 4 of the Study.

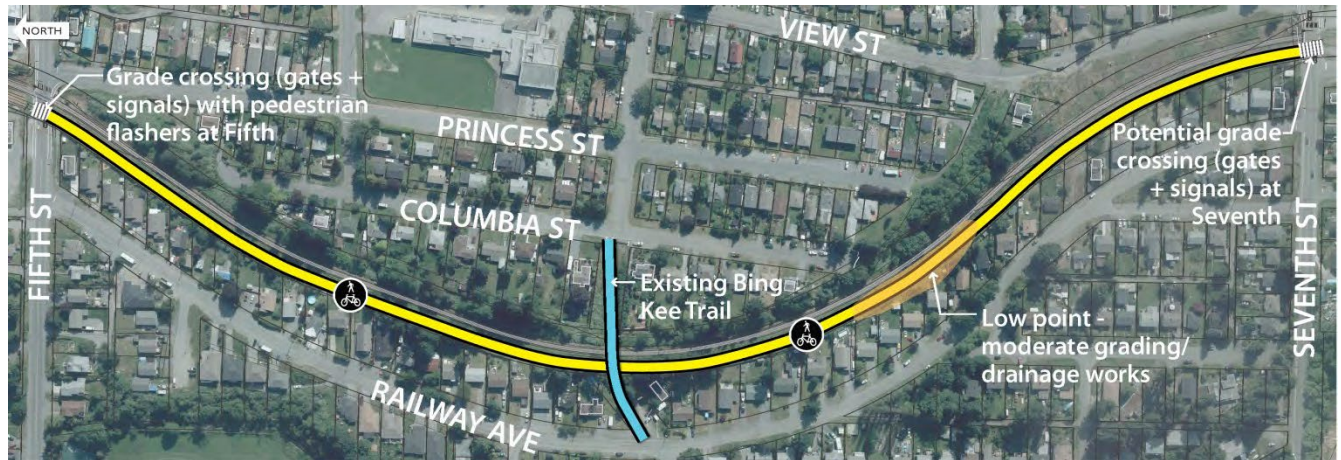


Figure 10: Section 4 - Option A



Figure 11: Section 4 - Option B

**Public Opinion – Which option is the better route for this section?**

	Option A	Option B (solid)	Option B (dashed)	Either Option
<b>Number of Dots (at Open House)</b>	19	16	2	0
<b>Number of Votes (at Columbia Street meeting)</b>	28	0	0	0

### Option A: Comments

- Option A with access to both ends of Columbia Street

### Option B: Comments

- Columbia may be more safe/comfortable – lights and houses



- How much safer is the “trail” overall when only 2 blocks are through residential street? Minor amount.
- Option B may improve safety on View Street (heavy pedestrian use without sidewalks)
- Option B using a current roadway (Columbia) is a huge cost saver

### **General Comments**

- Not really needed as Railway Ave. parallels

### **Priorities**

To help understand public priorities, participants at the Open House were provided with three tokens and asked to place them in the bins for the Section(s) that they considered their highest priorities. Results were as follows:

- Priority 1: Section 1 – Franklyn to Albert (**57** tokens)
- Priority 2: Section 3 – Kennedy/Hecate to Fifth (**46** tokens)
- Priority 3: Section 4 – Fifth to Seventh (**43** tokens)
- Priority 4: Section 2 – Albert to Kennedy/Hecate (**39** tokens)



## 4.0 PUBLIC QUESTIONNAIRE

### 4.1 Participation

A total of **130** people responded to the questionnaire between June 3 and July 8, 2015. Paper copies of the questionnaire were made available at the Open House and an online version was also available for those who weren't able to attend the Open House or preferred to answer the questions at home.

Figure 12 shows the location of questionnaire participants based on postal codes provided on the questionnaire. Note that dual postal codes (ie. two people living at the same postal code) are indicated by a single marker. A large portion of questionnaire participants lived in the downtown south area of the City, but attendees from throughout the City participated.

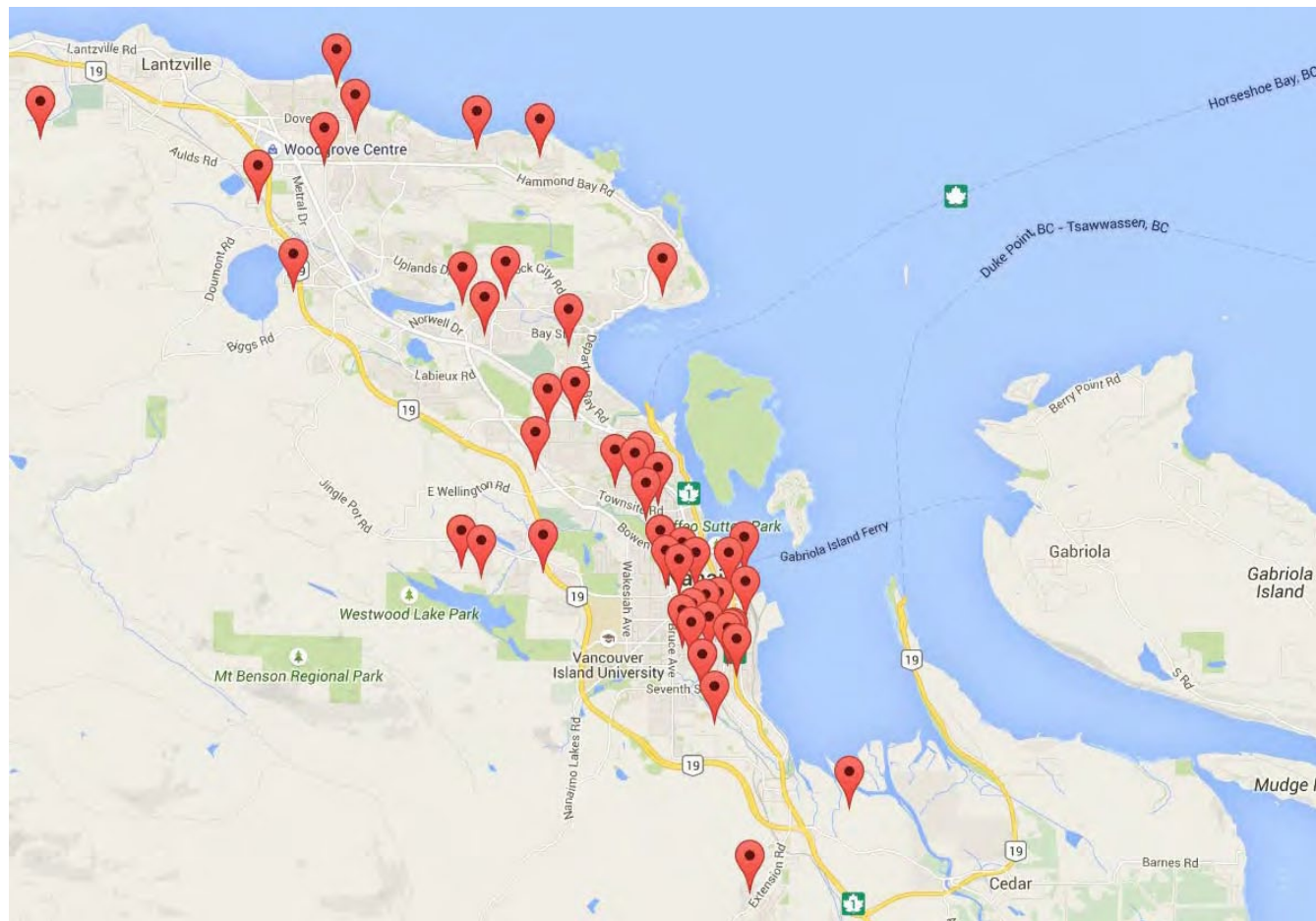


Figure 12: Postal Code Map of Questionnaire Participants

The following is a summary of input received through the questionnaire, organized by question. For a complete record of comments received, see **Appendix B**.



## Question 2: In which age group are you? (128 Responses)

To understand the demographics of those participating in the questionnaire, participants were asked to identify their age range.

- Generally, questionnaire participants had a fairly evenly distributed demographic.
- The majority of respondents were between 35-54 years old (42.2%).
- The young adults (15-24 years) and older adults (75+ years) had the lowest participation rates.

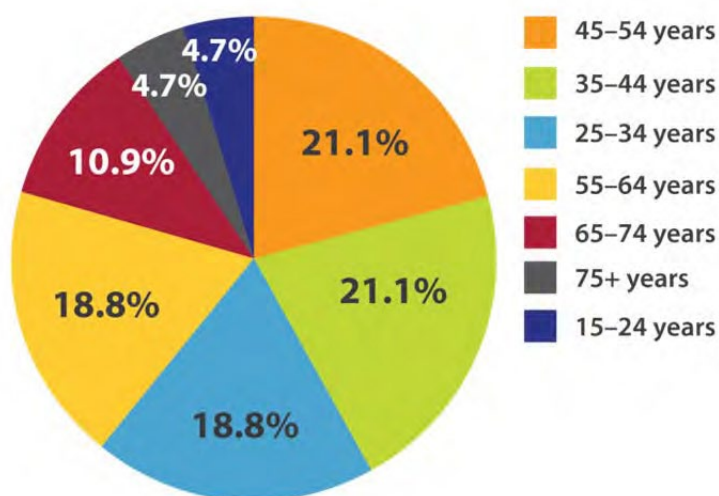


Figure 13: Age groups of questionnaire respondents



### Question 3: How would you describe your current trail use? (128 Responses)

To understand how people who participated are using trails today, participants were asked to identify their current trail uses:

- Most respondents (**62%**) described their current trail use as “Casual recreational users – walking or cycling for fun, exercise, dog walking, etc.”
- A large number of participants (**38%**) also identified as “Active transportation users”
- Examples of “Other” usage included: Cross-training, running

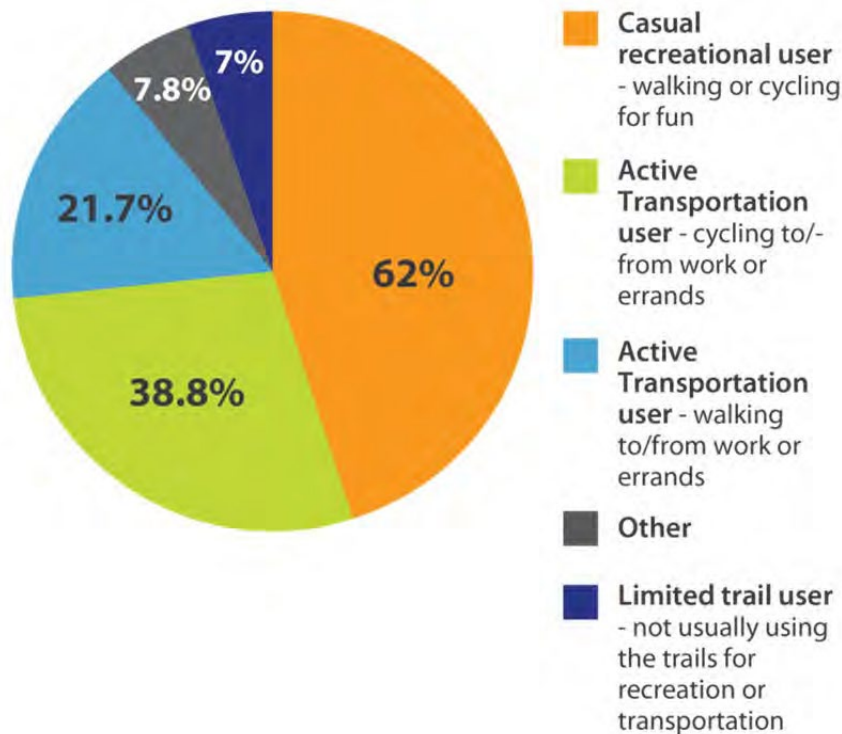


Figure 14: How respondents use trails



**Question 4: Have you previously walked or cycled along the E&N corridor between Franklyn and Seventh?** (127 Responses)

- The majority of participants (68.5%) have walked or cycled along the E&N corridor between Franklyn and Seventh previously.

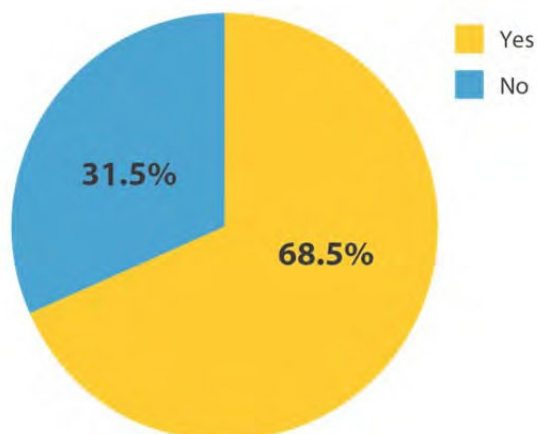


Figure 15: Respondents who have previously walked or cycled along the E&N corridor between Franklyn and Seventh

**Question 5: If yes, which sections?**

- Most respondents (83.8%) have walked or cycled both Section 1 and Section 2.
- Most respondents (80.9%) have also walked or cycled Section 3.
- A majority (67.6%), but less so, have also walked or cycled Section 4.

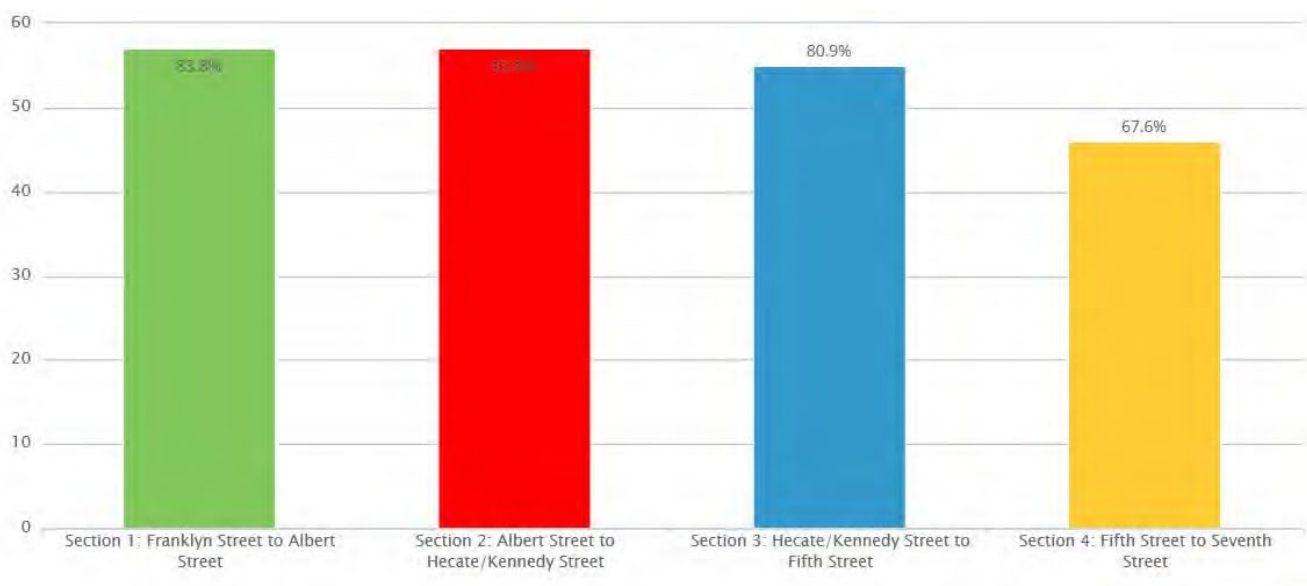


Figure 16: Sections that have been walked or cycled by respondents



**Question 6: Please select the top three criteria you believe are most important to consider when evaluating the route options for the E&N Trail Downtown South Alignment.**

- The most important criteria according to respondents was Pedestrian/Cyclist ease of use (**65.9%**)
- Second most important was Separation from vehicle traffic (**46.5%**)
- Third most important was Route Directness (**41.9%**)
- CPTED (feeling of safety by trail users) was a close fourth (**39.5%**)
- Cost was the sixth priority (**23.3%**)

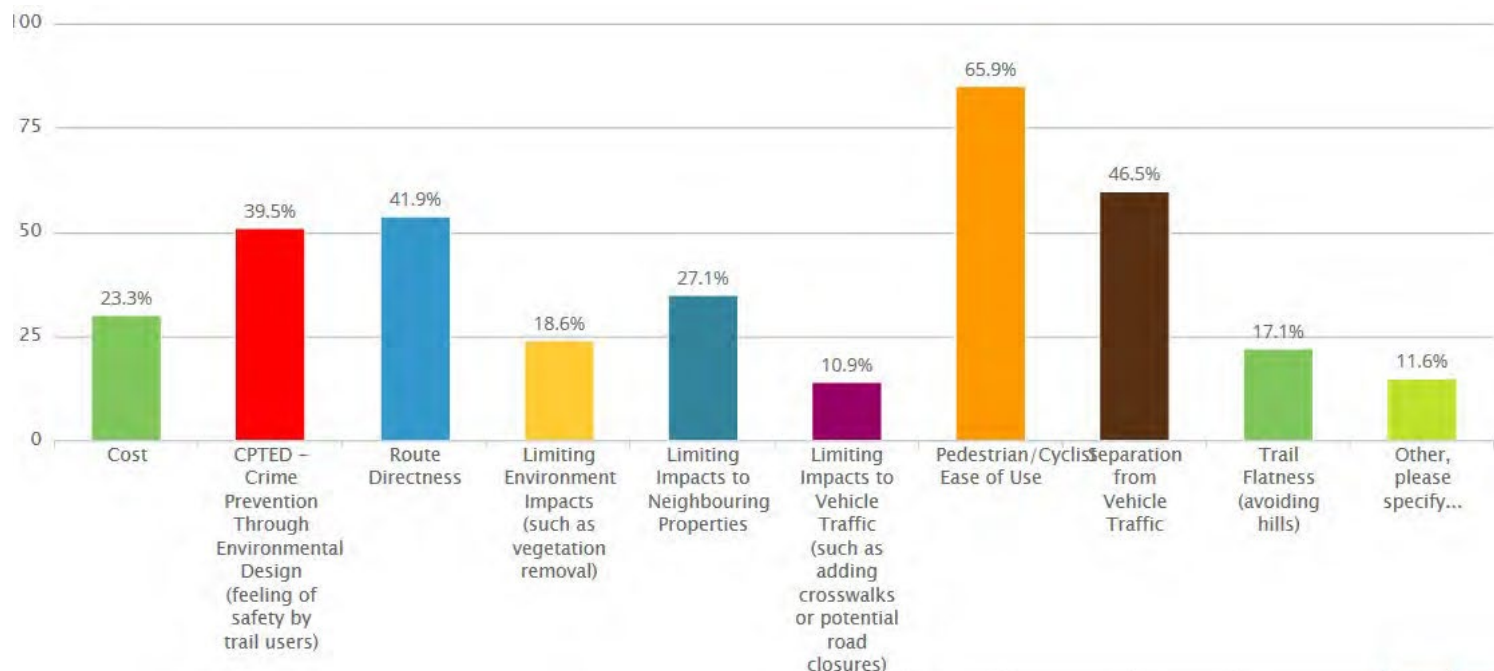


Figure 17: Top criteria for evaluating route options



**Question 7: Which option do you think would be the better alignment for Section 1: Franklyn to Albert?** (121 Responses)

- The majority of respondents (52.9%) chose **Option A** as the better alignment for Section 1.
- This aligns with the input received at the Public Open House.

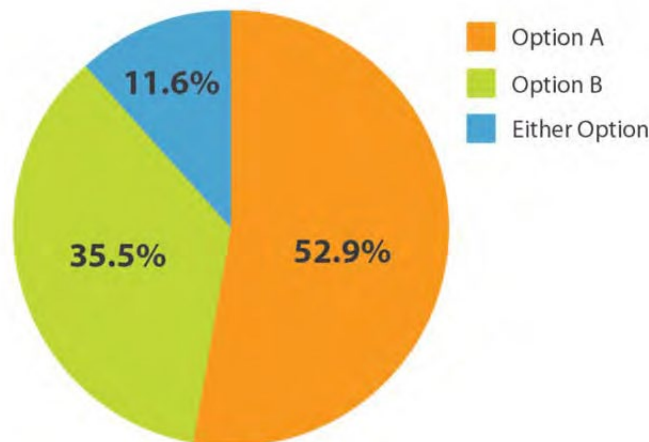


Figure 18: Option preference for Section 1: Franklyn to Albert

**Question 8: Why did you choose this option?** (98 Responses)

For those who selected **Option A**, the most common themes were: (52 Responses)

- Route directness (28 responses)
- Separation from vehicle traffic (10 responses)
- Truer to the trail (10 responses)
- Other misc. (1 response)

For those who selected **Option B**, the most common themes were: (37 Responses)

- Cost effectiveness (23 responses)
- Crossings that make more sense – e.g. no mid-block crossing (5 responses)
- Safety (3 responses)
- Other misc. (6 responses)



**Question 9: Which option do you think would be the better alignment for Section 2: Albert to Hecate / Kennedy?** (120 Responses)

- The majority of respondents (60.8%) chose **Option A** as the better alignment for Section 2.
- This aligns with the input received at the Public Open House.

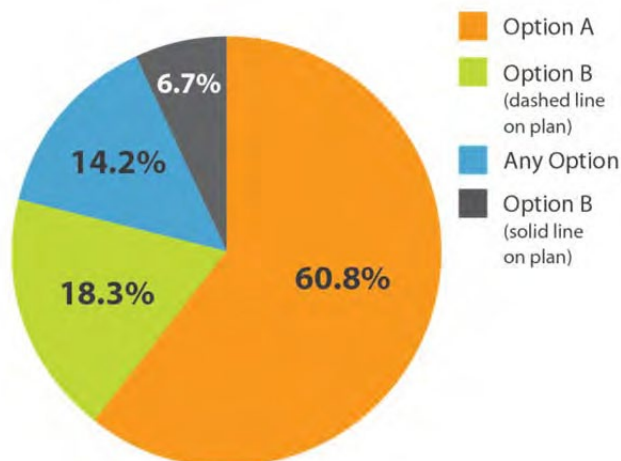


Figure 19: Option preference for Section 2: Albert to Hecate/Kennedy

**Question 10: Why did you choose this option?** (84 Responses)

For those who selected **Option A**, the most common themes were: (52 Responses)

- Route directness (28 responses)
- Use of the tracks (7 responses)
- Separation from traffic (5 responses)
- Flatter grade (4 responses)
- Other misc. (8 responses)

For those who selected **Option B**, the most common themes were: (24 Responses)

- Cost effectiveness (7 responses)
- Route directness (6 responses) – dashed line only
- Safety (3 responses)
- Streetscape improvements – e.g. street trees (3 responses)
- Other misc. (5 responses)



**Question 11: Which option do you think would be the better alignment for Section 3: Kennedy / Hecate to Fifth?** (121 Responses)

- Just over half of respondents (54.5%) chose **Option A** as the better option for Section 3.
- This aligns with the input received at the Open House and indicates a willingness to consider either side of the tracks for this section of trail.

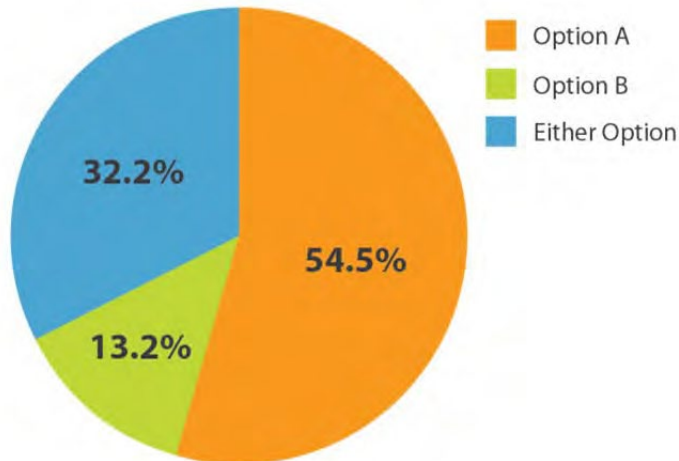


Figure 20: Option preference for Section 3: Kennedy/Hecate to Fifth

**Question 12: Why did you choose this option?** (72 Responses)

For those who selected **Option A**, the most common themes were: (45 Responses)

- Cost effective (19 responses)
- Route directness (7 responses)
- Follows existing footpath (6 responses)
- Ties with previous section (4 responses)
- Less tree damage/removal (4 responses)
- Other misc. (5 responses)

For those who selected **Option B**, the most common themes were: (10 Responses)

- Less crossings (7 responses)
- Other misc. (3 responses)

For those who selected **Either Option**, the most common themes were: (16 Responses)

- Similar options (11 responses)
- Tie with previous section (2 responses)
- Other misc. (3 responses)



**Question 13: Which option do you think would be the better alignment for Section 4: Fifth to Seventh?** (127 Responses)

- Just under half of respondents (**49.6%**) chose **Option A** as the better option for Section 4.
- These responses include participants from Columbia Avenue who requested additional consultation about the project.

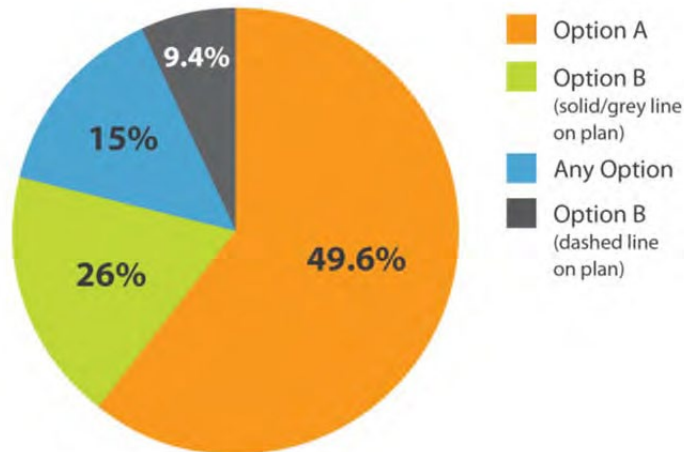


Figure 21: Option preference for Section 4: Fifth to Seventh.

**Question 14: Why did you choose this option?** (96 Responses)

For those who selected **Option A**, the most common themes were: (50 Responses)

- Keep traffic / trail off of Columbia (19 Responses)
- Separation from vehicles (9 Responses)
- Truer to the trail / nice route (8 responses)
- Safety (6 responses)
- Route directness (5 responses)
- Other misc. (3 responses)

For those who selected **Option B – Columbia**, the most common themes were: (29 Responses)

- Cost effective (18 Responses)
- Safety (9 Responses)
- Route directness (3 Responses)



**Question 15: If the City were to focus on building a first section of the E&N Trail Downtown South Alignment, which one do think should be considered the top priority? (103 Responses)**

- 44.7% of respondents believe that Franklyn St. to Albert St. should be considered the top priority section

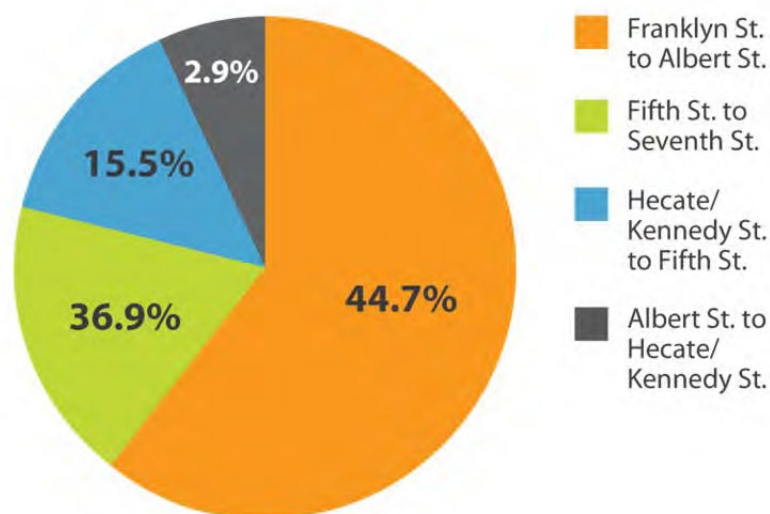


Figure 22: Respondents' top priority for development of the E&N Trail Downtown South

**Question 16: Do you have any comments about the timing and priority of the E&N Trail project moving forward (e.g. how soon should it be developed? How should it be prioritized amongst other potential projects?) (72 Responses)**

- High Priority / as soon as possible (41 responses)
- Low priority / too expensive (10 responses)
- Start with downtown section first (4 responses)
- Take the time to do it right (3 responses)
- Other misc. (17)

**Question 17: Do you have other comments or questions you'd like to share about the E&N Trail Downtown South Alignment Study? (59 Responses)**

- Let's get it started (15 responses)
- Separation is best – keep trail along track (6 responses)
- Better communication about the Project and public meetings is needed (6 responses)
- Need to resolve active railway / cost issues before building (6 responses)
- Put taxpayer money elsewhere (4 responses)
- Look at the cost most closely (4 responses)
- Consider doing a follow-up consultation so people can provide comment on the recommended alignment (3 responses)
- Other misc. (15)



## 5.0 COLUMBIA STREET MEETING

Section 4: Fifth to Seventh of the potential trail options considers Columbia Street as an on-street route in Option B. Concerns were expressed by Columbia Street residents that they had not been provided sufficient time to review and participate in the alignment study. Based on this feedback, the City arranged an informational meeting on Columbia Street on Saturday, June 27, 2015 and the online questionnaire was kept open until July 7, 2015.

At the information meeting the following materials were made available for review and comment: the large routing maps, the Section 4 poster, hard copy questionnaires and 11x17 versions of all the previous open house materials.

### 5.1 Participation

28 participants signed in at the meeting. Addresses showed participant addresses on Columbia, Princess, Railway and Fifth Streets.

### 5.2 Feedback and Observations

Observations from this meeting included:

- General preference from participants was for **Option A: On-Corridor** for the section between Fifth and Seventh.
- Residents identified several concerns about impacts of routing the trail along Columbia Avenue. Concerns included:
  - Potential for crime on Columbia Street to increase due to more cyclist / pedestrian traffic and increased accessibility to the area
  - Potential impacts to street parking
  - Potential for traffic to increase on Columbia
  - Potential conflicts between cyclists/pedestrians and vehicles (e.g. a car backing out of a driveway) and limitations to use for all ages and abilities
  - Potential disruption to the “quietness” of the Columbia Street neighbourhood
- One respondent noted they felt having the trail on Columbia would bring benefits to the neighbourhood.
- Identification from many participants (both Columbia Street Meeting and Open House participants) that staying on the E&N Trail for the long stretch between Fifth and Seventh would be more pleasant and aesthetically pleasing.



## **6.0 SMALL GROUP MEETING**

A small group meeting was held Thursday, June 18, 2015 at the City of Nanaimo Service and Resource Centre from 4pm to 5pm. The purpose of this meeting was to provide opportunity for representatives of community organizations with interests in the E&N Trail South Alignment Study to review the proposed alternatives and provide input into the process.

### **6.1 Participation**

Representatives from the following organizations were in attendance:

- Harewood Neighbourhood Association
- Greater Nanaimo Cycling Coalition
- Neighbours of Nob Hill
- Nanaimo Daily News

Other organizations invited, but unable to attend included:

- Downtown Nanaimo Business Improvement Association
- South End Neighbourhood Association
- Old City Quarter Neighbourhood Association

### **6.2 Feedback and Observations**

Generally stakeholder organizations indicated support for the project. Key directions and recommendations for consideration included:

- Preferred separation between pedestrians / cyclists and vehicles (off-street) and concerns about user “buy-in” if the trail diverts too substantially from the tracks.
- Recognition of the cost of developing the trail along the tracks and support for some interim routing on local streets.
- Concern that grade rail crossings would require upgrading regardless of the trail project.



## 7.0 NEXT STEPS

Based on the feedback received during this stage, our team will work with the City to review the options, update evaluations and finalize recommendations for the alignment. Next steps will include:

- Present the public consultation findings to City of Nanaimo Council.
- Finalize evaluations and recommendations for the alignment.
- Prepare a recommended alignment plan that includes a rationale, cost estimating, priorities and implementation plan.
- Present the plan to Council for consideration.



Jana Zelenski  
Associate

JZ/DC



Don Crockett  
Principal

c:\users\jzelenski\appdata\local\microsoft\windows\temporary internet files\content.outlook\i9sdrhex\en public consultation summary draft-2015-07-28.docx



This page intentionally left blank to facilitate double-sided printing.



# APPENDIX C

## CLASS “D” COST ESTIMATE



The following tables outline the unit costs and assumptions used to develop Class “D” cost estimating for this Study. Class “D” estimates are a high-level estimate based on conceptual design, estimated within +/- 30% accuracy. This estimate is suitable for planning and budgeting purposes, but will require refinement as detailed design is developed.



This page intentionally left blank to facilitate double-sided printing.



ITEM	UNIT	QTY	UNIT-COST	TOTALS	ROUNDED	CONT. (30%) + DD (20%)	ROUNDED
SECTION 1: FRANKLYN TO ALBERT							
Segment A - Franklyn Street Trail - Multi-use Trail	I.m.	25			1		
Removal / Disposal of Existing Curb (from existing trail to Prideaux)	I.m.	25	\$13.00	\$325.00			
Removal / Disposal of Existing Asphalt (from existing trail to Prideaux)	sq.m	50	\$10.00	\$500.00			
New Concrete Curb and Gutter (from existing trail to Prideaux)	I.m.	25	\$100.00	\$2,500.00			
Concrete Multi-use Trail - 3.0 m width	I.m	25	\$391.00	\$9,775.00			
Bollards	each	3	\$850.00	\$2,550.00			
Subtotal				\$15,650.00	\$16,000.00	\$23,475.00	\$23,000.00
Crossing 1/2 - Prideaux and Frankly Street Crossings	I.m.	20			1		
Curb Extension w/ CB Relocations at Prideaux	each	2	\$25,000.00	\$50,000.00			
Curb Extension w/o CB Relocations at Franklyn	each	2	\$20,000.00	\$40,000.00			
Thermoplastic Crosswalks at Franklyn and Prideaux	each	2	\$1,500.00	\$3,000.00			
Signage (incl. base and mounting post)	each	8	\$500.00	\$4,000.00			
Subtotal				\$97,000.00	\$97,000.00	\$145,500.00	\$146,000.00
Segment B - Prideaux Street Trail - Multi-use Trail	L.m.	160			1		
Removal / Disposal of Existing Sidewalk	sq.m	170	\$16.00	\$2,720.00			
Removal / Disposal of Existing Asphalt Lane	sq.m	150	\$16.00	\$2,400.00			
Clearing and Rough Grading	I.m.	120	\$75.00	\$9,000.00			
Concrete Multi-use Trail - 2.7 m width (along Prideaux)	I.m.	110	\$355.00	\$39,050.00			
Asphalt Multi-use Trail - 3.0 m width	I.m.	60	\$325.00	\$19,500.00			
Lane Improvements (to widen lane exit to Franklyn)	allow	1	\$25,000.00	\$25,000.00			
Steel Handrail	I.m.	55	\$130.00	\$7,150.00			
Bollards	each	3	\$850.00	\$2,550.00			
Signage (incl. base and mounting post)	each	1	\$500.00	\$500.00			
Drainage Allowance	I.sum	1	\$10,000.00	\$10,000.00			
Grading/Seeding of Lane Removal (incl. 150 mm Growing Medium)	sq.m	150	\$32.00	\$4,800.00			
Potential Land Costs	allow	1	\$5,000.00	\$5,000.00			
Improvements to Adjacent Yards	allow	4	\$5,000.00	\$20,000.00			
Subtotal without Pathway Lighting				\$147,670.00	\$148,000.00	\$221,505.00	\$222,000.00
Pathway lighting (on rail corridor)	I.m.	60	\$368.00	\$22,080.00			
Subtotal with Pathway Lighting				\$169,750.00	\$170,000.00	\$254,625.00	\$255,000.00
Crossing 3 - E&N Grade Crossing - Pedestrian Crossing	I.m.	17			1		
Rail line pedestrian grade crossing	each	1	\$40,000.00	\$40,000.00			
Signage (incl. base and mounting post)	each	4	\$500.00	\$2,000.00			
Bollards	each	6	\$850.00	\$5,100.00			
Painted Trail Stop Bar	each	2	\$200.00	\$400.00			
Thermoplastic Trail Symbol	each	2	\$350.00	\$700.00			
Subtotal				\$48,200.00	\$49,000.00	\$72,300.00	\$72,000.00
Section C - Prideaux to Albert - Multi-use Trail	I.m.	115			1		
Clearing and Rough Grading	I.m.	115	\$75.00	\$8,625.00			
Asphalt Multi-use Trail - 3.0 m width	I.m.	115	\$325.00	\$37,375.00			
Steel Handrail	I.m.	110	\$130.00	\$14,300.00			
Drainage Allowance	I.sum	1	\$50,000.00	\$50,000.00			
Bollards	each	3	\$850.00	\$2,550.00			
Retaining Wall - 1.0 m height	I.m.	35	\$500.00	\$17,500.00			
Improvements to Adjacent Yards	allow	2	\$5,000.00	\$10,000.00			
Potential Land Costs	allow	1	\$30,000.00	\$30,000.00			
Subtotal without Pathway Lighting				\$170,350.00	\$171,000.00	\$255,525.00	\$256,000.00
Pathway lighting	I.m.	115	\$368.00	\$42,320.00			
Subtotal with Pathway Lighting				\$212,670.00	\$213,000.00	\$319,005.00	\$319,000.00
TOTAL SECTION 1 (incl. pathway lighting)				\$543,270.00	\$544,000.00	\$814,905.00	\$815,000.00
ALBERT GRADE CROSSING							
Crossing 4 - Albert Street Crossing - East Side of Rail with Gate	I.m.	15			1 or 2		
Curb Extension w/o CB Relocations	each	2	\$20,000.00	\$40,000.00			
Thermoplastic Crosswalk and Stop Bars	each	1	\$1,500.00	\$1,500.00			
Painted Trail Stop Bar	each	2	\$200.00	\$400.00			
Signage (incl. base and mounting post)	each	4	\$500.00	\$2,000.00			
Pedestrian Flashers at Crosswalk	each	1	\$15,000.00	\$15,000.00			
Supply and Installation of Railway Crossing Signal and Gate by Southern Railway*	each	1	\$400,000.00	\$400,000.00			
Utility conflict allowance for gate installation	I.sum	1	\$25,000.00	\$25,000.00			
Removal of Existing Railway Infrastructure and Installation of New Bases, Electrical Ducting	each	1	\$100,000.00	\$100,000.00			
Subtotal				\$583,900.00	\$584,000.00	\$875,850.00	\$876,000.00
TOTAL ALBERT STREET GRADE CROSSING				\$583,900.00	\$584,000.00	\$875,850.00	\$876,000.00



**E&N Trail Downtown South Alignment and Costing Study**  
**Class "D" Estimate of Probable Costs - Recommended Alignment**

February 25, 2016

ITEM	UNIT	QTY	UNIT-COST	TOTALS	ROUNDED	CONT. (30%) + DD (20%)	ROUNDED
SECTION 2: ALBERT TO HECATE / KENNEDY							
Segment D/E - Albert to Milton Trail / Milton Street Trail to Crosswalk - Multi-use Trail (Preferred)	l.m.	150			2		
Removal / Disposal of Existing Sidewalk	sq.m	90	\$16.00	\$1,440.00			
Removal / Disposal of Existing Curb	l.m.	55	\$13.00	\$715.00			
Removal / Disposal of Existing Asphalt	sq.m	125	\$10.00	\$1,250.00			
Clearing and Rough Grading	l.m.	150	\$75.00	\$11,250.00			
New Concrete Curb and Gutter	l.m.	55	\$100.00	\$5,500.00			
Relocation of CBs	each	2	\$2,500.00	\$5,000.00			
Asphalt Multi-use Trail - 3.0 m width	l.m.	105	\$325.00	\$34,125.00			
Concrete Multi-use Trail - 3.0 m width	l.m.	45	\$391.00	\$17,595.00			
Curb Letdown at Driveways / Crossings	each	1	\$1,200.00	\$1,200.00			
Steel Handrail (rail side)	l.m.	95	\$130.00	\$12,350.00			
Chain-link Fence (property side)	l.m.	80	\$85.00	\$6,800.00			
Drainage Allowance	l.sum	1	\$15,000.00	\$15,000.00			
Bollards	each	6	\$850.00	\$5,100.00			
Thermoplastic Trail Symbol	each	1	\$350.00	\$350.00			
Signage (incl. base and mounting post)	each	1	\$500.00	\$500.00			
Grading/Seeding of Boulevard (inc. 150 mm growing medium and irrigation)	sq.m	55	\$53.00	\$2,915.00			
Street Trees (6 cm cal.)	each	3	\$450.00	\$1,350.00			
Potential Land Costs	allow	1	\$10,000.00	\$10,000.00			
Subtotal without Pathway Lighting				\$132,440.00	\$133,000.00	\$198,660.00	\$199,000.00
Pathway Lighting (on rail corridor)	l.m.	95	\$368.00	\$34,960.00			
Subtotal with Pathway Lighting				\$167,400.00	\$168,000.00	\$251,100.00	\$251,000.00

Crossing 5a - Milton Street Crossing - Pedestrian Crosswalk 30 m from tracks (Preferred) I.m.		15	2
Curb Extension w/ CB Relocations	each	2	\$25,000.00 \$50,000.00
Thermoplastic Crosswalk and Stop Bars	each	1	\$1,500.00 \$1,500.00
Painted Trail Stop Bar	each	2	\$200.00 \$400.00
Signage (incl. base and mounting post)	each	4	\$500.00 \$2,000.00
Pedestrian Flashers at Crosswalk	each	1	\$15,000.00 \$15,000.00
<b>Subtotal</b>			<b>\$68,900.00 \$69,000.00 \$103,350.00 \$103,000.00</b>

<b>Segment F - Milton to Hecate - Multi-use Trail on East side of Rail (Preferred)</b>	<b>l.m.</b>	<b>110</b>		<b>2</b>			
Asphalt Multi-use Trail - 3.0 m width	l.m.	110	\$325.00	\$35,750.00			
Steel Handrail	l.m.	105	\$130.00	\$13,650.00			
Drainage Allowance	l.sum	1	\$15,000.00	\$15,000.00			
Signage (incl. base and mounting post)	each	1	\$500.00	\$500.00			
Bollards	each	6	\$850.00	\$5,100.00			
Thermoplastic Trail Symbol	each	1	\$350.00	\$350.00			
Potential Land Costs	allow	1	\$25,000.00	\$25,000.00			
<b>Subtotal without Pathway Lighting</b>				<b>\$95,350.00</b>	<b>\$96,000.00</b>	<b>\$143,025.00</b>	<b>\$143,000.00</b>
Pathway Lighting (on rail corridor)	l.m.	110	\$368.00	\$40,480.00			
<b>Subtotal with Pathway Lighting</b>				<b>\$135,830.00</b>	<b>\$136,000.00</b>	<b>\$203,745.00</b>	<b>\$204,000.00</b>

Crossing 6 - Hecate Street Crossing - Pedestrian Crosswalk 30 m from tracks (Preferred)		I.m.	15	2			
Curb Extension w/ CB Relocations	each	2	\$25,000.00	\$50,000.00			
Thermoplastic Crosswalk and Stop Bars	each	1	\$1,500.00	\$1,500.00			
Painted Trail Stop Bar	each	2	\$200.00	\$400.00			
Signage (incl. base and mounting post)	each	4	\$500.00	\$2,000.00			
<b>Subtotal</b>				<b>\$53,900.00</b>	<b>\$54,000.00</b>	<b>\$80,850.00</b>	<b>\$81,000.00</b>
<b>TOTAL SECTION 2 - PREFERRED ALIGNMENT (incl. lighting)</b>				<b>\$426,030.00</b>	<b>\$427,000.00</b>	<b>\$639,045.00</b>	<b>\$639,000.00</b>

Alternate for Section 2 - Follow Street Network						
Segment D/G - Albert to Milton Trail / Milton Street Trail to Hecate - Roadside Multi-use Trail (Alternate)						
	I.m.	225		2		
Removal / Disposal of Existing Sidewalk	sq.m	195	\$16.00	\$3,120.00		
Removal / Disposal of Existing Curb	I.m.	115	\$13.00	\$1,495.00		
Removal / Disposal of Existing Asphalt	sq.m	250	\$5.00	\$1,250.00		
Clearing and Rough Grading	I.m.	225	\$75.00	\$16,875.00		
New Concrete Curb and Gutter	I.m.	115	\$100.00	\$11,500.00		
Relocation of CBs	each	3	\$2,500.00	\$7,500.00		
Asphalt Multi-use Trail - 3.0 m width	I.m.	105	\$325.00	\$34,125.00		
Concrete Multi-use Trail - 3.0 m width	I.m.	120	\$391.00	\$46,920.00		
Curb Letdown at Driveways/Crossings	each	3	\$1,200.00	\$3,600.00		
Steel Handrail (rail side)	I.m.	95	\$130.00	\$12,350.00		
Chain-link Fence (1.4 m on property side)	I.m.	80	\$85.00	\$6,800.00		
Drainage Allowance	I.sum	1	\$15,000.00	\$15,000.00		
Thermoplastic Trail Symbol	each	1	\$350.00	\$350.00		
Signage (incl. base and mounting post)	each	3	\$500.00	\$1,500.00		
Bollards	each	6	\$850.00	\$5,100.00		
Grading/Seeding of Boulevard (incl. 150 mm growing medium and irrigation)	sq.m	175	\$53.00	\$9,275.00		
Street Trees (6 cm cal.)	each	8	\$450.00	\$3,600.00		
Potential Land Costs	allow	1	\$10,000.00	\$10,000.00		
Subtotal without Pathway Lighting				\$190,360.00	\$191,000.00	\$285,540.00
Pathway Lighting (on rail corridor)				\$34,960.00		
Subtotal with Pathway Lighting				\$225,320.00	\$226,000.00	\$337,980.00
Crossing 5b - Milton Street Crossing at Hecate (Alternate)		I.m.	15		2	
Curb Extension w/ CB Relocations	each	2	\$25,000.00	\$50,000.00		
Thermoplastic Crosswalk and Stop Bars	each	1	\$1,500.00	\$1,500.00		
Painted Trail Stop Bar	each	2	\$200.00	\$400.00		
Signage (incl. base and mounting post)	each	4	\$500.00	\$2,000.00		
Pedestrian Flashers at Crosswalk	each	1	\$15,000.00	\$15,000.00		
Subtotal				\$68,900.00	\$69,000.00	\$103,350.00



ITEM	UNIT	QTY	UNIT-COST	TOTALS	ROUNDED	CONT. (30%) + DD (20%)	ROUNDED
Segment H - Hecate Street Trail - Roadside Multi-use Trail (Alternate)	I.m.	95			2		
Removal / Disposal of Existing Curb	I.m.	100	\$13.00	\$1,300.00			
Removal / Disposal of Existing Asphalt	sq.m	330	\$10.00	\$3,300.00			
New Concrete Curb and Gutter	I.m.	100	\$100.00	\$10,000.00			
Relocation of CBs	each	2	\$2,500.00	\$5,000.00			
Concrete Multi-use Trail - 3.0 m width	I.m.	95	\$391.00	\$37,145.00			
Raised Crosswalk at Alley	each	1	\$5,000.00	\$5,000.00			
Curb Letdown at Driveways / Crossings	each	3	\$1,200.00	\$3,600.00			
Bollards	each	6	\$850.00	\$5,100.00			
Grading/Seeding of Boulevard (incl. 150mm growing medium and irrigation)	sq.m	130	\$53.00	\$6,890.00			
Street Trees (6 cm cal.)	each	9	\$450.00	\$4,050.00			
Update Stop Bars and Centreline Paint	allow	1	\$4,000.00	\$4,000.00			
Signage (incl. base and mounting post)	each	2	\$500.00	\$1,000.00			
Subtotal				\$86,385.00	\$87,000.00	\$129,577.50	\$130,000.00
TOTAL SECTION 2 - ALTERNATE ALIGNMENT (incl. lighting)				\$380,605.00	\$381,000.00	\$570,907.50	\$571,000.00

HECATE / KENNEDY GRADE CROSSING							
Crossing 7 - Kennedy Street Crossing - East Side of Rail with Gates	I.m.	45			2 or 3		
Curb Extensions (Kennedy) w/ CB Relocations	each	2	\$25,000.00	\$50,000.00			
Thermoplastic Crosswalk and Stop Bars	each	1	\$1,500.00	\$1,500.00			
Signage (incl. base and mounting post)	each	4	\$500.00	\$2,000.00			
Supply and Installation of Railway Crossing Signal and Gates by Southern Railway*	each	1	\$550,000.00	\$550,000.00			
Utility conflict allowance for gate installation	I.sum	1	\$50,000.00	\$50,000.00			
Removal of Existing Railway Infrastructure and Installation of New Bases, Electrical Ducting	each	1	\$150,000.00	\$150,000.00			
Subtotal				\$803,500.00	\$804,000.00	\$1,205,250.00	\$1,205,000.00
TOTAL HECATE / KENNEDY STREET GRADE CROSSING				\$803,500.00	\$804,000.00	\$1,205,250.00	\$1,205,000.00

Crossing 7 - Kennedy Street Crossing - East Side of Rail with no Gates	I.m.	45			2 or 3		
Curb Extensions (Hecate) w/o CB Relocations	each	2	\$20,000.00	\$40,000.00			
Curb Extensions (Kennedy) w/ CB Relocations	each	2	\$30,000.00	\$60,000.00			
Thermoplastic Crosswalk and Stop Bars	each	2	\$1,500.00	\$3,000.00			
Bollards	each	3	\$850.00	\$2,550.00			
Signage (incl. base and mounting post)	each	8	\$500.00	\$4,000.00			
Closure of Kennedy Street southbound	allow	1	\$25,000.00	\$25,000.00			
Opening of Kennedy Street at Victoria at Hecate	allow	1	\$150,000.00	\$150,000.00			
Subtotal				\$284,550.00	\$285,000.00	\$426,825.00	\$427,000.00
TOTAL HECATE / KENNEDY STREET GRADE CROSSING				\$284,550.00	\$285,000.00	\$426,825.00	\$427,000.00

SECTION 3: HECATE / KENNEDY TO FIFTH							
Segment I - Hecate to Fifth Trail - Multi-use Trail on East Side of Rail	I.m.	345			3		
Clearing and Rough Grading	sq.m.	2000	\$20.00	\$40,000.00			
Retaining wall - 2.0 m height (near Hecate)	I.m.	50	\$750.00	\$37,500.00			
Retaining wall - 1.5 m height (near Fifth)	I.m.	75	\$600.00	\$45,000.00			
Asphalt Multi-use Trail - 3.0 m width	I.m.	345	\$325.00	\$112,125.00			
Drainage Allowance	I.sum	1	\$75,000.00	\$75,000.00			
Concrete Stair Access to Pine	sq.m.	20	\$250.00	\$5,000.00			
Bollards	each	6	\$850.00	\$5,100.00			
Steel Handrail	I.m.	325	\$130.00	\$42,250.00			
Naturalized Landscape (replanting regraded slopes)	sq.m.	650	\$59.00	\$38,350.00			
Thermoplastic Trail Symbol	each	2	\$350.00	\$700.00			
Signage (incl. base and mounting post)	each	2	\$500.00	\$1,000.00			
Subtotal without Pathway Lighting				\$402,025.00	\$403,000.00	\$603,037.50	\$603,000.00
Pathway lighting	I.m.	325	\$368.00	\$119,600.00			
Subtotal with Pathway Lighting				\$521,625.00	\$522,000.00	\$782,437.50	\$782,000.00
TOTAL SECTION 3 (incl. lighting)				\$521,625.00	\$522,000.00	\$782,437.50	\$782,000.00

FIFTH STREET GRADE CROSSING							
Crossing 8 - Fifth Street Crossing - East Side of Rail with Gate	I.m.	11			3 or 4		
Curb Extensions w/ CB Relocation	each	2	\$25,000.00	\$50,000.00			
Thermoplastic Crosswalk and Stop Bars	each	1	\$1,500.00	\$1,500.00			
Painted Trail Stop Bar	each	2	\$200.00	\$400.00			
Signage (incl. base and mounting post)	each	4	\$500.00	\$2,000.00			
Overhead Pedestrian Flashers at Crosswalk	each	1	\$30,000.00	\$30,000.00			
Supply and Installation of Railway Crossing Signal and Gate by Southern Railway*	each	1	\$500,000.00	\$500,000.00			
Utility conflict allowance for gate installation	I.sum	1	\$40,000.00	\$40,000.00			
Removal of Existing Railway Infrastructure and Installation of New Bases, Electrical Ducting	each	1	\$125,000.00	\$125,000.00			
Subtotal				\$748,900.00	\$749,000.00	\$1,123,350.00	\$1,123,000.00
TOTAL FIFTH STREET GRADE CROSSING				\$748,900.00	\$749,000.00	\$1,123,350.00	\$1,123,000.00

SECTION 4: FIFTH TO SEVENTH							
Segment J - Fifth to Bing Kee Trail - Multi-use Trail on East Side of Rail	I.m.	415			4		
Clearing and Rough Grading	I.m.	415	\$100.00	\$41,500.00			
Asphalt Multi-use Trail - 3.0 m width 5.0 m base	I.m.	415	\$365.00	\$151,475.00			
Signage (incl. base and mounting post)	each	2	\$500.00	\$1,000.00			
Drainage Allowance	I.sum	1	\$150,000.00	\$150,000.00			
Bollards	each	3	\$850.00	\$2,550.00			
Subtotal without Pathway Lighting				\$346,525.00	\$347,000.00	\$519,787.50	\$520,000.00
Pathway lighting	I.m.	415	\$368.00	\$152,720.00			
Subtotal with Pathway Lighting				\$499,245.00	\$500,000.00	\$748,867.50	\$749,000.00

Crossing 9 - Bing Kee Crossing - Existing Pedestrian Grade Crossing	I.m.	60			4		
Signage (incl. base and mounting post)	each	4	\$500.00	\$2,000.00			
Bollards	each	6	\$850.00	\$5,100.00			
Painted Trail Stop Bar	each	2	\$200.00	\$400.00			
Subtotal				\$7,500.00	\$8,000.00	\$11,250.00	\$11,000.00



E&N Trail Downtown South Alignment and Costing Study  
Class "D" Estimate of Probable Costs - Recommended Alignment

February 25, 2016

ITEM	UNIT	QTY	UNIT-COST	TOTALS	ROUNDED	CONT. (30%) + DD (20%)	ROUNDED
Segment K - Bing Kee to Seventh Trail - Multi-use Trail on West Side of Rail	I.m.	520			4		
Clearing and Rough Grading	I.m.	520	\$100.00	\$52,000.00			
Asphalt Multi-use Trail - 3.0 m width 5.0 m base	I.m.	520	\$365.00	\$189,800.00			
Drainage Allowance	I.sum	1	\$150,000.00	\$150,000.00			
Signage (incl. base and mounting post)	each	2	\$500.00	\$1,000.00			
Retaining Wall - 1.0 m height	I.m.	200	\$500.00	\$100,000.00			
Bollards	each	3	\$850.00	\$2,550.00			
Subtotal without Pathway Lighting				\$495,350.00	\$496,000.00	\$743,025.00	\$743,000.00
Pathway lighting	I.m.	520	\$368.00	\$191,360.00			
Subtotal with Pathway Lighting				\$686,710.00	\$687,000.00	\$1,030,065.00	\$1,030,000.00
TOTAL SECTION 4 (incl. lighting)				\$1,193,455.00	\$1,194,000.00	\$1,790,182.50	\$1,790,000.00

BASE SCENARIO COST	ACTUAL	ROUNDED
Subtotal, Recommended Alignment	\$4,820,680.00	
Contingency 30%	\$1,446,204.00	
Detailed Design Development 20%	\$964,136.00	
TOTAL, RECOMMENDED ALIGNMENT PRELIMINARY ESTIMATE	\$7,231,020.00	\$7,240,000.00

POTENTIAL LIGHTING COSTS	ACTUAL	ROUNDED
Segment B - Prideaux Street Trail - Multi-use Trail	\$22,080.00	
Section C - Prideaux to Albert - Multi-use Trail	\$42,320.00	
Segment D/E - Albert to Milton Trail / Milton Street Trail to Crosswalk - Multi-use Trail (Preferred)	\$34,960.00	
Segment I - Hecate to Fifth Trail - Multi-use Trail on East Side of Rail	\$119,600.00	
Segment J - Fifth to Bing Kee Trail - Multi-use Trail on East Side of Rail	\$152,720.00	
Segment K - Bing Kee to Seventh Trail - Multi-use Trail on West Side of Rail	\$191,360.00	
Subtotal, Lighting Costs for all Segments	\$563,040.00	
Contingency 30%	\$168,912.00	
Detailed Design Development 20%	\$112,608.00	
TOTAL, POTENTIAL LIGHTING COSTS	\$844,560.00	\$850,000.00

GRADE CROSSING-RELATED COSTS	ACTUAL	ROUNDED
Subtotal, Costs for Gated Grade Crossings	\$1,980,000.00	
Contingency 30%	\$594,000.00	
Detailed Design Development 20%	\$396,000.00	
TOTAL, GRADE CROSSING RELATED COSTS	\$2,970,000.00	\$2,970,000.00
PERCENTAGE OF PROJECT COSTS DIRECTLY RELATED TO GRADE CROSSINGS	41%	

	TOTAL - BASE	TOTAL - BASE SCENARIO (w/ contingency + detailed design)	TOTAL - REDUCED COST SCENARIO - No Gates at Hecate/Kennedy, Section 2 Alternate Alignment (w/ contingency + detailed design)
SUMMARY BY SECTION			
Section 1: Franklyn to Albert	\$543,270.00	\$814,905.00	\$814,905.00
Albert Grade Crossing	\$583,900.00	\$875,850.00	\$875,850.00
Section 2: Albert to Hecate/Kennedy (Preferred Route: corridor alignment)	\$426,030.00	\$639,045.00	
Section 2: Albert to Hecate/Kennedy (Alternate Route: Milton/Hecate alignment)	\$380,605.00		\$570,907.50
Hecate/Kennedy Grade Crossing (Full cost - with gated crossing)	\$803,500.00	\$1,205,250.00	
Hecate/Kennedy Grade Crossing (Reduced costs - without gated crossing)	\$284,550.00		\$426,825.00
Section 3: Hecate/Kennedy to Fifth	\$521,625.00	\$782,437.50	\$782,437.50
Fifth Grade Crossing	\$748,900.00	\$1,123,350.00	\$1,123,350.00
Section 4: Fifth to Seventh	\$1,193,455.00	\$1,790,182.50	\$1,790,182.50
TOTAL	\$5,485,835.00	\$7,231,020.00	\$6,384,457.50
ROUNDED	\$5,490,000.00	\$7,240,000.00	\$6,390,000.00

OVERALL SUMMARY		
Total Cost of Recommended Alignment (incl. Section 2 Preferred Alignment, gated crossing at Hecate / Kennedy, Lighting, Contingency and Design)	\$7,240,000.00	\$7,240,000.00
Potential Costs Savings if Existing Hecate / Kennedy Grade Crossing and Signals can be Retained	-\$778,425.00	-\$780,000.00
Potential Costs Savings if Lighting Excluded	-\$850,000.00	-\$850,000.00
Potential Cost Savings if Alternate Route for Section 2 is Required	-\$68,137.50	-\$70,000.00

PHASING		
A - KENNEDY / HECATE TO FIFTH (Section 3)	\$1,987,687.50	\$1,990,000.00
B - FRANKLYN TO HECATE / KENNEDY (Sections 1 & 2)	\$2,329,800.00	\$2,330,000.00
C - FIFTH TO SEVENTH (Section 4)	\$2,913,532.50	\$2,910,000.00

- Notes:
- This cost estimate is based on historical cost data. Actual costs can vary widely depending on industry labour and material availability.
  - Estimates based on high-level preliminary design intended for planning and budgeting purposes only. Updated cost estimating to be completed during future detailed design.
  - Grade crossing costs (identified by \* in the spreadsheet) incorporate rail materials that are purchased from the USA. These material costs are calucated an an exchange rate of 1.00 Canadian dollar = 0.70 US dollars based on January 2016 exchange rates. Changes in exchange rate would affect the costs of improvements at these grade grossings. The following table summarizes the estimated material costs that would be affected by changes to the exchange rate.

SUMMARY OF COSTS AFFECTED BY CHANGES TO THE EXCHANGE RATE	RAIL MATERIAL COSTS (USD)	JAN. 2016 EXCHANGE RATE	RAIL MATERIAL COSTS (CAD)	OTHER CROSSING COSTS (CAD) (not affected by exchange rate)	TOTAL ESTIMATED CROSSING COSTS (CAD)
Albert Grade Crossing (Crossing 3)	\$196,000.00	\$0.70	\$280,000.00	\$120,000	\$400,000.00
Hecate / Kennedy Grade Crossing (Crossing 7)	\$269,500.00	\$0.70	\$385,000.00	\$165,000	\$550,000.00
Fifth Grade Crossing (Crossing 8)	\$245,000.00	\$0.70	\$350,000.00	\$150,000	\$500,000.00
TOTAL POTENTIAL COSTS THAT COULD BE AFFECTED BY CHANGES TO EXCHANGE RATE	\$710,500.00		\$1,015,000.00		



# APPENDIX D

## RECOMMENDED CONCEPT ALIGNMENT DRAWINGS



To assess feasibility of the alignment options and develop Class “D” cost estimating, conceptual design drawings were developed for the Study. These drawings are provided for information only and are not intended for construction purposes. Further design development will be required at the detail design stage.-

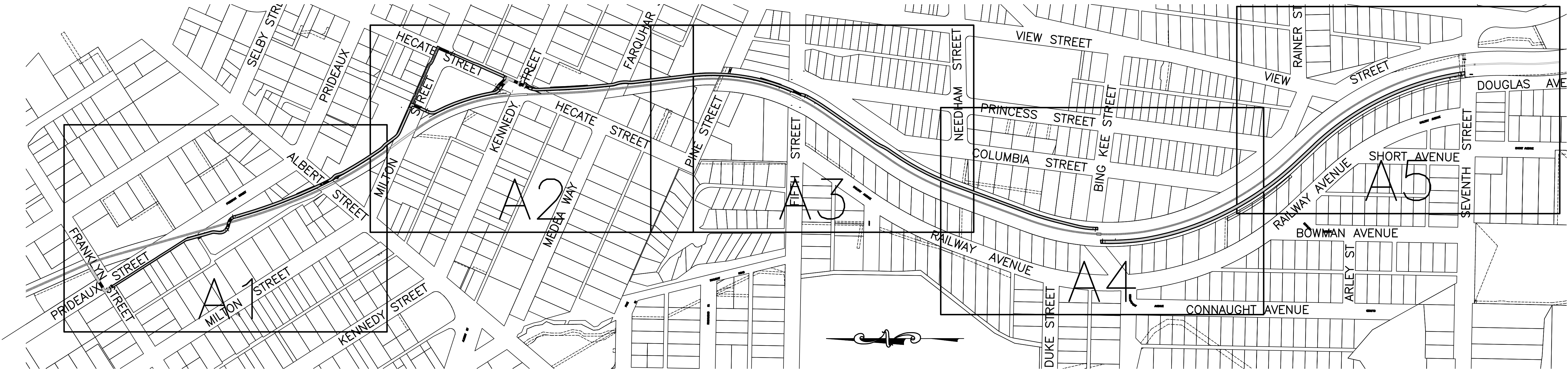






# CITY OF NANAIMO

THE HARBOUR CITY



## E & N TRAIL

### DOWNTOWN SOUTH ALIGNMENT PLAN

RECOMMENDED ALIGNMENT CONCEPT

#### DRAWING SCHEDULE

DWG No.	REV	TITLE
A1	06	FRANKLYN ST TO MILTON ST
A2	06	MILTON ST TO PINE ST
A3	06	PINE ST TO NEEDHAM ST
A4	06	NEEDHAM ST TO RAINER ST
A5	06	RAINER ST TO SEVENTH ST

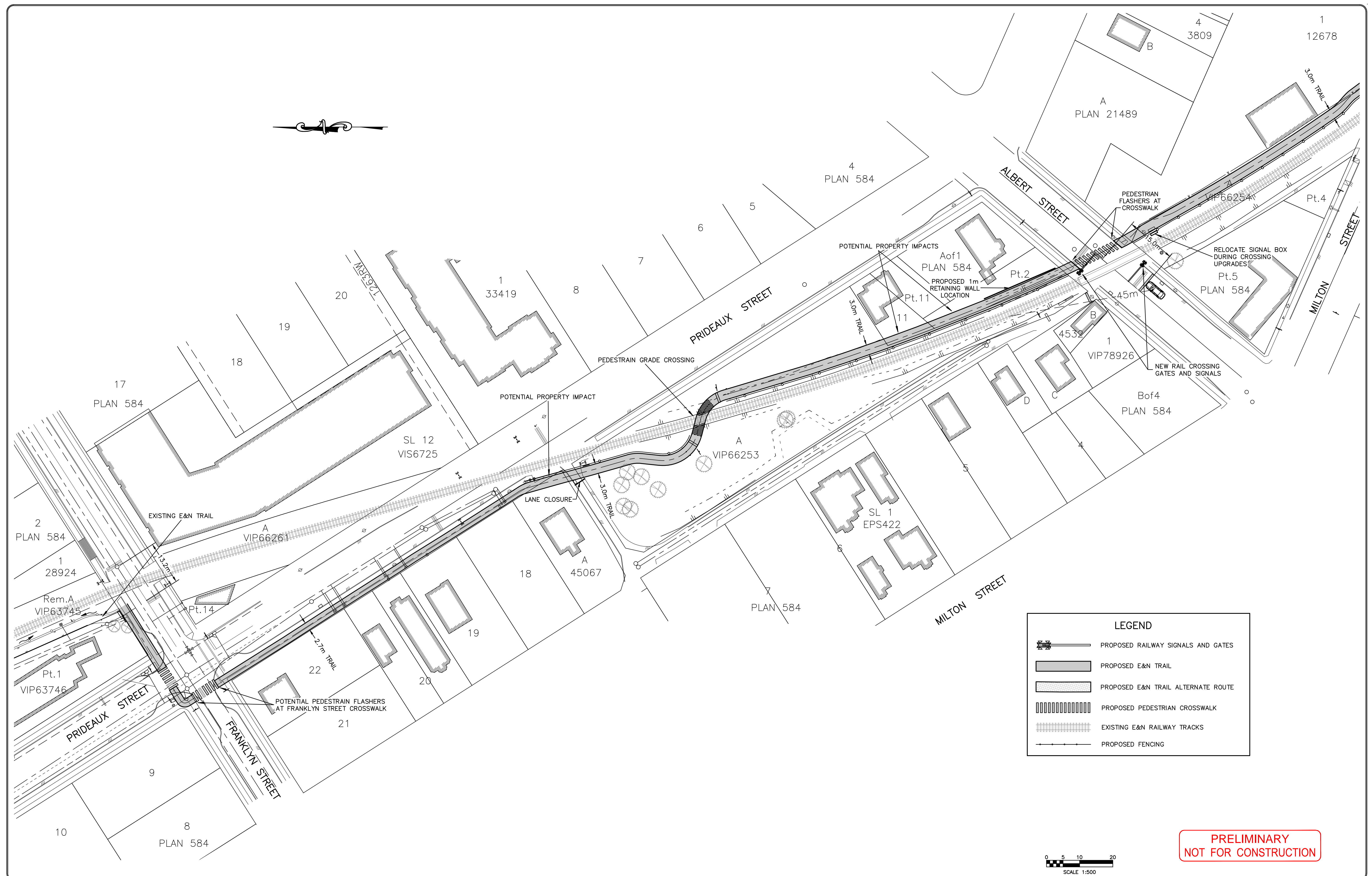
PRELIMINARY  
NOT FOR CONSTRUCTION



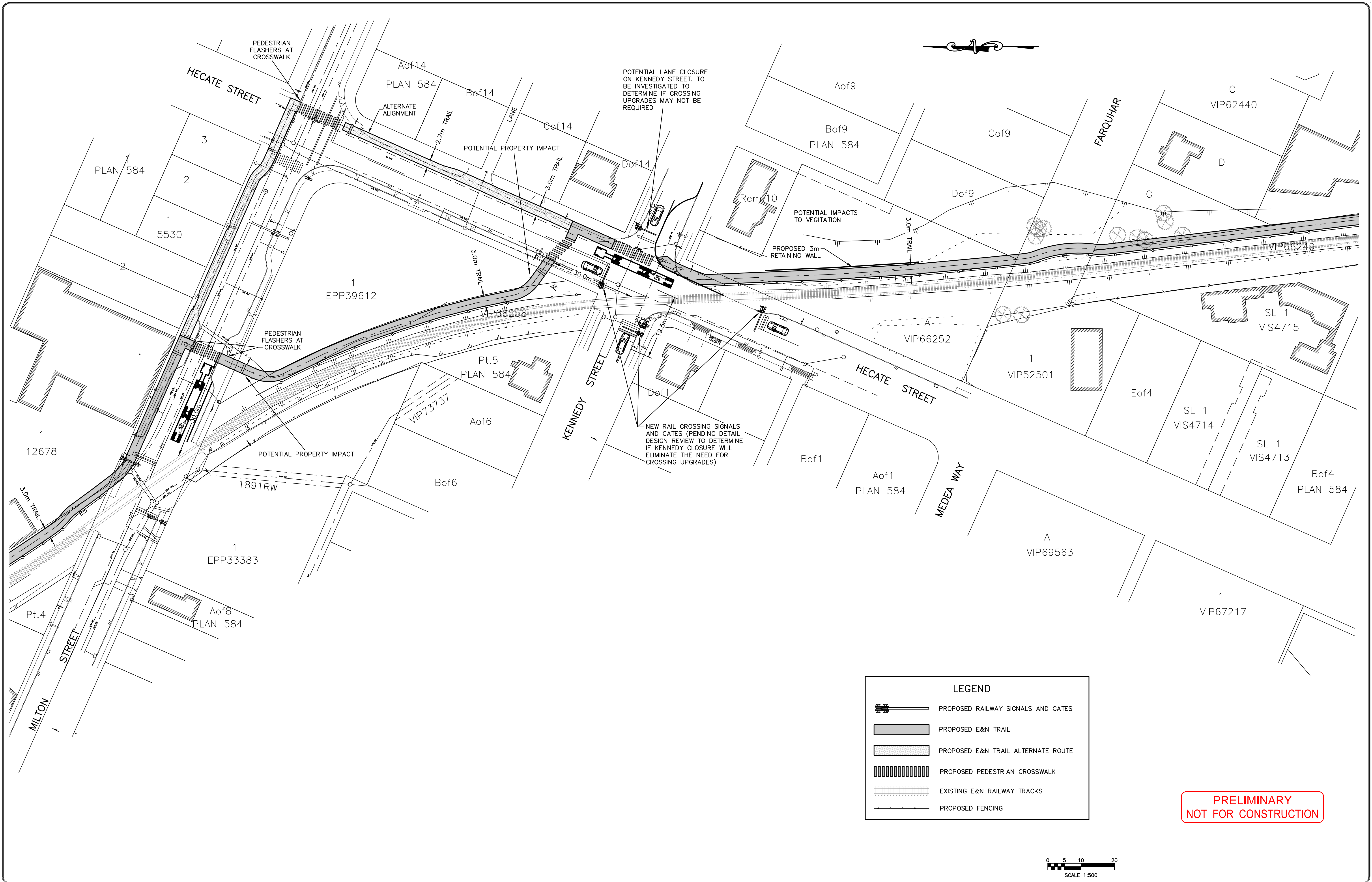
Design by	Date
SAL	02/24/16
Drawn by	Date
KA	02/24/16
Checked by	Date
Approved by	Date

Scale	horiz. 1:2500 vert.
Neg. No.	Sheet 00 of 5
Cost Center	
Drawing No.	Rev
A0	06









LEGEND

PROPOSED RAILWAY SIGNALS AND GATES

PROPOSED E&N TRAIL

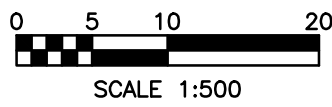
PROPOSED E&N TRAIL ALTERNATE ROUTE

PROPOSED PEDESTRIAN CROSSWALK

EXISTING E&N RAILWAY TRACKS

PROPOSED FENCING

PRELIMINARY  
NOT FOR CONSTRUCTION



Composite drawg.

Notes

Project No. L534-06

NEWCASTLE  
ENGINEERING LTD.

00	02/19/15	NT	SUBMITTED TO GOLDER ASSOCIATES FOR REVIEW - NOT FOR CONSTRUCTION	SAL
01	03/04/15	NT	SUBMITTED TO GOLDER ASSOCIATES FOR REVIEW - NOT FOR CONSTRUCTION	SAL
02	03/16/15	NT	SUBMITTED TO GOLDER ASSOCIATES FOR REVIEW - NOT FOR CONSTRUCTION	SAL
03	04/14/15	NT	SUBMITTED TO GOLDER ASSOCIATES FOR REVIEW - NOT FOR CONSTRUCTION	SAL
04	06/01/15	NT	SUBMITTED TO GOLDER ASSOCIATES FOR REVIEW - NOT FOR CONSTRUCTION	SAL
05	01/12/16	KA	SUBMITTED TO GOLDER ASSOCIATES FOR REVIEW - NOT FOR CONSTRUCTION	SAL
06	02/24/16	GC	SUBMITTED TO GOLDER ASSOCIATES FOR REVIEW - NOT FOR CONSTRUCTION	SAL
No.	Date	By	Revisions	Eng.

Design by  
SAL

Date  
02/24/16

Drawn by  
KA

Date  
02/24/16

Checked by

Date

Approved by

Date

CITY OF NANAIMO  
THE HARBOUR CITY

Scale  
horiz. 1:500 vert.

Neg. No.

Sheet 2 of 5

Cost Center

Drawing No. A2

Rev. 06

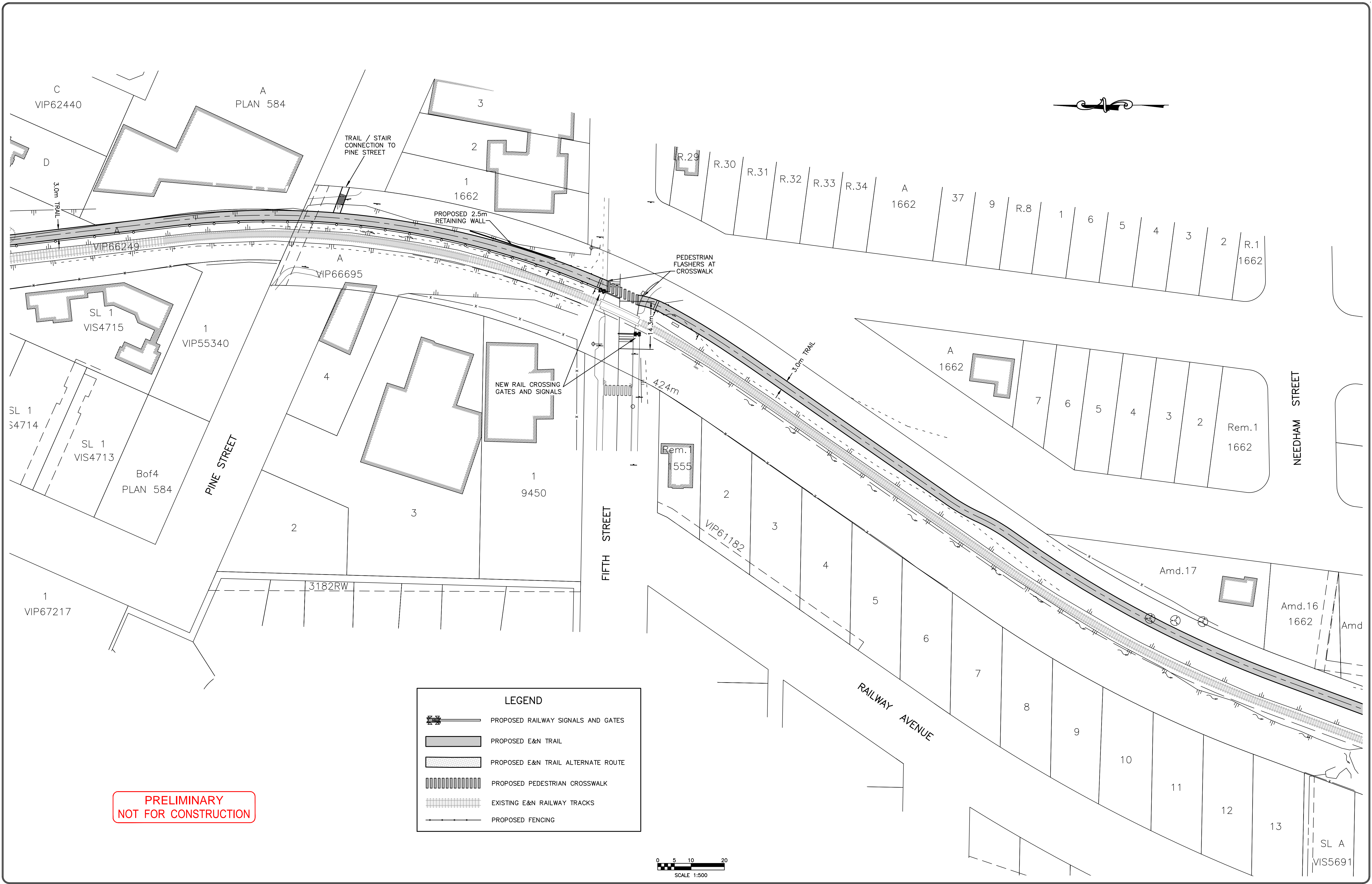
Project

E & N TRAIL  
DOWNTOWN SOUTH ALIGNMENT

Title

MILTON ST TO PINE ST

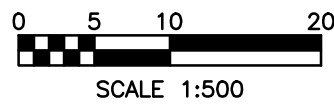




PRELIMINARY  
NOT FOR CONSTRUCTION

**LEGEND**

- PROPOSED RAILWAY SIGNALS AND GATES
- PROPOSED E&N TRAIL
- PROPOSED E&N TRAIL ALTERNATE ROUTE
- PROPOSED PEDESTRIAN CROSSWALK
- EXISTING E&N RAILWAY TRACKS
- PROPOSED FENCING



Composite drwg.

Notes

Project No. L534-06

No.	Date	By	Revisions	Eng.
00	02/19/15	NT	SUBMITTED TO GOLDER ASSOCIATES FOR REVIEW - NOT FOR CONSTRUCTION	SAL
01	03/04/15	NT	SUBMITTED TO GOLDER ASSOCIATES FOR REVIEW - NOT FOR CONSTRUCTION	SAL
02	03/16/15	NT	SUBMITTED TO GOLDER ASSOCIATES FOR REVIEW - NOT FOR CONSTRUCTION	SAL
03	04/14/15	NT	SUBMITTED TO GOLDER ASSOCIATES FOR REVIEW - NOT FOR CONSTRUCTION	SAL
04	06/01/15	NT	SUBMITTED TO GOLDER ASSOCIATES FOR REVIEW - NOT FOR CONSTRUCTION	SAL
05	01/12/16	KA	SUBMITTED TO GOLDER ASSOCIATES FOR REVIEW - NOT FOR CONSTRUCTION	SAL
06	02/24/16	GC	SUBMITTED TO GOLDER ASSOCIATES FOR REVIEW - NOT FOR CONSTRUCTION	SAL

Design by Date  
SAL 02/25/16

Drawn by Date  
KA 02/25/16

Checked by Date

Approved by Date

Scale  
horiz. 1:500 vert.

Neg. No. Sheet 3 of 5

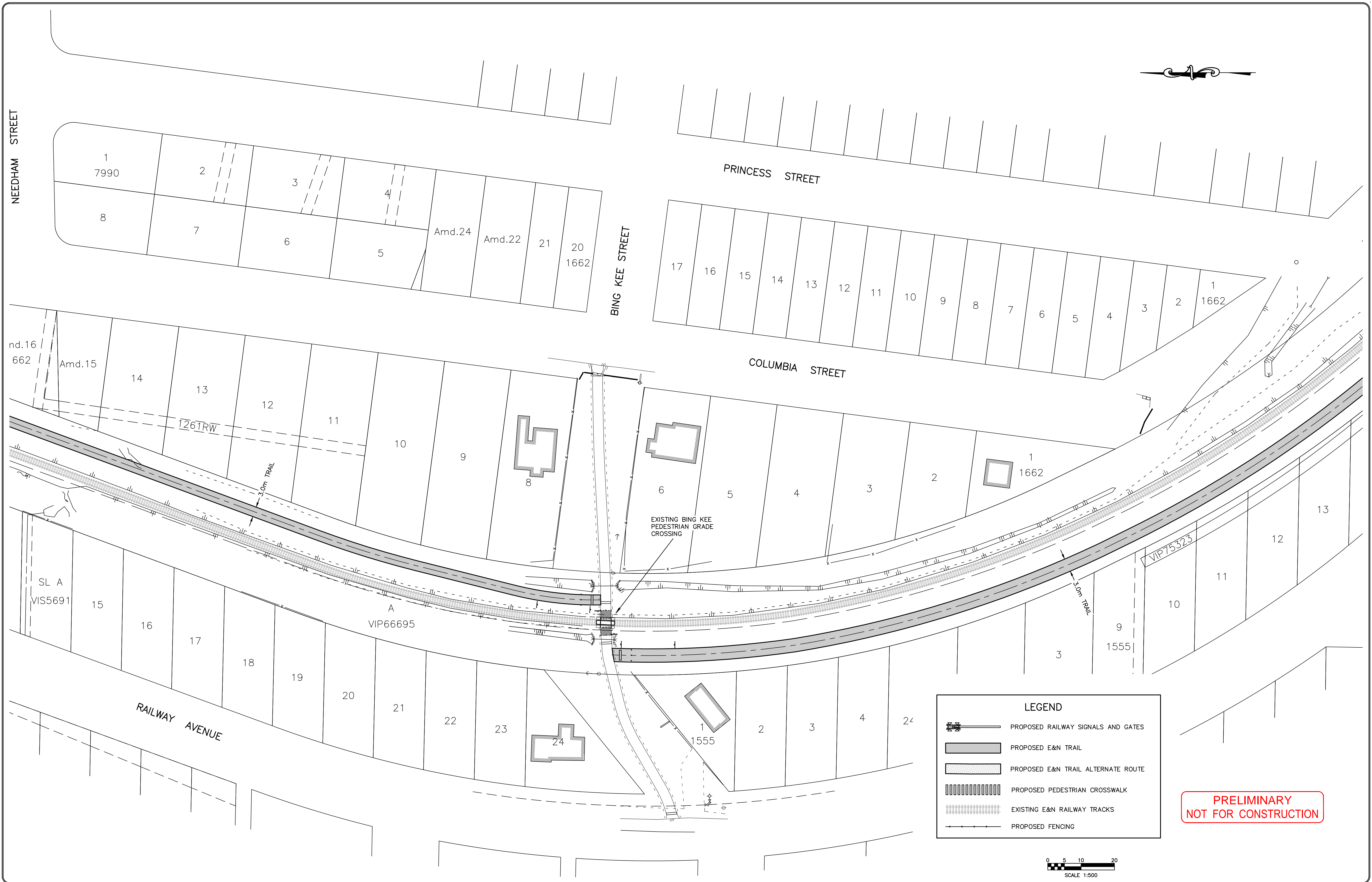
Cost Center

Drawing No. A3 Rev 06

Project E & N TRAIL  
DOWNTOWN SOUTH ALIGNMENT

Title PINE ST TO NEEDHAM ST

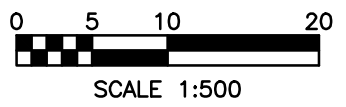




**LEGEND**

- PROPOSED RAILWAY SIGNALS AND GATES
- PROPOSED E&N TRAIL
- PROPOSED E&N TRAIL ALTERNATE ROUTE
- PROPOSED PEDESTRIAN CROSSWALK
- EXISTING E&N RAILWAY TRACKS
- PROPOSED FENCING

**PRELIMINARY  
NOT FOR CONSTRUCTION**



Composite drwg.

Notes

Project No. L534-06

No.	Date	By	Revisions	Eng.
00	02/19/15	NT	SUBMITTED TO GOLDER ASSOCIATES FOR REVIEW - NOT FOR CONSTRUCTION	SAL
01	03/04/15	NT	SUBMITTED TO GOLDER ASSOCIATES FOR REVIEW - NOT FOR CONSTRUCTION	SAL
02	03/16/15	NT	SUBMITTED TO GOLDER ASSOCIATES FOR REVIEW - NOT FOR CONSTRUCTION	SAL
03	04/14/15	NT	SUBMITTED TO GOLDER ASSOCIATES FOR REVIEW - NOT FOR CONSTRUCTION	SAL
04	06/01/15	NT	SUBMITTED TO GOLDER ASSOCIATES FOR REVIEW - NOT FOR CONSTRUCTION	SAL
05	01/12/16	KA	SUBMITTED TO GOLDER ASSOCIATES FOR REVIEW - NOT FOR CONSTRUCTION	SAL
06	02/24/16	GC	SUBMITTED TO GOLDER ASSOCIATES FOR REVIEW - NOT FOR CONSTRUCTION	SAL

Design by: SAL Date: 02/24/16

Drawn by: KA Date: 02/24/16

Checked by: Date:

Approved by: Date:

Scale: 1:500 vert.

Horiz. 1:500

Proj. No. Sheet 4 of 5

Cost Center

Drawing No. A4 Rev 06

Project: E & N TRAIL  
DOWNTOWN SOUTH ALIGNMENT

Title: NEEDHAM ST TO RAINIER ST



