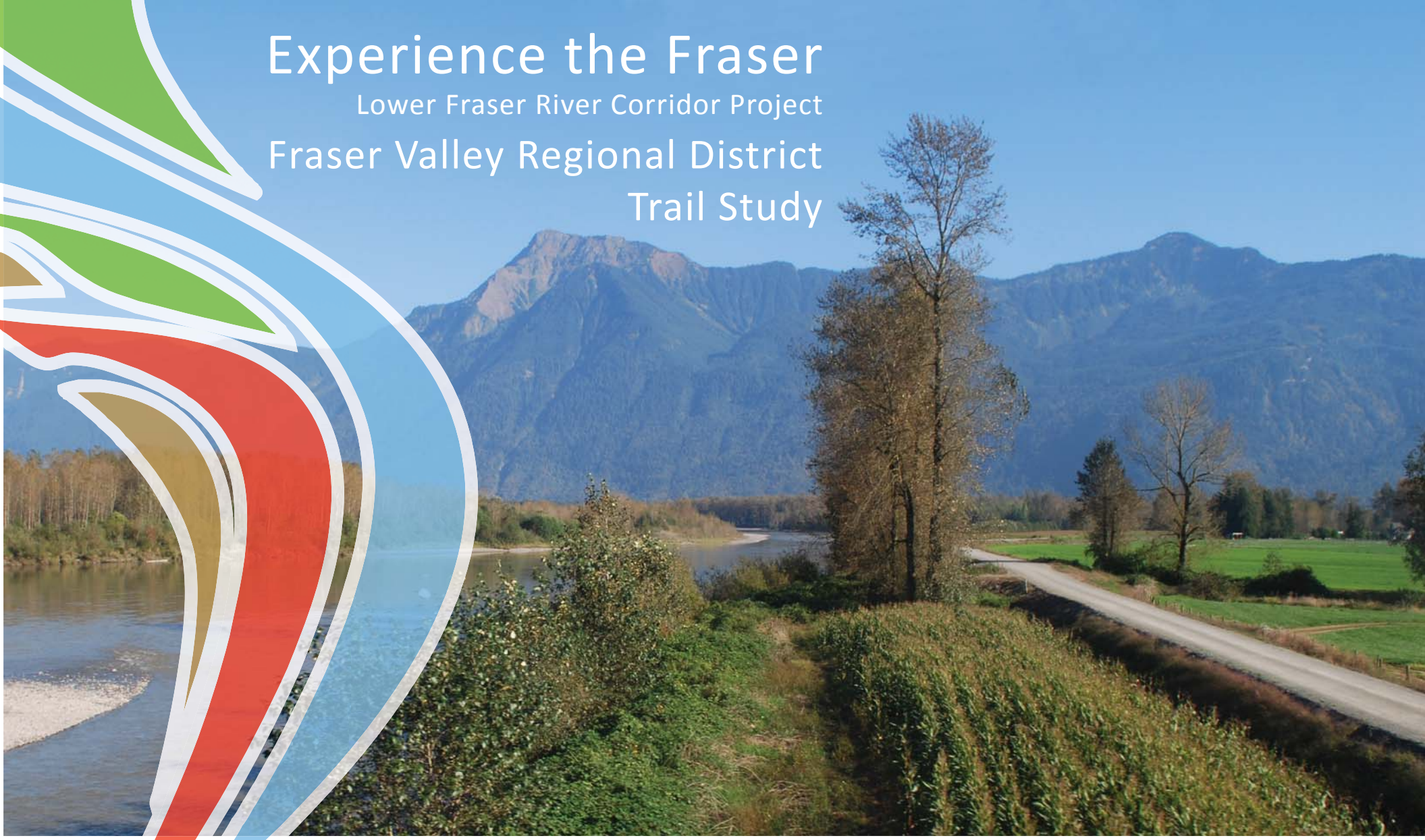
Experience the Fraser

Lower Fraser River Corridor Project

Fraser Valley Regional District Trail Study



September 2012

FRASER VALLEY REGIONAL DISTRICT

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EXECUTIVE SUMMARY

With the completion of the Experience the Fraser (ETF) Concept Plan in 2011, the ETF project is shifting from the conceptual phase to the implementation phase of building connections between communities, parks, natural features, historic and cultural sites and other points of interest along the Lower Fraser River Corridor. The Fraser Valley Regional District (FVRD) Trail Study reviews existing and future trail components of the ETF route, with the purpose of developing a high-level understanding of construction costs associated with implementing the trail specifically within the regional district. A high-level assessment provides a basis for discussing future funding requirements and sources with senior levels of government and other stakeholders.

Other aspects related to overall ETF implementation, such as governance, funding, and non-trail related infrastructure costs, are outside the scope of this study and will be addressed at a later date.

Findings:

1. The ETF Concept Plan identified two continuous trail routing options for the trail network, a short term "Interim" and long term "Vision". The "Interim" routing uses existing trails and roads allowing recreational users to travel the entire trail in near future. The "Vision" routing is more aligned with the river and amenities and as a result will take longer to build.

There was an assumption in the Concept Plan that utilizing existing roads and infrastructure would provide a less expensive approach to implementing the plan; this was called the "Interim" trail. Further analysis however, shows that bringing existing road infrastructure and trails up to an appropriate trail design standard (i.e. bike lanes etc.) would not be economically feasible; 40% greater than the "Vision". As a result, the focus should be on the long term "Vision" and not the temporary approach which would ultimately be more expensive than pursuing the "Vision" trail from the onset. Users could still use some of this existing interim routing, but this study recommends that these trail segments would not be upgraded or formally identified as being part of the trail system.

Recommendation:

Pursue only the "Vision" routing as the official trail in the Fraser Valley Regional District.

2. Geographic information system (GIS) analysis of the routing shows that of the total 245 kilometres of trail, over 28% (69 kilometres) already exists, leaving 72% (176 kilometres) to be constructed. Success of the trail is contingent on strong partnerships. The FVRD collaborated with member municipalities and other stakeholders through the development of the Concept Plan, and in order to see the trail come to fruition must continue to do so. Ultimately the goal is to see the ETF Concept Plan and FVRD Trail Study being supported by local governments and being incorporated into municipal plans. Such actions are also supported by Goal 6, Actions 6.1 and 6.2 of the FVRD's Regional Growth Strategy.

Recommendation:

Work with local governments in the Fraser Valley Regional District to incorporate the trail into municipal plans.

3. Based on the different lengths of each trail type and related design standards, preliminary construction costs to build the trail are an estimated $9.6 million.

Recommendation:

The Fraser Valley Regional District will continue to seek funding from the Province and other sources.

4. 84% (206.5 kilometres) of the trail is on publicly owned or Crown land, 5% (11.2 kilometres) is located on privately owned land, and 11% (27.3 kilometres) is on land where the ownership is unknown since there are tenure coding omissions within the FVRD's spatial property information database. With such a significant amount of the trail located on publicly owned land, partnerships with the Province, First Nations and other stakeholders will be critical to successfully implementing the trail, especially towards allowing recreational access to dyke structures.

Recommendation:

Work with the Province, First Nations, and other stakeholders to further develop the Trail.

Recommendation:

Work with BC Assessment to clarify and correct tenure coding to facilitate the trail planning process.

5. Four of the priority trail segments on both sides of the river connecting park land and other related destinations to the ETF project are located along the existing dyke network to the west of the Agassiz-Rosedale Bridge. Since these trail segments are on the dykes efforts should be undertaken to determine the feasibility of recreational access on these systems.

Recommendation:

Work with member municipalities and dyking authorities to identify recreational access opportunities on these systems.

Dewdney Nature Regional Park and Strawberry Island

1.0 PURPOSE AND OBJECTIVES

Experience the Fraser is a recreational, cultural and heritage project seeking to connect communities and the places along the Fraser River. This network of trails, “Interim” and “Vision”, will connect river communities, existing points of interest, amenities, and features along the Lower Fraser River Corridor. These trails will be a catalyst for other groups to add their own Fraser River related initiatives for visitors to the Lower Mainland region to enjoy. The purpose of this study is to understand the high-level construction costs of implementing the ETF “Vision” Route within the Fraser Valley Regional District (FVRD), from the western jurisdictional boundary in Mission to Hope in the east.

Although the ETF Concept Plan includes an “Interim” and “Vision”continuous trail routing options, this study looks at only the costs associated with the “Vision” routing which will henceforth be referenced as the Trail in this study. Over several decades, the goal is to construct 245 kilometres (km) of the Trail in the FVRD as a continuous east-west trail located as close to the river as possible along both sides of the Fraser from Hope to Mission and include the communities shown in Figure 1.

The Trail will expand non-motorized outdoor recreation activities and economic opportunities across the region. Pedestrians will be accommodated along its entire length and cyclists and equestrians where appropriate, and where practical, there will be sections of universal accessibility.

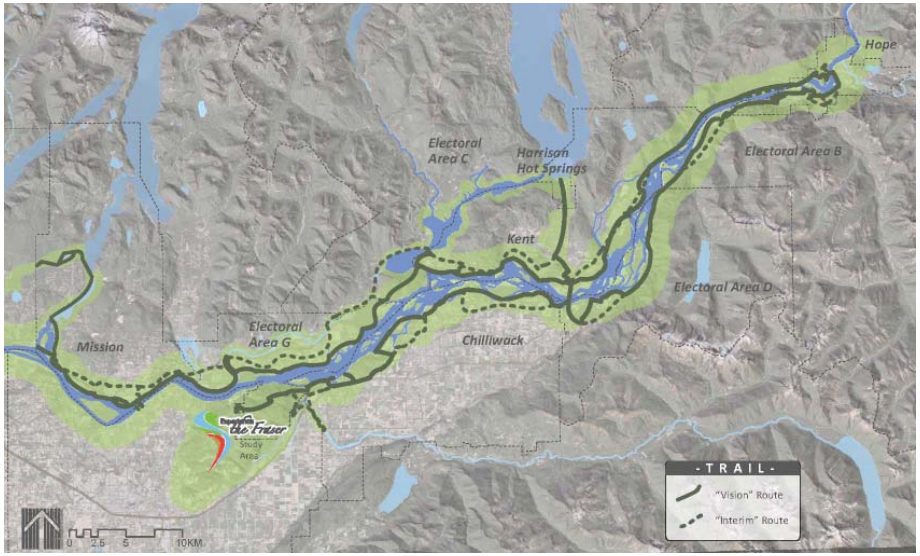


Figure 1: FVRD Trail Study Area Map

This FVRD Trail Study has four primary objectives:

1. Determine how much of the Trail exists and what remains to be constructed.
2. Estimate the preliminary construction costs to build the Trail.
3. Determine the Trail ownership.
4. Identify highest priorities Trail segments to be advanced.

2.0 FRASER VALLEY REGIONAL DISTRICT CONTEXT

The Regional District is a local government authority serving over 280,000 residents living within its six member municipalities and seven electoral areas (EAs). It is a region rich in diversity through its communities, economies, landscapes and recreation. Our stunning landscapes run the spectrum from agricultural vistas across the valley to soaring mountains and deep, rocky canyons through which the mighty Fraser River flows. Both our land and water based outdoor recreational assets are extensive and exceptional and offer great potential for additional recreation and economic opportunities.

This study complements and supports a number of FVRD Plans including the Regional Parks Plan, Regional Growth Strategy (RGS), and Regional Outdoor Recreation Opportunities Study.

2.1 Regional Parks Plan

The 2003 Regional Parks Plan proposes a "Fraser River Trail" that aligns with the ETF Trail route and states that:

"the continuation and development of a regional trail system along the Fraser river meets so many of the recreation objectives of the plan and satisfies the characteristics of future demand for recreation opportunities in the Lower Mainland, that any forward looking plan would be incomplete without identifying this corridor as a long term goal."[1]

As the Regional Parks Plan is to be updated by 2013, this presents a great opportunity for the Trail to be more formally integrated into this plan. This would lead to strengthened recreation opportunities in a broader regional planning framework.

2.2 Regional Growth Strategy

A key Goal of the 2004 Regional Growth Strategy is to develop a network of sustainable communities. The proposed trail will strengthen and, in some cases, provide new connections between communities within the Region.

The Trail also provides an opportunity for people to directly experience and interact with the river, its riparian areas, and other ecologically valuable habitats, promoting stewardship and raising awareness of these threatened and beautiful natural places. This supports broad RGS Goals to protect the natural environment and promote environmental stewardship.

As completed, the Trail will significantly contribute to providing healthy, sustainable, active-transportation options, and would greatly enhances the bicycle and pedestrian infrastructure in the region.

[1]FVRD Official Regional Parks Plan Bylaw No. 0225, 1998. P. 41 & 42.

2.3 Regional Outdoor Recreation Opportunities Study

The first phase of the Regional Outdoor Recreation Opportunities Study, completed in early 2011, found that Fraser Valley residents are among the most active outdoor recreationalists in the province. The Outdoor Recreation Study also found that trails along dykes or rivers are one of the top five preferred landscapes for outdoor recreation. Furthermore, walking and hiking are the most popular outdoor activities in the region and the future trend indicates that walking, hiking and cycling will become even more popular. Therefore, the implementation of a region-wide riverfront Trail network would help meet the demands of Fraser Valley residents who engage in outdoor activities.

Mission Waterfront Demonstration Project

3.0 TRAIL STUDY ASSUMPTIONS AND CONSIDERATIONS

The FVRD Trail Study covers the Trail from the western boundary of the District of Mission east to the District of Hope. Trail segments within the City of Abbotsford are not included as the City of Abbotsford receives regional parks services from Metro Vancouver. This section sets out the assumptions as well as considerations that have not been considered in the study's high-level construction costs, but will at some point have to be taken in to account.

3.1 Assumptions

With a study of this scope, the construction cost estimate of the Trail could have a +/- 20% variation since there are numerous unknown variables that could affect both the soft costs and construction costs with trail routing of this length and variety. Only through site specific detailed work can a more accurate cost of each trail segment be better determined. There are a variety of factors that influence the actual on the ground cost of trail development including:

- point of access
- location of materials and delivery distances
- existing substrate
- forest or land cover type
- existing and desired grade
- site preparation
- existing condition of trail (if applicable)
- degree of universal access desired
- environmental requirements, and
- fluctuations in machine and labour costs.

In addition, a number of external factors will also impact trail construction, such as the state of the economy, and labour force costs at the time of trail construction.

Understanding a rough order of magnitude of estimated costs is an important first step for determining the feasibility of trail construction. The total cost of constructing new or enhancing existing trails will be determined through a detailed cost breakdown once the Trail routing is better defined. Detailed on-the-ground investigations and routing of each trail segment by regional and municipal parks departments will provide more accurate cost estimates than those provided in this study.

Nicomen Island and Chilliwack

3.2 Future Cost Considerations

This study has assessed the cost of constructing the Trail at a preliminary level, with more specific details related to each trail segment to be considered at a later date. Detailed cost estimates will be undertaken as the trail project moves closer to implementation. Considerations that will require more detailed analysis includes:

Existing ETF Trails - upgrades and/or enhancements

Existing trails which are in need of upgrading or other enhancements are not included in this study due to the high cost variability associated with upgrading these trails. Approximately 28% (69 kilometres) of the Trail will require more detailed assessment on an individual trail segment basis.

Soft Costs

These costs include, but are not limited to, project management or contracting, permitting and environmental assessment, archaeology assessments, design and engineering work.

Supporting Trail Amenities

These amenities include items such as staging or parking areas, signage, washrooms, shelters, waste and recycling containers, benches, picnic tables, and access gates.

Water and Rail Crossings

Major infrastructure crossing costs are not included because of the extreme cost variability of individual crossings. Significant involvement from senior levels of government and the private sector will be necessary to complete these important links. Some crossings will be new while others would be considered upgrades. There are seven water and a least fourteen rail crossings across the study area, of various distances and types, and will therefore have a significant impact on the actual costs of trail implementation. The major crossings include:

Water Crossings	Rail Crossings
Ruskin Dam, Mission	Silverdale, Mission
Mission Bridge, Abbotsford/Mission	Mission Railway Bridge, Mission
Nicomen Slough, Dewdney	Sumas River Railway Bridge, EA G/Chilliwack
Sumas River, City of Chilliwack	Harrison Mills dyke, Agassiz
Harrison River, Agassiz	Agassiz-Rosedale Highway,EA D
Agassiz-Rosedale Bridge	Flood Road, Hope
Fraser Bridge, Hope	Landstrom Ridge, Hope

Operations and Maintenance Costs

These costs can range significantly based on site specific requirements. With the Trail in the conceptual phase there are significant “unknowns” around what organizations might ultimately fund, build, and maintain these trail segments, therefore costs cannot be quantified at this time.

Sumas Mountain

Potential Land Acquisition or Purchasing Costs

Trail access can be achieved through several regulatory avenues, such as statutory right-of-ways, easements, or covenants. When this is not viable purchasing a strip of land or the parcel are two other options that can be used. Diverse landscapes throughout the study area will result in highly variable land values which will impact the potential costs associated with land acquisition.

ETF Concept Plan Elements

For the purposes of this study, other components of the ETF Concept Plan, such as the recreational "Blueway", amenity and feature points, nodes, or portals are not included in Trail construction cost estimates. The Trail is considered the backbone of the project with these other elements acting as supporting infrastructure.

Blueway – represents the recreational use of the river itself and best expressed through the supporting infrastructure that enables water access and uses such as launch sites and access points.

Nodes – destinations along the Trail and Blueway or locations where people can 'experience the Fraser' away from the Trail.

Portals – entry points of welcome to ETF.

Feature Points – discrete 'projects' that are either infrastructure, program-based, or project wide opportunities.

4.0 FINDINGS

The network of trails as set out in the ETF Concept Plan forms the backbone of the project and is represented by both short term "Interim" and long term "Vision" trail routing. The short term routing was intended to allow existing trails and roads to be utilized allowing users to travel the entire project corridor in the near future. The "Vision" route is also continuous but is more aligned with the river and amenities and as a result will take longer to build.

When the "Interim" alignment was analyzed, it was found that the 233 kilometres of trail would cost approximately $13.5 million to be constructed, 40% greater than the cost of the Vision alignment ($9.6 million). The additional costs came from the fact that the majority of the short term routing is located within the road right-of-way, which is the most expensive trail type to be constructed. Based on these significantly higher costs and the overall user experience, it would not be an efficient use of time and resources to advance the Interim route. Instead, this study focuses on costs associated with the "Vision" alignment. The Trail routing in each of the applicable jurisdictions of the Region is shown in Appendix B.

4.1 Trail Lengths and Presence

This section of the study highlights how much of the Trail already exists and provides an assessment of the types and standards of trails that may be considered for where there is no existing trail. As shown below in Figure 2, the Trail has been divided into four categories of trail type and four categories of off-road trail standard. Further details on these trail types and standards are summarized in Appendix A.1 and A.2. With dykes being such a significant linear feature along the Fraser River, the opportunity they present to further advance the Trail is explained.

Within the FVRD Trail Study area, there is a total of 245 kilometres of the Trail, spanning from Hope to Mission along both sides of the Fraser River. Of which 28% (69 kilometres) of the Trail is already in place as municipal, regional, provincial or other trail networks and 72% (176 kilometres) remains to be constructed as highlighted in Figure 3.

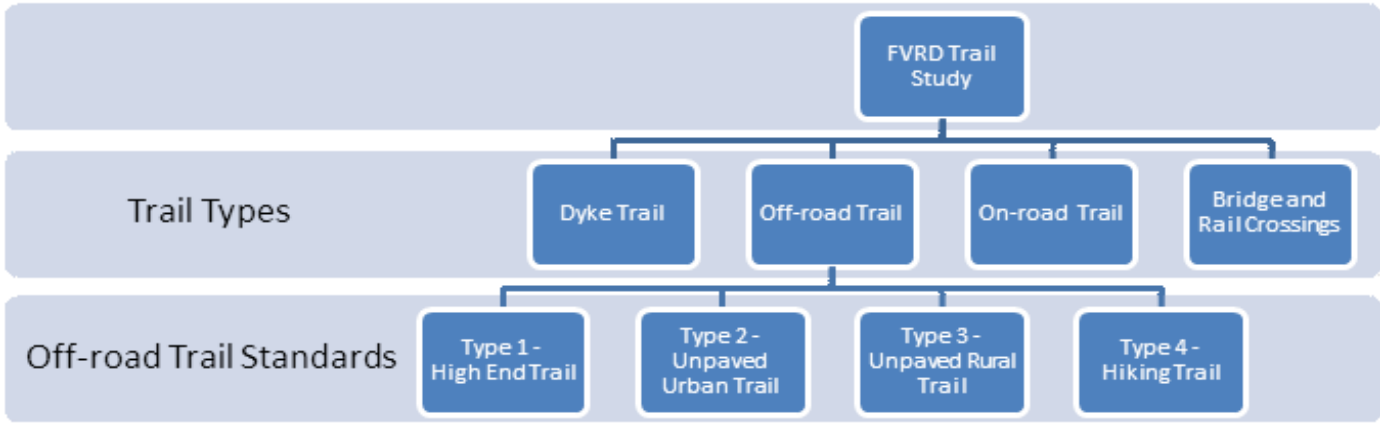


Figure 2: Classification of ETF Trail Types and Standards

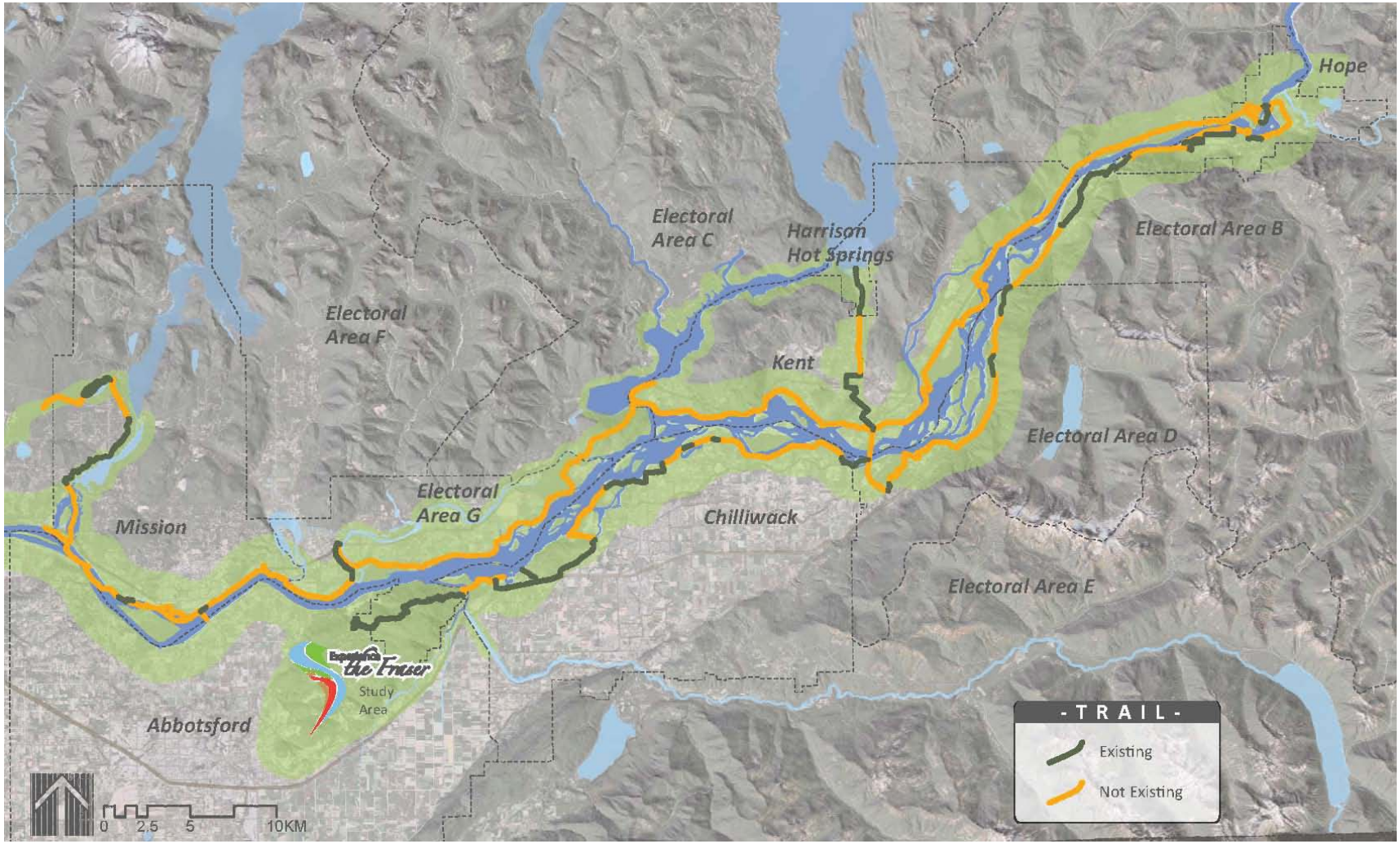


Figure 3: Trail Presence

By using both the Fraser River and the Agassiz-Rosedale Bridge the study area can be separated into four sub-regions. When the two sub-regions to the west of the bridge are combined (Lower Fraser Valley), the characteristics of the Trail routing are quite distinct from the characteristics of the two combined sub-regions to the east of the bridge (Upper Fraser Valley). In the Lower Fraser Valley the routing totals 155 kilometres with approximately 34% (52 kilometres) exists and in the Upper Fraser Valley the routing is approximately 90 kilometres in length with approximately 18% (or 16 kilometres) in place. Likewise, there are Trail characteristic differences between the north and south sides of the Fraser River. South of the river the routing totals 97 kilometres with approximately 43% (42 kilometres) exists and on the north side routing is approximately 148 kilometres in length with approximately 18% (27 kilometres) in place. When the four sub-regions are considered on their own, the variation in existing Trail becomes quite apparent as shown in Figure 4.

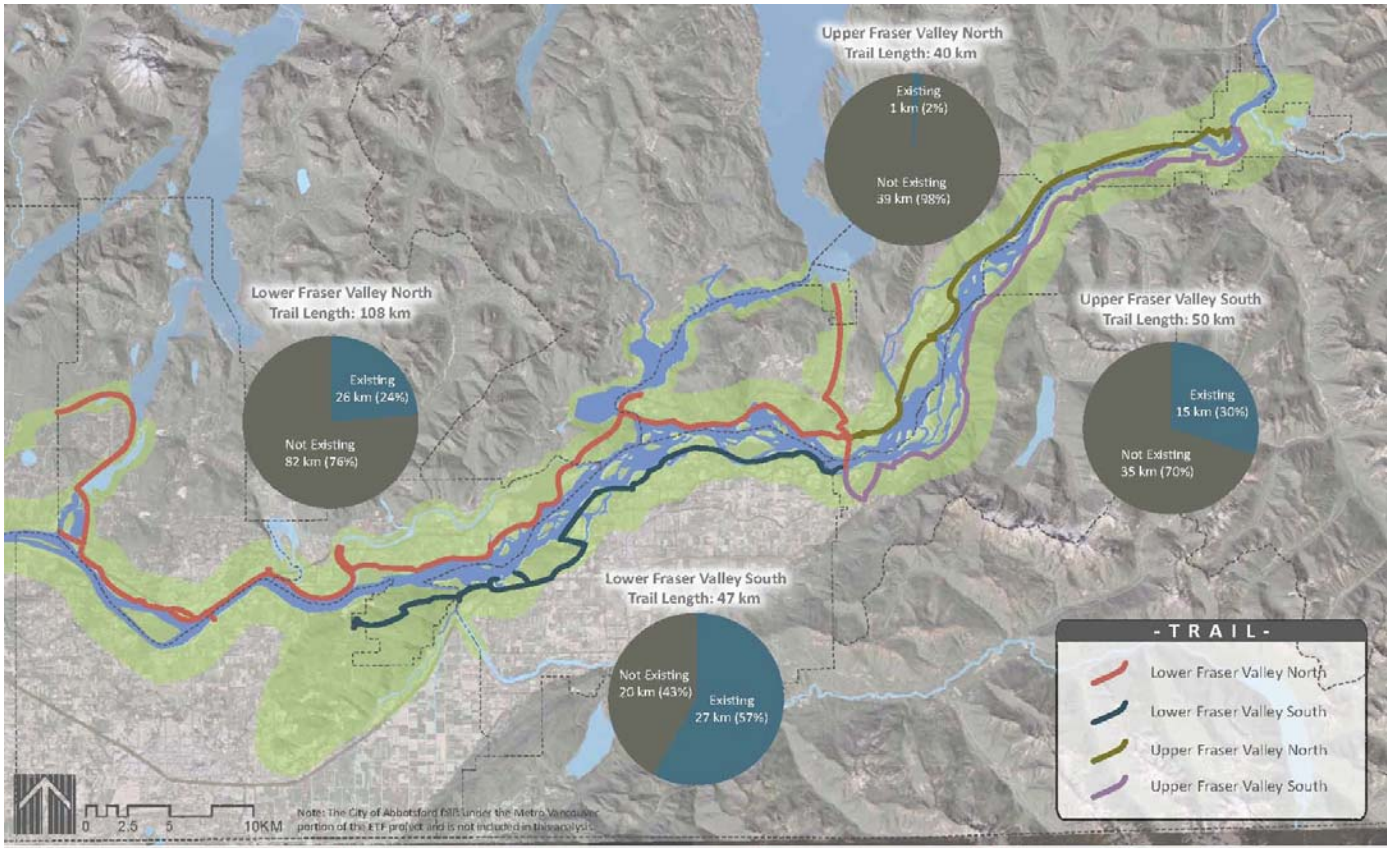


Figure 4: Trail Lengths by Sub-region

By using these sub-regions the remaining 176 kilometres of Trail to be constructed can be further broken down by trail type and standards as shown in Table 1. Of interest it that 76% (133 kilometres) will be comprised of the three least expensive trail types (Dykes, Off-road Unpaved Rural Trails, Off-road Hiking Trails).

Trail Type and Standard (see Appendix A)		Lower Fraser Valley North (km)	Lower Fraser Valley South (km)	Upper Fraser Valley North (km)	Upper Fraser Valley South (km)	FVRD Total
Dyke		40.2 (49%)	11.9 (61%)	4.5 (11.5%)	0 (0%)	56.6 (32.2%)
Off-road	Type 1 - High End	3.7 (4.5%)	0 (0%)	0 (0%)	0 (0%)	3.7 (2.1%)
	Type 2 - Unpaved Urban	7.5 (9.1%)	0 (0%)	0 (0%)	0.4 (1.2%)	7.9 (4.5%)
	Type 3 - Unpaved Rural	10 (12.2%)	6.8 (35%)	25.1 (63.9%)	17 (49%)	58.9 (33.6%)
	Type 4 - Hiking	5.5 (6.7%)	0.4 (2%)	2.2 (5.6%)	9.8 (28.2%)	17.9 (10.2%)
On-road		12.5 (15.2%)	0 (0%)	7.3 (18.6%)	7.3 (21%)	27.1 (15.4%)
Bridge and Rail		2.7 (3.3%)	0.4% (2%)	0.2 (0.1%)	0.2 (0.6%)	3.5 (2%)
Sub-region Total		82.1	19.5	39.3	34.7	175.6

Table 1: Trail Lengths still required, by trail type and standard

Dykes are a significant linear feature along the Fraser River and have 66 kilometres of the Trail located on them. 14% (9.4 kilometres) already exist as Trail in the form of dedicated road on top of the dyke. All of the dykes of interest to the ETF Trail are located to the west of the Agassiz-Rosedale Bridge, in the more populated areas of the region. Securing recreational access on Mission, Chilliwack, Kent, and Electoral Area G dyke systems would total 56.6 kilometers of new Trail, increasing the total amount of existing Trail to 51% as highlighted in Figure 5.

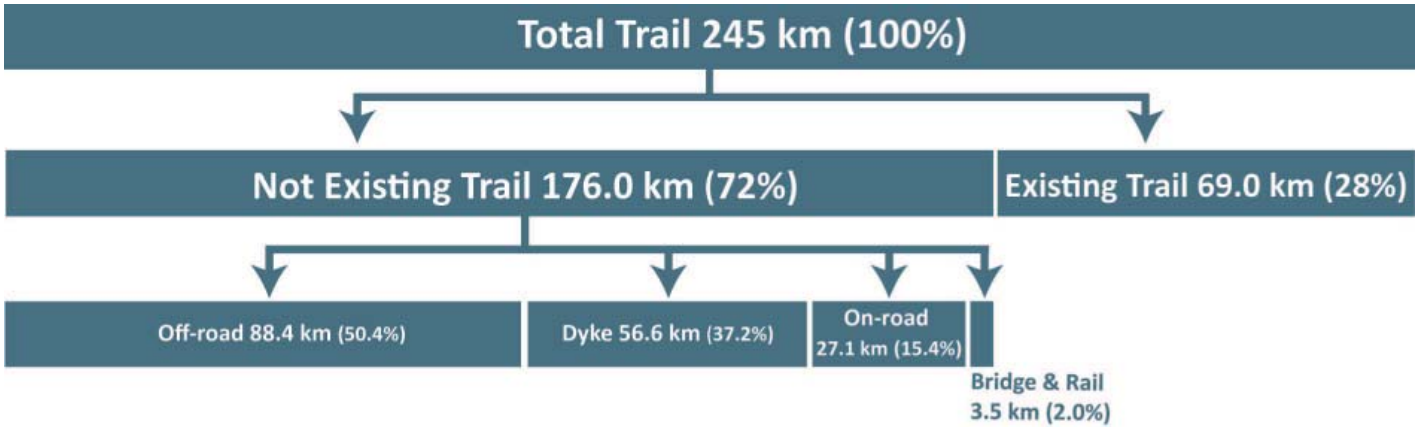


Figure 5: Trail Presence by Trail Type

ETF recognizes the paramount function of dyke structures as flood protection infrastructure. Working with, and respecting this primary function, ETF also recognizes the additional opportunities for using them as recreational trails. Public access and utilization of the dykes is a highly valued social benefit, providing recreational connectivity and may even increase surveillance of the dyke system. Through ETF, a regional approach to recreational dyke access can improve recreational access without jeopardizing the structural integrity and primary function of the dykes to provide flood protection.

4.2 Trail Ownership

The intent of the Trail is to follow and feature the Fraser River as closely as possible. Where possible, the Trail routing utilizes existing public land, however there are several areas where this is not possible. As individual Trail segments are advanced alignment to harmonize with First Nation land and private land interests, sensitive natural features, and river industrial activities will be undertaken. Fortunately, 84% (206.5 kilometres) of the Trail is on publicly owned land or roadway. With the opportunity to use such a large amount of public land the Trail can be located in preferred areas to showcase the river and points of interest along the route.


Harrison Mills Dyke

Of the 28% (69 kilometres) of Trail that already exists, none is on privately owned land. Of the 72% (176 kilometres) of Trail remains to be constructed 5% (11.2 kilometres) is located on privately owned land as shown in Figure 6. For both existing and remaining Trail to be constructed there is a combined 11% (27.3 kilometres) where the ownership is unknown since there is no associated property information.[2] With two dyking improvement district overseeing the dykes in Electoral Area G, the dyke trail has been categorized as "public" which significantly increases the amount of public lands in the study area.

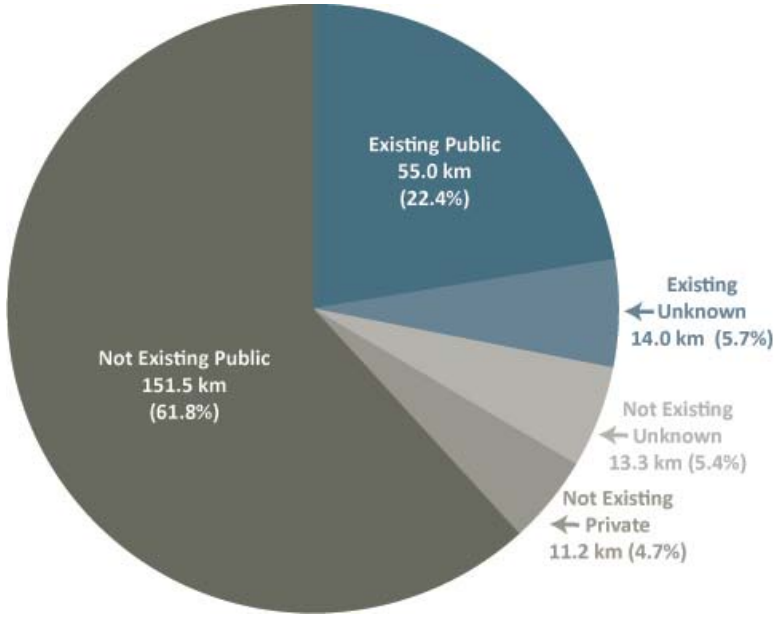


Figure 6: Trail Presence with Land Ownership

[2]This analysis is based on the tenure coding in the FVRD's spatial property information database, and are not entirely accurate because many of the unknown Trail parcels of interest are coded as 'Crown Granted' which generally means that they are privately owned. However, upon further investigation, it is found that many of these parcels of interest are actually publicly owned by various levels of government, such as the dyke network in the District of Kent, and properties along the Trans-Canada Highway, which are owned by BC Hydro. This demonstrates the ownership data needs further analysis.

4.3 Trail Construction Cost Estimates

It has been estimated that, based on proposed trail characteristics/standards and associated per kilometre costs, see Appendix A.3, the 72% (176 kilometres) of not existing Trail will cost approximately $9,581,000 to build in the FVRD. This cost does not include any associated costs with upgrading the existing 28% (69 kilometres) of Trail due to the high degree of variability associated with these costs since this routing requires more detailed assessment on an individual trail segment. It is important to note that this estimate excludes the City of Abbotsford since they receive their regional parks services from Metro Vancouver.

In recognizing that completion of the Trail will likely take decades, estimated construction cost should be viewed from a similar perspective. Prorating the estimated annual construction costs over five different decade offers multiple funding scenarios to complete this Trail as shown in Table 3. As an illustration, the Region's current assessed values were used as the basis of determining the Trail's estimated average annual resident cost. If the Trail was to be completed in ten years the average annual resident trail cost would be $12.48, whereas if it took fifty years to complete the Trail the average resident trail cost would be a fifth the cost at $2.50 per year.

Decades (10y)	Trail Costs per year ($)	Average Annual Resident Trail Cost ($)
1	958,100	12.48
2	479,050	6.24
3	319,367	4.16
4	239,525	3.12
5	191,620	2.50

Table 3: Trail Construction Costs prorated over five different decades[3,4]

Harrison Hot Springs Spirit Square

[3] 2012 dollars and assessed values

[4] The study recognizes there are a number of variables that can impact construction costs. A number of organizations were contacted to help arrive at a reasonably accurate cost estimates associated with trail construction including the FVRD Parks Department, MV Parks Department, BC Parks Facility Inventory System (last updated in 2000), the Sea to Sky Trail Master Plan (2006) and Trans Canada Trail Foundation. The wide variety of costs collected were then synthesized into applicable dollar amounts per kilometre and broken down by the various trail standards as described in Appendix A.3. Estimated Trail construction cost include: materials, supplies, equipment, machines, and labour.

As this initiative advances it will rely on other funding sources. Once the project's governance structure is determined the appropriate funding sources and requirements can be further explored. As well there will be ongoing opportunities for First Nations, businesses, and landowners and other interests to participate in the delivery of the Trail.

It is important to emphasize that these construction costs could have a +/- 20% variation due to the uncertainties previously discussed in this study. These costs should therefore be considered a high level or rough order of magnitude cost estimate based on information from similar projects. In addition, these costs are based on current construction costs which may increase in the future. Other associated costs not included, such as water and rail crossings, are outlined in Section 3.2 – Future Cost Considerations.

Agassiz and Green Mountain

5.0 TRAIL PRIORITIES

The intention of the Trail is to connect communities to each other and to the river, to knit together points of interest such as parks, natural features, historic and cultural sites and festivals. There are a number of examples where this is being realized throughout the region. Already this has happened in Mission with the completion of the Mission Waterfront Demonstration Project. In Hope, the Chawathil First Nation is willing to share their cultural heritage in ETF's east portal.

This study focuses on the Trail itself and in order to advance the Trail and associated attributes, four priority trails have been identified. The reasoning as to why they were picked is they are:

- supported in our member municipalities' plans;
- recommended priority projects in the ETF Concept Plan; and
- noted in this study as to be a cost effective way to advance routing on existing infrastructure.

Hope and Mount Hope

The 49 kilometres that make up the four priority trails will cost approximately $1,225,000 million to build and would nearly double the total amount of existing Trail. All of these dykes have minimal grade increases, therefore offering the potential for a universally accessible experience close to the Fraser River. In addition, these dykes provide recreational access while requiring significantly fewer upgrades to reach the defined standards than would be required to build a brand new trail.

All of the recommended four priority trail segments involve using existing dyke on both sides of the river, connecting park land and other related destinations to the ETF project as shown on Figure 7. The four priority dyke trail segments recommended are:

- Part of the Dewdney dyke system (~6 km) from Dewdney Nature Regional Park to Lougheed Highway #7
- Part of the Nicomen Island dyke system (~20 km) from Dewdney to Deroche
- Part of the Chilliwack dyke system (~18 km) from Island 22 Regional Park to Ferry Island Provincial Park
- Part of the Harrison Mills dyke system (~5 km) from Lougheed Highway #7 to Mt. Woodside

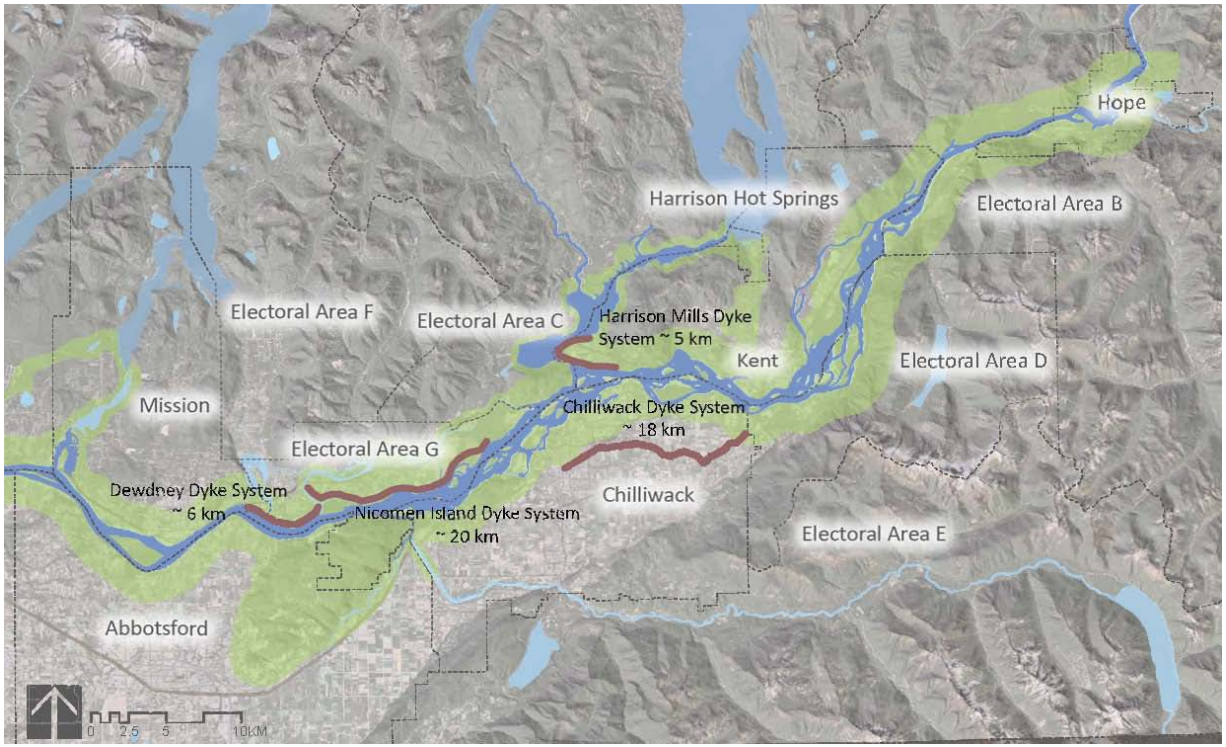


Figure 7: Trail Priorities

6.0 CONCLUSIONS AND RECOMMENDATIONS

A study of this nature provides a high-level assessment of what will be required to construct the Trail and is the first step in realizing Experience the Fraser on the ground. It is an important starting point to proceed with a gradual implementation of such an ambitious endeavour. It is the first step at a region wide scale of bringing together the conceptual Trail planning work with the estimated Trail construction costs. This high-level assessment provides a basis for discussing future Trail development, funding requirements, and sources with senior levels of government and other stakeholders.

The preliminary Trail construction cost to achieve the goal of 245 kilometres of continuous Trail along both sides of the Fraser River in the FVRD is estimated at $9,581,000. To advance the development of this Trail the study concludes with the following recommendations:

1. The Fraser Valley Regional District will continue to seek funding from the Province and other sources.

2. Going forward the focus of trail construction should solely be on the ETF "Vision" Trail alignment.

Narrowing down the Trail routing by eliminating the "Interim" route as identified in the ETF Concept Plan due to high costs associated with bringing trail segments that would only be temporary in nature, up to an acceptable standard.

3. Continue to work with the Province and the Agricultural Land Commission and other stakeholders towards allowing recreational access to dyke structures.

4. Coordinate trail planning efforts with member municipalities and dyking authorities of the four priority dyke trail segments be undertaken to pursue recreational access on these systems.

Continue to work on securing recreational access on dykes. The study identifies 56.6 kilometres of trail on dykes that are not sanctioned for recreation and/or lacks public access. Since this makes up 32% of the Trail that does not currently exist, obtaining access to these dykes for recreation purposes would result in a third of the incomplete portion of the Trail being completed at a very low cost.

5. Member municipalities recognize the ETF Concept Plan and the FVRD Trail Study as regionally important and beneficial initiatives and commit to integrating both initiatives into municipal plans and actions wherever feasible.

Develop strong partnerships amongst member municipalities and other stakeholders. The success of the Trail and ETF is contingent on a shared common vision, where partners recognize the multiple benefits of participation and are committed to seeing the project come to fruition. Local government support and participation is critical to achieving Trail success.

6. The FVRD work with BC Assessment Authority to verify these parcels of interest in order to get a more accurate picture of which lands of interest are publicly or privately owned.

Further land tenure analysis is needed. 11% (27.3 kilometres) of the Trail is on land where the ownership is unknown. Proper analysis could not be conducted on these parcels due to BC Assessment Authority tenure coding omissions observed within the FVRD's spatial property information database.

Chilliwack Dyke

APPENDIX A: TRAIL INFRASTRUCTURE STANDARDS AND COSTS

A.1 Trail Types

The ETF Trail can be divided into four categories of trail type: (1) dyke trail, (2) off-road trail, (3) on-road trail, and (4) bridge and rail trail. These are described in further detail below.

1. Dyke Trail

Consists of a 3 metre wide crushed gravel surface with a gradient less that 5%. As most of the infrastructure is already in place with the dyke network for potentially offering recreational access, costs are generally considered low to establish dyke trails

2. Off-road Trail

Off-road trails are of varying widths and surfaces that occur through neighbuorhoods, forests, or other habitats. Due to the varying degree of topography in the Fraser Valley, the off-road trails were further broken down by four trail different trail standards:

Type 1 – High End Trail
Type 2 – Unpaved Urban Trail
Type 3 – Unpaved Rural Trail
Type 4 – Hiking Trail.

These types of off-road trails are further described below.

3. On-road Trail

On-road trails are generally defined as a 1.5 to 2.0 metre wide paved shoulder or land, with cyclist/pedestrian infrastructure (such as sidewalk, painted bike lane or signage), and often with a barrier to separate non-motorized trail users from vehicle traffic in areas of high volume or high roadway speed. An important note to consider for this study is that some on-road trail segments were assumed to be already existing in situations where the road has very little vehicle traffic (rural roads with less dense population), despite their lack of pedestrian or cyclist infrastructure.

4. Bridge and Rail Trail

Crossing watercourses and railways are integral aspects of ensuring a continuous trail network within the project area. Each crossing will be site specific in terms of infrastructure needs and safety considerations.

A.2 Trail Standards for Off-road Trail

Off-road trails were further broken down by four different trail standards which are outlined below:

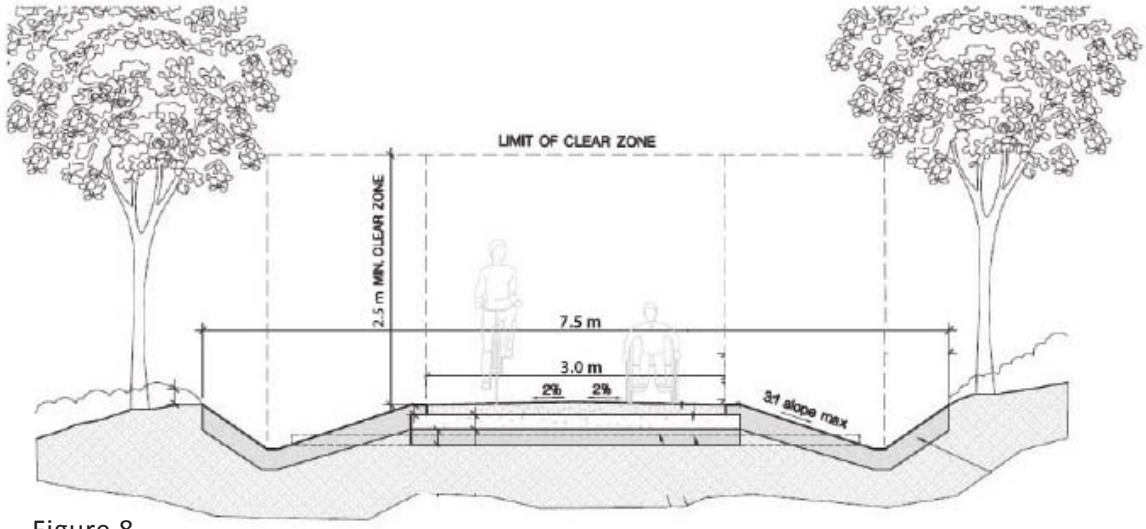


Figure 8

Type 1
High End Trail

Tread Surface:	asphalt or compacted granite aggregate
Tread Width:	3+ metres
Gradient Range:	maximum 5%
Design Features:	Can handle steady two-way flows of traffic, is universally accessible, and has a wide variety of amenities along its length, such as benches and extensive signage
Users:	pedestrians, cyclists, when appropriate equestrians

Mission Waterfront Demonstration Project

Type 2
Unpaved Urban Trail

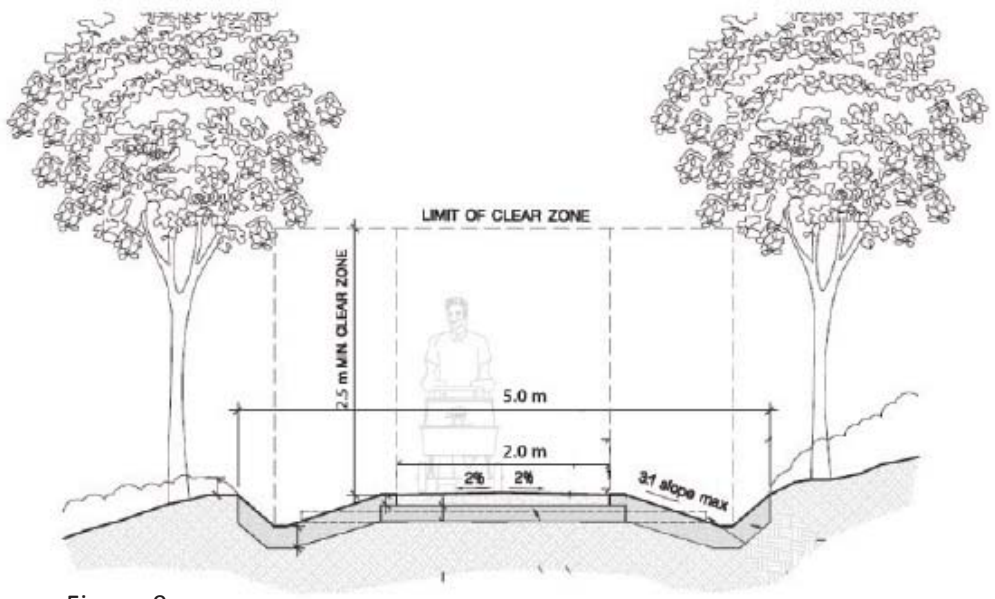


Figure 9

Tread Surface:	compacted granite aggregate or gravel
Tread Width:	2 to 3 metres
Gradient Range:	maximum 5%
Design Features:	Can handle two-way flows of traffic, is mostly universally accessible, and has a variety of amenities along its length, such as benches and signage
Users:	pedestrians, cyclists, when appropriate equestrians

Thacker Regional Park, Hope

Type 3

Unpaved Rural Trail

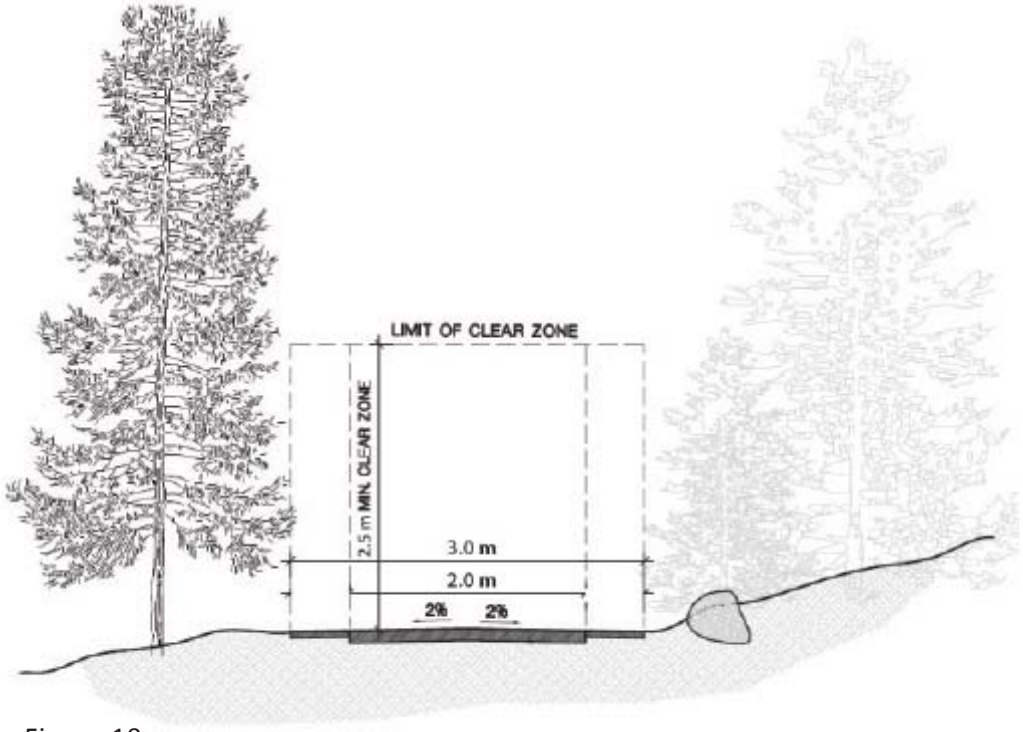


Figure 10

Tread Surface: compacted gravel or native soil
Tread Width: 1.5 to 2 metres
Gradient Range: maximum 10%
Design Features: Two people can comfortably walk side by side, hiking trail with most trail obstacles removed
Users: pedestrians, cyclists, when appropriate equestrians

Cheam Lake Wetlands Regional Park, Popkum

Type 3

Unpaved Rural Trail

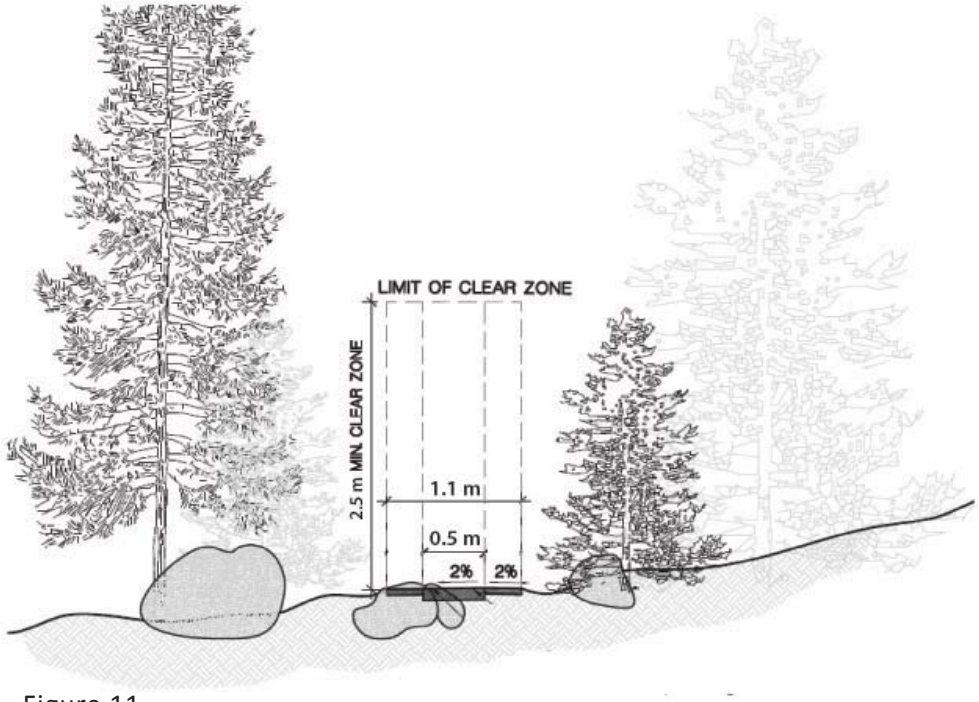


Figure 11

Tread Surface: native soil
Tread Width: 0.5 metres
Gradient Range: maximum 15%
Design Features: A more challenging hiking trail, can be rough terrain with some obstacles
Users: pedestrians, when appropriate cyclists and equestrians

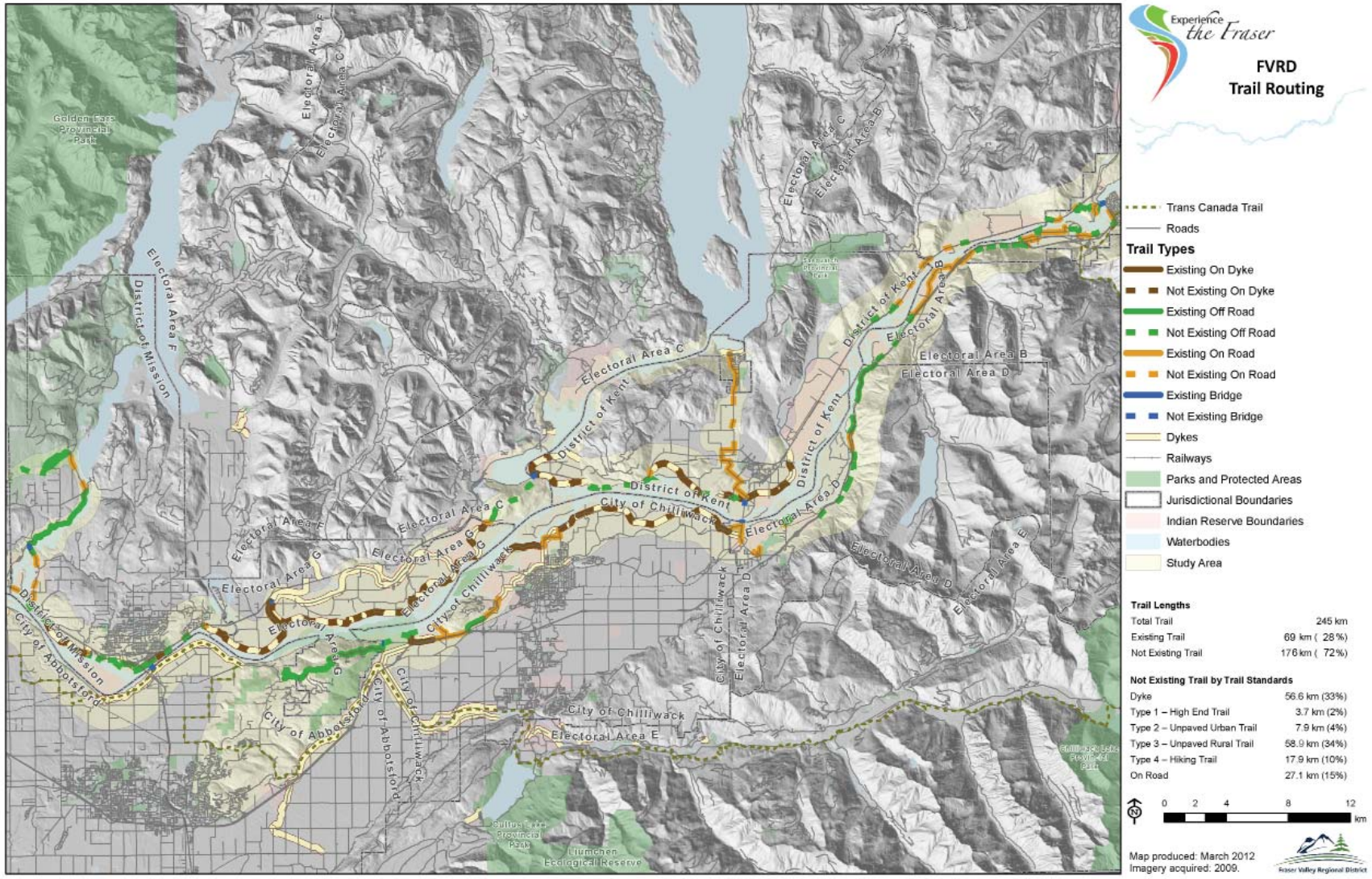
Sumas Mountain Regional Park, Electoral Area G

A.3 Estimated Trail Construction Costs by Trail Type and Standard

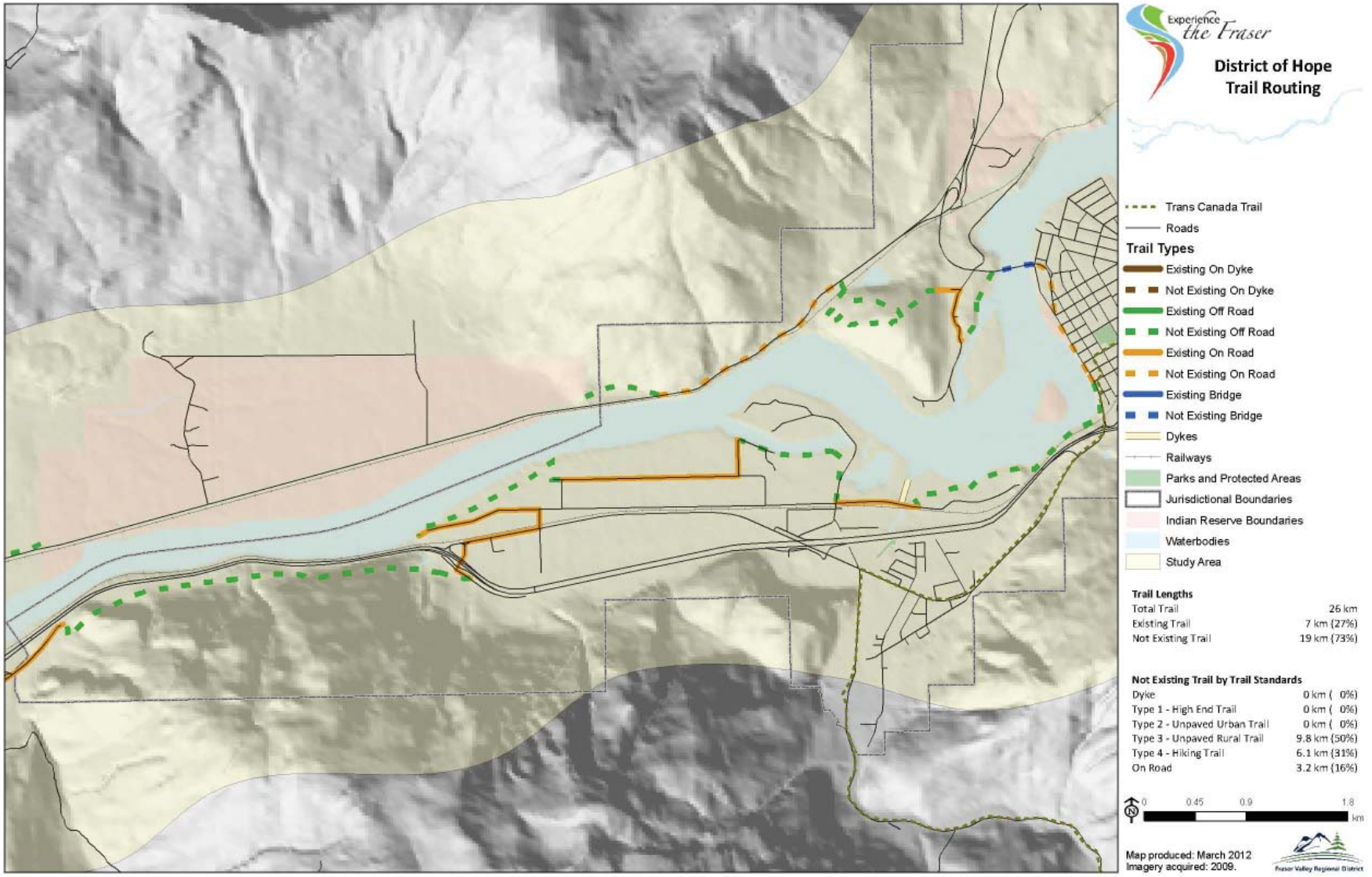
Trail Type and Standard		Estimated Cost per km for Trail Construction ($)
On-road		150,000
Off Road	Type 1 - High End	100,000
	Type 2 - Unpaved Urban	60,000
	Type 3 - Unpaved Rural	45,000
	Type 4 - Hiking	10,000
Dyke		25,000
Bridge and Rail		site specific

APPENDIX B: TRAIL ROUTING MAPS

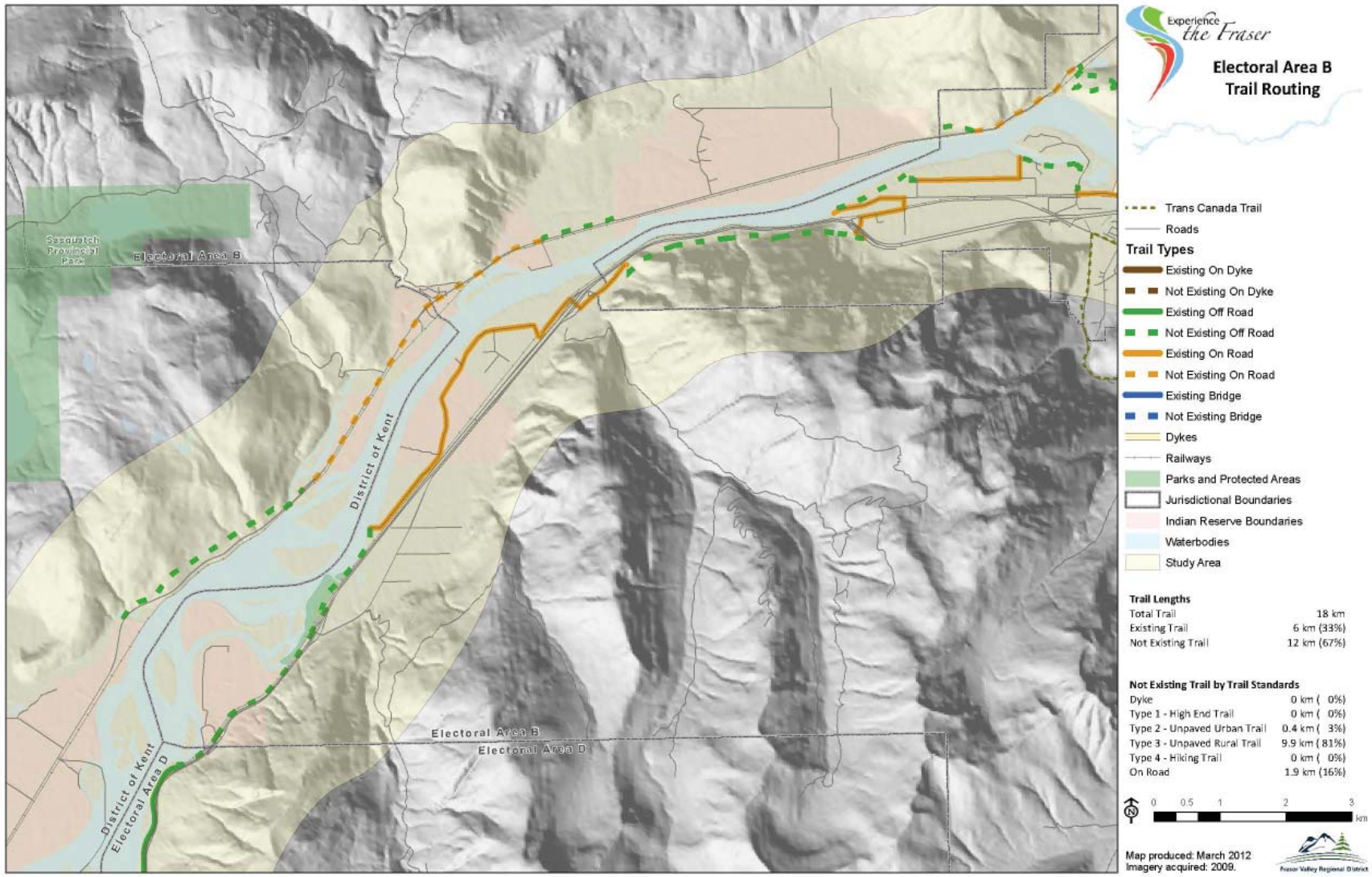
The primary objective when developing the Trail is to construct a continuous east /west connection from the western jurisdiction boundary in Mission to Hope in the east. The intent was to follow and feature the Fraser River as closely as possible: however, the Trail route will have to be aligned to harmonize with private land and First Nation land interests, sensitive natural features working, and river industrial activities. The Trail routing shows gaps but this represents locations where further discussions are needed with First Nations.



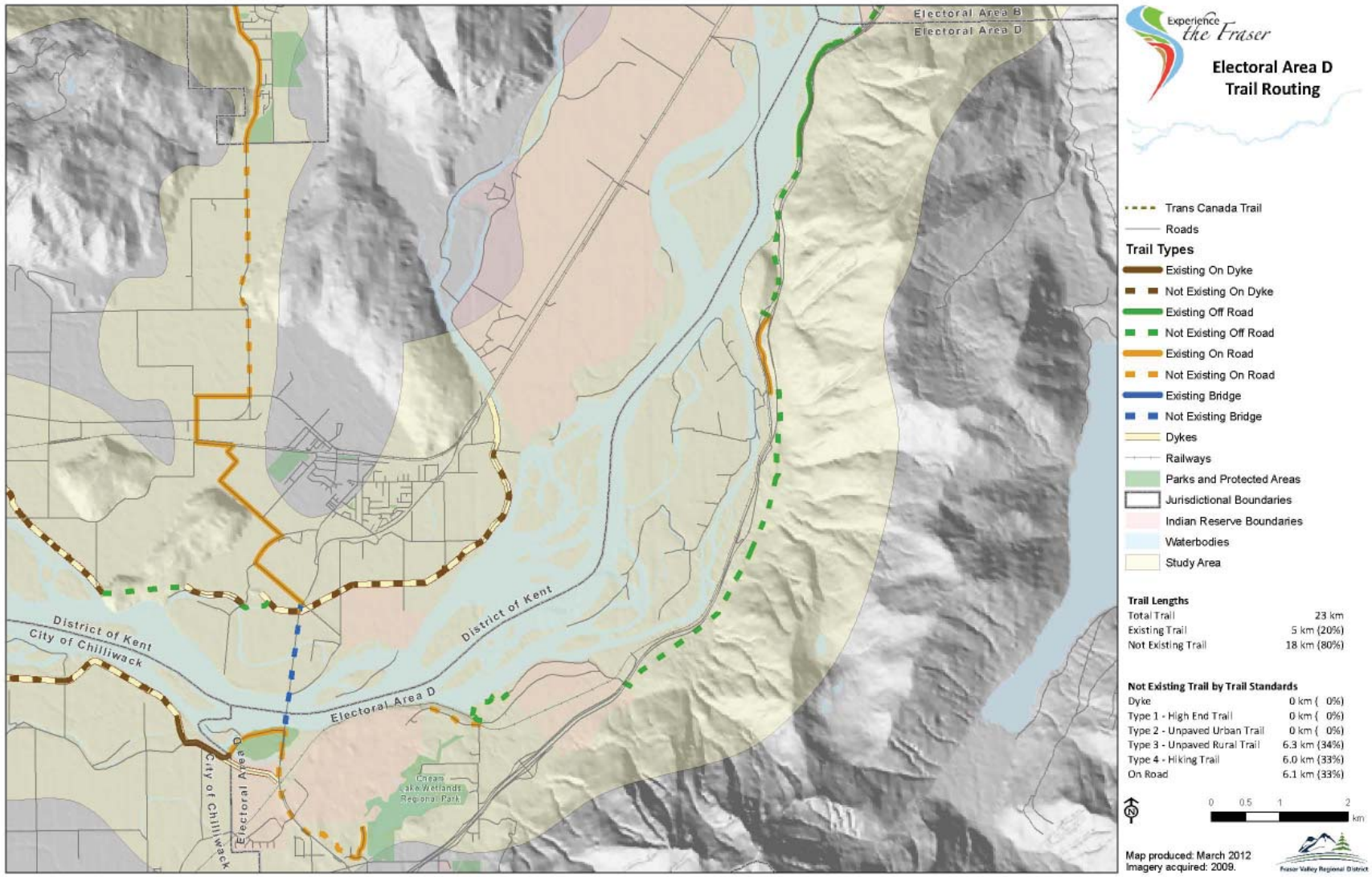
Map 1


Experience the Fraser
District of Hope
Trail Routing
Trans Canada Trail
Roads
Trail Types
Existing On Dyke
Not Existing On Dyke
Existing Off Road
Not Existing Off Road
Existing On Road
Not Existing On Road
Existing Bridge
Not Existing Bridge
Dykes
Railways
Parks and Protected Areas
Jurisdictional Boundaries
Indian Reserve Boundaries
Waterbodies
Study Area
Trail Lengths
Total Trail 26 km
Existing Trail 7 km (27%)
Not Existing Trail 19 km (73%)
Not Existing Trail by Trail Standards
Dyke 0 km (0%)
Type 1 - High End Trail 0 km (0%)
Type 2 - Unpaved Urban Trail 0 km (0%)
Type 3 - Unpaved Rural Trail 9.8 km (50%)
Type 4 - Hiking Trail 6.1 km (31%)
On Road 3.2 km (16%)
0 0.45 0.9 1.8
km
Map produced: March 2012
Imagery acquired: 2009.
Fraser Valley Regional District

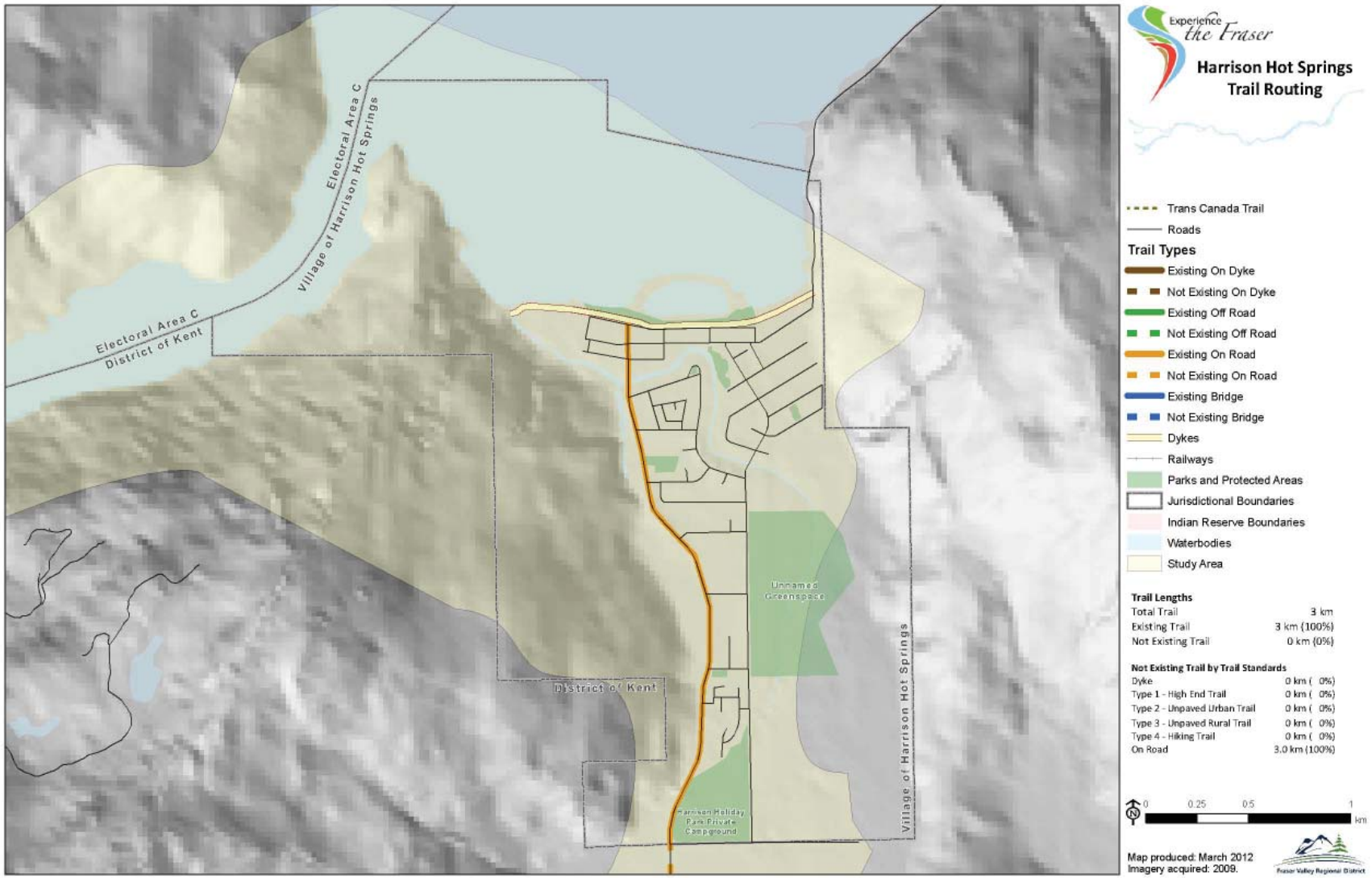
Map 2


Experience the Fraser
Electoral Area B
Trail Routing
Sasquatch Provincial Park
Electoral Area B
District of Kent
Electoral Area B
Electoral Area D
District of Kent
Electoral Area D
Trans Canada Trail
Roads
Trail Types
Existing On Dyke
Not Existing On Dyke
Existing Off Road
Not Existing Off Road
Existing On Road
Not Existing On Road
Existing Bridge
Not Existing Bridge
Dykes
Railways
Parks and Protected Areas
Jurisdictional Boundaries
Indian Reserve Boundaries
Waterbodies
Study Area
Trail Lengths
Total Trail 18 km
Existing Trail 6 km (33%)
Not Existing Trail 12 km (67%)
Not Existing Trail by Trail Standards
Dyke 0 km (0%)
Type 1 - High End Trail 0 km (0%)
Type 2 - Unpaved Urban Trail 0.4 km (3%)
Type 3 - Unpaved Rural Trail 9.9 km (81%)
Type 4 - Hiking Trail 0 km (0%)
On Road 1.9 km (16%)
0 0.5 1 2 3 km
Map produced: March 2012
Imagery acquired: 2009.
Fraser Valley Regional District

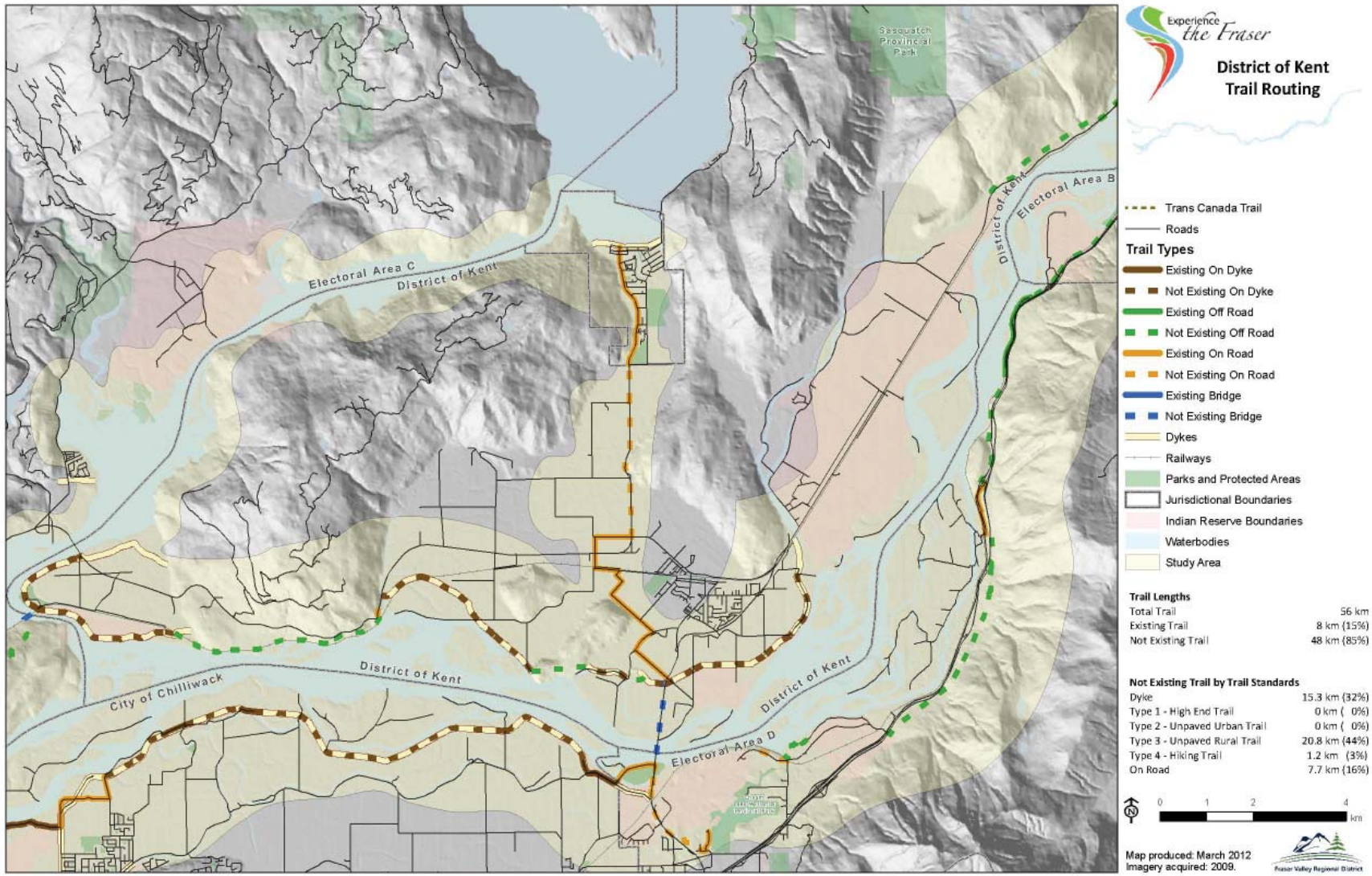
Map 3


Electoral Area B
Electoral Area D
District of Kent
City of Chilliwack
District of Kent
Electoral Area D
City of Chilliwack
Electoral Area D
Cream Lake Wetlands Regional Park
Experience the Fraser
Electoral Area D
Trail Routing
Trans Canada Trail
Roads
Trail Types
Existing On Dyke
Not Existing On Dyke
Existing Off Road
Not Existing Off Road
Existing On Road
Not Existing On Road
Existing Bridge
Not Existing Bridge
Dykes
Railways
Parks and Protected Areas
Jurisdictional Boundaries
Indian Reserve Boundaries
Waterbodies
Study Area
Trail Lengths
Total Trail 23 km
Existing Trail 5 km (20%)
Not Existing Trail 18 km (80%)
Not Existing Trail by Trail Standards
Dyke 0 km (0%)
Type 1 - High End Trail 0 km (0%)
Type 2 - Unpaved Urban Trail 0 km (0%)
Type 3 - Unpaved Rural Trail 6.3 km (34%)
Type 4 - Hiking Trail 6.0 km (33%)
On Road 6.1 km (33%)
0 0.5 1 2
km
Map produced: March 2012
Imagery acquired: 2009.
Fraser Valley Regional District

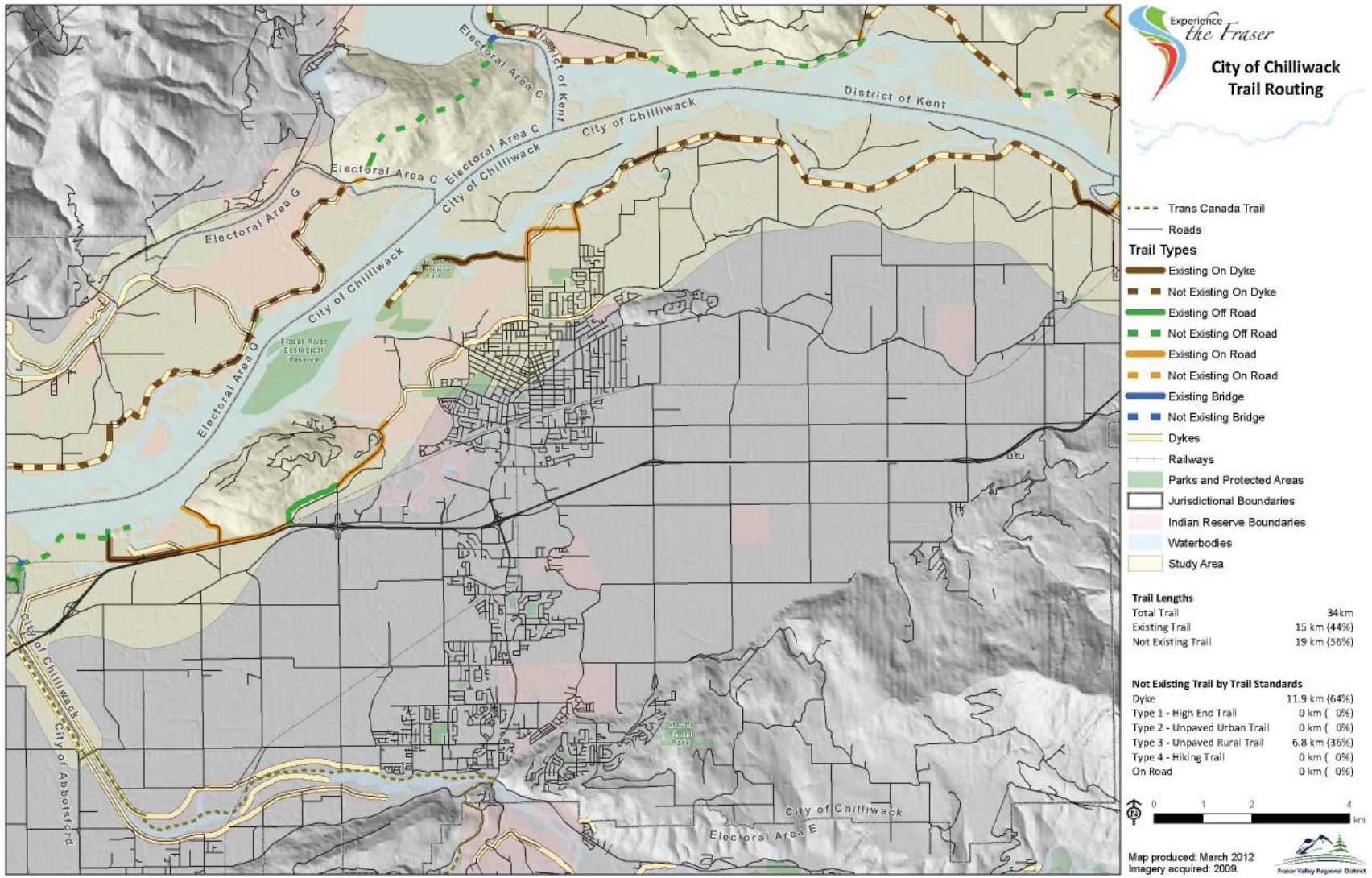
Map 4


Experience the Fraser
Harrison Hot Springs
Trail Routing
Electoral Area C
Village of Harrison Hot Springs
Electoral Area C
District of Kent
District of Kent
Unnamed Greenspace
Village of Harrison Hot Springs
Harrison Holiday Park Private Campground
Trans Canada Trail
Roads
Trail Types
Existing On Dyke
Not Existing On Dyke
Existing Off Road
Not Existing Off Road
Existing On Road
Not Existing On Road
Existing Bridge
Not Existing Bridge
Dykes
Railways
Parks and Protected Areas
Jurisdictional Boundaries
Indian Reserve Boundaries
Waterbodies
Study Area
Trail Lengths
Total Trail 3 km
Existing Trail 3 km (100%)
Not Existing Trail 0 km (0%)
Not Existing Trail by Trail Standards
Dyke 0 km (0%)
Type 1 - High End Trail 0 km (0%)
Type 2 - Unpaved Urban Trail 0 km (0%)
Type 3 - Unpaved Rural Trail 0 km (0%)
Type 4 - Hiking Trail 0 km (0%)
On Road 3.0 km (100%)
0 0.25 0.5 1 km
Map produced: March 2012
Imagery acquired: 2009.
Fraser Valley Regional District

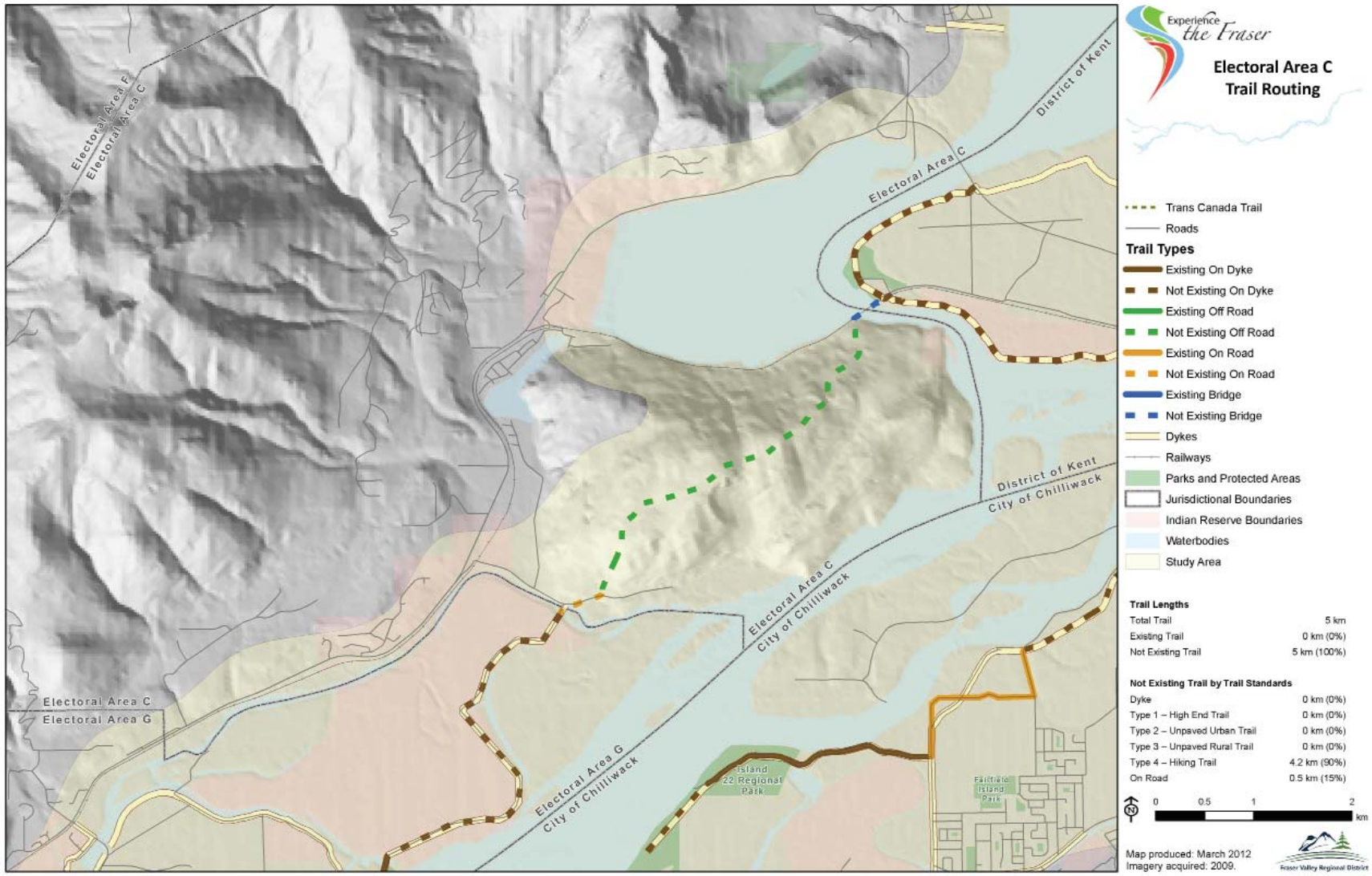
Map 5


Experience the Fraser
District of Kent
Trail Routing
Sasquatch Provincial Park
Electoral Area C
District of Kent
District of Kent
Electoral Area B
City of Chilliwack
District of Kent
District of Kent
Electoral Area D
Trans Canada Trail
Roads
Trail Types
Existing On Dyke
Not Existing On Dyke
Existing Off Road
Not Existing Off Road
Existing On Road
Not Existing On Road
Existing Bridge
Not Existing Bridge
Dykes
Railways
Parks and Protected Areas
Jurisdictional Boundaries
Indian Reserve Boundaries
Waterbodies
Study Area
Trail Lengths
Total Trail 56 km
Existing Trail 8 km (15%)
Not Existing Trail 48 km (85%)
Not Existing Trail by Trail Standards
Dyke 15.3 km (32%)
Type 1 - High End Trail 0 km (0%)
Type 2 - Unpaved Urban Trail 0 km (0%)
Type 3 - Unpaved Rural Trail 20.8 km (44%)
Type 4 - Hiking Trail 1.2 km (3%)
On Road 7.7 km (16%)
0 1 2 4 km
Map produced: March 2012
Imagery acquired: 2009.
Fraser Valley Regional District

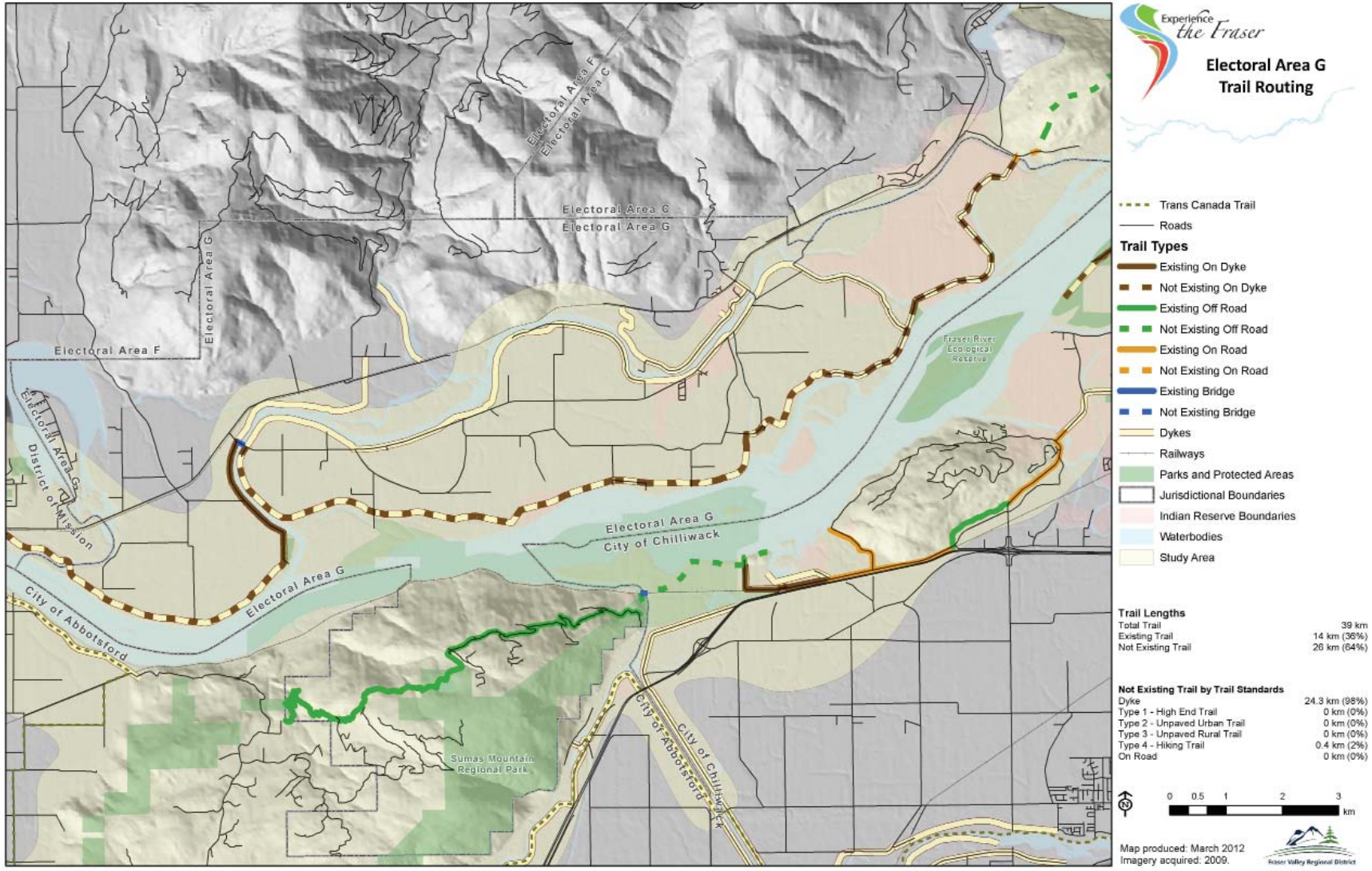
Map 6


Experience the Fraser
City of Chilliwack
Trail Routing
Trans Canada Trail
Roads
Trail Types
Existing On Dyke
Not Existing On Dyke
Existing Off Road
Not Existing Off Road
Existing On Road
Not Existing On Road
Existing Bridge
Not Existing Bridge
Dykes
Railways
Parks and Protected Areas
Jurisdictional Boundaries
Indian Reserve Boundaries
Waterbodies
Study Area
Trail Lengths
Total Trail 34km
Existing Trail 15 km (44%)
Not Existing Trail 19 km (56%)
Not Existing Trail by Trail Standards
Dyke 11.9 km (64%)
Type 1 - High End Trail 0 km (0%)
Type 2 - Unpaved Urban Trail 0 km (0%)
Type 3 - Unpaved Rural Trail 6.8 km (36%)
Type 4 - Hiking Trail 0 km (0%)
On Road 0 km (0%)
0 1 2 4 km
Map produced: March 2012
Imagery acquired: 2009.
Fraser Valley Regional District
Electoral Area C
District of Kent
City of Chilliwack
Electoral Area G
Fraser River Ecological Reserve
City of Abbotsford
Mount Thom Park
Electoral Area E

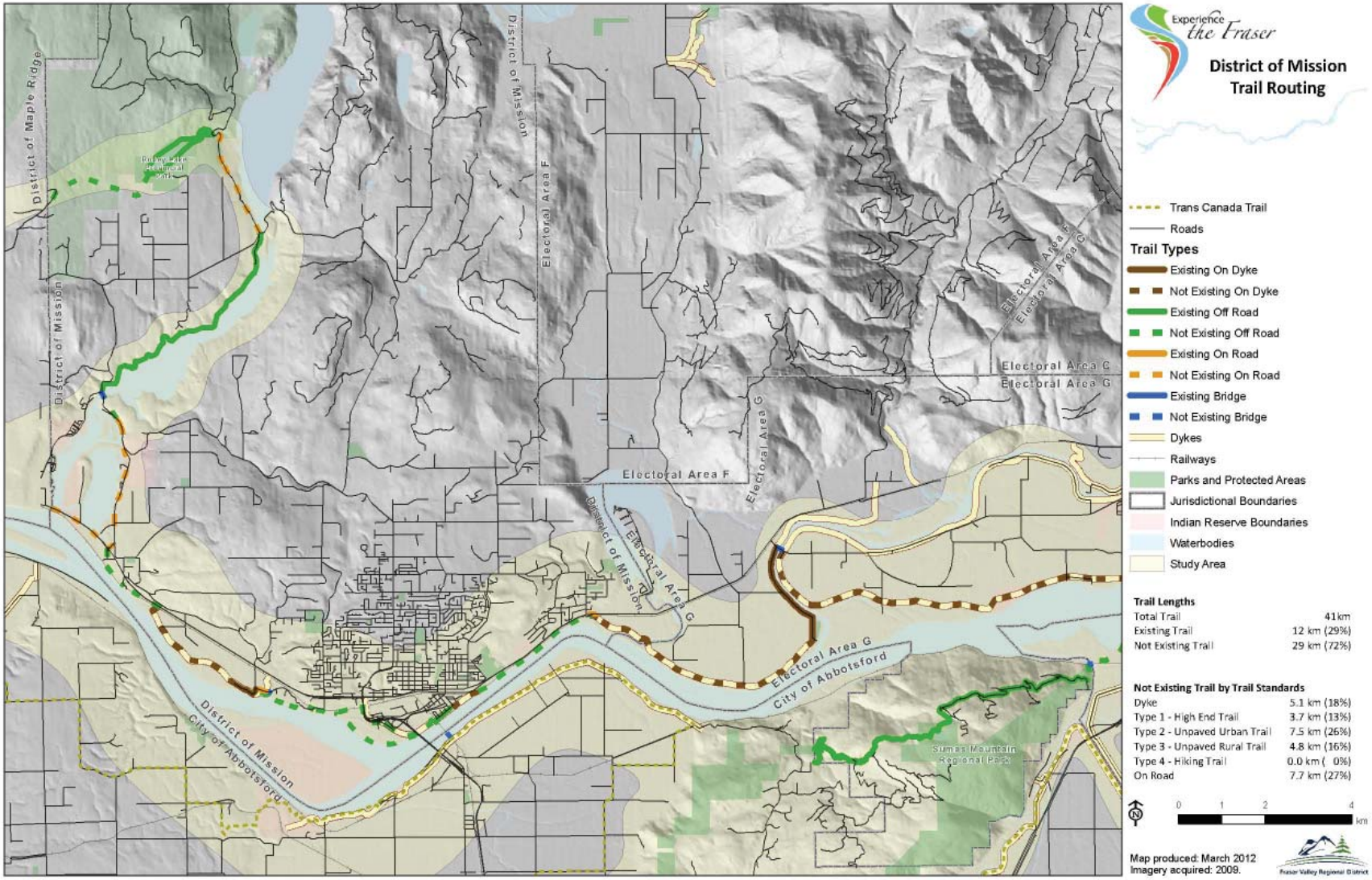
Map 7


Experience the Fraser
Electoral Area C
Trail Routing
Trans Canada Trail
Roads
Trail Types
Existing On Dyke
Not Existing On Dyke
Existing Off Road
Not Existing Off Road
Existing On Road
Not Existing On Road
Existing Bridge
Not Existing Bridge
Dykes
Railways
Parks and Protected Areas
Jurisdictional Boundaries
Indian Reserve Boundaries
Waterbodies
Study Area
Trail Lengths
Total Trail 5 km
Existing Trail 0 km (0%)
Not Existing Trail 5 km (100%)
Not Existing Trail by Trail Standards
Dyke 0 km (0%)
Type 1 – High End Trail 0 km (0%)
Type 2 – Unpaved Urban Trail 0 km (0%)
Type 3 – Unpaved Rural Trail 0 km (0%)
Type 4 – Hiking Trail 4.2 km (90%)
On Road 0.5 km (15%)
0 0.5 1 2 km
Map produced: March 2012
Imagery acquired: 2009.
Fraser Valley Regional District
Electoral Area F
Electoral Area C
District of Kent
Electoral Area C
District of Kent
City of Chilliwack
Electoral Area C
City of Chilliwack
Electoral Area C
Electoral Area G
Electoral Area G
City of Chilliwack
Island 22 Regional Park
Fairfield Island Park

Map 8


Experience the Fraser
Electoral Area G
Trail Routing
Trans Canada Trail
Roads
Trail Types
Existing On Dyke
Not Existing On Dyke
Existing Off Road
Not Existing Off Road
Existing On Road
Not Existing On Road
Existing Bridge
Not Existing Bridge
Dykes
Railways
Parks and Protected Areas
Jurisdictional Boundaries
Indian Reserve Boundaries
Waterbodies
Study Area
Trail Lengths
Total Trail 39 km
Existing Trail 14 km (36%)
Not Existing Trail 26 km (64%)
Not Existing Trail by Trail Standards
Dyke 24.3 km (98%)
Type 1 - High End Trail 0 km (0%)
Type 2 - Unpaved Urban Trail 0 km (0%)
Type 3 - Unpaved Rural Trail 0 km (0%)
Type 4 - Hiking Trail 0.4 km (2%)
On Road 0 km (0%)
0 0.5 1 2 3 km
Map produced: March 2012
Imagery acquired: 2009.
Fraser Valley Regional District
Electoral Area F
Electoral Area C
Electoral Area G
Fraser River Ecological Reserve
District of Mission
City of Abbotsford
City of Chilliwack
Sumas Mountain Regional Park

Map 9


Experience the Fraser
District of Mission
Trail Routing
Trans Canada Trail
Roads
Trail Types
Existing On Dyke
Not Existing On Dyke
Existing Off Road
Not Existing Off Road
Existing On Road
Not Existing On Road
Existing Bridge
Not Existing Bridge
Dykes
Railways
Parks and Protected Areas
Jurisdictional Boundaries
Indian Reserve Boundaries
Waterbodies
Study Area
Trail Lengths
Total Trail 41 km
Existing Trail 12 km (29%)
Not Existing Trail 29 km (72%)
Not Existing Trail by Trail Standards
Dyke 5.1 km (18%)
Type 1 - High End Trail 3.7 km (13%)
Type 2 - Unpaved Urban Trail 7.5 km (26%)
Type 3 - Unpaved Rural Trail 4.8 km (16%)
Type 4 - Hiking Trail 0.0 km (0%)
On Road 7.7 km (27%)
0 1 2 4 km
Map produced: March 2012
Imagery acquired: 2009.
Fraser Valley Regional District
District of Maple Ridge
District of Mission
Electoral Area F
Electoral Area G
City of Abbotsford
Sumas Mountain Regional Park

Map 10

FRASER VALLEY REGIONAL DISTRICT