



Fraser River Tunnel Project

Application Summary

May 2025

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Application Summary

The Application Summary provides an overview of the purpose and objectives of the Fraser River Tunnel Project (Project); an overview of Project-related components and activities, including potential environmental, economic, social, cultural and health effects; potential adverse effects on First Nations; proposed mitigation measures; residual effects; and any proposed follow-up programs.

Project Overview

Transportation Investment Corporation on behalf of the Ministry of Transportation and Transit (Proponent) proposes to construct a new eight-lane immersed tube tunnel (ITT), a new eight-lane Deas Slough Bridge, associated connections to the existing Highway 99 between Steveston Highway and Highway 17A, and temporary construction facilities. The Project also involves closing the existing George Massey Tunnel (Existing Tunnel) and partially removing the existing Deas Slough Bridge. Once operational, the Project is expected to improve traffic flow across the Fraser River along Highway 99 and will meet modern standards for seismic performance and vehicle clearance. The Project will make travel faster and more reliable for people taking transit, with two dedicated transit lanes (one in each direction) for rapid bus transit. It will also provide a fully separated multi-use path (MUP) for pedestrians and cyclists.

The Project is a substantial investment in multi-modal transportation improvements that support provincial and regional strategies and sustainability objectives as well as regional, provincial and federal economic development.

Project Objective

Highway 99 is a major north-south corridor that serves urban and rural communities on each side of the Fraser River. The Existing Tunnel is an essential link in a corridor of regional, provincial and national importance. In addition to connecting communities north and south of the Fraser River, the corridor provides access to the international transportation gateways of the region's port and airport facilities. Now 65 years old, the Existing Tunnel suffers from congestion and reliability challenges, as reflected in traffic delays and queues, and safety challenges related to the congestion, seismic performance and roadway clearances.

The Existing Tunnel was opened in 1959 and has operated as a retrofitted counter-flow system for the past 40 years, with three lanes in the peak direction and one lane in the non-peak direction, to address traffic demand that has far exceeded the original design volumes. The Existing Tunnel suffers from congestion and reliability challenges, particularly reflected in traffic delays and queues in the non-peak direction, as well as safety challenges related to the congestion, seismic performance and roadway clearances. Given its age and current challenges, the Existing Tunnel is a hinderance to the growth, sustainability and liveability of the region.



The Project directly responds to a vital demand for reliable movement across the Fraser River to serve current challenges and forecast growth, with the primary objective to improve access and provide a safe and reliable crossing for current and future generations.

Key benefits of the Project include:

- > Providing congestion relief and improved reliability
- > Addressing the long-term seismic safety performance of the Existing Tunnel
- > Improving transit accessibility, speed and reliability along the Highway 99 corridor
- > Establishing a dedicated active transportation connection for pedestrians and cyclists across the Fraser River along Highway 99
- > Improving access to designated development centres and enhanced connections between communities north and south of the Fraser River
- > Improving connectivity to the international marine and air transportation gateways, other key provincial highways, the Tsawwassen ferry terminal and Canada's land border with the United States
- > Maintaining navigation clearances for the Fraser River

Delivery Approach

Based on market engagement following the Business Case in 2021, a progressive design build procurement model was chosen to deliver the Project. The progressive design build model creates the opportunity for meaningful collaboration between the Proponent and the selected Design-Build Contractor to develop the Project's design from reference concept to a detailed design ready for construction. The selected Design-Build Contractor was announced on July 23, 2024, and detailed design is continuing in parallel with the Application Development and Review stage of the environmental assessment (EA) process.

As a result of this progressive design-build approach and timing, the Project can be responsive to feedback received during Application Review. It also ensures that advancement to detailed design and implementation can focus on continual improvement that may lead to additional opportunities for the Project to maximize benefits or further improve mitigation of potential Project-related effects.



Project Description Summary

Project Location

The Project is located predominantly within the existing Highway 99 right-of-way directly upriver of the Existing Tunnel within Metro Vancouver in southwestern British Columbia (BC) and within the municipal boundaries of the City of Richmond (Richmond) and City of Delta (Delta) (Figure 1). The Project is within or near the Traditional Territories of several First Nations, including Katzie First Nation, Kwantlen First Nation, kʷikʷəłəm (Kwikwetlem First Nation), Leq'á:mel First Nation, Matsqui First Nation, xʷməθkʷəyəm (Musqueam Indian Band), Pauquachin First Nation, Popkum First Nation, Quw'utsun Nation (comprising Cowichan Tribes, Halalt First Nation, Lyackson First Nation, Penelakut Tribes and Stz'uminus First Nation), Sq'éwqel Band, Semiahmoo First Nation, Shxw'ówhámél First Nation, Snuneymuxw First Nation, S'ólh Téméxw Stewardship Alliance, Squamish Nation, Tsartlip First Nation, Tsawout First Nation, Tsawwassen First Nation, Tseycum First Nation, Tsleil-Waututh Nation, and Ts'uubaa-asatx. The Project footprint does not overlap with First Nation Reserve Lands.



Figure 1 Regional Location of the Project



Project Components

The Project includes a new eight-lane Immersed Tube Tunnel (ITT), a new eight-lane Deas Slough Bridge, associated connections to the existing Highway 99 between Steveston Highway and Highway 17A, and temporary construction facilities. The Project also involves closing the Existing Tunnel and partial removal of the existing Deas Slough Bridge.

Project-related activities will occur in two distinct areas of the Project footprint:

- > The Tunnel Corridor Area (TCA), which extends along Highway 99 from the Steveston Highway interchange in the north to the Highway 17A interchange in the south.
- > The Temporary Moorage Area (TMA), which is located approximately 6 kilometres (km) downriver of the TCA and is planned to be used for in-channel storage of completed tunnel elements prior to immersion during the construction of the new ITT.

Collectively, the TCA and the TMA represent the Project footprint, which encompasses approximately 215 hectares (ha). The proposed Project footprint is sufficiently large to include permanent and temporary work areas, and to encompass locations where work activities are anticipated to occur.

Project Timing

Project Construction is planned to commence in 2026, with the new ITT opening to traffic in 2030, subject to receipt of an Environmental Assessment Certificate and associated regulatory permits. Following the opening of the new ITT, the Existing Tunnel will be closed as part of the Project, currently planned by the end of 2032. The new ITT is designed to operate for approximately 150 years.

Evaluation of decommissioning options for the new ITT and associated components will occur at the end of Project life in accordance with regulatory requirements and management practices at that time.

Table 1 Overview of the Project Phases

Phase	Approximate Duration
Preparatory Construction	Approximately 1 year
Main Construction	Approximately 4 years
Operations	150 years
Closure of Existing Tunnel and Removal of Infrastructure	Approximately 2 years



Project Construction

The new ITT will be constructed in seven key steps (Figure 2).

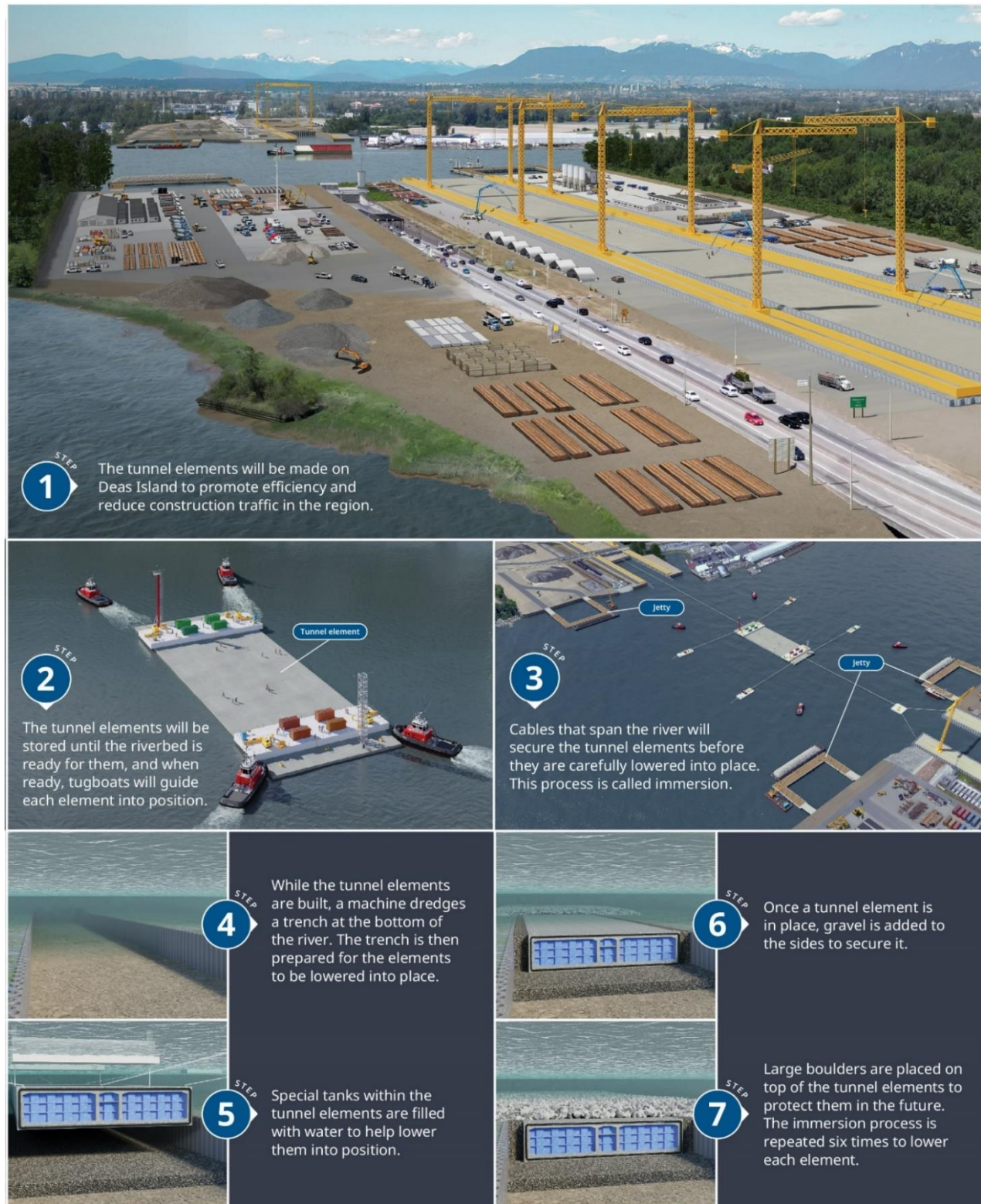


Figure 2 Tunnel Construction Steps



Regulatory Context

Reviewable Project

The Project meets the criteria under the Reviewable Projects Regulation (BC Reg 67/2020, Part 5, Table 9) and is therefore subject to review under the BC *Environmental Assessment Act*. Under the Reviewable Projects Regulation, the Project qualifies as a Shoreline Modification Project since it is expected to cause direct physical disturbance of more than 2 ha of foreshore or submerged land, or a combination of foreshore and submerged land, below the natural boundary of the Fraser River.

Project Environmental Assessment Overview

The Proponent submitted an Initial Project Description on April 7, 2022, commencing the 90-day Early Engagement phase. Government agencies, First Nations and relevant interested parties participated by providing review, comment and input on the Initial Project Description, selection of Valued Components (VCs) and the draft Early Engagement Plan. A Detailed Project Description that considered feedback provided during Early Engagement was submitted to the BC Environmental Assessment Office (EAO) on May 15, 2023. The EAO reviewed the Project's Detailed Project Description in collaboration with First Nations and technical advisors and the Project received a Readiness Decision on September 14, 2023.

VCs were selected by the Proponent and consider the priorities of First Nations, the public, local and regional governments, provincial and federal government agencies, and interested parties. On December 22, 2023, the Proponent requested an extension to the 120-day legislated timeline to allow adequate time for consultation with the Technical Advisory Committee (TAC) and First Nations on Project changes made as a result of feedback gathered during Early Engagement. The EAO issued a Process Order, which is customized to reflect the Project and sets the scope, procedures and methods of the EA. The Process Order is made up of the main body and two appendices – the Assessment Plan and the Application Information Requirements (AIR). The EAO, through collaboration with First Nations, deemed the scope of the Project final and issued a Process Order under Section 19(2) of the *Environmental Assessment Act* on March 22, 2024.

The Proponent developed the Application for an Environmental Assessment Certificate in accordance with the Process Order and AIR, incorporating feedback, where relevant, gathered through engagement with interested parties and First Nations. Following the review of this Application, the Proponent expects to finalize and submit the Revised Application as per feedback from the EAO, the TAC, First Nations and the public.



First Nations Engagement

The Proponent began engagement with potentially affected First Nations in 2019. This initial engagement was focused on developing regional consensus on principles, goals and objectives and identifying and shortlisting options for the location of the new tunnel crossing. Since then, the Proponent has remained committed to open, transparent and meaningful engagement with potentially affected First Nations throughout the EA process.

As documented in the Project's Assessment Plan and Indigenous Engagement and Collaboration Plan, the Proponent has actively engaged with potentially affected First Nations that have self-identified as Participating Indigenous Nations (Table 2). The Proponent also provided regular communications to Notification First Nations, those potentially affected First Nations that did not self-identify as a Participating Indigenous Nation (Table 2).

Table 2: Overview of Participating Indigenous Nations and Notification First Nations for the Project

Participating Indigenous Nations	Notification First Nations
> ᑭᓄᓐᓂᓐᓂᓐ (Kwantlen First Nation) > Leq'á:mel First Nation > xʷməθkʷəyəm (Musqueam Indian Band) > Quw'utsun Nation, including: – Cowichan Tribes – Xeláltxw (Halalt First Nation) – Lyackson First Nation – Spune'luxutth (Penelakut Tribe) – Stz'uminus First Nation > SEMYOME (Semiahmoo First Nation) > Snuneymuxw First Nation > S'ólh Téméxw Stewardship Alliance, including: – Aitchelitz First Nation – Chawathil First Nation – Cheam First Nation – Kwaw-Kwaw-Apilt First Nation – Semá:th (Sumas) First Nation – Shxwhá:y Village – Skowkale First Nation – Skwah First Nation – Soowahlie First Nation – Sq'ewá:lw (Skawahlook) First Nation – Sq'éwlets (Scowlitz) First Nation – Shxw'ówhámél First Nation	> ᑭᓂᓐᓂᓐ (Katzie First Nation) > kʷikʷəłəm (Kwikwetlem First Nation) > Matsqui First Nation > BOKÉCEN (Pauquachin First Nation) > Pópkw'em (Popkum First Nation) > Skwxwú7mesh Úxwumixw (Squamish) Nation > WSIKEM (Tseycum) First Nation



Participating Indigenous Nations	Notification First Nations
– Squiala First Nation – Tzeachten First Nation – Yakweakwioose First Nation – Yale First Nation > WJOLÉLP (Tsartlip First Nation) > SṪÁUTW (Tsawout First Nation) > sṫcəwaθən məsteyəx^w (Tsawwassen First Nation) > səlilwətaṫ (Tseil-Waututh Nation) > Ts'uubaa-asatx	

The Proponent's engagement approach aligns with the *Environmental Assessment Act* goal of supporting reconciliation and respecting Indigenous rights to self-determination and self-governance. Engagement was focused on advancing a consensus-seeking process that fosters a shared understanding of potential effects on Indigenous Interests, Indigenous Knowledge (IK) sources and protocols, and collaborative authorship of First Nation-specific assessments. Each potentially affected First Nation has guided the frequency of and priority topics for engagement. The Proponent's robust engagement program incorporated various tools and activities such as routine Project update meetings, technical workshops, site visits, field work opportunities and collaborative review of key EA materials. For more information on the Proponent's First Nation engagement approach and activities, see the Indigenous Engagement and Collaboration Plan for the Project and Section 11 of this Application. The Proponent acknowledges the important and detailed input from First Nations received to date and looks forward to continuing engagement activities through future stages of the Project.

Detailed descriptions of the issues and concerns raised by each potentially affected First Nation and the Proponent's response are provided in First Nation-specific assessments within Section 11 of this Application. The following list is a high-level summary of the key issues and concerns raised by potentially affected First Nations:

- > Capacity to meaningfully engage in the environmental assessment process
- > Potential effects to fish and fish habitat from in water activities
- > Underwater noise effects and related assessment methodology
- > Vessel traffic, movements and river closures and related effects on Indigenous Interests
- > Location of the temporary moorage site
- > Cumulative effects on the Lower Fraser River
- > Existing conditions methodology
- > Potential effects on the ability to fish, hunt or harvest resources for subsistence, social, ceremonial and economic purposes
- > Potential effects on lands and resources, cultural continuity, Indigenous health and wellbeing, Indigenous governance systems and social and economic conditions



Public and Government Engagement

The Proponent recognizes the key role of the public, businesses, nonprofit organizations, residents, local government, provincial and federal regulatory agencies, and other interested parties in identifying and helping to address potential adverse effects of the Project.

The Proponent began engagement with the public, local governments, provincial and federal government agencies, and other interested parties in 2019 through early Project planning, before the Proponent formally entered the provincial EA process. This active engagement has continued throughout the entirety of the process.

Engagement activities have been guided by regulatory requirements, including the Process Order, and are consistent with the Fraser River Tunnel Project Engagement Plan prepared by the Proponent. The engagement program has been designed to encourage participation and provide an accessible way for First Nations, the public and interested parties, as well as local governments and government agencies to meet the following objectives:

- > Introduce the public and interested parties to the Project and the EA process
- > Support EAO-led engagement activities, including public open houses, community workshops and presentations with all parties interested in the EA process, as required by the EAO
- > Establish Project-led forums and tools for Project engagement for the public and interested parties
- > Build strong relationships with interested parties
- > Identify public and stakeholder concerns related to the Project

The Proponent employs a range of tailored communication and engagement methods to effectively achieve the goals of the engagement programs, including:

- > Workshops
- > In-person or virtual meetings
- > In-person or virtual open houses
- > Pop-up events
- > Comment periods
- > Social media posts
- > Advertising
- > Project website
- > Phone calls and/or emails
- > BC Gov News information bulletin
- > Direct mail outreach



Key issues raised through these engagement programs included concerns about residential disturbance, traffic effects, environmental considerations, access constraints to the Millennium Trail and Deas Island Regional Park, and implications for cycling, running and other active transportation activities. This feedback informed Reference Concept Design considerations and helped identify additional VCs that have been assessed in the Application. Mitigation measures have been developed based, in part, on the feedback from public and local government engagement during Early Engagement, Process Planning and Application Development, which have been incorporated into this Application.

The main feedback received from local governments has been regarding effective restoration and habitat offsetting to mitigate environmental effects, safety for MUP users, connectivity for users throughout and after the Construction phase, transit accessibility and maintenance responsibilities. Feedback received from local governments has informed the development of the Application.

Provincial and federal agencies have been engaged throughout Project development. Meetings were held with the TAC, including representatives from First Nations, as well as local, provincial and federal governments. Comments received from the TAC have been incorporated into the Process Order, including the AIR, Assessment Plan and Regulatory Coordination Plan.

The Proponent is committed to continued engagement after Application submission and will employ similar methods used to date. Public engagement activities may include translation of specific communication materials, targeted outreach and collaboration with local community organizations so that under-represented communities are able to provide their feedback and input effectively. The Proponent will continue offering meetings and workshops, which have been well-received by local governments. These engagement activities will include presentations tailored to address previously raised concerns and focus on areas of jurisdictional interest.



Key Effects Summary

The following sections summarize key potential effects, proposed mitigation measures and residual and cumulative effects identified through consideration of potential interactions between Project components and/or activities with each of the VCs. Management, monitoring and restoration plans have been proposed and will be developed and implemented by the Proponent. A full list of mitigation measures and follow-up strategies are included in each VC section and summarized in Appendix A. In addition to the VCs summarized below, the Application includes assessment of greenhouse gas emissions, malfunctions and accidents and effects of the environment on the Project.



Air Quality

Air Quality was selected as a VC because emissions related to the Project have the potential to change ambient concentrations of criteria air contaminants, diesel particulate matter (DPM) and volatile organic compounds (VOCs). Ambient concentrations of air quality contaminants were modelled corresponding to four scenarios: baseline (2022 conditions), Project construction (conditions during Construction), future baseline (2050 conditions without the Project) and Project Operations (future conditions).

Project activities during Construction may result in short-term increases in dust emissions from concrete batch plants, construction equipment driving on unpaved roads and combustion emissions from equipment (exhaust from diesel-powered construction equipment and marine vessels). During Operations, emissions may result from exhaust, tire wear, brake wear and fugitive dust from vehicles transiting through the new ITT and over the new Deas Slough Bridge.

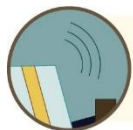
Proposed mitigation measures during Construction include implementing standard practices to reduce emissions from diesel combustion by construction equipment, following routine equipment maintenance procedures on construction equipment and marine vessels, covering haul truck loads, maintaining batch plant emissions controls, watering unpaved roads and cleaning paved roads.

During Construction, carbon monoxide, sulphur dioxide and ammonia, as well as most VOCs remain well below relevant air quality criteria. A number of contaminants, such as nitrogen dioxide and benzene, particulate matter and benzo(a)pyrene have high baseline values or are already at or above the relevant air quality criteria. As a result, localized areas may experience infrequent periods during which these contaminants exceed relevant air quality criteria.

During Operations, concentrations of carbon monoxide, sulphur dioxide, ammonia, and most VOCs remain below the relevant air quality criteria. Particulate matter and nitrogen dioxide concentrations may exceed relevant air quality criteria; however, these elevated levels extend only slightly beyond the roadway and are unlikely to create long-term exposure to particulate matter or nitrogen dioxide.



Monitoring programs for ambient concentrations of particulate matter and nitrogen dioxide are proposed during the Construction (Preparatory and Main) and Closure of Existing Tunnel and Removal of Infrastructure phases of the Project.



Acoustic

The Acoustics section describes the study and evaluation of Project-related noise and vibration effects on the environment and surrounding communities. The potential effects of the Project on Acoustics include change in ambient noise levels and change in vibration levels.

Construction-related noise is considered temporary and variable due to changes in noise emission levels and activity locations. Noise modelling predicted exceedances at two to three of the 17 assessed receptor locations depending on the construction year. By year four, there are no clearly noticeable noise level changes or exceedances. Vibration levels for pile driving and operation of heavy machinery are predicted to remain below thresholds for building damage at all receptors.

Mitigation measures to avoid and reduce potential negative effects from noise and vibration will be detailed in a noise mitigation strategy and are expected to include scheduling noise-generating activities (e.g., pile driving) during daytime hours and establishing a communication protocol, prioritizing vibratory pile driving methods, limiting atmospheric noise from pile driving to 95 A-weighted decibels at 15 metres from the hammer, applying an anti-idling policy and installing noise walls during Operations.

Post-mitigation, the only residual effect that may last into the Operations phase is noise associated with traffic using the Project. Noise changes range from negligible to low, depending on receptor proximity.

Noise from Project activities may interact with maintenance dredging in the Fraser River, which also generates noise. No additional mitigation is proposed, and the cumulative effects are expected to be short term, reversible and localized.

A process for receiving and managing noise and vibration reports will be established for the Construction and Closure of Existing Tunnel and Removal of Infrastructure phases, whereby persons can contact the Project if there are perceived noise or vibration issues. Complaints will be investigated and, if justified, the noise source that caused the complaint will be investigated.





Surface Water and Sediment Quality

Surface Water and Sediment Quality describes the quality of the aquatic environment, including sediment, for the Fraser River South Arm, Deas Slough, upland tributaries and the marine environment. Changes in surface water quality due to dredging and in-river works have been raised as topics of interest by First Nations, regulators, government agencies and the public through engagement.

During Construction, the potential effects of the Project on Surface Water and Sediment Quality include changes in suspended sediments in water due to sediment disturbance and soil removal and sediment suspension and deposition due to erosion. These in turn have the potential to cause remobilization of trace metals and organic constituents. Project construction also may cause changes in runoff quality into watercourses, stormwater runoff quality, release of alkaline material during concrete works and changes in water quality due to dewatering activities.

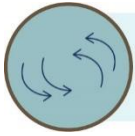
Proposed mitigation measures include: an environmental monitoring program, erosion and sediment control, the management and treatment of sediment-laden water (including stormwater, road runoff, dewatering and site contact water), sediment management measures to minimize resuspension during dredging and in-river work, and spill prevention and emergency response procedures. Monitoring programs during all phases are proposed to verify the effectiveness of proposed mitigation measures.

The Lower Fraser River is a naturally turbid river system influenced by tidal cycles and variable river flows, which transport and redistribute sediments within the river and into the marine environment. Dredging is expected to be the primary Project activity which may result in a potential negative residual effect on surface water quality as a result of sediment disturbance and mobilization of trace metals and organic constituents. These effects are anticipated to be reversible following the completion of sediment disturbance activities.

Positive residual effects are anticipated during Operations as a result of the implementation of the stormwater management systems and drainage infrastructure. New infrastructure is expected to improve existing stormwater and surface water runoff treatment compared to the existing treatment systems.

Cumulative effects may result from the interaction between the Project activities and the activities of other developments that cause changes in suspended sediments and remobilization of trace metals and organic constituents due to sediment disturbance. With mitigation measures in place, cumulative effects are expected to be negligible, temporary and reversible.





River Hydraulics and Morphology

River Hydraulics and Morphology refers to the physical characteristics and dynamic behaviour of the Fraser River. The Project may affect River Hydraulics and Morphology by altering flow patterns and velocities and by altering riverbed scour and sediment deposition patterns as a result of the construction of temporary and permanent in-river infrastructure.

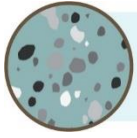
During Construction, flow velocity changes are expected to range from -2 metres per second (m/s) to +1 m/s. During the Operations phase, changes to flow velocity are expected to remain within ± 1 m/s. Most effects are expected to be localized within 1 kilometre (km) of the TCA and TMA. While the Project may cause localized changes in riverbed scour and sediment deposition, these changes are expected to remain within the natural range of variability.

Proposed mitigation measures include scheduling in-river construction activities to avoid the freshet season and reduce the severity of scour and sedimentation, limiting the duration of the ITT open trench to reduce sediment trapping and installing temporary and permanent scour protection.

The lower Fraser River has been highly modified to support industrial and commercial development and to protect adjacent communities from flooding. Historic, current and reasonably foreseeable developments on the lower Fraser River in combination with the Project may cause residual cumulative effects on flow patterns and velocities, especially during certain tidal cycles. With mitigation measures in place, these effects are expected to be temporary and reversible. Residual cumulative effects on riverbed scour and sediment deposition patterns near the TCA and TMA may also occur, but these residual cumulative effects are anticipated to be partially reversible.

During Construction and in the initial phase of Operations, monitoring of flow patterns and velocities is proposed, including regular velocity-discharge measurements. A follow-up program is proposed to monitor scour and sediment deposition patterns through bathymetric surveys of the riverbed in the areas near the TCA and TMA. Results of monitoring will be reviewed, and mitigation measures will be adaptively developed and implemented, as warranted.





Groundwater

Groundwater refers to the quality and quantity of water stored in aquifers, including groundwater levels, flow patterns and interactions with the salt wedge (saline water that extends from the ocean upriver along the base of the Fraser River). The Project may affect groundwater by altering local infiltration of precipitation and groundwater recharge patterns, changing groundwater levels and flow patterns due to dewatering, affecting local groundwater quality and modifying the extent of the salt wedge in the subsurface.

Proposed mitigation measures include: backfilling with clean material that meets BC regulatory standards to protect groundwater and allows it to flow, recharge and prevent contamination; managing surface water; and restoring infiltration and recharge patterns by undertaking onsite ecosystem and wetland restoration, including replanting native vegetation and recontouring land.

Following the application of proposed mitigation and monitoring, no residual effects to the Groundwater VC are anticipated.



Soil

Soil was selected as a VC because it is the medium that supports ecosystems and their associated plant species, wildlife habitat and wildlife species, as well as land uses that are valued by humans, like natural areas and agriculture. The Project may affect soil due to the removal or disturbance of ecologically valuable soil and contaminated soil during the Construction and Closure of Existing Tunnel and Removal of Infrastructure phases.

During Construction, soil may be disturbed and permanently lost due to the construction of new infrastructure. Reduction in soil volume could also occur due to erosion, loss of stockpiled material and/or changes in topsoil or subsoil depths. Following the Construction and Closure of Existing Tunnel and Removal of Infrastructure phases, reclamation efforts aim to restore disturbed areas to near-original conditions. A reduction in soil quality may occur due to compaction and rutting, admixing, placement of fill, and relocation and removal of soil, but these effects will be managed through mitigation measures such that no Project-related residual effects on soil quality are anticipated.

Proposed mitigation measures include: limiting ground disturbance and vegetation clearing, conservation of ecologically valuable soils, and management and remediation of contaminated soils to collectively protect soil resources throughout the Project area, supporting reclamation, ecosystem restoration and agricultural land preservation. A negative residual effect may occur as a result of loss in areal extent of mapped ecologically valuable soils; however, the soil itself will be salvaged and conserved resulting in no loss of soil volume. A Soil Management Plan will be developed as part of the Construction Environmental Management Plan.





Vegetation

Vegetation refers to all plant life, including plant species of conservation concern, invasive plant species, terrestrial and riparian ecosystems, wetlands and culturally important and traditional use plant species for First Nations.

During Construction, the Project may result in the loss or alteration of plant species at risk and culturally significant plants, reducing habitat availability and connectivity, and an increase in invasive plants due to habitat disturbance and relocation, and expansion of the existing highway.

Mitigation measures are proposed to minimize potential negative effects, including limit soil and vegetation disturbance to designated areas; implement site-specific procedures within the Construction Environmental Management Plan to control invasive plants; transplant/protect plant species listed under the *Species at Risk Act*; and implement a Restoration Plan, including elevation adjustments, native vegetation and wildlife features.

Localized Project-related residual effects on habitat loss are expected during construction activities, with indirect effects associated with shading from the new Deas Slough Bridge extending into Operations. With mitigation, most upland ecosystems are expected to return to their existing conditions or better during the Operations phase. Culturally Important and Traditional Use Plants occurring in the marine construction staging area will be avoided; however, development of permanent works or upland construction staging (temporary works) areas may result in the direct loss of occurrences of these species. Through restoration, the Project is anticipated to result in a net increase in available habitat for vegetation during the Operations phase.

The Project, along with other foreseeable developments, is expected to contribute to cumulative vegetation loss and alteration, affecting plant species of interest, culturally significant plants, ecosystems and wetlands. Through a comprehensive restoration plan, the Project will focus restoration efforts on re-establishing native plant communities representative of naturally occurring ecosystems in the lower Fraser delta.



Wildlife and Wildlife Habitat

Wildlife and Wildlife Habitat refers to the individual species, populations and communities of wildlife as well as the ecosystem and physical features that they rely on for survival. Project activities may result in direct and indirect habitat loss, increased mortality risks and potential changes to wildlife movement and habitat fragmentation.

Some species are expected to experience direct habitat loss during Construction and Closure of Existing Tunnel and Removal of Infrastructure. Temporary losses are proposed to be mitigated through post-Construction restoration. Indirect habitat loss due to noise and light disturbance is expected to be temporary and limited. Higher traffic volumes could increase mortality risk for raptors, small mammals and bats. While no new fragmentation is expected, the widening of the

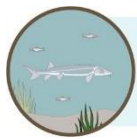


Highway 99 corridor within the existing right-of-way may create additional barriers to wildlife movement.

Proposed mitigation measures include minimizing vegetation clearing and using previously disturbed areas to reduce habitat loss and disturbance; scheduling construction to avoid critical periods for amphibians, reptiles, birds, bats and barn swallows; controlling light pollution and noise disturbance, particularly near sensitive habitats; implementing setback buffers; adaptive management practices; and installing wildlife collision barriers to mitigate mortality from vehicle strikes. The Proponent proposes to develop and implement a Restoration Plan to reinstate ecosystems and wetlands, and an Offsetting Plan to offset wetland losses.

Combined with other foreseeable developments, the Project may contribute to habitat loss and sensory disturbances; however, mitigation and habitat restoration are expected to help reduce long-term effects.

A follow-up program, including road mortality surveys, is proposed to verify predicted changes in mortality. Additional data will be collected before Construction, with ongoing surveys throughout key Project phases to verify the accuracy of the assessment.



Fish and Fish Habitat

Fish and Fish Habitat describes the aquatic ecosystems that sustain fish species, including their life cycle, population dynamics and the condition of their physical environment. The Project is anticipated to affect Fish and Fish Habitat primarily during the Construction and Closure of Existing Tunnel and Removal of Infrastructure phases. Construction activities like dredging, disturbing sediment and generating underwater noise may affect fish in several ways. Effects include changes in fish behavior, risk of injury or mortality, exposure to contaminants, disturbance to habitat in and around the water, and impacts to the abundance and types of aquatic invertebrates. These changes may affect fish by displacing them from habitats, disrupting feeding and migration, and exposing them to contaminants. In turn, sediment remobilization and habitat loss may affect invertebrate communities, further reducing food availability for fish.

Proposed mitigation measures include: soft start procedures that gradually expose fish to noise and a minimum eight-hour daily work stoppages during pile driving to reduce fish stress and minimize injury. Underwater noise adaptive management is predicted to help maintain noise levels below harmful thresholds for aquatic species, and the use of side-scan sonar will guide activities to avoid fish disruption. Fish salvage will relocate fish from dewatered areas, and vessels will follow speed limits to minimize noise and habitat disturbance. The draft Fisheries Habitat Offsetting Plan identifies a range of aquatic and riparian habitat offsetting opportunities. These will be explored further and refined during Application Review in consultation with First Nations, Fisheries and Oceans Canada (DFO), other regulatory agencies and key interested parties.



The Project is expected to have residual effects on Fish and Fish Habitat during the Construction and Closure of Existing Tunnel and Removal of Infrastructure phases. However, such Project activities are anticipated to cause few direct physical effects on fish, and few individuals are likely to be affected through crushing, entrainment or stranding. Changes in fish behaviour are expected to be minimal and primarily due to potential temporary exceedances of underwater noise thresholds. Project activities such as dredging could cause a temporary reduction in the abundance and distribution of benthic invertebrates within the Project footprint.

Cumulative residual effects may occur on fish mortality and/or injury, fish behaviour and exposure to contaminants, and habitat alteration, disruption or destruction. While climate change may exacerbate some effects, overall Project-related cumulative effects are expected to be short to medium term, and reversible.



Marine Mammals

For the effects assessment, Marine Mammals refers to eight sub-components that may be affected by the Project: Humpback Whale, Grey Whale, Southern Resident Killer Whale, Transient Killer Whale, Harbour Porpoise, California Sea Lion, Stellar Sea Lion and Harbour Seal.

The study assessed the potential for the Project to affect these species through physical harm from vessel strikes, disturbances caused by underwater and airborne noise, and health effects resulting from changes in prey abundance, distribution and quality due to contaminant exposure. These effects could influence Marine Mammal populations and overall ecosystem health. With appropriate mitigation measures in place, most residual effects are expected to be short term, localized and reversible.

Proposed mitigation measures include: complying with Marine Mammal Regulations, scheduling in-river construction activities within the least-risk timing windows, conducting monitoring by Marine Mammal Observers during pile driving and implementing an underwater noise mitigation strategy.

The Project, in conjunction with other regional developments, may contribute to localized, short-term cumulative effects on Southern Resident Killer Whales from underwater construction-related noise, reduced prey availability and exposure to contaminants. Mitigation measures, such as vessel slowdowns and improved water quality management, are expected to reduce the Project-related potential cumulative effects. There are no follow-up strategies outlined for Marine Mammals.





Employment and Economy

Employment and Economy refers to local and regional employment opportunities, economic activity and the financial wellbeing of communities. This includes assessing economic development, the labour market, employment and contracting, and business activity.

While nearby businesses may experience some negative effects during the Construction phase due to disruption of access, the majority of effects are expected to be positive. During Construction, the Project will create business and contracting opportunities, support workforce training and enhance long-term business activity by improving transportation connectivity. Although most benefits are predicted to be concentrated in Metro Vancouver, some will extend beyond the region.

The Operations phase is expected to bring improvements in infrastructure and traffic flow, benefiting business activity. The Project is expected to have positive economic effects, including increased economic output, tax revenues and employment, particularly during the Construction and Closure phases. The Project will create job opportunities and generate considerable contracting opportunities over the six-year period of the Construction and Closure phases of the Project.

Enhancement measures provide opportunities to enhance positive effects and/or support equitable distribution of positive effects. Proposed enhancement measures include an Environmental, Social and Governance Strategy Plan promoting equitable hiring, annual workforce reporting and a Respect in the Workplace Plan, and establishing Indigenous workforce requirements, including equitable contracting, cultural awareness training for staff and engagement with First Nations in Project design. Potential negative effects will be mitigated through the implementation of a Marine Communication Plan, Marine Supply Chain Logistics and Operating Procedures, Fisheries Access Management Protocols and a Construction Traffic Management Plan.

Following mitigation, no negative residual effects on the Employment and Economy VC are anticipated.



Land and Resource Use

Land and Resource Use refers to the various land uses, activities and resources within the Project area, including traditional land uses by Indigenous communities as well as commercial, retail and industrial uses; residential and public facilities; recreational and tourism areas; and agricultural land use.

The Project has been designed to minimize potential effects on land and resource uses through measures such as realigning Rice Mill Road and the CN Rail overpass to minimize disruption to access during Construction. However, the Project may affect land availability, access and use across commercial, industrial, residential, recreational, agricultural and First Nations users.

During the Construction and Closure of Existing Tunnel and Removal of Infrastructure phases, land use changes may temporarily disrupt access to roads, trails and parks in Richmond and Delta.



Temporary access restrictions to recreational and tourism spaces, such as Deas Island Regional Park and the Millennium Trail are expected. Noise, dust and lighting from construction may affect nearby land users, and visual effects may be noticeable in residential, recreational and industrial areas. Land use by First Nations may also be temporarily affected by restricted access and environmental disturbances.

In the Operations phase, long-term land use effects are predicted to be minimal, with improved traffic flow benefiting access for all users. Recreational areas will see some permanent changes, but public access will be restored in most locations. Environmental effects, such as noise, vibration and air quality changes are expected to remain within acceptable limits, while minor visual changes may be noticeable near new infrastructure.

Proposed mitigation measures include: providing safe alternative routes and maintaining cyclists' access through the Existing Tunnel via the bike shuttle service.

The Project is expected to bring several positive effects during the Operations phase, including new multi-modal transportation through the new crossing connecting into existing networks in Richmond and Delta, and improved road capacity and reduced traffic congestion, which is expected to enhance access to recreational areas, commercial and industrial lands, First Nations' lands and agricultural sites.

During the Construction and Closure phases, cumulative effects are expected, primarily due to traffic delays, congestion and detours. During Operations, cumulative effects are considered at least partially reversible, with access efficiency and land use conditions expected to improve after the Construction and Closure phases.

No follow-up strategies are proposed for the Land and Resource Use VC. Communications programs in the Socio-Economic Management Plan will allow for adaptive management related to communication concerns.



Marine Use

Marine Use refers to the various marine use activities and resources within the Project area, including navigation, commercial transportation, industrial foreshore use, fisheries (Indigenous, commercial and recreational), marine tourism, recreation and marine use by First Nations.

The Construction phase of the Project is expected to temporarily restrict navigation in the Fraser River South Arm by reducing the deep-sea channel width, requiring vessels to alter course or change speed. The presence of in-river construction activities and equipment, navigation channel restrictions and the planned TCA closures for the immersion of tunnel element are expected to have an effect on commercial marine transportation and industrial foreshore access and use. Increased vessel traffic may lead to longer transit times, but commercial marine routes will remain accessible.



The Project may also affect fishing activities. Commercial, Indigenous and recreational fishers could experience delays due to navigation restrictions, especially during salmon fishery openings, although areas upriver and downriver of the construction zones will remain accessible. No effects on fish harvesting infrastructure are expected; however, temporary operational delays could affect commercial fishery revenues.

Noise, air quality and visual quality during Construction may negatively affect marine tourism and recreation. Increased noise levels and visual changes are expected to reduce the enjoyment of areas such as Deas Slough and the Fraser River South Arm. For First Nations, construction may disrupt access to cultural and fishing sites, affecting cultural practices.

Proposed mitigation measures include plans and procedures for marine activities and Fisheries Access Management Protocols.

Once construction activities are complete and the new ITT is operational, no effects on marine navigation are anticipated. Once the Construction and Closure phases of the Project are complete the visual changes in the marine environments will remain, which may negatively affect tourism and Indigenous marine use. Restoration of natural ecosystems, wetlands and native riparian forests will help mitigate these effects over time.

Cumulative effects are considered continuous during Construction, but short term and reversible. While temporary access disruptions may occur, mitigation measures and navigation protocols will minimize potential effects.



Visual Quality

Visual Quality refers to the aesthetic and scenic characteristics of the Project area's visual landscape, encompassing both natural and constructed elements.

During Construction, Visual Quality is expected to be temporarily affected through the introduction of tower cranes, vessel movements and vegetation clearing on Deas Island. Light trespass, defined as the effect of light that strays from its intended purpose onto neighbouring areas, and sky glow are predicted to increase, although all predicted levels remain within applicable criteria, with effects expected to be intermittent and localized.

During the Operations phase, permanent infrastructure including the Deas Slough Bridge, technical buildings and roadway modifications are expected to result in changes to the visual landscape at most viewpoints. Light trespass levels are expected to remain similar to existing conditions at most locations, with minor increases near the new highway alignment. All light levels will remain within applicable standards.

Proposed mitigation measures for built structures include reducing glare and contrast with the surrounding landscape and managing nighttime lighting. The restoration of natural ecosystems, wetlands and native riparian forests is expected to help blend Project elements into the surrounding landscape.



Residual cumulative effects on visual quality are expected to be consistent with the existing industrial character of the area. While the Construction and Closure phases may temporarily alter the landscape, these changes are expected to be short term. During Operations, permanent infrastructure may contribute to minor visual changes. A follow-up strategy is not proposed for the Visual Quality VC.



Infrastructure, Services and Transportation

Infrastructure, Services and Transportation refers to the physical and organizational structures that support communities and economic activities. These include transportation, housing and temporary housing, and utilities such as power, water and telecommunications. Infrastructure, Services and Transportation also encompasses essential public services like healthcare, emergency response, education and waste management.

The Project may affect Infrastructure, Services and Transportation by requiring modifications to flood protection infrastructure (e.g., dikes, stormwater basins), utility relocations and landfill use. The Project is expected to result in positive effects on transportation during the Operations phase, including increased road capacity, dedicated bus lanes and a MUP that is intended to enhance vehicle, public transit and active transportation access.

During Construction, the Project proposes to modify Richmond's flood protection infrastructure, utility relocations and landfill use. Temporary effects on transportation include potential delays on secondary roads, short-term disruptions to active transportation routes and interactions with the Canadian National Railway, although public transit routes are expected to remain largely unaffected. Emergency services and housing demand are expected to experience minimal effects due to the existing capacity of local resources.

During Operations, the new eight-lane ITT is expected to greatly improve vehicle capacity, reduce congestion and enhance travel times. Dedicated bus lanes are expected to improve transit speed and reliability, and a new MUP is expected to enhance pedestrian and cyclist connectivity. The Project is expected to have no long-term negative effects on rail transportation, emergency services or utilities, while transportation improvements will provide lasting regional benefits.

Proposed mitigation measures include a Traffic Management Plan to mitigate congestion and disruptions, a detour for the Millennium Trail to maintain active transportation access, and relocation of the existing George Massey Tunnel shuttle for cyclists stop to maintain uninterrupted service.

The Proponent acknowledges existing cumulative effects on vehicle traffic from overlapping construction activities, particularly on secondary roads near the Project site. Key contributors include the proposed BC Ferries Fleet Maintenance Unit Site Redevelopment Project and BC Hydro's proposed George Massey Tunnel Transmission Relocation Project, both of which could increase traffic congestion and temporary access restrictions. No additional mitigation is proposed beyond standard traffic management measures.





Archaeological and Heritage Resources

Archaeological and Heritage Resources refers to the physical and cultural landscape of the Project area, including palaeontological, archaeological and historical heritage resources. Ground disturbance during the Project's Construction and Closure phases could damage the integrity and context of paleontological, archaeological or historical sites, if present.

One known Historical Heritage Resource is located within the Project footprint; specifically, a heritage wreck (DgRs-114) that is protected under the *Heritage Conservation Act*. No other palaeontological, archaeological or historical heritage resources are known to occur in the assessment area. Mitigation measures for the known sites, including the heritage wreck, will be carried out through Project design measures, engineering controls, systematic data recovery and/or documentation by record. These mitigation measures are expected to be highly effective at avoidance. For protected sites on provincial or private lands, such as heritage wreck DgRs-114 within the Project footprint, engineering controls as a mitigation measure will be subject to Archaeology Branch review and will be conducted under an Alteration Permit pursuant to s. 12.4 of the *Heritage Conservation Act*.

Due to the inability to access areas within the Project footprint that were paved or previously developed during the archaeological assessment, small, low-density and/or isolated unknown archaeological resources may be present. Mitigation measures for as-yet unknown Archaeological and Heritage Resources include archaeological monitoring of ground-disturbing activities in areas that were not able to be fully assessed during the existing conditions program as well as implementing a chance find management protocol.

No negative residual or cumulative effects are expected for Archaeological and Heritage Resources.



Human Health

Potential effects of the Project on Human Health could result from changes in soil, surface water, fish tissue, vegetation tissue and air quality resulting from changes in criteria air contaminants and other contaminants of potential concern (COPC). A risk-based assessment approach focused on the physical determinants of health (e.g., the effects of chemicals on Human Health) was used to conduct the Human Health VC assessment.

In addition to mitigation measures identified for related VCs, the Proponent will implement a diesel particulate matter (DPM) monitoring plan that specifies Project-related thresholds and trigger values for DPM concentrations based on Health Canada air quality criteria/approach for DPM and a measure of local background DPM concentrations.

Based on evaluation of all pathways in the scoping stage of the risk assessment, a change in air quality was the only pathway identified for further quantitative evaluation of potential health effects with mitigation measures implemented. An inhalation human health risk assessment was conducted for this evaluation. The assessment identified a change in baseline conditions for



receptors from Project-related exposure to COPCs identified in air. Projected increases in air quality concentrations attributed to the Project were generally highest during the Construction phase. The exposure risk for all COPCs, except DPM, is considered negligible to low based on frequency and duration of identified exposures. While the exposure risk for DPM was considered moderate, additional DPM monitoring during Construction in areas near the Project is proposed.

Cumulative effects as a result of changes to air quality may occur in combination with the emissions of other nearby projects.



Community Health and Wellbeing

Community Health and Wellbeing refers to the overall physical, mental and social health of individuals and communities potentially affected by the Project. It encompasses factors such as the physical environment, built environment, community services, sustainable livelihoods and healthy lifestyles, all of which contribute to individual and collective health outcomes.

During the Construction and Closure phases, temporary negative residual effects are predicted from Project-related environmental disruptions, including noise and visual changes. Residents living near construction-related pile driving activities and regular users of Deas Island Regional Park may experience increased stress and annoyance. Additionally, the construction of new transportation routes may result in temporary disruptions for both vehicle and active transportation users, leading to increased stress and delays. These effects are predicted to be more pronounced for commuters and those with limited detour options. Minor and temporary disruptions to marine and land-based businesses are expected.

During the Operations phase, the Project is expected to have positive residual effects, decreasing stress and annoyance, and improving safety. The new ITT is predicted to reduce congestion and travel times for vehicle users. Active transportation users are also expected to benefit from the inclusion of a MUP, improving access for pedestrians and cyclists, which in turn supports better physical and mental health.

Mitigation measures and management plans have been proposed for the linked VCs to reduce effects that indirectly affect Community Health and Wellbeing such as minimizing potential effects of noise, mitigating potential effects on recreational marine users and ensuring access to key services and that reliability of key services is maintained to the extent possible.

Potential cumulative effects on vehicle transportation may arise if construction activities from other projects overlap with the Project Construction phase, particularly on secondary roads such as Rice Mill Road and River Road.

For recreational land use, a potential cumulative negative effect on community, health and wellbeing may arise if other projects affect recreational lands, such as Deas Island Regional Park and Iona Beach Regional Park.



Greenhouse Gas Emissions

One of the key objectives of the Project is to reduce traffic congestion; therefore, reducing greenhouse gas (GHG) emissions associated with traffic using Highway 99. Project-related GHG emissions are expected during the Construction, Closure and Operations phases, primarily from fossil fuel combustion in vehicles, equipment and marine vessels, as well as indirect emissions from electricity use.

The Project's annual GHG emissions are estimated to contribute less than 0.01% to Canada-wide emissions and 0.05% to British Columbia's emissions during Construction, making its impact on climate targets negligible. The Project is expected to contribute minimally to British Columbia's GHG reduction targets by 2050, with emissions during Operations projected to decrease by 4.5% compared to current conditions, due to improved traffic flow, increased vehicle speeds and a shift to electric vehicles.

Malfunctions and Accidents

The Proponent assessed potential malfunctions and accident scenarios that may occur in connection with the Project. Scenarios assessed include hazardous material spills, sediment and surface water management failures, marine and road transportation incidents, accidental damage to infrastructure, and fires during Operations. Specific risk mitigations, including prevention measures; contingency and emergency response measures; and communication, public notification and monitoring plans will be developed and are considered in the assessment.

The assessment concluded that no high or extreme risk scenarios are anticipated, with residual risks ranging from low to medium. While low to medium risks such as hydrocarbon spills, sediment failures and traffic incidents may occur during Construction and Operations, the Project's modern design standards significantly reduce the likelihood and severity of such events. For example, the ITT will feature modern fire and life safety systems, automated incident detection and emergency response capabilities. The risk assessment found that the Project will improve safety for road users compared to current conditions, reducing collision rates and enhancing emergency response.

Effects of the Environment on the Project

The assessment of the effects of the environment on the Project includes analysis of environmental factors that may have negative effects on infrastructure and public safety such as natural hazards, seismic events and tsunamis, fire, extreme weather events, and sediment/riverbed instability and liquefaction. Climate change projections, such as rising temperatures, increased precipitation and sea level rise, have been factored into the design to ensure long-term safety and reliability. The assessment identified low to medium residual risks for extreme weather, seismic events and flooding, with no significant risk from natural fires due to the urbanized Project location. The Project is expected to significantly improve safety and reduce risks compared to the Existing Tunnel, which does not meet current seismic and climate-resilient standards.



Key Effects on First Nations and their Rights

Key effects on Indigenous Interests predominantly occur within the Construction (Preparatory and Main) and Existing Tunnel Closure and Removal of Infrastructure phases of the Project. Negligible effects were determined for most Indigenous Interests during the Operations phase. The six key potential Project-related effects on Indigenous Interests – including some positive effects of the Project – that were identified in the environmental assessment are summarized here.

Potential Effect #1: Change to First Nation Harvesting and Subsistence Activities Interest

First Nations fish for a broad range of fish and aquatic species throughout the year as part of their harvesting and subsistence activities. Various types of culturally important plants are harvested for subsistence and medicinal use, as well as other cultural purposes. This includes plant species gathered from terrestrial settings, including forests, wetlands and riparian areas, and aquatic environments. First Nations hunt and trap within the LAA, including along the tributaries of the Fraser River. During the Construction and Closure phases, Project activities may change fishing activities, fishing areas and fish and aquatic resources; plant harvesting activities, plant harvesting areas and terrestrial and aquatic plant resources; and hunting activities, wildlife hunting areas and wildlife resources used for harvesting and subsistence activities. Project activities may also change the quality of experiences during harvesting and subsistence activities due to changes in sensory conditions (e.g., noise, dust, visual quality).

Potential Effect #2: Change to First Nation Lands and Resource Use for Cultural Purposes Interest

First Nations use the lands, waters and resources in their territories for many different tangible and intangible cultural purposes. This usage supports essential facets of their cultural heritage, including travel, harvesting food for subsistence needs, medicines and materials used in ceremonial and spiritual contexts, supporting cultural practices and exercising of rights in land- and water-based settings. Historical and archaeological sites are often important locations for cultural activity due to their role in affirming culture, language, history and identity. Project activities and physical works may cause changes to traditional lands, waters, species and resources important for cultural purposes (including tangible and intangible cultural heritage).

Potential Effect #3: Change to First Nation Cultural Continuity Interest

Cultural continuity is reaffirmed and developed through the continued current use of lands, waters, species and resources throughout traditional territories for intergenerational cultural transmission, culture and building cultural attachment and sense of place through access to cultural, sacred and heritage sites. Culturally important areas are important to the transmission of knowledge, cultural practices, values, beliefs and way of life to younger generations. Project activities and physical works may cause changes to access and quality of culturally important areas and sites and availability of species and resources required for cultural continuity.



Potential Effect #4: Change to Indigenous Health and Wellbeing Interest

Indigenous health and wellbeing is linked to the ability of members to use the lands, waters and resources for cultural purposes. Indigenous health and wellbeing is further supported by conducting harvesting activities and spiritual practices, using traditional travel ways and waterways, and intangible aspects of culture such as Knowledge transmission, language and peaceful enjoyment of culturally important lands and waters. Project activities and physical works may cause a change to areas, species and resources that are inseparably connected to Indigenous Health and Wellbeing.

Potential Effect #5: Change to Indigenous Governance Systems Interest

Indigenous governance systems (e.g., ongoing conservation efforts; stewardship approaches; and implementation of laws, customs and protocols) are inseparably connected with the lands, sites, areas, species and resources that First Nations holistically govern as part of their territories. Project activities and physical works may change lands, sites, areas, species and resources that are a critical part of and/or contribute to Indigenous governance systems.

Potential Effect #6: Change to First Nation Social and Economic Conditions Interest

First Nations use and have future aspirations for the lands, sites and areas which characterize their territory (including areas that overlap with the Project footprint and LAA) for social and economic purposes. Project activities and physical works may change First Nation economic benefits (wage and non-wage economy related). Project activities may also positively affect the availability of employment and contracting opportunities for First Nation-owned or affiliated businesses.

Mitigation Measures

Effects management approaches for Indigenous Interests include avoiding, reducing or mitigating potential negative effects and enhancing positive effects. Two types of measures to manage potential Project effects are proposed: 1) modification to Project design, and 2) mitigation and enhancement measures.

Project Design Measures

Proposed Project design and avoidance measures such as Project scheduling, design, construction and operational procedures and practices have the potential to help minimize negative effects and enhance positive effects on Indigenous Interests by reducing Project-related access, quality and availability-related effects. These measures, as relevant and in response to the assessment of Indigenous Interests, are described in First Nation-specific assessment sections.



Mitigation and Enhancement Measures

Two types of mitigation measures were identified to mitigate potential effects on Indigenous Interests. For positive effects on Indigenous Interests, an enhancement measure was also identified as captured below.

1. VC mitigation measures identified for linked VCs also work to mitigate and reduce potential Project effects on Indigenous Interests. These VC mitigation measures are integral to the overarching management of potential effects on Indigenous Interests. Applicable VC mitigation measures are described in each First Nation's section 11 assessment.
2. Two Indigenous Interest-specific mitigation measures are proposed to specifically mitigate potential Project effects on Indigenous Interests:
 - i. The Proponent will engage with applicable First Nations in developing and implementing the Construction Environmental Management Plan (CEMP) and corresponding Environmental Management Plans (EMP) based on the potential effects identified on their Indigenous Interests. Through this engagement and ongoing involvement, First Nations will have the opportunity to:
 - > Contribute IK and First Nation perspectives into plan development and implementation
 - > Identify which mitigation and monitoring programs they want to participate in and how
 - > Identify which adaptive management processes they want to be involved in and how they wish to be involved
 - > Specify their notification and reporting preferences
 - ii. The Proponent will develop a First Nation Construction Monitoring and Engagement Plan (the FN-CMEP) post-certificate through ongoing engagement with First Nations as applicable depending on the potential effects identified on their Indigenous Interests. The objectives of the FN-CMEP are to:
 - > Summarize First Nation-specific involvement in the CEMP: to establish a single reference point that summarizes First Nation involvement in CEMP/EMP implementation throughout Construction.
 - > Support ongoing engagement protocols and processes between the Proponent and First Nations: to define mechanisms that support ongoing consultation, engagement and communications between the Proponent and First Nations relevant to Indigenous Interests, respectively.
 - > Establish ongoing feedback mechanism: the FN-CMEP will provide a mechanism for ongoing First Nation-specific opportunities to identify IK that each First Nation would like to share and apply to track progress achieved and monitor positive and/or negative effects on Indigenous Interests.



An Indigenous Workforce Requirements Enhancement Measure is also proposed, to enhance positive effects on First Nations by creating employment or contracting opportunities for First Nation members and Indigenous-owned or affiliated businesses for First Nations whose Interests are potentially affected by the Project. Specific related requirements that the contractor will be responsible for implementing will be identified to help ensure that participating Indigenous Nations benefit from Project-related employment and contracting opportunities, including making reasonable efforts to provide contracting opportunities on an equitable basis to each participating Indigenous Nation for which qualified Indigenous workers have been identified.

Conclusion

This Application for an Environmental Assessment Certificate has been developed in accordance with the Process Order and Application Information Requirements. Following the review of this Application, the Proponent expects to finalize and submit the Revised Application as per feedback from the EAO, the TAC, First Nations and the public.

Engagement with First Nations, the public and government agencies has been integral to the assessment process. The Proponent's engagement approach aligns with the *Environmental Assessment Act* goal of supporting reconciliation and respecting Indigenous rights to self-determination and self-governance.

The Existing Tunnel has operated as a retrofitted counter-flow system for the past 40 years during peak periods, in effort to serve traffic demand that has far exceeded the original design volumes. Improvements to the crossing are required to alleviate congestion, improve travel times and reliability for drivers, enhance transit service, establish new active transportation connections and meet modern seismic performance standards.

The Project also represents a substantial investment in multi-modal transportation and supports provincial and regional transportation strategies, sustainability objectives and regional, provincial and national economic development. This investment is intended to address access and safety challenges, and improve transit and cycling connections within the Highway 99 corridor.

The VC assessments provide information on key potential effects, proposed mitigation measures and residual and cumulative effects identified through consideration of potential interactions between Project components and/or activities with each of the VCs. Management, monitoring and restoration and offsetting plans have been proposed and will be developed and implemented by the Proponent.

The Project's potential impacts primarily occur during Construction and they are expected to be short-term and reversible, affecting the natural environment and nearby communities only temporarily. Measures have been carefully planned to avoid, reduce or offset these potential effects. Once complete and during Operations, the Project will help future generations by easing traffic congestion and improving road safety. It will also enhance transit and cycling connections along Highway 99, offering safe, reliable and accessible transportation that supports Metro Vancouver's goals for sustainable growth.





highway99tunnel.ca
highway99tunnelprogram@gov.bc.ca

 **Highway 99
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