



Ministry of
Transportation
and Infrastructure

Fraser Valley Regional Rail Pre-Feasibility Study

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DRAFT



STEWART GROUP

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Executive Summary

Over the last two decades, the Fraser Valley has evolved from an agriculturally centred community into a rapidly growing region, attracting new businesses, residents and developing an increasingly diversified economy around flourishing urban centres. Key drivers of this growth have been the area's proximity to Metro Vancouver, which has also experienced high rates of growth, and the availability and affordability of land – for housing, commerce, and industry – and ready access to markets, jobs, and a wealth of community amenities.

Growth has also been met with challenges. Growing communities require a range of facilities to meet their needs, such as schools, hospitals, parks, community centres, and transportation infrastructure. For transportation, the Valley has relied heavily on vehicle travel as the key mode of transportation for the past several decades. However with increasing congestion, more accidents, rising fuel costs, emissions, and growing competition for space on the road, the region is in need of more diversified transportation options offering fast, reliable, affordable, safe and environmentally friendly ways to travel. A key mobility strategy to meet these challenges is the opportunity to establishing a regional rail transit system.

Regional rail, a style and technology of rail transit well suited to the geography and conditions of the Fraser Valley, has the potential to provide significant benefits in shaping the growth and evolution of communities, including job creation, access to housing options and services, and a more sustainable mode of travel. However, like any transit system, success requires significant investment along with careful thought and planning to support a service that best meets the needs of a community today, and into the future.

As a first step in developing options for a regional rail system, this Pre-feasibility Study has examined the opportunities for rail through review and analysis of geography, demographics, movement patterns, development and growth, infrastructure needs, and has identified conceptual service options and the key requirements and processes to advance them. Key findings of the Study include:

- The Fraser Valley contains existing rail corridors, providing a right-of-way that links the centres of key communities, and may be able to support passenger rail service. This would provide for an efficient use of infrastructure, with cost savings and less disruption compared to developing a new corridor.
- A number of preliminary concepts demonstrate potential possibilities to connect areas in the Valley that are key destinations today and envisioned for substantial future population and employment growth. The concept of regional rail transit could be part of future long term planning.
- Preliminary analysis of possible demand suggests concepts could achieve ridership in line with similar systems in comparable contexts.
- These concepts can integrate with existing and planned transit systems, including SkyTrain, West Coast Express, and bus services, leveraging infrastructure investments and supporting transit networks.
- A regional rail style system could provide an appropriate style of service and system to meet the unique geographic conditions and travel patterns of communities in the Fraser Valley.
- The rail corridors identified for regional rail concepts are active freight railroads, with varying ownership and operating structures. Through ownership by BC Hydro, the Province has retained passenger rights on some corridors, while others are owned by private entities with exclusive rights. A range of partnerships and negotiated access with a number of railroads would be required to support passenger services.

While focused on regional rail concepts utilizing existing corridors, it should be noted that this study does not consider or preclude other mobility solutions, such as bus rapid transit or light rail transit, and options for new transportation corridors, and any potential future planning or work should consider additional solutions. In addition, this Report should not be construed as a commitment to advance the presented concepts and associated improvements by the Ministry of Transportation and Infrastructure or any other body.

The concept of regional rail in the Fraser Valley could have the potential to shape growth and development in the region and support a shift to cleaner modes of transportation while making

efficient use of existing infrastructure. This study has identified a number of key considerations that would need to be further reviewed as part of any future work on these concepts.

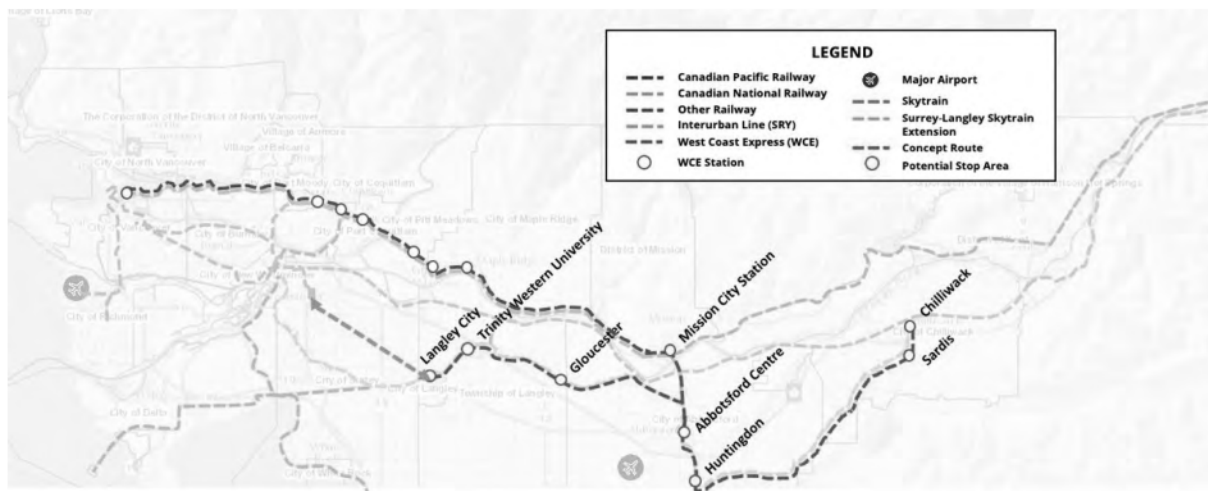


Figure 1 - Long term Regional Rail Network concept

Introduction

Over recent decades, the Fraser Valley has experienced some of the highest growth rates of any region in the province. Fuelled in part by high land costs and housing affordability challenges in Metro Vancouver, growing numbers of residents and businesses have been choosing to locate or relocate to the Valley. This growth has been particularly notable in the major communities of Langley, Abbotsford, Chilliwack, and Mission, and has brought about a number of significant shifts in development and transportation patterns, with growing communities facing increasing strain on infrastructure, land supply, housing, and the need for services.

As an historically agricultural oriented area with smaller exurban communities separated by large farmlands, the Fraser Valley, particularly to the south of the Fraser River, has been reliant on Highway 1 as the main transportation corridor. While providing regional connections, over time the highway has come to increasingly supports multiple functions - providing local and regional connectivity for residents and business in the Valley, commuter route for trips into Metro Vancouver, a key route for goods moving to and from Vancouver's ports to the rest of Canada, and travel route for people accessing BC's interior and beyond. This has led to significant, regular congestion on the highway, with travel times increasing, growing accident rates, higher emissions, and economic costs due to delays and disruption.

Over the coming decades, high growth rates in the Valley are anticipated to continue, along with continued pressure on transportation infrastructure, services, and housing affordability. In addition, job sectors in the region are expected to shift in response to changing economic patterns, with a larger professional services and knowledge worker sector, focusing on innovation, particularly in the areas of agri-tech and clean energy.

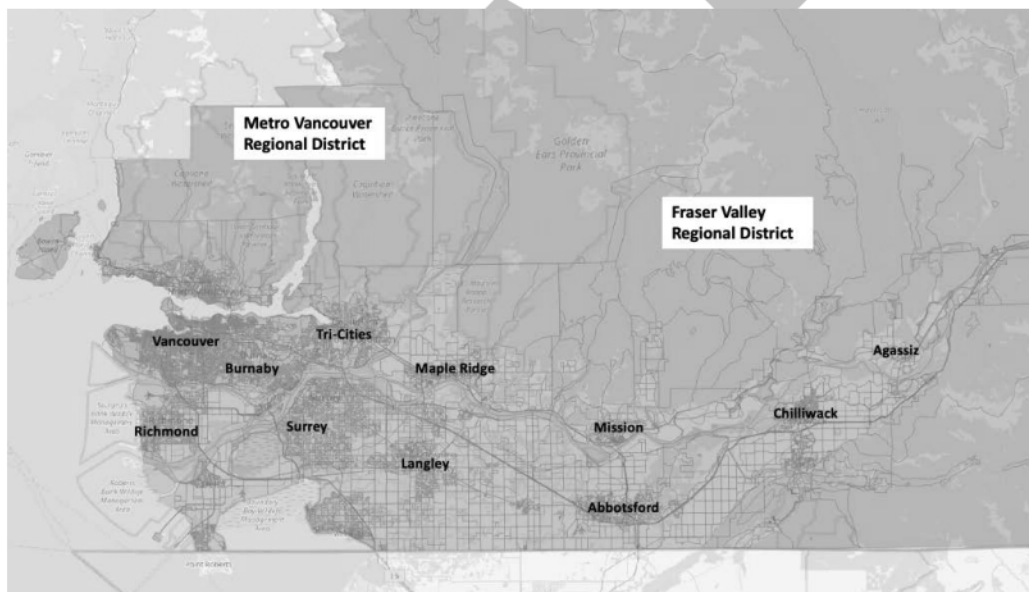


Figure 2 - BC's Lower Mainland (note: not all municipalities are labelled)

To support this growth and evolution of communities in the Valley, a number of key investments and transformations will be required. Communities will need to encourage land use patterns that support business and commercial endeavours along with a diversity of housing options to meet a range of needs and household compositions. These will also need to be supported with the amenities and facilities residents and business require. And critically, all of this will need to be supported with a range of fast, affordable, reliable and clean transportation solutions.

The Province has started to address these challenges through a number of transportation initiatives, including widening Highway 1 with HOV lanes for high-occupancy and electric vehicles, extending the SkyTrain from Surrey to Langley (SLS), and studying the extension of passenger rail into the Fraser Valley. As the Highway 1 widening is underway, and the SkyTrain planning and development process is advancing, passenger rail in the Fraser Valley requires investigation and analysis.

What is Regional Rail?

Regional rail provides fast, regular connections across large distances linking multiple lower-density, regional urban centres, located outside of major metro areas. Regional rail can function as a backbone to municipal transit systems and can be designed to provide quick connections to local services. Systems are often closely aligned with local transit, including such features and coordinated schedules and integrated fares. Regional rail is often understood in contrast to commuter style systems, such as the Lower Mainland's West Coast Express, which focus on delivering large numbers of passengers into central business districts at peak times, often relying on large park-and-ride lots at stations to attract ridership and offering limited local service.

Service Style

Regional rail services are typically offered all day, every day, with a frequency generally not less than once an hour, and often higher frequency during peak periods.

Vehicles, Infrastructure, and Stations

Making use of less expensive, smaller and more flexible trains than conventional locomotive driven, bi-level commuter trains, regional rail provides a more flexible and adaptable system, with options for climate-friendly hydrogen and electric power technology. Trains are often designed for quick stop times at stations, with one seating level and multiple doors, allowing for rapid loading and unloading, similar to a metro or rapid transit system. Train layout configurations can vary, but often offer more seating to accommodate longer trips compared to rapid transit but will also retain comfortable standing room for shorter trips.

Regional rail regularly uses established railways, sometimes connected with newer lines, and often on at-grade corridors with single track lines shared with freight and longer distance intercity passenger services.

Generally, stations can be conveniently placed along the line and adjusted as necessary, as they require relatively minimal infrastructure. Due to the nature of connecting multiple urban centres, stop distance may not be consistent, with several closer-spaced stops in urban centres, and greater spacing between urban areas.



Figure 3 - The German Regionalbahn service provides regional level rail connections to smaller population centres

Study Objectives

This study provides a high-level assessment of regional rail opportunities for the Fraser Valley, and identifies a number of potential concepts for a passenger rail service to connect the major urban centres of the Fraser Valley (Abbotsford, Chilliwack, Mission, and Langley). A key objective is to develop service concepts and to identify the key areas of focus that would need to be considered for any further assessment, including supporting analysis identifying routes, potential stop areas, general service parameters, infrastructure considerations, potential ridership, and analysis of concept alignment with broader transportation and land use considerations.

As part of this study, a number of supporting memorandums were prepared exploring the above noted areas of analysis to inform the development of the service concepts and provide a framework for concept evaluation, including:

Planning and Development Analysis – Review of opportunities for alignment of rail options with long term planning and growth strategies.

Transit integration Analysis – Review of opportunities for integration with existing and planned transportation systems.

Ridership Analysis – Preliminary assessment of ridership and market demand.

Corridor Review – Review of railway corridor options and infrastructure considerations.

In addition, preliminary discussions on regional rail opportunities were held with key stakeholders at a staff level representing transit service providers and local municipalities. Summaries from these discussions are included in Appendix E – Stakeholder Engagement Comments.

Opportunities and constraints, background information, analysis, data developed through the above memorandums, and insights ascertained through stakeholder engagement, has been used to inform and support the development and evaluation of the identified service concepts. This report summarizes the findings of these supporting memorandums, which have been included as appendices to this report, and should be referred to for additional details.

What is a Pre-feasibility Study?

- Seeks to identify passenger rail concept(s) and high-level analysis of their feasibility
- Identifies concepts for the focus of further study, analysis, and engagement
- Identifies passenger rail goals, along with key opportunities to support these
- Identifies critical issues and considerations
- Provides a precursor to a more detailed engineering study
- Identifies the key considerations for any future assessment - service design, preliminary engineering, high level costing, demand analysis and land use integration, stakeholder engagement and partnership development

As a Pre-feasibility Study, this review provides a high-level, preliminary analysis of conceptual options and seeks to identify issues and considerations to inform any future assessment. It does not include preliminary engineering, costing, or comprehensive ridership modelling, and additional analysis would be required to determine the feasibility of any of the options.

Past Studies

Several past studies have examined options to utilize existing rail corridors in the Fraser Valley for passenger services, with a range of criteria and approaches. Notable studies include:

2010-2012 Surrey Rapid Transit Alternatives Analysis Assessment of the Interurban Corridor (TransLink/MoTI)

This was prepared as part of a study of options for extending rapid transit services to provide connections between Surrey Metro Centre and other communities in Surrey and Langley. Focused on rapid transit (bi-directional, 30km or faster average speed, with 5 min headways), the study found that the portions of the Interurban corridor studied did not support such a service but noted that the evaluation did not preclude less frequent types of passenger service, such as commuter rail, which could potentially avoid some of the issues identified with rapid transit.

Since the completion of these studies, substantial planning and design work has advanced for the Surrey-Langley SkyTrain extension, which will provide a rapid transit connection to Langley. Accordingly, this study assumes the proposed terminus of the future SkyTrain in Langley will provide a connection point for rapid transit access to and from Metro Vancouver, and options to utilize rail corridors to connect into Surrey have not been considered.

2010 BC Transit Strategic Review of Transit in the Fraser Valley (BC Transit/MoTI/FVRD)

This study examined options to activate the Interurban rail corridor between Scott Road in Surrey, extending out to Chilliwack, as well as the potential extension of the West Coast Express into Abbotsford. The study considered options including light and heavy rail technologies, and provided an evaluation comparing rail options with bus alternatives. The Study recommended highway-based bus solutions on the basis of lower implementation costs.

In addition, while bus services provide regional transit connections and are anticipated to continue to play an important role in transit systems in the Fraser Valley, and can complement other transit such as rail, they generally do not encourage development investment to the same extent as fixed rail transit, and continuing high population growth rates, increasing congestion, and other socio-economic conditions merit continued and evolving evaluation of options to establish passenger rail to provide a fast, reliable regional transit service in the Fraser Valley.

Study Area

The Study Area encompasses parts of the broader Fraser Valley region and is generally defined by the major urban centres of Abbotsford, Chilliwack, Mission, and Langley. The communities included for this study have been chosen due to their interconnected travel markets, traffic volume, current reliance on Hwy 1, and continuing rapid growth.

It is important to note that while the focus of the Study is on the Fraser Valley, it is not constrained to the municipal boundaries of the Fraser Valley Regional District (FVRD) and includes Langley City and the Township of Langley (herein also collectively referred to as “Langley” or “the Langleys”), which are located within the boundaries of the Metro Vancouver Regional district. While largely addressing the major urban centres within the FVRD, the study has included Langley as it receives the largest share of travel trips leaving the Fraser Valley¹, and has a significant role in the Valley’s travel patterns.



Figure 4 - Study Area

¹ 2020 Fraser Valley Transportation Assessment prepared by Urban Systems.

In addition, Langley shares many attributes with communities in the Valley, including development patterns, demographics, economic sectors and history as a more rural and agricultural focused place that has seen significant population growth over recent years.

It should also be noted that the scope of this Study has been limited to evaluating the potential for passenger rail concepts along existing rail corridors in the Fraser Valley. Options that consider the development of new rail corridors have not been included as part of the development and review of concepts, with the exception of potentially necessary service components such as minor spurs (e.g. to support turning, temporary storage, stop locations, and other functions).

As part of an earlier phase of work, a capacity review of the current Fraser Valley rail network was undertaken. This review identified key corridors that held potential to support passenger services. This included corridors that provided greater connectivity to major destinations, ownership and operating structures, and key infrastructure linkages. Other corridors that provided a combination of poorer connectivity, complex traffic patterns, and heavy freight volumes have not been brought forward and evaluated as part of this Study but may provide opportunities as part of a wider network over the long term.

Background

The following section identifies demographic, economic and travel pattern trends in the Fraser Valley. This provides important context informing the current and anticipated future conditions for communities within the Study Area and identifies key issues that the development of a passenger rail service will need to address.

Demographics

Over the last decade, communities in the Fraser Valley region have experienced the highest growth rates of any region in BC, outmatching the provincial average over the same period.²

Within the municipalities of the FVRD, the current estimated population of 320,000 (2019) is anticipated to grow to over 500,000 by 2051, with the majority of that increase absorbed by Abbotsford (+ ~90k), Chilliwack (+ ~63k) and Mission (+ ~27k).

When other south of Fraser communities are included (Surrey, White Rock and Langley) the population is expected to grow by an additional 471,800 more residents by 2050. As a result, over the coming decades, the Fraser Valley corridor stretching from Surrey to Chilliwack is anticipated to increase by over 50% and become a region of more than 1.2 million people.

Population Growth Estimates				
	2016	2026	2041	2051
Abbotsford	148,056	172,767	214,935	237,422
Chilliwack	87,560	105,644	134,045	151,027
Mission	40,668	47,421	57,901	67,196
Hope	6,385	6,931	7,359	7,969
Kent	6,356	6,870	7,240	7,840
Harrison	1,514	1,750	2,027	2,196
EAs	10,775	12,515	14,674	15,578
Reserves	8,128	9,441	11,069	11,752
FVRD	309,442	363,338	449,249	500,979

Figure 5 - Fraser Valley Population Growth Projections. Source: FVRD Regional Growth Strategy Update, 2020 (draft)

Economic Development

Historically, the employment base of the Fraser Valley has been centred around agriculture and resource industries. The Valley also has significant job sectors in construction and associated trades, along with logistics.

More recently, the economy has begun to diversify, and increasingly includes a range of employment sectors such as professional services and emerging aerospace and high-tech fields³. Over the coming years, employment in the region is expected to increase by approximately 100,000 jobs by 2050. Of the job growth, approximately 52% will be in Abbotsford, 29% in Chilliwack, 12% in Mission with the remaining 6% in the rest of the region.⁴

Fraser Valley Travel Patterns

A broad review of travel patterns in the wider Lower Mainland reveals that urban centres within Metro Vancouver continue to be significant job markets and major destinations for people and are supported by a range of “hub and spoke” oriented transportation systems.

However, movement patterns in the Fraser Valley demonstrate a strong regional characteristic, with between 75% to 90% of automobile person trips staying within the region, and a majority of those staying within their originating municipality. Of trips leaving a municipality, top destinations include

² Fraser Valley Growth rate from 2011-2016 was 6.6%, compared to the provincial average of 5.6% (Statistics Canada, 2011 & 2016 Census)

³ 2020 Regional Growth Strategy Update (draft), Fraser Valley Regional District

⁴ Ibid

Langley, Abbotsford, and Chilliwack⁵. Accordingly, to address stronger intra-regional travel pattern, the approach to potential rail mobility solutions in the Valley can seek options that prioritize connecting local communities. In addition, with future development anticipated to be absorbed within urban centres, and limited opportunity for greater density of development within the Agricultural Land Reserve, future travel patterns are expected to reinforce point-to-point movement patterns between major urban nodes across the Fraser Valley corridor.

It is worth noting that current travel patterns are also influenced by housing location and employment sectors. Currently, the Fraser Valley has a slightly higher percentage of “non-fixed work locations” compared to Metro Vancouver⁶. This is indicative of work trips to varying locations, such as those common for construction sites and trade related fields, which is corroborated by the higher percentage of those employment sectors in the region. Overtime, with an increase in anticipated future economic diversification, it is expected that work-based trips to fixed locations (e.g. office) will increase as a percentage of overall work-based travel.

Transit in the Fraser Valley

Over the last decade, the Fraser Valley has seen a consistent, albeit minimal, increase in transit ridership, growing from 1% in 2011 to 3% in 2017. By comparison however, transit ridership as a percentage of overall transportation mode share remains relatively low in the Fraser Valley. For comparison, Metro Vancouver’s overall transit mode share in 2017 was 11.7%⁷. Over the long term, BC Transit’s Transit Future Plans for Abbotsford-Mission and Chilliwack have established the goal of achieving a transit mode share of 8% and 2%, respectively.

Reasons for lower transit adoption in the Fraser Valley are multi-fold. Key factors contributing to this include the Fraser Valley’s historically lower service hours compared with other communities where transit may be considered an attractive alternative⁸, and lower density land use patterns⁹. Inaccessible and limited transit has also historically been considered a key factor to minimal transit usage. To reach these targets, the Transit Future Plans identify transit system growth and transit supportive land use as two critical enabling factors. In addition, socio economic and demographic trends may also influence the propensity to take transit. As an example, and noted above, for the 2016 Census, populations in the Fraser Valley reported higher percentages of the labour pool employed in fields such as trades, construction, and transportation when compared with Metro Vancouver or the provincial average. As a result, the flexible location of workplaces associated with these fields may make transit more inconvenient and less available to meet needs. This is also supported by a greater response rate for “no fixed workplace address” for workplace locations.

It should be noted that there have been significant impacts to employment and commuting patterns due to the COVID-19 pandemic, introducing a high degree of uncertainty around a number of issues, including potential long-term changes to employment, housing, and travel patterns. This may result in significantly different outcomes over the long term for many of the above note demographic, employment, and transportation patterns and projections.

⁵ Travel Market includes communities within the Fraser Valley Regional District. Travel patterns based on 2011 and 2017 TransLink Trip Diary Survey, and 2020 Fraser Valley Transportation Assessment.

⁶ Source: Statistics Canada, 2016 Census

⁷ Source: 2011 & 2017 Regional Trip Diary, Translink

⁸ Strategic Review of Transit in the Fraser Valley, 2012

⁹ For comparison, Metro Vancouver has 854.6 people per square kilometre compared to 376.5/Km2 (Abbotsford), 320.2/km2 (Chilliwack), and 170.6 km2(Mission). Source: Statistics Canada, 2016 Census

Rail Corridors

The railway network in the Fraser Valley includes several lines run by various operators including Canadian Pacific Railway (CPR), Canadian National Railway (CN), and the Southern Railroad of British Columbia (SRY). Through an earlier completed Rail Capacity Review (December 2020), it was identified that some of the corridors through the Valley merited further examination to assess their feasibility to support passenger services. These included:

Parts of the corridor known commonly as the Interurban line, in particular the sections running from Langley City, through Abbotsford, and out to Chilliwack (Page Subdivision & Fraser Valley Subdivision). This corridor is owned by BC Hydro.

Parts of CPR's Cascade Subdivision, including sections currently used by the West Coast Express, and sections extending south from Mission across the Mission Rail Bridge into Abbotsford. This corridor is owned by CPR Rail.

The following provides a summary of the features and characteristics of these two corridors. For additional detail, please see Appendix A – Rail Corridor Review for information on the existing network capacities and currently planned improvements and initiatives.

Figure 5 shows the corridor study area, and the relationship of above noted segments in relationship to the broader rail network in the Fraser Valley.



Figure 6 – Rail Networks in the Fraser Valley

Interurban Line

General

Within the Study Area, this corridor extends approximately 75 km from Langley City, crossing the Highway 1 corridor where it meets with a major connection turnout that links it to the main CN Yale corridor via the Rowlison Spur. The corridor then continues east from that junction, running through mostly rural agricultural areas, before heading south into the City of Abbotsford.

The corridor continues through the older central part of Abbotsford and continues south parallel to the CPR line (that continues south to beyond the US border). The railway continues south to just short of the Canada/US border where it turns eastwards to continue toward Chilliwack and terminates at the junction with CN's Yale Subdivision through central Chilliwack.

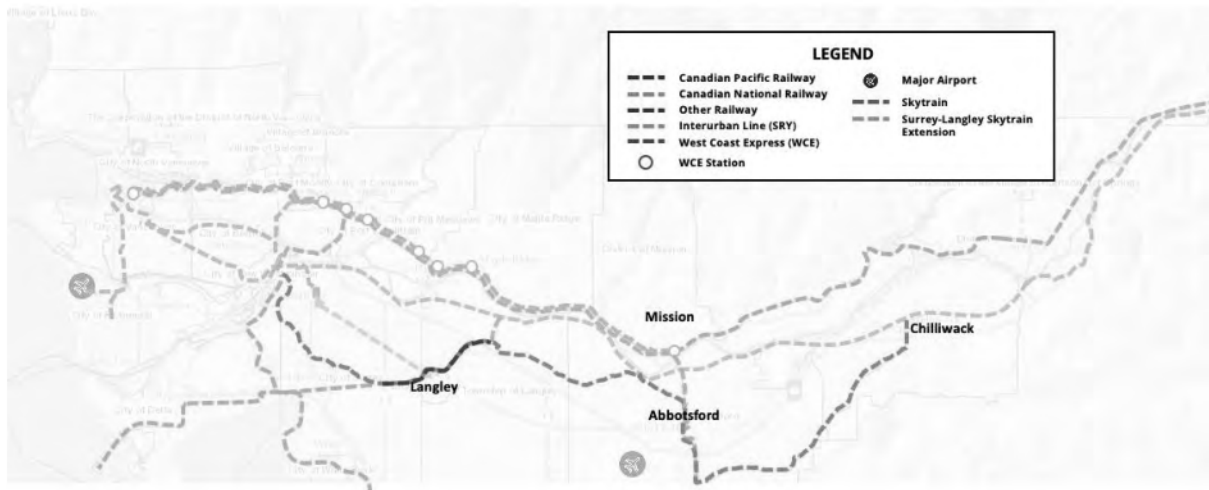


Figure 7 – Interurban Corridor

Within the Study Area, the Interurban line includes two notable subdivisions of the – the Page Subdivision and the Fraser Valley Subdivision. These are both parts of the longer original BC Electric Railway Interurban corridor – originally established by the BC Electric Railway company, a precursor to BC Hydro – which started in New Westminster and terminated in Chilliwack.

The Page Subdivision, which runs through the centre of Langley City, and forms an important part of the Roberts Bank Rail Corridor (RBRC). The RBRC connects the Delta Port Terminal at Roberts Banks to the CN corridor north east of Langley City, providing for freight traffic from the port east into the Fraser Canyon and beyond. As of 2016, there are an average of 18 trains running daily. Past studies have identified varying forecasts for future freight traffic increases with differing horizon years. As part of future work, up to date forecasts of future freight traffic should be secured to confirm projections.



Figure 8 – Page Subdivision along Interurban Corridor

The Fraser Valley Subdivision, which runs from the New Westminster Rail Bridge to Chilliwack, with the exception of the Page Subdivision portion, is currently in use as a low volume freight corridor. As of 2016, the line saw an average of 4 trains daily.¹⁰

Based on a desktop review the corridor is generally in fair condition, with some more recent upgrades completed to crossings and segments, particularly through the Page Subdivision portion (through

¹⁰ Fraser River Trade Area Multi-Modal Transportation Network Planning Study, Technical Memorandum No. 2 Current Condition Assessment, prepared by Parsons for the Gateway Transportation Collaboration Forum (2016)

Langley City). The corridor mainline track is generally lined on either side by BC Hydro Medium Tension hydro lines and poles, which would likely need to be relocated to accommodate double tracking and other improvements, where they are needed.

Ownership & Operating Agreements

In 1988, BC Hydro sold its freight rail division, including freight rights along the entire Interurban corridor through two agreements. For the Page Subdivision, BC Hydro sold the rail infrastructure and freight running rights to CPR. As part of the agreement BC Hydro retained running rights for passenger services. For the Fraser Valley Subdivision, BC Hydro sold the railway infrastructure and freight running rights to the ITEL Rail Corp. (now owned by the Washington Group through the Southern Railway of British Columbia – "SRY"). However, both the ownership of the corridor land and the option to grant rights for passenger rail services using the railway was retained by the crown corporation.

While both agreements allow BC Hydro to retain some passenger running rights, they require operators along the lines to not materially interfere with the operations of each other, and passenger services may be subject to capital and operating cost sharing provisions.

CPR Cascade and Mission Subdivisions

General

While the full extent of this corridor reaches beyond the Study Area, this review examines portions from just east of the Pitt River Bridge, along the CPR Cascadia Subdivision through to Mission, and then across the Fraser River via the Mission Rail Bridge to the south side of the river into Abbotsford. The approximate area of review is shown in Figure 8.

Based on a desktop review, the corridor appears generally in good condition, and has received regular upgrades to some crossings and segments to maintain a good state of repair and address rail-road conflicts.



Figure 9 – CPR Cascade and Mission Subdivisions

Ownership & Operating Agreements

The Cascade subdivision is owned by Canadian Pacific Railway. Securing access to the railway for a new or expanded passenger service would require an agreement with CPR. Currently, the West Coast Express operates under such an agreement.

West Coast Express Operating Agreement (CPR Corridor)

The West Coast Express operates along the CPR's Cascade Subdivision corridor from Mission to downtown Vancouver. Operating rights for the service along the corridor were secured from CPR through a 20 year agreement as part of the initial service development in 1995. It is worth noting that

as part of the development of the West Coast Express service, approximately \$62 million was allocated to CPR for infrastructure upgrades, to support the shared freight/passenger operations along the corridor. The agreement with CPR allows for WCE to operate a scheduled service along the corridor, but it is limited to an approximately 2 hour window during the AM and PM rush hour periods. The agreement was extended in 2015.

Analysis

A number of improvements may need to be considered to support passenger service along the surveyed rail corridors and further study would be required to confirm the extent of these improvements.

Corridor Improvements

Through a preliminary review, the general conditions of the corridors have been analysed, and a number of potential areas requiring improvements to support a regular passenger service have been noted. As part of any potential future work, an assessment of the corridors should be undertaken to confirm age of rail, turnouts, ballast and ties to determine operability as a corridor for daily passenger rail service, as only some of the corridor is being used regularly by freight trains (for example the Page subdivision which links the CN mainline to Roberts Bank Terminal). The assessment may reveal the need to bring the corridors to a higher level of readiness to enable passenger operation (rail ties replacement, track levelling, rail grinding are possible examples of maintenance and upgrades required). Other improvements that may be required to support a regular passenger service include, without limitation:

- **Double Tracking:** Some key sections of the corridors, particularly sections of the Page Subdivision, may require double tracking to allow for passenger train manoeuvrability, and to support minimization of impacts to freight traffic. Depending on the passenger service schedule, double tracking may also be needed at a designated crossing point(s), which would generally be located at railway station stops, and therefore these locations might require a set of turnouts and double tracks with minimum width platforms. Typically, 10 to 15 metres of clearway within a ROW is needed to accommodate double tracking, with some variation depending on speed and track curvature. In narrower sections of the corridor, this will likely require relocation of overhead hydro poles and shifting of existing track to create space for the second track. When adding station platforms to double tracked areas, these platforms would typically be between 3m and 4 metres in width which would add to the required clearway width (16 to 23 metres).
- **Sidings:** The addition of sidings to allow for passing manoeuvres may be warranted. Development of a service plan will be required to ascertain whether existing sidings are sufficient, or if additional are required. Some of these passing tracks may be more conveniently located at station stops where other amenities like platforms and shelters would also be provided.
- **Road Crossings:** Rail safety is governed by the Canadian Federal Government under the Railway Safety Act (1985) and Grade Crossing Regulations (2014)¹¹. When adding regularly scheduled passenger rail services to any rail corridor, the need for a higher level of safety at crossings is warranted and standard practice to support the increased frequency of rail traffic. Along the Interurban line, there are approximately 79 at-grade crossings, and with over 40 of these crossings being unsignalized. A review of these may be required as part of any future work to determine if they meet current safety standards for the intended use, and if signals are warranted relative to the type of passenger rail service that is planned. This will be particularly important for at-grade road-based crossings both public and private. Other crossing alternatives for pedestrian only crossings could also be considered (overhead walkway for example).

¹¹ Railways operating exclusively within one Province are governed under the respective Provincial Railway Safety Act and other regulations, however these are largely harmonized with the federal equivalents.



Figure 10 - Double tracked area of the Interurban corridor through Chilliwack

Mission Rail Bridge

The freight rail crossing traffic at the Mission Rail Bridge is significant today (average of 31 crossings per day in 2016) and is expected to increase to over 50 crossings per day by 2030. The crossing time for each of these trains will also need to be considered given the physical length of the trains and the average speed at which they are crossing.

Since 2000, the Mission Rail Bridge has been part of a Directional Running Zone used by CPR and CN as a means of optimizing their respective tracks running out into the Fraser River Canyon. All westbound trains use CN's corridor along the south side of the Fraser River, while Eastbound trains use CPR's corridor north of the River. Depending on their destination and origin, trains will switch over at the Mission Rail Bridge before continuing onward.

Given the anticipated future increase in bridge traffic, and third-party railway ownership (CPR), it is recommended as part of any future assessment that the anticipated future crossing traffic is confirmed, and the capacity of the bridge is modelled to understand required spacing between trains, signalling, direction, maximum train lengths, and other factors with the inclusion of the proposed scheduled passenger service. This would be necessary to identify the required infrastructure adjustments and improvements to support the rail service. In recognition that in addition to infrastructure, access to the bridge (and corridor) for passenger service, and any potential agreements to support this, would require further analysis and engagement with CPR.

Rail Corridors Recommended Next Steps

As part of further feasibility work, the following potential next steps are recommended to advance analysis of the required infrastructure improvements along the corridors:

- **Railway Assessment:** A detailed technical assessment of the corridor in terms of age of rail, turnouts, ballast and ties is recommended to determine operability as a corridor for daily passenger rail service
- **Electrification Options Analysis:** Depending on whether electrification is considered, further assessment as to how this can be achieved, including issues such as hydro pole relocation and integration of overhead catenary systems.
- **Crossing Analysis:** As part of development of a service plan for potential passenger service, a review and assessment of the signalized and unsignalized at-grade crossings along the Interurban part of the corridor is required to identify potential crossing enhancements required.
- **Mission Bridge Assessment:** To determine whether the insertion of scheduled passenger service across the Mission Bridge is feasible it is recommended that a review of the current freight crossing assumptions and model be reviewed. This should also include a review of the capacity of the rail/rail crossing south of the Mission Bridge at the CN Mainline corridor.

Land Use & Development Context

The alignment of transportation infrastructure with land use can support investments by fostering growth and development patterns that facilitate and encourage higher transit usage. The following provides a summary of long-term land use planning within the study area. A key objective is to understand how communities along the subject rail corridors are envisioned to evolve over the coming years, and how the potential utilization of rail corridors in these communities for passenger service has the potential to support existing plans and the intended future growth of the region. The following provides a summary of the Planning and Development Context Analysis (found in Appendix B). Please refer to the appendix for additional details and analysis.

Context

Historically defined by its agricultural identity, with comparatively limited growth pressure, auto-centric transportation systems, and the availability of low-cost land has informed patterns of development in the Valley generally characterized by low densities and separation of uses. In addition, the presence of considerable high quality, valued farmland has resulted in the designation of large areas as part of the Agricultural Land Reserve (ALR), the provincially administered zone which prioritizes farm uses and limits other land uses, such as residential, to preserve their function for agricultural purposes over the long term.

As development has expanded, new growth has been directed to existing urban areas, generally defined as the major urban communities of the Valley, which are demarcated by the Urban Growth Boundary (UGB) – the area outside of the ALR where a higher degree of development is permitted. Outside of the UGB only small, relatively isolated pockets of developable land exist, often with limited or constrained servicing and other infrastructure, making them inefficient options to accommodate any significant new development, and costly to support with municipal services and facilities.

Over the long term, the geographical constraints imposed by the ALR are expected to limit the ability of development to continue to expand outward, and place increasing pressure on existing urban land to accommodate growth through intensification and infill.

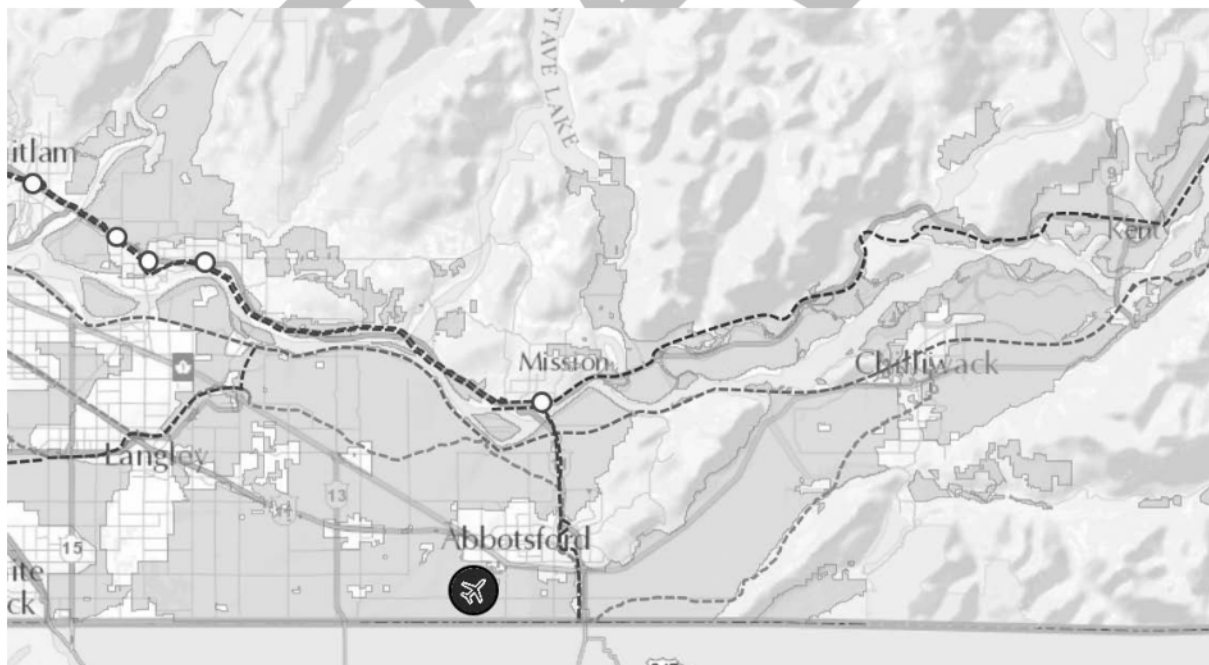


Figure 11 - Agricultural Land Reserve in the Fraser Valley (heavier green shading). Dashed lines show existing rail corridors.

Fraser Valley Regional District – Regional Growth Strategy

At a regional level, the Fraser Valley Regional District provides long term growth and land use planning direction through their Regional Growth Strategy (RGS). It aims to provide the vision and guidelines for growth over the coming decades, address challenges inherent to the region, and support its sustainable future.

Informed by the agricultural character of the Valley, and large ALR lands across the region, the RGS envisions growth to occur within the Urban Growth Boundaries which delineate areas for urban development outside of prime agricultural land. RGS policies encourage development of more compact, higher density development around downtown cores, and achievement of complete communities – places where residents' daily needs can be met within a short travel distance. The RGS also encourages commercial and industrial development that is clustered, with the stated objective to foster collaboration. Together, these directions seek to encourage greater Transit-Oriented Development in key areas which allows for enhanced transit connectivity regionally and inter-regionally.

Municipal Development Context

At a municipal level, long term development and growth planning is guided by local Official Community Plans (OCP) that provide growth strategies and policies, including direction on urban structure, prescribed land uses, and transportation with the goal of shaping long term growth and planning.

OCP's are periodically updated to reflect new emerging or shifting priorities, such as higher than anticipated growth in an area, introduction of major new infrastructure (e.g. rapid transit), or new/revised regulation, policies and laws. As such, the OCP's provide direction for the planned development and growth of a municipality.

The Study Area straddles two regional districts – Fraser Valley Regional District and Metro Vancouver Regional District. The directions of the OCPs for Abbotsford, Mission and Chilliwack are informed by the Fraser Valley Regional District's Regional Growth Strategy, which provides a regional level strategy and policy direction to manage growth and change across the Valley over the coming decades. As a member of Metro Vancouver, the OCPs for the Langleys are informed by the growth directions and strategies in Metro Vancouver's Regional Growth strategy (Our Future – Metro Vancouver 2040)¹².

Official Community Plans

In review of the respective OCP's of the study area municipalities, a number of consistent themes and objectives are worth noting. These include:

- Encouraging compact growth & intensification within existing Urban Growth Boundaries
- Limiting sprawl and decentralized growth pockets - e.g. isolated sub-divisions, limiting growth of Hamlets with poor transit/transportation connections and services.
- Creation of mixed-use centres
- Supporting planning for Transit Oriented Development
- Increasing the diversity of available housing types with more multi-family options
- Supporting affordability

It is important to note that in addition to these shared commonalities, the long-term vision for planning and growth contained within each municipality's OCP is responding to the unique sense of place and distinct needs of each, and the exact forms, timing and location of development is reflecting consideration for the attributes and features that define each community's character.

¹² As of the time of this report, Metro Vancouver is in the process of updating their regional growth strategy ("Metro 2050"), anticipated to be complete in 2022.

Rail – Urban Context Interface

In review of the subject rail corridors' (Interurban and relevant CPR portions) alignment with local land use strategies, they are generally geographically well situated. These lines generally run through urban centres, and directly through or in close proximity (e.g. within 15 min walk or less¹³) of areas identified in the municipalities' respective OCPs as targeted places for growth and intensification over the time horizons of the plans, and with land uses designations permitting potential development supportive of transit services. Outside of the Urban Growth Boundaries, corridors generally run through rural areas which are predominantly designated as ALR. As noted above, the ALR designation significantly restricts permitted development, providing limited long-term potential for intensification outside of major community nodes. Consideration of development aligned with these corridors - and potential stops - outside of the urban centres will require careful consideration and planning so as to protect environmental and agricultural assets, and support efficient and practical use of municipal infrastructure, such as water and sewers.

¹³ A 15 min walk shed is generally recognized in active transportation planning as a guideline for the maximum distance people are willing to walk to access a destination before considering alternative travel modes (e.g. car, transit, bike).

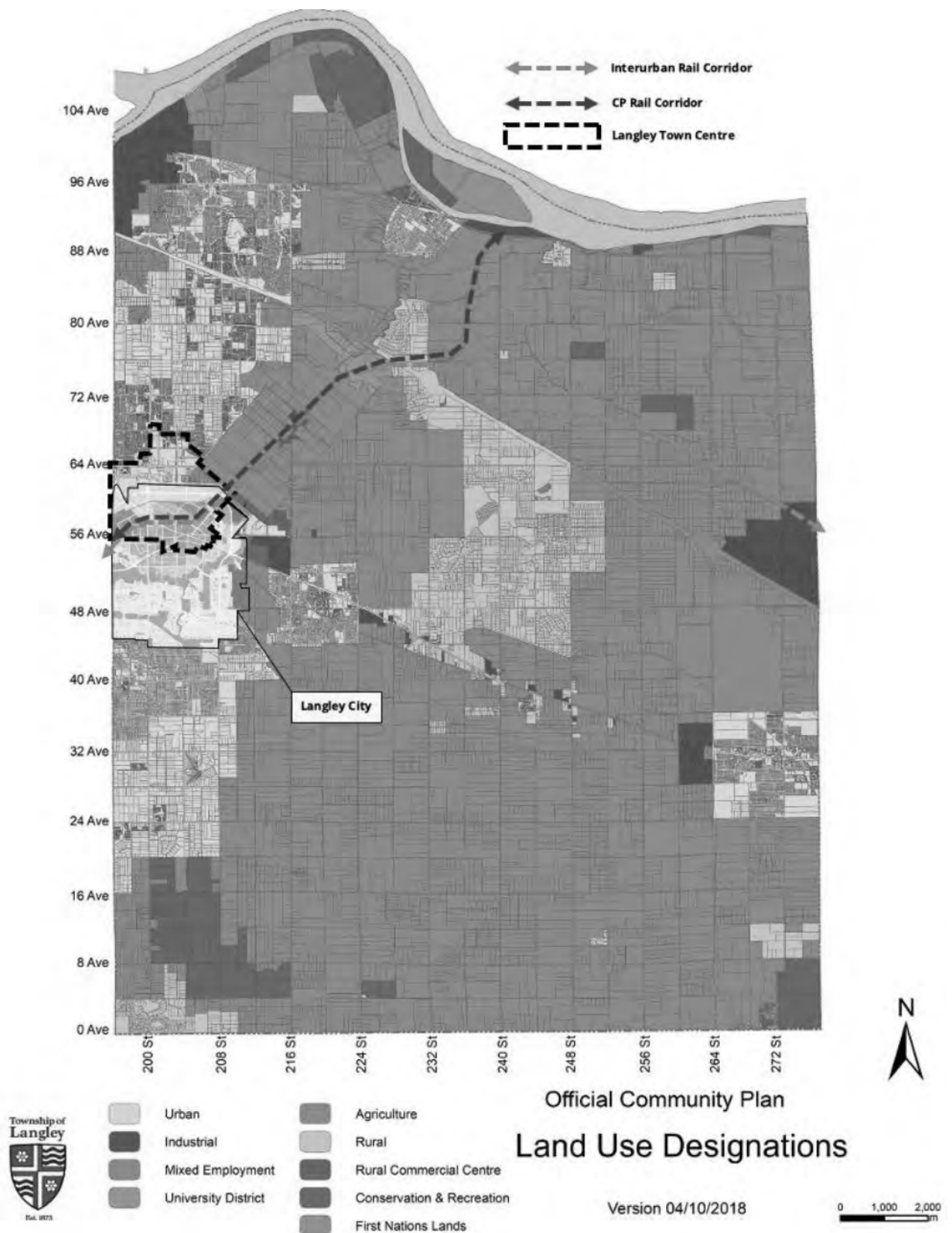


Figure 12 - Township of Langley OCP Land Use Designations and relationship to the Interurban corridor.

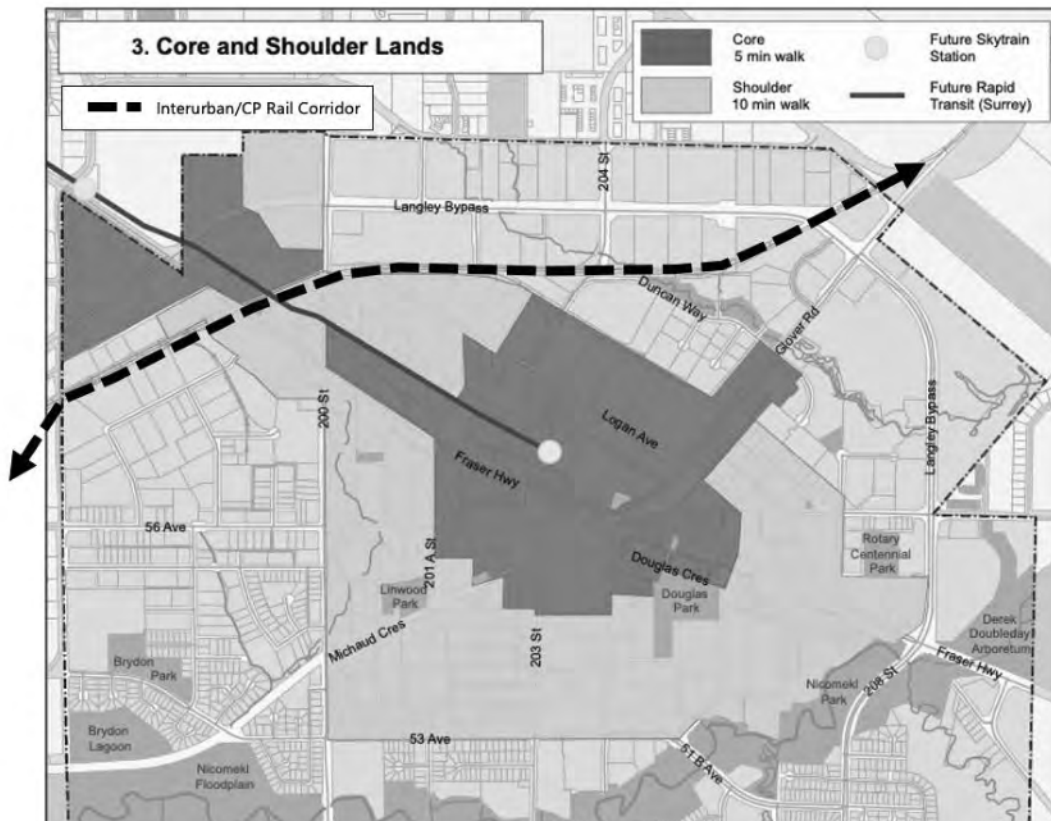


Figure 13 - Langley City Core Area and Proposed SLS route (Langley City Official Community Plan)

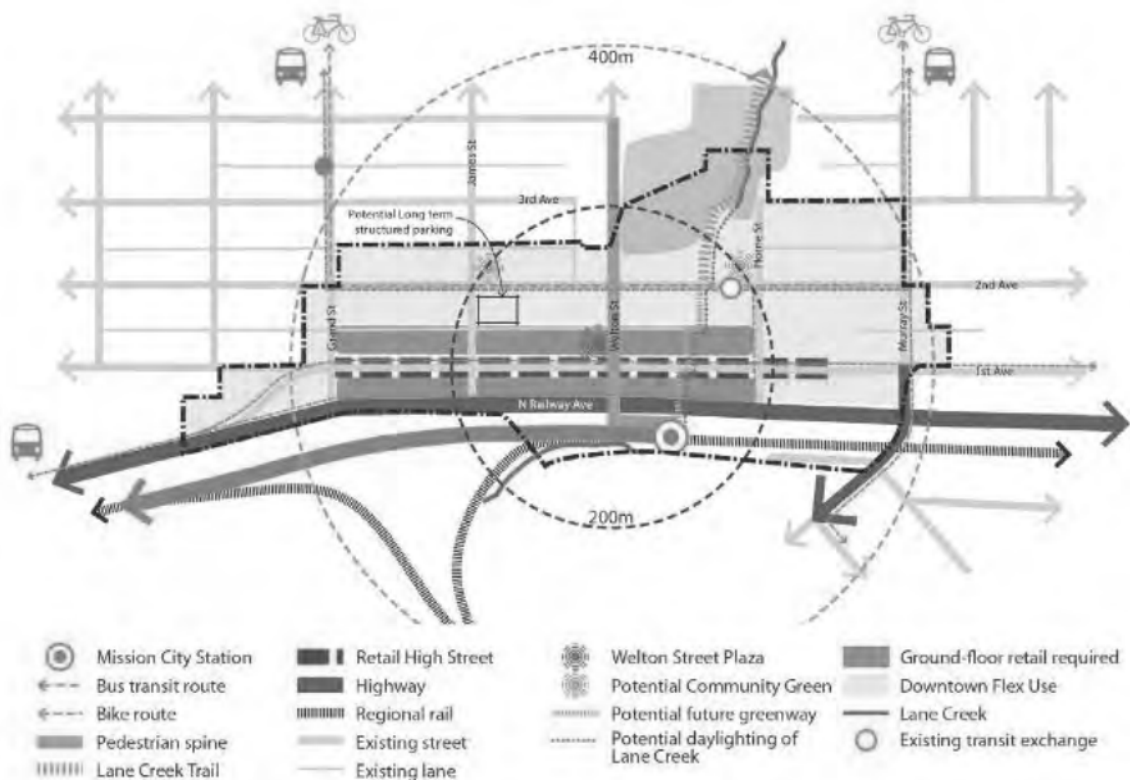


Figure 14 - Mission Downtown Plan (from District of Mission OCP) identifying areas envisioned to accommodate increased residential and employment densities. Current West Coast Express station and regional rail (currently freight only) connections noted.

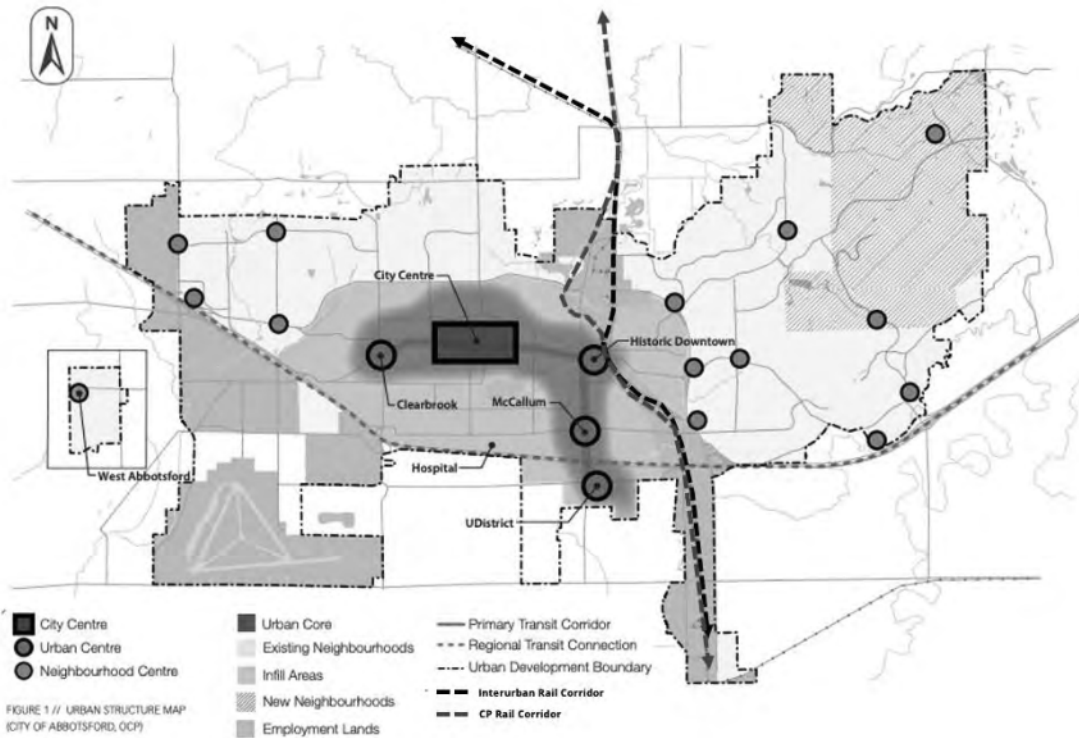


Figure 15 - Abbotsford Urban Structure (City of Abbotsford OCP) and relationship to the CP and Interurban corridor. Urban Centres and the Urban Core are areas designated to absorb a significant share of the City's growth over the coming decades.

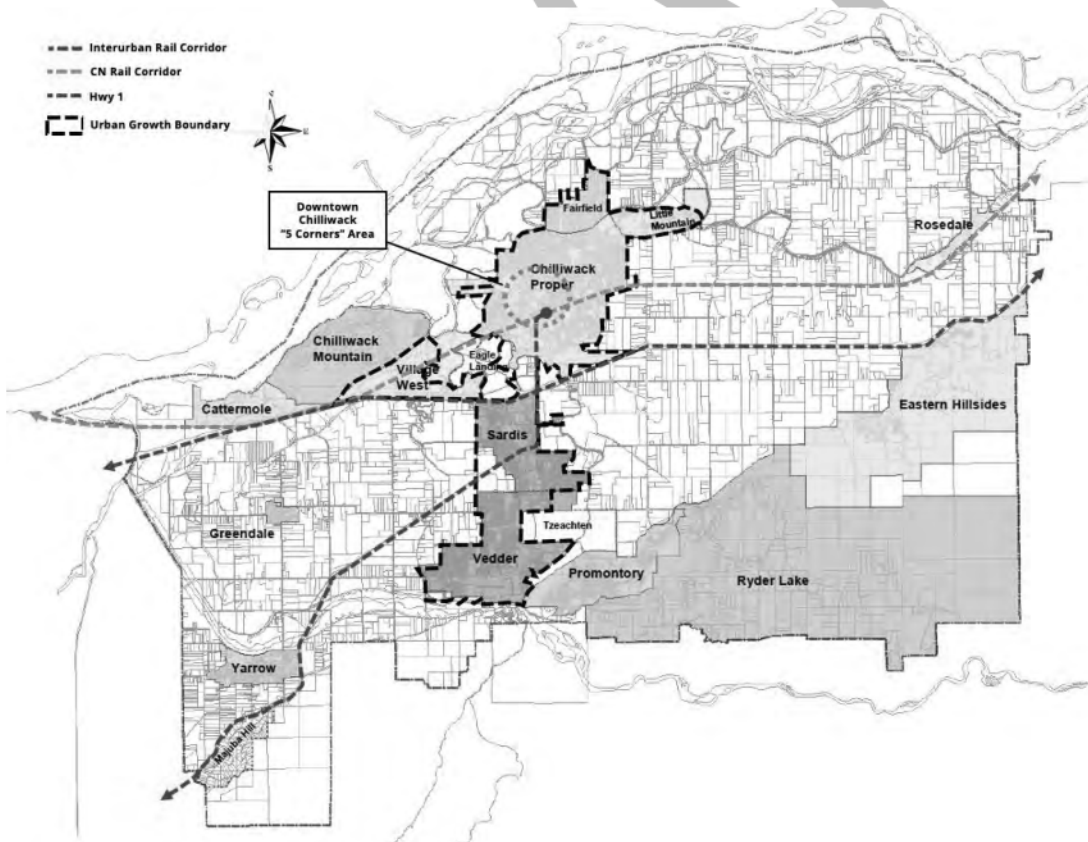


Figure 16 - Chilliwack Urban Structure (City of Chilliwack OCP). Coloured areas indicate neighbourhoods outside of the ALR. Of note is the Urban Growth Boundary surrounding Chilliwack Proper, Village West, Sardis, and Vedder – areas intended to accommodate growth

Analysis

Overall, land use and development patterns across the Study Area reveal a general pattern of increasingly dense urban nodes, which are anticipated to grow more compact over time and evolve as more transit supportive communities but will remain separated by large areas of farmland.

The Fraser Valley Regional Growth Strategy, and as implemented through local Official Community Plans, seeks to encourage a growth strategy over the long term that emphasizes more compact and sustainable patterns of development within major urban centres, with the goals of supporting the achievement of a diversity of housing options, employment opportunities, amenities, services, and facilities to meet the needs of residents, and realize densities making efficient use of infrastructure, including public transportation networks.¹⁴

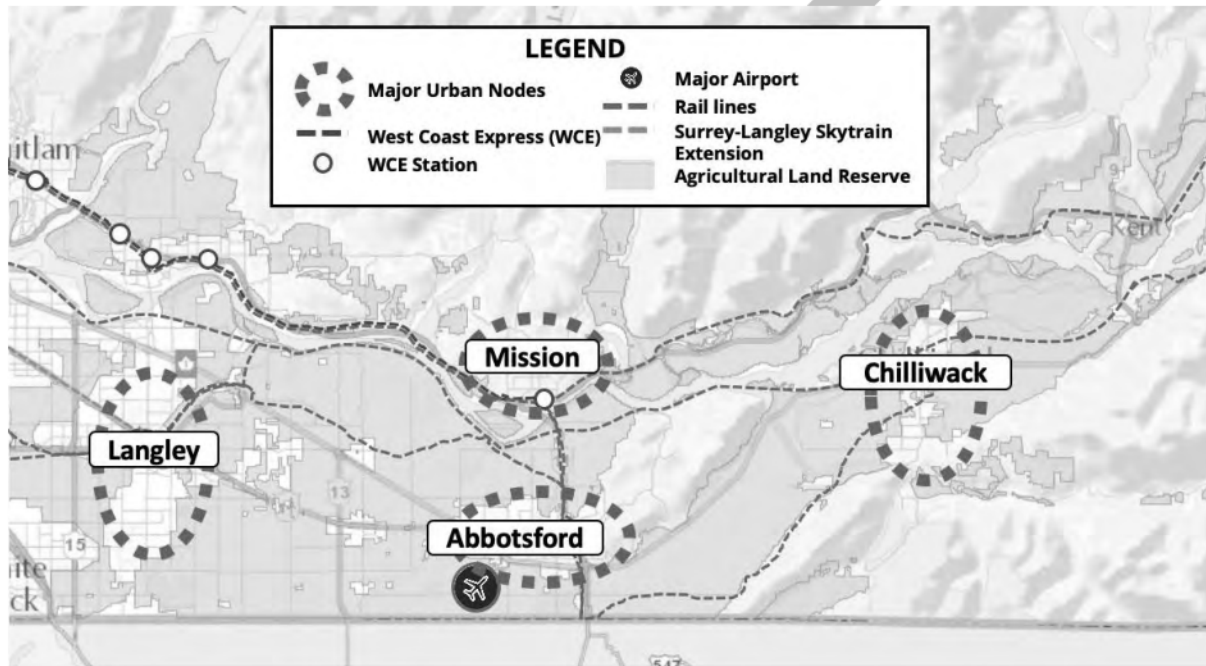


Figure 17 - Major urban nodes in the Fraser Valley and Agricultural Land Reserve boundaries

In summary, the following are key considerations with respect to the planning and development context in the Fraser Valley:

- Overall, the rail corridors generally link the major urban centres of the Valley, which have also been designated in planning documents as key areas to accommodate future growth over coming decades – through infill and intensification with denser, more transit supportive mixed-use and multi-family housing.
- Areas of close alignment between the rail corridors and long-term development planning may provide the strongest options for stop areas with larger planned population catchment areas (e.g. areas planned for transit supportive development).
- Outside of major urban centres, the corridors generally pass through protected farmland (ALR) with little potential for greater density. Utilizing existing infrastructure and encouraging more compact infill within Urban Growth Boundaries can spur greater transit supportive development, make efficient use of land and infrastructure, and support transit investments.
- With the notable exception of Langley City, current planning has limited consideration for the potential of higher order regional rapid transit. The introduction of passenger rail may provide the opportunity for municipalities to explore ways to develop enhanced transit supportive land

¹⁴ As of the time of this report, the Fraser Valley Regional District is in the process of updating their Regional Growth Strategy.

use policies to leverage transit investments and accommodate a greater degree of growth through more sustainable development patterns, particularly around station catchment areas.

- Success of land use integration and multi-modal linkages between potential stop areas and surrounding urban context will require close engagement and further study to identify optimal locations and supporting infrastructure.

The analysis of land use and development patterns across the Study Area highlights the unique nature of the region – increasingly populated urban centres separated by protected agricultural land. As the regions continue to grow according to their community plans, it will be increasingly important to consider and help shape this growth in a way that provides regional connectivity, multi-modality, sustainability, affordability and economic development.

Transit and Transportation Integration

Across the Study Area there are a number of established transit networks. Integrated connectivity between rail and these services can potentially support and leverage existing investments, and can improve ridership, multi-modal connectivity, and contribute to transportation and development goals for the communities it serves. In addition, there are key interface opportunities along the study area corridors with existing and planned fixed rail transit services - the West Coast Express terminus at Mission City Station, and the Surrey-Langley SkyTrain extension, with a planned terminus and stations in the core of Langley. The following provides a review of current and planned transit networks and fixed transit services, with an assessment of their alignment and integration with the Fraser Valley rail network. A key objective is to understand how a rail service could intersect with existing and planned transit services. For further details and analysis, please refer to the Transit Integration Analysis (Appendix C).

Service Jurisdictions

The study area is currently served by two transit providers – TransLink and BC Transit, with jurisdictions mirroring the Metro Vancouver Regional District and the Fraser Valley Regional District respectively. However, there are a number of points of cross jurisdictional connections worth noting, including Translink's West Coast Express (WCE) which provides service to Mission, and bus services via BC Transit's Fraser Valley Express ("FVX").

Transit Networks

Regional Transit Services: Fraser Valley Express (FVX)

Beginning operations in 2015, BC Transit's Route 66 Fraser Valley Express (FVX) was introduced to the Fraser Valley providing a regional, limited-stop transit service connecting Chilliwack, Abbotsford and Langley. Since commencement, the service has seen steadily increasing annual ridership, growing from 72,146 (2015/16) to 253,473 (2019/20), and is anticipated to increase further with a planned expansion to the Lougheed SkyTrain station, demonstrating a growing level of demand for cross regional transit options.

Despite growing ridership, key issues with the FVX have included on-time performance and reliability, as the FVX runs along Hwy 1, and increasing congestion and accidents lead to delays and cancelled trips, and reduced reliability, negatively impacting experience and constraining the potential for additional ridership. Current work to widen Hwy 1 is considering options to integrate transit priority measures to allow for faster and more reliable travel times.

Municipal Transit Services

Local transit services provided by TransLink (Langleys) and BC Transit (Mission, Abbotsford, and Chilliwack) include a range of bus routes generally serving local areas. In addition to the FVX, there are a limited number of other non-express inter-regional and inter-municipal transit links.

In the City of Langley and Township of Langley, Translink currently operates local bus routes that connect communities between the City and the Township, and inter-municipal routes that provide service between Langley and other municipalities in Metro Vancouver. Connections to the Fraser Valley Express are provided at the Carvolth exchange, located adjacent to Hwy 1 in the Township.

For Abbotsford, Mission and Chilliwack, BC Transit operates local services. Inter-municipal routes connect Abbotsford and Mission, while the FVX provides connections between Abbotsford and Chilliwack. For inter-regional trips, Translink also provides service from Maple Ridge to Mission via their 701 route, and non-express routes between Abbotsford and Langley require a transfer between service providers in Aldergrove.

In review of the existing and planned municipal transit networks, those within the study area are generally well aligned in relationship to the rail corridors, particularly within the urban centres of the major communities, with all providing connectivity to major transit exchanges and downtown areas within a 5-10 minute or less walking distance. These existing networks are also typically aligned with municipal land use plans, supporting the evolution of central areas into compact, walkable neighbourhoods with proximal access to transit services. Taken together, there is the opportunity for mutually supportive elements to further municipal goals of improved transit ridership, fostering transit

oriented development, and less reliance on automotive travel by providing regular, reliable, connected multi-modal services with destinations aligned with long term growth strategies.

It should be noted that the analysis for this Study has examined transit integration based on existing services, routes, and exchange locations. As part of any future work, a detailed analysis of the integration with existing and planned transit networks may be required, which may include analysis of routes, ridership, and connections to stations including boarding and alighting facilities.

Fixed Services Integration

SkyTrain Integration

The Expo Line SkyTrain extension, also known as the Surrey Langley SkyTrain, from King George Station (Surrey) to 203rd street in the City of Langley via the Fraser Highway will provide a rapid transit connection from Langley to Surrey and beyond. At the time of this report, preliminary design work is in progress, and the alignment and station locations have not been finalized, however it is expected that two stations will service Langley, one in the vicinity of Fraser Hwy and 196th St., and a terminus station at Fraser Hwy and 203 St.

As shown in Figure 16, the rail corridor intersects with the proposed Surrey Langley SkyTrain guideway slightly to the north east of Fraser Highway. Both the 196th St. and 203rd St. proposed SkyTrain stations are situated within approximately 600 metres of the rail corridor, equivalent to a 5-10 minute walk.

The physical proximity of the two corridors provides a potential opportunity for close integration and connection between the two services. Potential options to support integration between the Skytrain and FV rail service could include, without limitation:

- Establishing a stop platform within the rail corridor ROW, aligned with the SLS.
- The introduction of a spur line branching off the corridor to bring the FV Rail Service terminal closer to one to the other proposed Skytrain station (depending on the FV Rail technology, there is an ability to provide this type of connection potentially within an existing road right-of-way corridor, or via some of the adjoining lands in this area). This would provide the benefit of reducing distance between service connection points and the transfer penalty, providing a more attractive option for passengers making multimodal trips using both services.
- Use of existing industrial spurs in combination with new spur line.

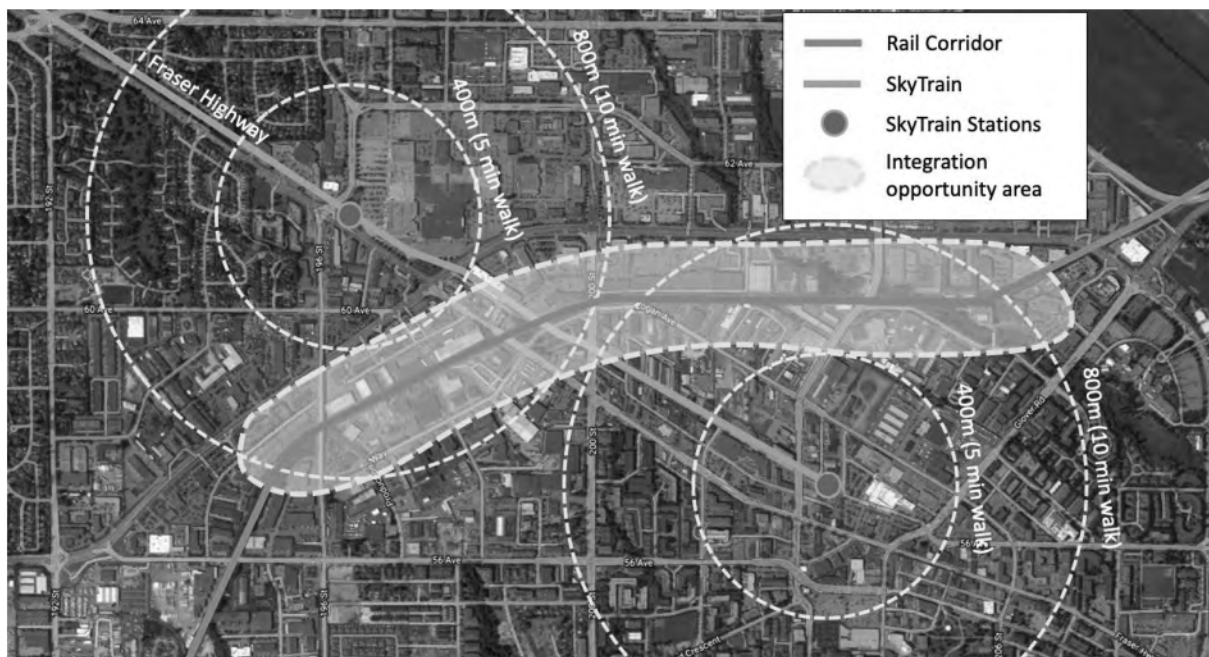


Figure 18 - Rail-SkyTrain integration in Langley City

West Coast Express Integration & Service Enhancement Options

Running along the CPR rail corridor, the West Coast Express terminates in downtown Mission at Mission City Station. The stop location is to the east of the Mission Rail Bridge, which provides rail connections over the Fraser River, linking to Abbotsford. The use of the bridge would be required to secure a rail connection between the West Coast Express and Abbotsford, via an extension of the commuter service or through connection with a new service. Integration opportunities may include the following:

- **New Abbotsford-Mission link** – A new service distinct from the WCE could offer rail connections from Abbotsford up to Mission, crossing the Mission Rail Bridge, with a stop location in the approximate area of Mission City Station. Passengers would be able to connect to WCE and local transit services via the existing pedestrian rail bridge, as well as have access to the existing WCE park and ride lot.
- **West Coast Express extension** – A number of studies have considered options to extend the WCE across the Fraser River into Abbotsford, including TransLink's West Coast Express Strategy ("the Strategy") (2012). To date, TransLink has not advanced this beyond the conceptual consideration provided in the Strategy. This option would require either relocating the Mission City Station to west of the Mission Rail Bridge, or reverse movements from the existing station to the bridge. Relocation of the station would involve considerable re-working of the station infrastructure, add distance between connections with local bus services, and result in potential impacts to current land use planning, which seeks to support intensification and development aligned around the location of the current station in the City's downtown core.
- **Other:** Other WCE options considered in the Strategy included additional stop locations, introduction of reverse peak, or off-peak service, which could support better local connectivity in addition to commuter links to downtown Vancouver. This includes consideration for additional stations in emerging Mission communities such as Silverdale, anticipated to be home to thousands of new residents over the coming decades.

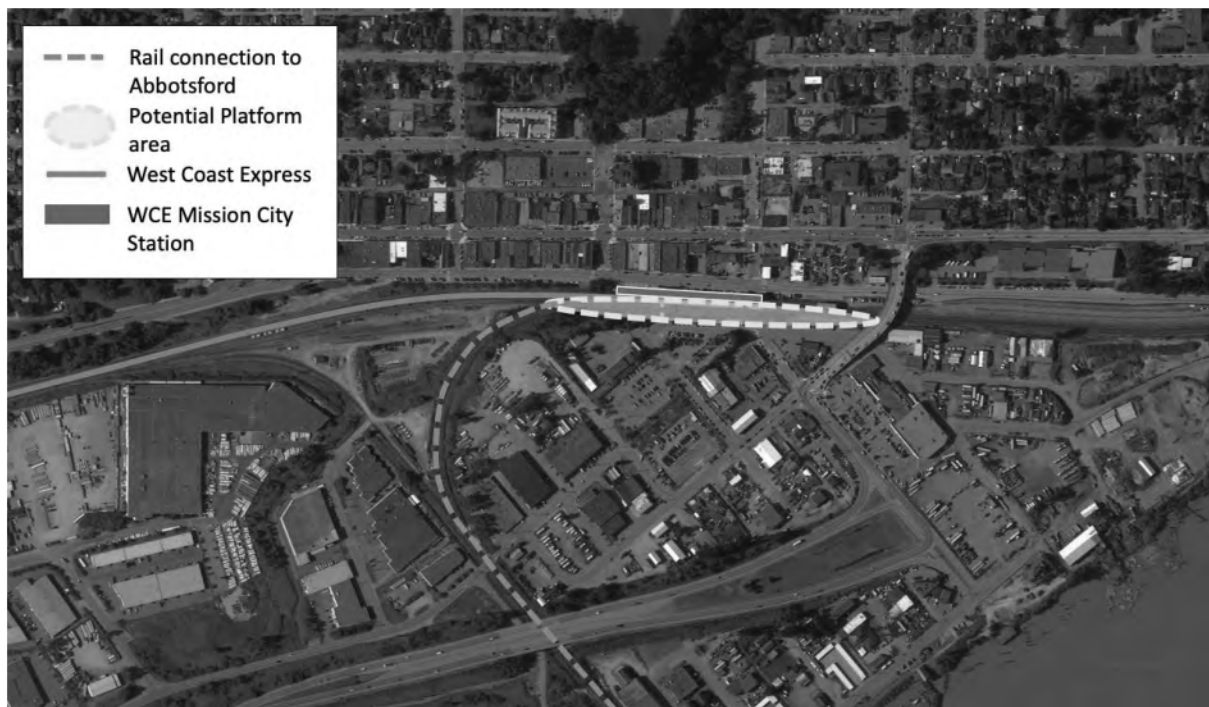


Figure 19 - Potential Regional Rail-WCE integration

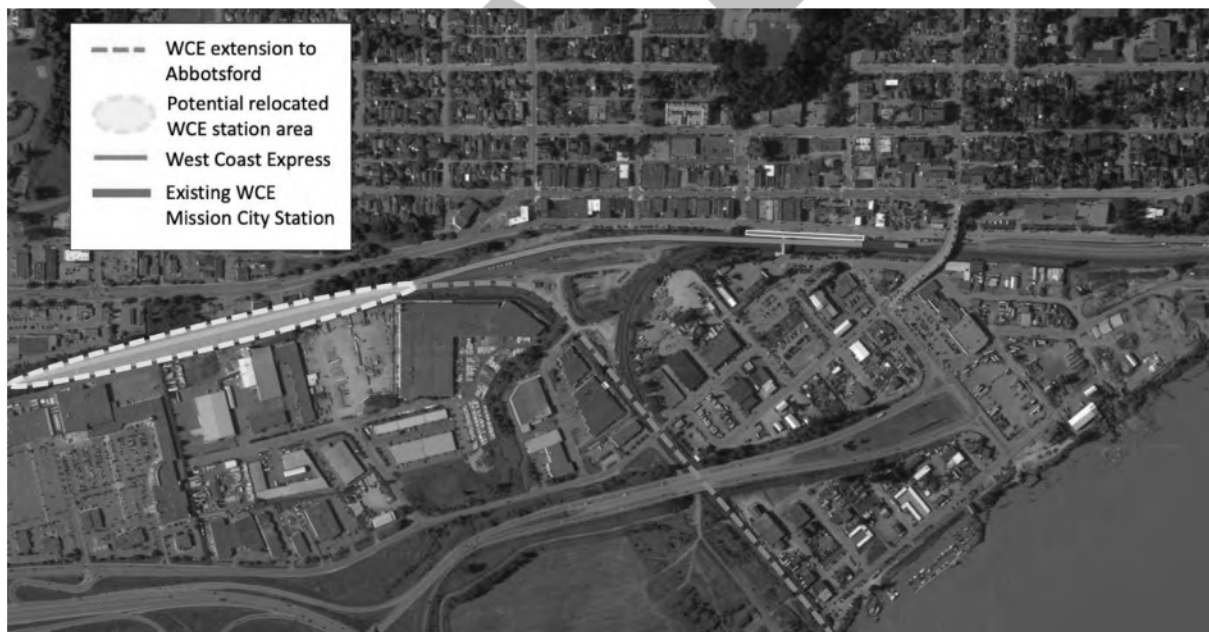


Figure 20 - Potential WCE Extension - Relocated Mission City Station

Analysis

In review, the region's key communities are currently being serviced by both regional and local transit networks generally oriented around the City's urban structure and connecting destinations. Over time, it is expected that these local services will improve with added routes and increased service hours. With the ability to shift routes overtime, bus services are anticipated to evolve in response to new rapid transit services and can be re-routed to provide multi-modal links and support ridership, as has been seen with the planned changes to Langley's network in response to the pending implementation of the SLS. With respect to existing fixed route systems in the study area, the subject rail corridors offer strong potential for close alignment and integration, and future work should include sensitivity analysis of stop locations along the corridors to optimize intermodal connectivity, engagement with transit service providers to support integrated service planning, and preliminary engineering and design analysis to understand infrastructure options to support close multi-modal connectivity.

Transit Integration – Recommended Next Steps

Any future assessment of transit integration should include:

- **Options Sensitivity Analysis** – Cost-benefit review of connection options and variability, transfer optimization.
- **Design Analysis** – Preliminary engineering and design feasibility review of stop locations and interface with urban context, technology used, rail corridor, and connecting transit services.
- **Engagement** with TransLink, BC Transit, railways and other key stakeholders to advance rail integration opportunities with existing and planned transit services.
- **Collaborative review** with service providers and municipal partners to identify possible new routes, optimization, and consideration of exchange locations to enhance intermodal connectivity.

Service Concepts

Based on review and analysis of the study area corridors, a number of service concepts have been developed. The concepts provide a number of options utilizing the subject rail corridors to establish a regional rail system. The routing, connectivity, and general stop areas for each concept is identified below. Also provided are estimated length and travel times for each segment, and end-to-end travel times and route length. An evaluation matrix has been provided identifying the potential strengths and weaknesses of each option, along with an overall assessment.

Major Destinations

The subject corridors provide connections to the below noted major destinations. These form the key population and job centres in the Valley and connection points with local transit and other regional services.

Langley City

With a western terminus in central Langley City, a regional rail service could provide a connection (within a 5-minute walk) to the Surrey-Langley SkyTrain extension, establishing transit links to Surrey and the rest of Metro Vancouver. Establishing a terminus in the core of Langley City would support the anticipated growth and development brought on by new access to rapid transit in the area. By offering a connecting transit link for users originating from, or destined to, the east, regional rail could bolster the business case for both systems by capturing additional transit riders.

Abbotsford

In Abbotsford, the Interurban corridor and the CPR corridor connecting to Mission come together in the City's Historic Downtown neighbourhood. This is an area identified as part of the urban core of the City and is envisioned to receive intensification and redevelopment over the coming years. A stop in this area would provide close connections to local transit oriented around service along the South Fraser Way corridor and out to surrounding neighbourhoods, while supporting growth in the area.

Mission

To connect Mission with other communities in the Valley, rail links could be extended across the Fraser River into Abbotsford, either as part of an extended WCE, or as part of a regional rail service. The link would make use of the CPR corridor and could arrive over the Mission Rail Bridge in close proximity to the West Coast Express Mission City Station. Together with the corridor segment between Langley and Abbotsford, a link across the Fraser River would close a "loop" with the WCE and SkyTrain, providing rail transit options to connect the north and south sides of the Fraser River. This link could offer service between Mission and Abbotsford, supporting localized regional travel, and/or bringing riders to the WCE.

Chilliwack

With downtown Chilliwack as the eastern terminus of the Interurban corridor, a service following this corridor would end in close proximity to the City's downtown core - an area planned for significant development and absorption of future growth under the City's Official Community Plan.

Other Stops

One of the benefits offered by the regional rail concept is the flexibility and relative ease to add additional stops in response to demand and changing needs. With trains running at-grade and shorter stop platforms, stops require significantly less infrastructure and space compared to heavy rail or rapid transit.

A number of potential additional stop areas outside of urban centres have been identified as part of the concepts, providing opportunities to capture additional ridership and support population hubs, employment areas and other destinations along the routes. These may include Trinity Western University, the Gloucester business park area (Hwy 1 and 264th St.), Huntingdon (industrial area in south Abbotsford), and Sardis (southern part of central Chilliwack). However, it should be noted that outside of the major destinations, there may be constraints on future development, due to ALR land use restrictions, limited municipal servicing, and growth policies discouraging higher intensities of

development outside of urban centres. Stops in these areas require careful consideration and planning, and engagement with local communities to understand the long-term vision for these places.

Service Parameters

The following provides assumed parameters for operational conditions of the concepts.

Speed

- The average speed range for the concepts is assumed to be between 50 to 65 km/hr (inclusive of acceleration/deceleration)¹⁵. This is derived from comparable speeds achieved by other similar services.

Distance between Major Destinations

- Langley City – Abbotsford: Approximately 36 km
- Langley City – Mission: Approximately 46.5 km
- Mission – Abbotsford: Approximately 10.5 km
- Abbotsford – Chilliwack: Approximately 39km

Approximate travel times

- Langley City – Abbotsford: Range 30 to 40 minutes
- Langley City – Mission: Range 40 to 45 minutes
- Mission – Abbotsford: approximately 10 minutes
- Abbotsford – Chilliwack: Range 30 to 35 minutes

Assumed Frequency

- Peak period – 30 mins
- Peak reverse – 30 mins
- Off-peak (+ reverse) – 1 hour

Capital Costs (Indicative)

- High level, indicative capital costs for rail infrastructure, stations, and corridor updates are \$15M to \$22M per kilometre, based on other similar projects with similar initial corridor conditions and stations.

Potential corridor upgrades

To support a service along the subject corridors under the assumed service parameters, the concepts assume a number of upgrades to the rail infrastructure may be required, including:

- Double tracking along Page subdivision between Langley City and Highway 1
- Additional track/siding at station locations
- Signalling upgrades
- Addition of level crossing audible and light warning at locations where warranted for safety
- Station platforms and standard amenities (shelters, power, security/safety systems)
- Operations and Maintenance Facility

¹⁵ These speeds are indicative based on similar systems. The actual average speed will need be adjusted to include any existing speed restrictions along some of the segments of the corridor, and account for stop times.

Technology

While determining appropriate train solutions will require additional study, consideration of possible technological options can help to inform concept feasibility. Aside from the option to extend the current WCE service, the concepts envision utilizing a multiple unit train system, which can offer a number of benefits over alternatives such as heavy rail driven by locomotives. Multiple unit systems consist of individually powered, self-propelling cars that can be coupled together to form train sets. Some of the characteristics of these systems include:

- Train options that can meet safety standards to operate on shared freight/passenger track
- Lower cost (capital + operating) compared to heavy rail with locomotives
- Shorter train configurations (77-90m) with no locomotives, providing greater flexibility of configuration, and requiring shorter sidings and less storage space
- Low floor boarding possible, providing better accessibility
- Maximum speed between 100 and 145 km/hr
- Double ended driver cabs enabling bi-directional travel
- Flexibility to accommodate changes in ridership (ease of adding/subtracting cars)
- Faster speed (improved acceleration/deceleration compared with heavy rail)
- In alignment with the Province's CleanBC initiatives, climate friendly technology options – Hydrogen¹⁶, electric (battery or overhead catenary)

In review, a regional style system employing multiple-unit trains provides service features and functions that appear most appropriately suited to support the observed travel patterns, development patterns and passenger rail transportation objectives for the Fraser Valley.

Hydrogen Technology

Hydrogen Multiple Unit (HMU) or “hydrail” is a relatively new rail technology, offering sustainable, high energy efficiency. Some of the unique features of HMUs include:

- Interoperability – can operate within a mixed fleet (e.g. diesel and hydrogen)
- Performance, operating range and refuelling duration comparable to that of diesel trains (900 to 1100 km range)
- Refuelling from empty tank takes 15 minutes
- Option to retrofit existing rail stock

In July 2021, the BC Ministry of Energy, Mines and Low Carbon Innovation released a Hydrogen Strategy – a “blueprint for how renewable and low-carbon hydrogen will support BC's climate goals.” It identifies a range of incentives to employ hydrogen technology across the province, provides opportunities for hydrail or similar clean technology.

¹⁶ B.C. Hydrogen Strategy – “A sustainable pathway for B.C.'s energy transition.”
https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/electricity-alternative-energy/electricity/bc-hydro-review/bc_hydrogen_strategy_final.pdf



Figure 21 - Example of a multiple-unit train (Alstom iLint hydrogen multiple unit train “HMU”)

Regional Rail Precedents

Sonoma – Marin Area Rail Transit (“SMART”)

Location: Sonoma & Marin counties, CA.
Area is located north of the San Francisco Bay Area

Owner: (service provider and rail owner):
Sonoma–Marin Area Rail Transit District
(regional level transit authority)

Operator: Sonoma–Marin Area Rail
Transit District

Rolling Stock: Nippon Sharyo Diesel
Multiple Units

Line length: 72 Km, 12 stops

Speed: Average: 62 km/h, top: 127 km/h

Corridor characteristics: Single-track on shared freight/passenger line with passing sidings

Ridership: 714,500 (2018)

Development Time & Cost: 5 years, \$450M (USD in 2008)

Relevance: The line provides passenger rail service to a number of lower density communities distributed over a large geographic area. The line does not connect to Bay Area transit services, and users seeking to commute into Oakland or San Francisco must transfer systems.

The service operates on an active freight line and has employed unique diesel multiple-unit trains which are FRA crash compliant – allowing them to operate in mixed freight/passenger traffic on the line, without the need for track or time separation, addressing an often-cited constraint to operating passenger services on active freight lines.



Figure 22 - SMART DMU Trains and stop platform

Capital Metro Rail

Location: Austin, Texas

Owner: (service provider and rail owner):
Capital Metropolitan Transit Authority

Operator: Herzog Transit (3rd party
private operator)

Rolling Stock: Diesel-electric Stadler
GTW

Line length: 51 Km, 9 stops

Speed: Average: 50 km/h, Top: 97 km/h

Corridor characteristics: Single-track
on shared freight/passenger line

Ridership: 1,000,000 (2019)

Development Cost: \$105M (USD in 2010)

Relevance: The line serves a number of lower density, auto-centric communities outside of Austin with 2-way, all day service on an established, single track active freight line. The operators secured an exemption from the FRA regulations to allow for shared freight/passenger use, with schedule time separations. The line was established to encourage greater transit use in the Austin metro area, with the corridor selected to support future growth of areas along the line. The line makes use of 40-50m 2-3 car diesel multiple units.



Figure 23 - Cap Metro Train at urban rail crossing

Concept 1 - WCE Extension

Route & Stop Areas

This concept envisions extension of the current WCE service across the Fraser River into Abbotsford. The route would make use of the CPR Cascade subdivision over the Mission Rail Bridge, continuing south into the Historic Downtown neighbourhood of Abbotsford.

The current Mission City Station would be retained at the current location (requiring a reverse movement) or relocated to west of the rail bridge.

Estimated Travel Time

- Mission - Abbotsford: 10-11 mins (10.5kms)

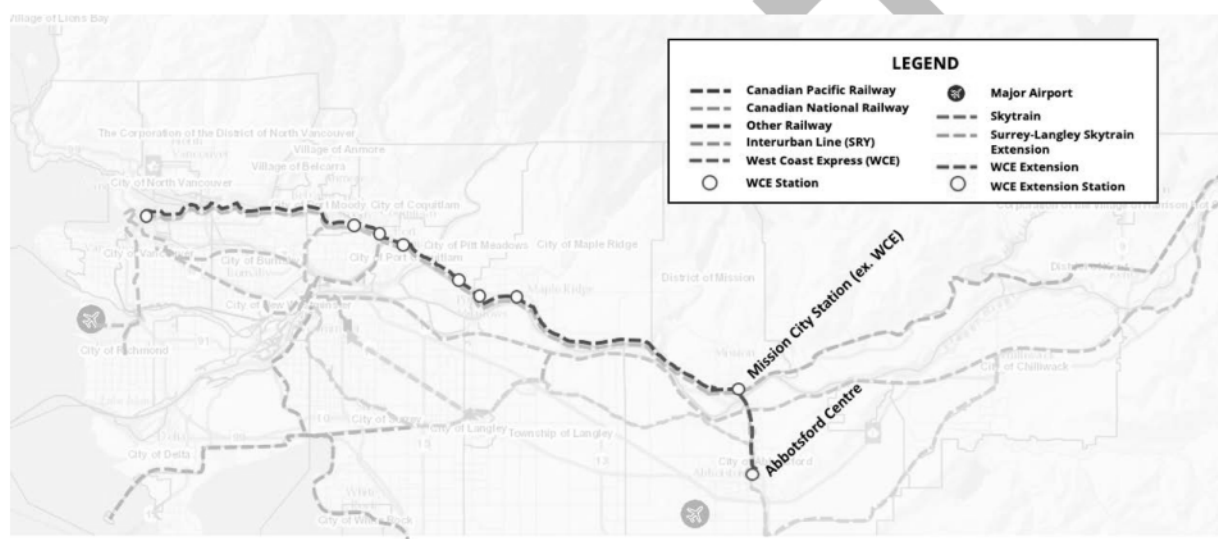


Figure 2414 - Concept 1: WCE Mission to Abbotsford

Infrastructure Considerations

This option requires securing use of the Mission Rail Bridge, as well as potential relocation of the existing Mission City Station to avoid reverse train movements, which can be time consuming and confuse passengers. Current train configurations require station platform lengths of approximately 190m, and straight alignments. Please see the West Coast Express integration analysis in the Transit Integration section for details.

Technology Note: While the other concept options have considered multiple unit trains, this option considers extension of the existing WCE service and use of current locomotives and cars currently in service. Alternatively, over the long term, replacement of the locomotives with multiple-unit trains could provide a nimbler service, avoid the need for lengthy platforms, and may be able to reduce the time required to cross the Mission Rail Bridge so as to minimize impacts to freight traffic¹⁷.

¹⁷ In 2021, TransLink announced that a refurbishment of the locomotives would be undertaken to extend their lifespan by an additional 15 years, allowing for their continued operation until 2035 or later.

Concept 2 - Langley - Abbotsford - Chilliwack (Interurban)

Route and Stop Areas

This concept envisions utilizing parts of the Page Subdivision and Fraser Valley Subdivision along the Interurban corridor. Starting in Langley City, the route would provide a link from the eastern terminus of the planned SLS and connect out to Abbotsford and Chilliwack.

In addition to stops within these three major urban centres, the route has opportunities to serve Trinity Western University and environs, the Gloucester business park area, Huntingdon industrial area south of Abbotsford, and smaller communities outside of downtown Chilliwack, including Sardis.

Estimated Travel Time

- Langley – Chilliwack: 60-75 mins (75kms)

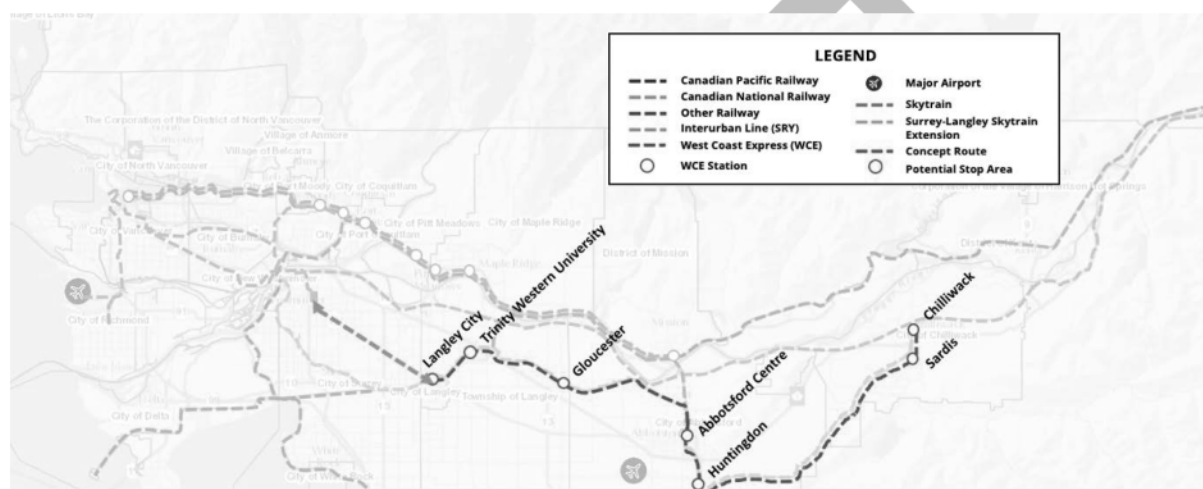


Figure 15 - Concept 2: Langley to Chilliwack (Interurban)

Concept 3 – Langley – Abbotsford – Mission (“The Valley Link”)

Route and Stop Areas

This concept utilizes the same routing and stop areas as Concept 2 until central Abbotsford, but then continues north towards Mission along the CPR corridor, crossing the rail bridge over the Fraser River, and stopping parallel or in close proximity to the current WCE Mission City Station. This routing provides a network link connecting the terminus of the SLS and the WCE, closing a “loop” in the lower mainland rapid transit network.

Estimated Travel Time

- Langley – Mission: 40-45 mins (46.5km)

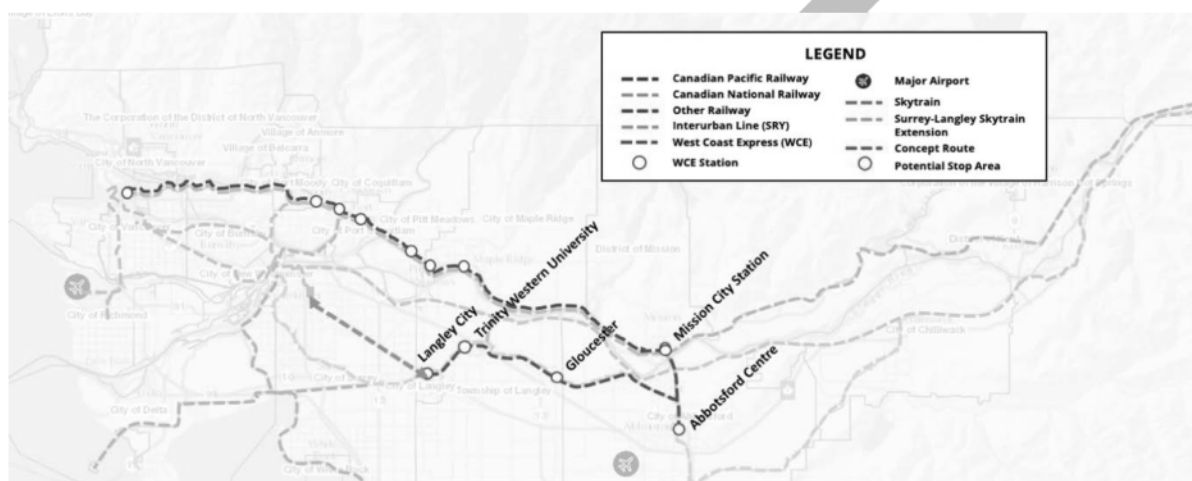


Figure 26 - Concept 3: Langley to Mission (Valley Link)

Network Concept - Long Term Regional Rail Network

Route

- Langley - Abbotsford - Chilliwack + Mission

Feasibility, cost considerations, infrastructure constraints and other factors may require a staged implementation of the above concepts, with a short (10 year), medium (15-20 year), and long-term (25 year+) phasing as possible time frames. Over the long term, the above concepts can be sequentially expanded and amalgamated to develop a comprehensive regional rail network for the Fraser Valley, providing regular, rapid transit connections between major urban centres as well as links with other services connecting into Metro Vancouver.

An initial Langley City - Abbotsford link could establish the first stage of the network, with subsequent phases reaching Chilliwack and Mission. The phasing of subsequent stages may depend on the demand generated on the initial route, ability to secure an operating agreement with CPR for use of the Cascade and Mission Subdivision, and Mission Rail Bridge. Development of detailed staging implementation should be included in any future analysis, including consideration for other aspects including costs, revenues, and schedules.



Figure 27 - Regional Rail Network Concept

Concept Summary						
	Distance	Travel Time (indicative)	Corridor	Potential Stops	Assumed Technology	Comparative Alternative Travel Time ¹⁸
Service Concept 1 - WCE Extension	10.5kms	10-11 mins	CPR (Cascade Subdivision)	Mission City Station (existing or relocated), Abbotsford Historical Downtown	Diesel push-pull locomotive (current WCE trains) or Multiple-Unit Train	Auto – 11 mins Ex. Transit – 20 mins
Service Concept 2 - Langley - Abbotsford - Chilliwack	75 kms	60-75 mins	Interurban (Page Subdivision + Fraser Valley Subdivision)	Langley City, Trinity Wester University, Abbotsford, Huntington, Sardis, Chilliwack	Multiple-Unit Train	Auto – 52 mins Ex. Transit – 98 mins
Service Concept 3 - Langley - Abbotsford - Mission	46.5 kms	40-45 mins	Interurban (Page Subdivision + Fraser Valley Subdivision), CPR (Cascade Subdivision)	Langley City, Trinity Wester University, Abbotsford, Mission	Multiple-Unit Train	Auto – 41 mins Ex. Transit – 110 mins

¹⁸ Times are approximate, and derived from Google Maps. Assumes minimal congestion and no transit wait time. Peak travel times would likely incur increased travel time due to congestion delays.

Ridership

High-level ridership estimates were developed for each of the three conceptual alignments. Together with the other assessment considerations, the ridership estimates provide useful insights with respect to the potential of a regional rail service. For more details of the methodology and applied parameters, please see the Appendix D – Ridership Analysis.

To derive the estimates, a multi-step methodology was developed and applied to the concept options. Steps included:

a) Determination of travel markets

- A review of travel patterns and trips as captured in available data sets was undertaken. Key geographic travel markets were identified (e.g. trips between Langley and Abbotsford), along with trip purpose (e.g. number of home-based work trips or home-based personal trips out of the total recorded trips).

b) Develop potential mode share

- The mode share was developed through consideration of the following:
 - Review of mode share captured by reference services (e.g. WCE, FVX, SkyTrain) and trip purpose (e.g. home-work trips, personal trips).
 - Development of a travel time and value weighting between options (e.g. travel time, weight time, fares vs drive time, parking costs).
 - Based on review and application of the above inputs, experience and qualitative analysis, development of potential mode share ranges (low-medium-high) of the travel markets for each trip purpose, including application of travel time and value weighting.
 - The mode share ranges provide a proxy to weigh for additional variables which cannot be controlled for individually at this level of analysis. These variables can be summarized as follows:
 - **Low Mode Share:** Station connectivity by driving, biking and walking, land use pattern around the station areas, and congestion level in the roadway network, are similar to the existing conditions.
 - **Medium Mode Share:** Fair relationship to station connectivity by driving, biking and walking, more compact land use pattern around the station areas, and increased travel time on the roadway network due to greater traffic volumes (congestion).
 - **High Mode Share:** Strong relationship and station connectivity by driving, biking and walking, high-density mixed-use land use pattern around the station areas, and significantly worse levels of congestion on the roadway network.

c) Apply reverse peak (2-way) trips

- Informed by reverse peak trips captured by other systems within the Lower Mainland and qualitative assessment, a reverse trip ratio was estimated and applied.

d) Apply off-peak trips

- Similar to the reverse peak ratio, an off-peak trip ratio was estimated and applied.

e) Apply future growth

- Based on TransLink's Regional Travel Model (RTM) projections of population and jobs for the year 2050, a growth ratio was then applied to each option to provide potential future ridership ranges over the low, medium and high ranges.

It should be noted that these high-level estimates have not been derived from modelling and is based on quantitative and qualitative methods using existing data. As such, there are a number of variables which cannot be controlled for at this level of analysis, including:

- Changes in future highway congestion
- Greater or lesser than anticipated population growth
- Use of park and ride lots at station locations
- Improvements to local bus services - e.g. first/last mile connections
- Future land use variability, such as greater density and planning for transit oriented development around stations
- Increased economic development and job creation within the travel markets for the service
- Fares, schedules, travel time, network connectivity
- Changes in travel patterns

Accordingly, the estimates should not be interpreted as a model of projected ridership, but as a preliminary analysis of potential demand.

Estimates

The following provides estimates of the potential ridership for the three proposed concepts¹⁹.

Concept 1: WCE extension

Estimated annual ridership at Mission City Station and a proposed Abbotsford Station.

Option 1: Current				
Mode Share Estimation	Total Trips – Peak Only		Total Trips - Including Reverse & Off-peak Trips ²⁰	
	Daily	Annual	Daily	Annual
Low	1,277	332,020	1,992	517,920
Medium	1,738	451,880	2,712	705,120
High	2,154	560,040	3,360	873,600

Option 1: Future (2050)				
Mode Share Estimation	Total Trips – Peak Only		Total Trips - Including Reverse & Off-peak Trips	
	Daily	Annual	Daily	Annual
Low	1,726	448,760	2,693	700,180
Medium	2,351	611,260	3,668	953,680
High	2,911	756,860	4,542	1,180,920

¹⁹These figures provide annualized ridership, assuming 260 weekdays. Mode share estimation is varied across the options, reflecting differences in the travel markets (e.g. commute vs. personal trips) and destinations (e.g. Abbotsford to Vancouver vs. Abbotsford to Langley).

²⁰ WCE is currently peak only. This option envisions expansion and extension of the service.

Concept 2: Langley - Abbotsford - Chilliwack

Estimated annual ridership for the Interurban line (Langley - Abbotsford – Chilliwack)

Option 2: Current				
Mode Share Estimation	Total Trips – Peak Only		Total Trips - Including Reverse & Off-peak Trips	
	Daily	Annual	Daily	Annual
Low	1,824	474,240	3,086	802,360
Medium	3,098	805,480	5,313	1,381,380
High	4,148	1,078,480	7,191	1,869,660

Option 2: Future (2050)				
Mode Share Estimation	Total Trips – Peak Only		Total Trips - Including Reverse & Off-peak Trips	
	Daily	Annual	Daily	Annual
Low	2,689	699,140	4,567	1,187,383
Medium	4,569	1,178,940	7,871	2,345,491
High	6,112	1,589,120	10,650	2,769,125

Concept 3: Langley - Abbotsford - Mission ("Valley Link")

Estimated annual ridership for the Interurban line, from Langley to Abbotsford, and CPR line to Mission

Option 3: Current				
Mode Share Estimation	Total Trips – Peak Only		Total Trips - Including Reverse & Off-peak Trips	
	Daily	Annual	Daily	Annual
Low	1,668	433,628	2,602	676,460
Medium	2,825	734,518	4,407	1,145,848
High	3,778	982,272	5,894	1,532,344

Option 3: Future (2050)				
Mode Share Estimation	Total Trips – Peak Only		Total Trips - Including Reverse & Off-peak Trips	
	Daily	Annual	Daily	Annual
Low	2,446	635,836	3,815	991,904
Medium	4,143	1,077,287	6,464	1,680,567
High	5,536	1,439,276	8,636	2,245,271

Ridership Analysis - Recommended Next Steps

As noted above, these estimates provide a preliminary look at potential ridership for the service concepts. Any potential future analysis should undertake more comprehensive ridership modelling to provide a greater degree of detail and calibration, and to inform a potential cost benefit analysis. In addition, potential future ridership analysis should include forecasting with examination of the impacts of the above noted variables, including:

- Development of more detailed and current origin-destination data
- Confirmation of routing, stop locations, and service plan (e.g. frequency, schedule, fares)
- Modelling of the impact of park and rides
- Geographic based application of potential future land use scenarios (population and job growth locations)
- Future travel patterns and congestion
- Planned new transportation infrastructure, including SLS and Highway 1

Concept Review & Analysis

In review of the proposed concepts, a range of evaluative criteria was used to assess the advantages and disadvantages of each. These criteria were informed by conclusions and directions emerging from the supporting analysis undertaken as part of this study. Preliminary evaluation criteria include:

- **Regional Connectivity** - Does the concept achieve a rapid, reliable, regional transit connection?
- **Facilitate Sustainable Growth** - Does the option support envisioned areas and priorities for growth across the region? Is the option likely to facilitate or encourage desired development patterns
- **Transit Connectivity** - Does the option support existing or proposed transit and transportation infrastructure (e.g. transit, SkyTrain, WCE). Does the option facilitate or encourage long term transportation and transit goals?
- **Leverage Existing Infrastructure** - Is the option viable and supported through use of existing infrastructure (e.g. existing rail corridors) that provide efficiency through lower need for capital investment, consumption of land, and impact to communities (both for construction and operation)? What is the perceived difficulty in securing the necessary partnerships and agreements with rail operators?
- **Transit Mode Share** - Could the concept potentially capture existing demand and generate new ridership?

The above criteria have been applied below in the below Concept Evaluation table using a qualitative scale to assess performance (e.g. fail, poor, fair, good, excellent) across the evaluation criteria. It should be noted that as a pre-feasibility analysis, the above criteria is limited to the preliminary analysis undertaken through this study, and as part of potential future work, additional criteria may need to be developed to provide a greater range of evaluative measurements, and with further detail and specificity.

Concept Evaluation						
	Regional Connectivity	Facilitate Sustainable Growth	Transit Connectivity	Leverage Existing Infrastructure	Transit Mode Share	Overall
	Does the proposed concept achieve a rapid, reliable, regional transit connection?	Does the proposed concept connect anticipated areas of future growth and align with long term municipal land use planning?	Does the proposed concept align with and support existing and planned transit services?	Does the proposed concept make efficient use of existing corridors. To what extent does the concept require potential infrastructure improvements and use agreements to enable?	What is the potential of the concept to attract ridership?	
Concepts						
Concept 1: WCE Extension to Abbotsford	Concept extends existing commuter service into Vancouver. If provided as a peak only service, would not provide significant regional connectivity.	Likely to support residential growth and intensification around stop areas for residents who commute into Metro Vancouver, however does not strongly facilitate municipal focused growth and planning objectives.	Provides close connections with local bus services, and extends existing WCE service	Requires relocation of Mission City WCE Station or reverse movements, and, securing access across the Mission Rail Bridge, extended use of CP owned railway and securing expanded WCE use agreement.	Responds predominantly to commuter ridership bound for Metro Vancouver. Potential performance improved as a 2-way, all day service.	
Scoring						
Concept 2: Langley - Abbotsford - Chilliwack	Concept generally provides good connectivity to centres of major Fraser Valley Communities. Bi-directional, all-day service can support full range of movement patterns.	Potential for supportive alignment with long term municipal growth and planning	Potential for close connections with local bus services in largest population centres, integration opportunity with SLS.	Utilizes Interurban corridor - rights retained for passenger service. Corridor upgrades likely required for Page Subdivision through Langley.	Addresses largest travel patterns across the Valley. Highest ridership potential of the three concepts.	
Scoring						
Concept 3: Langley - Abbotsford - Mission	Concept generally provides good connectivity to centres of most major Fraser Valley Communities. Bi-directional, all-day service can support full range of movement patterns.	Potential for supportive alignment with long term municipal growth and planning.	Provides links to local transit services in communities, along with connections to other regional rapid transit services (SLS, WCE)	Utilizes Interurban corridor - rights retained for passenger service. Corridor upgrades likely required for Page Subdivision through Langley. Requires securing access across the Mission Rail Bridge, and agreement with CP for use of the bridge + railway	Addresses significant share of travel patterns, except for Chilliwack.	
Scoring						

Legend				
Fail - Does not support the objective	Poor - Poorly supports the objective	Fair - Reasonable support for the objective	Good - Substantially achieves the objective	Excellent - Provides excellent response to the objective

Evaluation Commentary

Concept 1 - WCE Extension

In review, Concept 1 provides its greatest benefits in addressing long distance commuting travel between Mission/Abbotsford and Metro Vancouver. The existing WCE service has demonstrated the ability to capture a significant share of this travel market and has provided a consistent and reliable service. Existing travel patterns indicated that a strong portion of users at the current Mission City Station are originating from Abbotsford today, and extension of the service would capture these riders and additional riders due to increased convenience and station proximity for trips originating south of the River. As a regional service connecting travellers within the Fraser Valley, Concept 1 provides limited ability to support inter-regional movement patterns. This is further constrained by the current WCE offering of a peak only service; if offered with reverse peak and off-peak service, there is improved potential to better serve regional travel patterns, as well as capture additional travel markets between the Fraser Valley and Vancouver/Burnaby/Tri-cities.

In the above analysis, Concept 1 requires securing an agreement with CPR to extend the operating agreement for the WCE, as well as address scheduling/signalling issues to secure scheduled access across the Mission Rail Bridge. In addition, securing access beyond the current peak period would introduce an additional level of complexity to be resolved.

From a corridor and infrastructure perspective, extension into Abbotsford would require either relocation of the Mission City Station or reverse movements at the current station. Either of these options has varying impacts to development costs, travel time, along with urban and transit network integration which merits further analysis.

In review, Concept 1 may best serve as a complement to an option better serving regional travel patterns and can continue acting as a commuter line and transit link from the Valley to Metro Vancouver.

Concept 2 - Langley - Abbotsford - Chilliwack

In analysis of the regional travel patterns in the Fraser Valley, particularly south of the River, Concept 2 offers strong potential to link communities and respond to the point-to-point travel between major urban centres. The concept provides connections between the three largest population centres in the study area, offering coverage to the largest share of inter-municipal travel patterns.

With a terminus in Langley City, the route offers the opportunity to establish a transit integration point with the SLS, extending the reach of rail transit eastwards from Metro Vancouver. With the planning and design for SLS station locations and guideway alignment well advanced, additional study is required to develop options for optimization of stop location and proximity with SkyTrain to support fast and convenient transfers.

While BC Hydro retains some rights for passenger service along the corridor under the terms of the agreements with the freight operators, it is anticipated that implementing this concept will require securing an agreement with CNR and SRY to support continued freight rail traffic, as well as address issues related to corridor infrastructure. Areas for future analysis include understanding the required improvements and infrastructure to support continued operation of all operators along the line, while ensuring safe and reliable operation and minimization of urban-rail conflicts.

Concept 3 - Langley - Abbotsford - Mission

This concept adopts parts of the routes from concepts 1 and 2, utilizing portions of the Interurban corridor from Langley to Abbotsford and looping north up to Mission, with a terminus in the vicinity of the existing WCE Mission City Station.

This option provides linkages between Langley and Abbotsford, which accounts for the largest portion of inter-municipal travel, as well as the Abbotsford-Mission connection. The route also makes use of the key sections of the Page Subdivision through Langley City, as well as the crossing of the Mission Rail Bridge, requiring resolution of the considerations identified above for the use of these rail corridor sections.

It should be noted that Concepts 2 and 3, which propose alternative routing making partial use of the same corridor, could be part of a phased line, with an initial stage linking Langley to Abbotsford, and following stages providing extensions to Chilliwack and Mission.

Implementation

This study has demonstrated that the concept of regional rail in the Fraser Valley may warrant further detailed analysis to confirm specific alignment and operational requirements and to understand both the capital and operating costs. In addition to this more detailed analysis, there are other issues that will need to be considered in order to implement this new transit service. This includes responsibility and governance, funding sources for both capital and operations and access requirements specifically related to co-existing with commercial rail operations. These are described below.

Responsibility & Governance

The proposed regional rail service crosses jurisdictional boundaries that are the responsibility of different municipal authorities and operating agencies. For example, West Coast Express is operated by a subsidiary of TransLink, formally the South Coast British Columbia Transportation Authority. However, the eastern most station in Mission falls within the jurisdiction of BC Transit. Similarly, the boundary between Langley and the Fraser Valley are also the responsibility of TransLink and BC Transit respectively. These types of cross jurisdictional projects, and their corresponding operations, are often developed and managed by higher orders of government, such as Ontario's GO Transit services provided by Metrolinx, a Crown agency of the Ontario Government. Given the concept's cross-jurisdictional nature, operations and authority for a regional rail system may be best addressed through a provincial level service provider with jurisdiction across municipal and regional boundaries. It is recommended that a review be undertaken as part of any future analysis to examine the possible provincial governance approach, along with opportunities for partnership arrangements with potential operators.

In addition to operational considerations and jurisdictional authority, funding opportunities should also be considered as part of any future work. This includes both capital funds to facilitate the design and construction of the infrastructure, and operational funds to manage the ongoing operations and maintenance responsibility of the service. Consideration will also be needed for appropriate revenue sources, fares, and funding responsibilities.

Commercial Partnerships

Railway Owners and Operators

As illustrated in this report, the proposed regional rail service would utilize existing, active commercial rail corridors. Operating any passenger rail service along these commercial corridors will require partnership and agreements with the respective commercial rail operators to secure the necessary running rights to facilitate regional rail scheduling as well as access for operations and maintenance responsibilities. As part of any potential future work, engagement with rail operators is recommended to understand issues, constraints, potential solutions, and partnership opportunities.

Conclusions and Recommendations

The above analysis has identified a number of concepts to enable passenger rail services into the Fraser Valley, making use of the existing rail network to connect major destinations and support travel demands today and into the future. Along with the opportunities, the above analysis has identified a range of considerations, and are identified below as possible next steps for any future analysis.

In review of travel across the Fraser Valley, there is a strong regional pattern, with a majority of trips originating and ending within the region, and less emphasizing travel to/from Metro Vancouver. At the same time there is an increasing movement in long term planning and growth strategies towards greater concentration and density of development around the key urban nodes, supporting the emergence over time of more transit supportive places.

In response, these conditions may be well suited to a point-to-point regional rail style system, designed to connect small to mid-sized communities over longer distances, and with more flexibility than heavy commuter rail.

Key opportunities to establish regional rail include activating parts of the existing Page Subdivision and Fraser Valley Subdivision (Interurban corridor) to connect Langley, Abbotsford and Chilliwack, along with possible opportunities to establish a passenger rail link across the Fraser River between Mission and Abbotsford.

Considerations:

- The subject corridors have active freight traffic, with varying volumes which are expected to increase over time. In key sections, there will be a need for corridor infrastructure upgrades, including double tracking, signal improvements, crossing controls, and other measures to support safe and reliable passenger rail traffic with continued freight.
- Emerging rail technologies, including hydrogen and electric options, can provide environmentally clean alternatives. FRA compliant passenger vehicles also provide safe options that can be operated on shared corridors.
- Ownership and current operations along the corridors vary, with some having agreements in place retaining rights for passenger rail, but no current services (Interurban), and others having limited existing agreements (e.g. WCE). New agreements and partnerships will be necessary with operators and owners to accommodate passenger services on these corridors.
- The ridership analysis presented reflect different potentials based on a number of variables, such as optimization of land use, economic development, and competitiveness of alternatives. As a high-level analysis, the ranges provide a proxy for the condition of these variables, and more detailed analysis and modelling should follow to confirm.
- The proposed service concepts offer options for staged implementation, allowing for segments to be brought online first, with phasing of subsequent stages. This can reduce the total initial investment and allow for an earlier phase to build ridership and awareness of the system before expansion.
- While the Province may retain some passenger rights along the subject corridors, partnerships with rail operators will be required to support implementation of the concept(s). It is recommended that engagement and discussion with rail operators be a primary task to be undertaken as part of potential future analysis.
- It should also be noted that the scope of this study has been to examine options for passenger rail using existing corridors, and has not undertaken an alternatives analysis, of either transit alternatives (e.g. LRT/BRT) or corridor alternatives (e.g. utilizing highway ROW, establishing new rail corridors, utility corridors or others). It is recommended that examination of the advantages and disadvantages of these alternatives should be considered and included as part of future work.

As a pre-feasibility Study, this analysis provides a preliminary study of potential passenger rail service concepts, and high-level analysis and evaluation. As a potential next step, the concepts identified in this study could be subjected to a more detailed review through a comprehensive Feasibility Analysis. It is recommended that any potential future work examine the following, without limitation:

- **Stakeholder and Partner Engagement**
 - Discussions with railways to understand issues, including future freight volumes and current network constraints, and advance partnership options.
 - Engagement with local municipalities and service providers.
- **Governance and Funding Review & Analysis**
 - Develop strategy for service provider governance structure, capital funding and procurement approach, along with operations and maintenance funding.
- **Corridor and Infrastructure Analysis**
 - Review of corridor conditions, including grade crossings, track condition, utility locations (much of the corridor is bounded on both sides by hydro lines), and analysis of required improved and necessary new infrastructure (e.g. stations, double tracking, signalling, grade separations) to support service concept(s).
 - Study and analysis of integration options with SLS
 - Study and analysis of integration options with WCE
 - Assessment and evaluation of rail technology options
 - Identify potential maintenance facility locations and require size
- **Ridership and Demand Projection**
 - Develop ridership and demand modelling, including land use sensitivity analysis.
- **Preliminary Cost Analysis**
 - Assessment of capital and operating costs.

While concepts to establish passenger rail services making use of the existing Fraser Valley rail network have been examined in the past, evolving conditions and priorities continue to bring attention to the opportunity. Over the long term, communities in the Fraser Valley will need alternative transportation solutions to provide regional connections independent of the highway. In addition, mobility solutions such as regional rail have the potential to provide clean, fast, reliable transit for the region that can also support more sustainable land use patterns, access to affordable housing and jobs, spur economic investment, and support the long-term wellbeing and health of communities in the Fraser Valley.

Appendices

A - Rail Corridor Review, prepared by the Stewart Group

B - Planning and Development Context Analysis, prepared by the Stewart Group

C - Transit Integration Analysis, prepared by the Stewart Group

D - Ridership Analysis, prepared by Mott MacDonald and the Stewart Group

E – Stakeholder Engagement Comments, prepared by MoTI and the Stewart Group

FRASER VALLEY RAIL CORRIDOR TECHNICAL MEMO

FRASER VALLEY REGIONAL RAIL PRE-FEASIBILITY STUDY (APPENDIX “A”)

August 2021

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Note: This Memo is part of the overall analysis for studying regional rail concepts for the Fraser Valley. This analysis, along with further qualitative and technical analysis, forms part of the broader Pre-feasibility Study.

Introduction

This Technical Memo forms part of the Fraser Valley Regional Rail Pre-Feasibility Study. The Study is reviewing the feasibility of implementing a passenger rail service through the Fraser Valley, by making use of the existing rail network. This memo provides a current (2021) review of selected existing rail corridors that span the Fraser Valley, generally from Surrey/Langley through Abbotsford to Chilliwack, and Mission. The physical state of the corridors has been reviewed at a desktop level with added inputs from additional verbal and written sources where necessary.

Corridor Review

The railway network in the Fraser Valley includes several lines run by various operators including CP, CN, and SRY (Southern Railroad of British Columbia). Through an earlier completed Rail Capacity Review (December 2020), a number of rail corridors in the Fraser Valley were examined. It was identified that two of the corridors through the Valley merited further examination based on their perceived connectivity and links to communities in the Study Area to assess their feasibility to support passenger services. Other corridors reviewed as part of the Capacity Review have not been included as part of this analysis.

These included:

- Parts of the corridor known commonly as the Interurban line, in particular the sections running from Langley City, through Abbotsford, and out to Chilliwack (Page Subdivision & Fraser Valley Subdivision). This corridor is owned by BC Hydro.
- Parts of CP's Cascade Subdivision, including sections currently used by the West Coast Express, and sections extending south from Mission across the Mission Rail Bridge into Abbotsford. This corridor is owned by CP Rail.

Figure 1 shows the corridor study area, and the relationship of above noted segments in relationship to the broader rail network in the Fraser Valley. For further details, please refer to the Rail Capacity Review for information on the existing network capacities and currently planned improvements and initiatives.

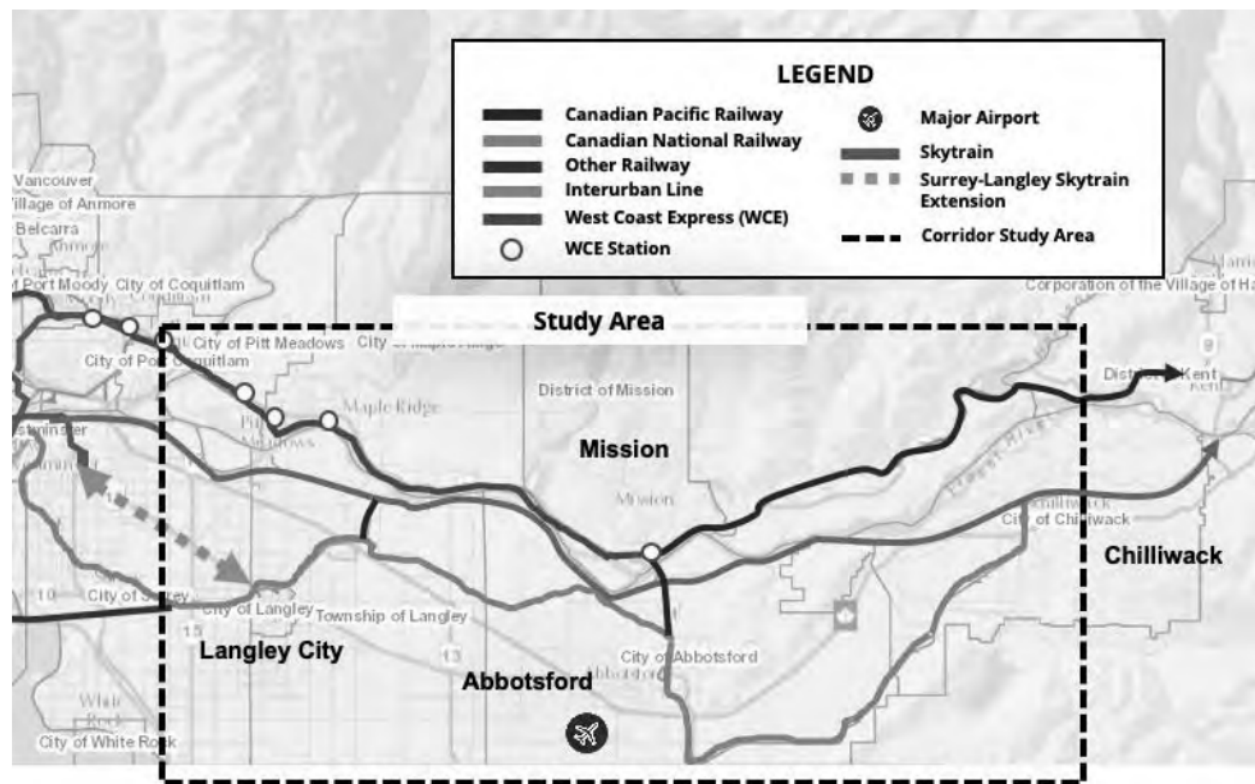


Figure 1 – Corridor Study Area

Interurban Line

General

This corridor extends approximately 75 km from Langley City, crossing the Highway 1 corridor where it meets with a major connection turnout that links it to the main CN Yale corridor via the Rawlinson Spur. The corridor continues east from that junction, running through mostly rural agricultural areas, before heading south into to the City of Abbotsford.

The corridor continues through the older central part of Abbotsford and continues south parallel to the CP line (that continues south to beyond the US border). The railway continues south to just short of the Canada/US border where it turns eastwards to continue toward Chilliwack.

The corridor consists of standard gauge 1435mm. Track weights and further technical track specifications will need to be determined through future study and confirmed with respective railways.

Railway Crossings

Through a desktop review, it was determined that there are approximately 79 at-grade crossings varying from 1 to 5 lanes depending on whether they are private, local or arterial roads. Most of the crossings are unprotected with Stop signs and Railway Crossing signs. Figure 2 Shows a typical unprotected and uncontrolled crossing to a private road. Unprotected and uncontrolled crossings such as these are also evident for minor municipal roads.



Figure 2 - Typical Private Uncontrolled Crossing

Out of the 79 at-grade crossings, 17 are protected/signalized. Depending on the road type or the number of traffic / pedestrian crossings, they will also have gates. Gates are mostly present in urban centres and at roads with high traffic levels or crossings close to major intersections where there would be a need to synchronize the traffic signal with the railway signal. Figure 3 and Figure 4, show these types of crossings.



Figure 3 - Typical Rural Corridor Section showing Hydro Power lines on Either Side of Single Mainline Track



Figure 4 - Typical Fully Protected Crossing Parallel to Major Divided Highway

There are 9 road overpasses and 1 rail bridge (including a new one over the Hwy 1 corridor south of Chilliwack).

Figure 5 and Figure 6 show typical overpasses. Note also the extent of the use of this corridor by BC Hydro, with medium voltage hydro poles on either side of the single track.



Figure 5 - Typical Cross Section at Major Overpasses - Note the Extensive Hydro lines on Either Side of the Mainline Track



Figure 6 - New Railway Bridge over Highway 1 that includes rail trail - south of Chilliwack

There are also number of major Hydro Corridor ROW crossings (High Tension). There is one water crossing over the Chilliwack River, south of Chilliwack. The crossing is an older single-track bridge (structure needs to be verified).

Spur Lines and Turnouts/Connectors

There are multiple active spur lines throughout the length of the corridor as well as connectors between BC Rail and CPR mainlines. There are 8 sidings and there is one rail/rail crossing (just north of Abbotsford with the CPR mainline connector). The shortest siding is approximately 400 metres while the longest is approximately 700 metres. Details of these are listed in Table 1.

There is also a 2.65km two track section just south of the CN Rawlison Spur connector (where the CN track and the BC Railway Track (Page Subdivision) connect. This is likely to enable smoother transfer between the two corridors (areas where trains can wait until they are cleared to move on).

Corridor Condition

Based on this desktop review the Corridor is generally in fair condition (based on review from photomap and selected photos from Google), although there have been some upgrades to some crossings and segments. A more thorough assessment of the corridor status (in terms of age of rail, ballast and ties) would be needed to determine if there have been upgrades or improvements in some of the areas of the corridor. That type of information may be available from the railway companies.

The corridor mainline track is generally lined on either side by BC Hydro Medium Tension hydro lines and poles, giving no room to add a track on either side unless the poles are relocated.

Evidence in the photos indicate that the Hydro Corridor is used to provide hydro feeds to local communities along the corridor (evidence of connecting circuits at road crossing locations).

As shown in Figure 7, regular Hydro line maintenance is done by BC Hydro crews by using the rail line on a flatbed type truck that has rail wheel fittings (get name of vehicle). This is the only way the lines can be checked and maintained as there is generally no parallel roadway to access the mainline track by these crews.



Figure 7 - Typical BC Hydro Maintenance Activities Regularly Taking Place Along Entire Corridor

Right-of-Way Widths

Most of the corridor has a width of approximately 27 metres to 30 metres except for certain areas (urban centres or parallel to major highways) where the Right-of-Way (ROW) widths vary to slightly less than 20 metres or almost 100 metres.

East of Abbotsford, the ROW maintains a width of approximately 27 to 30 metres all the way to Chilliwack. Please refer to Appendix A: IUL/CP Right-of-Way Widths for Details.



Figure 8 - Double tracked area through Chilliwack with hydro poles (approx. 23m ROW)

Detailed Corridor Features Review

A key map was created to identify sub-areas of the railway corridors. In the case of the Interurban corridor and CP Rail Page subdivisions, the key map identified these sub-areas as IUL with a set of section numbers.

Please refer to Appendix B: Detailed Corridor Features Review and Appendix C: Corridor Maps for Details. Table 1 provides some further details on key elements including crossings, sidings, spur lines and other features that are deemed relevant to the review.

CP Cascade and Mission Subdivisions

General

For the purposes of this review this corridor extends from just east of the Pitt River Bridge, along the CP Cascadia Subdivision through to Mission. The corridor reviewed then goes from Mission, across the Fraser River to the south side of the river and continue southwards into Abbotsford. The approximate area of review is shown in Figure 9. From the perspective of potential passenger rail options, this corridor is being considered for opportunities to support extended or enhanced West Coast Express service, or a new passenger rail service.

The corridor consists of standard gauge 1435mm. Track weights and further technical track specifications will need to be determined through future study and confirmed with respective railways.

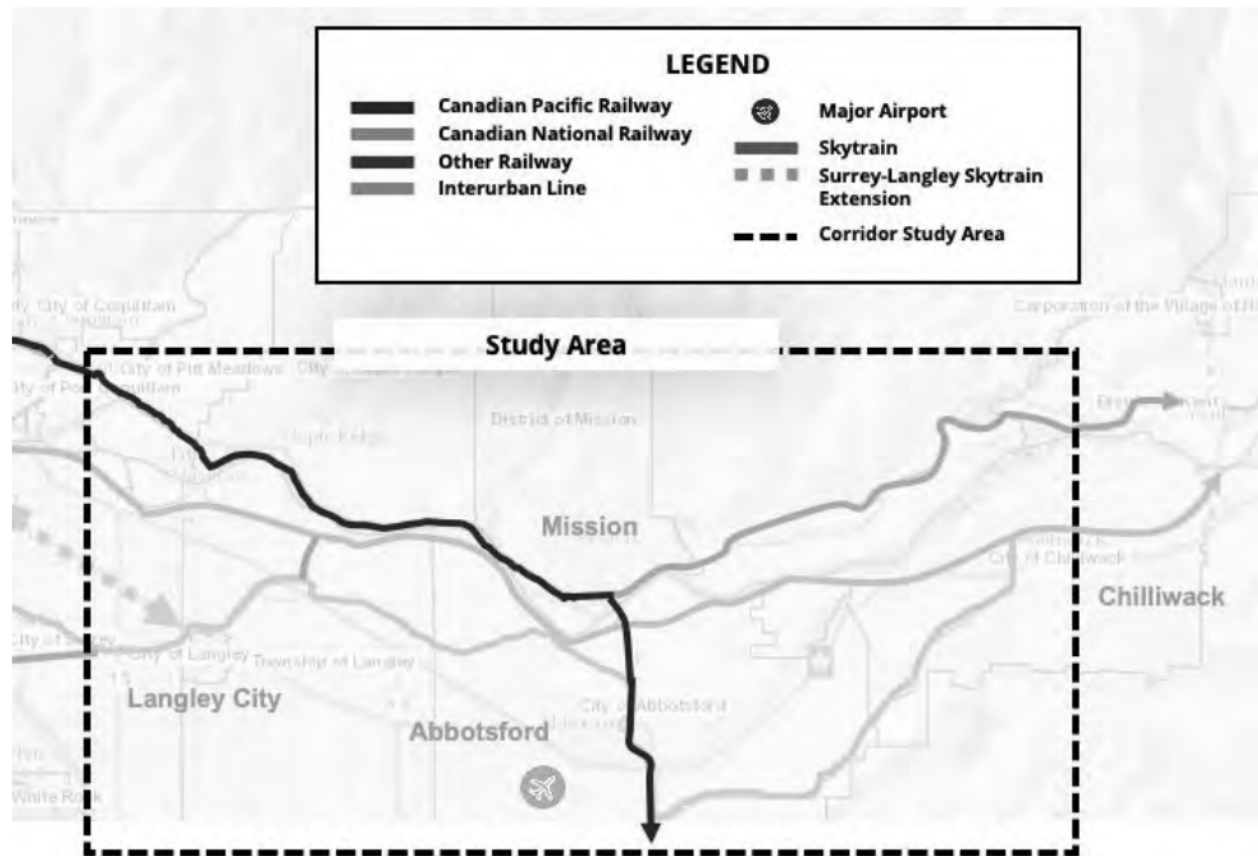


Figure 9 - CP Cascadia Sub and South Connection Review Area

Railway Crossings - Pitt River Bridge to Mission – Cascadia Subdivision

There are 31 crossings with 28 at-grade crossings varying from 1 to 4 lanes depending on whether they are private, local or arterial roads along the CP Cascade Subdivision. This corridor has always at least two tracks. And most of the crossings are protected with both signals and gates. There are 3 unprotected crossings with Stop signs and Railway Crossing signs that access small private lands by the Fraser and are either secondary access points with locked gates or no commonly used private access.

Figure 10, Figure 11 and Figure 12, show these types of crossings along the CP Cascade corridor.



Figure 10 - Typical urban at-grade Crossings (and overpass)



Figure 11 - Typical rural at-grade crossing



Figure 12 - Typical unprotected at-grade crossing

Railway Crossings - Mission to Abbotsford – Mission Subdivision

The Mission subdivision runs from the CP Cascades subdivision, on the north side of the Fraser River, from the centre of Mission, across the River to the south side and continues south to and through Abbotsford to eventually cross the Canada/US border.

After crossing the Fraser River the single-track corridor meets up with the Fraser Valley Subdivision and runs parallel to it most of the way south to Abbotsford.

As of 2016, an average of 31 train crossings occurred per day over the rail bridge, with a forecast that traffic will increase to 53 trains by 2030¹.



Figure 13 - CP Mission Subdivision Crossing over Fraser River

¹ Figures drawn from 2016 Fraser River Trade Area multi-modal transportation network planning study, prepared by the Gateway Transportation Collaboration Forum.

There are 18 crossings along the corridor into Abbotsford, 14 of which are at-grade, with mostly signaled and gated crossings.

There are two rail/rail at-grade crossings, the most important of which is the one with the CN Yale Subdivision (a two-track crossing).

Spur Lines and Turnouts/Connectors

There no noticeable spur line throughout the length of the corridor and there are several connectors between BC Rail and CP mainlines. Details of these are listed in Table 2.

Corridor Condition

Based on this desktop review the Corridor is generally in good condition (based on review from photomap and selected photos from Google), with upgrades to some crossings and segments. A more thorough assessment of the corridor status (in terms of age of rail, ballast and ties) would be needed to determine if there have been upgrades or improvements in some of the areas of the corridor. That type of information may be available from the railway companies.

Right-of-Way Widths

Most of the corridor has a width of approximately 15 metres to 20 metres except for certain areas (urban centres or parallel to major highways) where the Right-of-Way (ROW) widths will vary. Please refer to Appendix A: IUL/CP Right-of-Way Widths for Details.

Detailed Corridor Features Review

A key map was created to identify sub-areas of the railway corridors. In the case of the CP Rail Mission subdivision, the key map identifies this sub-area as MA with a set of section numbers.

Based on desktop review and spot checks, Table 2 provides some further details on key elements including crossings, sidings, spur lines and other features that are deemed relevant to the review.

Please refer to Appendix B: Detailed Corridor Features Review and Appendix C: Corridor Maps for Details.

Considerations

A number of improvements may need to be considered to support passenger service along the surveyed rail corridors and further study would be required to confirm the extent of these improvements.

General Corridor Improvements and Maintenance

Based on this desktop review the Corridor is generally in fair condition, although there have been some upgrades to some crossings and segments especially those at or near urban centres and through areas with higher traffic.

An assessment of the corridors in terms of age of rail, turnouts, ballast and ties is recommended to determine operability as a corridor for daily passenger rail service, as only some of the corridor is being used regularly by freight trains (for example the Page subdivision which links the CN mainline to Roberts Bank Terminal). The assessment may reveal the need to bring the corridors to a higher level of readiness

to enable passenger operation (rail ties replacement, track levelling, rail grinding are possible examples of maintenance and upgrades required).

Depending on whether electrification is considered, further assessment as to how this can be achieved given the Interurban corridor's single track is lined on either side of it by BC Hydro Medium Tension lines, is also recommended.

Double Tracking

Some key sections of the corridors, particularly sections of the Page Subdivision, may require double tracking to allow for passenger train maneuverability, and to support minimization of impacts to freight traffic. Depending on the passenger service schedule, double tracking may also be needed at a designated crossing point(s), which would generally be located at railway station stops, and therefore these locations might require a set of turnouts and double tracks with minimum width platforms.

Typically, 10 to 15 metres of clearway within a ROW is needed to accommodate double tracking, with some variation depending on speed and track curvature. In narrower sections of the corridor, this will likely require relocation of overhead hydro poles and shifting of existing track to create space for the second track. The Interurban corridor track is generally lined on either side by BC Hydro Medium Tension hydro lines and poles and would need to be relocated to accommodate double track. For reference, the ROW of the corridors ranges from a minimum of approximately 15m to 100m (see Appendix 'A' for details).

When adding station platforms to the double track, these platforms would typically be between 3m and 4 metres in width which would add to the required clearway width (16 to 23 metres).

Sidings

For single track portions of the corridors, the addition of sidings to allow for passing maneuvers may be warranted. Development of a service plan would be required to ascertain whether existing sidings are sufficient, or if additional are required. As noted above, some of these passing tracks may be more conveniently located at station stops where other amenities like platforms and shelters would also be provided.

Road Crossings

Rail safety is governed by the Canadian Federal Government under the Railway Safety Act (1985) and Grade Crossing Regulations (2014)². When adding regularly scheduled passenger rail services to any rail corridor, the need for a higher level of safety at crossings is warranted and standard practice under these to support the increased frequency of rail traffic. With over 40 unsignalized at-grade crossings along the Interurban corridor, it is recommended to review these as part of a Feasibility Study to determine if they meet current safety standards for the intended use, and if signals are warranted relative to the type of passenger rail service that is planned. This will be particularly important for at-grade road-based crossings both public and private. Other crossing alternatives for pedestrian only crossings could also be considered (overhead walkway for example).

² Railways operating exclusively within one Province are governed under the respective Provincial Railway Safety Act and other regulations, however these are largely harmonized with the federal equivalents.

Mission Rail Bridge

The freight rail crossing traffic at the Mission Rail Bridge is significant today (average of 31 crossings per day in 2016) and is expected to increase to over 50 crossings per day by 2030. In 2030 that translates to over 2 trains per hour crossing this bridge. The crossing time for each of these trains will also be important given the physical length of the trains and the average speed at which they are crossing.

Given the anticipated future increase in bridge traffic, and third party railway ownership (CP), it is recommended as part of future feasibility work that the anticipated future crossing traffic is confirmed, and the capacity of the bridge is modelled to understand required spacing between trains, signaling, direction, maximum train lengths, and other factors with the inclusion of the proposed scheduled passenger service. This would be necessary to identify the required infrastructure adjustments and improvements to support the rail service. In recognition that in addition to infrastructure, usage of the bridge (and corridor) would need to be part of an agreement with CP, it is recommended that the proposed passenger service concept should also provide the basis for discussion with CP on the securing of track space across the bridge, and other associated corridor sections.

Recommended Next steps

The following additional reviews are recommended once a general concept of passenger rail services and operation is developed:

- **Railway Assessment:** A detailed technical assessment of the corridor in terms of age of rail, turnouts, ballast and ties is recommended to determine operability as a corridor for daily passenger rail service
- **Electrification Options Analysis:** Depending on whether electrification is considered, further assessment as to how this can be achieved, including issues such as hydro pole relocation and integration of overhead catenary systems.
- **Crossing Analysis:** As part of development of a service plan for potential passenger service, a review and assessment of the signalized and unsignalized at-grade crossings along the Interurban part of the corridor is required to identify potential crossing enhancements required.
- **Mission Bridge Assessment:** To determine whether the insertion of scheduled passenger service across the Mission Bridge is feasible it is recommended that a review of the current freight crossing assumptions and model be reviewed. This should also include a review of the capacity of the rail/rail crossing south of the Mission Bridge at the CN Mainline corridor.

Attachment A – IUL/CP Right-of-Way Widths (Approximate)

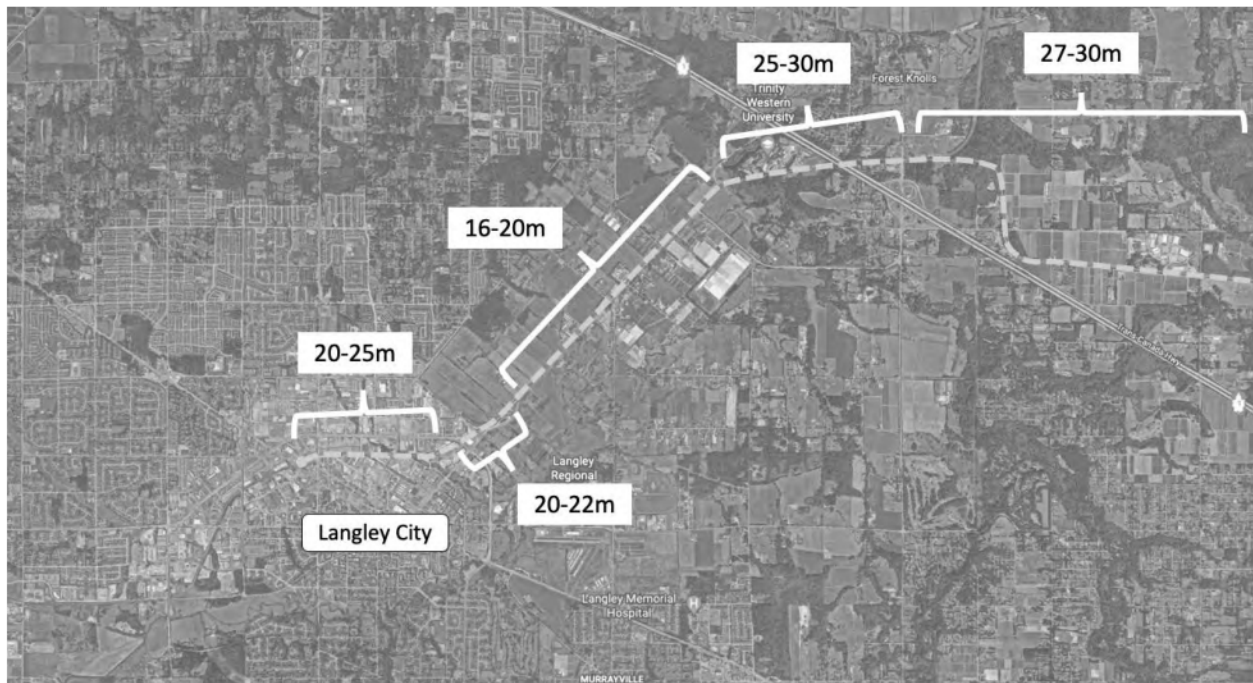


Figure 14 - Approximate Interurban corridor ROW widths through Langley City up to Hwy 1

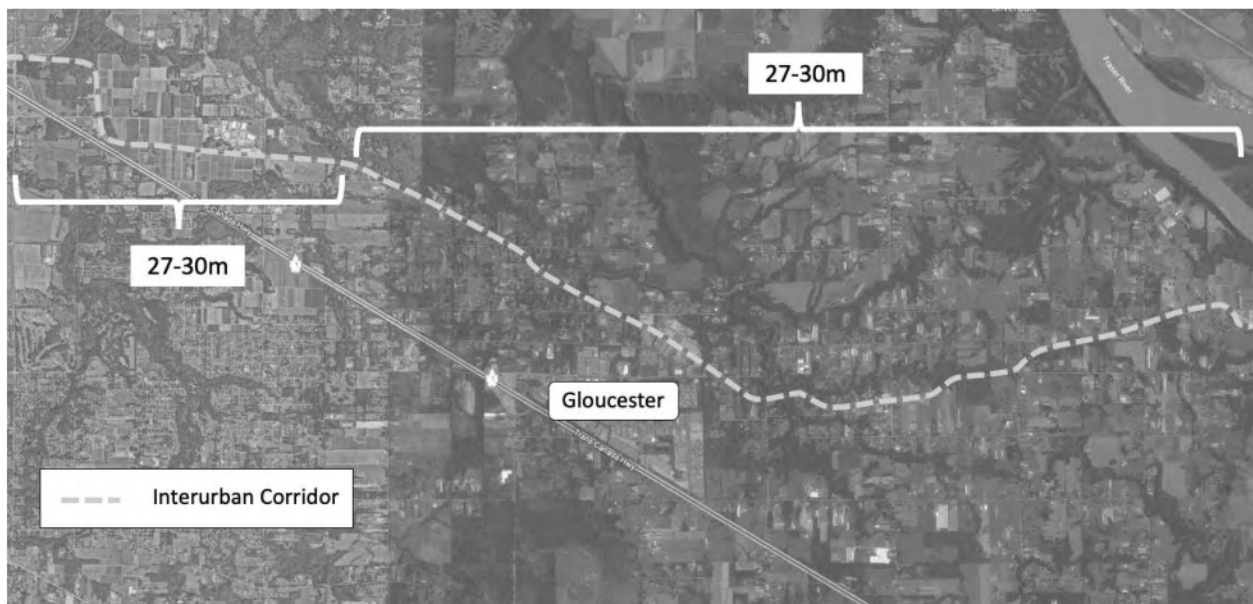


Figure 15 - Approximate Interurban corridor ROW widths north of Hwy 1

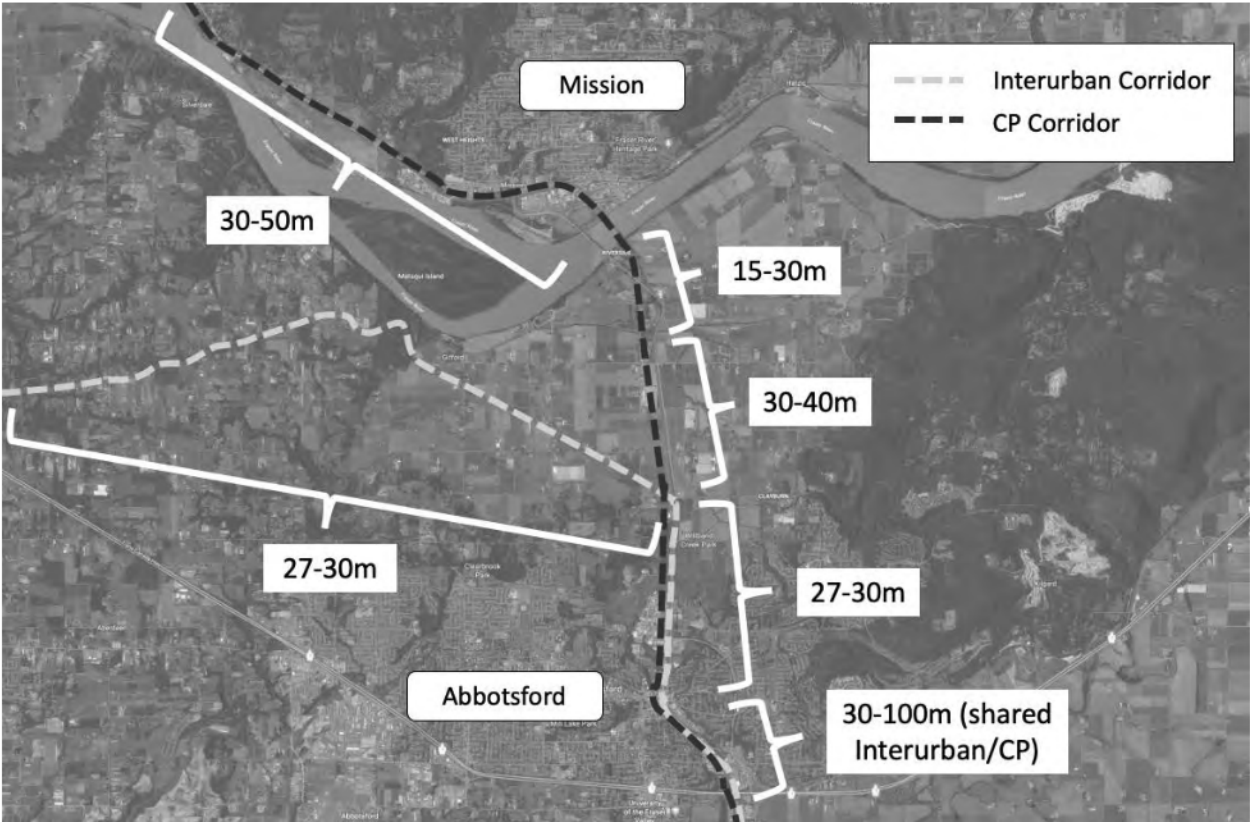


Figure 16 - Approximate Interurban & CP corridor ROW widths through Mission and Abbotsford

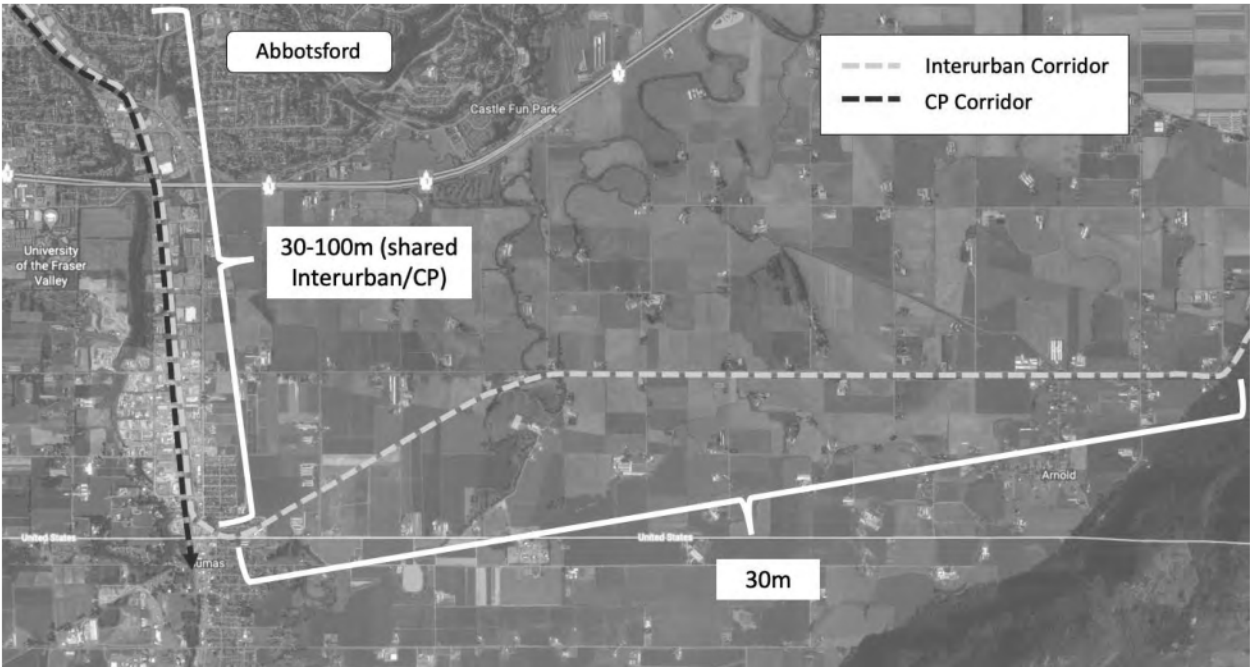


Figure 17 - Approximate Interurban & CP corridor ROW widths through South Abbotsford

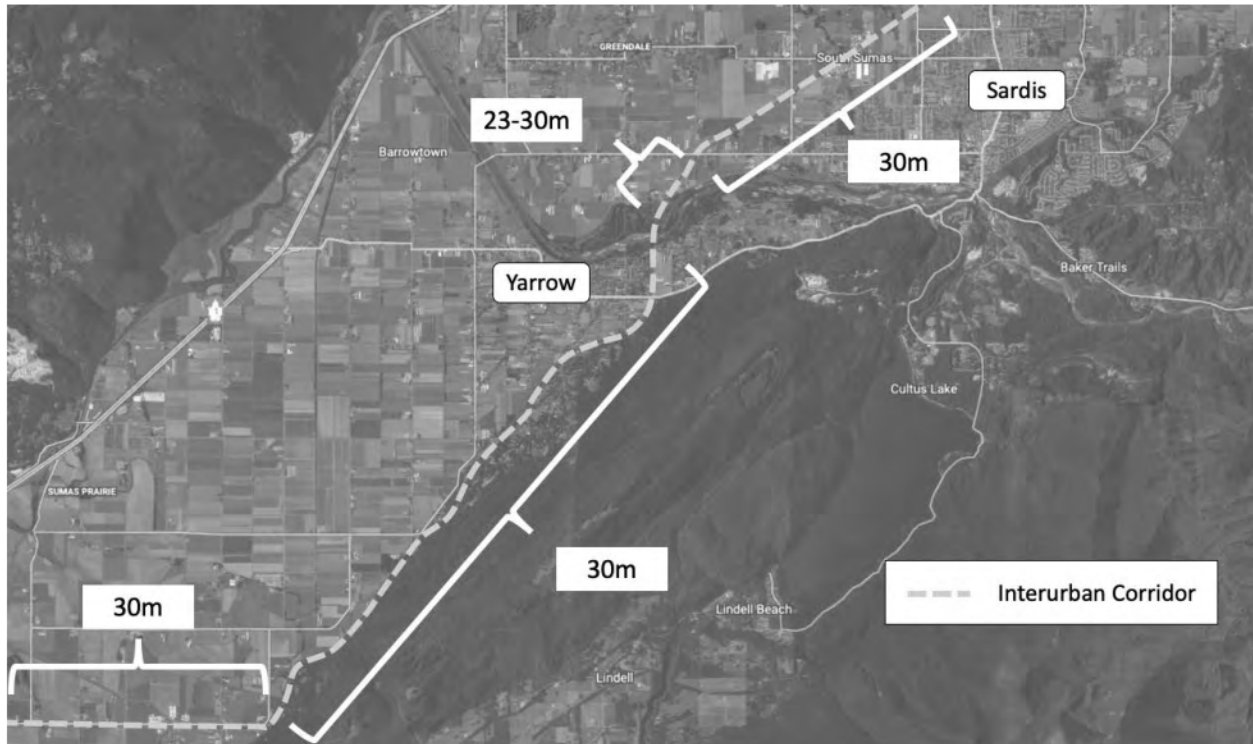


Figure 18 - Approximate Interurban corridor ROW widths through rural Chilliwack

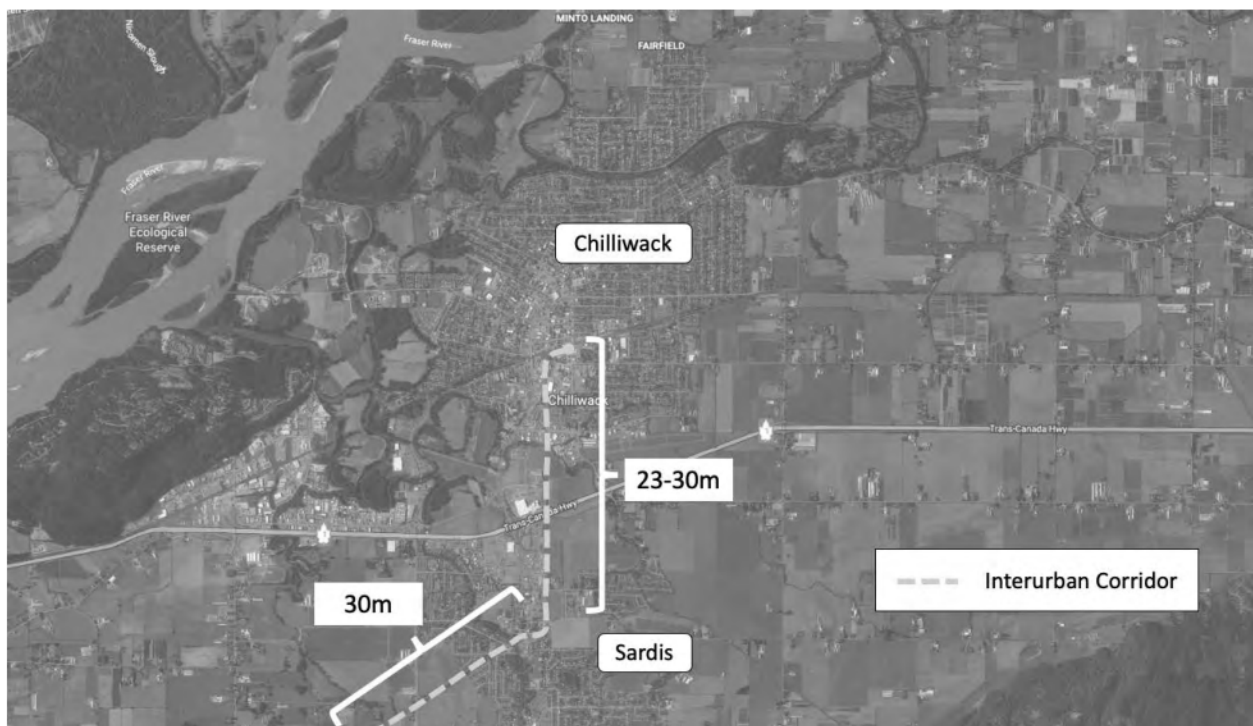


Figure 19 - Approximate Interurban corridor ROW widths through Chilliwack

Attachment B - Detailed Corridor Features Review

A key map (Figure 20) was created to identify sub-areas of the railway corridors. In the case of the Interurban corridor, the key map identified these sub-areas as “IUL” with a set of section numbers. The CP Cascade Subdivision is identified as Mission-Abbotsford or “MA”. Aerial photography and feature maps of each section can be found in the document entitled Corridor Maps, provided under separate cover and referenced in this Technical Memo as Appendix C.

Based on desktop review, Table 1 provides further details on key elements including crossings, sidings, spur lines and other features that are deemed relevant to the review.



Figure 20 - Corridor Key Map

TABLE 1 – SUMMARY LIST OF CROSSINGS/SPUR LINES/SIDINGS				
IUL Section	Crossings	Type	Signalized	Other/Notes
IUL-1	134 Street	2 lanes at-grade	Yes	
IUL-1	188 Street	Walking path	no	Not an official crossing. Connects to 51b Ave.
IUL-2	192 Street	4 lane overpass	N/A	51b Ave also passes under and next to Railway line. Need to check column spacing and hydro under crossing
IUL-2	Hydro	Major ROW crossing over (3 sets of 3 HT Lines)	N/A	Just east of 192 Street overpass. Need photo and better understanding of heights and ROW Type
IUL-1 and 2	Hydro	Parallel	N/A	Two Parallel Hydro lines – one on either side of existing railway track
IUL-3	Spur Line	Single Track	N/A	No longer active – south of 54 Ave overpass
IUL-3	54 Ave	2 lane overpass	N/A	Check for column locations at underpass
IUL-3	Spur Line	Single Track	N/A	North of 54 Ave – connects to Central Cedar – not know if still active
IUL-3	56 Ave	2 Lanes at-grade	Yes (assumed)	
IUL-4	196 Street	4 lane overpass	N/A	Column locations at underpass to be confirmed through more detail study
IUL-4	Multiple Spur lines	South and north connecting to multiple locations	N/A	Need to confirm which ones are active – approximately 5 or 6
IUL-4	Multiple track section	Maximum 2 for spur track access	N/A	600 m – east of 196 Street overpass
IUL-5	Fraser Highway	4 lanes at-grade	Yes	
IUL-5	200 Street	6 lane at-grade	Yes	Includes SB-LT lane for intersection with Production Way south of railway corridor – very constrained intersection and railway crossing design
IUL-5	Multiple track section	3 track for spur line accesses	N/A	Begins approx. 150m east of 200 Street crossing.
IUL-5	Spur Lines	Single Track	N/A	Both on south and north sides – do not know if active

IUL-6	204 Street	4 lane overpass	N/A	Check for number of track going under the road – looks to be one main plus two side – one of which has turnout to east of overpass and also spur connection to property at 206 Street cul-de-sac
IUL-6	Langley By-pass (10)	4 lanes – partially divided – at-grade	Yes	Just west of major intersection with Glover Road – could be subject to EB-LT backups during peaks
IUL-7	Mufford Crescent	4 lane overpass with pedestrian walkway	N/A	Major crossing structure – looks to have sufficient width for 2 more tracks – currently single track and hydro corridor.
IUL-8	Private Access	1 lane at-grade	No	Access to private property / farmlands
IUL-9	Private Access	2 lane at-grade	No	Between 64 Ave and Worrell Cres.
IUL-9	Worrell Crescent	2 lane at-grade	Unknown – to be verified	Access to private property / farm
IUL-9	Spur Line	Single line on west side	N/A	Spur with turnouts in each direction – appears to have previously been in use to serve a grain elevator that is still visible – to be verified
IUL-9	Crush Crescent	2 lanes at-grade	Yes	Next to Hwy 10 (Glover Road) intersection – to be verified if intersection is signaled and roadway signals are synchronized
IUL-10	Smith Crescent	2 lanes at-grade	No	Access to private properties / farms
IUL-11	216 Street	2 lanes at-grade	Unknown – to be verified	Crossing may be signalized with Hwy 10 intersection
IUL-12	Glover Road	2 lanes at-grade	Yes	
IUL-13	Private Path	Path Crossing at-grade	No	Unprotected path crossing from Trinity Western University Grounds to adjacent playing fields to south of corridor
IUL-13	Private Road	1.5 lane crossing at-grade	No	Private road crossing – need to check if paved – from Trinity University to playing fields on south side of corridor
IUL-14	Hwy 1	2 x 2 lane under passes	N/A	Major crossing of railway over existing Hwy 1 – two separate culvert like structures (one for each hwy direction) – site survey required to verify width, age of structure, and ability to accommodate additional tracking.
IUL-14	232 Street	2 lane overpass	N/A	Width between columns of overpass to be verified

IUL-14	Hydro Lines	Multiple crossings	N/A	Significant hydro line crossings just east of 232 Street overpass
IUL-15	Double Tracking (north line) connect to CN mainline	2 track section	N/A	2.64 Km from just east of 232 Street overpass just beyond turnout as the corridor turns northward
IUL-16	72 Avenue	2 lane crossing at-grade	No	
IUL-18	240 Street	2 lane crossing at-grade	No	
IUL-18	Siding	400 metres	N/A	Just east of 240 Street crossing
IUL-19	248 Street	2 lane crossing at-grade	No	
IUL-20	256 Street	2 lane crossing at-grade	No	Note: turnout to west of road on north side next to old BC electric railway Terminal building
IUL-21	67 Avenue	1 lane crossing at-grade	No	Used for private property access / Stop sign + X-ing sign
IUL-22	64 Avenue	2 lane crossing at-grade	No	Stop sign + X-ing sign
IUL-22	264 Street	2 lane overpass	N/A	Need to confirm ToR to underside of this structure
IUL-23	62 Avenue	2 lane crossing at-grade	No	Stop sign + X-ing sign
IUL-25	272 Street	2 lane crossing at-grade	No	Stop sign + X-ing sign
IUL-25	Spur Line	Turnout just east of 272 St	N/A	Active – serves Ropak Packaging on S/S
IUL-25	Spur Line	Turnout east of previous SL	N/A	To be verified if active – Hardwood Specialty products on S/S
IUL-25/26	Spur Line and Short Siding	East of Previous	N/A	Active – General Motors on S/S
IUL-26	Spur Line	East of Previous	N/A	To be verified if active – Formations on S/S
IUL-26	Harris Rd./56 Avenue	2 lane Crossing at-grade	No	Very narrow ROW in this section as Bayne Street parallels the corridor for about 100m on the north side. Stop sign + X-ing sign

IUL-27	LeFeuvre Rd.	1.5 lane at-grade	No	Private Property Access – extension of LeFeuvre Rd. beyond cul-de-sac - Stop sign + X-ing sign
IUL-28	Rand Street	1.5 lane at-grade	No	Private Property Access - Stop sign + X-ing sign
IUL-29	Bradner Road	2 lane at-grade	No	Stop sign + X-ing sign
IUL-29	Siding	500 metres	N/A	Siding to North Side of mainline
IUL-30	Rodd Road	2 lane at-grade	No	Stop sign + X-ing sign – local
IUL-32	Mt. Lehman Road	2 lane at-grade	No	Stop sign + X-ing sign – local
IUL-33	Burgess Avenue / Trans Canada Trail	2 lane at-grade	No	Stop sign + X-ing sign – local + trail crossing
IUL-34	Trans Canada Trail	Path crossing - gravel	No	
IUL-35	Harris Road	2 lane at-grade	No	Stop sign + X-ing sign
IUL-36	Private access	1.5 lane at-grade	No	Private farm field access
IUL-36	Siding	600 metre	N/A	Siding to north side of mainline
IUL-36	Glenmore Road	2 lane at-grade	No	Stop sign + X-ing sign
IUL-37	Private Access	1.5 lane at-grade	No	Private Residence Access (to north side)
IUL-39	Gladwin Road	2 lane at-grade	Yes	Fully protected with gates
IUL-39	Private access	1 lane at-grade	No	Private gravel access to farm field just east of Gladwin Road
IUL-39	Townshipline Road	2 lane at-grade	Yes	Fully protected with gates
IUL-40	Private access	1 lane at-grade	No	Private gravel access to farm field south-east of Townshipline Road
IUL-41	Clayborne Road/Riverside street	2 lane at-grade multiple roads	No	Stop Sign + X-ing sign
IUL-42	Rail-Rail Xing	1 x 1 rail/rail crossing	N/A	BC Hydro Rlwy crosses CPR North/South Rlwy corridor/line
IUL-43	Private Access	2 lane at-grade	No	Private Road access to multiple properties to the west side of both BC Rlwy and CPR track just south of Bateman Road.
IUL-43 F	Valley Road	2 lane at-grade	No	Stop-sign and X-ing sign. Next to intersection with Abbotsford Hwy. Signalized based on actuated sensors for LT's

IUL-44f	McCallum Road	4 lane + LT lane at-grade	Yes Fully gated	Fully protected with gates and likely synchronized with adjacent intersection traffic control along Abbotsford Hwy.
IUL-44	Spur Line	Just south of Hazelwood Avenue	N/A	Active – Serves two businesses – Ritchie-Smith Feeds and ClearBrook Grain and Milling
IUL-44	Turner Street	2 lane at-grade Right in Right out access	No	Access to industrial subdivision
IUL-44	Hydro ROW	3 main lines above	N/A	3 sets of 3 main lines crossing over and Perpendicular to Rlwy line
IUL-45	Siding	450m	N/A	Siding on east side of mainline
IUL-45	Spur Line	West Side	N/A	To be verified if active - Mountainview Speciality Products
IUL-46	Morey Avenue	2 lane at-grade local	No	Stop + X-ing signs only
IUL-46	Spur Line	East Side	N/A	Turnout just north of Morey Avenue
IUL-46	George Ferguson Way	4 lane at-grade	Yes	Fully protected with gates
IUL-46	Essendene Avenue	4 lane at-grade	Yes	Fully protected with gates
IUL-47	Turnout from CPR	Connector track	N/A	North to south turnout from CPR to BC Rlwy
IUL-47	Turnout from BC Rlwy	Connector track	N/A	North to south turnout from BC Rail to CPR
IUL-47	Siding Ladder	2 tracks – 435m	N/A	Ladder on north side of mainline
IUL-48	South Fraser Way	Overpass – 2 lanes	N/A	To be verified if active - Clearances height and width between columns to be verified
IUL-49	Marshall Road	4 lane at-grade	Yes	Fully protected with gates
IUL-49	Hwy 1	6 lane overpass	N/A	
IUL-50	Spur Line	East Side	N/A	Not-Active – empty lot north of McClary Avenue
IUL-51	Siding 2 track	West side – 700 m	N/A	
IUL-51	Spur Lines	2 turnouts	N/A	Not-Active based on Photomapping
IUL-52	Vye Road	2 lane at-grade	No	Industrial Area – mostly truck traffic
IUL-53	Turnout from BC Rail	Connector track	N/A	Active – shows regular use

IUL-53	Siding Ladder	2 to 3 tracks either side		To be verified if active - BC Rail Yard / staging area north of Canada-US border
IUL-54	4 Avenue	4 lane at-grade	Yes	O-head signals only, no gates
IUL-54	Sumas Way	2 lane at-grade x 2	Yes	Fully protected with gates
IUL-55	2 Avenue	2 lane at-grade	No	Local road
IUL-56 to 79	Multiple – approx. 14	2 lane at-grade	No	Both public and private access crossings – parallel mostly to Vye Road for 20 km
IUL-80	Yarrow Central Rd.	2 lane at-grade	Yes	Signals only, no gates
IUL-81	Private Road	1.5 lane	No	
IUL-81	River Crossing	1 track	N/A	Crossing of Chilliwack River – structure types and condition to be verified
IUL-82	Hodge Road	2 lane at-grade gravel	No	
IUL-82	Keith Wilson Rd.	2 lane at-grade	No	
IUL-85	Lickman Road	2 lane at-grade	No	
IUL-86	Spur Line	1 track to multiple	N/A	Active – Rogers Foods
IUL-87	Siding	170m	N/A	North side of ML, south of Sumas Road
IUL-87	South Sumas Rd.	2 lane at-grade	No	
IUL-87	Unsworth Road	2 lane at-grade	No	
IUL-88	Spur Lines	Multiple	N/A	Both north and south sides – active – Dryco Industries
IUL-89	Evans Road	4 lane at-grade	Yes	O-Head Signals, no gates
IUL-91	Spruce Drive	2 lane at-grade	No	
IUL-91	Vedder Road	4 lane at-grade	Yes	O-Head Signals, no gates – To be verified if active
IUL-92	Webb Avenue	2 lane at-grade	No	
IUL-93	Valley Rail Trail		N/A	Parallel to east side of track from Webb Avenue to Hwy 1. Goes over Hwy 1 on newly constructed rail bridge (F) – trail continues north to Airport Road
IUL-95	Airport Road	2 lane at-grade	No	
IUL-95	Hocking Avenue	2 lane at-grade	No	
IUL-95/96	Siding	800 m	n/a	Connects to CPR Mainline – just west of Former location of Chilliwack Rail Station

TABLE 2 – SUMMARY LIST OF CROSSINGS/SPUR LINES/SIDINGS – CP Rail Mission Subdivision				
MA Section	Crossings	Type	Signalized	Other/Notes
MA-1	London Ave	2 lanes at-grade	Yes	Industrial Road in Mission north of Fraser River
MA-1	Hwy 11 Access Ramps	3+3 lanes overpass	N/A	
MA-2	Rail Bridge	1 Track	N/A	CP Rail Mission Bridge across Fraser River – Single Track with swing bridge at southern end of river. 31 train crossings in 2016.
MA-2	Trans Canada Trail	Pathway at-grade crossing	No	Unprotected
MA-3	Turnout	Single	N/A	Switch/turnout that connects to CN Yale Subdivision going west
MA-3	Page Road	2 lanes at-grade	Yes	Signals only
MA-3	Turnout	Single	N/A	Switch/turnout that connects to CN Yale Subdivision going east
MA-4	Hwy 11	4 lanes overpass	N/A	
MA-4	Rail/Rail Crossing	At-grade 2 tracks	Rail based	Major rail/rail at-grade perpendicular crossing of CN Yale Subdivision
MA-4	Fore Road	2 lanes at-grade	No	Unprotected – stop and x-ing signs only
MA-5	Harris Road	4 lanes divided at-grade	Yes	Gates and signals
MA-7	Townshipline Road	2 lanes at-grade	No	Unprotected – stop and x-ing signs only
MA-8	Clayburn Road	2 lanes at-grade	No	Unprotected – stop and x-ing signs only
MA-8	Rail-Rail Xing	1 x 1 rail/rail crossing	N/A	BC Hydro Rlwy crosses CPR North/South Rlwy corridor/line
MA-10	Private Access	2 lane at-grade	No	Private Road access to multiple properties to the west side of both BC Rlwy and CPR track just south of Bateman Road.
MA-10	Valley Road	2 lane at-grade	No	Stop-sign and X-ing sign.
MA-12	MacLure Road	4 lanes at-grade	Yes	Signals and gates
MA-12	McCallum Road	2 lanes at-grade	Yes	Signals and gates
MA-13	Connector track	CP to FV sb	N/A	

MA-13	George Ferguson Way	4 lane at-grade	Yes	Fully protected with gates
MA-13	Essendene Avenue	4 lane at-grade	Yes	Fully protected with gates
MA-14	Turnout to CPR	Connector track	N/A	North to south turnout from CPR to BC Rlwy
MA-14	Turnout to BC Rlwy	Connector track	N/A	North to south turnout from BC Rail to CPR
IUL-47	Siding Ladder	2 tracks – 500m	N/A	Ladder on north side of mainline
IUL-48	South Fraser Way	Overpass – 2 lanes	N/A	Clearancesheight and width between columns to be verified
IUL-49	Marshall Road	4 lane at-grade	Yes	Fully protected with gates
IUL-49	Hwy 1	6 lane overpass	N/A	
IUL-51	Siding 2 track	West side – 700 m	N/A	
IUL-52	Vye Road	2 lane at-grade	No	Industrial Area – mostly truck traffic
IUL-53	Turnout from BC Rail	Connector track	N/A	Active – shows regular use
IUL-54	4 Avenue	4 lane at-grade	Yes	O-head signals only, no gates

Attachment C - Corridor Maps

Included under separate cover.

FRASER VALLEY PLANNING AND DEVELOPMENT ANALYSIS

FRASER VALLEY REGIONAL RAIL PRE-FEASIBILITY STUDY (APPENDIX “B”)

June 2021

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Note: The following memorandum provides a more detailed review of land use and development patterns in the Fraser Valley, including the opportunities and constraints related to the topic. This work has informed the analysis found in the broader Pre-Feasibility Study and provided one of the qualitative outputs to assess regional rail the region

Introduction

As part of the FVITDP Pre-Feasibility Rail Study, a review of development planning and growth strategies has been undertaken to assess the alignment of potential passenger rail services on existing corridors with municipal and regional long range land use planning.

The following provides an analysis of the growth and development framework of the communities within the Study Area, including Abbotsford, Chilliwack, Langley and Mission, along with the Fraser Valley Regional District. Objectives of this review include analysis of:

- Physical corridor alignment with long term municipal growth and development planning
- Relationship and integration of rail corridors with existing land use patterns and urban structure
- Congruency of municipal growth and transportation policy directions with passenger rail opportunities

As an outcome, the goal is to better understand current and future plans for the areas surrounding the existing potential rail corridors, in order to analyze how the potential utilization of rail corridors in these communities for passenger service supports existing plans and the intended future growth of the region and its communities. This analysis will also inform the development of service concept options, including optimal possible stop areas along the corridors that align with municipal development plans, and which could support the viability of a rail service with greater potential demand and access to key destinations.

Demographics

Over the last decade, the Fraser Valley region has experienced the highest growth rates of any region in BC, with an overall growth rate of 6.6%, compared to the provincial average of 5.5% over the same period.

Within the municipalities of the FVRD, the current estimated population of 320,000 (2019) is anticipated to grow to around 500,000 by 2051, with the majority of that increase absorbed by Abbotsford (+ ~90k), Chilliwack (+ ~63k) and Mission (+ ~27k).

Langley's population has also experienced considerable growth over recent years, with the population growing by 17% since 2011. Recent projections by Metro Vancouver forecast that the east region south of Fraser River (including Surrey, White Rock and Langley) will increase by 471,800 more residents by 2050, growing on average 1.6% annually. These growth rates compare to the projected provincial growth rate of approximately 1.1% to 2040.¹

This rapid growth has placed increasing pressure on both transportation networks and land supply in the Fraser Valley, and this is anticipated to only continue into the future, placing further strain on infrastructure, housing and facilities.

Table 1. FVRD Population Growth Estimates 2016-2051

Population Growth Estimates				
	2016	2026	2041	2051
Abbotsford	148,056	172,767	214,935	237,422
Chilliwack	87,560	105,644	134,045	151,027
Mission	40,668	47,421	57,901	67,196
Hope	6,385	6,931	7,359	7,969
Kent	6,356	6,870	7,240	7,840
Harrison	1,514	1,750	2,027	2,196
EAs	10,775	12,515	14,674	15,578
Reserves	8,128	9,441	11,069	11,752
FVRD	309,442	363,338	449,249	500,979

Figure 1 - Fraser Valley Population Growth Projections. Source: FVRD Regional Growth Strategy Update, 2020 (draft)

Economic Development

Historically, the employment base of the Fraser Valley has been centred around agriculture and resource industries. The Valley also has significant job sectors in construction and associated trades, along with logistics. More recently, the economy has begun to diversify, and increasingly includes a range of employment sectors including in professional services and emerging aerospace and high-tech fields². Over the coming years, employment in the region is expected to increase by approximately 100,000 jobs by 2050. Of the job growth, approximately 52% will be in Abbotsford, 29% in Chilliwack, 12% in Mission with the remaining 6% in the rest of the region.³

Fraser Valley Regional District – Regional Growth Strategy

The Fraser Valley Regional District Regional Growth Strategy (Fraser Valley Future 2050) was published in August 2020, and builds upon the 2014 RGS update and the original 2004 RGS 'Choices for our Future'. It aims to provide the vision and guidelines for growth unto 2050, address challenges inherent to the region and support the sustainable future of the region.

The Regional Growth Strategy provides a long-term vision and guidance for the growth of communities in the Fraser Valley, and promotes coordination among municipalities on cross-jurisdictional issues, including land use and transportation strategies to be considered in the development of municipal development plans.

¹ BC Statistics, PEOPLE 2020: BC Sub-Provincial Population Projections

² 2020 Regional Growth Strategy Update (draft), Fraser Valley Regional District

³ Ibid

Regional Development Structure (RGS)

The agricultural function of the Fraser Valley, including significant areas dedicated to agricultural production through the Agricultural Land Reserve, have had a significant impact on the evolution of urban development and land uses in the region. As a provincial designation, lands within the ALR are to be used exclusively for a limited range of agricultural related activities, and provincial policies limit the use of the ALR for non-agricultural uses (e.g. housing)⁴. As a result, there continues to be a high proportion of agricultural land with major urban centres separated by farmland extending significant distances. Over the long term, agricultural lands are anticipated to be protected for agricultural purposes. This has created a unique landscape within the region as the protection and preservation of agricultural land encourages more centralized urban centres with a concentration of population and services.

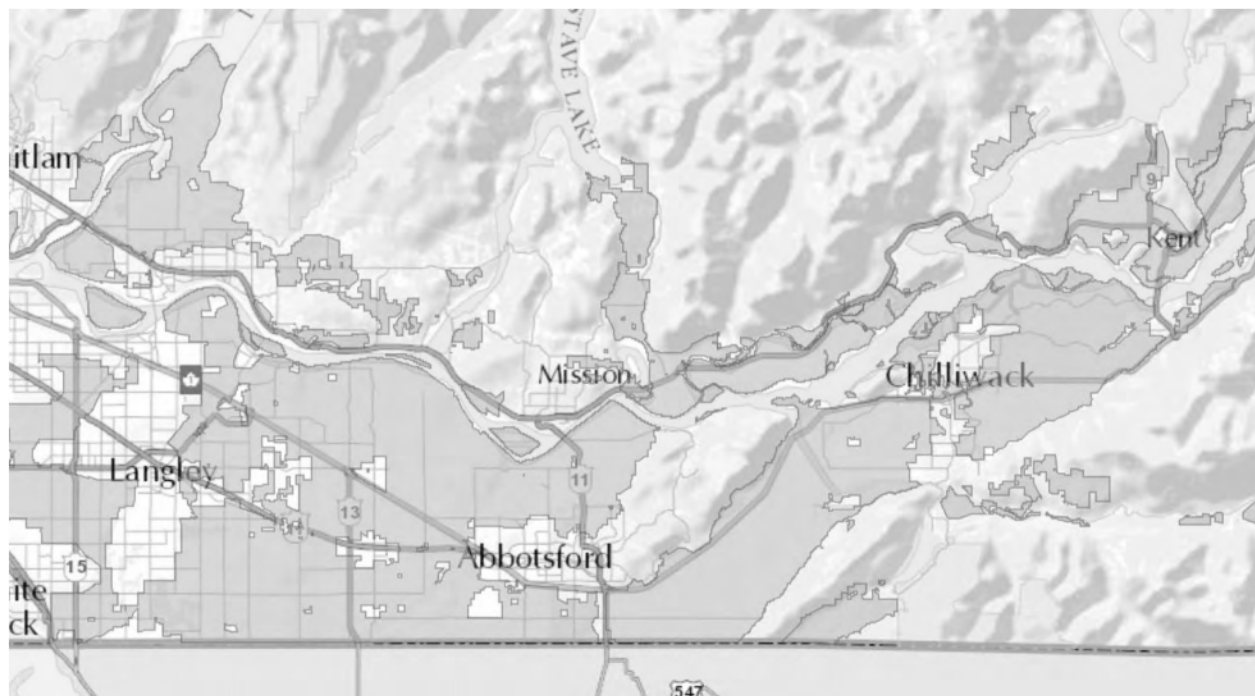


Figure 2: Prevalence of ALR (in darker green) across the Fraser Valley

Land Use & Growth Policies

Informed by the significant presence of the ALR across the region, the RGS envisions growth to occur within Regional Growth Boundaries which delineate areas of concentrated urban development and are outside of prime agricultural land across the Valley. Key growth directions encourage development of more compact, higher residential density development around downtown cores, and facilitate more complete communities (places where residents' daily needs can be met within a short distance). The RGS also encourages commercial and industrial development that is clustered in order to create

⁴ The upgrading or expansion of existing road, rail or utility infrastructure within an ROW is generally permitted within the ALR, however introduction of new ROWs or expansion of existing requires an application to the Agricultural Land Commission. The application process is provincially mandated opportunity for the Commission to consider and mitigate the impacts of a ROW project.

competitive advantages and foster collaboration. By concentrating and densifying key locations through residential, commercial and industrial development, the intent is for the region to facilitate Transit-Oriented Development in key areas which allows for enhanced transit connectivity regionally and inter-regionally, and attract more movement using active transportation methods rather than through automotive means.

The RGS also includes an integrated, region wide transportation vision, and sets a number of Transportation Priorities to achieve it. Currently, the Regional Transit Network is envisioned to include a combination of Bus Rapid Transit services, Frequent Transit Service, Express Transit and West Coast Express services. The aim is to provide attractive regional and inter-regional transit services within the Fraser Valley and between the Fraser Valley and Metro Vancouver, connecting the various residential, industrial and commercial hubs in their respective municipalities.

Analysis

Over the long term, the RGS supports the evolution of communities in the Fraser Valley as compact and complete urban areas connected by sustainable transportation systems that support minimizing sprawl and protection of agricultural areas. From the perspective of the regional structure, these concentrated urban nodes distributed across the region are envisioned to be supported by higher order transportation corridors offering fast, efficient and sustainable mobility options to link major destinations, and complement local mobility networks (local roads, transit, and active transportation).

With the presence of ALR areas within the region there are significant distances that separate communities, with low concentrations of development in between. Densities also drop sharply outside of major urban centres. Overall, the pattern of development in the region is characterized by concentrated and growing urban nodes, separated by long distances and areas with low development activity and minimal anticipated growth. This regional landscape, and it's concentrated pattern of development, could respond well to a fixed route system connecting major centres.

With respect to transportation corridors, the land use structure of the Valley leaves considerable ALR land between urbanized communities, requiring most corridors to cross considerable distances of low density farm land to reach from one population centre to another, regardless of mode. In review, the subject rail corridors respond to these conditions with a point-to-point alignment, linking the largest population centres, and generally running through low-density, underdeveloped agricultural lands outside of urban areas.

Regional Development Analysis Summary			
Objectives	Physical corridor alignment with long term municipal growth and development planning	Rail corridor relationship and integration with existing land use patterns and urban structure	Alignment of municipal growth and development policy directions with passenger rail opportunities
Opportunities & Constraints	<ul style="list-style-type: none"> At the regional scale, the corridors provide an existing ROW from urban areas through 	<ul style="list-style-type: none"> Provides direct connection to centres of the major key urban areas (Mission, Langley 	<ul style="list-style-type: none"> Responds in direction to create a sustainable regional level transit system.

	<p>the ALR, minimizing consumption of land</p> <ul style="list-style-type: none"> • Offers opportunity for high order transit corridor to connect envisioned compact urban nodes. 	<p>City, Abbotsford, Chilliwack)</p> <ul style="list-style-type: none"> • Corridors connect between key employment and residential communities covering significant travel markets. • Less connectivity to population areas in Langley Township, or smaller communities outside of major centres – Fort Langley, Aldegrove and Murrayville (Langley Township)⁵ 	<ul style="list-style-type: none"> • Provides opportunities to support inter-regional connections with Metro Vancouver. • Creates infrastructure to support objectives of achieving compact, transit supported development.
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Municipal Development Context

At a municipal level, long term development and growth planning is guided by local Official Community Plans (OCP). OCP's provide growth strategies and policies, including direction on urban structure, prescribed land uses, and transportation with the goal of shaping long term growth and planning. The OCP's land use plans also inform zoning by-laws, which control property level development.

OCP's are periodically updated to reflect new emerging or shifting priorities, such as higher than anticipated growth in an area, introduction of major new infrastructure (e.g. rapid transit), or new/revised regulation, policies and laws. As such, the OCP's provide the best indication of the planned development and growth direction of a municipality.

The Study Area straddles two regional districts – Fraser Valley Regional District and Metro Vancouver Regional District. The directions of the OCPs for Abbotsford, Mission and Chilliwack are informed by the Fraser Valley Regional District's Regional Growth Strategy, which provides a regional level strategy and policy direction to manage growth and change across the Valley over the coming decades.

As a member of Metro Vancouver, the OCPs for the Langleys are informed by the growth directions and strategies in Metro Vancouver's Regional Growth strategy (Our Future – Metro Vancouver 2040)⁶.

City of Langley

⁵ Located within Langley, these communities are outside of the FVRD, and fall under the jurisdiction of the Metro Vancouver Regional District.

⁶ As of the time of this report, Metro Vancouver is in the process of updating their regional growth strategy ("Metro 2050"), anticipated to be complete in 2022.

The City of Langley's OCP envisions growth and densification that is shaped around rapid transit, and focused on the downtown core, to support the achievement of a high level of liveability. It also envisions a long-term transportation plan that supports mobility at the neighbourhood, municipal and regional levels. In advance of the arrival of the planned Surrey-Langley Skytrain extension (SLS), the City of Langley is updating their OCP. While the new OCP remains in draft form, it has been reviewed here as indicative of the City's long term planning and development strategy.

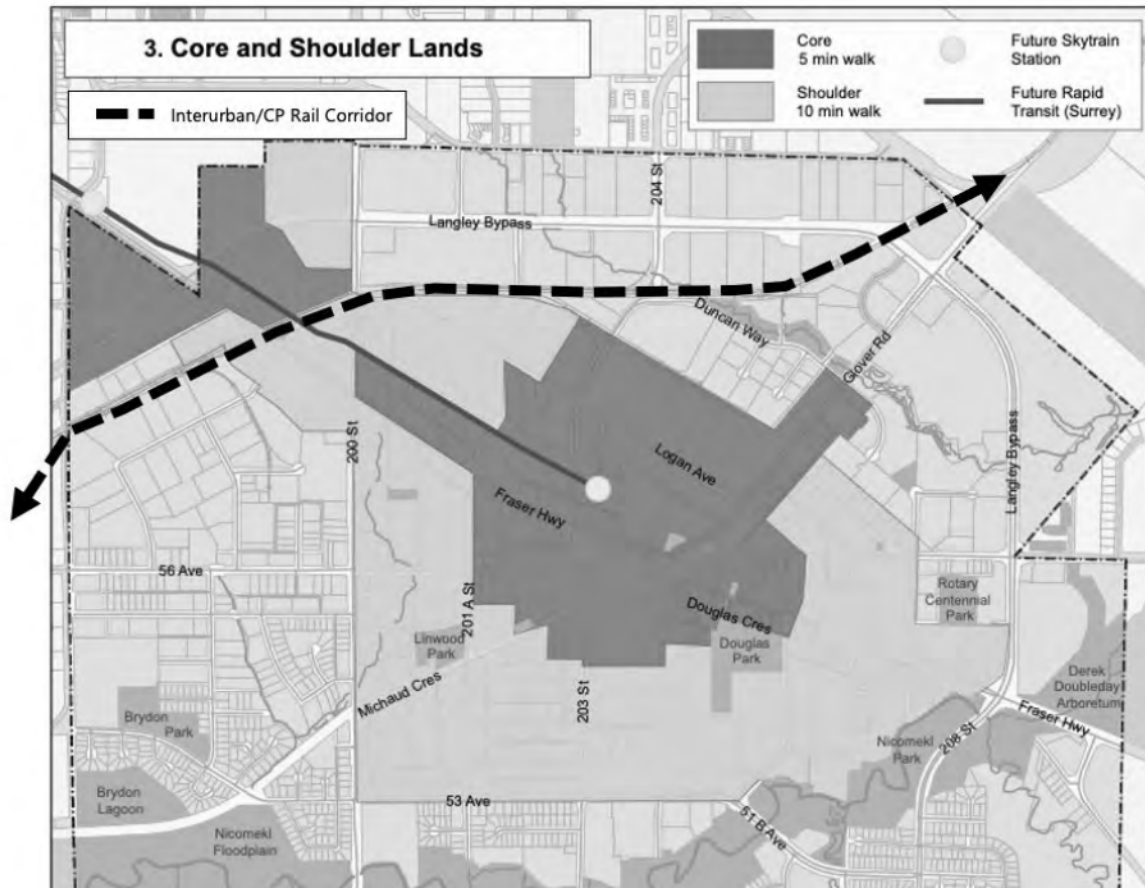


Figure 3 Langley City OCP Core Area and Proposed SLS route

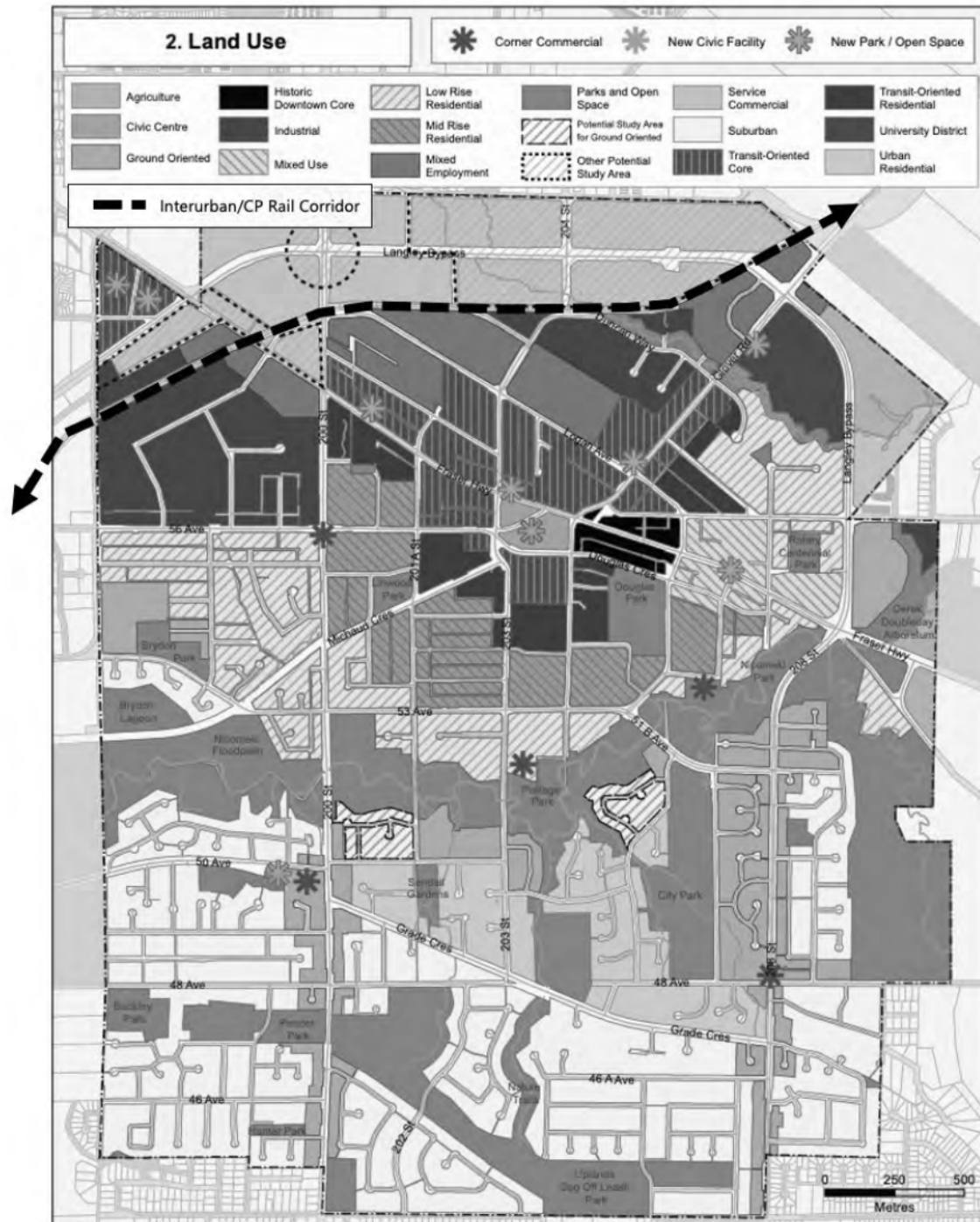


Figure 4 Langley City OCP Land Use Map

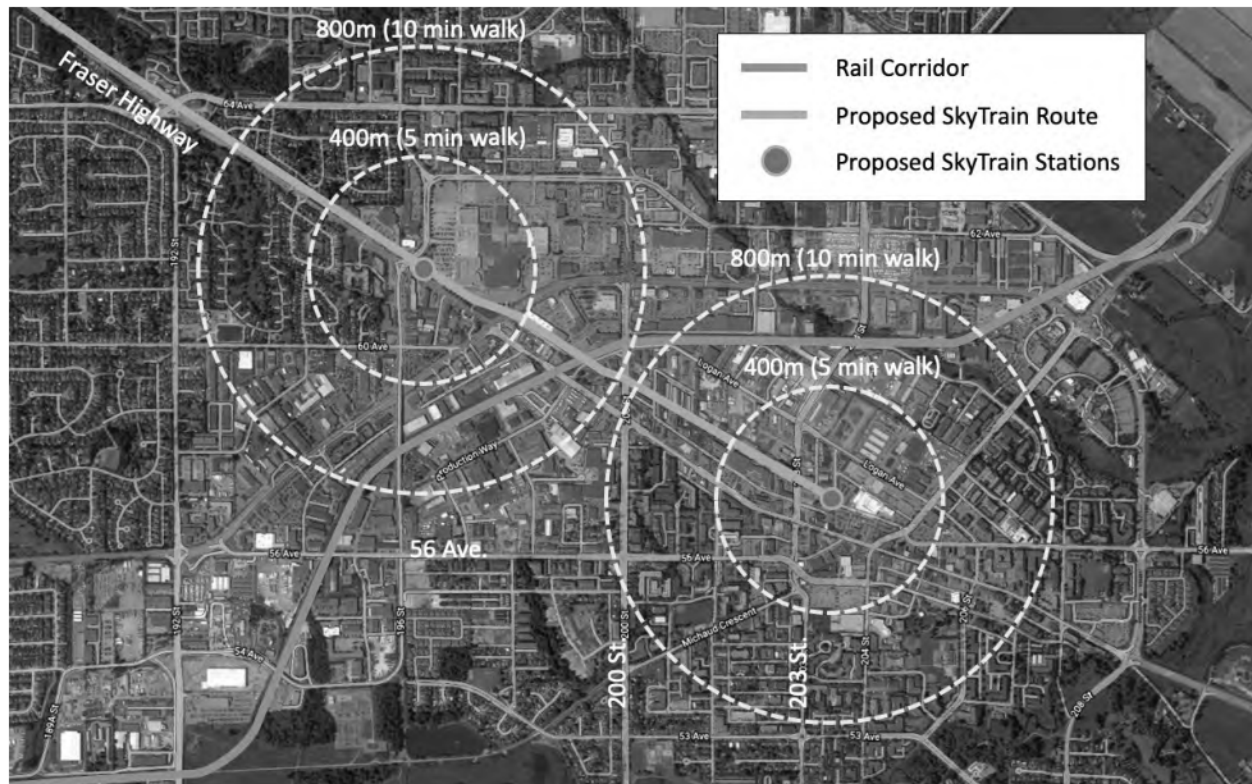


Figure 5 - Rail corridor relationship with Langley City downtown and proposed SLS line and stations.

Urban Structure and Land Use

In relationship to the urban structure of the City, the rail corridor (Interurban/Page subdivision) is located along the north edge of the City's Downtown Core, and runs in parallel with the Langley Bypass, intersecting with the Fraser Highway. As a long term growth and development strategy, the OCP envisions residential and commercial growth on underutilized land in the central downtown area.

The land immediately adjacent to the corridor is envisioned as a mix of service commercial, employment and industrial uses, reflecting historic land use patterns along the rail corridor as well as the Langley Bypass, which serves as a regional retail and service destination. In close proximity to the rail corridor within the City's downtown core, a number of significant changes have been proposed as part of the OCP update, in anticipation of the SLS⁷. This includes revised land uses supportive of densifying areas within a "Transit-Oriented Core", with high-density mixed used buildings around future SkyTrain stations, and considering locations near transit, commercial and employment hubs.

⁷ As of March 2021, final design and precise station configuration and locations for the SLS extension to Langley are still under development.

Analysis

With the arrival of SkyTrain service to central Langley, the City has planned for the downtown core to transform over time into a more compact and transit oriented community, with significant growth in population, employment opportunities, amenities and services and increasing the area's role as a regional centre and destination.

Along the Interurban/CP corridor, existing commercial and employment uses are planned to be retained, however denser forms of development are contemplated to increase employment concentrations. The corridor is also in close proximity (400-800m, 5-15 min walking distance)⁸ from both proposed SLS stations and the downtown core area, and as a potential passenger transportation corridor would offer an opportunity for increased multi-modal options to support the envisioned growth of central Langley.

City of Langley Development Analysis Summary			
Objectives	Physical corridor alignment with long term municipal growth and development planning	Rail corridor relationship and integration with existing land use patterns and urban structure	Alignment of municipal growth and development policy directions with passenger rail opportunities
Opportunities & Constraints	<ul style="list-style-type: none"> Corridor is within walking distance of areas planned for significant future intensification as a "Transit Oriented Core" with higher densities in a compact, emerging "downtown" area supported by rapid transit. Significant development is envisioned immediately around the SLS stations – consideration needed around land use around rail corridor to support TOD 	<ul style="list-style-type: none"> The corridor is in close proximity to the current commercial core of Langley City, and within short distance of the proposed SLS stations. Continued presence of employment/light industrial areas along the corridor require consideration as part of station area selection (limited TOD opportunities). Longer walking distance to connect FV Rail and SLS may impede ridership due to time transfer penalty. Consideration should be given to station location and if there can be synergies or changes to 	<ul style="list-style-type: none"> Introduction of an additional rail transit line in close proximity to the SLS can bolster the viability for both, as well as support the City's objective of fostering Transit Oriented Development.

⁸ The walkshed represents the estimated distance that an average person may reasonably be expected to walk to access a destination (approximately 5km/hr). This is determined with a radius around a given location, with the walk time calculated by distance.

		SLS in conjunction with planning of FV rail.	
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Township of Langley

Adopted in 2016, the Township of Langley OCP aims to provide a community vision and guidelines for growth over the next 30 years (2043). The OCP envisions sustainable growth that does not compromise the Township's agricultural or ecological integrity.

Urban Structure and Land Use

Similar to other areas of the Fraser Valley, Langley township is covered by large agricultural areas held within the ALR. Urbanized areas are generally concentrated around Langley City and to the north towards Hwy 1.

The OCP identifies the area surrounding 200th Street and the Fraser Highway as the core of Langley (Langley Town Center) and envisions the area as the commercial core and a regional business centre, with good prospects for retail, office and light industrial development and multi-family, higher density residential uses. It is worth noting the Township boundaries encircle Langley City, however the area functions as a contiguous urban centre.

Within the boundaries of the Township, a majority of the Interurban/CP corridor is bounded by agricultural land. However, the rail corridor does intersect with areas of commercial, residential and employment growth in the immediate area between the Township and the City of Langley and also runs in close proximity to Trinity Western University.

A key node within the Town Centre is the Willowbrook Regional Centre, which is bounded along the southern edge by Fraser Highway and 200st. This is also the approximate area for the proposed 200 St. Station of the SLS, and within a short distance (400-600 m) to the Interurban/CP rail corridor.

In response to the impending SkyTrain extension, the Township is expected to undertake a review and update of the Willowbrook Community Plan to leverage the infrastructure investment and rapid transit connectivity. In addition to creating a compact transit oriented node around the future SkyTrain station location, intensification and redevelopment in the Willowbrook area and surrounding context will also add considerable density of people and jobs within the central parts of the Langley Township.

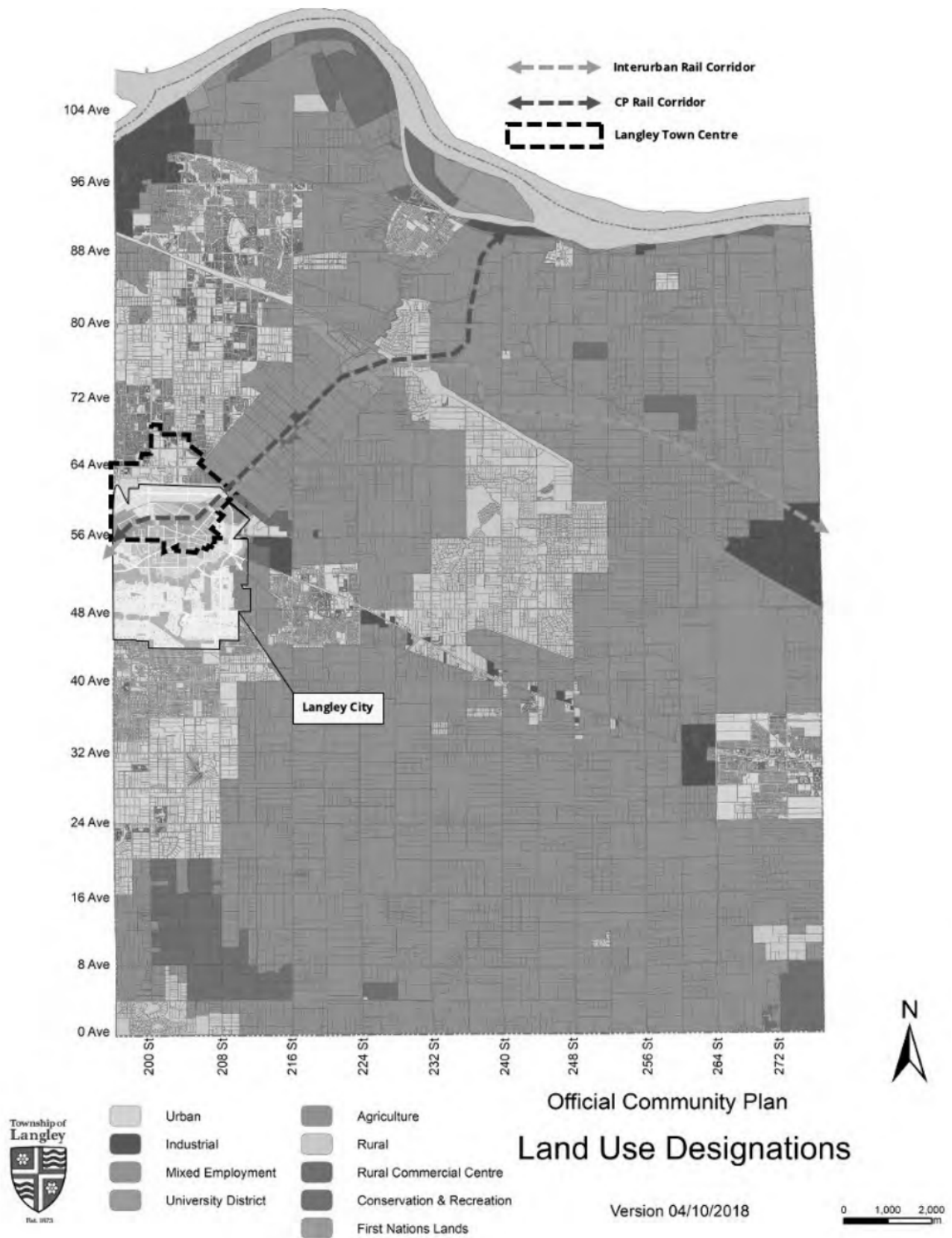


Figure 6 - Township of Langley OCP Land Use Designations

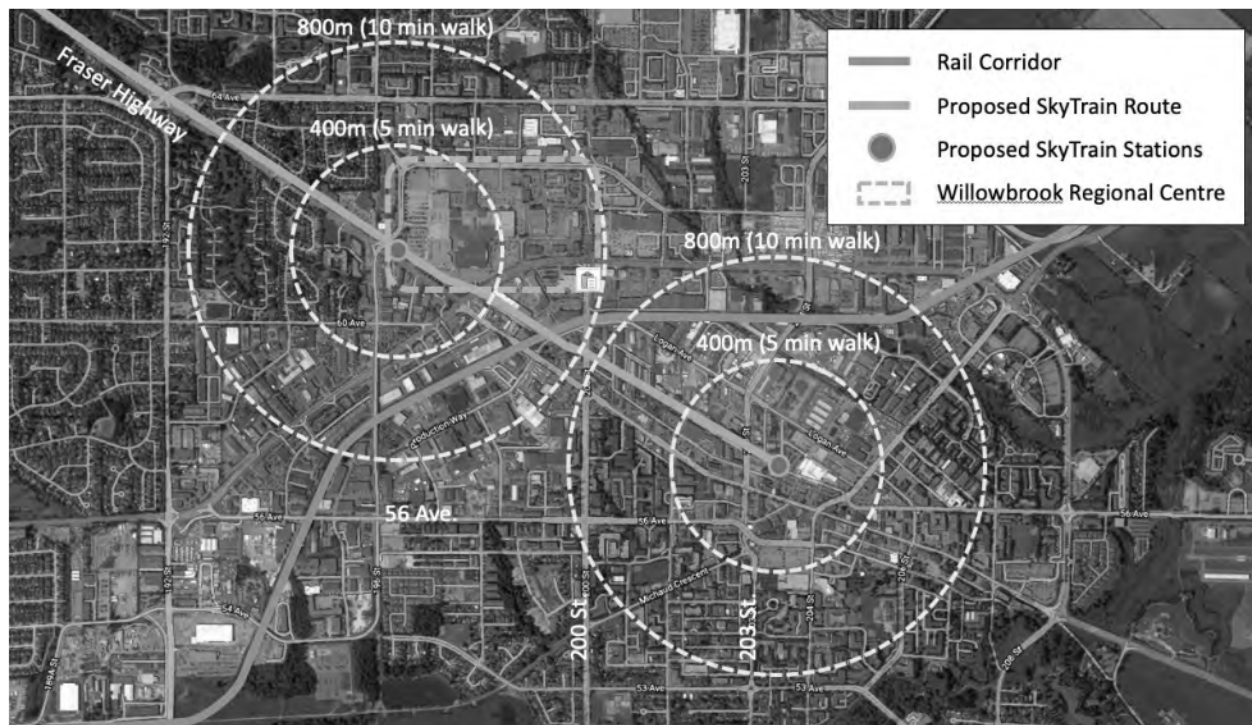


Figure 7 - Location of Willowbrook Regional Centre in relation to Interurban corridor and proposed SLS route and stations.

Analysis

Current land use patterns in the Township reflect the evolution of the municipality with an identity strongly informed by its agricultural heritage and suburban character as a community that was located on the periphery of Metro Vancouver. The unique municipal boundaries of the Township and Langley City effectively separates the urban core of broader Langley as Langley City, while more rural and suburban areas form the Township. As an outcome, the Township has not developed a distinctly identifiable urban centre from the City, and the two municipalities function as a continuous urban area with undistinguishable boundaries. However, significant growth pressure in the Langleys, and introduction of the SkyTrain extension are likely to spur a level of intensification and redevelopment in areas with good linkages and proximity to the transit service. This includes areas where there is a relatively close physical relationship between the Interurban/CP rail corridor and proposed Skytrain line and stations (Willowbrook Regional Centre), particularly in the vicinity on the intersection of the rail corridor with the Fraser Highway.

In relationship to the rail corridor, the future growth of Willowbrook as a TOD area, and broader increasing concentration of employment and people in the Langley Town Centre area will be well aligned with the introduction of passenger rail with station options within close proximity. However, it is worth noting that historically, the Township's growth has been oriented around a north-south axis along 200th St., with most growth being absorbed through predominantly single-detached subdivisions. While planning is underway to accommodate more transit supportive land uses around the future SLS station (Willowbrook), it remains to be seen how this will impact long term growth patterns, and the ability to achieve greater densities of people and jobs in the Langley Town Centre Area.

Outside of Urban areas (see Figure 7), there remains considerable ALR areas along the Interurban/CP corridor that are not anticipated to absorb growth, and have been planned over the long term to remain as agricultural lands with a low level of population density and development, leading to a concentration of development and growth within existing urbanized nodes, which if focused around potential station areas, could support the realization of transit supportive densities along a point-to-point rail network.

Township of Langley Development Analysis Summary			
Objectives	Physical corridor alignment with long term municipal growth and development planning	Rail corridor relationship and integration with existing land use patterns and urban structure	Alignment of municipal growth and development policy directions with passenger rail opportunities
Opportunities & Constraints	<ul style="list-style-type: none"> Corridor is in close proximity to the Willowbrook Regional Centre, which is anticipated for long term evolution into a mixed-use, TOD area. There is good connectivity to Willowbrook and the Langley Town Centre area. While the Township's growth has been oriented around 200th St., the rail corridor runs through predominantly ALR land outside of Langley Town Centre. 	<ul style="list-style-type: none"> To the east of Langley Town Centre, key destinations are limited (large ALR presence). The notable areas of development would include Trinity Western University and the Gloucester Business Centre. 	<ul style="list-style-type: none"> As of the time of this report, the Township is still in the process of updating the Willowbrook Community Plan with transit-oriented land uses policies, however, broader OCP policies support the objective of developing a multi-modal transportation system.

District of Mission

Similar to OCP's for other Fraser Valley communities, the District of Mission's Plan recognizes a need to encourage mixed land uses, and establish well designed, highly dense, compact and walkable neighbourhoods to achieve a high level of liveability. The OCP also considers the need for dense community development as important in making the expansion of transit economically feasible and achieve the goal of Transit-Oriented Development.

Urban Structure and Land Use

The CP Rail Corridor (and WCE line) is located in South Mission, and runs in parallel with the Fraser River (east-west). As the terminus for the West Coast Express, the Mission City station, lies in close proximity

with Mission's Downtown, which is approximately framed by North Railway Avenue, Birch Street, Fifth Avenue and Murray Street (see Figure 8). The District's Downtown Action Plan envisions Downtown Mission as a place that will provide a range of mixed-use, residential, commercial, civic, educational and community spaces with a compact and attractive urban form that supports walking and transit use among other mobility options. The plan also envisions stronger connections between Mission City Station to 1st Avenue and other downtown activity nodes, and attract families to live in the downtown area through supporting a mix of medium and high-density residential units.

Mission's OCP also identifies the Waterfront Comprehensive Planning Area as an area for future development. The OCP indicated that part of this area is currently a mix of light industrial and commercial land. However, there is indicated potential to support mixed use development of both high-density residential units and commercial land, due to its proximity to the West Coast Express station.

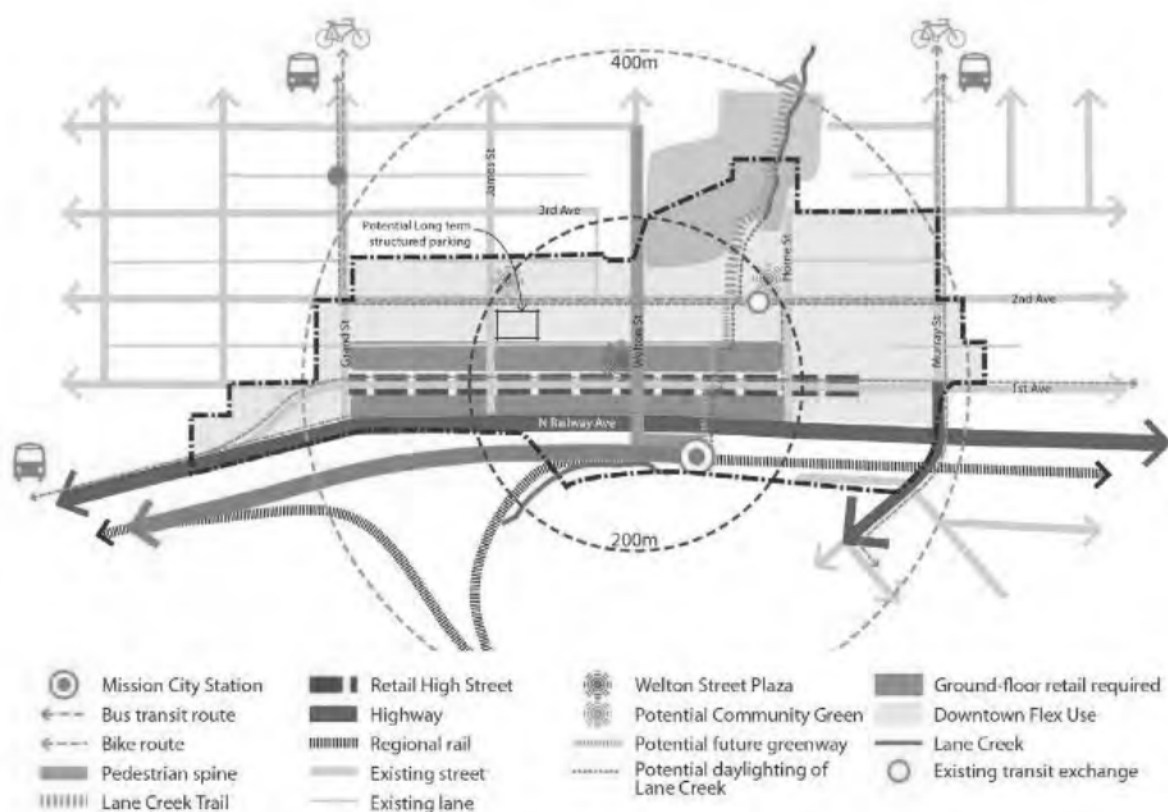


Figure 8 Mission Downtown Plan (District of Mission OCP)

Outside of the downtown area, the OCP envisions the development of hubs that link Mission City, Cedar Valley, Hatzic and Silverdale neighbourhoods together through higher residential densities and transportation.

Of note is the Silverdale area, an emerging neighbourhood with a forecasted population of 25,000 people, for which the OCP supports the development of a compact neighbourhood with a mobility hub, providing local and regional transit connections. Located to the west of central Mission, and adjacent to

the CP/WCE corridor, the area has in the past been considered a suitable location for a potential additional West Coast Express station to serve the emerging neighbourhood⁹.

In terms of residential land use patterns, the District continues to have single-detached housing as the dominant form, attributed to the relative affordability and character of the District compared to other places in the Lower Mainland. With land available for development and comparatively lower price pressures, a noted challenge has been the ability to establish a market that attracts buyers of higher density housing¹⁰.

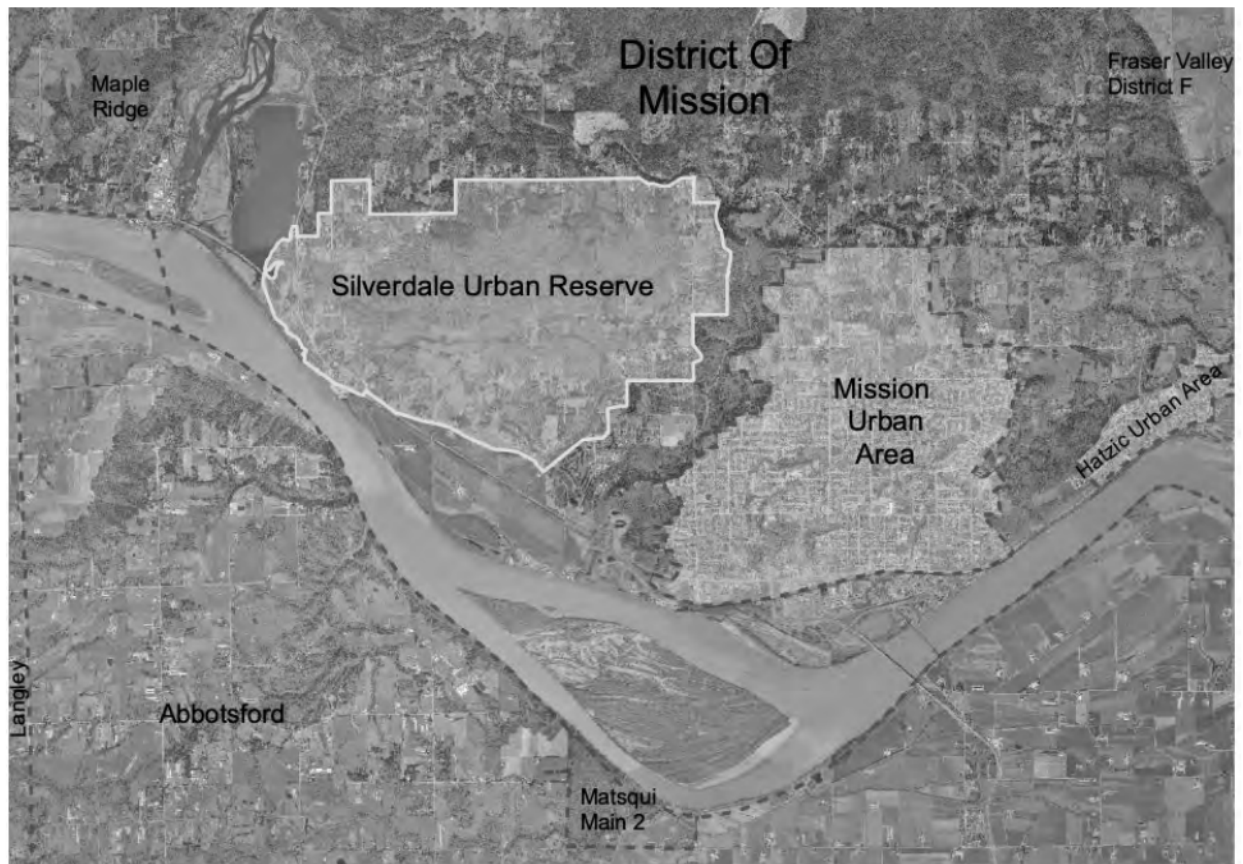


Figure 9 Silverdale Neighbourhood Area (in yellow)

⁹ West Coast Express Strategy Service, Fleet and Infrastructure 2013-2014, August 2013

¹⁰ District of Mission OCP Draft (2017), S. 5.0 Housing & Lifestyle

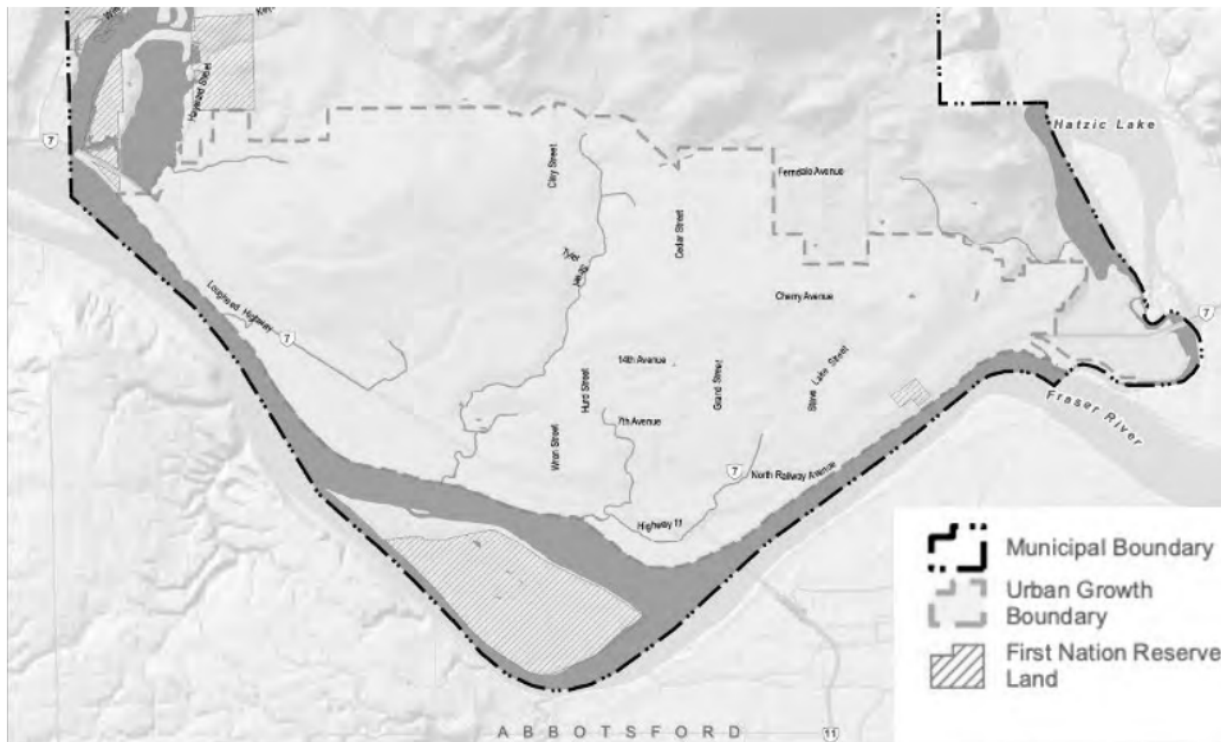


Figure 10 District of Mission Urban Boundaries

Analysis

The District's long-term planning and development strategies envision future intensification and development to be focused within the area immediately surrounding the rail corridor and Mission City WCE Station. However it is also worth noting that in comparison to other Fraser Valley communities, Mission has significant undeveloped areas within the Urban Growth Boundary (e.g. not within the ALR). Accordingly, while the District has seen significant growth rates over the last decade, most of this has been realized through new greenfield development at the urban built boundary, and at relatively low densities (i.e. low rise, predominantly single-detached housing) and minimal redevelopment or infill has occurred in central parts of the city or in proximity to the WCE station.

While the WCE has provided a reliable commuter service to access Metro Vancouver, as a one-direction, peak only service, it has not supported regional travel and accessibility to Mission from adjoining communities. Options to address better inter-regional connectivity through passenger rail might include additional WCE stations within Mission, such as Silverdale, extending WCE to Abbotsford to serve the Mission-Abbotsford corridor, as well as enhancements to the existing service, which could include reverse peak or off-peak trains to meet regional movement patterns along with commuters into Metro Vancouver. Another option could include connecting a new passenger rail service linking with the WCE in mission, and running south into Abbotsford and beyond as a more frequent and bi-directional service with greater reach into the Fraser Valley. This could support the realization of the District's growth strategies for the downtown area with enhanced regional and local connectivity, as well as provide the opportunity to support more transit oriented forms of development in new growth areas.

Mission Development Analysis Summary			
Objectives	Physical corridor alignment with long term municipal growth and development planning	Rail corridor relationship and integration with existing land use patterns and urban structure	Alignment of municipal growth and development policy directions with passenger rail opportunities
Opportunities & Constraints	<ul style="list-style-type: none"> • Current WCE area has been identified as a future growth node through intensification by the District • New greenfield development (e.g. Silverdale) may compete with intensification objectives, however improved rail service along existing WCE corridor which is aligned with proposed development areas could help to shape more transit supportive new growth. 	<ul style="list-style-type: none"> • Existing WCE station (and CP corridor) is well situated within Mission's downtown, providing a centralized station area with good transit and pedestrian connectivity to commercial and retail areas. • Extension of WCE may require relocation of Mission Station away from the Downtown area. • Residential land use patterns generally remain lower density with distributed growth. Growth has historically come through expansion of urban areas into greenfield development – considerable undeveloped areas remain. 	<ul style="list-style-type: none"> • OCP encourages more dense, transit oriented development near transit stops, and calls for supporting high densities in the downtown, waterfront, and established neighbourhoods to make transit expansion more economically feasible.

Abbotsford

The Abbotsford OCP (2016) aims to provide direction in shaping the future growth of Abbotsford over the next 24 years, setting the direction for development of supporting plans such as the Transportation & Transit Master Plan (2018) and various area plans to guide the growth of new communities and the evolution of existing, established neighbourhoods.

Urban Structure and Land Use

The OCP identifies an Urban Core centered around a City Centre, with a number of Urban Centres along an envisioned rapid transit corridor oriented along South Fraser Way and McCallum Road (see urban structure designations on Figure 11). The Urban Core includes four Urban Centers (Clearbrook, Historic Downtown, McCallum and UDistrict), the City Center and surrounding areas linked by South Fraser Way

(shown on the map below). While the City Centre is identified as the downtown core of the city, the Urban Centers act as anchors on a transit corridor to connect Neighbourhood Centres to the City Centre.

As part of the City's growth strategy identified through the OCP, a target of 75% of total new residential growth is anticipated to occur in existing centres and neighbourhoods, of which 60% of new residential growth (approximately 35,000 new residents) will be in the Urban Core. The OCP also plans to focus 70% of new commercial development in areas designated as the City Centre, Urban Centres and 'Neighbourhood Centres'.

Over recent years, development patterns have shown indications of a shift toward more compact development envisioned in the OCP. From 2011 to 2016, multi-unit dwellings grew from 26% of total dwelling types to 31%, while single detach homes fell from 44% to 39% of the total, reflecting a development trajectory supportive of increasing compact housing forms¹¹ and transit supportive development.

With respect to the rail corridors, the Interurban and CP lines are situated to the east of Abbotsford's City Center, running north-south. Once within the Urban Development Boundary (see Figure 11), the rail corridors are bounded to the north and south by Employment Lands. These areas are intended to support commercial and industrial activities, and are not planned for residential uses, mixed-use, or intensification. Moving beyond these bordering Employment Lands, the corridors pass through the City's Historical Downtown Urban Centre. The OCP envisions the Historical Downtown area evolving as a focus for employment, commercial activity and business, with a mix of multi-family, multi storey low to mid rise and commercial buildings.

While the rail lines are situated approximately 1.5km from the City Centre, the entire corridor from Historic Downtown to City Centre forms part of an "Urban Core", envisioned as a transit supported area capturing future growth through infill and redevelopment. Long term transit plans also call for the creation of a rapid transit route along this corridor as either a rapid bus or light rail service (identified as the Primary Transit Corridor on Figure 11)¹². In addition, the City has identified the location of a future Transit Hub along Montrose Ave. in the Historic Downtown, within 1-2 min walking distance to the Interurban/CP corridor (see Figure 12). The hub would serve local bus services, as well as the provide a stop or exchange for the rapid transit route.

¹¹ Statistics Canada, 2011 & 2016 Census, Abbotsford City CSD

¹² See the Transit Integration Analysis prepared as part of the Regional Rail analysis for further details.



Figure 11 - Examples of recent mixed-use and multi-family development in Abbotsford's Historic Downtown Neighbourhood [2493 Montrose Ave (left); 33568 George Ferguson Way (right)]

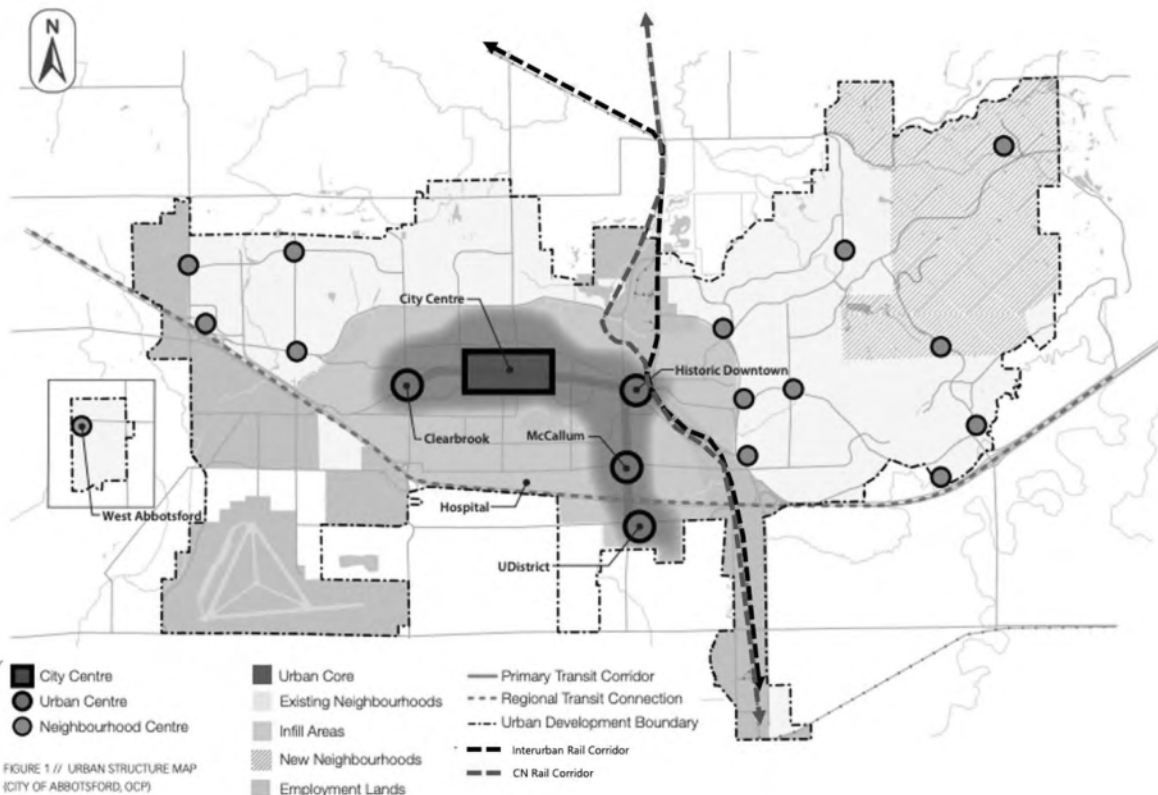


Figure 12 - Abbotsford Urban Structure (City of Abbotsford OCP)

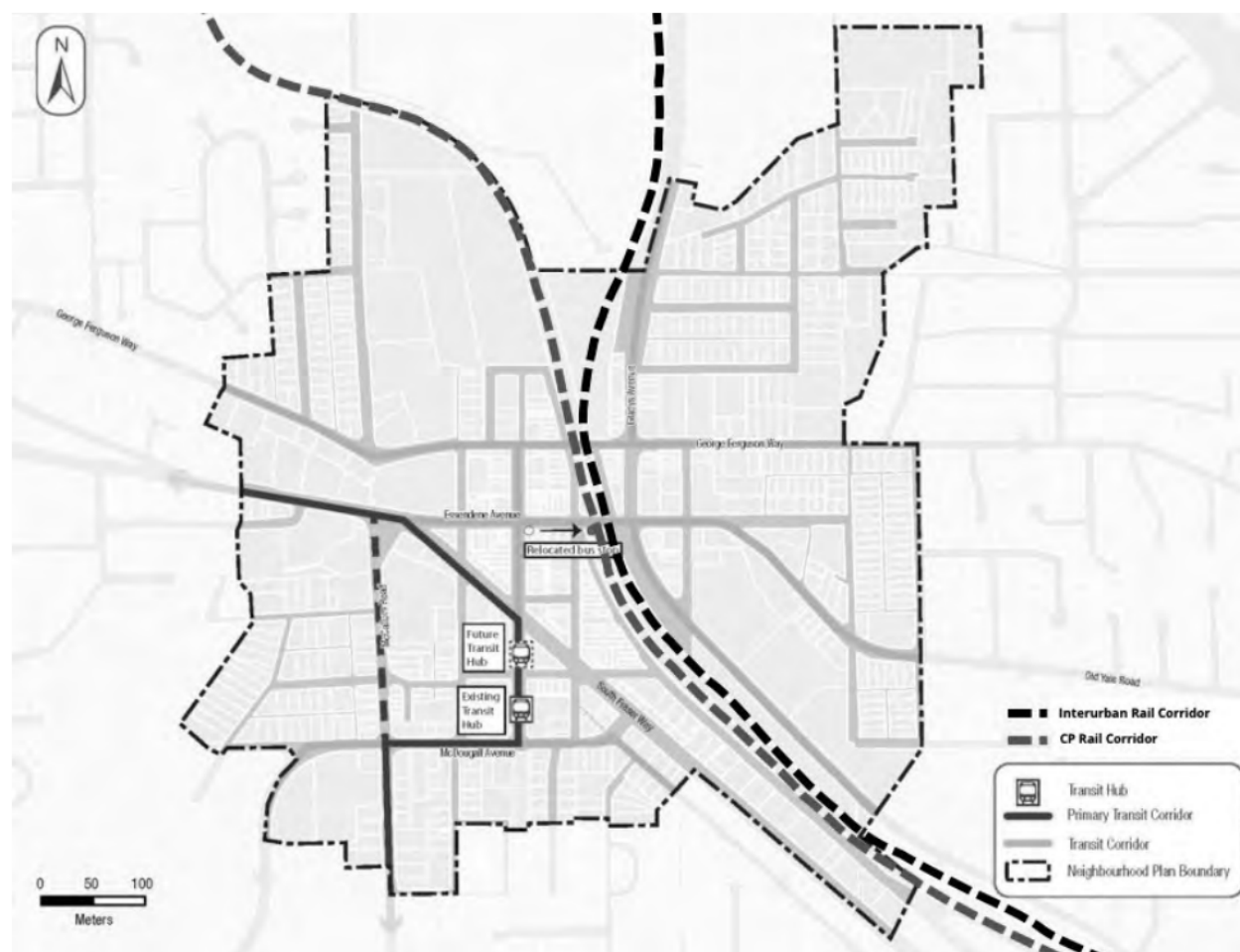


Figure 13 - Transportation connections in Abbotsford's Historic Downtown (Abbotsford OCP). Note the location of current and future transit hubs.

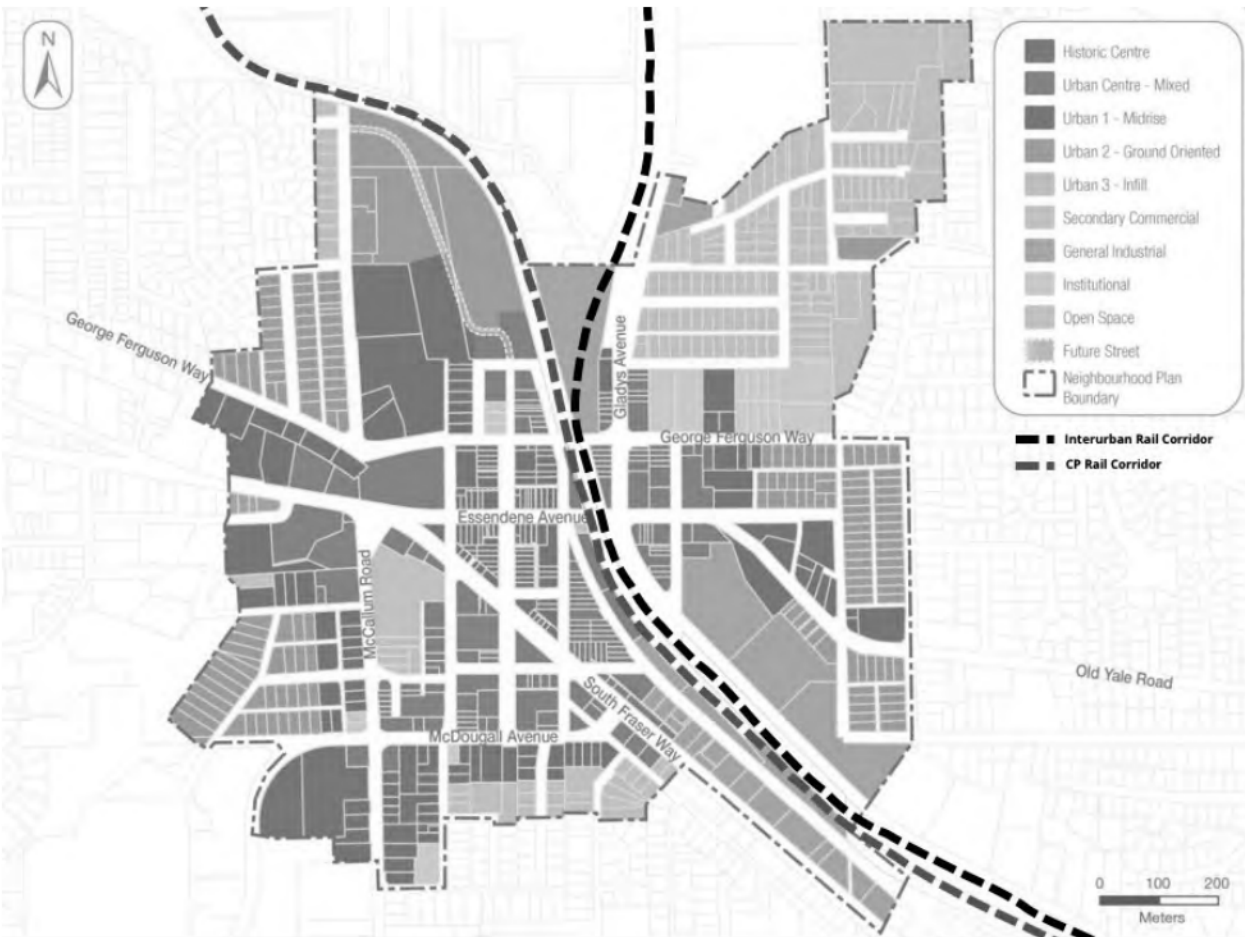


Figure 12 - Land use in Abbotsford's Historic Downtown. Note areas designated for mixed-use and midrise development in close proximity to the rail corridors.

Analysis

In review, the area of intersection between the rail corridors and the Historic Downtown may provide a supportive development context, along with integration with other transit services, for a stop area for a rail service in the City. Over the long term, the City’s growth strategy seeks to promote the development of the City’s urban centre along the South Fraser Highway Corridor, bookended by Clearbrook Road to the west, and the Historic Downtown and rail corridor to the east. The envisioned future evolution of the Historic Downtown as one of the Urban Centres, collectively targeted to absorb significant growth through intensification, would provide transit-oriented development in the area adjacent to and within walking distance of the rail corridor. In addition, the proposed relocated transit hub on Montrose Ave. and envisioned rapid transit corridor (see Transit Integration Analysis) would provide additional transit connectivity within the immediate rail corridor area and the Historic Downtown Urban Centre.

City of Abbotsford Development Analysis Summary			
Objectives	Physical corridor alignment with long term municipal growth	Rail corridor relationship and integration with	Alignment of municipal growth and development policy directions with

	and development planning	existing land use patterns and urban structure	passenger rail opportunities
Opportunities & Constraints	<ul style="list-style-type: none"> • Very close proximity to envisioned growth areas of S. Fraser corridor and Historic Downtown. • City Centre is ~2kms from corridor, however is linked by S. Fraser corridor (intended future higher order transit route) 	<ul style="list-style-type: none"> • Historic Downtown is a key node for commercial and retail activity, with increasing multi-family residential development occurring. • Close proximity to current Downtown transit exchange. 	<ul style="list-style-type: none"> • OCP recognizes providing increased transportation choice, and fostering policies aligning land uses supportive of walking, cycling and transit. • Outside of the Urban Development Boundary, intent is to shift mobility modes over time more to transit, along with walking and biking.

Chilliwack

Similar to other communities within the study area, Chilliwack's OCP (2014) envisions growth and densification within the urban growth boundary, with a focus on infill and intensification in a downtown core area to achieve high level of liveability and sustainable growth.

Urban Structure and Land Use

The City's urban centre is generally organized along the north-south corridor formed by Yale Rd. and Vedder Rd., which connects Chilliwack's downtown areas with the residential communities of Sardis and South Chilliwack. Outside of this area, there are a number of smaller pockets of urban development, including Yarrow, Greendale, Hillside and Rosedale.

Recent development patterns in the City have reflected two trends. In the downtown area, the OCP vision has begun to manifest itself with an increasing number of development projects in the core area proposing multi-family and mixed-use developments. However, growth of low rise, detached housing continues along the periphery and in smaller hamlet areas, including areas outside of the Urban Growth Boundary. As a result, despite growth in infill development and a supportive policy context, single detached dwellings still account for a majority of dwelling types in the city at 55% of all dwellings, while multi-family accounting for 35% in 2016 (shifting from 58% and 33% in 2011, respectively)¹³.

The combination of continued robust growth in both segments has also been complemented by comparatively rapid growth in the municipality, with a 5 year growth rate of 7.5% (2018), making it one of the fastest growing municipalities in the province.¹⁴

¹³ Statistics Canada, 2011 & 2016 Census, Chilliwack City CSD

¹⁴ Statistics Canada, 2011 & 2016 Census

While there continues to be undeveloped areas outside of the ALR in the municipality, urban expansion around central Chilliwack has largely run up against the Urban Growth Boundaries, and the OCP envisions future growth to shift towards increased infill and redevelopment within existing built up areas, and discourage expansion into agricultural areas.

The direction of the OCP seeks to encourage this future growth and development through intensification to be concentrated around the north-south corridor, anchored by Downtown Chilliwack to the North and the neighbourhoods of Sardis and Vedder to the South.

Of note, the Downtown area is centered around the historical “Five Corners”, an intersection where major routes (Yale, Young, Wellington, First and Hodgins) fan outwards to the rest of the City (see figure 13). The OCP envisions Downtown Chilliwack as a focal point for higher density growth in the City, incorporating a mix of uses including medium to high density residential, along with commercial and employment uses supported by a multi-modal transportation network with a pedestrian oriented core area (e.g. slow vehicle speeds, narrower road ways, wider sidewalks). The neighbourhood is specifically identified as a key area to accommodate a significant share of Chilliwack’s overall residential growth over the coming decades through multi-family and mixed-use developments.

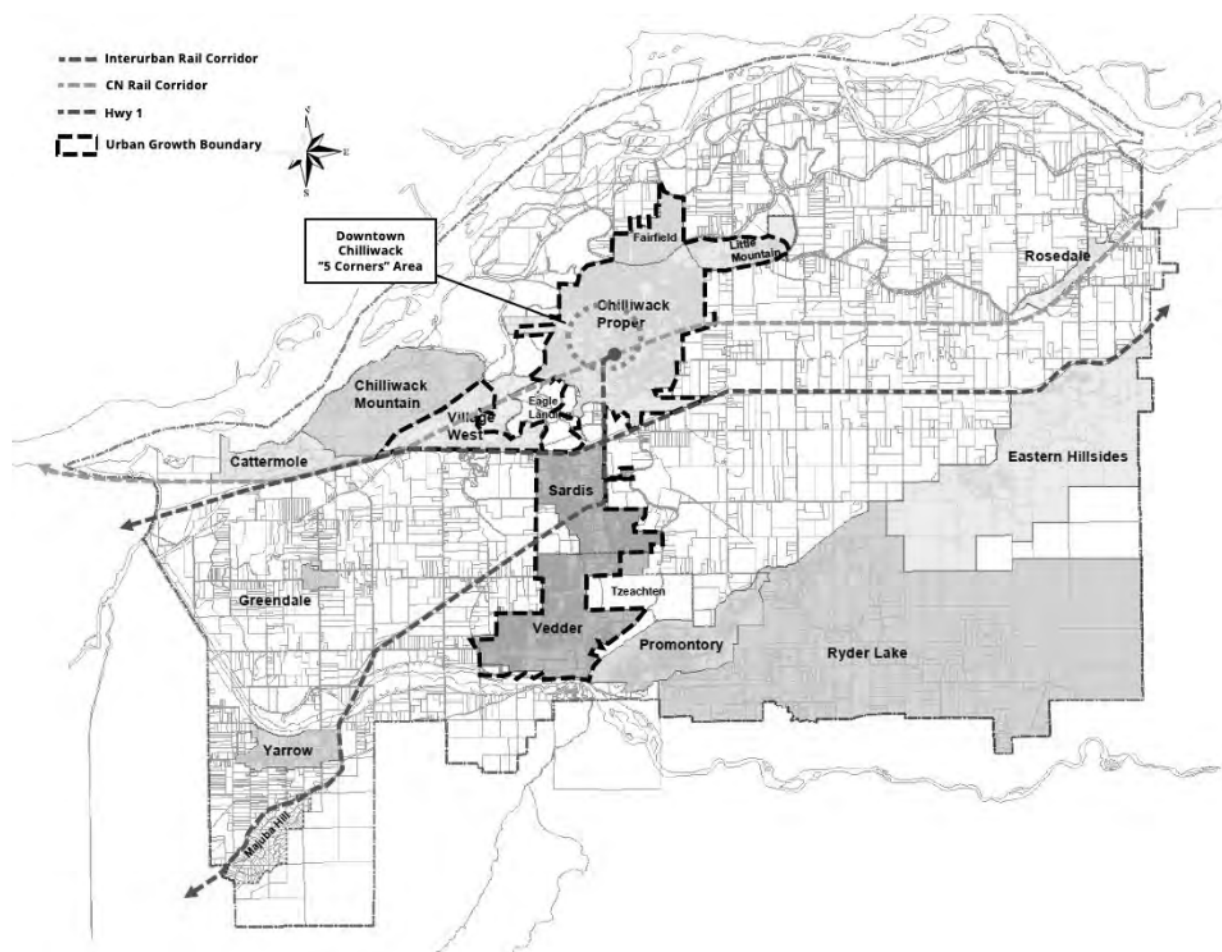


Figure 13 Chilliwack Urban Structure (City of Chilliwack OCP). Coloured areas indicate neighbourhoods outside of the ALR. Of note is the Urban Growth Boundary surrounding Chilliwack Proper, Village West, Sardis, and Vedder – areas intended to accommodate future growth.

In relationship to the Interurban, the rail corridor passes through predominantly agricultural areas to the west, passing the hamlet of Yarrow before entering into Chilliwack's Urban Growth Boundary at Sardis, then heading north and terminating where it intersects with the CN line. The Five Corners intersection is less than a kilometre north of where the Interurban and CN corridors converge (~10 minute walking distance), connected by Young Rd. and Yale Rd., both identified in the OCP as anchor streets for the downtown core mixed-use area.

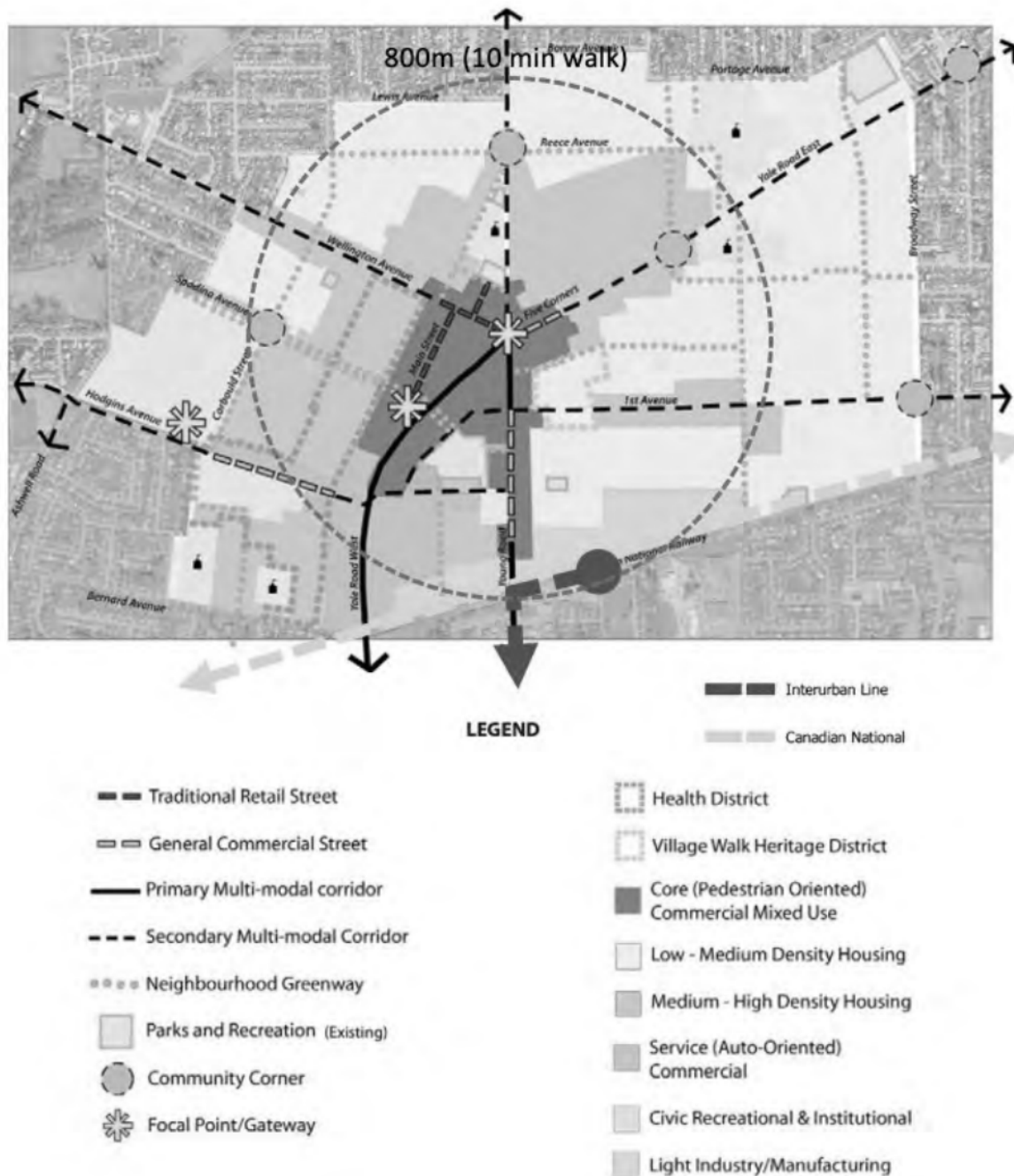


Figure 146 Chilliwack Downtown Land Use and Development Plan – the “Five Corners” area (City of Chilliwack OCP). Note plans for higher density in areas surrounding the Core (medium – high density housing). The distance from the terminus of the Interurban to the Five Corners is 800m, or approximately a 10 min walk.

Analysis

With a time horizon out to 2040, the City's growth and development strategy seeks to support increased intensification and density in and around the downtown core to accommodate a significant portion of new growth. A key challenge to realizing the City's designs for a more compact, pedestrianized and transit oriented environment in the downtown are fast and reliable transportation options connecting the area to both local, but also inter-regional transit services providing alternative travel modes to access residents and businesses beyond vehicle travel on Highway 1.

With considerable ALR land within the municipality's boundaries, future development is intended to be focused within the Urban Growth Boundaries, which generally align with the areas of Chilliwack proper (including Downtown), Sardis, and Vedder. With close, walking distance proximity to the downtown core and these areas envisioned for significant intensification over the OCP planning horizon, the current terminus area of the Interurban corridor could provide an option for a stop area that could offer quick access to inter-regional transit connectivity, and support and encourage investment and intensification in the area.

Outside of the City's urban centre, and beyond the limits of the Urban Growth Boundary, hamlet areas connected by the Interurban line are expected to retain their low density, rural character over the long term, supporting continued agricultural functions. As such, use of the corridor for a local service would require close analysis of the potential impacts to growth in these areas and risk of development pressure on agricultural lands.

Chilliwack Development Analysis Summary			
Objectives	Physical corridor alignment with long term municipal growth and development planning	Rail corridor relationship and integration with existing land use patterns and urban structure	Alignment of municipal growth and development policy directions with passenger rail opportunities
Opportunities & Constraints	<ul style="list-style-type: none"> • Close proximity to key future growth node of downtown Chilliwack. • Good alignment with Sardis area. • Corridor is ~3km from Vedder, a recent growth neighbourhood to the south. 	<ul style="list-style-type: none"> • Corridor terminates within central Chilliwack – area of concentration for commercial and business activity, and increasing residential density. • Areas immediately adjacent the corridor are light industrial/manufacturing, reflecting historical usage. 	<ul style="list-style-type: none"> • Corridor alignment supports concentration of growth along north-south axis, and accommodation of mid to high density growth. • Supports mobility policy to provide transit options to reach other parts of the city and region.

Conclusions

Overall, land use and development patterns across the Study Area reveal a general pattern of increasingly dense urban nodes, which are anticipated to grow more compact over time and evolve as more transit supportive communities, but remain separated by large areas of farm land.

The Regional Growth Strategy, and as implemented through local Official Community Plans, seeks to encourage a growth strategy over the long term that emphasizes more compact and sustainable patterns of development within major urban centres, with the goals of supporting the achievement of a diversity of housing options, employment opportunities, amenities, services, and facilities to meet the needs of residents, and realize densities making efficient use of infrastructure, including public transportation networks.

In review of the rail corridors' (Interurban and relevant CP/CN portions) alignment with local land use strategies, they are physically well connected to major communities, with the existing lines generally running through their urban centres, and directly through or in close proximity (e.g. within 15 min walk or less) of areas identified in the municipalities' respective OCPs for growth and intensification over the time horizons of the plans, and with land uses designations permitting potential development supportive of transit services. Outside of the Regional Growth Boundaries, corridors generally run through rural areas which are predominantly designated as ALR. As noted above, the ALR designation significantly restricts permitted development, providing limited long term potential for intensification outside of major community nodes.

In summary, the above analysis notes the following key considerations:

- Overall, the rail corridors directly link the major urban centres of the Valley, which have also been designated in planning documents as key areas to accommodate future growth over coming decades – through infill and intensification with denser, more transit supportive mixed-use and multi-family housing.
- Areas of close alignment between the rail corridors and long term development planning may provide the strongest options for stop areas with larger planned population catchment areas (e.g. areas planned for transit supportive development).
- Outside of major urban centres, the corridors generally pass through protected farm land (ALR) with little potential for greater density. Therefore, utilizing existing infrastructure and encouraging more compact infill within Urban Growth Boundaries can spur greater transit supportive development, make efficient use of land and infrastructure, and support transit investments.
- With the notable exception of Langley City, current planning does not consider the potential for a higher order regional rapid transit corridor. The introduction of passenger rail may provide the opportunity for municipalities to explore ways to develop enhanced transit supportive land use policies to leverage transit investments, and accommodate a greater degree of growth through more sustainable development patterns. Updated municipal land use policies conceived in response to a proposed rail service can result in station catchment areas that can accommodate significantly more population and employment than is currently envisioned.
- Success of land use integration and multi-modal linkages between potential stop areas and surrounding urban context will require close engagement and further study to identify optimal locations and supporting infrastructure.

The analysis of land use and development patterns across the Study Area highlights the unique nature of the region – increasingly populated urban centres separated by protected agricultural land. As the regions continue to grow according to their community plans, it will be increasingly important to consider and help shape this growth in a way that provides regional connectivity, multi-modality, sustainability, affordability and economic development.

TRANSIT INTEGRATION ANALYSIS

FRASER VALLEY REGIONAL RAIL PRE-FEASIBILITY STUDY (APPENDIX “C”)

June 2021

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Note: The following memorandum provides a more detailed review of existing transit services in the Fraser Valley, including the opportunities and constraints related to the topic. This work has informed the analysis found in the broader Pre-Feasibility Study and provided one of the qualitative outputs to assess regional rail the region

Introduction

The viability of a fixed route passenger rail system can be supported by a range of factors, such as adjacent land uses and population density, proposed routes and stop locations, as well as through multi-modal connectivity with other transit services. Understanding the existing structure, function, and long-term objectives of existing and planned transit serving communities in the study area can provide insight as to how a potential passenger rail service could support and leverage local services to improve ridership, multi-modal connectivity, and contribute to the transportation and development goals for the communities it serves. Accordingly, the following provides a review of current and planned transit services and an assessment of their alignment and integration with a potential Fraser Valley regional rail network¹. A key objective is to understand how a rail service could intersect with existing and planned transit services, and support long term mobility objectives, including increasing transit mode share. Informing this is a review of the geography and routing of existing services, as well as long term transit planning, through both future route and service targets and strategic regional transit objectives.

It should be noted that for the purposes of this study, no alternatives to existing and planned transit services have been considered, and as a concept level analysis, this study has not assessed the potential route and service realignments that the introduction of a rail service may warrant. However, it is recognized that the development of a higher order rail transit service would necessitate comprehensive consideration for how multi-modal connectivity could be optimized with a new offering (i.e. with changes such as service levels, routing, exchange locations and long term transit planning).

Transit in the Fraser Valley Today

Over the last decade, the Fraser Valley has seen a consistent, albeit minimal, increase in transit ridership, growing from 1% in 2011 to 3% in 2017², with some variability by municipality. By comparison however, transit ridership as a percentage of overall transportation mode share remains relatively low; for reference, Vancouver's overall transit mode share in 2017 was 11.7%³. Over the long term, BC Transit, the service provider for communities within the Fraser Valley Regional District, has set a long term goal of achieving a transit mode share of 8%, contingent on population growth, ridership targets, and supported by investment and supportive land use development.⁴

Reasons for lower transit adoption in the Fraser Valley are multi-fold. Key factors contributing to this include the Fraser Valley's historically lower service hours compared with other communities where transit may be considered an attractive alternative⁵, and lower density land use patterns⁶. Inaccessible and limited transit alternatives have also historically been considered a key factor to minimal transit usage. In addition, socio economic and demographic trends may also influence the propensity to take transit. As an example, for the 2016 Census, populations in the Fraser Valley reported percentages of the labour pool employed in fields such as trades, construction, and transportation when compared with

¹ The reference concept network envisions a regional rail system operating along parts of the existing Interurban corridor (Langley – Abbotsford – Chilliwack) and CP Cascade Subdivision (Mission-Abbotsford)

² Source: 2011 & 2017 Regional Trip Diary, Translink

³ 2017 Regional Trip Diary, Translink

⁴ Transit Future Plan, Abbotsford-Mission, 2013 (BC Transit)

⁵ Strategic Review of Transit in the Fraser Valley, BC Transit, 2012

⁶ For comparison, Metro Vancouver has 854.6 people per square kilometre compared to 376.5/Km² (Abbotsford), 320.2/km² (Chilliwack), and 170.6 km²(Mission). Source: Statistics Canada, 2016 Census.

Metro Vancouver or the provincial average. As a result, the flexible location of workplaces associated with these fields may make transit more inconvenient and less available to meet the needs. This is also supported by a greater response rate for “no fixed workplace address” for workplace locations.

While beyond the scope of the Pre-feasibility Study, analysis of the variability in the market and geography of housing and employment in the Fraser Valley over the long term (e.g. higher/lower shift to multi-family residential or office based work) may further contribute to change in movement patterns, leading to changes in transit demand, and as part of future work, would merit analysis to better understand future development scenarios and anticipated mobility trends in the region.

Service Jurisdictions

The study area is currently served by two transit providers – TransLink and BC Transit, with jurisdictions mirroring the Metro Vancouver Regional District and the Fraser Valley Regional District respectively. However, there are a number of points of cross jurisdictional connections worth noting, including Translink’s West Coast Express (WCE) which provides service to Mission, and bus services via BC Transit’s Fraser Valley Express (“FVX”).

Cross-Regional Transit Services

Fraser Valley Express (FVX)

Beginning operations in 2015, BC Transit’s Route 66 Fraser Valley Express (FVX) was introduced to the Fraser Valley providing a regional, limited-stop transit service connecting Chilliwack, Abbotsford and Langley. As a cross jurisdictional service, it is funded through an agreement between BC Transit, the City of Abbotsford and the City of Chilliwack and coordinated by the Fraser Valley Regional District (FVRD). The current route (as of 2021) runs between downtown Chilliwack and the Carvolth Transit Exchange in Langley. There are plans to extend the route further west to the Lougheed Town Center SkyTrain Station in Burnaby, providing a link for the FVX to the SkyTrain network and expanded inter-regional connectivity. The Fraser Valley Express’ extended service is anticipated to begin in January 2022.

Since commencement, the service has seen steadily increasing annual ridership, growing from 72,146 (2015/16) to 253,473 (2019/20), and is anticipated to increase further with the expansion to the Lougheed Skytrain station.

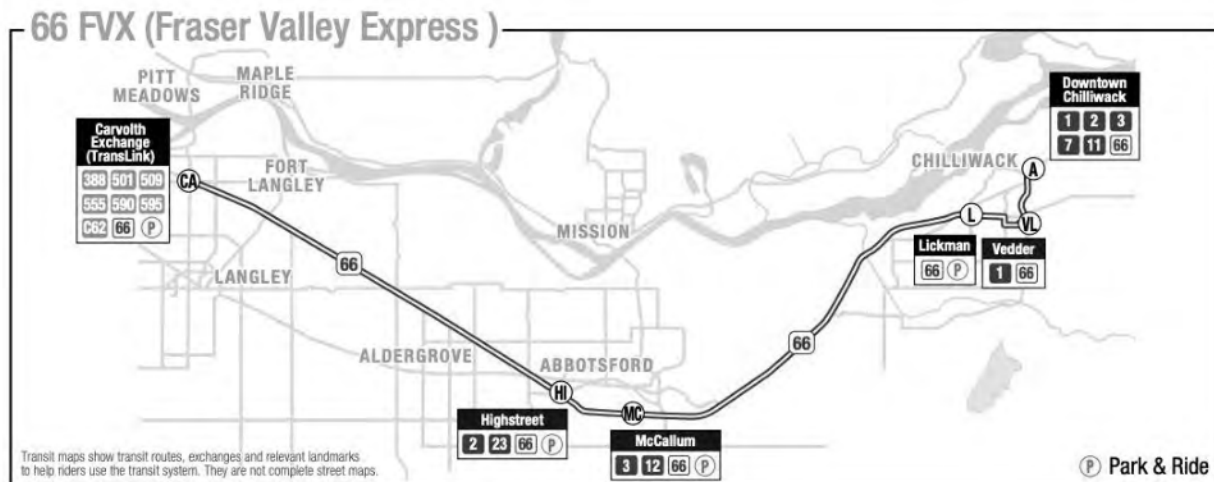


Figure 1 - Fraser Valley Regional Bus Service - Route 66

Despite growing ridership, key issues with the FVX have included on-time performance and reliability, as the FVX runs along Hwy 1, and increasing congestion and accidents lead to delays and cancelled trips, and reduced reliability, negatively impacting experience and constraining the potential for additional ridership. Current work to widen Hwy 1 is considering options to integrate transit priority.

West Coast Express

Operated by TransLink, the WCE has been offering commuter rail service between downtown Vancouver and Mission since 1995. It provides directional peak service to eight stations, with five westbound trains in the morning and five eastbound trains in the evening every weekday. Ridership has been growing over recent years, with Mission City Station seeing 140,000 annual boardings in 2019, up from 117,900 in 2016 (+~20%)⁷.

Municipal Transit Services

The following provides a review of current transit services within the study area, including route patterns and exchanges, relationships to the urban structure, and long term plans. Analysis is provided of the potential implications for rail services making use of existing corridors through these communities, and areas of alignment.

City of Langley/ Township of Langley

In the City of Langley and Township of Langley (Langley or “the Langleys”), a total of 17 TransLink bus routes service the city, including local routes that connect communities between the City and the Township, inter-municipal routes that provide service between Langley and other municipalities in Metro Vancouver, and an inter-regional express route (BC Transit’s Fraser Valley Express) that connects Langley to Abbotsford and Chilliwack.

⁷ Source: Translink Transit Service Performance Review, 2016-2019

Local bus routes are connected through the Langley Center transit exchange that serves both the City and the Township. The bus exchange is located in the downtown area of Langley City (the intersection of Logan Avenue and Glover Road). It is worth noting that in anticipation of the SkyTrain extension, the City of Langley and TransLink are reviewing the current transit exchange, including possible new locations to align bus connections more closely with SkyTrain stations⁸, and it is assumed that as part of the SkyTrain implementation, there will be bus transfer integration including the relocation of the current Langley bus exchange to the Skytrain Terminus station at 203rd Street.

To the north end, the Carvolth bus Exchange is located in close proximity to Highway 1 and supports routes from Langley City and the Township to Vancouver and Surrey. In addition to this, the Fraser Valley Express (which connects to Abbotsford and Chilliwack) also provides service at this exchange.

There are also plans to extend the Fraser Valley Express' service from Langley's Carvolth Exchange to Lougheed Town Center Station in Burnaby, providing expanded inter-regional connectivity. The Fraser Valley Express' extended service is anticipated to begin in January 2022.

SkyTrain Integration

The Expo Line SkyTrain extension, also known as the Surrey Langley Skytrain, from King George Station (Surrey) to 203rd street in the City of Langley via the Fraser Highway, will provide a new rapid transit connection from Langley to Surrey and beyond into Metro Vancouver. At the time of this report, preliminary design work is in progress, and the alignment and station locations have not been finalized, however it is expected that two stations will service Langley, one in the vicinity of Fraser Hwy and 196th St., and a terminus station at Fraser Hwy and 203 St.

As shown in Figure 2 below, the rail corridor intersects with the proposed Surrey Langley SkyTrain guideway slightly to the north east of Fraser Highway. Both the 196th St. and 203rd St. proposed Skytrain stations are situated within approximately 600 metres of the rail corridor, equivalent to a 5-10 minute walk.

⁸ The City of Langley's 2014 Transportation Master Plan, developed prior to advancement of the SLS, identified the intersection of 203st. and Fraser Hwy as a potential location for the transit exchange, which is the proposed terminus of the SkyTrain extension.

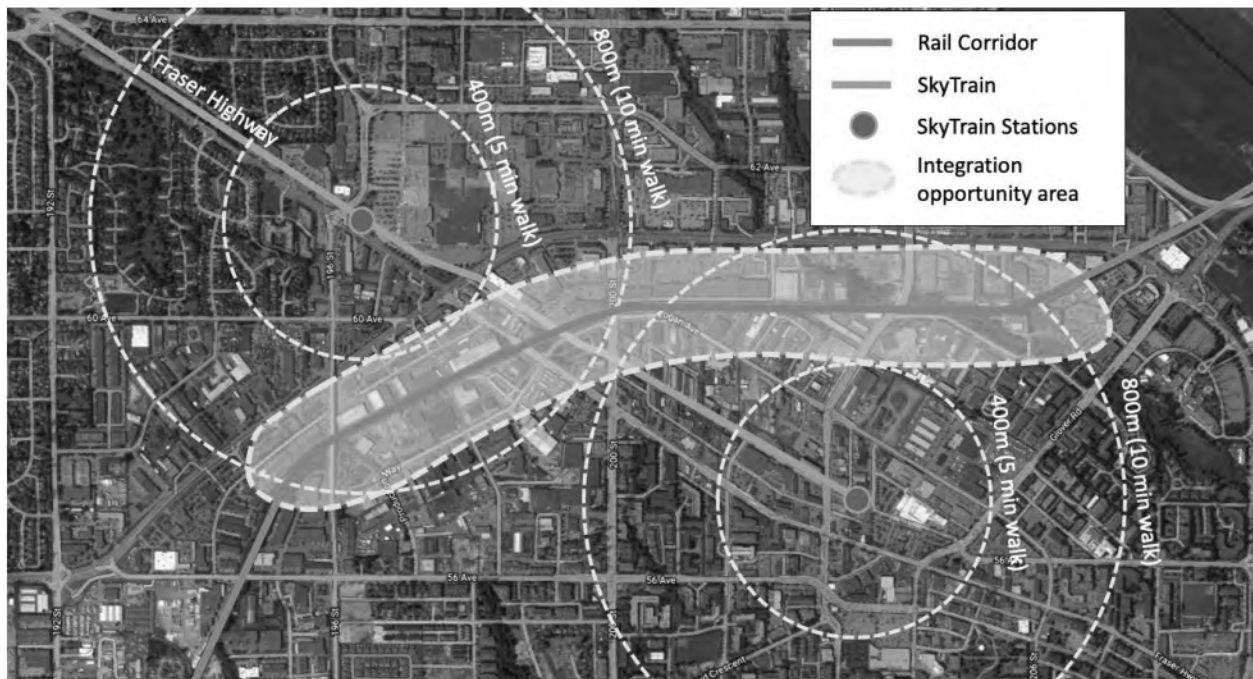


Figure 2 - Rail-Transit integration at Langley City



Figure 3 - Rail corridor spur lines through Langley City

The physical proximity of the two corridors provides an opportunity for close integration and connection between the two services. Potential options to support integration between the Skytrain and FV rail service could include, without limitation:

- Establishing a stop platform within the rail corridor ROW.

- The introduction of a spur line branching off the corridor to bring the FV Rail Service terminal closer to one to the other proposed Skytrain station (depending on the FV Rail technology, there is an ability to provide this type of connection potentially within an existing road right-of-way corridor, or via some of the adjoining lands in this area). This would provide the benefit of reducing distance between service connection points and the transfer penalty, providing a more attractive option for passengers making multimodal trips using both services.
- Use of existing industrial spurs in combination with new spur line (see Figure 3)

Another option would be to consider shifting one of the Skytrain stations closer to the rail corridor, however as of the time of this report, planning and design for the SLS has advanced significantly, and re-evaluation of station locations would require active engagement and collaboration with all partners in the near term.

To understand the feasibility of integration and connection options, more in-depth study as part of a future Feasibility Study is recommended, including:

- **Options Sensitivity Analysis** – Cost-benefit review of connection options and variability, transfer optimization.
- **Design Analysis** – Preliminary engineering and design feasibility review of stop locations and interface with urban context, technology used, rail corridor, and connecting transit services.
- **Engagement** with TransLink, CP Rail and partners, the City of Langley and other key stakeholders.

Analysis

In review, it is anticipated that transit services within central Langley (and those in proximity to the rail corridor) are likely to experience significant re-alignment in advance of the SkyTrain extension, particularly in the location of transit centres and downtown route alignment. As of the time of this report, TransLink is also in the process of developing their Transport 2050 plan, which will provide a strategy for transportation in Metro Vancouver over the next 30 years. As such, the future connectivity between the rail corridor and transit services is expected to evolve, as further design details of the SkyTrain are advanced, and associated reconfiguration of the local bus network is updated in response. As part of a more detailed Feasibility Study, a more detailed engineering and preliminary design assessment should be undertaken, along with engagement with key stakeholders, to develop and assess feasibility of integration options.

City of Abbotsford

In the City of Abbotsford, BC Transit provides 17 bus routes to the city, including local routes that service neighborhoods North, West and East of the downtown area and the University of the Fraser Valley, and one inter-municipal route (Abbotsford-Mission). The Fraser Valley Express also makes stops in Abbotsford providing inter-regional connections to Chilliwack and Langley.

Routes are currently run through two bus exchanges: Downtown Exchange and Bourquin Exchange. The Downtown Exchange is located in the Historic Downtown area, and provides connections to a majority of routes. Bourquin Exchange is located west of the Historic Downtown area, at the corner of Bourquin Crescent West and Mill Lake Road. The City's long term transit planning has identified a proposed future

new exchange, to be located in the Historic Downtown, which is envisioned to centralize and consolidate connections at the eastern end of the South Fraser Corridor.

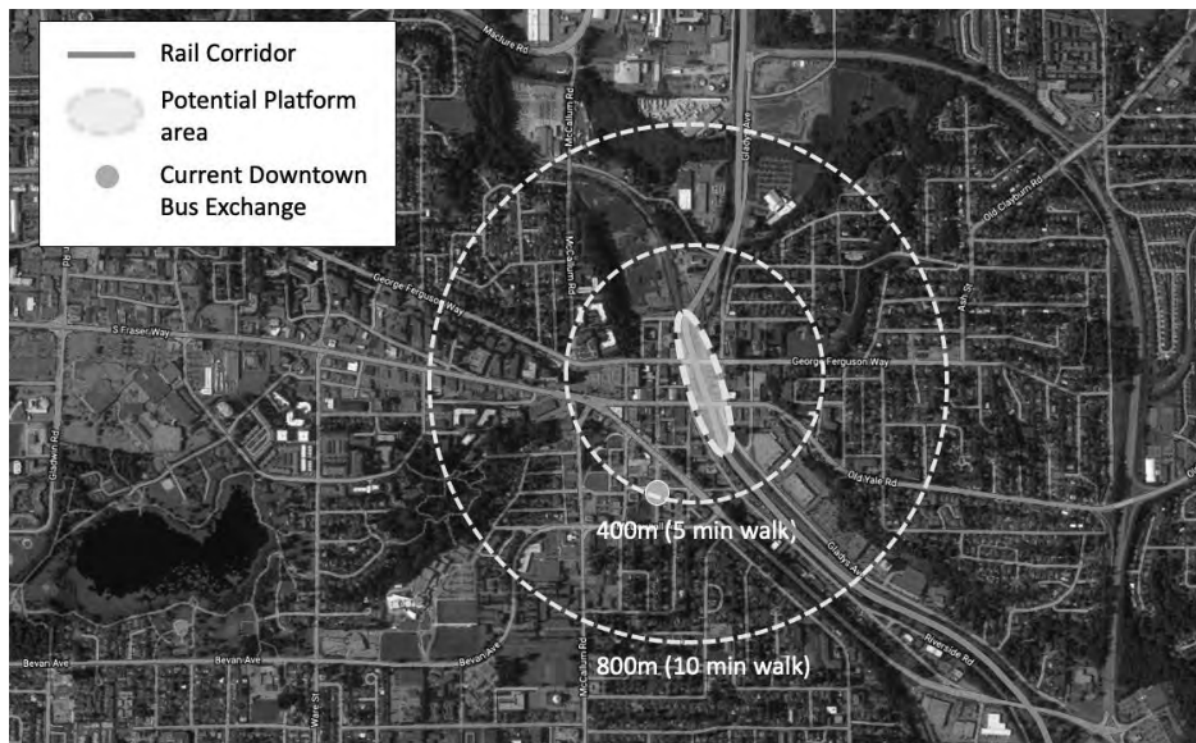


Figure 4 - Transit-Rail alignment in Abbotsford's Historic Downtown

Both the existing Downtown Exchange and proposed new exchange are approximately 300 meters (~4 min walk) from the rail corridor, providing the opportunity for a rail stop location in this vicinity to establish close multi-modal integration between rail service and local transit services.

As part of BC Transit's Transit Future Plan (2013), The Abbotsford 25 Year Network Vision identifies a proposed Rapid Transit corridor (envisioned as bus or urban rail, to be determined through further planning) running along South Fraser Way and south on McCallum to the University of the Fraser Valley. It is also worth noting that while the Rapid Transit Corridor provides links between South Fraser Way, the rail corridors, and the university, it is not proposed to link directly to Abbotsford Airport⁹, a major trip destination within not only the city, but also the broader Fraser Valley. The corridor is proposed to connect to a Major Transit Facility, aligned with the location of the future relocated Downtown Exchange. This could provide further integration between local and regional rapid transit services within a close, walkable distance. The City also completed a Transportation and Transit Master Plan in 2018, affirming the proposed South Fraser Way rapid transit corridor, along with proposed evolution of transit routes across the city over the coming years.

Connecting Abbotsford and Mission, BC Transit currently runs regular bus service (route 31) along the Abbotsford-Mission Highway, across the River to Mission, including to the Mission City WCE station. These services align with the WCE schedule to provide connections to transit users from Abbotsford to

⁹ Bus connections to the airport have been proposed as part of a Frequent Transit Network.

the commuter rail line, but also provides service outside of the WCE service windows (AM and PM peak).

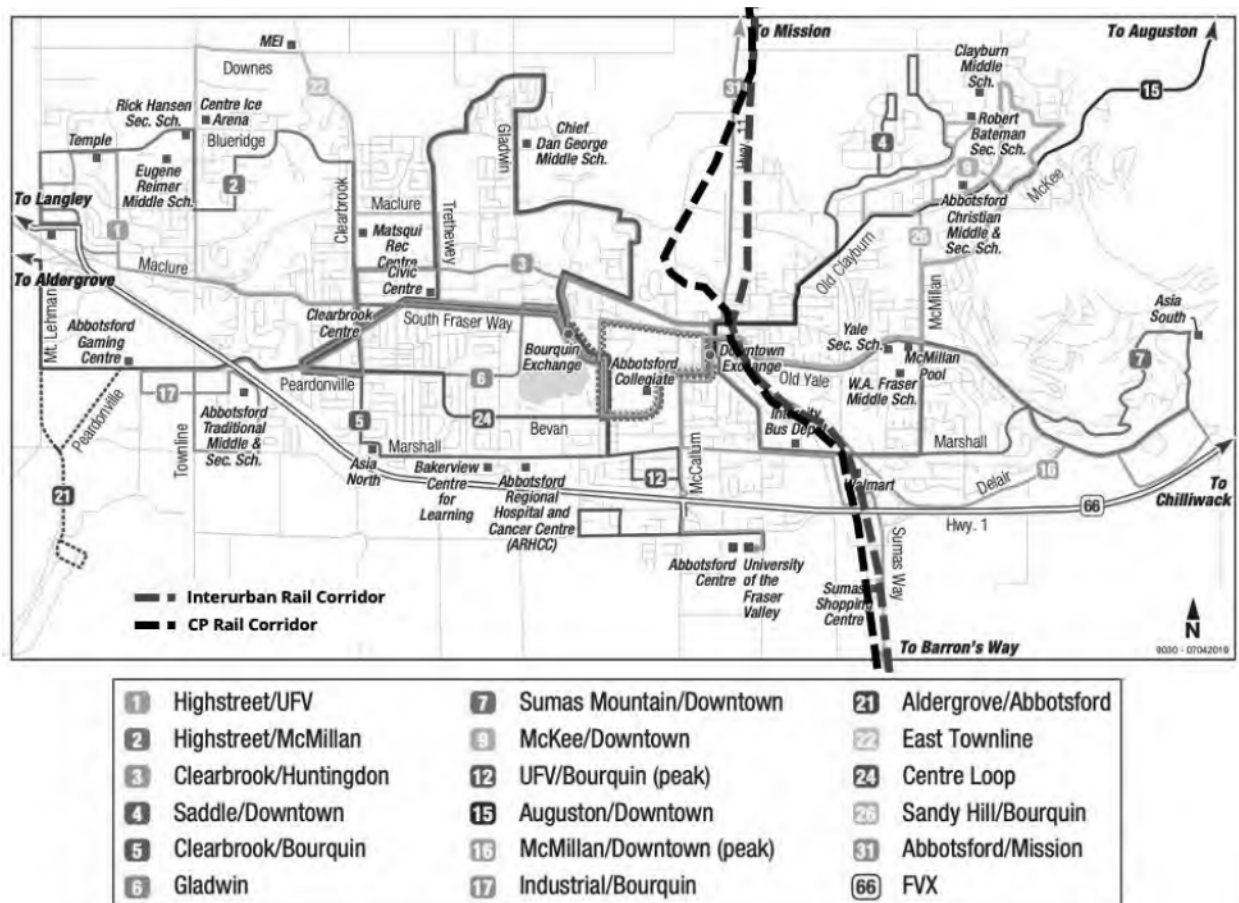
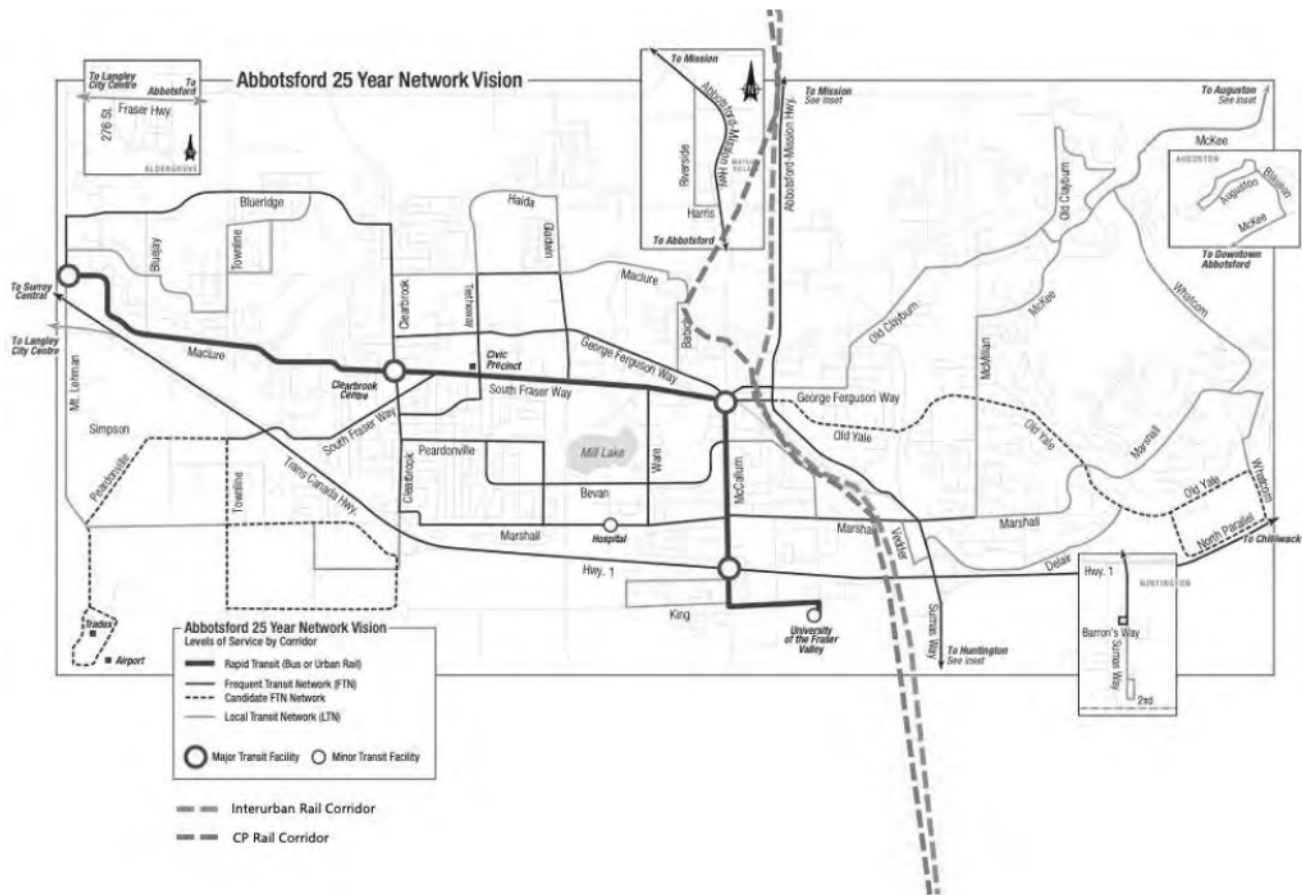


Figure 5 - Abbotsford Current Bus Transit Network



Analysis

Over the long term, the City's transit strategy seeks to enhance and improve both routes and frequency of local bus services, providing improved connectivity for residents within Abbotsford. Key to the realization of the strategy is the establishment of a transit spine along South Fraser Way, connecting a series of Urban Centres, areas planned as dense, walkable mixed-use neighbourhoods.

This is supported by the growth strategies in the City's OCP, which envisions areas along the corridor emerging as compact, transit-oriented places that will capture a significant portion of future growth through intensification and infill. Over the long term, transit services along this corridor can evolve to provide robust, fast transit connectivity within the City, with feeder bus lines linking surrounding communities. The introduction of a regional rail connection closely aligned with local major transit exchanges and the proposed rapid transit corridor could complement these municipal transit services with regional connections for users travelling outside of the City. This could support the increased viability of local services, bring transit users into the City and to the central core, as well as foster the emergence of the South Fraser Corridor and Historic Downtown into the Urban Centres as envisioned in the City's long term growth plans.

District of Mission

The District of Mission is served by a total of 6 bus routes, with a majority of the routes servicing the local Mission area and one inter-municipal route providing service between Mission and Abbotsford (#31). The District of Mission is connected to Metro Vancouver through the West Coast Express, which runs a AM and PM peak inbound service to Vancouver, with stops in Haney, Maple Ridge, and the tri-cities.

Currently, there is only one bus exchange in Mission, and it is situated in the Downtown district, at the corner of Home Street and 2nd Ave. It is the terminus station for all 6 bus routes. The exchange is within short walking distance (300m) from the WCE Mission Station, providing close multi-modal connectivity.

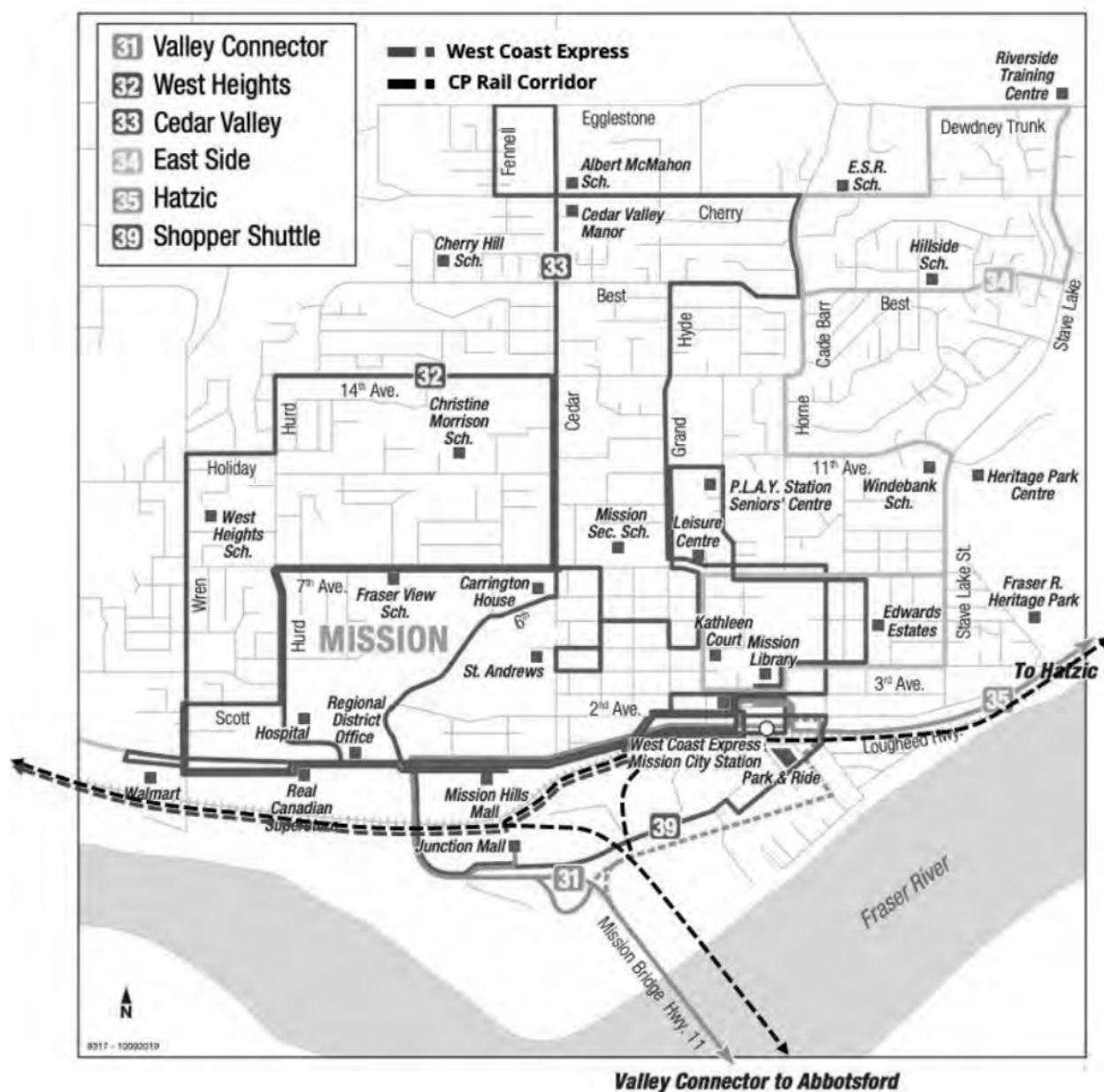


Figure 7 - Current Mission Transit Network

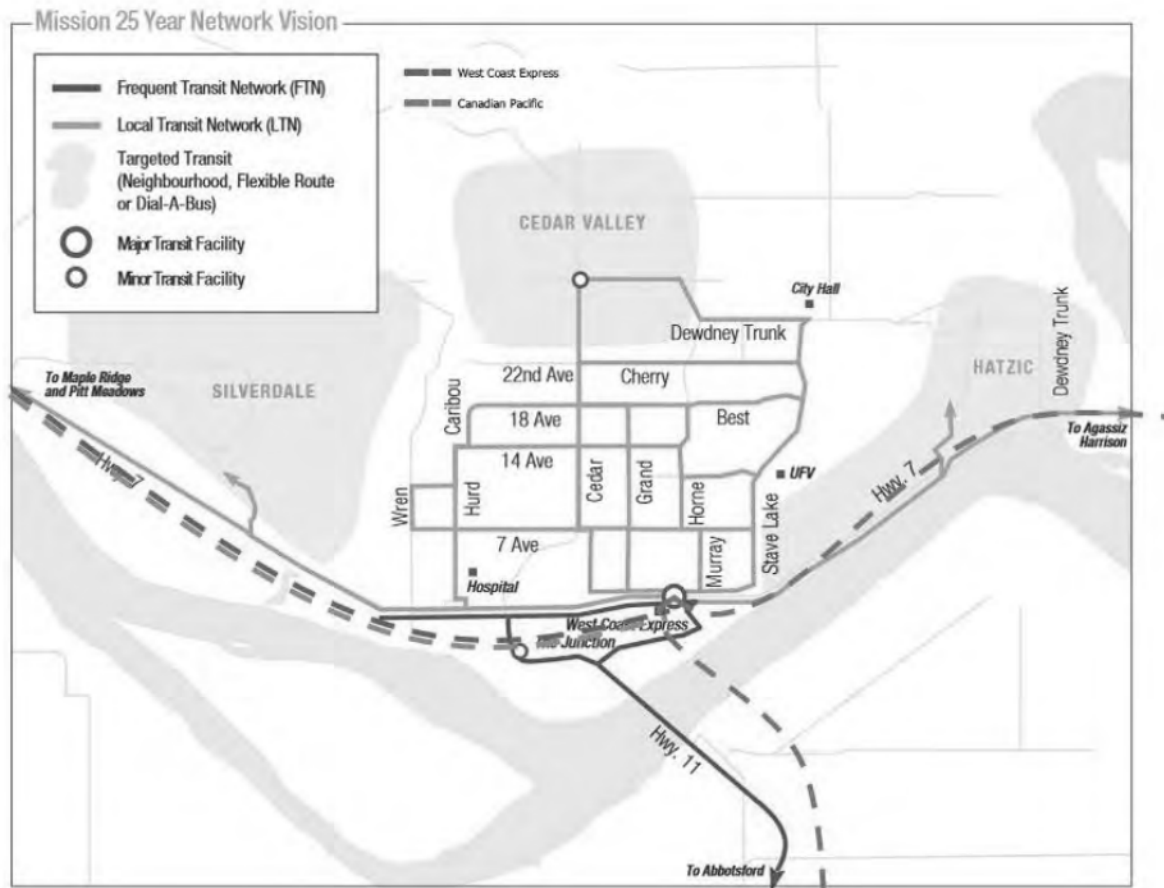


Figure 8 - Future Transit Vision for Mission (BC Transit Abbotsford- Mission Transit Future Plan, 2013)

In the future, Mission is envisioned to develop two minor Transit Facilities in the immediate area, to serve the Cedar Valley town center, and the Junction shopping center area. There are also plans to provide targeted transit (Flexible Routes/Dial-a-Bus services) to neighborhoods including the growth areas of Silverdale and Cedar Valley. BC Transit also envisions a Highway Express bus service between Mission and Maple Ridge along Highway 7 (Lougheed Highway), strengthening the interregional connectivity between Fraser Valley and Metro Vancouver.

West Coast Express Integration

Running along the CPR rail corridor, the West Coast Express terminates in downtown Mission at Mission City Station. The stop location is to the east of the Mission Rail Bridge, which provides rail connections over the Fraser River, linking to Abbotsford, and the use of it would be required to secure a rail connection between the West Coast Express and Abbotsford, via an extension of the commuter service or through connection with a new service. Integration opportunities may include the following:

- **New Abbotsford-Mission link** – A new service distinct from the WCE could offer rail connections from Abbotsford up to Mission, crossing the Mission Rail Bridge, with a stop location in the approximate area of Mission City Station. Passengers would be able to connect to WCE and local

transit services via the existing pedestrian rail bridge, as well as have access to the existing WCE park and ride lot.

- **West Coast Express extension** – A number of studies have considered options to extend the WCE across the Fraser River into Abbotsford, including TransLink’s West Coast Express Strategy (“the Strategy”) (2012). To date, TransLink has not advanced this beyond the conceptual consideration provided in the Strategy. This option would require either relocating the Mission City Station to west of the Mission Rail Bridge, or reverse movements from the existing station to the bridge. Relocation of the station would involve considerable re-working of the station infrastructure, add distance between connections with local bus services, and result in potential impacts to current land use planning, which seeks to support intensification and development aligned around the location of the station in the City’s downtown core.
- **Other:** Other WCE options considered in the Strategy included additional stop locations, introduction of reverse peak, or off peak service, which could support better local connectivity in addition to commuter links to downtown Vancouver. This includes consideration for additional stations in emerging Mission communities such as Silverdale, anticipated to be home to thousands of new residents over the coming decades.

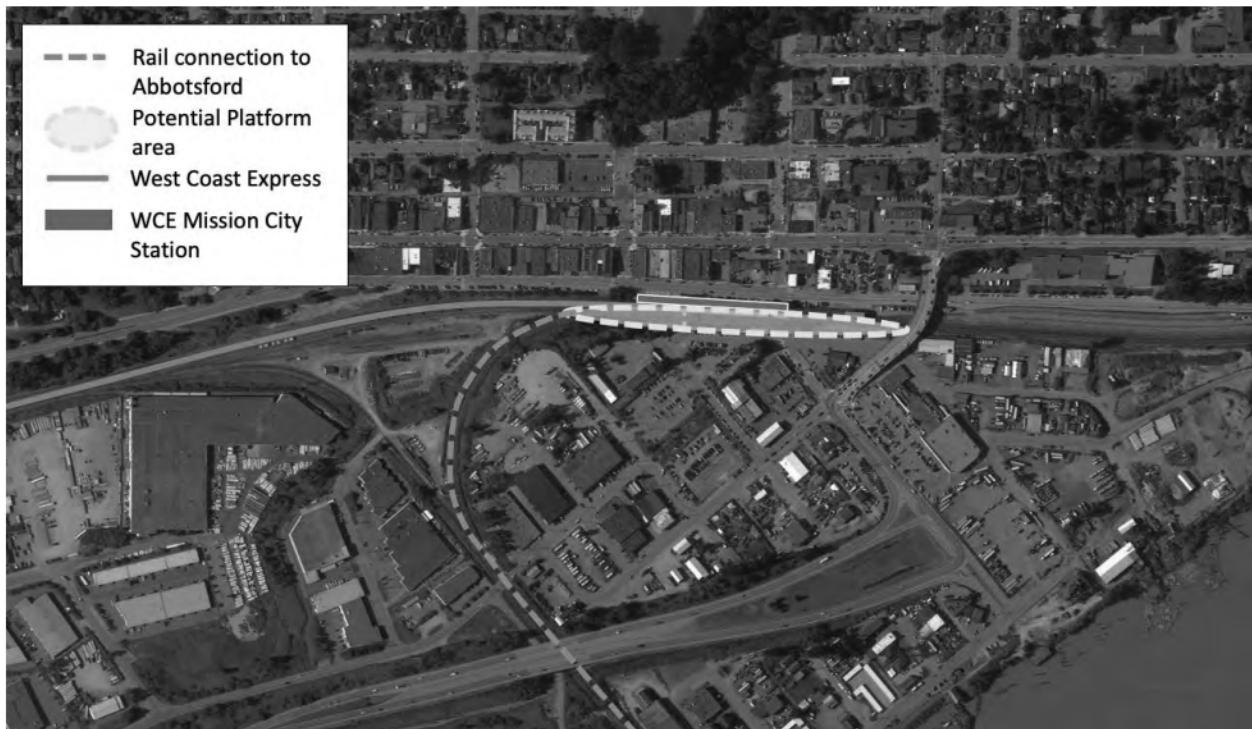


Figure 9 - Potential Regional Rail-WCE integration

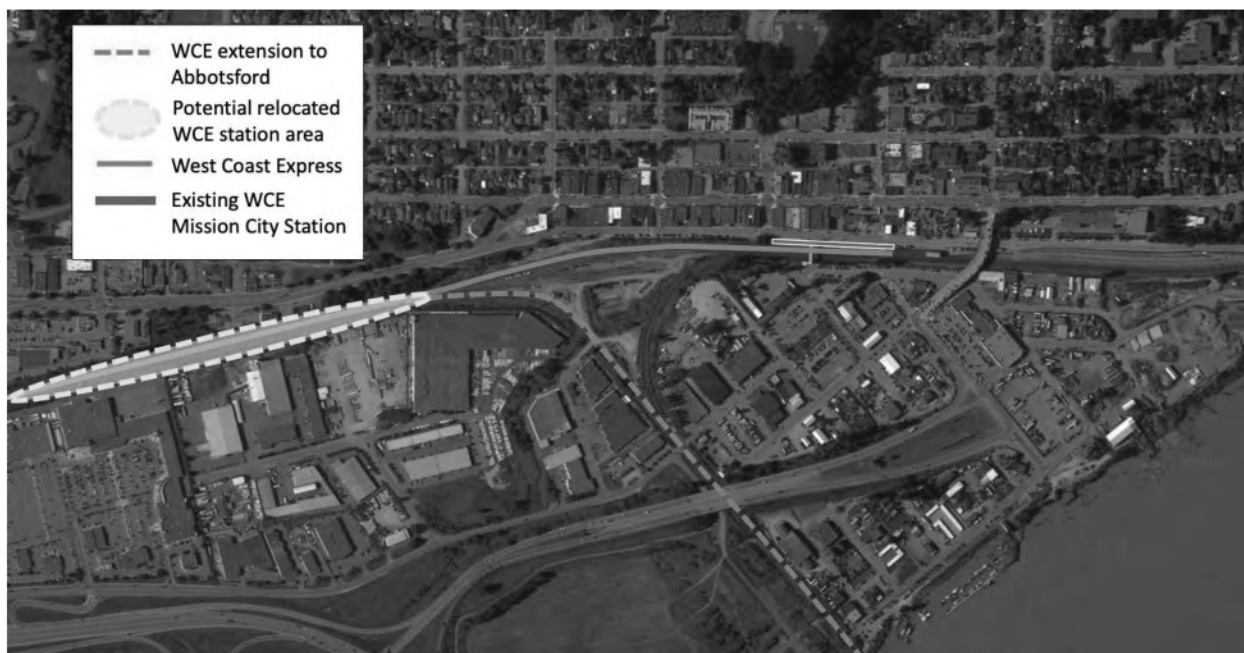


Figure 10 - Potential WCE Extension - Relocated Mission City Station

Analysis

Despite the available local transit services and access to the West Coast Express, transit represents 3% of the travel mode share, which is comparable to Langley and Abbotsford (4% and 2.5% respectively)¹⁰. In part, this may be due to lower service levels, but may also reflect a lack of fast and reliable connections for travel from Mission to other locations in the Fraser Valley, which represent the significant majority of trip destinations for residents, as demonstrated by the higher demand amongst existing transit services for the Abbotsford – Mission route^{11,12}. Providing a new passenger rail link with destinations south of the Fraser River, or extending and improving the current WCE service with stronger local connectivity, could address this shortcoming in current transit service, and support regional growth and development objectives.

City of Chilliwack

The City of Chilliwack is serviced by a total of 11 bus routes, with 8 local services, and 3 inter-municipal routes (#11 to Agassiz/Harrison, #22 to Hope and the Fraser Valley Express). Within Chilliwack proper, routes are generally organized by north-south routes, connecting downtown in the north to the areas of Sardis and Vedder south of Highway 1, and neighbourhood routes providing local service from exchange locations.

BC transit identifies one formal exchange (Downtown Exchange), which is located in Downtown Chilliwack in proximity to the designated 'Five Corners', downtown core (corner of Yale Road and

¹⁰ Statistics Canada, Census 2016

¹¹ Frequent service is defined as 15 minutes or better, between 7:00am-10:00pm. Current service between Abbotsford and Mission varies between 15-30 minute headways (March 2021).

¹² The #31 route provides direct connections to the WCE Mission City Station from both of Abbotsford's bus exchanges.

Spadina Avenue). Another connection point for multiple routes is located at the Cottonwood Mall, south of Highway 1, and west of Vedder Rd. Several routes are connected to both exchanges, including the Fraser Valley Express, providing both local and inter-regional links.

The Downtown Exchange is also proximal to the rail corridor (approximately 800 meters). A rail stop location in this vicinity (see figure 11) could provide a link within walking distance of the current exchange, as well as to Chilliwack's urban centre, supporting a potential centralized multi-modal connection point between local bus services and regional links within the core of city – an area planned to accommodate growth and intensification over the coming years as a walkable, transit oriented urban centre.

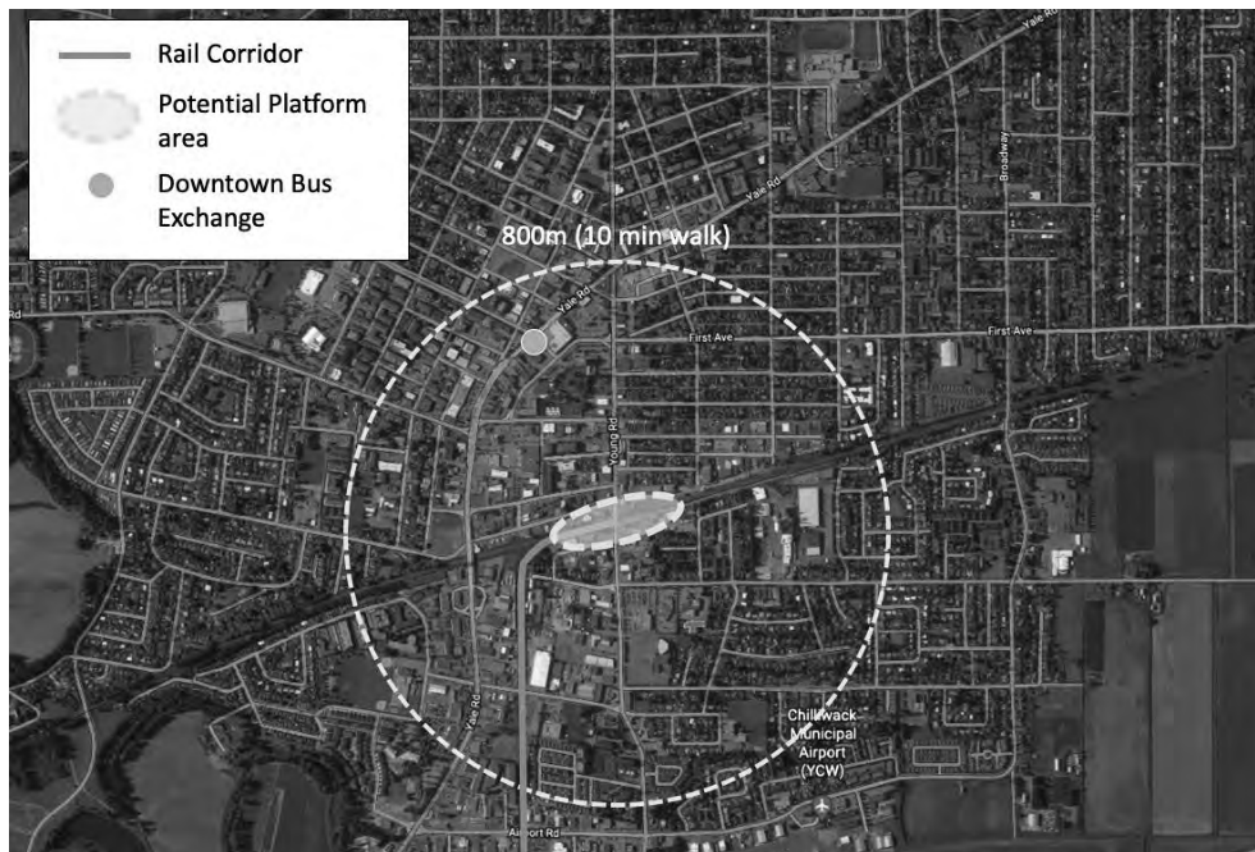


Figure 11 - Downtown Chilliwack transit-rail integration

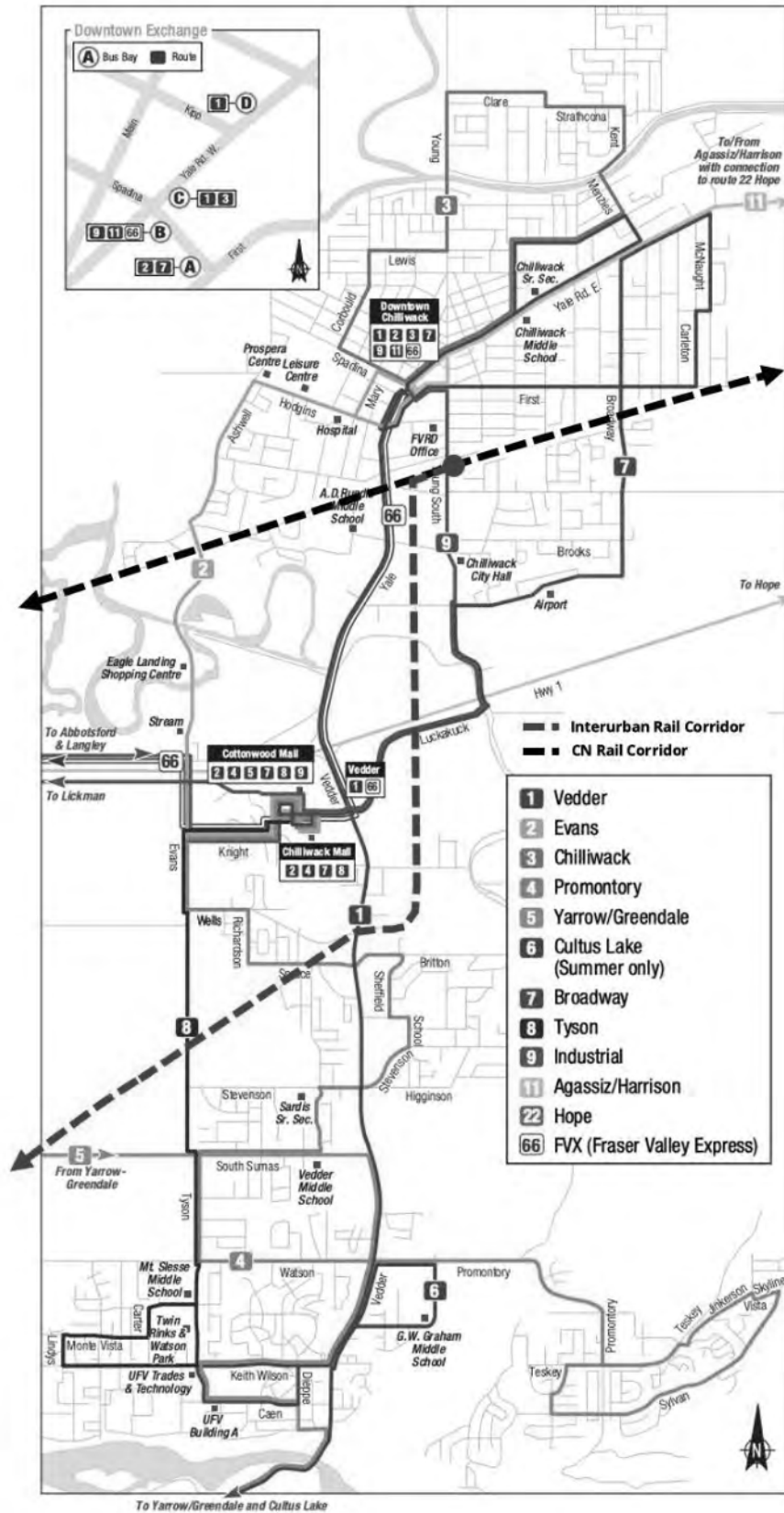


Figure 12 - Current central Chilliwack Transit Network

Analysis

Chilliwack's local transit services are aligned along the primary north south corridor formed by Vedder Rd and connect downtown to neighbourhood areas. This generally follows the City's long term development patterns and growth plans to concentrate density and a mix of uses downtown and provide an alignment between land use and transportation. The alignment of the rail corridor from Sardis north largely mirrors this north-south link, and terminates within the downtown area, and is near the existing Downtown Exchange and urban context (within a 10-15 min walking distance), suggesting that services utilizing the rail corridor could achieve alignment with transit objectives, as well as provide multi-modal connections in close proximity to planned focal growth areas.



Figure 13 - Chilliwack future transit vision (BC Transit Chilliwack Transit Future Plan, 2013)

Conclusions

In review, the region's key communities are currently being serviced by both regional and local bus networks generally oriented around the City's current urban structure and connecting destinations. However, these networks have not resulted in strong transit ridership, with only 2-3% of Fraser Valley residents utilizing the services. According to BC Transit, this has been attributed in part to historically lower service hours, as well as long travel distances and time between destinations, and in some instances, reliability issues due to congestion. Reliability has particularly been noted as a challenge in providing regional services, such as the FVX, which make use of Highway 1. Taken together, transit offerings have historically not offered a competitive alternative to car travel, and have been met with low uptake as a result. Over time, it is expected that these local services will improve with added routes and increased service hours, however congestion and travel time may continue to present an obstacle to higher uptake, particularly for longer regional trips.

To address this, the introduction of a regional rail system making use of existing rail corridors could provide an option for a more reliable regional service, while also supporting and integrating with local bus services.

Transit Integration Summary		
	Opportunities	Constraints
Langley City/Township	<ul style="list-style-type: none"> Options for close connections with SLS, supporting multi-modal transfers. Can establish connection to rapid transit into Metro Vancouver. Connection point between services supports ridership and improves business case for both. 	<ul style="list-style-type: none"> Need for more study and options to reducing distance between connections and minimize transfer penalty between FV rail and SLS. Rail corridor through Langley City is within developed urban context – corridor ROW is constrained on sides. Major bus transit hub at Carvolth exchange is located north of the corridor at Hwy 1.
Abbotsford	<ul style="list-style-type: none"> Close connection opportunity with existing and planned major transit hub in Historic Downtown area – connection point to potential rapid transit corridor along S. Fraser Way. Transit hub connection supports local “first mile/last mile” bus routes from potential stop area. 	<ul style="list-style-type: none"> Transit access to City Centre (envisioned future downtown, ~ 2kms west of rail corridor) would require transfer. No direct links to Abbotsford Airport – Transfer would be required.
Chilliwack	<ul style="list-style-type: none"> Terminates in Downtown area, within walking distance to major destinations and intended growth area for transit supportive development. 	<ul style="list-style-type: none"> Potential transfer penalty of ~10 min walk between downtown bus hub to corridor terminus, and similar walking distance

	<ul style="list-style-type: none"> • Potential stop area at Interurban terminus would be within walking distance to existing downtown bus hub. 	<p>from corridor to Cottonwood Mall exchange in Sardis.</p> <ul style="list-style-type: none"> • Transit access to Vedder neighbourhood and south Chilliwack with existing routes would likely necessitate additional transfers.
Mission	<ul style="list-style-type: none"> • FV rail linking up to Mission City Station could provide excellent opportunity for close integration with WCE and local bus services, with minimal transfer time. • Extension of WCE to Abbotsford, with terminus in Historic Downtown would provide rail connectivity to Mission and commuter option to Metro Vancouver. 	<ul style="list-style-type: none"> • Extension of the WCE may necessitate station relocation further from downtown centre and distance from existing bus services.

In review of the existing and planned transit, services within the study area generally appear to be well aligned in connection to the rail corridors and envisioned regional rail, particularly within the urban centres of the major communities, with all providing connectivity to major transit exchanges and downtown areas within a 5-10 minute or less walking distance. These existing services are also typically aligned with city's land use plans, which envisions the evolution of the core areas into compact, walkable neighborhoods with proximal access to transit services. Taken together, there is the opportunity for mutually supportive elements to further municipal goals of improved transit ridership, fostering transit oriented development, and less reliance on automotive travel by providing regular, reliable, connected multi-modal services with destinations aligned with long term growth strategies.

As noted above, this memorandum has analyzed transit integration based on existing services, routes, and exchange locations. With the introduction of a regional rail service, it would be recommended to undertake a collaborative review with municipalities and service providers of existing and planned local transit, to identify possible new routes, optimization, and consideration of exchange locations to enhance intermodal connectivity.

In both Langley City and Mission, the presence of existing rail services and planning for the SkyTrain provide additional benefits to improve regional transit links, with increased connections providing mutually beneficial support to the business case for each. However, the established WCE rail infrastructure and the advanced stage of corridor alignment development for the SLS requires further technical analysis to identify optimal stop areas and integration points at these key junctures, including stop locations, potential land requirements, track and platform spacing, pedestrian connections, pick-up/drop-off points, and other integration issues.

In general, recommended further steps also include sensitivity analysis of stop locations along the corridors to optimize intermodal connectivity, along with close engagement with transit service providers and municipalities to support integrated service planning, and preliminary engineering and design analysis to understand infrastructure options and needs.

RIDERSHIP ANALYSIS

FRASER VALLEY REGIONAL RAIL PRE-FEASIBILITY STUDY (APPENDIX “D”)

August 2021



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Note: This Memo is part of the overall analysis for studying regional rail concepts for the Fraser Valley. This analysis, along with further qualitative and technical analysis, will form part of the broader Pre-feasibility Study.

Purpose

The Fraser Valley Regional Rail Pre-feasibility study assesses the opportunities and potential for a regional passenger rail service providing connections between communities within the Fraser Valley and beyond, to determine whether such a service warranted more detailed investigation. Following an initial review of available corridors, including an assessment of operational and infrastructure constraints, three conceptual alignment options were developed and considered from a passenger demand / ridership perspective.

This technical memo summarizes the results of a high-level ridership estimation exercise for each of the three conceptual alignments. These estimates provide preliminary quantitative inputs to better inform the broader assessment and evaluation of proposed regional rail concepts. Together with the other assessment considerations, the ridership estimates provide useful insights with respect to the potential of a regional rail service.

This analysis is part of a larger Pre-feasibility assessment that considers a broad set of factors relevant to the potential success of a regional rail service. These factors include how such a service may contribute to the achievement of broader regional transit objectives, how well it aligns with future growth and development patterns, whether there are opportunities to integrate a new regional rail service with existing and planned transit infrastructure, whether such a service could leverage existing infrastructure and investments, and the extent to which a regional rail service may require operating agreements and partnerships and whether these are achievable. These factors, along with this ridership analysis, contribute to a multi-faceted review and analysis of potential regional rail opportunities in the Fraser Valley, and identify further directions for future study and project development.

Methodology

To derive the estimates, a multi-step methodology was applied. Steps included:

- a) Determination of travel markets
 - A review of travel patterns and trips as captured in available data sets was undertaken. Key geographic travel markets were identified (e.g. trips between Langley and Abbotsford), along with trip purpose (e.g. number of home-based work trips or home-based personal trips out of the total recorded trips).
- b) Develop potential mode share
 - The mode share was developed through consideration of the following:
 - Review of mode share captured by reference services (e.g. WCE, FVX, SkyTrain) and trip purpose (e.g. home-work trips, personal trips).
 - Development of a travel time and value weighting between options (e.g. travel time, weight time, fares vs drive time, parking costs).
 - Based on review and application of the above inputs, experience and qualitative analysis, development of potential mode share ranges of the travel markets for each trip purpose, including application of travel time and value weighting.
- c) Apply reverse peak (2-way) trips
 - Informed by reverse peak trips captured by other systems within the Lower Mainland and qualitative assessment, a reverse trip ratio was estimated and applied.

- d) Apply off-peak trips
 - Similar to the reverse peak ratio, an off-peak trip ratio was estimated and applied.
- e) Apply future growth
 - Based on TransLink's Regional Travel Model (RTM) projections of population and jobs for the year 2050, a growth ratio was then applied to each option to provide potential future ridership ranges over the low, medium and high ranges.

Limitations

As a high-level estimate supporting a Pre-feasibility study, the following has not been developed from any modelling, and makes use of a blended quantitative and qualitative methodological approach using existing data sources, best practices, and application of professional expertise which was applied to determine potential ridership ranges. The results should not be interpreted as a projected future outcome, but as a preliminary analysis of the potential ridership which could be captured by the service. The provided ridership ranges allow for a variety of possible scenarios, which would likely lead to greater or lower ridership depending on the conditions.

The following qualifications of the methodology and outputs should be noted:

- For future growth, population and job projections are at a municipal level, and do not contain any smaller level of geographical granularity (e.g. traffic zone or census dissemination block). In other words So, they are not sensitive to changes in the geographical distribution of population and job density across an area or around a station.
- The 2017 TransLink Trip Diary, one of the primary data sources used for this analysis, does not contain internal origin-destination data for trips within communities located in the Fraser Valley Regional District. This has been determined through supplemental use of StreetLight GPS based travel data.
- Future ridership has been derived solely from projected population and job growth figures obtained from TransLink's RTM. The RTM data available did not include a model of future travel patterns or potential additional transportation infrastructure changes – i.e. impacts from future Highway 1 conditions, SLS, changes to the West Coast Express (WCE), and other transit and transportation services are not considered directly, and only by proxy through the representative impacts captured through a low, medium, and high estimated mode share, as described below.
- The estimates are provided across three ranges (low, medium, high), reflecting an assumed mode share captured by a service depending on the combination of factors. Factors include:
 - Current mode share for each trip purpose of the surveyed travel markets. This informs a higher or lower estimated mode share by trip purpose for each concept.
 - Weighted Travel Time and Equivalent Value of Time – a measure of competitiveness against other modes. It quantifies time for in-vehicle time and wait time, converted to a dollar value. This is weighted against costs for other modes, such as fares, parking, and their respective in vehicle/wait time.

With consideration for these factors and professional assessment, an assumed mode share has been estimated across low, medium, and high ranges. These ranges provide a proxy to weigh for additional variables which cannot be controlled for individually at this level of analysis, such as:

- Changes in future highway congestion¹
- Greater or lesser than anticipated population growth
- Use of park and ride lots at station locations
- Improvements to local bus services - e.g. first/last mile connections
- Future land use variability, such as greater density and planning for transit oriented development around stations
- Increased economic development and job creation within the travel markets for the service
- Fares, schedules, travel time, network connectivity²
- Change in travel patterns

These factors can be summarized across the ranges as follows:

Low Mode Share: Station connectivity by driving, biking and walking, land use pattern around the station areas, and congestion level in the roadway network, are similar to the existing conditions.

Medium Mode Share: Fair relationship to station connectivity by driving, biking and walking, more compact land use pattern around the station areas, and increased travel time on the roadway network due to greater traffic volumes (congestion).

High Mode Share: Strong relationship and station connectivity by driving, biking and walking, high-density mixed-use land use pattern around the station areas, and significantly worse levels of congestion on the roadway network.

Generally, the higher mode capture represents more optimized future conditions, with greater alignment of development and land use patterns, transit integration, population and economic growth, and a competitive service offering versus alternatives. Conversely, lower mode capture would reflect poorer conditions. For example, slower population growth, increased urban sprawl, or continued suppressed commute patterns over the long term due to COVID, or changing economic conditions and shifts in the work force.

¹ A weighted time and equivalent value factor has been applied, but these variables have not been modelled.

² Ibid

Concept Routes

As part of the ridership estimates, three conceptual passenger rail options were considered, including the following:

Option 1: WCE extension

Concept proposes extending the West Coast Express across the Fraser River, south into Abbotsford. While the service currently operates as a peak only service, conceptual options with reverse peak and off-peak travel were also considered.

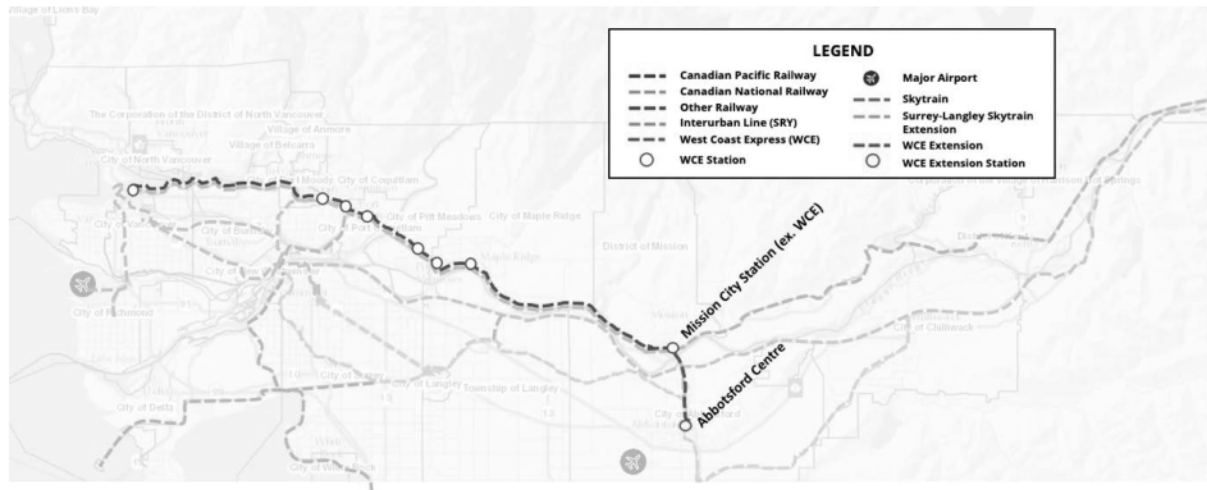


Figure 1: Concept 1 - WCE Mission to Abbotsford

Option 2: Langley - Abbotsford - Chilliwack

Concept proposes activating parts of the former Interurban corridor between Langley City and Chilliwack, connecting through Abbotsford.

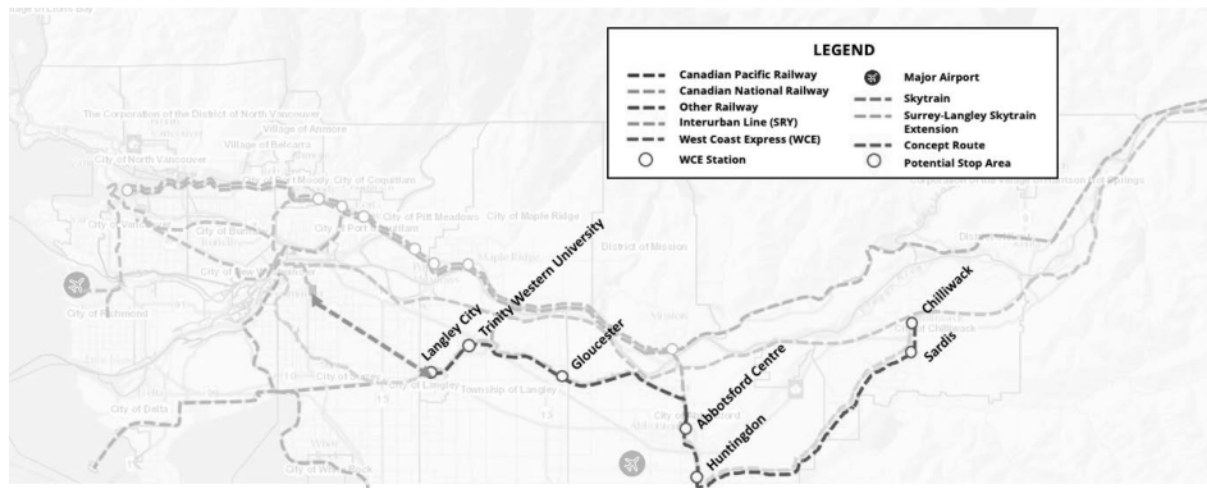


Figure 2: Concept 2 - Langley to Chilliwack

Option 3: Langley - Abbotsford - Mission ("Valley Link")

Concept proposes activating parts of the former Interurban corridor between Langley City and Abbotsford, then connecting up across the Fraser River to Mission.



Figure 3: Concept 3 - Langley to Mission

Service Parameters

The following provides assumed parameters for operational conditions of the service concepts. These have been derived from known route conditions and reference performance of similar systems.

Speed

- The average speed range for the concepts is assumed to be between 50 to 65 km/hr (inclusive of acceleration/deceleration)³. This is derived from comparable speeds achieved by other similar services.

Distance between Major Destinations

- Langley City – Abbotsford: Approximately 36 km
- Langley City – Mission: Approximately 46.5 km
- Mission – Abbotsford: Approximately 10.5 km
- Abbotsford – Chilliwack: Approximately 39km

Approximate travel times

- Langley City – Abbotsford: 30 to 40 minutes
- Langley City – Mission: 40 to 45 minutes
- Mission – Abbotsford: Approximately 10 minutes
- Abbotsford – Chilliwack: 30 to 35 minutes

Assumed Frequency

- Peak period – 30 mins
- Peak reverse – 30 mins
- Off-peak (+ reverse) – 1 hour

³ These speeds are indicative based on similar systems. The actual average speed will need be adjusted to include any existing speed restrictions along some of the segments of the corridor, and account for stop times.

Estimates

Based on the above methodology and proposed concepts, the following provides estimates of the potential ridership for each.

Notes:

- The following provides potential ridership for current and future year 2050.
- These figures provide daily and annualized ridership, with annualized assuming 260 weekdays⁴.
- The mode share is varied across the options, reflecting differences in the travel markets (e.g. commute vs. personal trips) and destinations (e.g. Abbotsford to Vancouver vs. Abbotsford to Langley). Estimates include all trips (Home-based Work, Non Home-Based Work, Home-based University, Home-based Personal Business) and time/directions (peak, peak-reverse, off-peak).

Option 1: WCE extension

Estimated annual ridership at the Mission City Station and Abbotsford Station.

Option 1: Current				
Mode Share Estimation	Total Trips – Peak Only		Total Trips - Including Reverse & Off-peak Trips ⁵	
	Daily	Annual	Daily	Annual
Low	1,277	332,020	1,992	517,920
Medium	1,738	451,880	2,712	705,120
High	2,154	560,040	3,360	873,600

Option 1: Future (2050)				
Mode Share Estimation	Total Trips – Peak Only		Total Trips - Including Reverse & Off-peak Trips	
	Daily	Annual	Daily	Annual
Low	1,726	448,760	2,693	700,180
Medium	2,351	611,260	3,668	953,680
High	2,911	756,860	4,542	1,180,920

⁴ Weekends would likely have lower ridership. 7 days a week service would use 300 service days as a factor.

⁵ WCE is currently peak only. This option envisions expansion and extension of the service.

Option 2: Langley - Abbotsford - Chilliwack

Estimated annual ridership for the Interurban line (Langley - Abbotsford – Chilliwack)

Option 2: Current				
Mode Share Estimation	Total Trips – Peak Only		Total Trips - Including Reverse & Off-peak Trips	
	Daily	Annual	Daily	Annual
Low	1,824	474,240	3,086	802,360
Medium	3,098	805,480	5,313	1,381,380
High	4,148	1,078,480	7,191	1,869,660

Option 2: Future (2050)				
Mode Share Estimation	Total Trips – Peak Only		Total Trips - Including Reverse & Off-peak Trips	
	Daily	Annual	Daily	Annual
Low	2,689	699,140	4,567	1,187,383
Medium	4,569	1,178,940	7,871	2,345,491
High	6,112	1,589,120	10,650	2,769,125

Option 3: Langley - Abbotsford - Mission ("Valley Link")

Estimated annual ridership for the Interurban line, from Langley to Abbotsford, and CP line to Mission

Option 3: Current				
Mode Share Estimation	Total Trips – Peak Only		Total Trips - Including Reverse & Off-peak Trips	
	Daily	Annual	Daily	Annual
Low	1,668	433,628	2,602	676,460
Medium	2,825	734,518	4,407	1,145,848
High	3,778	982,272	5,894	1,532,344

Option 3: Future (2050)				
Mode Share Estimation	Total Trips – Peak Only		Total Trips - Including Reverse & Off-peak Trips	
	Daily	Annual	Daily	Annual
Low	2,446	635,836	3,815	991,904
Medium	4,143	1,077,287	6,464	1,680,567
High	5,536	1,439,276	8,636	2,245,271

Reference Systems

Within the Lower Mainland, the proposed regional rail concepts are a unique service model that does not currently exist, and existing systems (e.g. FVX, SkyTrain, WCE) may not provide a relevant comparison. Regional rail style systems are also not common across North America, where there has generally been a preference to develop locomotive based commuter-style services. However, a few reference systems currently active in North America can provide reference as systems with comparable jurisdictions and land use settings, and are provided for comparison and illustrate the levels of ridership achieved:

SMART Sonoma-Marin, CA

Service Type: All-day, bi-directional service

Frequency: Bi-directional 30-45min (peak), 1-1.5hr (off-peak), with more limited weekend service (2hrs, bi-directional)

Speed: Average: 62 km/h, top: 127 km/h

Line length: 72 Km, 12 stops

Annual Ridership - 714,500 (2018)

Austin Cap Metro Rail – Austin, TX

Service Type: All-day, bi-directional service

Frequency: Bi-directional, 30 mins all day (7 days/week)

Line length: 51 Km, 9 stops

Speed: Average: 50 km/h, Top: 97 km/h

Annual Ridership – 1,000,000 (2019)

Recommended Next Steps

The above estimates provide a preliminary look at potential ridership for the service concepts. As part of any potential future work, more comprehensive ridership modelling is recommended to provide a greater degree of detail and calibration, and to inform a potential business case. In addition, any future ridership analysis should include forecasting with examination of the impacts of the above noted variables, including:

- Development of more detailed and current origin-destination data
- Confirmation of routing, stop locations, and service plan (e.g. frequency, schedule, fares)
- Modelling of the impact of park and rides
- Geographic based application of potential future land use scenarios (population and job growth locations)
- Future travel patterns and congestion
- Planned new transportation infrastructure, including SLS and Highway 1

STAKEHOLDER ENGAGEMENT COMMENTS

**FRASER VALLEY REGIONAL RAIL PRE-FEASIBILITY
STUDY (APPENDIX “E”)**

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Background

The following includes commentary from discussions held with key stakeholders as part of the Fraser Valley Regional Rail Pre-Feasibility Study. Two rounds of discussion were held – an initial information gathering round, and a later presentation of the draft report findings. The objective of the discussions was to inform stakeholders of the work to-date, and on-going work, and to understand any ongoing work, insights and perspectives on rail transit for the Fraser Valley, including both opportunities and constraints, and any considerations to help inform the Study's work. Comments received were used to inform the development and analysis of regional rail concept options, along with additional analysis.

Stakeholders included:

- Fraser Valley Regional District
- BC Transit
- TransLink
- Langley City
- Township of Langley
- Abbotsford
- Mission
- Chilliwack

It should be noted that these comments are not a verbatim recording of the discussions, but capture the key themes, ideas and insights provided by participants, and unrelated, off-topic, or unnecessary details may have been omitted or condensed for concision and readability.

FVITDP: Rail Pre-Feasibility Discussion Guide

April 13, 2021

The following has been prepared to inform discussions with stakeholders as part of the FVITDP: Rail Pre-Feasibility Study. The Context is to remind stakeholders of the work to-date, and to inform those who may not have been previously engaged about the on-going work. The below Discussion Prompts are not intended to be distributed to stakeholders in advance, nor are they envisioned as providing a structured question format, but are to inform and guide the conversation, and identify key topics and areas for discussion.

Context (to be shared in advance on invite to stakeholders)

The Fraser Valley Integrated Transportation and Development Plan (FVITDP) was initiated in the summer of 2020 with the objective to study integrated multi-modal regional transportation solutions – aligned with anticipated growth and development patterns – to support the sustainable and successful evolution of communities in the Fraser Valley over the long term.

Since initiating the Plan, a number of transportation projects in the Fraser Valley have been identified by the new Government, including widening Hwy 1 to Whatcom Road and completion of the Surrey-Langley SkyTrain (SLS), as well as planning work to explore further expansion of passenger rail into the Valley.

With the Hwy 1 widening and SLS work underway, a Regional Rail Pre-feasibility Study has been initiated to review passenger rail opportunities in the Fraser Valley. Building off previous analysis from BC Transit and TransLink, this Study includes a review and analysis of the existing rail network and rail traffic patterns, and an initial screening to consider how the existing network could offer opportunities to support passenger services. The objective of the Study is to assess if any existing corridors, or parts thereof, merit a more comprehensive feasibility study.

We're interested to hear from you and understand what you see as the opportunities and challenges with respect to passenger rail, any past work and analysis your organization has undertaken, and any insights or considerations you could share with us.

Chilliwack/Abbotsford

- What do you see as the key opportunities that should be considered regarding a passenger rail service in the Fraser Valley?
- What do you see as the key challenges that should be considered regarding passenger rail service in the Fraser Valley?
- Has the municipality considered inter-regional commuter or passenger rail before? If yes, what did that analysis or study look like? Could you describe the context, assumptions, and any outcomes? If not, why not? Were there any constraints?
- In the past BC Transit (and others) have examined using the Interurban corridor for passenger services. What has been the City's perspective on that opportunity?
- What has been the long term planning view on the role and function of the existing rail corridors in the municipality? As transportation corridors or otherwise.
- What are the challenges that have arisen with respect to the rail corridors as they are today? E.g. traffic disruption, safety, noise?
- Are there any municipal plans or projects related to the rail corridors in the municipality that you would want to share with us? E.g. grade separations projects, trail and active transportation.

Langley (Township and City)

- What do you see as the key opportunities that should be considered regarding a passenger rail service in the Fraser Valley?
- What do you see as the key challenges and/or downsides that should be considered regarding a passenger rail service in the Fraser Valley?
- Recognizing that the SLS would provide rapid transit connections from Langley to the rest of Metro Vancouver, what opportunities does the municipality see with regional rail that could provide connections with the Fraser Valley?
- In the past, the interurban rail corridor through Langley has been reviewed and considered for potential as part of a regional rail service. What has been the long-term planning view on the role and function of the corridor in the municipality? As a transportation corridor or otherwise?

- What are the challenges that have arisen with respect to the corridors as they are today? E.g. traffic disruption, safety, noise?
- Are there any plans or projects related to the rail corridors in the municipality that you would want to share with us? E.g. grade separations projects, trail and active transportation.

Mission

- What do you see as the key opportunities for expanded WCE or new passenger rail service in the Fraser Valley?
- What do you see as the key challenges and/or downsides for expanded WCE or new passenger rail service in the Fraser Valley?
- How has the WCE been considered and/or incorporated into long term municipal land use planning and growth?
- Expansion of the WCE has been studied a number of times, including options for extension to Abbotsford, new station in Silverdale, and additional trains, reverse peak, etc. What has been the view on the role of the WCE and its future?
- What are the challenges that have arisen with respect to the corridors as they are today? E.g. traffic disruption, safety, noise?
- Are there any plans or projects related to the rail corridor in the municipality that you would want to share with us? E.g. grade separations projects, trail and active transportation.

BC Transit

- The past work on rail in the Valley (e.g. BC Transit Strategic Review, South of Fraser study, etc.) have provided a good analysis of some of the considerations with respect to rail, looking specifically at the interurban corridor and WCE expansion. Thinking beyond the scope of those studies, what do you see as the key opportunities that should be considered regarding a passenger rail service in the Fraser Valley?
- What would you see as some of the key challenges and issues for a rail service in the Fraser Valley?

- Has there been any longer term thinking by BC Transit, outside of existing plans (e.g. Transit Futures work), about the role of rail as part of a multi-modal network in the Valley?
- In addition to the past work on rail in the Valley through the Strategic Review, has there been any additional work or analysis of inter-regional rail in the Valley?

FVRD

- What do you see as the key opportunities that should be considered regarding a passenger rail service in the Fraser Valley?
- What do you see as the key challenges and/or downsides that should be considered regarding a passenger rail service in the Fraser Valley?
- Has there been any longer term thinking or planning by the FVRD about the role of rail as part of a multi-modal transportation network in the Valley?
- Has there been any consideration on how rail might affect long term growth and development in the Region?

Engagement Round 1 Comments

Opportunities

- There has been a significant influx of population, including many people moving into the Valley from urban areas (Metro Vancouver), and are expecting more urban transit options.
- A lot of support for having a transit priority on Hwy 1 for buses.
- The recently introduced FVX route is continuing to grow and is going to expand – demonstrates growth in demand for cross regional trips, which rail could support.
- Local governments have shown interest to increase service levels due to fast growing populations.
- A passenger rail system in the FV could make sense to support connections between cities. Think it's great the Ministry is looking at this, though it is likely a longer term thing.
- Many urban areas in the Valley are planning for high densities, particularly around forthcoming SkyTrain stations – opportunity to make those areas part of a multi-modal transit system with connections to FV rail.
- OCPs have been changed and densified through the core areas – rail could support future intensification.
- If analysis shows project is not feasible now, look forward in timelines and identify opportunities to evolve existing modes of transportation (i.e. BRT, Rapid Transit etc.).
- If a service was established, it would be important that it connect to all of the major Valley population centres, including Chilliwack and Mission.
- Hwy 1 expansion alone won't address demand for east / west travel. Will need to have to have some sort of high-speed rapid transit – either dedicated along the Hwy 1 corridor, or in a different corridor – FV rail could provide that opportunity.

Challenges

- The cost of upgrading the rail system, connectivity etc. would be high, might be better option to have light rail along the highway
- Existing WCE service is costly to run, with limited service. Any new service would need to provide more access and frequency to have real benefits.
- Rail is important to consider, but we should be looking at transit and mobility across the region in an integrated manner.
- Rail has a very important role in goods movement, and is growing – existing lines have significant volumes through important areas, and will get start getting busier in the next 30 years due to Roberts Bank Expansion - this will need to be addressed.
- Current rail traffic results in long trains going through communities with limited infrastructure (Overpasses etc.) Investment would be needed to substantially upgrade the infrastructure. Concerns about the Interurban – Section running through Langley city is CP rail corridor with about 20 trains a day and could get to 40 trains a day and it's single track. Have doubts that passenger rail would work without building a separate track, which is costly
- Interurban may have a relatively slow rate of travel compared to other forms of transportation - It would have to be competitive with Hwy 1 – however this may change if congestion on the highway increases.

- Have a quick service bus lines, people having to take a bus to a train station may not make sense.
- The existing line touches many of the urban areas but does not hit all the central urban areas. If trains are going slow and they do not go through the urban core – is it attractive? Don't think it's a direct enough route to be attractive to move people into Vancouver.
- There has been concerns about the ownership of rail lines and ability to secure them for passenger usage. Some have passenger rights, but others will need to be negotiated.
- Lower density communities surrounded by ALR have limited long term growth projections, with citizens showing little support to growth and densification – this could be an impediment to greater uptake and support for rail.
- Cost of such a service would be difficult for local municipalities to fund under current transit funding arrangements.

Other Considerations

- Should look at destination data in detail to understand what future movement patterns might be.
- There is a lack of industrial land and access to existing – provincial support needed to help municipalities address this issue. Can rail be part of the solution?
- What are we doing in the short and medium term to address other transit options?
- This project should be complimentary to existing services, not detract from them
- There are some significant development projects and planning work in early stages across the region, such as the Mission waterfront masterplan work. Taking a look at how these might impact future mobility patterns will be important for rail and other transportation.
- Transit ridership across the region is growing quickly, but still remains comparatively low (1-3%).
- Great importance in improving connections between Mission and Abbotsford – whether it is rail or bus – it is the only connection between the North or the South.
- Focus of planning and growth in FV is keeping people within the community – we don't want people to have to travel into Vancouver.
- Concerned rail may be more a tourist attraction rather than a viable mode of transit.
- Magnitude of the loss of a railway for a few months would have a huge economic impact on both BC and Canada. The expansion of a rail line to move goods off of the roads onto rail would be economically beneficial.

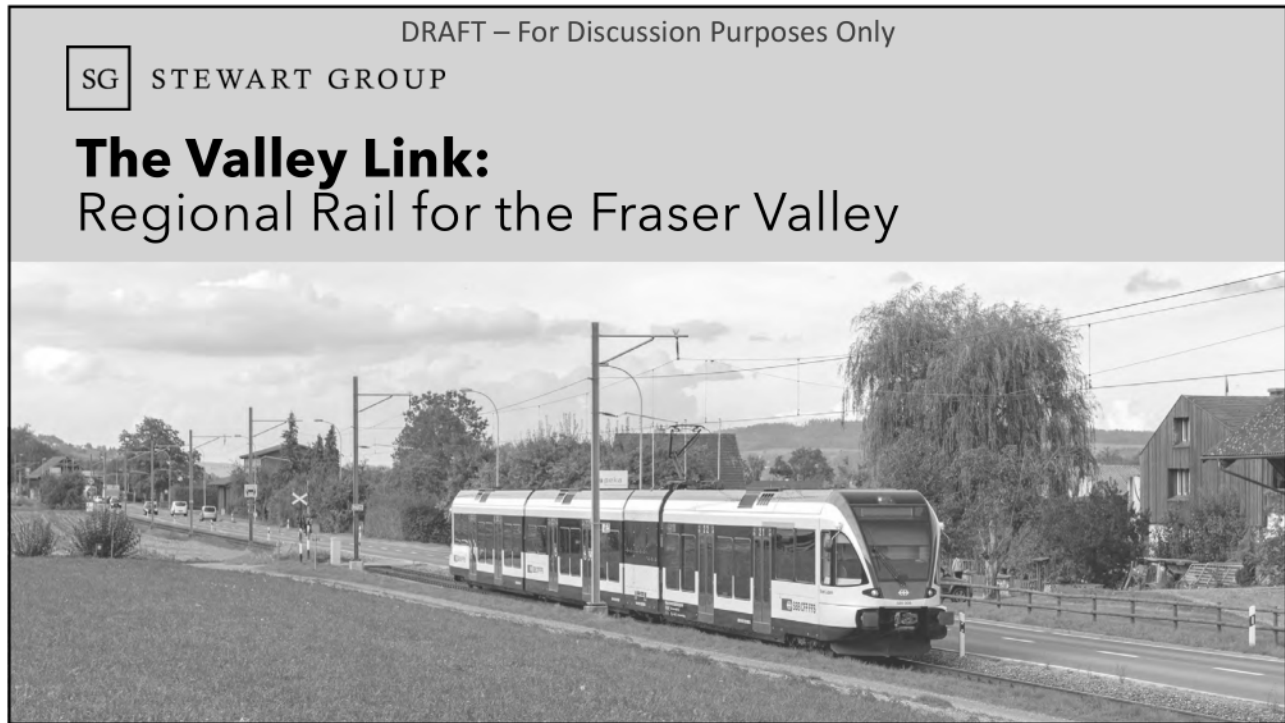
Past work

- Interurban studies and TransLink studies have ruled it out for South Surrey, and opted for SkyTrain, FV municipalities haven't looked at it recently.
- A report was done in 2010 and found bus on Hwy 1 to be better performing and more cost effective.
- Past reports have not found the Interurban to be the most viable option today. An inter-regional transit system is still 20-30 years away.
- There was an updated transit plan for the Valley in 2018, which spoke about regional connectivity related to Transit. Looked at cost of improving existing FVRD connection by Rapid Bus etc. and advocated for inter-regional bus.
- Transportation and Transit master plan looks at safety issues and has promoted range of mobility options, including bike and transit (bus).

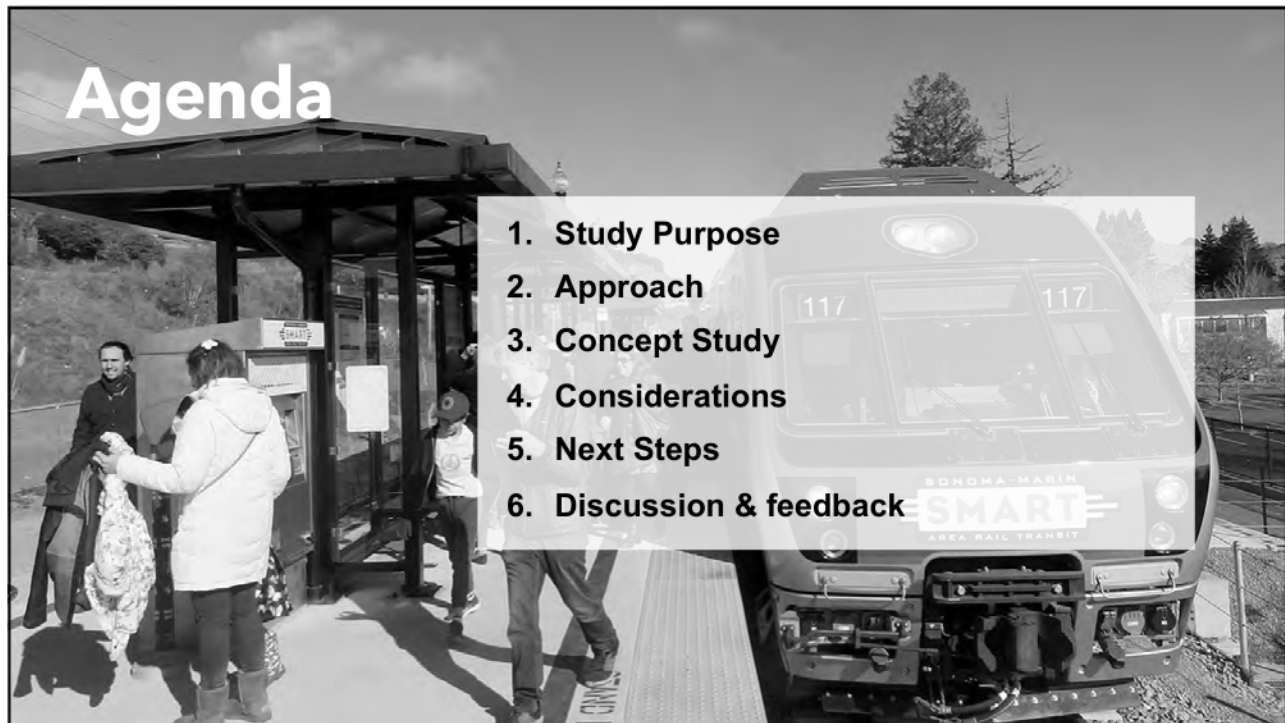
West Coast Express

- WCE has been a success, but its limited service has not meant it has delivered everything hoped for - not convenient for shoppers, students or medical appointments.
- 2-way service with a more local pattern could help to support local economic development along the line, not just funnel people into downtown Vancouver.
- Making it a more regional service could help pay for the service.
- It is more comfortable than a bus or SkyTrain, which makes it an attractive service for those who can use it.
- Past studies have examined and expanded alignment into Abbotsford on the existing rail line, or adding a station in Silverdale (Silverdale being a likely strong population growth area that could be addressed with adding a station)
- WCE uses older, expensive heavy rail technology. Could benefit from upgrades (battery operated service, hybrid service).
- Freight has caused delays to passenger rail due to right of way and increasing trips. Unsure passenger rail could share the corridor with freight traffic.

Engagement Round 2 Presentation Guide



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Study Purpose

- Examine existing rail infrastructure for potential to support sustainable inter-regional transit options for the Fraser Valley

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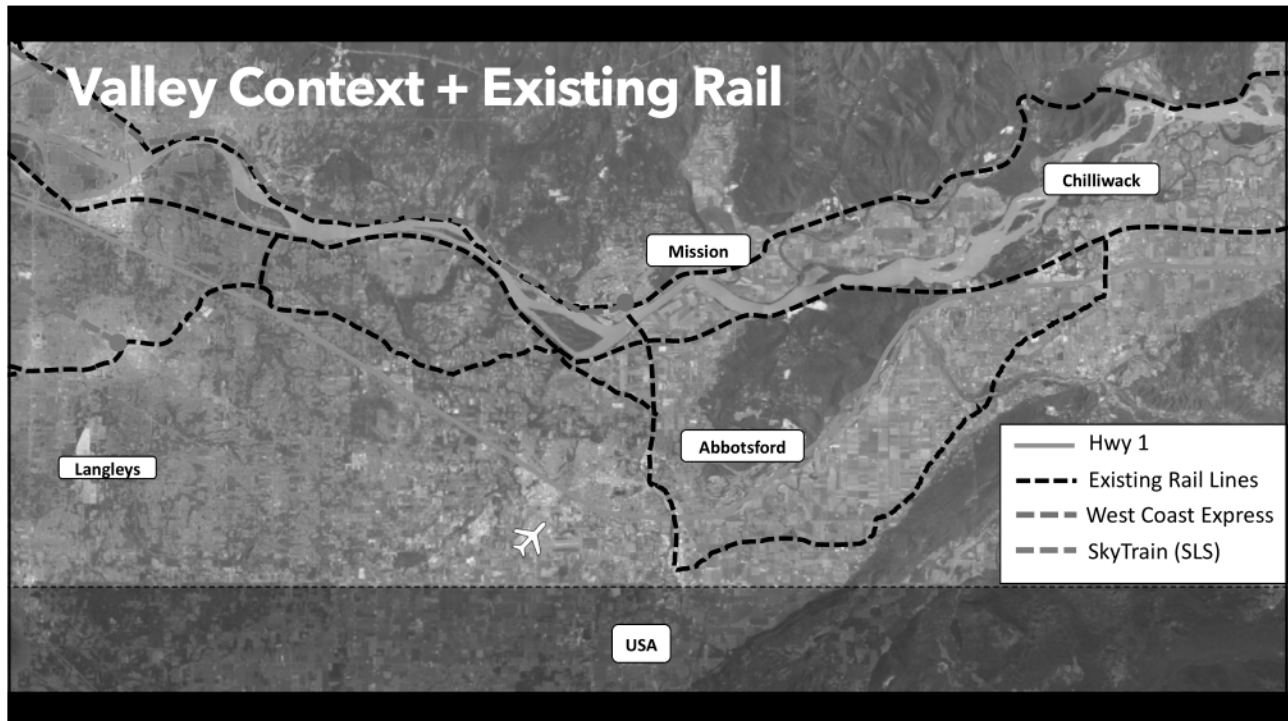
Approach

- Explore regional rail service opportunities
- Supporting analysis:
 - Past work and initiatives
 - Land use and movement patterns
 - Route concepts and technology
 - Infrastructure, ridership, transit integration, partnerships

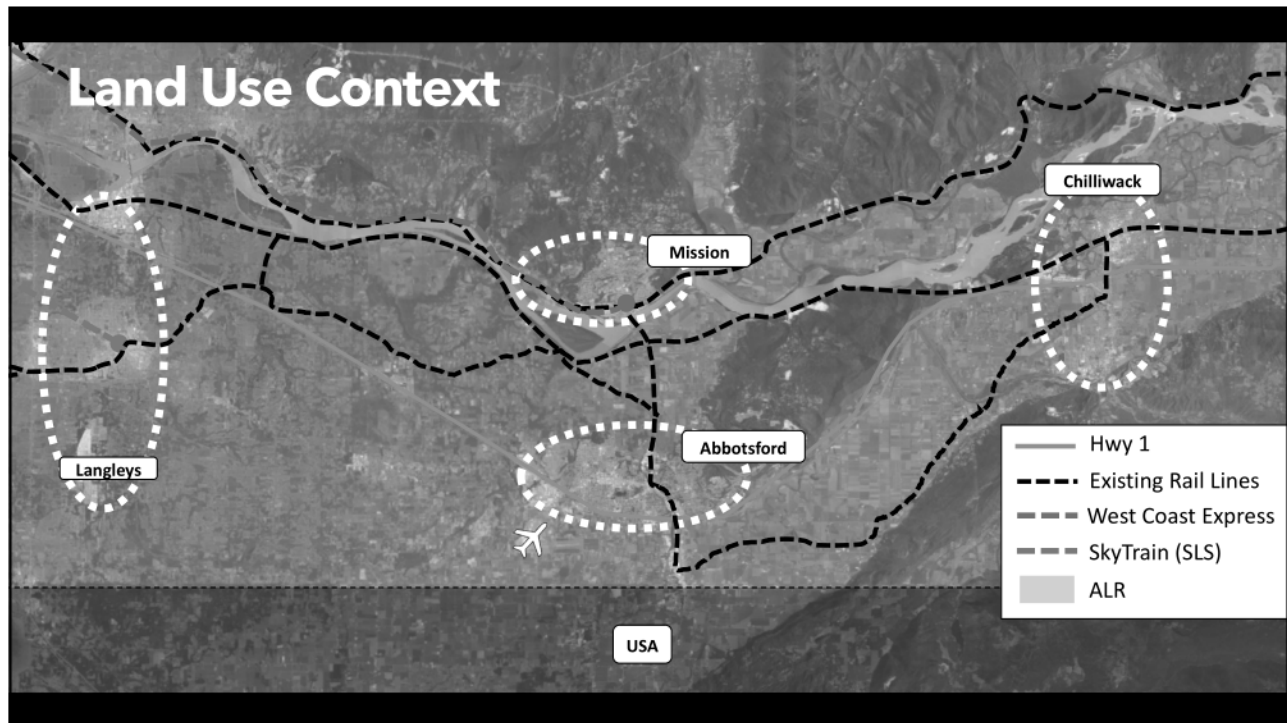
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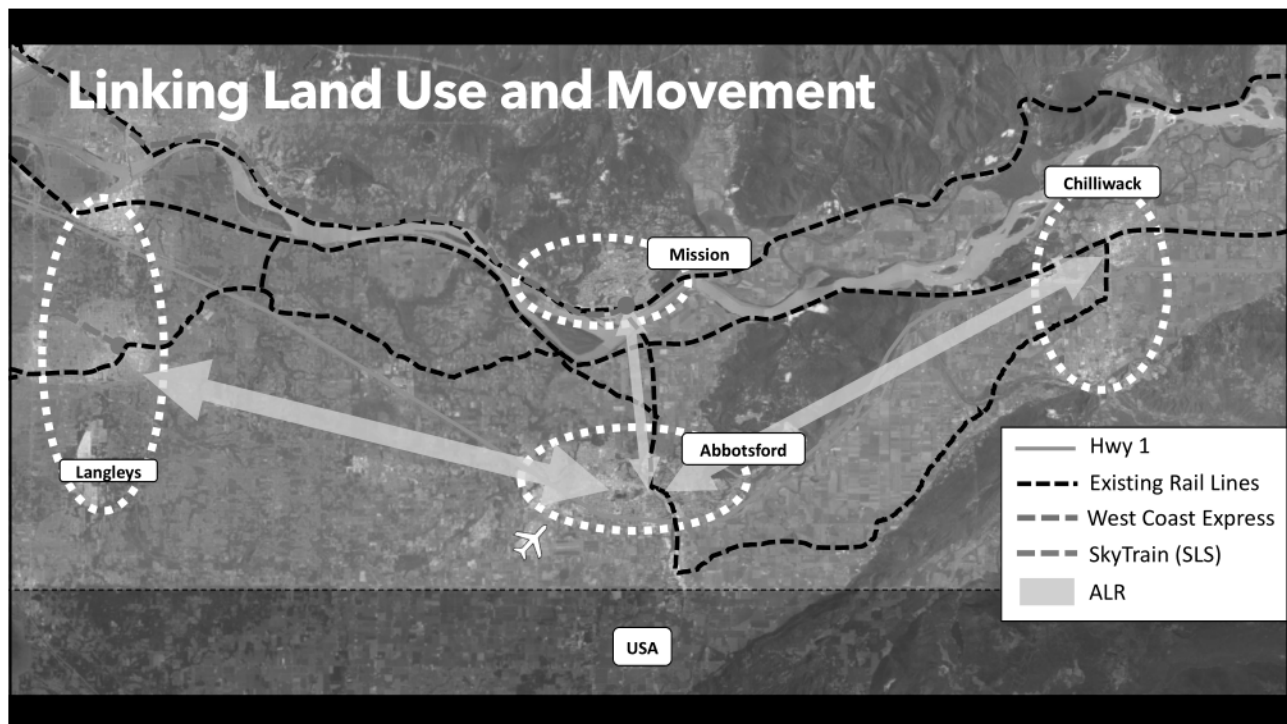
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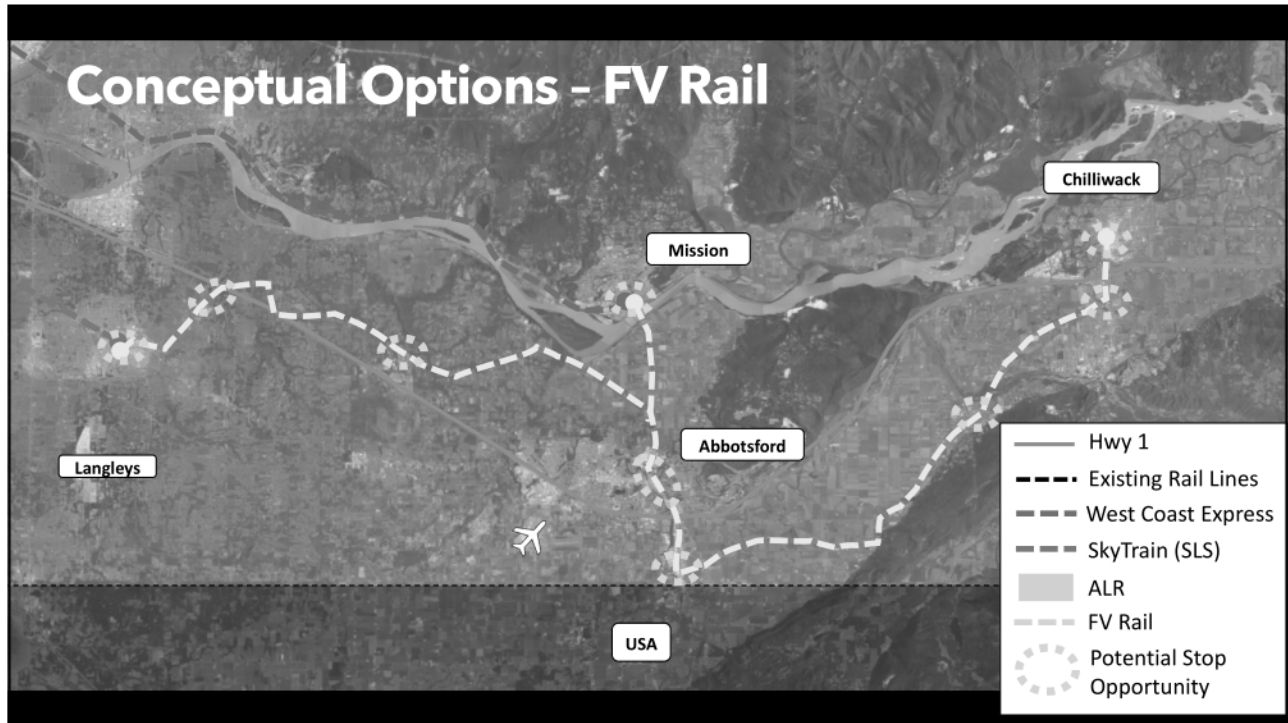
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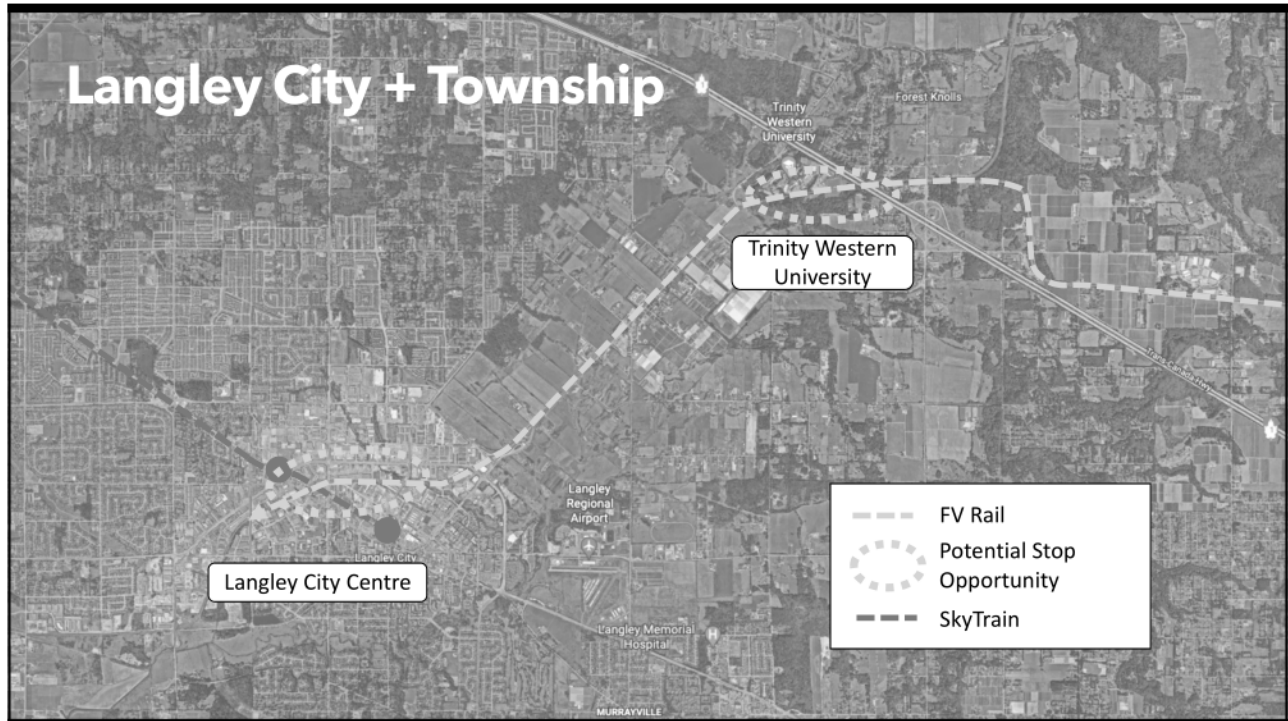
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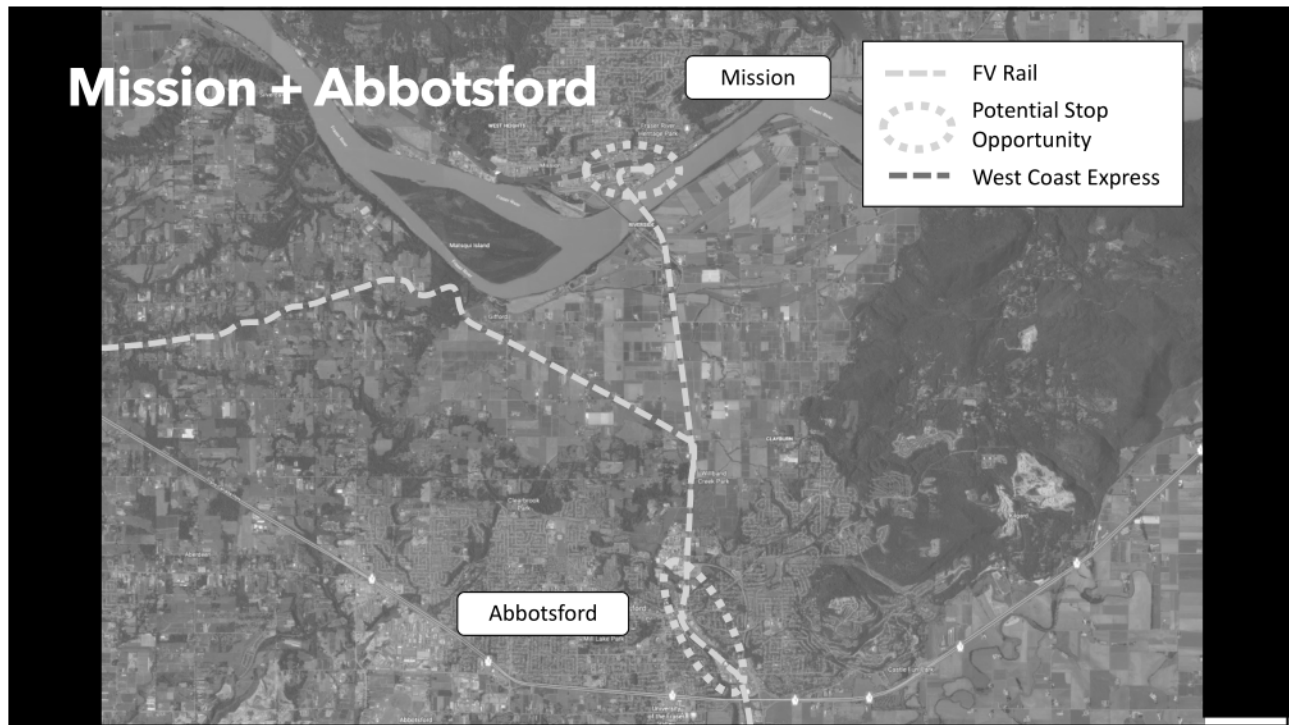
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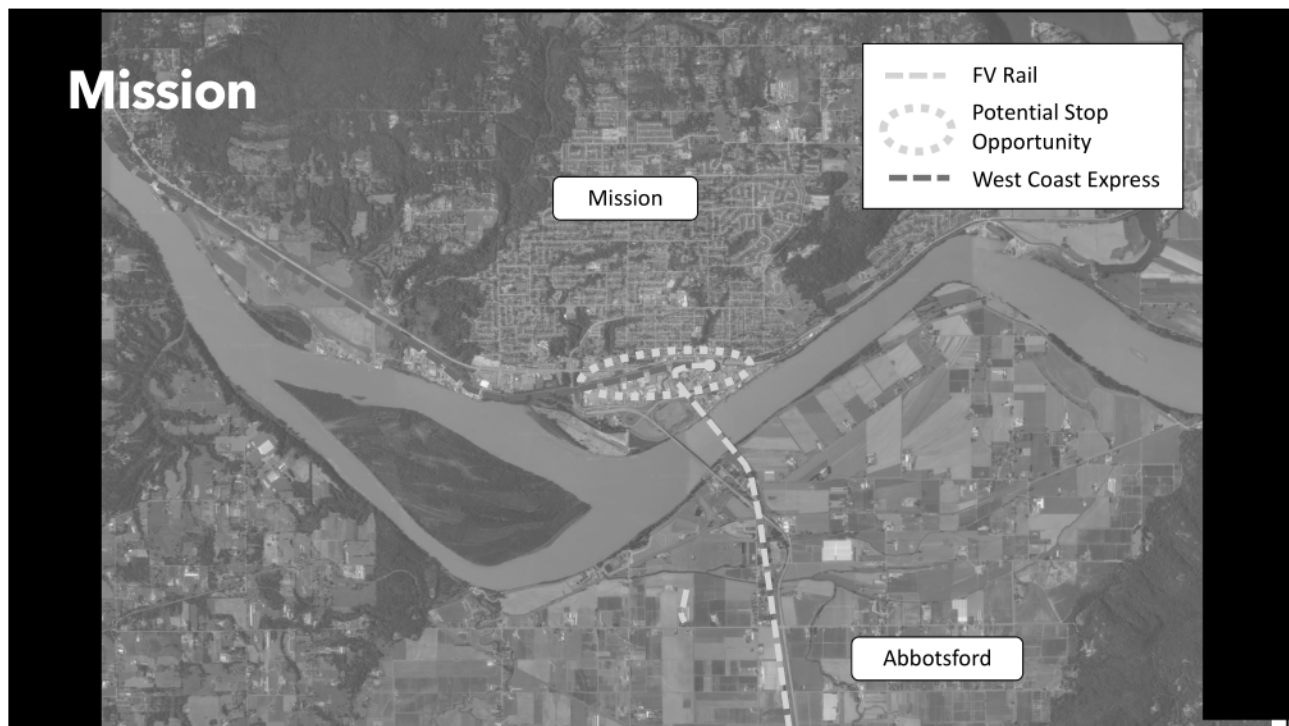
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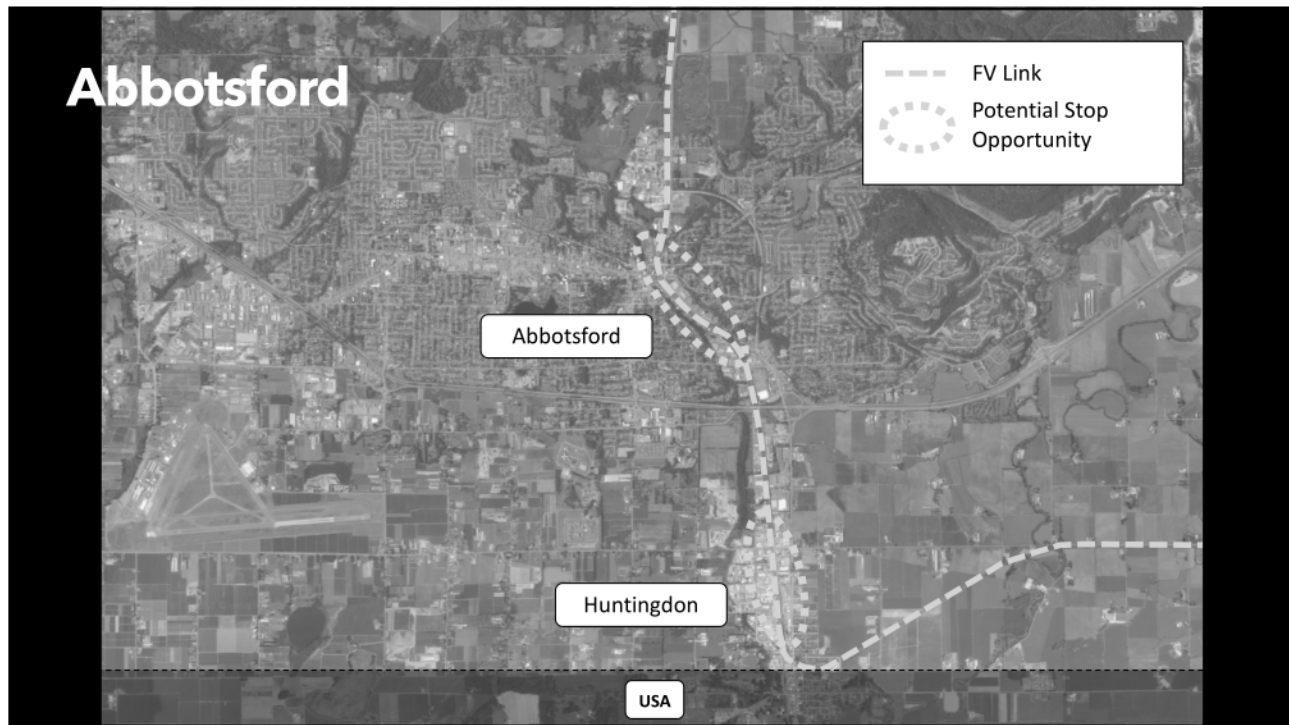
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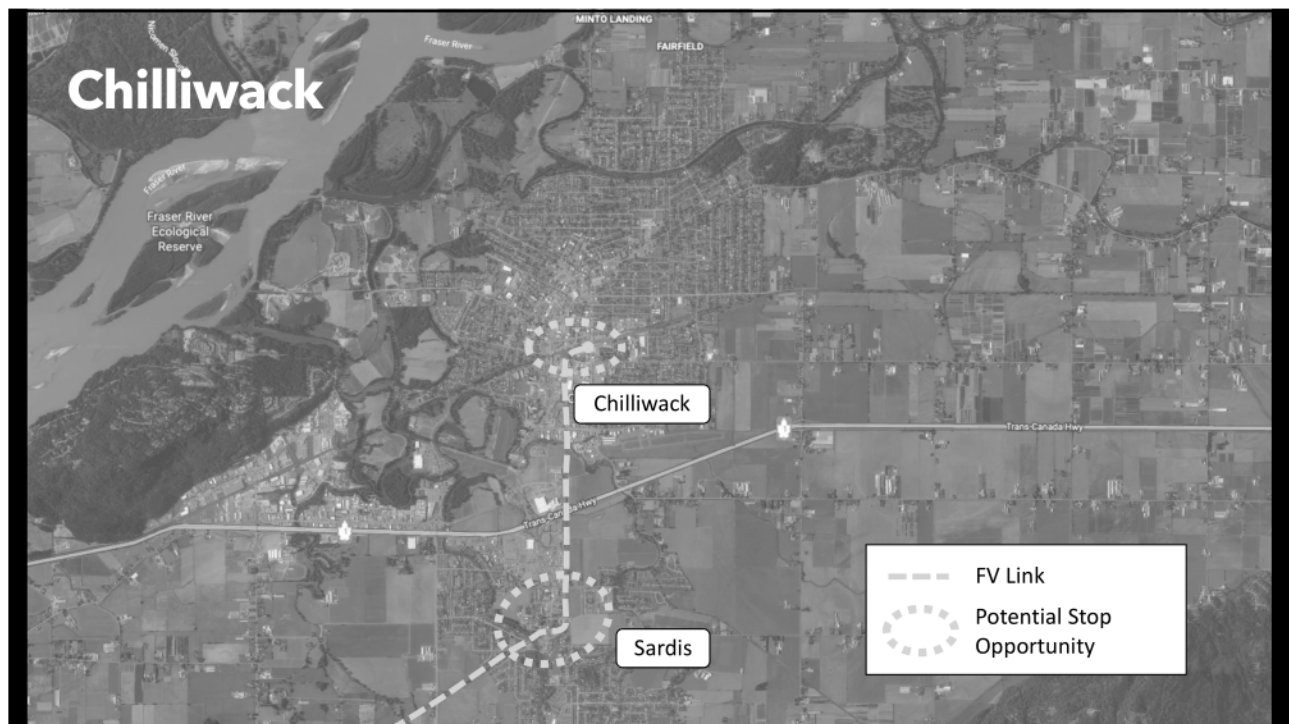
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What is Regional Rail?

- Can run **2-way, all day**
- **Flexible and adaptable** – smaller, lighter trains
- Clean technology options - Hydrogen

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Considerations

- **Infrastructure**
 - Utilizing existing lines for sustainability and affordability
 - Investment to support continued, growing freight and passenger movement
 - Address pinch points – corridor improvements

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Considerations

- **Ridership Potential**
 - Market analysis + high level review based on current movement patterns
 - Considered potential ridership for 2021 & 2050
 - Comparable with similar services

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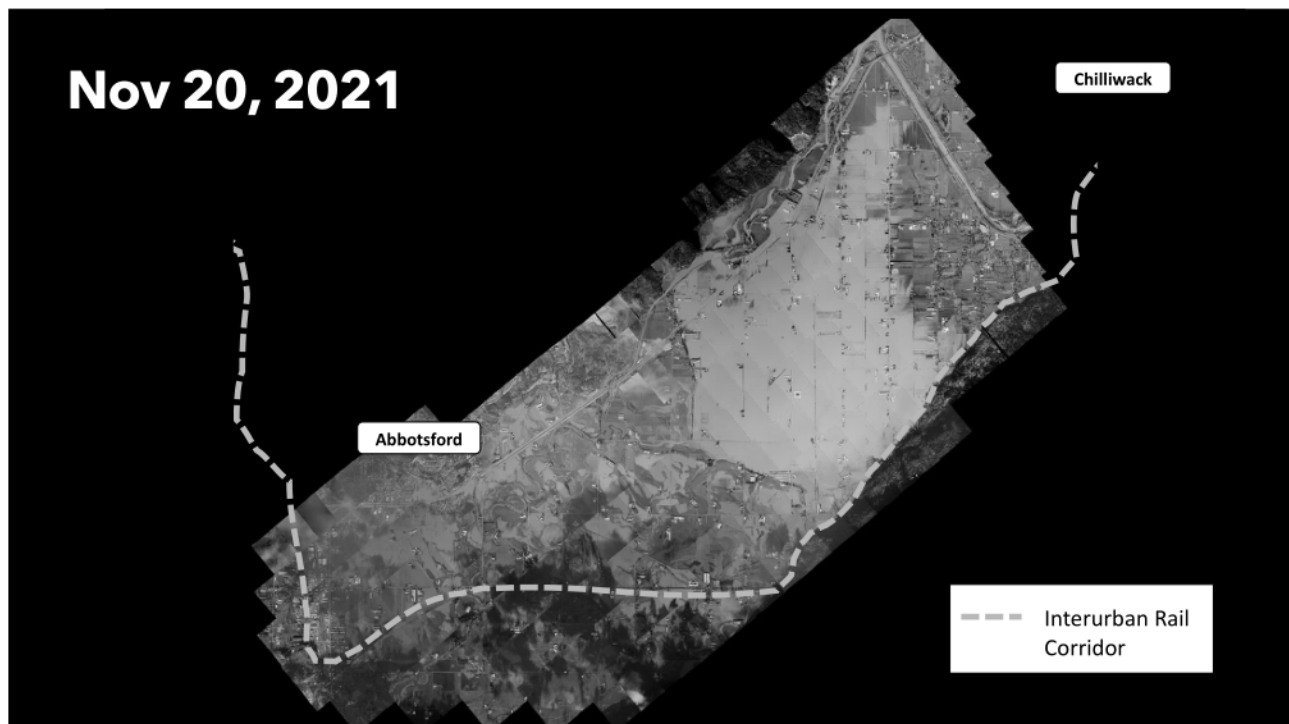
Considerations

- **Transit**
 - Act as inter-regional "spine" for local services
- **Partnerships**
 - Railroads, local municipalities, transit service providers, BC Hydro, Federal Gov't
- **Rail Line Ownership**
 - Province has passenger operating rights on over 80% of the line

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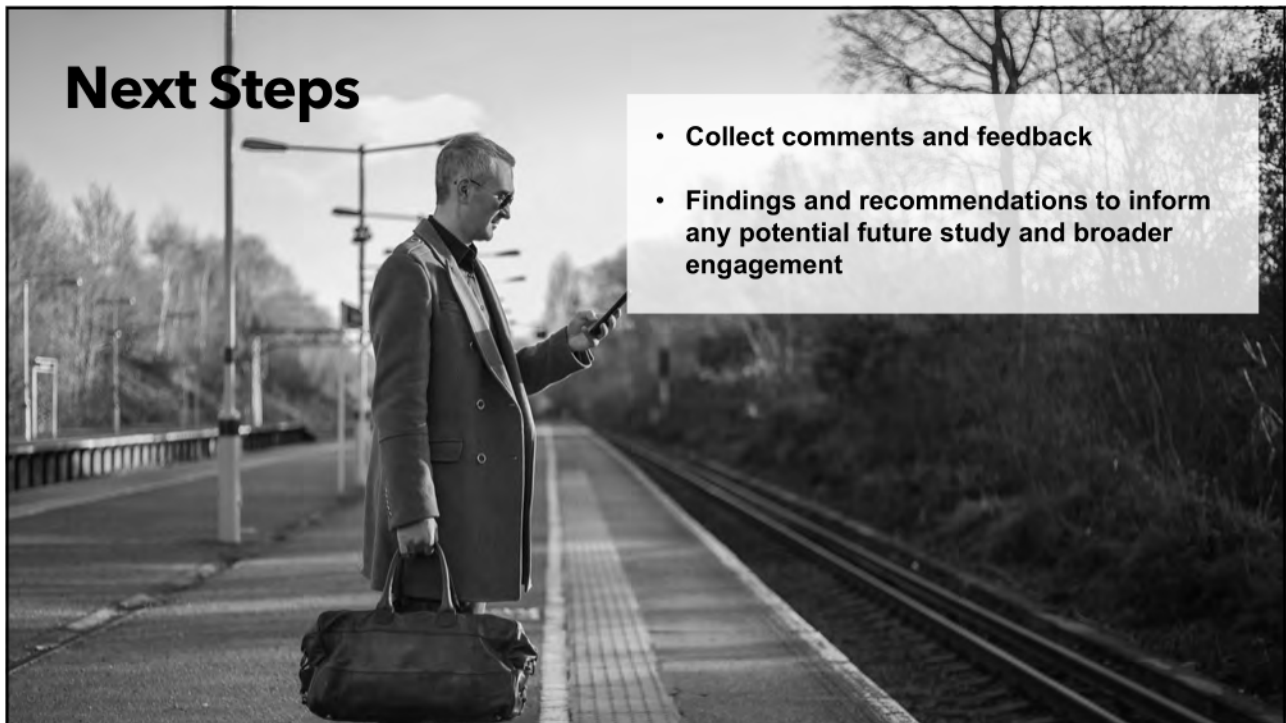
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Next Steps

- Collect comments and feedback
- Findings and recommendations to inform any potential future study and broader engagement

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Engagement Round 2 Comments

Transit Integration

- Long term transportation planning by BC Transit and TransLink recognizes need to protect rail corridors for potential passenger rail service over the long term
- Currently, the priority has been to focus on actions that will move quickly. There is a big emphasis on improved bus service, which can be done at lower cost and in the near term.
- Transit agencies are working together on cross jurisdictional bus services.
- Over the long term, the rail corridors could provide opportunities for passenger services when other services (e.g. SkyTrain) reach capacity.
- Important to have BC Transit and TransLink working with the Province for integration of services
- Opportunities to consider this type of service in conjunction with the FVX are encouraged.
- Consider the relationship to the FVX on Hwy 1, and potential stop opportunities with bus connections
- How would this impact the FVX? It is a growing service that communities are investing in. The rail line might pull customers.

Travel Patterns

- People don't just need to go to Metro Vancouver – local travel within the Fraser Valley is a significant portion of trips and key focus.
- Consider destinations on the rail line further to the west - your study area terminates in Langley – consider links to Cloverdale, with the forthcoming hospital and Kwantlen Campus.
- Kwantlen Polytechnic university in Langley is a major destination and close to the line – could it be serviced with a stop?
- Route: There are a few sections which take longer to travel along (due to infrastructure constraints) and it's a bit off the main paths thereby avoiding the major growth corridors - That's where we see a lot of the growth happening.
- This line would serve central Fraser Valley. There is also a need to move people from Agassiz/Kent west to Mission. Are there additional opportunities to serve this route? Agassiz, Kent and Hope are included in the FV – realize a business case to Hope is not plausible, however they were the pinch point for all major transportation routes.
- A connection to the University of FV in Abbotsford would be very beneficial. Transportation constraints routinely cited as key obstacle for students.
- Importance of an airport connection – prior to COVID-19 there was growing flight traffic. Is there an option to connect?
- There will be some interesting real time ridership changes happening with the introduction of the FVX bus connection to Burnaby, which should be monitored to understand travel demand patterns. Is the rail line where people are wanting to go?
- There are some very large employment centres in South Surrey which pull workers from as far as Chilliwack – could be very important to understand this trend connection and opportunity.
- There is a similar focus on significant growth in the Gloucester area (large employment centre). Can this line help to get people to their jobs?
- Must look at the patterns and trends of the labour force and employment centres. A lot of port workers live in the Valley – how might this line help?

Communication

- Interested in sharing the rail and transportation planning questions with a more broad audience, including local councils.
- What this work has done is to help answer the question: is there any merit to passenger rail on the corridors. I think that's a different question to "What is the transportation options in the FV" – I would hope that there will be a fuller conversation about all transportation options

Service Considerations

- Commuters want to get to work as fast as possible. Need to consider this challenge with the Interurban line. We could put a train down the Hwy 1 right of way - would be costly but efficient. Commuter times are going to be important to make it viable to mode shift over from personal vehicles.
- Would be curious to understand the opportunity in more detail – services levels, costs, ridership modeling.
- Some studies in the past looked at Interurban between Chilliwack and Langley – the travel time was deemed to be unfeasible – Should look at travel time/comparable travel times for different modes.
- What is the goal of the Interurban line? Is it a commuter train or a tourist train? How does it become a viable option?
- Probably see this as a phased approach to happen overtime – would like to see more of that. Can't expect everyone to put in required dollars today to build this.
- Rail service to provide redundancy to other networks - should be considered.
- Need to consider the governance for rail, and how operations may overlap – projects should be doing things in a way that make it easier to take transit. Curious to understand who would own, operate, and pay for this service?
- Should look at some of the other options, great to see study of the Interurban line, but think there is an interest in looking at other connections.
- Also need to look at some alternatives, including the continuation of the Interurban rail line into (Interurban corridor) into South Surrey.
- Also a comparison of travel times between modes (bus vs. rail). Would be interesting to see what capital and operating costs are and how these have changed from the 2010 study.
- Speaking from interactions from partners, the WCE with Mission and Abbotsford contributing ridership and being owned by TransLink - there is some opportunity to change that model to one that addresses jurisdictional boundaries between Metro Vancouver and the Fraser Valley.

Partnerships With Railroads

- In terms of working with the railways, you alluded to freight. The CN line is fully utilized by freight rail, and they plan on using that more. Have you had detailed conversations? Or just noted more work needs to be done?
- We know the rail line services Roberts Bank and freight will double over time. Will be a challenge balancing that.
- There are currently agreements with the railroads to address at grade crossings i.e.. Grade separations, however these have been in response to freight traffic. How would these arrangements work with passenger service introduced? Would there be a need for more grade separations? Who will pay?

Infrastructure

- Have concerns on the infrastructure. Parts of the identified corridors will require substantial investment, and a lot of the track would require upgrades
- The link in Langley City is along the rail line where it crosses under the proposed Skytrain line – how would that link up to the SkyTrain? The station(s) would need to be reconfigured significantly if we were to make a seamless connection there.
- Would likely need to build additional sidings and double track certain portions – would be interested to see how that would be done. Parts of the corridor are constrained.
- Understanding is speed limited through certain areas due to the quality of the existing rail – have you looked at cost of upgrading?

Climate and Environment

- There is a significant financial investment that would be required to reinforce the corridor - would like to make sure climate resilience and agility of service are considered, which may come through an options analysis.
- After the floods, the Interurban line was washed out in some areas and it was down for quite some time – it wasn't under water, but they did lose some track. This could be an ongoing issue into the future.
- Lots of lessons learned through COVID-19, floods, fires there was a lot of things we could do with busses that we wouldn't be able to do with rail. Can't change the fact that part of the track is at the base of a mountain and there will be rivers and creeks.
- Railway has acted as a floor barrier. We are utilizing it to slow the water down. It has breached in 1990, and recently. If we do improvements in that area, upgrades to CP land need to be done as well to allow water to flow through. Build-Back-Better needs to protect Hwy 1, transportation networks and this railway.
- Nooksack river flood plain needs to be considered in terms of climate resilient infrastructure