REPORT A – VANCOUVER–ABBOTSFORD RAIL + PACIFIC CENTRAL REDEVELOPMENT

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Executive Summary

This report evaluates the feasibility, infrastructure needs, and long-term planning considerations for establishing a Vancouver–Abbotsford passenger rail service while simultaneously redeveloping Pacific Central Station and relocating the adjacent VIA Rail maintenance facility. Population and employment growth across Surrey, Langley, and the Fraser Valley have intensified east–west travel demand, placing sustained pressure on Highway 1 and underscoring the need for high-capacity, sustainable alternatives. Existing freight corridors owned by CN, CP, and BNSF provide a foundational alignment for introducing passenger rail, and Abbotsford's role as the principal Fraser Valley hub strengthens its suitability as the eastern anchor for a phased regional rail system.

The analysis finds that passenger rail in this corridor is technically feasible but requires targeted infrastructure upgrades, including selective double-tracking, signaling modernization, and station-area improvements. Pacific Central Station—constrained by heritage geometry, narrow platforms, fragmented pedestrian routes, and limited multimodal integration—cannot support future regional rail growth without major redevelopment. An essential prerequisite for expansion is the relocation of the VIA Rail maintenance facility, which currently occupies the only contiguous land capable of supporting new platforms, concourse expansion, and integrated multimodal circulation.

Relocating the facility would also unlock a strategically located parcel within the False Creek Flats, enabling higher-value land uses consistent with Vancouver's long-term plans for employment intensification, innovation-district development, and improved public realm. Potential relocation scenarios include sites within the Flats, the Terminal Avenue industrial corridor, or suburban satellite yards in Surrey/Langley for light maintenance. Redevelopment of

the freed parcel further supports the creation of a modern multimodal hub capable of unifying regional rail, intercity bus, SkyTrain, and potential future Cascadia and High-Frequency Rail services.

Effective governance, multi-tier coordination, and sequenced capital funding remain essential. Interdependence among federal, provincial, regional, municipal, and freight-rail stakeholders presents both constraints and opportunities. A long-term implementation horizon—consistent with major redevelopment cycles—is required to achieve operational readiness, secure financing, and manage cross-border continuity for shared station-area operations. Overall, the report concludes that the Vancouver–Abbotsford corridor presents a viable pathway toward long-term regional mobility transformation, provided that infrastructure upgrades, station redevelopment, and facility relocation proceed in a coordinated and phased manner.

Introduction

The Vancouver–Abbotsford corridor has emerged as one of the most important population and economic axes in British Columbia, shaped by accelerating growth in Metro Vancouver's eastern municipalities and the rapid expansion of communities throughout the Fraser Valley. Over the past decade, rising housing pressures in the metropolitan core, shifts in employment geography, and the increasing regional role of centers such as Surrey, Langley, and Abbotsford have collectively intensified east–west travel demand. As these demographic and economic trends converge, the limitations of the region's predominantly highway-oriented transportation system have become more visible, particularly as Highway 1 experiences persistent congestion, extended travel times, and declining reliability during peak and off-peak periods. These conditions underscore the need to evaluate higher-capacity, sustainable modes that can complement existing infrastructure and support the long-term mobility requirements of the region.

The purpose of this introductory section is therefore to situate the Vancouver–Abbotsford passenger rail concept within its broader regional context. This includes examining the forces driving travel demand, identifying the strategic role of Abbotsford as the Fraser Valley's principal urban center, and outlining the policy landscape in which this corridor is being reconsidered. As provincial and regional agencies advance long-range plans emphasizing climate action, multimodal integration, and compact urban development, a passenger rail connection emerges not as an isolated project but as a logical extension of British Columbia's evolving mobility objectives. Establishing this contextual foundation is essential before assessing corridor feasibility, operational potential, and the long-term service vision that could emerge for this inter-regional connection.

Regional Corridor Context & Service Vision

The Vancouver–Abbotsford corridor reflects deeper structural changes in the urban development pattern of southwestern British Columbia. Surrey and Langley have become two of the fastest-growing municipalities in the province, with Surrey approaching a population that is expected to surpass Vancouver's within the next decade, while Abbotsford stands as the largest municipality outside Metro Vancouver. This expanding urban footprint has created a continuous growth belt stretching from Vancouver's eastern boundary to the heart of the Fraser Valley, intensifying cross-regional commuting for employment, education, and commercial activities. As population and employment distributions shift, the reliance on Highway 1 as the sole high-capacity east–west link has produced recurrent congestion that now operates as a structural constraint on regional mobility, economic productivity, and environmental targets.

This travel pattern evolution intersects with the geography of existing rail corridors owned and operated by CN, CP, and BNSF. Although these lines primarily serve freight movements, they define the physical framework within which a potential passenger rail system must operate. CP's alignment parallel to Highway 1, in particular, presents a unique opportunity for integrating passenger services along a corridor that naturally corresponds to regional movement patterns. The broader presence of CN and BNSF within the Lower Mainland further demonstrates the feasibility of freight–passenger coexistence and highlights the importance of coordinated planning when evaluating rail-based mobility options.

Abbotsford's strategic importance within this context strengthens the rationale for establishing an eastern anchor for passenger rail service. As the regional hub of the Fraser Valley—supported by a growing labor force, a diversified economy, and Abbotsford International Airport (YXX)—the city functions as both a commuter generator and a destination

for regional travel. Increased interaction between Metro Vancouver and the Fraser Valley, whether for work, education, or services, reinforces the need for a mode that can deliver consistent, reliable, and congestion-resilient travel times. Consequently, Abbotsford is well positioned to serve as a terminal point for an initial phase of passenger rail implementation and as a central node for further eastward expansion.

Provincial and regional planning frameworks reinforce this direction. Transport 2050 emphasizes mode shift toward sustainable, high-capacity transit, reduced automobile dependence, and strengthened regional links. Metro 2050 advances compact growth strategies oriented around major transit corridors, while the Fraser Valley Future 2050 strategy underscores the need for improved east–west connectivity to support economic growth, housing development, and regional accessibility. Within these policy environments, a Vancouver–Abbotsford passenger rail service emerges as an implementation mechanism for long-range mobility, land-use, and climate objectives.

Building on these conditions, the long-term service vision for the Vancouver–Abbotsford corridor can be conceptualized as a phased rail system that evolves alongside demand, funding, and infrastructure readiness. Initial stages may focus on limited-stop service between Abbotsford and major transit hubs in Metro Vancouver using upgraded existing track infrastructure. Subsequent phases could introduce more frequent, bi-directional service throughout the day, integrated connections to local transit networks, and expanded stations in high-growth nodes. In the long term, a fully developed regional rail network—potentially electrified and extended toward additional Fraser Valley municipalities—would enhance regional mobility, support transit-oriented development, reduce pressure on Highway 1, and align British Columbia's inter-regional travel patterns with broader sustainability and economic resilience goals.

This section establishes the foundational context for assessing the development of a passenger rail connection between Vancouver and Abbotsford. Population and employment growth in Surrey, Langley, and the Fraser Valley has intensified east–west travel demand, creating sustained pressure on Highway 1 as the primary intercity route. As congestion increasingly reflects structural limitations rather than peak-period fluctuations, the region's existing highway-dependent framework no longer aligns with its long-term mobility needs. These demographic shifts, expanding commuter flows, and changing economic geographies demonstrate the necessity of a reliable, high-capacity, and sustainable transportation alternative.

The presence of existing CN, CP, and BNSF freight corridors provides an established spatial framework for examining passenger rail feasibility. The alignment of the CP mainline parallel to Highway 1 closely corresponds with prevailing regional travel patterns and therefore offers a strategic opportunity for introducing passenger operations. Abbotsford, now the largest city outside Metro Vancouver and supported by a growing workforce, diversified economy, and an international airport, emerges as the logical eastern anchor for a future rail service.

Regional planning and policy frameworks reinforce this direction. Transport 2050, Metro 2050, and Fraser Valley Future 2050 place strong emphasis on sustainable mobility, compact land use, regional accessibility, and reduced automobile dependence. Within this policy environment, a phased passenger rail vision, beginning with initial limited-stop service and gradually expanding into a comprehensive regional system, represents a viable pathway for improving mobility, supporting economic integration, and advancing long-term environmental and land-use objectives. Together, these elements establish the underlying rationale for a passenger rail service linking Vancouver and Abbotsford.

Travel Demand, Ridership Potential & Economic Rationale

Demand Drivers and Target Market

For the past two decades, proponents of restoring the intercity corridor have been actively promoting the significant benefits and necessity of this public transport service in the region south of the Fraser Valley. According to Statistics Canada, the Fraser Valley region continues to grow, with the city of Abbotsford's population estimated at approximately 153,524, an 8.6% increase from 2016. The population is projected to peak in 2024, with an average annual growth rate of 3.3% (see Appendix F, Government of Canada, 2023). This significant population growth has increased the demand for east-west traffic on Highway 1. The Fraser Valley-Greater Vancouver corridor is one of Canada's fastest-growing transportation markets and is expected to continue growing, driven primarily by factors including:

Daily Commuters: Residents of Abbotsford/Chilliwack who commute to Surrey, Burnaby, and the Vancouver Employment Centre.

Post-Secondary Education Students: Students enrolled at the University of British Columbia (UBC), Simon Fraser University (SFU), and British Columbia Institute of Technology (BCIT).

Airport Passengers: Travelers transiting through Abbotsford International Airport (YVR) to the Greater Vancouver area.

Cross-Regional Business Travelers: Professional services, healthcare, and government employees.

Highway Capacity Saturation: Highway 1 serves over 80,000 daily drivers between Langley and Abbotsford (Transit, T. A. (n.d.-b).

Transit Service Gaps: Limited inter-regional transit connectivity

Current Commuting Patterns

Despite significant investments in public transportation in the Greater Vancouver area over the past decade, private cars remain the primary mode of transport. According to TransLink, 71.9% of trips to and from the Greater Vancouver area in 2017 still relied on private vehicles (Zeidler, 2020). However, public transport options are limited, and peak-hour highway congestion can add 30 to 60 minutes to travel time. With traffic volume increasing by 2% to 3% annually, concerns about the reliability of public transport are growing. Additionally, there were 800,445 places of work located in Metro Vancouver to which Canadian residents commuted in 2021. Of these, 798,880 (99.8%) commuted from within BC, with the remaining 1,565 (0.2%) "commuting" from elsewhere in Canada. Surrey was next, accounting for 16% of jobs to which Lower Mainland residents commuted (127,855 jobs), followed by Burnaby, with 11% (86,565) (Berlin, 2023). The average commute time in British Columbia is approximately 26 minutes; however, the average commute time in the Greater Vancouver area is around 30 minutes. Unfortunately, residents of Abbotsford and Mission have even longer commute times; nearly 15% of the population in these areas commute for more than an hour, one of the highest percentages in the country. Statistics Canada data show that about 70% of commuters drive private cars, and the vast majority travel alone (Recksiedler, 2024).

Travel Time Competitiveness

For such large-scale infrastructure projects, a comparison of existing car travel times and the travel times of proposed conceptual rail services reveals that car travel times are significantly longer during peak hours than during periods of smooth traffic, while rail remains competitive on all major routes. Furthermore, travel times on Highway 1 fluctuate considerably during peak hours, typically exceeding 40%. A journey that takes 60 minutes during off-peak hours can

extend to 90-120 minutes during congested periods. In contrast, rail services offer stable and punctual travel times with significantly reduced volatility (see Appendix G).

Ridership Potential Estimation

Ridership projections employ a four-step transportation demand model calibrated to Fraser Valley-Metro Vancouver conditions:

Step 1: Trip Generation

Population × Labor Force Participation × Metro Vancouver Employment Rate

Elasticity adjustments for distance decay

Non-work trip generation (education, airport, discretionary)

Step 2: Trip Distribution

Gravity model allocation to Metro Vancouver sub-regions

Impedance function based on generalized cost

Destination attractiveness weights (employment density)

Step 3: Modal Split

Multinomial logit choice model

Utility functions incorporating: travel time, cost, reliability, comfort

Calibrated to 2016 Census mode share data with 2024 adjustments

Step 4: Trip Assignment

Peak/off-peak temporal distribution

Directional split (AM inbound 70%, PM outbound 75%)

Station boarding allocation. However, according to the Greater Vancouver Area 2024 Growth Forecast Update, under a medium-growth scenario, the region's population is projected to increase from 2.78 million in 2021 to 3.81 million in 2040, and employment is projected to

increase from 1.61 million in 2021 to 2.16 million in 2040. This growth will have a positive impact on the economy, transportation, and the environment (Metro Vancouver Regional Planning, n.d.).

Economic Benefits

Highway 1, which runs through the Fraser Valley, carries over 80,000 vehicles daily between Langley and Abbotsford. To alleviate traffic congestion and boost regional productivity, the provincial government is building essential housing, schools, hospitals, and highways. A new $2.65 billion plan will improve traffic flow, reduce transportation costs, and increase business efficiency across the region, creating significant economic value (Transit, T. A. (n.d.-b). Furthermore, improved rail connectivity will expand the Greater Vancouver workforce and create more job opportunities for Fraser Valley residents. The living wage in Greater Vancouver is projected to increase by $27.05 per hour by 2024, a 5.3% increase from the previous year; however, the average hourly wage in the Fraser Valley is $23.22, a difference of approximately 16%. This allows Fraser Valley workers to earn higher wages in Greater Vancouver, increasing household income and reducing recruitment costs for businesses. The expanded labor market will benefit both employers seeking qualified workers and residents seeking better employment opportunities (see Appendix H, Living Wage BC, 2024).

Furthermore, regional rail transit offers significant environmental and economic benefits. Studies show that choosing public transport over driving can reduce emissions from light vehicles by 80%. According to data from the Greater Vancouver area, the SkyTrain generates only 0.01 kg of CO2 equivalent per trip, while a gasoline-powered train generates 2.30 kg, demonstrating the significant potential of rail transit in reducing emissions. Furthermore, with appropriate investment, the expansion of public transportation can significantly increase

passenger capacity. In Surrey and Abbotsford alone, improvements to bus routes increased ridership by 20% in 2024, with six routes adding 4 million passengers annually. This growth is attributed to fundamental improvements such as increased bus frequency and bus priority measures. High-quality public transport projects, such as the proposed SkyTrain BC and Simon Fraser University cable car, are projected to reduce emissions by 327,470 kg per day by 2030 while serving more than 163,000 passengers daily, demonstrating the immense potential of transit-oriented development models centered around major stations (see Appendix I, Movement, 2025).

Infrastructure Requirements & Operational Feasibility

Purpose: To identify infrastructure upgrades required and assess whether a passenger rail service between Vancouver and Abbotsford can operate effectively with existing freight traffic (Transport Canada, 2019; Stewart Group, n.d.).

Track Ownership & Existing Assets

Figure 3-1. Vancouver–Abbotsford rail corridor and track ownership (schematic, not to scale)

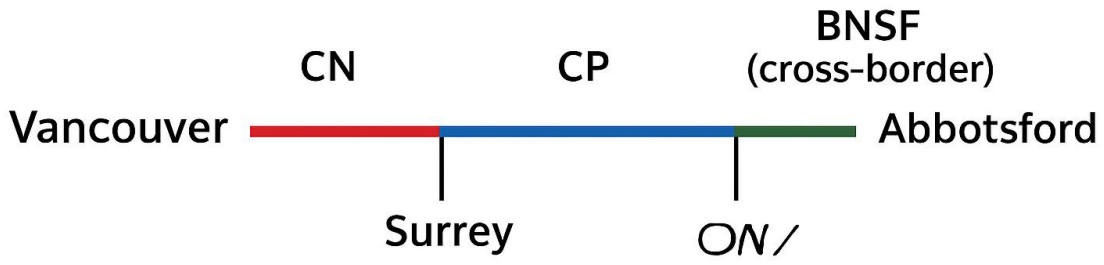


Figure 1 illustrates the primary track ownership along the Vancouver–Abbotsford corridor, showing:

- **Canadian National (CN):** Metro Vancouver to Surrey.
- **Canadian Pacific (CP):** Surrey to Abbotsford.
- **BNSF Railway:** Cross-border segment near Abbotsford.

The existing infrastructure includes several facilities such as single and double-track segments, bridges, and signaling systems (Transportation Safety Board of Canada [TSB], 2020). Meanwhile, Glen Valley double-track project (~5.6 km), has reduced a key bottleneck (Transport Canada, 2019). In addition, freight trains dominate corridor operations, affecting scheduling flexibility (TransportAction, 2024).

Required Infrastructure Upgrades

Required infrastructure upgrades include steps to be taken on passing sidings, selective double-tracking, signaling upgrades, station & platform upgrades and bridge & crossings reinforcements(TSB, 2006; TransportAction, 2024)..

Table 3-1 Required Infrastructure Upgrades

Upgrade Type	Purpose	Location / Segment	Notes
Passing sidings	Allow passenger trains to overtake freight	Peak-direction bottlenecks	Needed at ~X km intervals
Selective double-tracking	Reduce conflicts and improve capacity	Critical single-track sections	Glen Valley completed; additional segments may be required
Signaling upgrades (PTC / train control)	Improve safety & increase throughput	Entire corridor	Required for mixed passenger-freight operations
Station & platform upgrades	Accessibility, multimodal connections	Key urban / suburban stops	New construction or retrofit needed
Bridges & crossings	Support increased service levels	Various locations	May require reinforcement

These upgrades will help to improve the bottleneck and increase efficiency.

Freight–Passenger Integration

Freight trains have flexible schedules and often receive priority on CN/CP lines. On the other hand, passenger trains require fixed slots and conflicts must be minimized via day-to-day operations such as negotiated passenger train windows, use of passing sidings and double-track sections, and signal priority and timetable optimization (TSB, 2020; Stewart Group, n.d.).
With strategic scheduling and infrastructure upgrades, passenger service is likely to be feasible if continued to coordinate well with freight operators (TransportAction, 2024).

Travel-Time Scenarios (Assumptions)

Table 3-2. Travel-Time Scenarios for Vancouver–Abbotsford Corridor

Scenario	Infrastructure & Operations	Estimated Travel Time	Notes
Starter Service (baseline)	Existing track, no major passenger-focused upgrades	>75 minutes	Freight congestion dominates; minimal infrastructure improvements
Full Build (optimized)	Passing sidings, selective double-tracking, upgraded signaling, express/local service	~60 minutes	Improved reliability, reduced conflict with freight; scenario-based assumption

Times are modeled assumptions. After the required upgrade, efficiency is expected to be improved (TSB, 2020; Transport Canada, 2019).

Conclusion

In conclusion, passenger service is technically feasible with the upgrades of targeted infrastructure and well-coordinated agreements among CN, CP, and BNSF, the passenger service can also be reliably achieved if effective freight negotiations, capital investment, sufficient ridership demand, and robust timetable planning are in place (Stewart Group, n.d.; TransportAction, 2024).

Pacific Central Station Redevelopment & Capacity Planning

Pacific Central Station (PCS) is Metro Vancouver's principal intercity rail and coach terminal and functions as a regional mobility hub serving VIA Rail, Amtrak Cascades, regional coach operators, and local transit services. Despite its strategic location near the False Creek Flats and the Main Street–Science World SkyTrain station, the station's heritage structure, limited platform capacity, and fragmented circulation routes no longer meet modern standards for rail operations or multimodal connectivity. Evidence indicates critical deficiencies in station

layout, platform access, pedestrian circulation, and intermodal integration that constrain PCS from supporting proposed regional rail expansions, including the Vancouver–Surrey–Langley–Abbotsford corridor.

Redevelopment must therefore address platform design, station geometry, circulation efficiency, passenger wayfinding, and multimodal interface upgrades in accordance with contemporary station-planning principles and TransLink's Transit-Oriented Communities (TOC) Design Guidelines (TransLink, 2023).

Existing Station Layout and Spatial Constraints

PCS functions as a two-sided station, with a **heritage headhouse** facing Thornton Park and a **rear operational yard** accommodating three island platforms, seven rail tracks, and approximately 24 bus bays. Over the past century, operational functions expanded through incremental additions, producing a complex spatial environment characterized by indirect corridors, narrow platform access points, and disconnected modal interfaces.

Smith (2008) identifies several critical deficiencies:

- **Non-intuitive interior circulation:** Indirect routes between the concourse and platforms reduce visibility and lengthen walking distances.
- **Heritage constraints:** The protected Beaux-Arts building restricts opportunities for interior expansion or modern circulation improvements.
- **Split-node design:** Primary activities are divided between the front heritage hall and the rear yard, forcing passengers to traverse disconnected and inconsistent pathways.
- **No integrated pedestrian spine:** No continuous walkway links SkyTrain → concourse → rail platforms → bus concourse.

- **Minimal weather protection:** Passengers often rely on unprotected outdoor routes when transferring between modes.

These constraints limit the station's ability to serve as a coherent and legible multimodal hub.

Platform Configuration and Rail Capacity Limitations

PCS provides three island platforms serving seven tracks, but effective operational capacity is restricted by:

- **Narrow platform access corridors**, producing bottlenecks during peak periods
- **Insufficient platform widths** compared to best-practice standards (typically 8–10 m minimum)
- **Lack of grade-separated access**, such as overpasses or underpasses
- **Customs-controlled sterile areas** required for U.S.-bound Amtrak Cascades trains
- **Legacy track geometry** originally designed for freight operations

These deficiencies reduce the station's ability to support:

- Concurrent VIA Rail and Amtrak Cascades arrivals
- Higher-frequency or bi-directional regional services
- Turnback movements needed for Vancouver–Abbotsford rail operations

Without platform realignment, widening, and improved vertical circulation, PCS cannot meet future regional-rail demand.

Circulation Challenges and Passenger Movement Constraints

Fragmented Internal Circulation

PCS's interior circulation relies on **narrow, visually discontinuous corridors** that lack intuitive wayfinding. Smith (2008) notes that passengers must navigate disconnected interior pathways, increasing cognitive load and slowing movement through the station.

External Transfer Difficulties

Transfers between SkyTrain, rail platforms, and bus bays require:

- Crossing **Station Street**
- Navigating **Thornton Park**
- Using **unprotected outdoor pathways**
- Following **non-linear, indirect routes**

These conditions reduce system legibility, increase transfer time, and compromise accessibility.

Passenger Information and Wayfinding Gaps

Each service operator—VIA Rail, Amtrak Cascades, intercity buses, and SkyTrain—uses **distinct signage systems**. PCS lacks an **integrated wayfinding hierarchy**, causing passengers to self-navigate a fragmented intermodal environment.

Multimodal Integration Limitations

Although PCS hosts rail, bus, and transit services, it does **not operate as a unified multimodal hub**. Evidence shows:

- No **central multimodal plaza** organizing transfers
- Fragmented information systems across operators
- Indirect pedestrian routes linking SkyTrain with rail and bus facilities
- Lack of micromobility infrastructure (bike parking, scooters, car-share zones)
- Discontinuity between indoor and semi-indoor movement networks

Smith (2008) concludes that PCS operates more like **adjacent but disconnected transport facilities** than a coordinated regional node.

Redevelopment Needs

Platform Expansion and Realignment

Recommended improvements include:

- Widening platforms to meet modern safety standards
- Adding or reconfiguring platform faces
- Straightening or simplifying track geometry
- Creating grade-separated concourse-to-platform access
- Integrating customs functions without reducing usable capacity

These improvements will increase throughput, reduce dwell times, and enable regional-rail operations.

Creation of a Continuous Passenger Spine

A unified circulation spine should connect:

SkyTrain → Heritage Concourse → Rail Platforms → Bus Concourse

This spine must include:

- Weather-protected walkways
- Accessible ramps and elevators
- Tactile indicators
- Clear, hierarchical wayfinding signage

Unified Multimodal Plaza

A single pedestrian-priority plaza should integrate:

- Rail
- SkyTrain
- Bus and coach services

- Cycling and micromobility
- Pick-up/drop-off zones

This aligns with TOC principles emphasizing **compact, walkable, multimodal station precincts** (TransLink, 2023).

Integrated Information and Wayfinding System

PCS requires a unified, multimodal information platform featuring:

- Consistent signage hierarchy
- Real-time displays for all modes
- Digital trip-planning integration
- Accessible wayfinding elements

Transit-Oriented Development (TOD) Support

PCS is located within the **False Creek Flats**, a major redevelopment district. Redevelopment should support:

- Mixed-use intensification
- Active frontages
- Improved public realm
- Cycling and micromobility infrastructure
- Shortened pedestrian distances

These changes align with the "Six Ds" of TOC design—Destinations, Distance, Design, Density, Diversity, and Demand Management (TransLink, 2023).

Vision for a Modern Pacific Central Station

A comprehensive redevelopment program would transform PCS into a **high-capacity, fully integrated regional mobility hub** characterized by:

A. Modern Station Layout

- Centralized, legible concourse
- Improved sightlines
- Enhanced customer-service and retail functions

B. Increased Platform Capacity

- Three to four high-capacity platforms
- Expanded track flexibility
- Full canopy weather protection

C. Optimized Circulation

- Continuous indoor/semi-indoor passenger spine
- Barrier-free vertical and horizontal access
- Streamlined transfer sequences

D. Integrated Multimodal Environment

- One multimodal plaza
- Direct SkyTrain–rail connection
- Safe walking and cycling networks
- Integrated real-time information systems

E. TOD-Compatible Public Realm

- High-quality, walkable district
- Land-use intensification
- Urban design that reinforces transit use

Conclusion

Pacific Central Station's existing infrastructure is insufficient to support future regional rail service or meet contemporary multimodal integration standards. Its heritage layout, narrow platforms, fragmented circulation, and disconnected modal interfaces all contribute to operational inefficiency. A comprehensive redevelopment program—guided by TOC principles and modern station-capacity criteria—will allow PCS to function as a high-performance regional mobility hub capable of supporting future Vancouver–Abbotsford and Cascadia rail expansion.

VIA Maintenance Shed Relocation & Site Redevelopment

Introduction

The VIA Rail maintenance facility located immediately north of Pacific Central Station plays a significant operational role, but its position constrains the long-term expansion of the station precinct and limits opportunities for higher-value urban development. This section evaluates why relocating the facility is necessary and why the freed parcel presents a strategic redevelopment opportunity.

Current Operational Role and Spatial Constraints

Figure 5-1

Geographic Context of Pacific Central and VIA Maintenance Centre

Operational Function of the Facility

The Vancouver Maintenance Centre (VMC), located adjacent to Pacific Central Station, forms part of VIA Rail's official network of maintenance and real-estate assets and supports the servicing requirements for trains terminating in Vancouver (VIA Rail Canada, 2025). Recent infrastructure upgrade tenders for ventilation and controls at the VMC further indicate its ongoing role in routine servicing and operational support activities for VIA's western terminus (Merx, 2024). The proximity of the facility to Pacific Central enables efficient layovers, staging, and preparation for departures, reinforcing its operational value within the broader regional rail network.

Spatial Limitations and Conflicts with Station Growth

Although operationally convenient, the facility occupies the only contiguous land immediately adjacent to the station that could accommodate additional platforms, expanded track approaches, or enhanced passenger circulation. The City of Vancouver's False Creek Flats Plan notes that the rail corridor in this area is severely capacity-constrained, with limited flexibility for track reconfiguration due to legacy industrial land patterns and fragmented ownership (City of Vancouver, 2017). The shed blocks potential northward expansion of passenger platforms, restricts track geometry improvements, and prevents consolidation of the multimodal hub around Pacific Central.

Figure 5-2

Track & Platform Constraint Diagram

Note：Shed footprint restricts northward platform expansion

Conflicts with Urban Redevelopment and Land-Use Goals

The site lies within the False Creek Flats, an area already identified for employment intensification and strategic redevelopment. Municipal planning documents emphasize the need to transition industrial rail parcels toward higher-value uses, including mixed-employment precincts and innovation-oriented districts (Chan, 2017). The presence of a low-density maintenance facility is misaligned with this direction and constrains the delivery of broader city-building objectives.

Rationale for Relocating the VIA Maintenance Facility

Enabling Station Capacity Expansion

Relocating the facility is essential for adding new platforms required for expanded domestic rail service, including the proposed Vancouver–Abbotsford corridor. Studies of

comparable stations demonstrate that platform expansion is feasible only when adjacent trackside parcels are reconfigured or freed entirely, as seen in Toronto Union Station's recent expansions (Mackenzie, 2022). Without freeing the land currently occupied by the VIA shed, Pacific Central cannot support service growth.

Supporting Multimodal Integration

Pacific Central Station's redevelopment potential hinges on improving its multimodal role connecting regional rail, intercity bus, SkyTrain, cycling, and pedestrian networks. The current spatial arrangement forces awkward circulation patterns and prevents cohesive station-area planning. Relocation would allow integrated concourse expansion, clearer passenger movement pathways, and improved interchange design, similar to the approach adopted at Seattle's King Street Station modernization (Evans et al., 2022).

Unlocking Land for Higher-Value Urban Development

The False Creek Flats Plan identifies this area as one of Vancouver's most significant long-term employment lands, with opportunities for innovation hubs, commercial density, and mixed-employment revitalization (City of Vancouver, 2017). The VIA maintenance site, as a low-intensity industrial use, underperforms relative to its strategic central-city location. Relocation is therefore a prerequisite for achieving the city's long-term land-use intentions.

Improving Regional Rail Network Efficiency

Relocation also allows operational efficiencies by consolidating maintenance activities in a location that better supports future expansion, noise mitigation, and environmental compliance. Recent research and Canadian proximity-planning guidelines show that rail yards and maintenance facilities are significant local sources of noise and air pollution, and that relocating or redesigning these facilities in more suitable locations can help reduce exposure for

surrounding communities while supporting a more efficient regional rail network (CPCS, 2017; Valencia et al., 2021).

Potential Relocation Scenarios

Relocation Within the False Creek Flats

One scenario involves relocating the maintenance functions to another rail-adjacent parcel within the Flats. The Flats Plan identifies several blocks with rail adjacency currently underutilized or in transition (City of Vancouver, 2017). These parcels could support a modernized facility with improved noise mitigation and environmental controls. The main advantage of this option is continued proximity to Pacific Central, preserving operational efficiency.

Relocation to the South Shore or Terminal Avenue Corridor

The industrial lands south of Terminal Avenue, including BC Hydro and rail-serving parcels, may offer a second scenario for relocation. Recent municipal policy updates indicate that several industrial areas near Terminal Avenue and the False Creek Flats may be suitable for intensification or transition toward logistics-oriented and transportation-serving functions, provided they continue to support the regional economy and goods movement network (Metro Vancouver, 2021; City of Vancouver Council, 2023). This option would require coordination with CN and CP regarding track access.

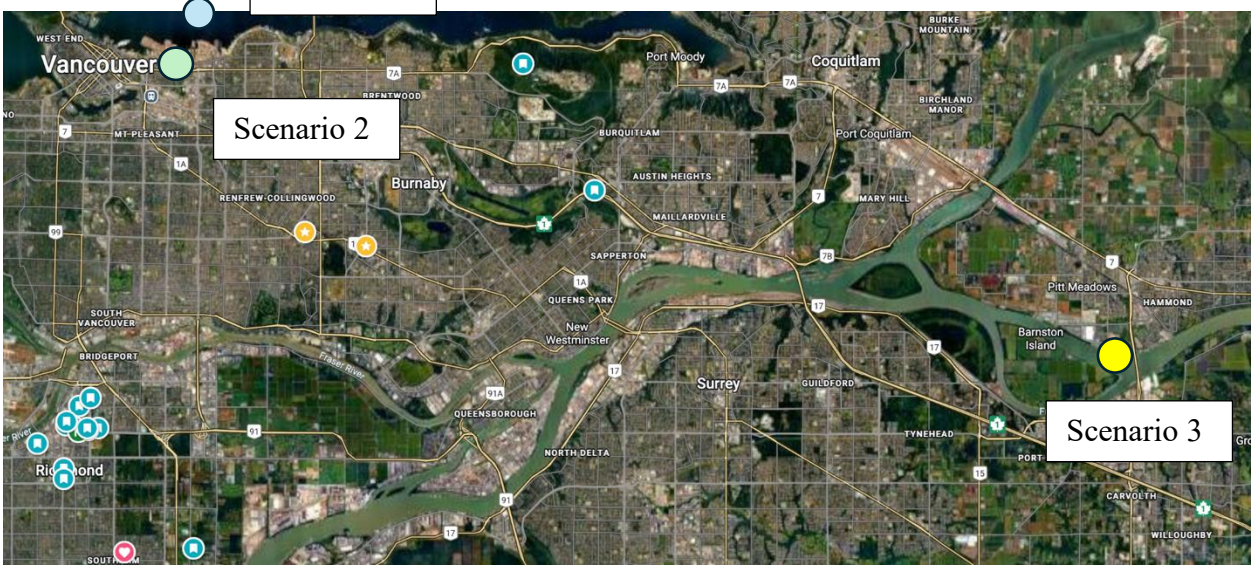
Suburban Relocation (Surrey or Langley) for Light Maintenance

A third scenario involves splitting operations between a core Vancouver servicing point and a suburban satellite facility, similar to regional approaches used in Seattle, Toronto, and Montreal. Satellite yards in Surrey or Langley could handle light servicing, staging, and

cleaning, while Vancouver retains only a minimal footprint for turnarounds. This would significantly reduce spatial pressure near Pacific Central.

Figure 5-3

Regional overview of three potential relocation scenarios for VIA Rail's maintenance functions.



Note. Option 1: Relocation within False Creek Flats (proximal, low disruption), Option 2: Terminal Avenue / South Shore (industrial adjacency, rail access), Option 3: Surrey/Langley satellite yard (regional distribution, lower land cost)

Evaluation Summary

Evaluating the scenarios also requires consideration of environmental permitting, rail access, capital costs, and adjacency to residential areas. The False Creek Flats Plan emphasizes minimizing land-use conflicts and transitioning noisy industrial uses where feasible (Chan, 2017). Relocation outside the downtown core may offer stronger long-term compatibility with rail operations and land-use policy.

Redevelopment Opportunities for the Freed Parcel

Expansion of Passenger Rail Capacity

Freed land can support additional platforms, enhanced track approaches, expanded concourse areas, and improved passenger circulation. Toronto Union Station's expansion demonstrated how modest spatial increases can unlock substantial capacity gains (Mackenzie, 2022).

Creation of a Modern Multimodal Hub

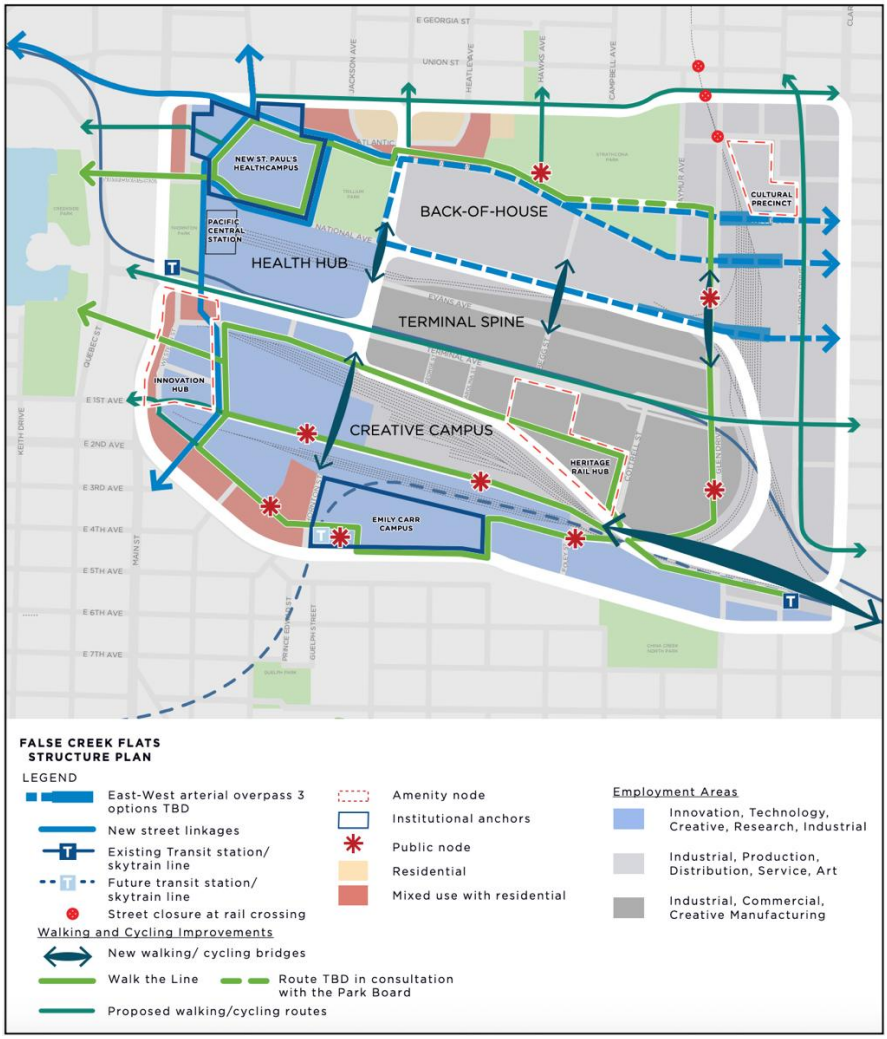
Redevelopment allows Pacific Central to evolve into a coherent multimodal hub that unifies VIA, future commuter rail, Amtrak Cascades, SkyTrain, long-distance bus, active transportation, and potential future high-frequency rail services. Past studies show that hub modernization dramatically increases passenger throughput and improves accessibility (Evans et al., 2022).

Mixed-Employment and Innovation District Development

The False Creek Flats Plan identifies the area as a future innovation district supporting tech, media, and creative industries. Redevelopment of the freed parcel can align with this vision, enabling modern commercial spaces, co-working areas, and employment-oriented mixed-use development (City of Vancouver, 2017). These uses generate higher economic value than the existing industrial use.

Figure 5-4

False Creek Flats Structure Plan and Long-Term Redevelopment Vision



Note. Adapted from *False Creek Flats Structure Plan*, by City of Vancouver (2017), False Creek Flats Plan

Station-Area Public Realm Enhancements

Redevelopment also provides opportunities for improved public spaces, pedestrian plazas, cycling corridors, and urban green linkages. Vancouver's citywide planning documents emphasize that major redevelopment projects—especially in transit-adjacent or industrial

transition areas—should enhance the public realm through new plazas, pedestrian connections, cycling corridors, and integrated green infrastructure (City of Vancouver, 2022; City of Vancouver, 2023).

Implementation Considerations and Phasing

Relocation and redevelopment will require phased implementation given operational requirements, funding complexity, and multi-stakeholder coordination. Key considerations include interagency agreements with VIA Rail, Transport Canada, the City of Vancouver, and CN/CP for track access; a transition plan ensuring uninterrupted maintenance operations; environmental assessments; and alignment with major capital funding cycles. The City's recent updates to its industrial and transportation planning framework describe major redevelopment processes—particularly those involving rail-adjacent or infrastructure-dependent lands—as unfolding over long-term, multi-phase horizons, often extending 10 to 20 years to align with land-use policy shifts and capital planning cycles (City of Vancouver Council, 2023).

Conclusion

The VIA Rail maintenance facility plays an important operational role, but its current location imposes significant constraints on Pacific Central Station expansion and the False Creek Flats redevelopment framework. Relocating the facility will unlock critical space needed for improved rail capacity, multimodal integration, and higher-value urban development. This makes relocation a central component of long-term station renewal and regional rail planning.

Governance, Stakeholders, and Funding Opportunities

Corridor expansion and station redevelopment demand more than technical design; they rely on governance, funding, operational coordination, and cross-border reliability. This segment highlights the systems and dependencies that shape feasibility and outlines how risks can be mitigated through resilience measures. The discussion proceeds from governance and funding to station operations, cross-border interfaces, and risk and resilience, establishing a coherent framework for delivery.

Governance System and Stakeholder Dependencies

Corridor expansion and station redevelopment are governed through a multi-tier system linking regulation, funding, and operations. Governance functions as a set of cascading dependencies: federal priorities on infrastructure investment inform provincial transport strategies, which in turn shape regional integration and municipal land-use planning (International Monetary Fund, 2022). At the project level, dependencies become more granular: rail expansion requires environmental approvals and safety certifications before construction can proceed; funding commitments must be secured across multiple budget cycles; and operational planning must integrate passenger services with freight scheduling and station accessibility (see Appendix A). Because these dependencies are interlocked, delays or shortfalls at any tier reverberate across the entire project lifecycle. This layered structure underscores the need for governance frameworks that can coordinate regulation, financing, and operations while respecting stakeholder authority at every level.

Private partners are part of the governance system and are interdependent on other institutions. Effective collaboration, particularly in financing arrangements and risk-sharing mechanisms, supports feasibility and reduces exposure to delivery risks (International Monetary Fund, 2022). Ultimately, the effectiveness of this interlinked governance framework will determine whether expansion and redevelopment proceed as integrated, resilient components of the regional transportation network. Accordingly, financing must be staged to align with approvals, access negotiations, and operational commitments.

Funding Pathways and Capital Sequencing

Funding for corridor expansion and station redevelopment progresses through a layered sequence that reduces risk and builds confidence as projects advance. Canada's infrastructure plan highlights an immediate and transformative investment approach and emphasizes diversified funding pathways, providing a framework for rail project financing (Infrastructure Canada, n.d.). Early catalytic instruments initiate planning and feasibility studies, core capital provides resources for physical construction, complementary sources align multimodal and station-area improvements, and sustaining revenues reinforce long-term resilience through commercial activity and transit-oriented development (see Appendix B).

The strength of this approach lies not in any single layer but in the order of activation and the alignment of responsibilities across governments and private partners. Strategic sequencing diversifies and stabilizes the financing environment, ensuring expansion and redevelopment move forward as integrated, reliable, and resilient undertakings. This sequencing enables station-level integration of operator schedules, freight dispatching, and circulation design.

Station Coordination and Operational Integration

Pacific Central Station's shared operating environment requires coordination among passenger operators, freight railways, and private partners to align schedules and platform use with freight dispatching priorities, while balancing revenue generation with circulation and reliability. Regional transit connections through SkyTrain, bus, and active modes add requirements, influencing circulation and access redesign. Legacy infrastructure adds another layer of complexity: platform geometry, heritage constraints, and limited back-of-house space restrict expansion and require careful integration of preservation with modernization (see Appendix C).

These challenges reflect the broader lessons identified by the World Bank (2023): multi-operator alignment, multimodal integration, heritage preservation, and revenue generation must be managed through governance frameworks that sustain reliability and growth (World Bank, 2023). Managing these interdependencies is less about resolving individual conflicts than about designing a framework that maintains reliability while enabling growth, positioning Pacific Central to accommodate future corridor expansion. Operational integration must also incorporate cross-border requirements for secure circulation and processing capacity.

Cross-Border Interfaces and Continuity Planning

The Beyond the Border Action Plan (Public Safety Canada, 2011) embeds principles of secure flows, predictable processing, and bilateral coordination into cross-border mobility. This framework underscores the need to integrate customs and immigration continuity planning into design and operations, ensuring that international services remain reliable during modernization

(see Appendix D). The plan supports the negotiation of rail preclearance arrangements, establishing a legal basis for border agencies to conduct inspections in each other's territory (Public Safety Canada, 2011). Redevelopment should incorporate flexible and scalable station designs to ensure operational readiness for future expansion of cross-border services.

Because international operations rely on bilateral coordination, interruptions in one jurisdiction can directly impact the other, undermining reliability and affecting passenger confidence in Vancouver as a dependable gateway. These bilateral dependencies heighten systemic risks, which the resilience framework addresses next.

Risk Dependencies and Resilience Measures

Progress in corridor expansion and station redevelopment is vulnerable to cascading dependencies, where delays or misalignment in one domain can ripple across others and compromise overall delivery. The World Bank (2023) identifies challenges such as funding gaps, long timelines, operational conflicts, legacy constraints, institutional complexity, and limited capacity, several of which are applicable here. As systemic risks, they necessitate integrated governance (World Bank, 2023). Reducing single-point failures transforms risks into manageable dependencies and sustain feasibility (see Appendix E).

RAND's framework complements risk mitigation by framing resilience as absorptive, restorative, equitable, and adaptive capacities that must be embedded across transportation systems (RAND Corporation, 2019). In corridor and station context, this entails sustaining

continuity during construction, designing for adaptability after redevelopment, and building institutional frameworks that reduce uncertainty and secure long-term delivery.

Taken together, risk management and resilience measures reinforce one another: integrated governance reduces cascading risks, while resilience ensures recovery and adaptability. This dual lens positions corridor expansion and station redevelopment as reliable, future-ready assets within the wider transport system.

Conclusion

The findings of this report demonstrate that a Vancouver–Abbotsford passenger rail service represents a strategic, feasible, and regionally transformative mobility investment. Travel demand driven by sustained growth across Metro Vancouver and the Fraser Valley has exceeded the operational resilience of Highway 1, making a high-capacity rail alternative both necessary and aligned with long-range provincial, regional, and municipal planning objectives. Existing freight corridors provide a workable framework for introducing passenger operations, contingent on targeted infrastructure upgrades and coordinated scheduling with CN, CP, and BNSF.

A central conclusion is that the long-term success of the corridor is inseparable from the modernization of Pacific Central Station. The station's current platform geometry, circulation limitations, multimodal integration challenges, and fragmented operational layout cannot accommodate expanded regional-rail services without significant redesign. Relocating the VIA Rail maintenance facility emerges as the critical enabling move: it removes spatial constraints, unlocks the station's potential for capacity expansion, and opens a rare redevelopment opportunity within the False Creek Flats. This relocation is further justified by the City of Vancouver's broader objectives for employment intensification, innovation-district development, and improved public-realm connectivity.

The assessment of relocation scenarios shows multiple viable pathways, each requiring coordination among VIA Rail, freight railways, Transport Canada, the City of Vancouver, and regional partners. Redevelopment of the freed parcel supports not only station modernization but also broader economic, land-use, and urban-design goals. Governance, funding alignment, risk mitigation, and phased implementation will be critical to transitioning from conceptual feasibility to delivery.

Taken together, the analysis indicates that passenger-rail expansion, station redevelopment, and maintenance-facility relocation are mutually reinforcing components of a unified regional-mobility strategy. With systematic planning, intergovernmental coordination, and sustained capital commitments, these initiatives can collectively reshape inter-regional travel, strengthen multimodal integration, and support Vancouver's long-term urban and economic vision.

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Appendix A

Multi-Tier Governance: Stakeholders, Functions, Dependencies, and Instruments

This appendix summarizes governance actors, their core functions, dependencies, and mechanisms relevant to corridor expansion and station redevelopment.

Table A1:

Governance Stakeholders, Core Functions, Dependencies, and Formal Instruments

Stakeholder	Core Function	Dependencies	Formal Instruments
Federal (Transport Canada, CIB)	Regulation, safety, financing support	Federal funding → requires provincial sponsorship	Railway Safety Act; federal programs; concessional loans
Provincial (BC MoTI)	Alignments, capital prioritization, freight negotiations	Provincial feasibility → depends on freight access	Capital budgeting; intergovernmental agreements
Regional (TransLink)	Multimodal integration, demand planning	Regional integration → depends on provincial/federal direction	Transit planning; service coordination
Municipal (City of Vancouver, others)	Zoning, growth-node designation, value capture	Land-use tools → depend on provincial capital commitments	Zoning bylaws; development charges
Freight Railways (CN, CPKC)	Track access, dispatching priorities	Passenger feasibility → depends on freight agreements	Dispatching control; access contracts
Passenger Operators (VIA, Amtrak, Rocky Mountaineer)	Service requirements, platform/dwell times	Passenger reliability → depends on freight dispatching	Operating agreements; scheduling
Private Partners (Retail, TOD developers)	Commercial programming, station activation	Revenue viability → depends on reliable passenger services	Concessions; leases; TOD investments

Note. CIB = Canada Infrastructure Bank; BC MoTI = British Columbia Ministry of Transportation and Infrastructure; CN = Canadian National Railway; CPKC = Canadian Pacific Kansas City; VIA = VIA Rail Canada; Amtrak = Amtrak Cascades; TOD = Transit-Oriented Development; Arrows (→) indicate directional dependency relationships among governance stakeholders.

Appendix B

Sequenced Funding Layers, Purposes, Dependencies, and Instruments

This appendix outlines the funding layers, showing their strategic purpose, activation triggers, prerequisites, and the funding instruments that enable sequencing.

Table B1:

Funding Layers, Strategic Purpose, Triggers, Prerequisites, and Instruments

Funding Layer	Strategic Purpose	Activation Trigger	Prerequisites	Funding Instruments
Catalytic Funding	Initiates early planning and feasibility work; reduces risk and attracts partners	Policy alignment with national mobility/climate objectives	Federal support → requires provincial sponsorship	Federal programs; concessional loans; feasibility studies
Core Capital Funding	Provides major investments for track upgrades and station modernization	Feasibility confirmation and provincial sponsorship	Core capital → depends on freight access agreements	Provincial budgets; intergovernmental agreements; procurement
Complementary Funding	Supports multimodal integration and public-realm improvements	Secured core commitments	Complementary → depends on provincial/federal capital cycles	Regional revenues; municipal tools; transit integration
Sustaining Revenues	Reinforces financial resilience and ongoing operations	Completion of modernization and reliable passenger services	Sustaining → depends on successful service delivery	Concessions; retail; transit-oriented development

Note. Arrows (→) indicate prerequisite relationships among funding layers.

Appendix C

Station-Level Stakeholders, Tensions, and Coordination Instruments

This appendix highlights the operational tensions faced by key stakeholders at Pacific Central Station and the coordination instruments used to balance reliability, circulation, and revenue generation.

Table C1:

Stakeholders, Operational Tensions, and Coordination Instruments

Stakeholder	Operational Tensions	Coordination Instruments
Passenger Operators (VIA Rail, Amtrak Cascades, Rocky Mountaineer)	Reliability vs. platform dwell time flexibility	Scheduling agreements; coordinated platform allocation
Freight Railways (CN, CPKC)	Passenger frequency vs. freight dispatching priorities	Access contracts; dispatching protocols
Regional Transit (TransLink – SkyTrain, bus, active modes)	Circulation/access vs. queuing and station space	Multimodal integration planning; transit service coordination
Provincial (BC MoTI)	Capital prioritization vs. freight access and station modernization	Capital planning; intergovernmental agreements
Municipal (City of Vancouver)	Heritage preservation vs. redevelopment growth; zoning approvals vs. circulation needs	Zoning bylaws; heritage registry; development charges
Private Partners (Retail, concessions, TOD developers)	Revenue generation vs. passenger circulation capacity	Lease agreements; commercial programming aligned with station operations

Note. Operational tensions highlight competing objectives that must be balanced at the station.

Appendix D

Cross-Border Continuity: Requirements, Risks, and Operational Measures

This appendix identifies the continuity requirements that shape international passenger services, the dependencies and risks, and the operational measures used to sustain reliable cross-border service.

Table D1:

Continuity Requirements, Dependencies, Risks, and Operational Measures

Continuity Requirement	Dependencies	Continuity Risk	Operational Measures
Customs Processing	Bilateral coordination with CBSA & U.S. CBP	Delays in clearance → departure disruptions	On-site customs facilities; harmonized inspection protocols
Immigration Control	Federal immigration agencies (Canada & U.S.)	Extended processing → passenger dissatisfaction, missed connections	Secure circulation zones; staffing agreements
Secure Circulation	Station design and controlled access pathways	Bottlenecks → reduced passenger throughput	Dedicated secure corridors; signage; controlled entry points
Preclearance Flexibility	Future bilateral agreements	Lack of adaptability → costly retrofits, service interruptions	Modular processing areas; scalable facility design

Note. CBSA = Canada Border Services Agency; U.S. CBP = U.S. Customs and Border Protection. Arrows (→) indicate directional dependencies within continuity risks.

Appendix E

Risk Categories, Drivers, and Mitigation Actions

This appendix presents the principal risk categories affecting corridor expansion and station redevelopment, the drivers, and the mitigation actions used to manage them.

Table E1.

Risk Categories, Drivers, and Mitigation Actions

Risk Category	Underlying Drivers	Mitigation Actions
Provincial Sponsorship	Federal funding → requires provincial leadership	Early provincial engagement; formal sponsorship commitments; alignment with federal mobility/climate priorities
Capital Cycle Alignment	Provincial budgets → must align with federal and regional funding windows	Coordinated funding applications; harmonized capital planning; intergovernmental scheduling
Freight Access	Passenger feasibility → depends on CN/CPKC dispatching agreements	Negotiated access principles; joint operating protocols; phased service integration
Cross-Border Continuity	Reliable service → depends on customs/immigration coordination	Bilateral engagement; scalable preclearance design; contingency planning for processing disruptions

Note. Arrows (→) indicate dependency relationships within risk drivers.

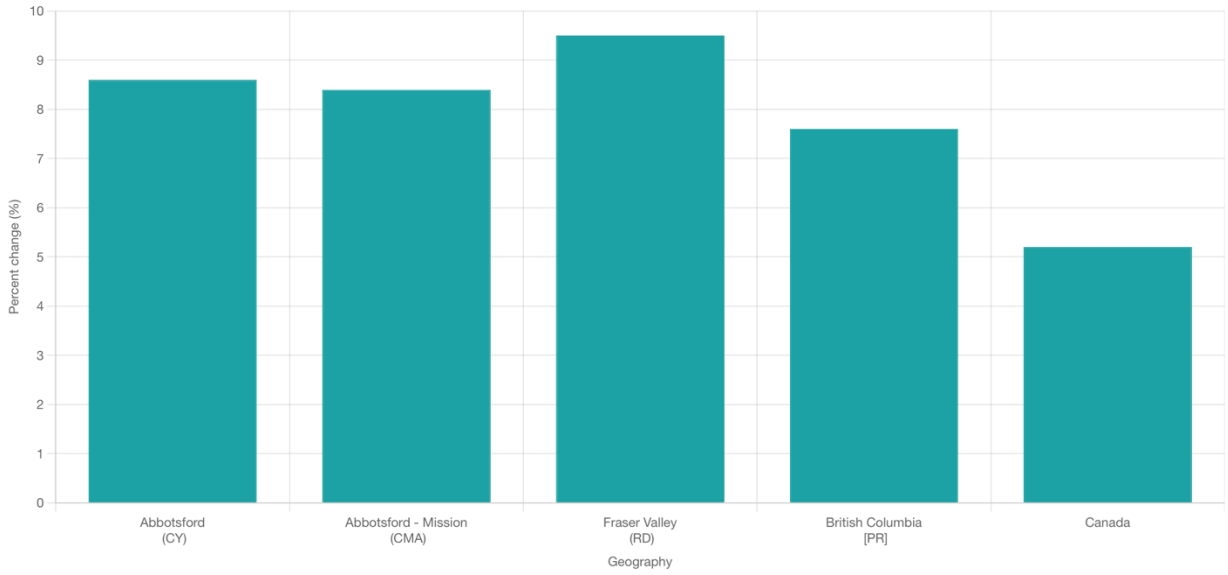
Appendix F

Population changes for Abbotsford (City) and higher level geographies, 2016 to 2021

Residents in the Fraser Valley experienced notable population increases between 2016 and 2021, with Abbotsford and the surrounding Census Metropolitan Area (CMA) outpacing the British Columbia and Canadian averages. The data shown in Figure F1 were retrieved directly from the Statistics Canada Focus on Geography Series, based on the 2021 Census of Population.

Figure F1

Population changes for Abbotsford (City) and higher level geographies, 2016 to 2021



Note. Data for this figure were retrieved from Statistics Canada (2022), *Focus on Geography Series, 2021 Census of Population: Abbotsford, City (CSD)*. https://www12.statcan.gc.ca/census-recensement/2021/as-sa/fogs-spg/page.cfm?dguid=2021A00055909052&lang=E&topic=1

Appendix G

Estimated Travel Times Between Abbotsford and Key Metro Vancouver Destinations

This table presents estimated travel times between Abbotsford and selected Metro Vancouver destinations under different travel modes. Auto travel times are shown for both free-flow and peak-period conditions, while conceptual rail times reflect a hypothetical express passenger rail service. Time savings represent the difference between peak-period auto travel and conceptual rail.

Table G1

Estimated Travel Times Between Abbotsford and Key Metro Vancouver Destinations

Origin	Auto (Free-Flow)	Auto (Peak)	Conceptual Rail	Time Savings
Abbotsford-Surrey Central	40 minutes	75-90 minutes	35 minutes	40-55 minutes
Abbotsford-Burnaby Metrotown	52 minutes	85-110 minutes	50 minutes	35-60 minutes
Abbotsford-Vancouver Downtown	70 minutes	100-130 minutes	65 minutes	35-65 minutes

Note. Estimates reflect typical weekday conditions and assume uninterrupted rail service under conceptual operating assumptions. Auto travel times are based on free-flow and peak-period congestion ranges along Highway 1.

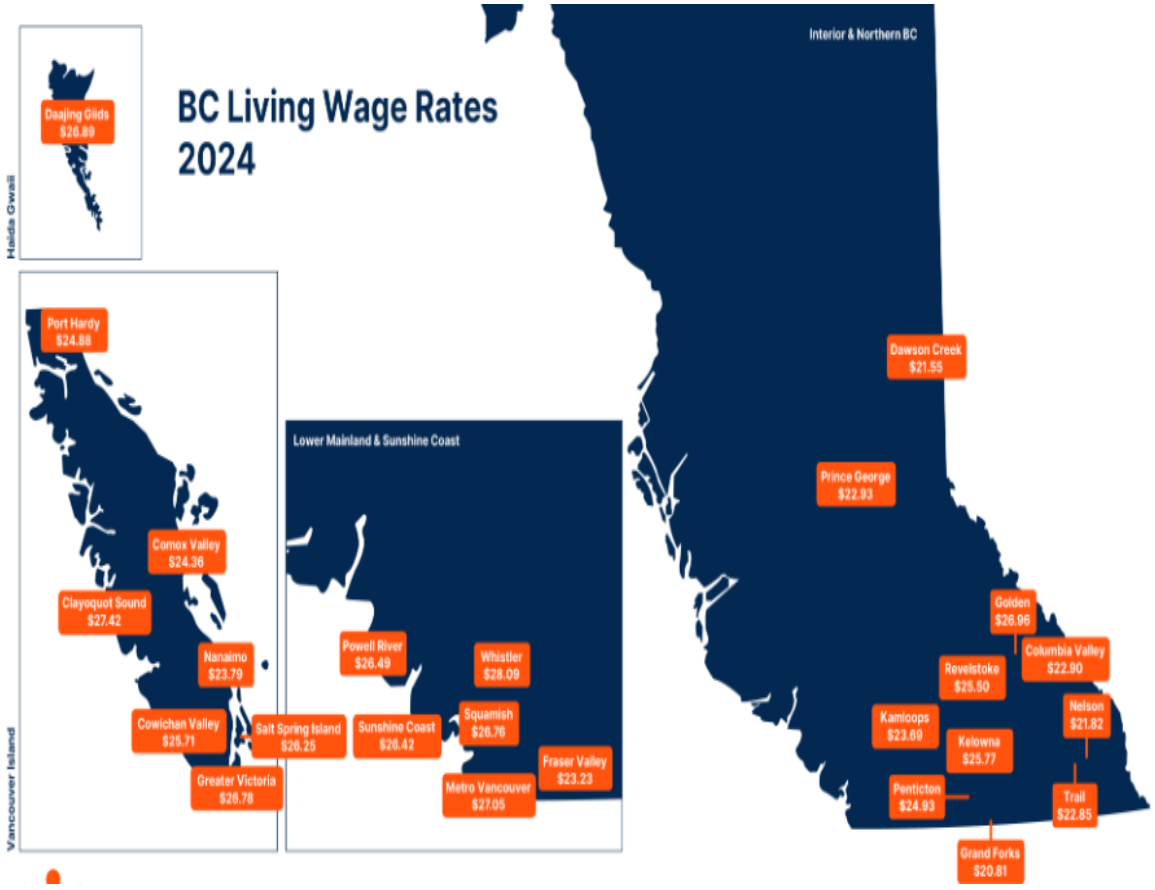
Appendix H

BC Living Wage Rates Across British Columbia (2024)

The map presented in Figure H1 illustrates the living wage required across different regions of British Columbia in 2024. These rates represent the hourly earnings needed for a two-parent household with two children to afford basic living expenses, including housing, transportation, food, and essential needs. Regional variation reflects differences in local affordability, service access, and employment conditions across the province.

Figure H1

BC Living Wage Rates Across British Columbia (2024)



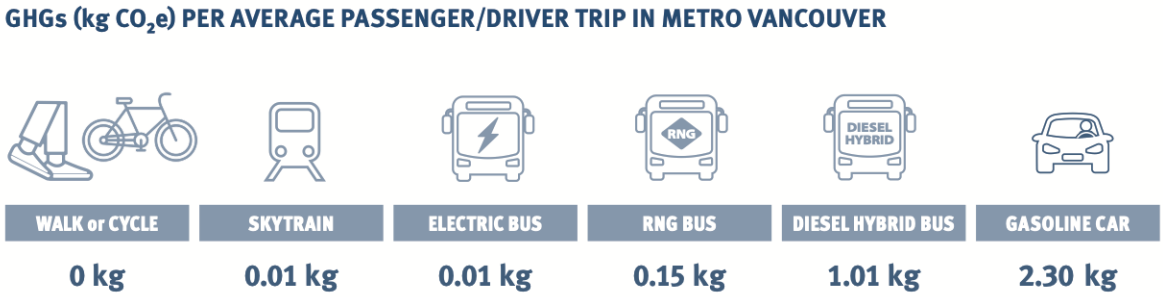
Note. Data retrieved from Living Wage for Families BC (2024), *2024 Living Wage rates*. Retrieved from https://www.livingwagebc.ca/calculations2024

Appendix I

GHG Emissions per Average Passenger/Driver Trip in Metro Vancouver

The following figure presents greenhouse gas emissions in kilograms of CO_2e per average passenger or driver trip in Metro Vancouver. Six transportation modes are shown, including walking or cycling, SkyTrain, electric buses, RNG buses, diesel hybrid buses, and gasoline cars. These values reflect regional travel behaviour and energy consumption patterns documented across multiple transportation agencies.

Figure I1



Note. This figure illustrates per-trip greenhouse gas emissions across major transportation modes commonly used in Metro Vancouver. The values are derived from provincial greenhouse gas quantification guidance, regional transportation energy consumption reports, and TransLink's trip diary data. The figure was recreated for this project using the following sources: *Methodological Guidance for Quantifying Greenhouse Gas Emissions* (Ministry of Environment and Climate Change Strategy, 2018), *Internal Energy Consumption Passenger-Kilometre Reports* (TransLink, BC Rapid Transit Company, & Coast Mountain Bus Company, 2020), *Trip Diary Survey* (TransLink, 2017), and *Approved Carbon Intensities: Information Bulletin RLCF-012* (Ministry of Energy, Mines and Low Carbon Innovation, 2021).