City of Pitt Meadows
OFFICE OF THE MAYOR

March 18, 2022 File: 16-8640-01/22

Jeff Edwards, Assistant Vice President Market Strategy & Demand Management
Canadian Pacific Railway (CP)
7550 Ogden Dale Road SE
Calgary, AB T2C 4X9
Sent via email: Jeff_Edwards@cpr.ca

Dear Mr. Edwards:

Re: CP Logistics Park: Vancouver – City of Pitt Meadows' Assessment of CP's Environmental Effects Evaluation and Select Technical Studies

The purpose of this letter is to provide the City of Pitt Meadows' (City) response to CP's Environmental Effects Evaluation (EEE), and select technical studies for the proposed CP Logistics Park: Vancouver project (Logistics Park, Proposed Project).

It is the City's view that the EEE contains numerous errors and omissions and does not provide a sufficient or suitable basis for CP to proceed with an application to the Canadian Transportation Agency (CTA). These errors and omissions include an inadequate and inaccurate identification of baseline and background conditions, impacts of the Proposed Project, and evaluation of many critical components, as well as a lack of clarity on how conclusions, recommendations, and minimal mitigation was determined. Neither the EEE nor the technical studies have adequately identified or mitigated the many significant impacts that the Logistics Park will have on the Pitt Meadows community.

It was the City's understanding that CP was seeking feedback in order to inform their assessments and better understand and mitigate the local issues and concerns of the community; however, the EEE and technical studies have not taken into account the City's previous feedback regarding CP's Comparative Site Evaluation (CSE) and draft Terms of Reference (TOR) documentation. This includes the concerns outlined in the City's February 16, 2021, June 18, 2021, and July 29, 2021 letters to CP. With this, the City continues to have serious concerns for the well-being and future of Pitt Meadows, and does not have confidence in CP's examination of this matter.

A brief and non-exhaustive list of key concerns within the EEE that the City has identified are below, with further detail of each, as well as additional concerns, outlined within Appendix A:

- CP has neither recognized nor adequately considered the impacts of the Proposed Project on the City's two unconstructed highways and future plans for the City's transportation network and associated truck routes. The Logistics Park site layout shows four road and rail crossings of City unconstructed highways, including three crossings of the City's future McTavish Connector. The McTavish Connector is a critical component of the City's future transportation network and will have significant benefit the City by providing a direct and safe connection between the Pitt River Bridge, Pitt Meadows Regional Airport, Golden Ears Business Park, and other areas within the southwest corner of the City. In CP's traffic assessment, there was no analysis of Proposed Project impacts to the future McTavish Connector, or for Kennedy Road west of the site. The McTavish Connector would be impacted by the proposed Logistics Park with respect to safety, traffic flow, levels of service, and other considerations. For these reasons, the impacts of the Proposed Project need to be identified and adequately mitigated;
- CP has not addressed the impacts associated with the considerable increase in heavy truck traffic (up to 746 average daily truck trips) that will occur during pre-construction (preloading), construction, and operation of the Proposed Project. CP's traffic assessment does not use the current traffic light timing plans for the already failing (LOS F) Kennedy Road/Lougheed Highway intersection and instead assumes that the timing will be optimized for the sole benefit of the Proposed Project. There is no basis for that conclusion and CP has not undertaken any sensitivity scenarios to understand the implications of the significant adverse changes it proposes to other traffic movements. In addition, CP's traffic assessment and recommendations aim to discourage active transportation instead of presenting solutions to improve the facilities for active users;
- The Proposed Project will place an unreasonable and unsupported burden on emergency services that arise from the storage, transloading and transportation of large quantities of dangerous goods. Pitt Meadows Fire and Rescue Services (PMFRS) is a volunteer based service that does not have the personnel, equipment, infrastructure, or specialized training to safely and adequately respond to the vast majority of emergency scenarios for the Logistics Park. Despite previous City feedback to CP's TOR and CSE on this subject, it appears that CP continues to minimize the extensive risk that will be created by the Proposed Project and proposes insufficient mitigation measures. It is the City's view that this will put Pitt Meadows residents, PMFRS staff/volunteers, CP employees, and various public and private property at extensive risk during an emergency scenario;
- CP has not adequately identified or addressed negative impacts of the Proposed Project with respect to noise and vibration. CP's noise and vibration assessment methodology is deficient and conflicts with certain recommendations contained within guidelines from the Canadian Transportation Agency and Health Canada. Examples of this include not monitoring and assessing low-frequency noise and tonal/impulsive sounds, as well as CP's incorrect usage and categorization of 'community type'. In addition, CP has not

completed a quantitative assessment of pre-construction and construction activities, despite the fact that construction works would occur within 6.5m of certain residences, and that quantitative pre-construction and construction assessments are typical for projects of this scale;

- CP has not adequately identified and addressed the impacts of the Proposed Project on the City's drainage systems including, but not limited to, Katzie Slough, Kennedy Pump Station and surrounding properties. CP states that "during the preload program, the groundwater level will tend to mound above the existing level, probably in the order of 1 to 2 m" and that "ground water levels…will likely stabilize at a higher elevation than current levels, and almost certainly higher than the current ground surface". Notwithstanding CP's admission that that the Proposed Project will result in significant ground water changes during all stages of the Proposed Project, CP has not assessed how this will impact the Katzie Slough, surrounding surface water bodies, properties and infrastructure, or proposed any mitigation to address these impacts. In addition, it is clear that there is a lack of understanding of how the existing drainage network functions, including the pump station, flood gates and associated water flows, and the factors that influence the network. This has resulted in incorrect identification of Proposed Project impacts that need to be corrected before mitigation measures can be proposed;
- CP has not adequately identified and addressed impacts of the Proposed Project associated with air quality and human health. CP's air quality modeling found the air quality impacts of Proposed Project operation emissions, plus background concentrations of total suspended particulates (TSP), $PM_{10}$, benzene, and $NO_2$ (i.e., Project-related air contaminants), could exceed applicable ambient air quality objectives off-site. In addition, the estimated cumulative off-site $PM_{2.5}$ levels would be just below the ambient air quality objectives. While this information on its own creates concern, it is also based on background concentrations from a monitoring station that is 1km up-wind from the site, resulting in understated impacts. Furthermore, the analysis did not consider pre-construction or construction emissions, or cumulative impacts associated with emissions from the projected doubling of mainline train traffic (from 28 to 56 freight trains per day) that will occur by the time the Proposed Project is operational;
- While CP is already the largest single private developer to permanently remove prime agricultural land from production in Pitt Meadows, it now proposes to remove an additional 41 hectares of prime agricultural land for the Proposed Project. This will have impacts and cumulative effects to agri-tourism, pollinator populations, food crop quality, agricultural land value, and agricultural producer and farm worker health;
- At least 10 critical documents, including studies for noise, vibration, air quality, human health, drainage, vegetation, fish, and wildlife have not been provided by CP, despite multiple requests from the City. CP should release these documents to be fully transparent, as well as, to provide much-needed context to the EEE and allow the City to be more thorough in the feedback provided. Contrary to CP's assertion that the EEE suffices as a standalone document, evaluation by City and its consultants have concluded that the EEE is fundamentally deficient and reliant on undisclosed information.

It is the City's conclusion that when considering the above, as well as Appendices B-F, that the EEE is so deficient that it is currently unreasonable to conclude that CP was able to accurately identify all impacts caused by the proposed Logistics Park and by extension, propose adequate mitigation to address these impacts.

Further, CP has not allocated sufficient or reasonable time for stakeholders, rightholders, and other interested parties to assess and respond to the EEE documentation (800 pages). On the basis of CP's stated intention to submit its application to the CTA shortly after the engagement, there is clearly no intention by CP to incorporate the feedback provided. The CTA outlines that CP has an obligation to conduct meaningful public engagement prior to their CTA application in order to receive and consider feedback, work collaboratively to address concerns raised, and to use the feedback received to inform their submission. In the City's view, CP has failed to do this. The proposed Logistics Park is a large and permanent change to the community and will create substantial adverse impacts. The lack of time or information to fully understand those impacts and to provide meaningful feedback is contrary to general engagement practices and CTA requirements. Prior to any submission to the CTA, CP should release all project documentation, consider and incorporate feedback received thus far, address the errors and omissions in the EEE and technical studies, and then conduct a meaningful public engagement process.

The City strongly requests that CP correct the extensive deficiencies within the EEE and provide the information and assessments that would reasonably be needed to understand the direct impacts of the Logistics Park on the Pitt Meadows community, including but not limited to:

- City drainage systems including Katzie Slough and Kennedy Pump Station;
- The future McTavish Connector;
- Emergency response resources and infrastructure;
- Noise & vibration;
- Local agriculture;
- Air quality and human health;
- Water quality, wildlife, fish, and vegetation.

Only then can adequate mitigation measures be proposed to address these impacts and suitable engagement occur.

In closing, while Pitt Meadows Council remains strongly opposed to the proposed Logistics Park, it is the City's intention to continue to provide good faith feedback to ensure that baseline conditions and Proposed Project impacts are fully understood, evaluated, and ultimately mitigated in the best interests of the community.

Yours Truly,

Mayor Bill Dingwall
*BGS, LL.B., CPHR*

Mark Roberts, Chief Administrative Officer
*CPA, AAT; CPA, CPM*

Encl: Appendix A – Detailed City Assessment of CP's Environmental Effects Evaluation
Appendix B – Air Quality and Human Health Third Party Review (Envirochem)
Appendix C – Noise and Vibration Third Party Review (RWDI)
Appendix D – Surface Water, Groundwater, Drainage, Fish and Fish Habitat, Vegetation and Wetlands, Wildlife Third Party Review (ISL Engineering)
Appendix E – Agricultural Use and Soil Third Party Review (McTavish Consultants)
Appendix F – Transportation Third Party Review (McElhanney)

Cc: City of Pitt Meadows Council
Chief Grace George, Katzie First Nation
Hon. Dominic LeBlanc, Minister of Intergovernmental Affairs, Infrastructure & Communities
Hon. Omar Alghabra, Minister of Transport
Hon. Steven Guilbeault, Minister of Environment and Climate Change
Hon. Joyce Murray, Minister of Fisheries, Oceans, and the Canadian Coast Guard
Hon. Marc Dalton, MP, Pitt Meadows/Maple Ridge
Hon. Lisa Beare, MLA, Pitt Meadows/Maple Ridge
Hon. Rob Fleming, BC Minister of Transportation and Infrastructure
Hon. George Heyman, BC Minister of Environment and Climate Change Strategy
France Pégeot, Chair and CEO, Canadian Transportation Agency
John Woodward, Senior Environmental Officer, Canadian Transportation Agency
Jennifer Dyson, Commission Chair, Agricultural Land Commission
Mike LoVecchio, Director, Indigenous Relations and Government Affairs, CP
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# Appendix A – Detailed City Assessment of CP's Environmental Effects Evaluation

As stated in the cover letter, it is the City of Pitt Meadows' (City) view that Canadian Pacific's (CP) Environmental Effects Evaluation (EEE) document and select studies for the proposed CP Logistics Park: Vancouver project (Logistics park, Proposed Project, LPV) contains many errors and omissions and does not provide a sufficient or suitable basis for CP to proceed with an application to the Canadian Transportation Agency.

It is the City's assessment that when considering the concerns outlined in this document and in Appendices B-F, that the EEE contains deficiencies of such a high volume and degree of magnitude that it is unreasonable to conclude that CP was able to accurately identify all significant impacts that will be caused by the proposed Logistics Park and by extension, propose adequate mitigation to address these impacts.

An initial overview of errors and omissions identified by the City is below. Note that this overview is not necessarily an all-inclusive list of the issues the City may have concern over. Instead, the intent of this overview is to allow CP to consider the City's feedback and concerns and to incorporate and address them in its ongoing technical assessments prior to its application to the Canadian Transportation Agency (CTA), as well as, in its future discussions with the City. A formal response adding clarity to a variety of items would also be helpful.

## EEE Section #16 / CP Valued Component #8 – Transportation

### City Third Party Review

Refer to Appendix F for the City's Transportation Third Party Review conducted by McElhanney, which further details the errors, omissions, and lack of clarity contained within this Section of the EEE.

### Project Impacts to the City's two unconstructed highways and McTavish Connector

As shown in Figures 1 & 2, the Proposed Project site layout shows four road and rail crossings of City unconstructed highways, including three crossings of the City's future McTavish Connector.

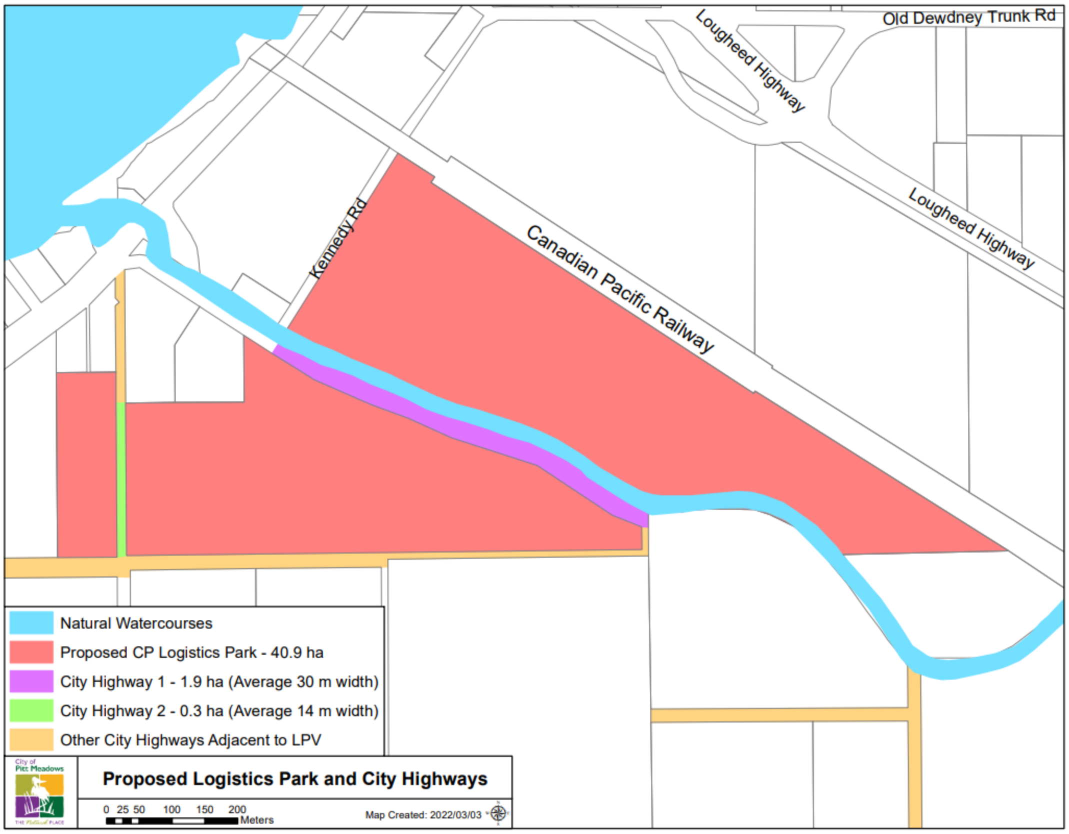


Figure 1 – City Unconstructed Highways

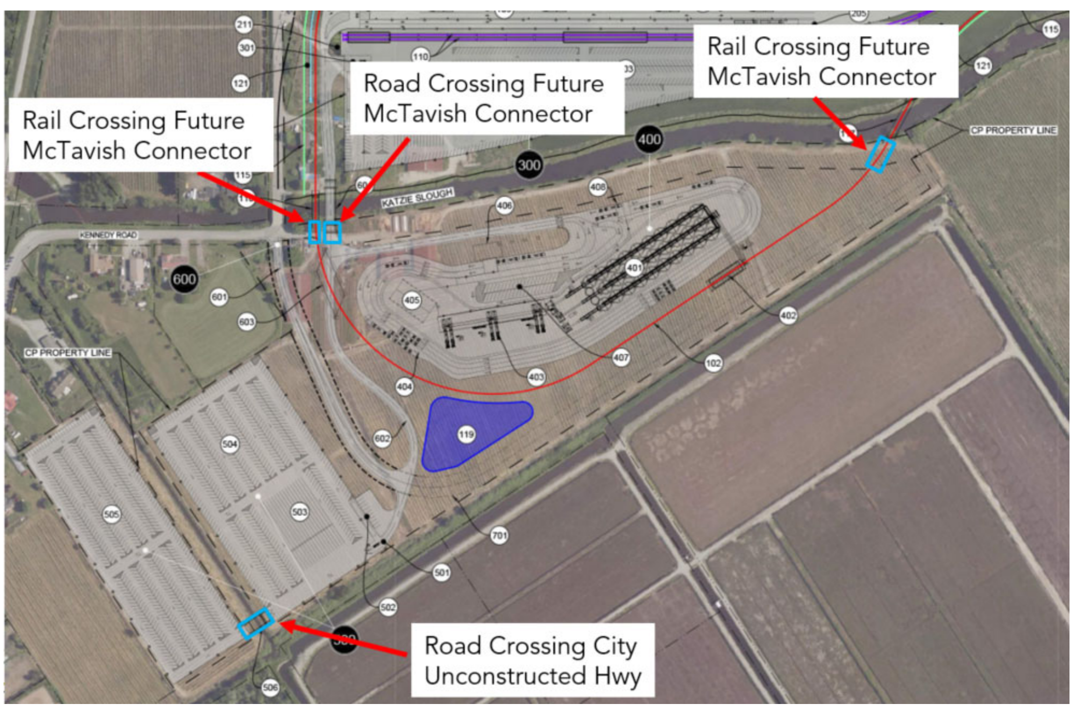


Figure 2 – CP Crossing City Unconstructed Highways, including McTavish Connector (CP, with City Edits)

Impacts to the City's unconstructed highways and transportation systems have not been identified or addressed. The route of McTavish Connector has simply been redrawn around the south side of CP's property, without any consideration of its impacts or functionality. It is also not clear if alternative routes/access points to the LPV site were assessed.

The McTavish Connector is a critical component of the City's future transportation network. It will have significant benefits to traffic flow and provide a much more direct and safe connection between the Pitt River Bridge, Pitt Meadows Regional Airport, Golden Ears Business Park, and other areas within the southwest corner of the City. It will also benefit the movements of goods regionally.

CP had an opportunity to identify, consider, and propose mitigation for LPV impacts to the City's unconstructed highways by including the McTavish Connector (both in it's current location and CP's proposed location), as well as Kennedy Road west of the LPV site (as Kennedy Road ties into either configuration of the McTavish Connector), in their Transportation Impact Study (Transportation Study). Instead, as shown below in Figure 3, this area was omitted from the Transportation Study. Without conducting any traffic analysis, it is unreasonable for CP to state that the impacts of the LPV to the City's unconstructed highways, including McTavish Connector, have been adequately identified or mitigated. Therefore, CP's assessment that "no significant Project-related residual or cumulative effects on transportation are expected" is incorrect.

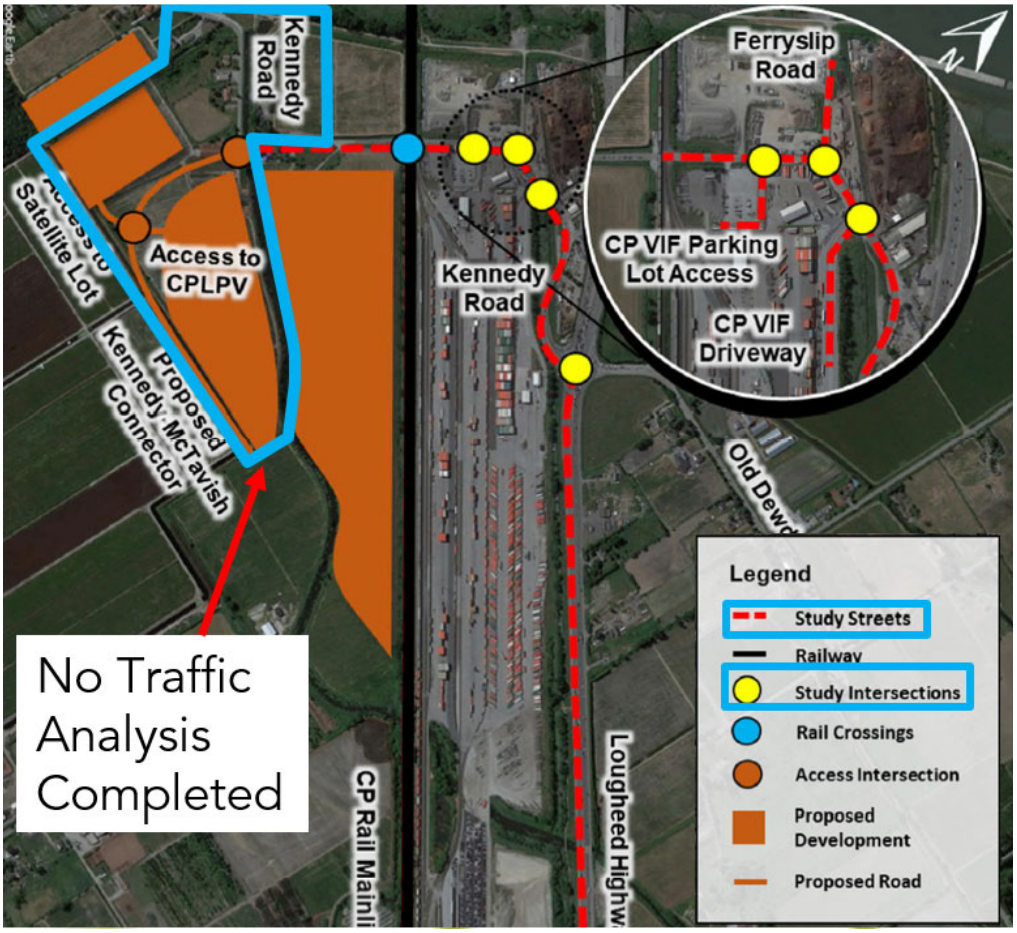


Figure 3 – Lack of Traffic Analysis in Vicinity of City's Unconstructed Highways (CP, with City Edits)

Assumption of Signal Timing at Kennedy Road / Lougheed Highway Intersection

CP conducted its Transportation Study assuming that the signal timing at the Kennedy Road / Lougheed Highway intersection would be optimized for its benefit, rather than using existing timings. To be conservative, CP's Transportation Study should have used current signal timing plans for their assessment, especially since CP's expected pre-construction works are expected to occur starting in 2023, and the pursuit to change signal timings at critical intersections is not typically a short term endeavor. Existing signal timings would have been obtainable from the Ministry of Transportation and Infrastructure (MOTI) had CP requested this information.

Furthermore, in CP assuming that there would be optimized signal timings for its sole benefit, the study failed to conduct any sensitivity scenarios to understand what the potential implications of these proposed timing changes could be to other traffic movements. The Kennedy Road/Lougheed Highway intersection is already failing (LOS F), and potential changes to the timing could have adverse impacts on other users.

Finally, even when assuming optimized signal timings, there were many Project impacts associated with the increased quantity of trucking which were not adequately mitigated.

<u>Discouraging Active Transportation and Placing Responsibility of Mitigation of Project Impacts on the City</u>

In CP's Transportation Study, it acknowledges that existing active transportation facilities in the vicinity of the Proposed Project includes a paved multi-use trail on Kennedy Road between Lougheed Highway and Ferryslip Road (including CP's VIF driveway), as well as, a neighborhood bikeway traveling south on Kennedy Road from Ferryslip Road.

CP also acknowledges that the LPV will cause adverse impacts to active transportation users, by stating that "the increased number of trucks may cause cyclist discomfort on Kennedy Road" and that the increased additional traffic "may pose a safety risk for cyclists who share the road with vehicles using the bike route".

Despite this, CP incorrectly and without justification seeks to place the responsibility of mitigating  LPV impacts onto the City by stating that "it is recommended that the City of Pitt Meadows review if Kennedy Road, south of Ferryslip Road, should be classified as a neighbourhood bikeway after the full build-out of the facility" and stating that the City should "ensure adequate illumination is provided, faded pavement markings are painted, upgrading the type of crossing treatment". CP should be required to accept responsibility, examine the issue, and propose appropriate mitigation measures for impacts of the LPV, rather than seeking to transfer responsibility on others.

CP's proposed solution is to discourage active transportation in the area. CP states throughout its Transportation Study that it will discourage its employees from using active transportation to and from work. Instead, CP should be assessing ways to improve overall safety.

Furthermore, with respect to the pedestrian and cycling midblock crossing on Kennedy Road between the CP VIF driveway and Ferryslip Road, CP states that "the increased number of trucks are not expected to trigger upgrades at the pedestrian and cycling midblock crossing". This assessment is flawed and likely incorrect, as the pedestrian/cyclist counts collected by CP were taken in November, which typically has a much lower volume than summer months. CP acknowledges this error in methodology by stating that "it should be noted that these volumes are likely underestimated since it was collected during the winter season", but fails to adequately address this error in any meaningful fashion.

Incorrect Assumptions and Variances in the Traffic Report

In conducting the Transportation Study, CP either ignored, overlooked, or didn't adequately pursue many critical pieces of source information, which detrimentally impacted its assessment. This results in an understatement of LPV impacts and identified mitigation measures. Examples include, but are not limited to:

- CP stated that traffic counts were not available for the intersections of Kennedy Road and Ferryslip Road and the CP VIF Parking lot:
    - Instead of conducting traffic counts to ensure accurate data input into the study, CP made assumptions based on an independent traffic report that was both outdated and conducted for another project;
- CP stated that traffic signal timing plans for the two signalized intersections in the study area were not provided by the City of Pitt Meadows:
    - The City did not receive a request to provide this information;
    - If CP had requested this information from the City, the City would have directed CP to MOTI; and
    - If CP had requested this information from MOTI, it likely would have received this information.
- CP stated that actual lane widths on various roads were unknown:
    - This could have been clarified by simply visiting the site and collecting measurements.
- CP stated that bus occupancy on Lougheed Highway was not available (and therefore associated impacts were ignored):
    - Bus schedules and other information are available on TransLink's website.

Compensating the City via Soil Removal and Fill Deposit Regulation Bylaw No 2593

Under Section 3 of the EEE, CP states that they "compl(y) with the spirit of provincial and municipal legislation" and in Section 8, CP states that it will "voluntarily adhere to the City of Pitt Meadows bylaws and engineering design standards". It is the City's assessment that this should include compliance with the City's Soil Removal and Fill Deposit Regulation No. 2593, 2013 (Soils Bylaw) and Extraordinary Traffic Regulation Bylaw No. 583 (Extraordinary Traffic Bylaw), if the Project was to proceed. As outlined in these bylaws, levies are paid to the City for soil import and export activities to cover repairs and aid in the cost of future repaving, collected at a rate of \$0.50/$m^3$.

In addition to language in the EEE, CP set a precedent by complying with similar City bylaws during the construction of VIF. Referencing CP's presentation to the City and select community members on October 20, 1999 during the *CPR Pitt Meadows Terminal*

*Community Meeting*, CP stated that it "paid a special road tax to the District…for gravel that was delivered to site during construction".

With respect to granular material required for the LPV site, the City anticipates that the volume of material required will be much more extensive than for VIF. When comparing recent topographic maps with preload drawings that CP provided, the City estimates that CP will need to import approximately 3,297,376m$^3$ of preload material. Note that this estimate excludes additional volumes required to replace topsoil that will be stripped, as well as, the toe of the preload slopes; therefore, the actual preload volume required is likely to be greater. Refer to Figure 4 below:

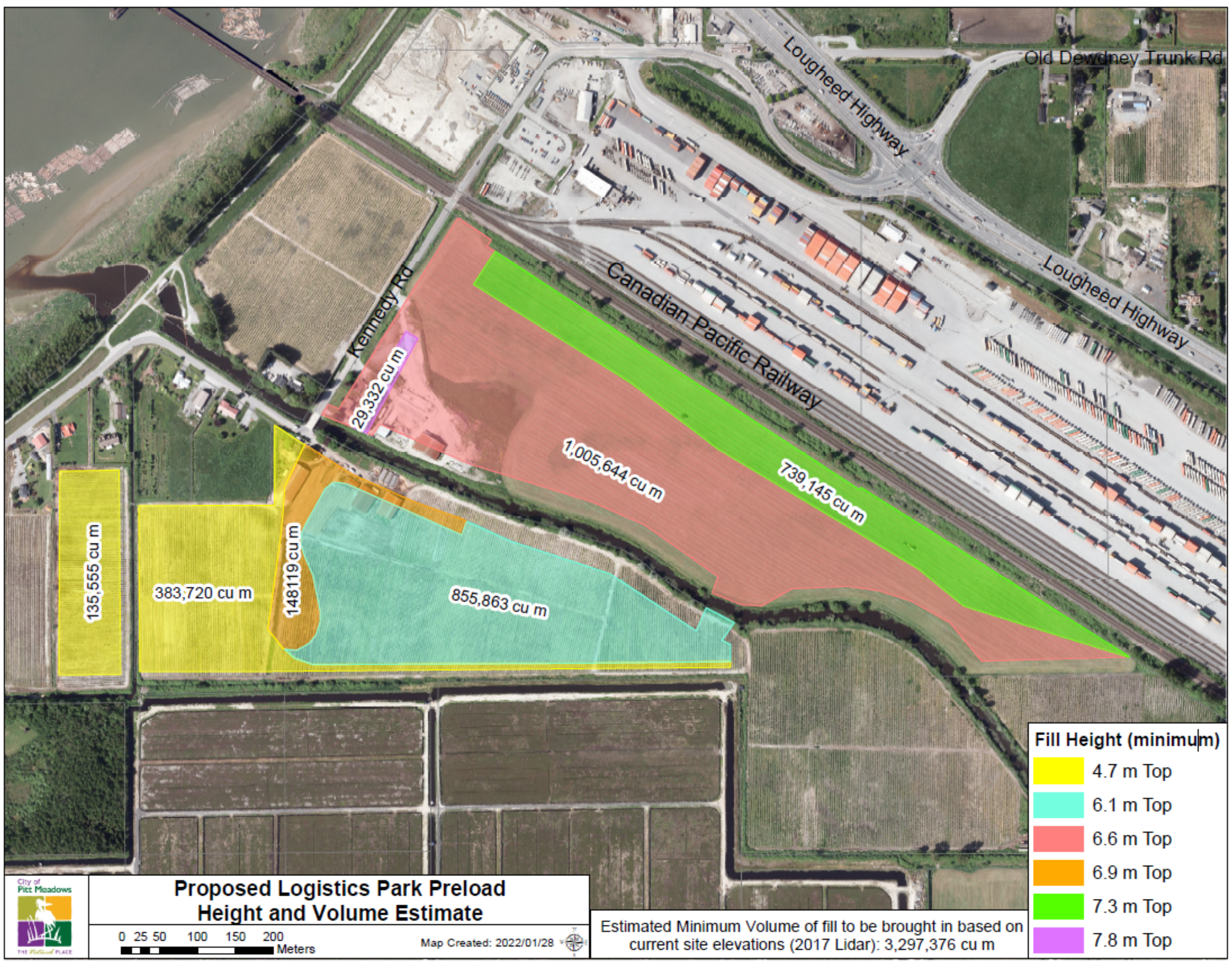


Figure 4 – Expected Preload Volumes for Logistics Park

When considering the imported preload material volume, by "voluntarily adher(ing) to the City of Pitt Meadows bylaws", including the Soils Bylaw and Extraordinary Traffic Bylaw, CP should be compensating the City roughly $1.65M upon delivery of the preload material to the LPV. Furthermore, this compensation value will increase when considering the many other soil import and export activities that will occur during the pre-construction and construction phases of the LPV:

- Topsoil that will be stripped and removed from site
- A certain quantity of preload that will be removed from site after settlement
- Various granulars materials that will be imported for various activities including, but not limited to:
  - Road/parking lot base and subbase;
  - Structure foundation base and subbase;
  - Piling and ground improvements activities;
  - Works near Katzie Slough (including where crossings are to be installed);
  - General site fill.

<u>Incorrect Assessment of Trips Generated during Pre-construction, Pre-construction Duration, or Both</u>

Section 4.1 of CP's Transportation Study states that preload will be imported via one of two options:

- Option 1: Importing 5000$m^3$ per day, using 272 trucks, assuming a 10 hour day and 6 day working week
- Option 2: Importing 7000$m^3$ per day, using 380 trucks, assuming a 14 hour day and a 7 day working week

As stated above, the City calculates that CP will require approximately 3,297,376$m^3$ of preload material during the pre-construction phases. This would mean that it would take CP roughly 110 weeks (2 years, 1.5 months) to import and place the preload for Option 1, or 68 weeks (1 year 3.5 months) for Option 2. In addition, Golder's Preliminary Geotechnical Design Report (Geotech Report) states that they are "assuming a preload period of 2.5 years".

Summing the duration of the above pre-construction activities results in a minimum duration of 3 years 9.5 months and a maximum 4 years 7.5 months, which is a much longer duration than CP's 3-year pre-construction schedule shown in Section 4 of the EEE. Note that this duration still excludes additional time will be required to complete other pre-construction activities, such as mobilization, vegetation removal, topsoil stripping, and preload removal, and site preparation.

Therefore, CP's EEE has a critical error as either:

- CP's pre-construction schedule as stated in Section 4 is incorrect, meaning that CP's evaluation of many VCs are incorrect. LPV pre-construction impacts will differ depending on schedule duration and pre-construction intensity;

- CP's pre-construction schedule as stated in Section 4 is correct, and CP is actively suppressing their pre-construction trucking volumes by extending the duration of the preloading activity over a longer period of time that will actually occur to make the results in its Transportation study appear more favorable.

Additional Transportation Considerations and Concerns

- In CP's Draft Project Description (DPD) dated December 2020, other fill import methods are mentioned in addition to trucking. This includes consideration of importing preload material by barge from the Pitt River and pumping or conveying it to site. The Transportation Study also references consideration of importing "50% of the preload material…utilizing hydraulic dredging". These alternate material import options are not referenced in the EEE and have been eliminated without justification. CP appears to have settled on trucking import material without evaluating the impacts of each import method to local and regional transportation, fish, surface water, and other valued components. As stated above, importing all preload material via truck will have substantial adverse affects to local roads and infrastructure. In addition, as outlined in Table 6, the City anticipates that 2.9M gallons of fuel will be burned importing preload material via truck, leading to GHG emissions that could have potentially been mitigated by implementing a more efficient material import option;
- CP has failed to disclose what (if any) discussions have occurred with MOTI regarding impacts that the LPV will have to the Lougheed Highway, namely the Kennedy Road intersection. Considering that CP did not consider MOTI's existing signal timing plans for their Transportation Study, the City assumes that discussions between MOTI and CP on this subject matter have been limited;
- CP states in its Transportation Study that "the timeline for the construction of the Kennedy Road Overpass is unclear" and yet states that "the Kennedy Road Overpass…(is) assumed to be completed prior to the implementation of the CPLPV". This is a significant assumption; the outcome/potential implementation of the Kennedy Road Overpass is not yet known and there has been no commitment by the City. Further sensitivity analysis should be conducted to identify traffic impacts in the scenario in which the Kennedy Road Overpass is not constructed;
- CP does not reasonably assess LPV impacts with respect to truck staging during the pre-construction, construction, and operation phases. Even with today's truck volumes and the operations of VIF, staging is observed along Kennedy Road. CP's Transportation Study fails to consider how truck staging on Kennedy Road will be

mitigated during the pre-construction, construction, and operation phases of the LPV;

- CP's predicted existing queue lengths at the rail crossing at Kennedy Road for a 15 minute rail event duration is much shorter than field data collected by Bunt & Associates (Bunt Study) in late 2019 for another project, as shown in Table 1 below. In addition, despite the introduction of additional traffic associated with the pre-construction and operational activities associated with the LPV, several of CP's future predicted queue lengths are still shorter than the field data collected by Bunt in late 2019. Therefore, both CP's evaluation of existing conditions as well as predicted future conditions are incorrect and should be adjusted:

Table 1 – Existing Kennedy Road Rail Crossing Queue Lengths – 15 Minute Duration

| Study | Northbound AM Peak | Southbound AM Peak | Northbound PM Peak | Southbound PM Peak |
|---|---|---|---|---|
| CP's Transportation Study, Existing Conditions[1] | 130m | 70m | 145m | 135m |
| CP's Transportation Study, 2025 – Growth & LPV Pre-Construction Traffic[1] | 180m | 155m | 185m | 175m |
| CP's Transportation Study, 2040 – Growth & LPV Operation Traffic[1] | 390m | 175m | 370m | 175m |
| Bunt Study, Existing Conditions (2019)[2] | 225m | 75m | 175m | 200m |

[1] 95th percentile queue lengths as identified in Figure 2-5, 5-6, and 7-9 of CP's Transportation Study

[2] Longest queue lengths as identified in Bunt & Associates Data Collection Study, November 1-7, 2019: Max Peak AM rail duration of 16:28, Max Peak PM rail duration of 15:45

## EEE Section #11 / CP Valued Component #3 – Surface Water, Groundwater, and Drainage

City Third Party Review

Refer to Appendix D for the City's Surface Water, Groundwater, Drainage, Fish and Fish Habitat, Vegetation and Wetlands, Wildlife Third Party Review conducted by ISL, which further details the errors, omissions, and lack of clarity contained within this Section of the EEE.

Failure to Evaluate Project Impacts Associated With Changes to Groundwater Levels Due to Site Fill

In CP's Stormwater Management Report, 60% Preload Design (Stormwater Preload Report), CP states that "during the preload program, the groundwater level will tend to mound above the existing level, probably in the order of 1 to 2 m" and that "ground water levels…will likely stabilize at a higher elevation than current levels, and almost certainly higher than the current ground surface". This is in general agreement with CP's Preliminary Geotechnical Design Report (Geotechnical Report), which states that "the possibility of perched water levels…should be noted" and that "it should be expected that there will be upward gradients… when the permanent grades are placed…".

CP's Geotechnical Report also states that "excavation for (LPV) structures is expected to extend below the groundwater table", which means dewatering will likely be required for the construction phase of the LPV. Dewatering can impact groundwater levels yet CP fails to specify a dewatering plan or assess how dewatering could affect groundwater levels.

Despite acknowledging that the Proposed Project will result in changes to groundwater levels in various ways, CP does not conduct an assessment on the impacts that the change in groundwater levels will have to the Katzie Slough, Kennedy Pump Station, surrounding surface water bodies, properties and other infrastructure. CP states in Section 11.3.2.3 that "water levels in the Katzie Slough appear to correlate with groundwater levels to a greater degree than rainfall events", meaning that this impact should be assessed and mitigation proposed.

Unsubstantiated Claims of Adequate Mitigation Measures

CP states that "mitigation measures to address potential effects include stormwater retention ponds and associated stormwater management system across the site" and that "with the application of mitigation measures, Project-related effects are anticipated to be fully mitigated". This claim is unsubstantiated, as no detailed calculations or analysis has been provided demonstrating that there is sufficient attenuation of runoff that would result in post-development rates being less than or equal to pre-development runoff. An error in the stormwater assessment and proposed mitigation could cause significant flooding to the surrounding low-lying properties and roadways, resulting in widespread damages, economic losses, and safety concerns. During the recent atmospheric river event that hit the Lower Mainland on November 13-15, 2021, there was widespread flooding on the Proposed Project site, as shown in Figures 5 and 6 below:

Figure 5 – Flooding at Proposed Project Site, November 15, 2021

Figure 6 – Flooding at Proposed Project Site, November 15, 2021

<u>Incorrect Understanding of Existing Conditions / Drainage Network</u>

CP states in Section 11.3.2.1 that "Katzie Slough is a closed system…", which is not accurate and represents a misunderstanding of the system. Based on the descriptions in the EEE, the function of the drainage network, pump station, flood gates and associated water flows are not well-understood; nor are the various factors that affect the network.

The Kennedy Pump Station only transfers water out of the system and the flood gates accommodate for water ingress and egress (freshwater exchange) at select periods and tides. The drainage network is required for flood management and works together with the City's 60km of dike to allow for use of the land with the floodplain. Based on the inadequate understanding of the City's drainage network, incorrect assumptions have been made in the EEE, leading to understated LPV impacts. For this reason, an accurate assessment of the proposed mitigation measures cannot be performed. Revisions are required to the EEE to address these deficiencies.

### EEE Section #9 / CP Valued Component #1 – Air Quality

City Third Party Review

Refer to Appendix B for the City's Air Quality and Human Health Third Party Review conducted by Envirochem, which further details the errors, omissions, and lack of clarity contained within this Section of the EEE.

General Errors, Omissions, Concerns and Feedback

The study/EEE does not provide an adequate or robust evaluation of Proposed Project-related air quality and greenhouse gas (GHG) impacts due to the following errors and omissions:

- Baseline air quality was established using data from monitoring stations located more than 1 km upwind from the site (based on average wind direction). This approach likely underestimates the contaminant levels for locations and sensitive receptors closer to the existing rail corridor and rail yard. As shown in the study's own dispersion analysis, relevant air contaminant levels are highest in close proximity to the Project site and disperse with distance from the source. Those living, working, going to school, and recreating close to the proposed LPV site (i.e., sensitive receptors) are most likely exposed to higher background/baseline levels than identified in this study;
- Estimates of future air quality impacts of the rail yard expansion underestimate the likely impacts because the study:
  - Used baseline values for criteria air contaminants that likely do not adequately represent actual conditions for sensitive receptors close to the rail corridor and rail yard, as discussed above;
  - Did not include emissions from the projected growth of mainline rail traffic, which is estimated to increase from 28 trains per day currently to 59 trains per day by 2030. Emissions from this traffic growth will result in substantially higher background levels than the values used in this study;

    - Did not include emission estimates for pre-construction and construction activities, which are expected to be substantial. Refer to 'EEE Section #24 – Contribution to Climate Change Reductions' for additional information;
    - Under-estimated locomotive emissions by assuming all locomotives will meet US EPA Tier 1+ emission standards when the EEE also identifies that only an unspecified portion of the fleet will actually meet this standard;
    - Appears to underestimate heavy truck emissions by using road speed limits (and, therefore, more efficient engine operation) to estimate emissions, rather than estimating emissions based on truck speeds that take into account: traffic volumes, local road network conditions, and proposed mitigation policies to operate at lower speeds;
    - Did not include air contaminant emission estimates for anticipated Project-related natural gas consumption;
    - Used default road silt load values for estimating road dust re-entrainment, despite contextual considerations suggesting a higher value may be appropriate;
    - Assumes the Project-related operational heavy truck traffic will only replace existing regional trips, rather than generate any new traffic or emissions. This is an absolute best-case scenario rather than a conservative approach to estimating emissions and air quality impacts.
- The study's methods were superficially described. No operational data, emission factors, or calculations used to produce the estimated emissions were included in the EEE. Without clear evidence presented, the findings lack supporting evidence and credibility;
- The study assumes as fact that Project-related heavy truck traffic will only replace existing heavy truck trips elsewhere in the region rather than contribute to traffic growth. This assumption is not supported by any analysis in any of the studies included in the EEE. All analysis of GHG emissions based on this assumption are, therefore, highly speculative and reporting the findings as based on qualitative analysis is misleading;
- The study does not clearly identify or discuss any limitations of its methods or findings. Only a few of the assumptions included discussion of limitations;
- Several key references are not cited or are unavailable for review, including, but not limited to:
    - Rail Simulation Study completed by Ausenco;
    - Dispersion Modeling Plan;
    - CP's emission factors and operational data used to calculate air emissions.
- The EEE uses subjective phrasing, rather than neutral language, throughout that diminishes potential or likely impacts while emphasizing any potential offsetting or net benefit, regardless of how small the offsetting or benefit actually is;

- The magnitude of the Project's impact on local air quality subjectively being described as 'minor' or 'low' despite applying best-case scenarios in the study's assumptions and under-estimating ambient air-contaminant levels and emission values. And, even with likely under-estimating the impacts, the findings still clearly represent a significant increase to local rail-source air contaminants, as shown in Table 2 below:

| Table 2 – Proposed Project Related Increases Over 2015 Metro Vancouver Estimate | | | | | | | |
|---|---|---|---|---|---|---|---|
| | TSP | DPM | PM10 | PM2.5 | NOX | SOX | GHG |
| EEE Table 9.7 Project totals (tonnes/year) | 21.4 | 0.58 | 6.0 | 1.7 | 29.4 | 0.02 | 2973 |
| EEE Table 9.7 Project Locomotive Emissions* (t/y) | 0.58 | 0.58 | 0.58 | 0.56 | 28.6 | 0.02 | 1988 |
| Metro Vancouver estimate of 2015 locomotive emissions in Pitt Meadows (t/y) | 0.9 | 0.9 | 0.7 | 0.6 | 21.4 | 0.0 | 1518.8 |
| Project-related locomotive emission increases over 2015* | 64% | 64% | 83% | 93% | 134% | - | 131% |

* Note: Project estimates do not include projected mainline train traffic increases.

Despite a high likelihood that Project air quality impacts are underestimated, the findings also identify several exceedances and near-exceedances of relevant air quality standards and health thresholds. This is concerning and adequate justification that the study's methods should be revisited and the assessment re-run in a transparent way (i.e., the methods and data made publicly available) to understand the true potential impacts of the Project.

Specific Errors, Omissions, Concerns, and Feedback

Section 9.2.2 Selection of Indicator Metrics

- The investigated commonly occurring criteria air contaminants (CACs) should include ground-level ozone ($O_3$) as this is a known by-product of engine emissions with known health impacts;
- In Table 9.1 relevant air quality criteria are presented as being "established to protect human health and the environment." For clarity, the EEE should acknowledge that the air quality criteria are not entirely health-based and that health and environment impacts can still occur when measured air quality remains below the relevant thresholds and standards.

Section 9.2.3.1 Spatial Boundaries

- The local evaluation area (LEA) is identified as a 10 km x 10 km area, but the study should acknowledge that air quality can vary significantly across the identified area and clarify how that was addressed in the methods;
- GHGs should have been analyzed for the LEA. Current GHG emissions should have been calculated for current rail operations and compared with future GHG emissions (including increases from projected mainline rail traffic plus those from the LPV);
- No reference was provided for provincial and federal guidelines to evaluating changes in GHG emissions;
- Metro Vancouver is not the smallest jurisdictional area for which there is GHG emission data. Metro Vancouver provides municipal-level GHG emission data.

Section 9.2.4 Regulatory and Policy Context

- In response to the statement "No directly relevant federal government legislation applies to the Project and its potential to affect air quality":
  - The Locomotive Emissions Regulation (https://laws-lois.justice.gc.ca/PDF/SOR-2017-121.pdf) and federal standards for rail and vehicle fuels do apply and should be included in Table 9.2. The MOU between Transport Canada and the Railway Association of Canada (https://tc.canada.ca/en/corporate-services/policies/memorandum-understanding-mou-between-transport-canada-railway-association-canada-reducing-locomotive-emissions) for member railways (including CP) to improve fuel efficiency and reduce emissions should also be included;
  - Under Section 3.2 of the EEE, CP states that they "compl(y) with the spirit of provincial and municipal legislation", therefore, Metro Vancouver's air quality management bylaws and permitting requirements should apply.

Section 9.2.4.1 Criteria Air Contaminants and Volatile Organic Compounds

- The Canadian Ambient Air Quality Standards (CAAQS) includes ground-level ozone ($O_3$), which should be included in the air quality study.

Section 9.2.4.2 Greenhouse Gases

- This section should include the federal Canadian Net-Zero Emissions Accountability Act which legislates GHG emissions to be 40-45% below 2005 levels by 2030 and net-zero by 2050.

Section 9.3 Existing Conditions

- Claims of relative air contaminant contributions to existing local air quality should be referenced and clearly discuss the relative air contaminant contribution of rail activity and operations in the area.

Section 9.3.1 Methods

- The approach used to characterize baseline ambient air quality should be explained;
- It appears only regional data was used to characterize the ambient air quality. Ambient air quality data should have been collected close to the Project site to establish a local air quality baseline. Data from regional monitoring stations will incorrectly characterize the ambient air quality for locations closer to the rail due to distance and prevailing wind patterns. The study, therefore, likely under-estimates ambient air contaminant concentrations for locations closer to the rail where concentrations are expected to be higher.

Section 9.3.2.2 Ambient Air Quality

- References should be included for factual statements about where contaminant concentrations tend to be highest;
- The assumption that the estimated baseline concentrations apply at all times of the year in all locations in the LEA (a 10 km x 10 km area) is overly simplistic for the purpose of reviewing the potential local impacts of the Project. Air quality changes through the year and across the 10 km x 10 km study area in response to weather patterns, locations of various sources, and air quality impacting events (e.g., wildfires). As the method for how the baseline concentration was identified is not explained, it is unclear how the presented values were developed or what they represent. The limitations of this assumption and the methods for identifying baseline values should have been discussed in the EEE.
- In Table 9.5 the baseline concentration value for $PM_{2.5}$ 24-hour period (12.2 µg/m3) exceeds the Health Canada two-hour exposure standard for diesel particulate matter (10 µg/m3) and the annual baseline concentration is equal to the Health Canada annual exposure standard (5 µg/m3). As diesel particulate matter generally consists of $PM_{2.5}$ (as per Health Canada), it seems reasonable to assume that any increase in diesel emissions in the LEA will result in further exceedances;
- DPM is not specifically monitored by the Metro Vancouver monitoring stations, therefore, CP should identify how DPM baseline concentrations were established.

Section 9.3.2.3 Greenhouse Gases

- The EEE notes regional GHG emissions are expected to hold steady; however, this is not consistent with regional, provincial, and federal policies and legislated requirements identified in Section 9.2.4. GHG reductions are needed in all sectors, including rail transportation, and this should be discussed in the EEE.

Section 9.4.1 Project Interactions

- Many project activities identified in Table 9.6 should include dust creation in the list of their potential effects;
- Construction of right-of-way noise mitigation feature will result in fugitive dust and will likely use both concrete and steel, which have indirect GHG emissions;
- Operation interactions should include emissions from heavy trucks.

Section 9.4.2.1 Project Pre-construction and Construction

- The analysis should have included a quantitative assessment of pre-construction and construction emissions. Estimates could have been made based on pre-construction and construction requirements of similar past projects and known information about this project (e.g., volume of top soil to be removed and preload/fill required);
- Claims that the magnitude of pre-construction and construction emissions can be considered minor are unsubstantiated and likely erroneous. Existing conditions for the site were not adequately established and the EEE identifies that the study team did not quantify the emissions; therefore, no comparative evidence was available to assess magnitude.
- The City estimates that approximately 3,297,376$m^3$ of preload volume will be required for the site. The trucking requirements for the import of estimated preload volumes results in at least 412,172 tandem truck loads (assuming 8$m^3$ per truck);
- The City has calculated that the import and placement of the preload material alone will burn approximately 5.16M US gallons of fuel, which amounts to approximately 53,564 tonnes of GHG emissions. Note that these values are strictly for the import and placement of the preload material only, and do not include any other aspect of pre-construction or construction activities. Refer to 'EEE Section #24 – Contribution to Climate Change Reductions' for additional information;
- Claiming minor magnitude by relying on emissions associated with other development projects applies a logical fallacy. Just because other projects produce emissions does not mean the magnitude of those emissions, or those of the Proposed Project, are minor.

9.4.2.2 Project Operation

- Manifest trains should be included in the emissions assessment, or "extended periods" should be defined and a clear rationale provided as to why this timeframe is inconsequential for the purpose of this study;
- "Container loading" should be defined. Does this include transfer to silos and then to containers, from train to containers, or both? These have different implications for fugitive dust emissions;

- The list of Air Emissions from Project Operations should clarify if "inbound and outbound trucks" includes the shuttling of containers to/from the VIF, fuel transport trucks, and car-carriers;
- A publicly available source for the emission factors used in the study should be identified. The study used emission factors sourced from personal communication and unreferenced reports;
- The methods and operational data used to generate the emissions estimate and the limitations of the approach used should be clearly explained;
- The assumption that all unit train locomotives meet US EPA Tier 1+ standards is unreasonable when CP should be able to provide information on what percentage of their fleet achieves this, both currently and in the future. Also, the same paragraph states that "a large portion of the locomotive fleet will meet the US EPA Tier 1+ emission standards". This clearly indicates that the assumption results in an under estimation of the locomotive emissions, yet these are still identified in the findings as the largest source of Project-related air contaminants;
- Rationale for not including vehicle traffic emissions on Lougheed Highway and beyond should be more clearly explained. The Project operation is understood to generate approximately 746 heavy truck trips, 108 private vehicle trips, plus other deliveries and services, every day. This additional traffic will have a significant impact on local traffic numbers (especially on Kennedy Road) and source of emissions;
- For estimating dust re-entrainment a default value was assumed, but the EEE notes several confounding factors related to the site and road use in the area. A more conservative approach would be to apply a weighted approach and adjust the default value to account for the confounding factors;
- Despite using a best case scenario and under-estimating background levels, exceedances of provincial air quality objectives were still identified in the EEE;
- For estimating fugitive VOCs from fuel handling it is assumed the fuel transport trucks will be bottom loaded. The EEE should clearly indicate if this is an industry standard that is always used by CP, or if this is a best practice that may or may not be applied;
- Emissions from natural gas consumption should have been estimated to avoid further under-estimating emissions from the Project;
- The study should have included the data used to calculate the estimated emissions and/or sample calculations to illustrate how they arrived at their findings;
- The emissions estimate in Table 9.7 is described as a "worst-case scenario"; however, most of the identified assumptions clearly under-estimated emission production, and pre-construction and construction emissions were not included in the study;

- The baseline data and emission estimate assumptions produce systemic faults with this study. As such, the findings presented in the "Change in Ambient CAC and VOC Concentrations" portion of the Air Quality study most likely under-estimate Project-related emission impacts;

9.4.2.3 Indirect Regional Effects

- The assumption that the project will consolidate commodity handling that occurs elsewhere in the region (i.e., will not generate any additional heavy truck traffic in the region) is misleadingly applied as a fact for the purpose of the analysis of regional impacts. This is an idealized best-case scenario and does not produce a conservative estimate of the Project's potential impacts;
- A Rail Simulation Study was cited as evidence for claims of a net reduction in locomotive fuel consumption; however, it was not fully explained or publicly available. Given the operational assumptions that were made for other aspects of the air quality study, it seems likely that the Rail Simulation Study would also be unable to provide accurate findings:
    - The estimated 0.2 M US gallon/year fuel consumption savings of the LPV operation will require 26 years to offset the fuel consumed by just importing and placing the preload needed for pre-construction.

9.4.3 Mitigation Measures

- Mitigation measures that should be added include:
    - Using electric switching engines;
    - Implementing long term air quality monitoring at locations no further from the site than the closest sensitive receptor; and,
    - Commitment to accelerating emission control retrofits to the entire CP locomotive fleet to meet US EPA Tier 3 or 4.
- Mitigation M9-1: Use Tier 2 or Higher Equipment identifies potential contractor equipment likely will meet higher emission standards, but should commit to requiring contractors to use Tier 2 or higher equipment;
- Mitigation M9-2: Use Ultra-Low Sulphur Diesel is not a true mitigation measure as it is already required under federal regulations and should have been incorporated in the emissions estimate;
- Mitigation M9-4: Apply Water to Reduce Dust requires more detail on watering frequency and definition of 'dry periods';
- Mitigation M9-6: Consider Use of High-Volume Fly Ash Concrete should identify where high-volume fly ash will be used and that fly ash can be used to replace up to 50% of total cementitious materials for certain uses;
- Mitigation M9-7: Implement Anti-Idling Policy should explain how this will be applied and enforced;

- Mitigation M9-8: Implement Vacuum Sweeping under-estimates street sweeping requirements for fill and construction sites, and fails to note the impact this will have on traffic flows. It is not the City's responsibility to conduct street sweeping on behalf of CP.

9.4.4.1 Criteria Air Contaminants and Volatile Organic Compounds

- The effects of Project Pre-Construction and Construction are identified as 'Low' magnitude and 'Not Significant'; however, no analysis of air quality impacts for these project phases were conducted. Emissions from pre-construction and construction activities will produce large volumes of air contaminants that will have health implications for community members, impacts on local agriculture and ecology, some of which will likely persist for many decades. The EEE cannot adequately rationalize that the magnitude is 'Low' and 'Not Significant' and should revise its findings accordingly;
- The air quality effects of pre-construction and construction are identified as 'Reversible'; however, the released air contaminants can trigger chronic health conditions which are not reversible;
- The methods used to assess the air quality impacts of the LPV operation appear to under-estimate emission levels – both baseline and those produced by the LPV. As such, claims of 'Moderate' magnitude and 'Not Significant' impacts are misinformed and the EEE should be revised accordingly;
- The EEE notes the impacts will be continuous for the life of the Project, but CP has not committed to a limited operational period, so it is ingenious to claim that the effects are 'Fully Reversible'. Unless CP specifies an operational lifespan for the LPV, the impacts will be permanent and the EEE should be revised accordingly. This would be consistent with other sections of the EEE that identified 'Permanent' effects.

9.4.4.2 Greenhouse Gases

- The magnitude of GHG emissions from the Project pre-construction and construction is rated as 'Low' and 'Not Significant'; however, no analysis was provided. Preliminary calculations, noted above, suggest these Project phases will generate significant GHG emissions. For completeness, analysis of GHG emissions should be completed and the EEE amended;
- The EEE notes that most GHGs "can persist for hundreds of years in the atmosphere", but rates their impact as 'Partially Reversible'. Since new GHG emissions from all of the project phases will contribute to permanent changes to global temperatures (and, therefore, changes to social, economic, and environmental systems), their impact is 'Permanent' and the EEE should be amended accordingly;

- As above, Project operation was rated as 'Low' magnitude and 'Not Significant'; however, the calculated Project GHG emissions represent a 131% increase over 2015 railway GHG emissions in Pitt Meadows. This is a 'High' magnitude and 'Significant' increase in local rail-source GHG emissions.

9.5 Cumulative Effects Evaluation

- The chosen list of projects is seemingly arbitrary and should include projected increases in mainline rail traffic for CP and other railway companies' operations and projects;
- Several of the projects discussed in Table 9.17 are identified as not interacting with the Project since they are located outside the LEA; however, all of these projects will cumulatively interact with GHG emissions produced by the Project and cumulatively impact regional air quality.

9.5.1 Cumulative Effects Evaluation for Criteria Air Contaminants and Volatile Organic Compounds

- This section misleadingly states as fact the assumption that Project-related heavy truck traffic will only replace existing heavy truck trips to other facilities, rather than generate new traffic, and should be revised.

9.5.1.2 Cumulative Effects Characterization and Significance

- This section should acknowledge the assumptions and limitations and discuss how they impact the reported findings. The analysis of cumulative impacts of emissions from Project-related road vehicles was based on an idealized, best-case scenario and assumptions, rather than a conservative scenario and assumptions. Also, the analysis used baseline data collected more than 700m from current rail operations and did not include projected mainline train traffic increases, which are significant gaps in the study.

9.5.2 Cumulative Characterization and Significance for GHGs

- Only regional data was used for comparison, which distorts the magnitude and impact assessment. Pitt Meadows level data should also have been used for comparison;
- The EEE should have considered that any increase in GHG emissions will contribute to permanent climate change impacts and the identified regional reductions are insufficient to meet legislated GHG emission reduction targets;
- This section also misleadingly states as fact the assumption that Project-related heavy truck traffic will only replace existing heavy truck trips to other facilities, rather than generate new traffic, and should be revised.

9.6 Monitoring

- The regional air quality monitoring station on Old Dewdney Trunk Road is approximately 1 km northeast from the closest point of the Project site, while there are sensitive receptor locations within 50m of the site's boundaries. As air contaminant concentrations generally decrease with distance, the existing air quality monitoring location is not sufficiently close to monitor air quality impacts. Further, the predominant wind direction is from the northeast so the air contaminants from the project are more likely to be blown away from the monitoring station, providing a distorted record of Project-related emission air quality impacts;
- The EEE states, "the Project is expected to meet all ambient air quality criteria at sensitive receptor locations"; however, the presented findings identified that exceedances are likely to occur at nearby sensitive receptors.

9.7 Conclusion

- Due to the points raised in this review, most of the conclusions identified in this section are deficient and not supported.

## EEE Section #10 / CP Valued Component #2 – Noise, Vibration, and Light

City Third Party Review

Refer to Appendix C for the City's Noise and Vibration Third Party Review conducted by RWDI, which further details the errors, omissions, and lack of clarity contained within this Section of the EEE.

Absence of a Quantitative Assessment for Construction Noise/Vibration

CP states that a quantitative assessment of potential noise effects for the LPV was not completed as "full information on construction equipment required, schedule of activities, and duration of use are not currently available" and that "assessment of noise effects during pre-construction and construction is done qualitatively". This conclusion is an immense error in judgement and a significant oversight; the pre-construction and construction works (such as piling, which is typically considered highly invasive) will occur as close as 6.5 meters to certain existing residences. This will have a substantial quantitative impact and require substantial mitigation. Figures 7 and 8 below provide a visual of the proximity of the construction work to existing residences:

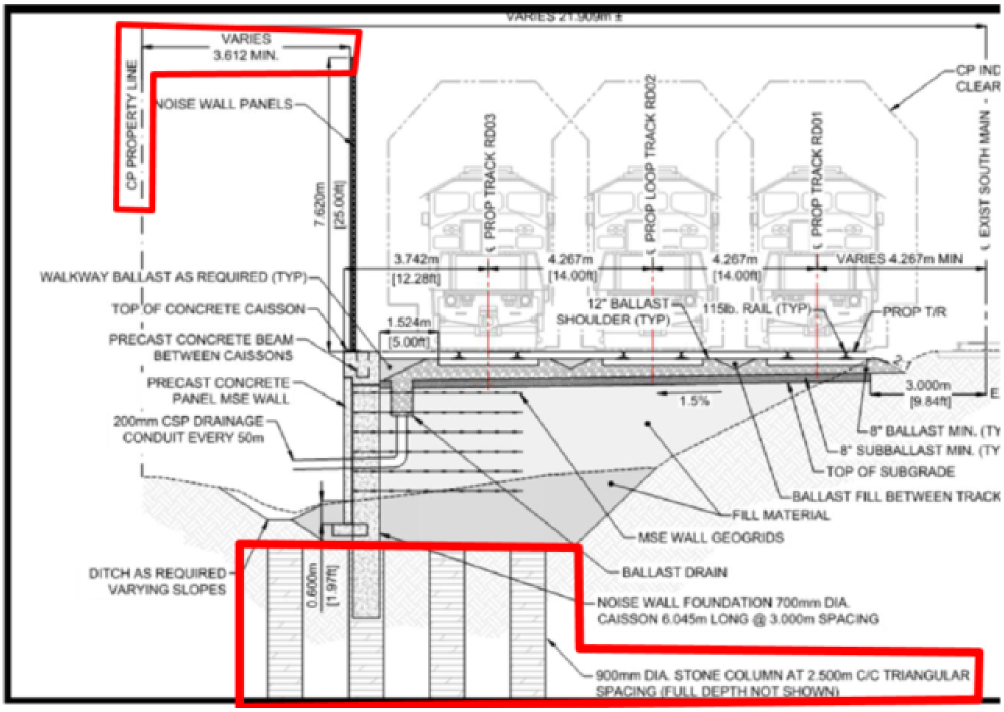


Figure 7 – Proximity of Construction Works (Including Piling) to Property Line (CP, with City Edits)

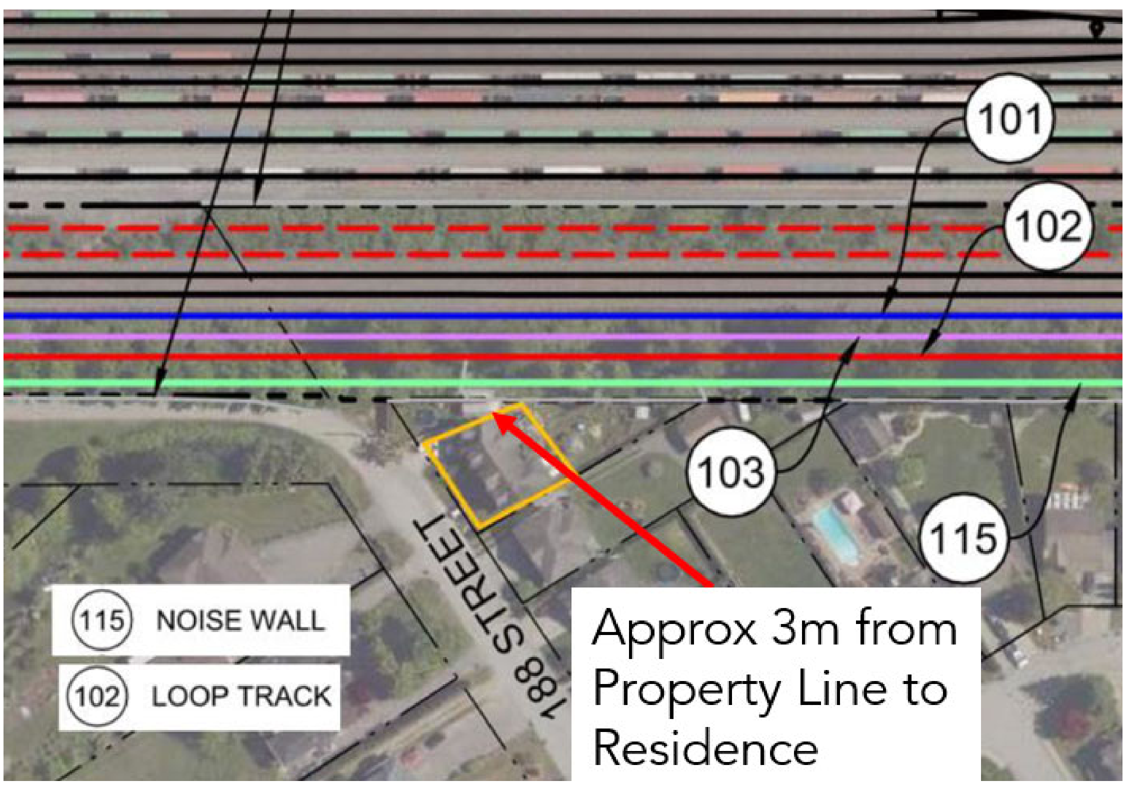


Figure 8 – Proximity of Construction Works to Existing Residences (CP, with City Edits)

Conducting quantitative pre-construction/construction noise and vibration assessments to determine the impacts and mitigation required is typical for projects of this scale. For example, CN's Milton Logistics Hub conducted a substantial construction impact assessment for both noise and vibration, considering both equipment and activities: (https://www.ceaa-acee.gc.ca/050/documents/p80100/104085E.pdf, https://www.ceaa-acee.gc.ca/050/documents/p80100/104077E.pdf).

Table 10.15 within Section 10.4.2.1 identifies the setback distances for vibration effects during Project Pre-Construction and Construction, including a setback distance of 19m for impact pile driving. CP states that "these setback distances are well within actual distances between Project activities and sensitive receptors; therefore, Project pre-construction and construction are not expected to result in any building damage." This statement is incorrect. As shown above, certain residences will only be approximately 6.5 meters away from piling activities, approximately 1/3 of the distance specified in Table 10.15.

Assessment's Apparent Contradiction to Certain CTA and Health Canada Guidelines

In Table 10.3, CP identified both the CTA's Railway Noise Measurement and Reporting Methodology (CTA 2011), as well as, Health Canada's (HC) Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise (Health Canada, 2017) as "Key Policies and Guidelines". However, CP's noise and vibration assessment appear to exclude and contradict several best practices identified in both documents. Examples include, but are not limited to:

- It appears that CP excluded tonal noise from their noise assessment. Per Section 2.2.2 of the CTA guidelines, tonal noise should be considered as part of a rail assessment;
- Low frequency noise should be considered as part of a rail assessment according to Section 2.2.2 of the CTA guidelines. The evaluation of low frequency noise was excluded from this Section, and was not monitored when CP collected data for existing conditions;
- CP used $L_{dn}$ to define community type, when the intent of the CTA guidance is to use community type to define potential ambient sound level when baseline monitoring hasn't occurred. In 10.3.2.1, CP identifies the area surrounding noise monitor N4 as "very noisy urban residential", despite the CTA and HC defining this classification as a major population center with a population density of 24,324 people per square kilometer. The entire population of Pitt Meadows doesn't exceed this value, therefore, this classification appears inappropriate.

Use of Vibration Data That Conflicts with Other Vibration Data Collected

CP collected baseline vibration monitoring only at one location near 13071 Kennedy Road, choosing instead to rely primarily on baseline vibration data collected by BKL for an independent project (BKL Study). Related to this independent project, the City procured RWDI to deploy vibration monitors and independently review and assess BKL's collected vibration data (RWDI Study). The outcome was that RWDI found much higher vibration values with respect to $RMS_{1s,\,max}$ compared to BKL, which is shown in Table 3 below:

| Table 3 – Select Vibration Data Collected by BKL and RWDI | | |
|---|---|---|
| Study | Monitor ID | $RMS_{1s,\,max}$ Z-axis, dB (re 1 nm/s) |
| BKL (2020)* | N4 & V4 | 105 |
| RWDI (2021)* | R3 | 115 |

*Refer to Table 5 of RWDI's Noise and Vibration Monitoring Summary (2021) for additional information
BKL Study: https://www.portvancouver.com/wp-content/uploads/2019/06/2020-09-04-Enviornmental-Noise-and-Vibration-Report-BKL-Pitt-Meadows-Road-and-Rail-Improvements-Project-1.pdf
RWDI Study: https://pub-pittmeadows.escribemeetings.com/filestream.ashx?DocumentId=673

Lack of Rationale For Mitigation, Lack of Information, and Failure to Consider Cumulative Effects

CP proposes three noise walls to "minimize Project operation noise effects", but fails to justify their rationale for excluding a noise wall on the North side of the Proposed Project near Harris Road to mitigate Proposed Project impacts for those residents. In addition, CP also fails to provide critical information on the proposed noise walls, including length, height, type (reflective vs absorptive), and other qualities. CP states that these details "will be confirmed during final engineering"; however, CP had to make certain assumptions regarding the noise wall properties to evaluate and justify the effectiveness of their proposed mitigation and this data should be provided. It is the City's assessment that when considering available information, the mitigation measures as proposed by CP will not be adequate to minimize Project impacts.

Within their Cumulative Effects Evaluation in Section 10.5, CP fails to consider the interaction between VIF, mainline tracks, Maersk Facility and the LPV. As identified by BKL's and RWDI's reports, the baseline conditions in the vicinity of VIF, Maersk Facility, the mainline tracks, and the LPV is considerably noisy due to rail and truck activity, and should be considered as part of the cumulative effects. Refer to Figure 9 below:

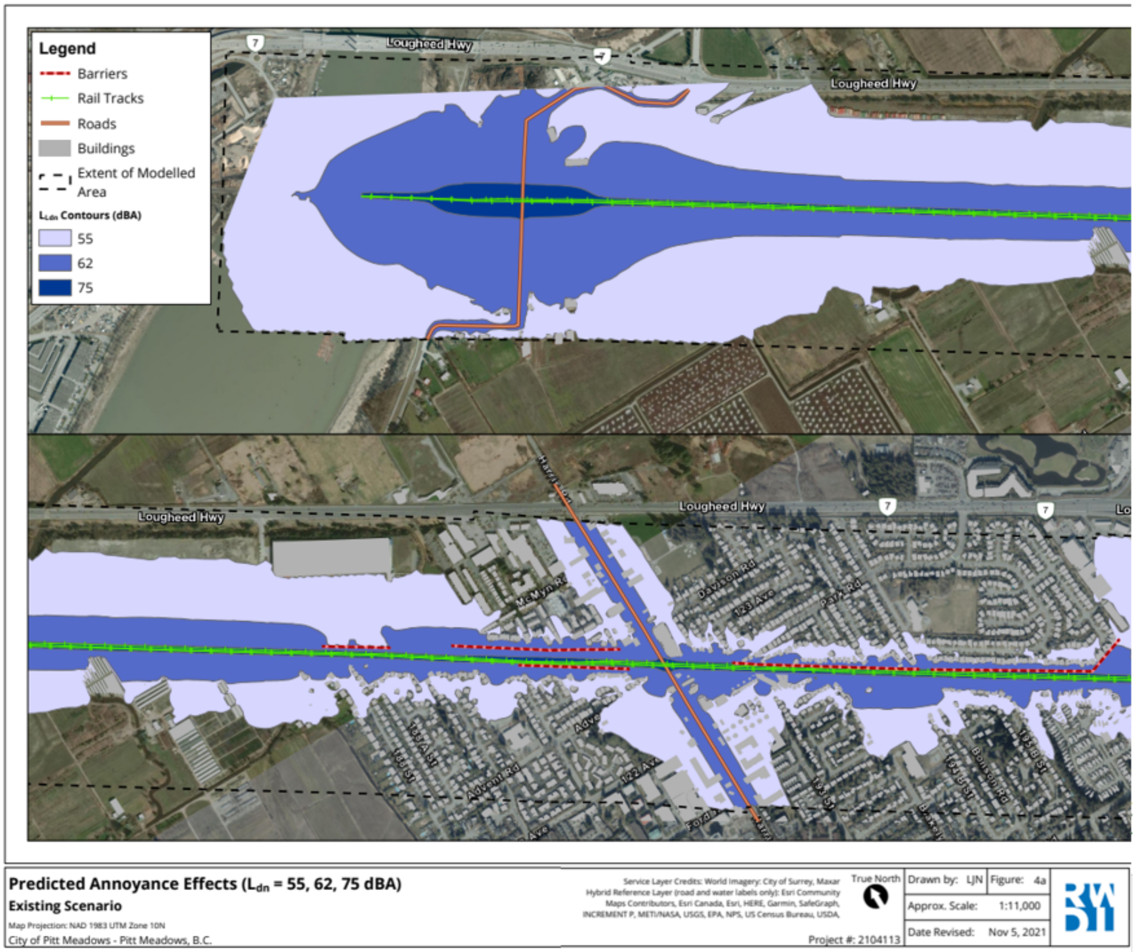


Figure 9 – Existing High Annoyance Day/Night ($L_{dn}$) Noise Levels within the Vicinity of the Proposed LPV (RWDI, with City Edits)

## EEE Section #22 – Accidents & Malfunctions

PMFRS General Errors, Omissions, Concerns and Feedback

Pitt Meadows Fire and Rescue Services is a department unique to the greater Vancouver area, in that it is a volunteer based department with minimal crews available during daytime hours (06:00-18:00). PMFRS does not have the personnel, equipment, infrastructure, or specialized training to safely and adequately respond to the vast majority of emergency scenarios for the Logistics Park. A Proposed Project of this size and associated storage and transportation of substantial quantities of dangerous goods via truck and rail has an emergency response requirement that far exceeds anything that PMFRS currently services in Pitt Meadows, or anticipates to service in the distant future, and would require significant changes to the organization. The City has previously provided feedback to CP's Terms of Reference and Comparative Site Evaluation on this subject; however, it appears that CP is continuing to minimize this extensive risk and proposing insufficient mitigation measures. CP's proposal of select training appears to demonstrate their lack of understanding with respect to the structure of the volunteer based PMFRS, the concerns of the City, and substantial project impacts. PMFRS has no resources to train. Not addressing these impacts directly caused by the Logistics Park will put Pitt Meadows residents, PMFRS staff/volunteers, CP employees, and various public and private property at extensive risk during an emergency scenario at the Logistics Park.

PMFRS has explored the possibility of developing automatic aid agreements with neighboring cities and current mutual aid in an attempt to partially mitigate certain impacts caused by the LPV. Initial feedback from various municipalities is that there is both a lack of ability to support such an agreement, as well as, a lack of interest in developing such an agreement.

Assessment Errors & Deficiencies

CP states that "in 2018, freight trains accounted for approximately 30% of all trains involved in rail accidents in Canada" and uses this data to justify their conclusion "given that train speeds are slow in the rail yards, it is not plausible that a derailment…could occur." This assessment is incorrect and incomplete, as it does not account for several different train types (and therefore train accidents) that are likely to be operational in the LPV, such as single cars/cut of cars and other train types, and therefore should be included in CP's 'likelihood of an accident or malfunction' assessment. Table 4 below summarizes certain components of Table 3 contained within the Transportation Safety Board's (TSB) Canada's Statistical Summary: Rail Transportation Occurrences in 2018 (https://www.bst-tsb.gc.ca/eng/stats/rail/2018/sser-ssro-2018.pdf).

Table 4 – Number of Trains Involved in Accidents by Train Type, 2018 (TSB, 2019)

| Train Type | 2018 Accidents | Percentage of 2018 Accidents | Operating in the LPV (City Assumption) |
|---|---|---|---|
| Freight Train | 388 | 30% | Yes |
| Passenger Train | 68 | 5% | No |
| Track Units | 81 | 6% | No |
| Single Car/Cut of Cars | 598 | 47% | Yes |
| Other train/rolling stock types | 153 | 12% | Yes |

CP also states that "the majority (60%) of freight train accidents were non-main-track derailments, which mainly involved only 1 rail car and are typically minor, occurring at speeds less than 10miles per hour (mph) or 16.1 kilometres per hour (km/h) (RAC 2019; TSB 2019)." Referring to TSB data, CP's statement appears incorrect and downplays potential accidents associated with the LPV.

Table 5 below summarizes components of Table 1 contained within TSB's Canada's Statistical Summary: Rail Transportation Occurrences in 2018.

| Table 5 – Quantity of Non-main-track Derailments and Cars, 2018 (TSB, 2019) | | |
|---|---|---|
| Accident | 2018 Derailments | Percentage of 2018 Derailments |
| Non-main-track derailments - 1-2 cars | 477 | 79% |
| Non-Main-Track Train Derailments - 3-5 cars | 100 | 17% |
| Non-Main-Track Train Derailments - 6+ cars | 23 | 4% |

Within this Section, CP states that the plausible worst-case scenario for the LPV would be the "entire loss of 1 railcar". As seen in Table 5, over 1 in 5 derailments along non-main-tracks in 2018 contained 3 or more cars, and an even higher percentage contained 2 or more cars. Therefore, CP's identification of a potential worst-case scenario is incorrect, as many derailments off the mainline track occur every year with greater than one car. Underestimating the worst-case scenario for a derailment, which CP has done in this Section, will result in insufficient identification of impacts and mitigation measures. It could also lead to potential risks to Pitt Meadows residents, PMFRS staff/volunteers, CP employees, and various public and private property in the future.

<u>PMFRS Feedback for LPV Pre-Construction and Construction Phases</u>

- A Construction Fire Safety Plan that is site specific will be required to comply with BC Fire Code Sections 2.8 and 5.6. The report will need to be extensive, detailed, and should be submitted for comments by PMFRS. Content of this report shall include, but is not limited to:
    - Site security;
    - Site access for emergency services;
    - Site access and staging of construction related traffic;
    - Temporary water access for fire mitigation;
    - Control of hazards;
    - Emergency procedures, contacts and site inspections.
- PMFRS has concerns regarding the potential for the large quantity of trucks and rail cars to block prompt site access at various locations;

- Section 18 (Utilities) speaks about increases to emergency services and community impacts potentials for site works. It does not address increased risks from rail & commercial truck impacts including staffing impacts related to traffic site access, egress of site, and local roadways.

PMFRS Feedback for LPV Operation Phase

PMFRS is responsible for safety of first responders, employees on site, residents of Pitt Meadows, protecting of property, infrastructure, and the environment. A thorough review of PMFRS capabilities and its limitations needs to be considered well in advance of all phases of the Proposed Project. Referencing Pitt Meadows Policy No. C038: Fire & Rescue – Service Level Establishment & Limitations (Policy C038) highlights the gaps between current capabilities and the risks identified throughout the EEE.

- For all itemized risk assessments within Section 22 of the EEE the PMFRS shall defer to Policy C038 item #4 (Fire & Rescue - Service Level Establishment & Limitations);
- PMFRS has concerns regarding the potential for the large quantity of trucks and rail cars to block prompt site access at various locations, as well as, the long and indirect route to the liquid transloading site. CP states under 18.4.3 that they will "construct a fire access road to facilitate firefighters' access to the Project site in an emergency", but fail to specify the location or any other detail of this road on their Facility General Arrangement Plan;
- Regular annual fire inspections of the LPV facility will be required;
- Regular annual fire inspections of staff and warehouse buildings will be required;
- 22.6 Containment failure and Spills:
    - Refer to Policy C038 for PMFRS response limitations.
- 22.6.1.2.3 Emergency Response Procedures (Hazardous Material Spill in Water – Diesel), 22.6.2.2.3 Emergency Response Procedures (Hazardous Material Spill on Land – Diesel), 22.6.3.2.3 Emergency Response Procedures (Hazardous Material Spill in Water – Ethanol), 22.6.4.2.3 Emergency Response Procedures (Hazardous Material Spill on Land – Ethanol), 22.6.5.2.3 Emergency Response Procedures (Sediment Release into Katzie Slough):
    - PMFRS operates at the hazardous materials awareness level as set out by NFPA 1072. Pitt Meadows Fire Rescue Services is not able to assist with any spills described in this section.
- 22.7 - Fire or Explosion:
    - PMFRS staff resource is limited, and the resources available for initial fire attack will be limited, which could contribute to fire growth or a delay in

suppression. On average a response to a fire incident would be staffed between 6-15 firefighters.

- 22.7.1 Hydrocarbon Fire & Explosions:
  - Refer to Policy C038 for PMFRS response limitations.
- 22.7.3 Grains storage Fire & Explosions:
  - Refer to COPM Policy C038 for PMFRS response limitations.

## EEE Section #19 / CP Valued Component #11 – Human Health

<u>City Third Party Review</u>

Refer to Appendix B for the City's Air Quality and Human Health Third Party Review conducted by Envirochem, which further details the errors, omissions, and lack of clarity contained within this Section of the EEE.

<u>General Errors, Omissions, Concerns and Feedback</u>

- The human health impacts study relies on the findings of several other sections of the EEE, which (as described in comments on those sections) contain errors, omissions, and gaps in their analysis and reporting. Therefore, the findings in the EEE suffers from systemic flaws and underestimates the human health risks of the LPV;
- The EEE did not provide enough information on the methods and data used, rationale for the assumptions and methods selection, or acknowledge study limitations;
- The EEE notes higher rates for asthma, chronic obstructive pulmonary disease, and heart failure in the local health area than the provincial average, which is notable since these are linked by Health Canada to diesel particulate matter exposure. It also notes that concentrations of airborne particulate matter are higher in Pitt Meadows than adjacent areas, "which is attributable to existing rail activity and equipment operation at the VIF." This supports a conclusion that existing health effects will be exacerbated by increased rail traffic and Project-related activities;
- Many residual effects identified in the EEE are considered to be minor provided mitigation and best management practices are implemented and maintained. The EEE should cite relevant references for best management practices to ensure a common understanding. Also, it should discuss accountability for implementation of mitigation measures and best management practices, including sharing monitoring reports with the City.

Specific Errors, Omissions, Concerns, and Feedback

19.1 Overview

- The EEE should acknowledges there will be residual human health effects during pre-construction and construction despite mitigation measures. Noise and vibration from pile-driving, traffic safety, and air quality impacts from equipment emissions will not be fully mitigated.

19.2.1 Selection as a Valued Component

- Traffic safety is missing from the potential health effects.

19.2.2 Selection of Indicators

- Table 19.1 is missing:
    - Human health effects due to increased traffic safety risks associated with construction and industrial traffic volumes;
    - Human health effects due to changes in the quality of commercial agricultural products;
    - Human health effects due to increased risk of fire, explosions, and hazardous contaminant spills;

19.2.4 Regulatory and Policy Context

- Table 19.3 lists federal guidance documents related to conducting human health impacts and correctly notes they provide "generic guidance." To provide evidence to support the claims in the EEE, it should also include descriptions of the actual methods used to conduct the human heath impact studies;
- Table 19.4 notes relevant international, First Nations, Provincial, Metro Vancouver, and City legislation, plans, policies, and guidelines, but does not articulate if, and how, these were considered for Project planning or the purposes of the study. Upon review, the Project appears to be inconsistent with the goals and objectives of many of the items included in Table 19.4.

19.3.1 Methods

- The EEE's methods, assumptions, and limitations are inadequately described and; therefore, the findings are not robust or well communicated;
- The health impacts study relies on the findings of several other sections of the EEE, which as described in comments on those sections, include concerning errors, omissions, and gaps in their analysis and reporting. As such, the findings reported in this section appear to suffer from systemic flaws and underestimate the human health risks of the Project.

19.3.2.1 Regional and Local Setting

- The list of recreational uses close to the Project should include:
    - Cycling on Kennedy Road;
    - Cottonwood Park and BMX track;
    - Pitt Meadows Gun Club.

19.3.2.2 Air Quality

- As noted in the comments for the air quality study (Section 9.0), the existing air contaminant levels close to the Project site and Project-related emissions appear to have been under-estimated. Despite this potential under-estimation, however, exceedances of air quality standards were predicted for off-site sensitive receptor locations. The study should be re-run to correct errors and omissions to provide a better analysis of air quality and human health impacts;

19.3.2.3 Ambient Noise and Vibration

- Refer to 'EEE Section #10 / CP Valued Component #2 – Noise, Vibration, and Light' for feedback from the City and Appendix C for feedback from RWDI.

19.3.2.5 Water Quality

- The EEE should provide a more detailed baseline description of water quality to provide a clear evaluation of potential health impacts.

19.4.1 Project Interactions

- Many of the human health effects associated with changes to quality of traditional foods would appear to apply to commercial agricultural products as well;
- Traffic safety is a missing potential effect associated with many of the Project activities listed in Table 19.10;
- Vegetation, soil stripping, excavation, granular fill placement and grading will generate air quality, noise, and vibration human health impacts;
- Construction of at-grade crossings and the railway tracks will likely also result in air quality, noise, and vibration human health impacts;
- Rail yard operations could result in human health impacts associated with impacts to traditional foods and commercial agriculture products;
- The above considerations have not been reviewed or addressed in the EEE.

19.4.2 Potential Effects

- The list of potential effects to human health should include discussion of traffic safety associated with the significant increase in local traffic during all Project phases;
- This section notes an HHRA framework was used to assess the potential changes in human health, but should also explain what this is, how it was applied, what

assumptions were made, and what the limitations are. Failing to include this additional information means the study results are unsupported;

- This human health impacts study relies on the findings of several other sections of the EEE, which as described in comments on those sections, include concerning errors, omissions, and gaps in their analysis and reporting. Therefore, the findings reported in this section appear to suffer from systemic flaws and underestimate the human health risks of the Project:
  - As noted in the comments for the air quality study, the scenarios and assumptions largely applied a best-case approach for the baseline and Project emissions estimates. If uncertainties were identified and conservative assumptions were made in calculating the potential air quality health risks, then they should be explained to provide evidence that this was done;
  - The noise and vibration subsection also claims major uncertainties were identified and conservative assumptions were made when evaluating human health impacts. If so, these should also be described in the EEE to avoid misleading the reader.

19.4.2.1 Human Health Effects from Changes to Air Quality

- The EEE cites undefined previous experience and unreferenced best management practices as evidence that pre-construction and construction air emissions will not cause adverse human health effects. These are not reasonable foundations for assessing health risk. The major components of the pre-construction and construction activities are reasonably established in the available information, so it is feasible to generate emission estimates and quantify the air quality human health risk for these Project phases:
  - Based on a preliminary review of available information, as noted in the comments on the air quality section, the pre-construction and construction phases will generate significant air contamination. This should be included in the EEE's evaluation.
- Without sufficient information on the methods, assumptions, data, and limitations of the air dispersion modelling assessment, the reported HHRA findings lack evidence and support. Further, the baseline air quality data and emissions estimates appear to underestimate the actual air contaminant concentrations (as noted in the comments on the air quality study), creating a systemic error that affects the dispersion modelling and HHRA results;
- As diesel particulate matter (DPM) is 90% PM2.5 (Health Canada 2016), the more stringent DPM acute inhalation exposure limit (10 µg/m3) should apply to both in Table 19.11;
- DPM is carcinogenic (Health Canada 2016), this should be reported in Table 19.12 and Table 19.13;

- The EEE claims it used conservative assumptions regarding exposure and toxicity; however, it should define 'conservative' and provide data on the exposure and toxicity values, plus demonstrate how the risk values were calculated.

19.4.2.2. Human Health Effects from Project-related Noise and Vibration

- The EEE should consider the change in noise impacts as the site is filled and equipment noise during all Project phases is less constrained by topography and vegetation;
- The EEE claims impacts to recreational and traditional use activities will be minor; however, the noise could deter recreational and traditional users from accessing in the area and participating in that activity. This negatively impacts the health and well-being of the users and the amenity value of the locations and/or facilities;
- The EEE should provide more detail on anticipated pile driving scheduling as simultaneous versus protracted pile driving activities will have different implications for understanding its effects;
- The EEE should clarify if baseline vibration levels included projected mainline train activity increases;
- A quantitative assessment of lighting impacts could have been completed by using a scenario where lighting standards similar to those used in the VIF were installed on the Project site.

19.4.2.4 Human Health Risk from Changes to Water Quality

- Equipment leaks and contaminant spills are identified as the primary Project activity that could contaminate water; however, contaminants and sediment carried by storm water run-off into surrounding watercourses are also key water quality concerns:
    - This could affect both traditional foods and commercial agricultural crops.

19.4.2.5 Human Health Risks from Changes to Quality of Traditional Foods

- The EEE diminishes the off-site impacts the Project (in all phases) will have on the vegetation and wildlife populations in the area. Drainage, flow, and water quality changes can adversely impact riparian vegetation (including traditional foods) and habitat areas, plus sensory disturbance will have further impact on local wildlife populations:
    - The EEE claims that wildlife can simply shift to other, similar habitat nearby; however, to support that claim, the wildlife study (Section 14.0) should have assessed habitat availability, quality and population densities off-site.

19.4.3 Mitigation Measures

- The mitigation measures should include consideration of traffic safety and more aggressive measures to mitigate air quality impacts.

- The EEE should clarify if the City and/or any other government or agency will receive a copy of the Construction Environmental Management Plan (CEMP) and Erosion and Sediment Control (ESC) Plan for review and comment. Also, the EEE should clarify if the CEMP and ESC will be included as a condition of any of the required permits;
- Mitigation M19-1 should clarify if a full list of scheduling considerations and timeframes will be available for public review. Some related EEE sections appear to have over-simplified scheduling considerations (e.g., agriculture and wildlife) indicating external review would be appropriate to mitigate impacts;
- Mitigation M19-2 should provide more detail on proposed communication protocols;
- Mitigation M8-8 should include commitments to construct the noise walls as early in the construction period as possible to mitigate construction noise disturbance;
- Mitigation M15-2 should include on-site air quality monitoring during Project operation as well. The regional air quality monitoring station is 1km away and generally upwind (based on average weather patterns); therefore, it is not suitable for monitoring the operational air quality impacts and mitigation measures;
- Mitigation M19-3 should define 'dry periods' to ensure a common understanding;
- Mitigation M19-4 should acknowledge that vehicles and equipment traveling at slow speeds produce more emissions and worsen air quality;
- Consider using earthworks during fill and construction activities to help buffer machinery noise;
- Mitigation M11-1 should define 'minimum extent required' for vegetation and soil disturbance;
- Mitigation M11-2 should include fully retaining untreated and turbid storm water on-site in the list of robust erosion and sediment control practices.

19.4.3.1 Summary of Effects to be Carried Forward

- Many residual effects identified in the EEE are considered to be minor provided mitigation and best management practices are implemented and maintained. The EEE should cite relevant references for best management practices to ensure a common understanding. Also, it should discuss accountability for implementation of mitigation measures and best management practices, including sharing monitoring reports with the City;
- The EEE should acknowledge there will be residual air quality impacts due to air contaminant emissions from Project pre-construction and construction. Even if Tier 2 construction equipment is used, there will still be significant volumes of emissions produced;
- The EEE should acknowledge that there will be residual impacts of pre-construction and construction noise and vibration. Noise and vibration will pass

the site's boundaries and, even with advance notification, it will cause stress and disturbance to surrounding community members.

19.4.4.1 Human Health Effects Associated with Project-Related Changes to Air Quality

- The human health impacts study relies on the findings of the air quality study (Section 9.0) which contains errors, omissions, and gaps in the analysis and reporting. The findings reported, therefore, appear to suffer from systemic flaws and underestimate the human health risks of the Project:
    - Despite likely underestimating the Project's air quality human health risk, exceedances of health thresholds were still noted. The study should be re-run with better data and methods to present a more robust analysis.
- The EEE suggests the potential effects to human health will decrease over time due to improved federal legislation improving non-rail emissions; however, it fails to and should consider the net implications of mainline train volume increases;
- The EEE incorrectly concludes the magnitude of the air quality human health impacts is 'Low,' when the EEE's own findings align with the definition of 'Moderate' – "Change in human health is detectable and results in moderate modification from existing conditions." Even with likely underestimating the baseline and Project-related contaminants, there was a detectable risk of increased cancer and other health effects. The EEE's phrasing attempts to diminish these findings and the potential health risk;
- The EEE misleadingly claims the health effects will be 'Fully Reversible' once the Project operation ceases. CP has not committed to a pre-determined Project operation lifespan, so it is unreasonable to assume Project operation will cease. Further, it is unreasonable to claim all the health outcomes associated with air quality issues (e.g., cancer, asthma, heart disease) are fully reversible.

19.4.4.2 Human Health Effects Associated with Project-related Changes to Noise and Vibration

- Refer to 'EEE Section #10 / CP Valued Component #2 – Noise, Vibration, and Light' for feedback from the City and Appendix C for feedback from RWDI;
- The EEE misleadingly claims the health effects will be 'Fully Reversible' once the Project operation ceases. CP has not committed to a pre-determined Project operation lifespan, so it is unreasonable to assume Project operation will cease.

19.5 Cumulative Effects Evaluation

- Most of the projects listed in Table 19.25 will affect regional air quality and will, therefore, interact with the Project.
- The siding and lead tracks listed in Table 19.25 will cumulatively impact light levels and, therefore, will interact with the Project.

- The EEE claims the North Lougheed Area Plan and North Lougheed Connector will interact with noise and vibration, and light level human health impacts from the Logistics Park project. These proposed projects are approximately 2 km and more from the Project site, and separated by Lougheed Highway and the VIF. The EEE should clarify how these projects would interact with the human health impacts of the Logistics Park project.
- While many of the projects listed in Table 19.25 are intended to improve local and regional road network efficiencies, as suggested, the EEE should clarify the emissions produced by the Project's construction and operation will reduce the overall cumulative net benefits for air quality and human health.
- Table 19.25 should include the projected mainline train traffic increases since these are a foreseeable and significant source of air contaminants, noise, and vibration impacts on human health that should have been accounted for in the baseline estimates of all relevant studies.

19.6 Monitoring

- As noted in the comments on the air quality study (Section 9.0), the Metro Vancouver air quality monitoring station on Old Dewdney Trunk Road is approximately 1 km from the Project site and generally upwind (when considering prevailing weather patterns). As air contaminants disperse with distance from the source and are affected by weather patterns, the EEE should recognize that the Metro Vancouver monitoring station will be of marginal use to monitoring the air quality and related human health impacts of Project-related emissions.
- The EEE should provide more detail on the proposed complaint management process and how that will be used to monitor changes in human health related to Project impacts.

## EEE Section #15 / CP Valued Component #7 – Agricultural Use & Soils

City Third Party Review

Refer to Appendix E for the City's Agricultural Use and Soil Third Party Review conducted by McTavish Consultants, which further details the errors, omissions, and lack of clarity contained within this Section of the EEE.

General Errors, Omissions, Concerns and Feedback

- The EEE should acknowledge that VIF, VAC, and the Maersk Facility (74.4 Ha) were all built on agricultural land, in addition to the 41 Ha of prime agricultural land that CP is proposing to consume for the LPV. This has cumulative impacts on agricultural goods and service providers, plus agricultural jobs;

- The EEE acknowledges that 41 ha of prime agricultural land will be permanently lost and the Project will have off-site impacts on the agricultural productivity and health of farm workers in the surrounding area. This indicates the Proposed Project is incompatible with its physical, economic, and social context including permanent negative impacts on local agriculture;
- The EEE claims that "planning has been informed by provincial and local agricultural policies and guidelines…as well as industry best practice undertaken by similar projects in the ALR" (Section 15.2.4). The EEE should discuss how the Project has been informed by relevant policies and guidelines since the Project appears to be entirely inconsistent with and contrary to the referenced policies and guidelines;
- Project-related studies have not provided a reasonable assessment of why the project must be built on ALR land;
- For completeness, the study should be revised to include analysis of Project-related:
    - Agri-tourism impacts;
    - Pollinator populations impacts;
    - Food crop quality impacts;
    - Agricultural land value impacts;
    - Impacts on agricultural capability of surrounding agricultural lands due to drainage impacts;
    - Potential uptake of salvaged top-soil and its likely agricultural capability impacts;
    - Weed and pest introduction potential in all Project phases; and,
    - Agricultural producer and farm worker health impacts.
- CP considers many residual effects identified in the EEE to be minor provided mitigation and best management practices are implemented and maintained. The EEE should cite relevant references for best management practices to ensure a common understanding. Also, the EEE should discuss accountability for implementation of mitigation measures and best management practices, including sharing monitoring reports with the City;
- The EEE cites information that is not publicly available.

<u>Specific Errors, Omissions, Concerns and Feedback</u>

15.1 Overview

- The EEE should cite resources for best management practices to ensure a common understanding.

15.2.1 Selection as a Valued Component

- The EEE should include discussion that these agricultural lands are also nationally valuable (not just locally and regionally valuable) due to their agricultural potential and the relatively mild climate supporting a large range of potential crops;
- The EEE should note that previous engagement also raised concerns about the loss of agricultural jobs.

15.2.2 Selection of Indicators

- Table 15.1 should include analysis of Project-related vibration impacts as these will impact the health and well-being of local producers and livestock.

15.2.4 Regulatory and Policy Context

- Note that the City of Pitt Meadows is the responsible agency for the City of Pitt Meadows Official Community Plan.

15.3.1 Methods

- The EEE notes that detailed results of the study can be reviewed in a baseline report; however, that baseline report is not publicly available for review.

15.4.1 Project Interactions

- In Table 15.6, the following Project activities should be identified as interacting with agriculture as there will likely be dust, noise, water quality, and traffic impacts:
    - Pre-construction staging works;
    - Utility protection or relocation;
    - Vegetation, soil stripping, excavation, fill placement and grading;
    - Construction of railway tracks;
    - Construction of agricultural products transload infrastructure;
    - Construction of liquid fuel storage depot;
    - Construction of auto transload infrastructure.
- Table 15.6 should include potential dust impacts on surrounding farmland from:
    - Preload aggregate delivery to site;
    - Surcharge removal and installation of foundation supports.
- The EEE should consider that noise and vibration from pile driving for construction activities will potentially interact by affecting the health and well-being of surrounding farm workers and livestock operations for some distance;
- Construction of agricultural products transload infrastructure is likely to produce noise, dust, water quality, and traffic impacts, but will not improve transportation of agricultural goods and services as claimed in Table 15.6;
- Revegetation may have a positive effect, as noted, if it includes more than simply hydroseeding and is appropriately maintained. The EEE should provide more details on revegetation plans;

- The EEE should consider how surface water management may also impact the agricultural capability of surrounding properties by altering drainage patterns and capacity;
- Rail yard operations will also produce noise, vibration, and dust that could impact surrounding agriculture.

#### 15.4.2 Potential Effects

- The EEE should consider how off-site effects may include reduced agricultural capability for surrounding parcels (i.e., soil class improvements) due to changes in surface and groundwater drainage. Also, large amounts of fill and settlement can alter ground levels of adjacent properties, which may affect cranberry producers;
- Other potential off-site, Project-related effects the study should include are:
  - Agri-tourism impacts;
  - Pollinator populations impacts;
  - Food crop quality impacts;
  - Agricultural land value impacts; and,
  - Agricultural producer and farm worker health impacts.
- The study argues it is too difficult to examine loss of aesthetic qualities and land speculation impacts; however, real estate appraisals are one commonly used methods for quantitatively evaluating these considerations.

##### 15.4.2.1 Agricultural Use

- The EEE acknowledges 41 ha of prime agricultural land will be lost to this Project, but should also clearly note the agricultural capability of surrounding agricultural parcels (which includes Class 1 to 3 land) could also be permanently affected by Project-related drainage impacts. The EEE implies this through discussion of potential offsite impacts, but avoids clearly stating the impacts;
- The EEE should consider that agricultural traffic diverting from routes through the LEA will contribute to congestion on other roads in the REA (i.e., Airport Way), which will impact agricultural producers and other community members;
- The road network projects relied on by the EEE to conclude that effects on agricultural transport will be minor are not confirmed. Even if the projects were confirmed, construction timeframes could be simultaneous to Proposed Project pre-construction and construction activities, which would exacerbate transportation delays for agricultural producers. The effects of the LPV on agricultural transportation, therefore, are likely to be significant and the EEE should be amended.

#### 15.4.3 Mitigation Measures

- Project-related studies have not provided a reasonable assessment of why the project must be built on ALR land;

- Mitigation 8-14 and 8-15 Light Management should identify how affected producers will be able to lodge complaints and what follow-up will happen to ensure complaints are acknowledged and acted upon;
- Mitigation M11-1 Procedural BMPs – Surface Water Management should define 'dormant season' since not all agriculture is crop-based or strictly seasonal:
    - This mitigation measure also provides vague references to "mitigation measures specific to water management" that should be more clearly defined.
- Mitigation M16-2 Traffic Management Plans should consider that several local agricultural products (e.g., nursery stock) are shipped at all times of year, including winter and spring:
    - The EEE incorrectly states as fact the assumption that the Project will not generate new heavy truck traffic. An additional 746 heavy trucks and 108 private vehicles accessing the site via Kennedy Road will increase local traffic congestion and impact agricultural producers.
- Mitigation M15-2 Site Monitoring should include sediment monitoring in surrounding drainage watercourses for all Project phases. The monitoring reports should be shared with the City and more detail is required about who would enforce site shut downs, should environmental thresholds be exceeded. While monitoring is helpful for identifying issues, past experience indicates not all site managers, sub-contractors, and QEPs are proactive about ensuring issues are addressed in a timely fashion;
- Mitigation M15-3 Dust Management should include more detail on the dust management plans for each Project phase and include ongoing air quality monitoring to inform reviews of operational procedures. Vegetative buffers need to be both tall and deep to effectively assist with dust management:
    - This mitigation measure indicates a public reporting system will be implemented; however, there is no reference to this mitigation measure in the Air Quality section.
- Mitigation M15-4 Soil Salvage and Re-use should be more specific about soil testing for invasive species and disease prior to transport, and who will pay for soil relocation and placement. Depending on the existing quality of the receiving sites, and volume of soil that is salvaged, this will have limited impact on mitigating lost agricultural productivity.
- Mitigation M15-5 Agricultural Benefit Fund should acknowledge that a benefit fund does not offset the loss of prime farmland, it only offsets the loss of productivity to the extent that funded improvements increase production beyond levels that would have occurred anyway. Also, the EEE should acknowledge the Project could have permanent and enduring agricultural impacts that cannot be fully offset by a one-time fund contribution, such as:
    - Agricultural land cost increases due to less supply;

    - Increased production costs and/or reduced agricultural productivity and quality for local producers;
    - Higher flood risk;
    - Lost agri-tourism and farm-gate sales;
    - Health impacts for farmers and farmworkers; and,
    - Transportation cost increases.

15.4.3.1 Summary of Effects to be Carried Forward

- There are likely to be residual effects from changes in drainage and irrigation systems, such as ground water impacts affecting drainage, infiltration, and storage rates on surrounding properties.
- There are likely to be residual offsite effects on agricultural operations due to dust migration, light, vibration and noise since the proposed mitigation will not fully control these.
- There are likely to be residual effects on the change in agriculture products or production due to the permanent loss of prime agricultural land, environmental impacts (dust, run-off, drainage changes, noise, etc.) affecting off-site agricultural land, and local traffic impacts.
- Disruption of transportation of agricultural goods and services will have residual effects for all Project phases, including operation. Agricultural goods and services are transported year round and the introduction of large volumes of traffic, plus related road closures, will have negative impacts.

15.4.4.1 Agricultural Use

- The EEE should acknowledge that VIF, VAC, and the Maersk Facility (74.4 Ha) were all built on agricultural land, thus CP is already the largest single private developer to permanently remove prime agricultural land from production in Pitt Meadows.
- Loss of productive land is not a reversible one-time impact as suggested in the EEE. It is:
    - The loss of annual crops;
    - The loss of products (i.e., forage and blueberries) used by other agricultural producers and companies elsewhere in Pitt Meadows;
    - The loss of customers for local and regional agricultural goods and service suppliers; and
    - The loss of agricultural jobs.
- Therefore, the loss of productive land should be 'High' since the "effect influences agricultural productivity at multiple locations in the LEA and extends into the REA." and, 'significant' since "the magnitude is high, the geographic extent includes the REA, and the effect is irreversible such that the cumulative constraints on agriculture are detectable."

15.4.4.2 Soil

- More detail is needed to clarify:
    - Who will remove the salvaged topsoil and cover the costs of transportation and placement?
    - What soil testing will be done to insure salvaged soil is free of weeds and diseases?
    - What monitoring or evaluation will be done to verify that the salvaged soil has improved the agricultural class of the receiving properties and, therefore, is actually mitigating the loss of agricultural productivity?
    - What additional mitigation is proposed if there is only limited uptake of the salvaged topsoil and blueberry plants?

15.5 Cumulative Effects Evaluation

- The additional local traffic introduced by the Project will reduce the net benefit of the listed road network projects by adding 746 new heavy truck trips, 108 private vehicle trips, plus other goods and service deliveries to local roads every day;
- Construction of the siding and lead tracks will interact with the Project construction to impact agriculture by generating dust, noise, vibration, construction traffic, and impacts to water quality.
- The Project will likely have a negative impact on the Kennedy Pump Station, by requiring larger pumps to manage the risk associated with increased run-off and storm water discharge from the Project site and less soil storage capacity in the area.

15.5.1 Cumulative Effects Evaluation for Agricultural Use and Soil

- To clarify a number of incorrect points in the EEE about the North Lougheed Area Plan (NLAP):
    - The NLAP is still under review and will not proceed until the review process is complete. The NLAP drafting and review process has included extensive engagement opportunities, plus review by First Nations rightsholders and multiple levels of government;
    - The draft NLAP has been informed by long-term regional and local planning initiatives;
    - The ALC reviewed the first NLAP and granted conditional ALR exclusion as they agreed that the project, through completion of the exclusion conditions, would provide a net benefit to local agriculture;
    - The NLAP has the potential to provide community and regional benefits, rather than primarily serve the business interests of a single private company;

    - Speculative pressures on agricultural land surrounding the North Lougheed Area have been considered in the planning process with mitigation measures included in the ALC's exclusion conditions to address this issue.

15.5.1.2 Cumulative Effects Characterization and Significance

- The EEE states the cumulative amount of agricultural land lost from the REA due to the NLAP and the Logistics Park project is twice what has been approved since 1996, but should clarify:
    - What was approved in 1996 and since then;
    - That the Logistics Park has not been approved by the ALC for removal from the ALR; and
    - CP is intending to develop this land without sufficient consideration of provincial, regional, and municipal agricultural policies and land use designations.
- The discussion of residual effects of loss of Class 1 to 3 agricultural land should also discuss the potential agricultural class/capability loss affecting surrounding parcels due to Project-related off-site impacts (e.g., drainage changes, dust damage, noise and vibration impacts, etc.);
- The EEE should also consider that the ALC required top soil salvage for the lands impacted by construction of the North Lougheed Connector. Therefore, the EEE should provide a better analysis of potential uptake of that soil volume combined with volume to be salvaged from the North Lougheed Area and the Project-site to identify the effectiveness of this mitigation. The EEE states it is likely that much of the soil will be salvaged, but should present analysis to support this claim.

15.6 Monitoring

- The EEE should include more details on proposed monitoring as the descriptions are quite vague;
- Monitoring of the mitigation measures should be included to evaluate their effectiveness and to determine whether greater mitigation is required.

15.7 Conclusion

- Potential indirect effects should include: land speculation pressures, increased costs of agricultural land, increased production costs and decreased productivity for surrounding producers, and impacts to agri-tourism.

EEE Section #23 – Effects of the Environment on the Project & EEE Section #24 – Contribution to Climate Change Reductions

Incorrect Assessment of GHG Reductions with Respect to Diesel Fuel Consumption

CP states in Section 24.5 that "it is estimated that the Project will reduce diesel fuel consumption in the region by approximately 0.20 M US gallons per year, while reducing CO2 emissions by 2.3 thousand metric tonnes per year. This is equivalent of removing approximately 500 passenger vehicles off BC roads". This assessment is incorrect and incomplete, as CP fails to account for fuel consumption and emissions produced during the pre-construction and construction phases of the LPV, which should be included as part of the overall "Project". As stated in 'EEE Section #16 / CP Valued Component #8 – Transportation', the City calculates that CP will need to import approximately 3,297,376m$^3$ of preload material during the pre-construction phase of the LPV. Estimating certain equipment sizes (as CP didn't provide this information) and productivity associated with the import and placement of preload material, a calculation of total fuel burned can be produced, as seen on Table 6 below.

| Table 6 – Estimated Fuel Burned by Importing and Placing 3,297,376m$^3$ of Preload | | | |
|---|---|---|---|
| Equipment | Estimated Gallons Burned per Hour | Estimated Productivity (m3)/hr | Estimated Gallons Burned Total |
| Tandem Truck | 7 | 8 (1 hr round trip) | 2,885,204 |
| Excavator | 11 | 50 | 725,422 |
| Dozer | 6 | 115 | 172,037 |
| Rock Truck | 15 | 69 (20 min round trip) | 716,821 |
| Packer | 8 | 40 | 659,475 |
| | | | 5,158,959 |

When comparing the estimated fuel burned associated with the importing and placing of preload to CP's stated annual fuel savings associated with the LPV, it can be calculated that it will take approximately 26 years of LPV operation to offset the fuel burned by the import and placement of preload material.

Note that the above calculation excludes other pre-construction and construction activities such as topsoil stripping, removal of preload material, installation of ground improvements, and the import and placement of road and foundation base, subbase, and concrete; all of which burn a substantial quantity of fuel. Based on this, it is not an unreasonable conclusion that the fuel consumed during the pre-construction and construction activities associated with the LPV could exceed the entire fuel consumption savings realized over the lifetime of the LPV. When considering the full life cycle of the LPV, CP's assessment that the LPV has GHG reduction outcomes is incorrect.

Information Regarding CP's Locomotive Modernization Program

CP states in this Section that "since 2012, CP has updated 386 line-haul locomotives (46% of CP's total active line-haul fleet) with EPA-certified fuel and emissions reduction technologies through its Locomotive Modernization Program. CP has committed to investing approximately $50 M to upgrade an additional 30 locomotives through this program in 2021" and states in Section 9 (Air Quality), that "CP is currently in the midst of the Locomotive Modernization Program, a multi-year program to renew emissions produced by CP's locomotive fleet. Under this program, up to 321 locomotives will be upgraded and retrofit with emission reduction technologies".

Additional clarity on CP's Locomotive Modernization Program is required with respect to timing, progress, and quantity of locomotives that have been/will be upgraded.

### EEE Section #12 / CP Valued Component #4 – Fish and Fish Habitat

City Third Party Review

Refer to Appendix D for the City's Surface Water, Groundwater, Drainage, Fish and Fish Habitat, Vegetation and Wetlands, Wildlife Third Party Review conducted by ISL, which further details the errors, omissions, and lack of clarity contained within this Section of the EEE.

General Errors, Omissions, Concerns and Feedback

- Field sampling only occurred during August, the hottest time of the year, and upstream samples from the VIF were not collected. The limitations of the field sampling methods should be clearly discussed in the EEE;
- The study did not sufficiently analyze the potential impacts to fish habitat and fish health during LPV operations. This should be examined and added to the EEE;
- Many residual effects identified in the EEE are identified as minor provided mitigation and best management practices are implemented and maintained. The EEE should cite relevant references for best management practices to ensure a common understanding. Also, the EEE should discuss accountability for implementation of mitigation measures and best management practices, including sharing monitoring reports with the City.

Specific Errors, Omissions, Concerns and Feedback

12.2.3.1 Spatial Boundaries

- The LEA should include additional intersecting watercourses since fish habitat will be impacted by LPV-related changes in water levels, flows, and quality.

12.2.4 Regulatory Context

- Table 12.2 should include the *Canada Transportation Act (*the *"Act")* as a permit is required under that *Act* and Section 95(3) states:
    - "If the railway company diverts or alters anything mentioned in paragraph (1)(b) or (d), the company shall restore it as nearly as possible to its former condition, or shall put it in a condition that does not substantially impair its usefulness."

12.2.4.1 *Species At Risk Act*

- The EEE states the *Act*'s prohibition of damage to residence of listed species applies only on federal land; however, Section 34(1) appears to clarify that this federal land limitation does not apply to aquatic species or migratory birds. This is an important distinction for considering the *Act*'s application to fish and fish habitat (i.e., aquatic species) and should be addressed in the EEE.

12.3 Existing Conditions

- The EEE incorrectly states the Katzie Slough channel is subject to dredging. The City does not dredge the channel.

12.3.1.2 Field Surveys

- The EEE should discuss the limitations of only conducting field surveys only in August 2020, during what is typically the hottest month of the year, and not collecting data upstream of the VIF.

12.3.2.1 Desktop Analysis

- City records indicate both goldfish (Carassius auratus) and largemouth bass (Micropterus salmonids) were identified in the LEA in 2020 field surveys.

12.3.2.2 Field Surveys

- The study should include discussion of the limitations of eDNA analysis. Particularly, that absence of eDNA from a target species does not prove absence of the species in the environment, as stated. Sampling period, environmental conditions, and DNA degradation can impact the results;
- The analysis of fish habitat indicates there is riparian vegetation in the study area and potential for over-wintering salmonid habitat further east in Katzie Slough, but concludes that "it is unlikely that salmonids utilize this area of Katzie Slough at any time of year". Under the *Fisheries Act*, the definition of 'fish habitat' includes areas that supply food; while salmonids and native species may not spawn in this stretch of Katzie Slough it is still considered fish habitat because the riparian vegetation can supply food for fish elsewhere in the watercourse network.

12.4.1 Project Interactions

- Most of the project activities listed in Table 12.7 should include potential introduction of sediment (via dustfall and storm water run-off), invasive species, and contaminants impacting fish health/mortality as potential effects. This includes pre-construction staging works, utility protection or relocation, preload and surcharge placement, equipment use, roadways and truck queuing zones, construction of railway tracks, etc.

12.4.2 Potential Effects

- The description of potential changes in fish habitat should include introduction of invasive species.

12.4.2.1 Changes in Fish Habitat

- The discussion of changes to fish habitat appear to only consider pre-construction and construction phase potential impacts. There will be operational impacts on fish habitat that should be analyzed and discussed as well;
- This section should also clearly discuss the impacts of changes in water flows on fish habitat due to changes in surface drainage, subsurface drainage, and groundwater flows.

12.4.2.2 Changes in Fish Health

- The EEE noted pile driving and heavy machinery vibrations can cause acoustic or pressure changes that affect fish health/mortality, but the EEE should also consider the similar vibration impacts of train and rail yard activities during operation.

12.4.3. Mitigation Measures

- Mitigation M12-1 Obtain Permits and Meet Notification Requirements is not a mitigation measure, permits and associated conditions are legislated requirements for the Project to proceed;
- Mitigation M12-2 Reduce Riparian Disturbance and Maintain Riparian Buffers identifies a 15m watercourse buffer and should be amended to a 30m watercourse buffer as recommended by research (e.g., Sweeney, B.W., and J.D. Newbold. 2014. Streamside forest buffer width needed to protect stream water quality, habitat, and organisms: A literature review. Journal of the American Water Resources Association 50:560-584):
    - Protecting riparian buffers should include installation of fencing to prevent encroachment from machinery and materials during all Project phases.
- Mitigation M12-3 Conduct Erosion and Sedimentation Control should cite a resource so there is a common understanding of 'best management practices':

- Silt fencing is recommended in the mitigation, but best management practices indicate it should be placed outside the riparian buffer rather than at the top of the watercourse bank as suggested;
  - The monitoring interval for storm water discharge (and other water quality measures) should be identified in the mitigation plan and should include regular intervals, plus during any rainfall events exceeding 25mm in 24 hours;
  - The mitigation description notes the QEP should suspend construction activities if water quality is impacted and corrective measures are insufficient. The EEE should clarify who will ensure that the QEP is empowered to suspend construction activities. Experience with other large construction projects suggests some QEPs are extremely reluctant to take enforcement steps even when there is blatant disregard for water quality concerns by site managers or sub-contractors. The monitoring reports should be shared with the City.
- Mitigation M12-4 Manage Vehicle and Equipment Access should be more specific about monitoring plans and plant mortality replacement for reclaimed sites:
  - The mitigation measures indicate vehicles should not be parked or stationed in a watercourse unless required for that immediate phase of construction, but should also prohibit parking or stationing vehicles in riparian buffer areas.
- Mitigation M12-5 Spill Prevention and Response should require designated refueling stations be positions as far from watercourses as is feasible and not within 30m of any watercourse top-of-bank;
- Mitigation M12-6 Avoidance of Environmentally Sensitive Areas should require installation of permanent fencing to prevent encroachment of machinery, vehicles, and material storage for all phases of the Project:
  - The fenced area should include an appropriate setback established by a QEP, based on evidence-based best practices.
- Mitigation M12-7 High Flow Mitigations should be expanded to include measures during Project operation to prevent impacts from contaminant run-off during high rainfall events or flooding;
- Mitigation M12-8 Conduct Restoration and Reclamation Activities should include more detail about monitoring period, management requirements, and plant mortality replacement.

12.4.4 Characterization of Residual Effects

- The EEE's definition of 'Significance' considers return of total suspended solids to background levels and other water quality parameters, which cannot be reasonably assessed within the bounds of this study as that is a future condition. Also, the mitigation measures have not been evaluated to demonstrate that this will occur; therefore, a different definition of significance should be used or the level of confidence should be 'Low'.

12.4.4.1 Residual Effects on Fish and Fish Habitat

- Analysis of change in sediment concentrations only considered construction phases and should include operational impacts. This will be a residual operational impact that should be identified and addressed;
- CP considers many residual effects to be minor provided mitigation and best management practices are implemented and maintained. The EEE should cite relevant references for best management practices to ensure a common understanding. Also, the EEE should discuss accountability for implementation of mitigation measures and best management practices;
- Analysis of change in water flows should have been considered in the analysis and in the discussion of residual effects.

12.5.1.1 Potential Cumulative Effects

- This section incorrectly assumes the Kennedy Pump Station can simply be upgraded to improve water quality. Re-establishing flushing flows and fish access is not a simple change as increasing flood risks must also be managed, particularly the increased run-off from the LPV site, reduced absorption capacity due to LPV-related changes, and impacts of climate change.

12.5.1.3 Cumulative Effects Characterization and Significance

- The City agrees the effect on fish and fish habitat is permanent and irreversible because the Proposed Project is indefinite. Several other sections of the EEE should be revised to similarly consider residual impacts (e.g., air quality and GHG emissions) to also be permanent and irreversible for the same reason.

## EEE Section #13 / CP Valued Component #5 – Vegetation and Wetlands

<u>City Third Party Review</u>

Refer to Appendix D for the City's Surface Water, Groundwater, Drainage, Fish and Fish Habitat, Vegetation and Wetlands, Wildlife Third Party Review conducted by ISL, which further details the errors, omissions, and lack of clarity contained within this Section of the EEE.

<u>General Errors, Omissions, Concerns and Feedback</u>

- The study boundaries appear ineffectively defined and should instead consider geography and ecological connectivity. The study should assess a revised LEA and REA to better understand existing off-site conditions, potential LPV-related impacts, and residual impacts:

  - The study should consider impacts to riparian vegetation and potential wetland communities along the unstudied watercourse edges connecting to the site and downwind from the site that are likely to be impacted by dust fall, water quality impacts, introduction of invasive species, and drainage changes.

- The study should have also considered impacts on pollinators and seed dispersal;
- CP considers many residual effects identified in the EEE to be minor provided mitigation and best management practices are implemented and maintained. The EEE should cite relevant references for best management practices to ensure a common understanding. Also, it should discuss accountability for implementation of mitigation measures and best management practices, including sharing monitoring reports with the City.

Specific Errors, Omissions, Concerns and Feedback

13.2.4 Regulatory and Policy Context

- The City notes that currently, there are large stands of untreated Japanese knotweed (and other priority invasive weeds) on CP lands which are a serious concern. Further, the knotweed and other invasives are spreading onto City, provincial, and private lands creating a cost and maintenance burden for others while CP has not addressed this issue.

13.3.2.2 Field Surveys

- The field survey discussion notes a total of 22 migratory bird species were identified at the very small (0.002 ha) wetland, Wm05, during surveys conducted in this area for the wildlife assessment. To better understand cumulative impacts on bird populations and wildlife biodiversity, there should be more discussion of how much local wetland areas have been cumulatively impacted by rail infrastructure.

13.4.1 Project Interactions

- While surveying activities are noted to have no interactions, surveying should aid in establishing riparian setbacks and buffers for sensitive ecosystem areas and mature trees;
- Many of the listed project activities in Table 13.12 should consider impacts to riparian vegetation and potential wetland communities along the unstudied watercourse edges connecting to the site and downwind from the site due to dust fall, water quality impacts, introduction of invasive species, and drainage changes.

13.4.2.1 Ecosystems of Management Concern

- The study should have surveyed a larger REA to identify the next closest ecosystem of management concern within the areas managed by flood infrastructure to assess potential impacts of drainage, water quality, and dust fall changes.

13.4.3 Mitigation Measures

- Mitigation M8-16 Project Design: Site Layout should include protecting and enhancing riparian vegetation. Interestingly, it also includes "placing infrastructure in an industrial area". Since the Proposed Project site is not an industrial area, it is protected agricultural land, this mitigation measure appears to preclude the LPV from being constructed;
- Mitigation M13-1 Integrated Vegetation Management Plan commits CP to managing invasive plants and noxious weeds on their properties, which is appreciated. It would be more progressive to commit to also enhancing and re-establishing ecosystems of management concern. This would help achieve goals of managing water quality and controlling invasive/noxious species, while still being compatible with railway safety and low maintenance requirements (once fully established);
- Mitigation M13-2 Construction Environmental Management Plan description identifies paved areas will not generate dust during operation; however, surface wear, dust carried in on vehicles and produced by their brakes, dust carried in on trains, fugitive dust from cargoes, and engine particulate matter will all generate dust that will be carried off-site by wind and storm water run-off:
  - Water trucks used to control dust from earthworks and street sweeping vehicles should have been included in the transportation modelling.
- Mitigation M13-4 Erosion and Sediment Control identifies a project-specific ESC plan will be produced. The mitigation description should cite relevant "industry and regulatory standards" and commit to sharing the ESC plan with the City for review.

13.6 Monitoring

- The EEE should provide more details about monitoring periods, management requirements, and plant mortality replacement for revegetation and habitat offsetting. Monitoring plans and reports should be shared with the City.

## EEE Section #14 / CP Valued Component #6 – Wildlife

<u>City Third Party Review</u>

Refer to Appendix D for the City's Surface Water, Groundwater, Drainage, Fish and Fish Habitat, Vegetation and Wetlands, Wildlife Third Party Review conducted by ISL, which further details the errors, omissions, and lack of clarity contained within this Section of the EEE.

General Errors, Omissions, Concerns and Feedback

- CP considers many residual effects identified in the EEE to be minor provided mitigation and best management practices are implemented and maintained. The EEE should cite relevant references for best management practices to ensure a common understanding. Also, the EEE should discuss accountability for implementation of mitigation measures and best management practices, including sharing monitoring reports with the City;
- The discussion also misleadingly diminishes the impacts of permanent loss of habitat by associating it with conventional agricultural practices. The two have different impacts;
- Also, off-site impacts (i.e., noise, dust, light) lowers surrounding habitat quality, which impacts foraging and breeding behaviours and effectively results in partial habitat loss. The extent of these impacts should have been considered in a more detailed manner.

Specific Errors, Omissions, Concerns and Feedback

14.2.3.1 Spatial Boundaries

- The spatial boundaries should better consider geography and ecological connectivity. A 300m LEA buffer around the site, for example, does not account for increased pressure on surrounding agricultural land for winter forage for migratory birds;
- The REA should consider all of Pitt Meadows and discuss relationships to local wildlife corridors, the Fraser River estuary, and Pacific Flyway.

14.2.3.2 Temporal Boundaries

- This section states habitat use peaks during the spring and summer; however, in the fall the area has significant bird migration volumes and many species preparing for winter (e.g., bears foraging on berry crops); and, in the winter the area has migratory and resident birds, plus other local wildlife foraging on agricultural fields. The EEE should acknowledge in its discussion that the existing habitats on the site provide important habitat for different species at different times of year.

14.2.4.1 Species At Risk Act

- The EEE states the *Act*'s prohibition of damage to residence of listed species applies only on federal land; however, Section 34(1) appears to identify this federal land limitation does not apply to aquatic species or migratory birds. This is an important distinction for considering the *Act*'s application to migratory birds and should be addressed in the EEE.

14.3 Existing Conditions

- The project site is incorrectly described as 'new land'. It is located on 41 ha of protected agricultural land and within the Katzie First Nation traditional territories.

14.2.1 Methods

- The EEE should clarify if any records of prior wildlife field studies in the area were reviewed and how they were used;
- The EEE identifies the guides used to inform the field surveys, but should also provide a summary of the methods used in order to clarify compliance. For example, eDNA samples were taken, but where, when, and the limitations of this approach should be discussed.

14.3.2 Results

- Field survey results note likely songbird nesting habitat along the edges of the North and South lots. The impact evaluation therefore should note that many songbird species are migratory and, therefore, federal protections would apply during the nesting season (commonly from March 1 to August 31).

14.4.1 Project Interactions

- The EEE should acknowledge that vegetation, soil stripping, excavation, fill placement and grading is habitat destruction, which will increase competitive pressure on surrounding habitat areas;
- For Preload and surcharge placement, and removal activities, Table 14.7 should identify an interaction as those activities will perpetuate impacts of vegetation removal, plus the resulting dust and noise will likely impact surrounding habitat quality and foraging and breeding/nesting behaviors;
- Drainage and storm water management activity should acknowledge changing drainage patterns, flows, and water quality will likely impact surrounding habitat quality;
- Roadways and truck queuing zones will likely have a direct interaction due to sensory disturbance, collision potential, and noise and dust generation that will impact nearby habitat quality and foraging behaviors;
- All Project construction and operation will also likely have REA impacts due to increased habitat competition from displaced wildlife, plus disturbance from dust, noise, and light impacting off-site habitat quality.

14.4.2.1 Increase in Risk of Direct Mortality to Terrestrial Wildlife and Migratory Birds

- The discussion should also address increased competition for off-site habitat (resulting in a likely decline of local populations), and impacts to the quality of off-site habitat from all Project phases.

14.4.2.2 Decrease in Terrestrial Wildlife and Migratory Bird Use Resulting From Habitat Loss

- The discussion erroneously diminishes the impacts of habitat loss by suggesting similar habitat is available elsewhere in the REA. While similar habitat is present elsewhere in the REA, the study has not examined its quality or population densities to confirm that there is sufficient alternative habitat available to host displaced wildlife populations. The connection between habitat loss and wildlife population declines is well established by research.

14.4.2.4 Sensory Disturbance Resulting in Habitat Displacement, Behavioural Changes, or Decreased Success Rate

- Again, the discussion erroneously diminishes the impacts of habitat loss by suggesting similar habitat is available elsewhere in the REA. While similar habitat is present elsewhere in the REA, the study has not examined its quality or population densities to confirm that there is sufficient alternative habitat available to host displaced wildlife populations;
- Also, off-site impacts (i.e., noise, dust, light) lowers surrounding habitat quality, which impacts foraging and breeding behaviours and effectively results in partial habitat loss. The extent of these impacts should have been better considered in the EEE.

14.4.3 Mitigation Measures

- Mitigation 14-1 Perform vegetation and soil stripping outside of the critical wildlife windows should also consider the fall migratory bird season:
    - If a no-disturbance buffer is identified for active nests, it should be clearly marked to mitigate encroachment by pre-construction and construction activities and equipment;
    - Mature trees, shrub clusters, and standing snags (i.e., dead trees) should be retained and/or re-established whenever possible. Breeding bird pairs of many species often re-use or repurpose existing nests, so removal of nesting trees outside of the nesting season will place added competitive pressure on remaining trees and snags the following nesting season.
- Mitigation 8-8 Noise Wall should be built early in the construction phase to minimize the impacts of construction activity;
- Mitigation 8-15 Directional Lighting should also be on motion sensors, timers, and/or auto dimming to mitigate albedo reflection impacts. Low, directional pedestrian path or vehicle lane lighting is preferable over tall flood light towers;

- Mitigation M14-3 Re-establish vegetation should include mature trees and standing snags for wildlife use. Also, a 30m riparian buffer on either side of Katzie Slough, rather than the 10m identified, is recommended. A 30m riparian buffer is identified in the Vegetation and Wetlands study (Section 13.0) and is consistent with recommended best practices;
- Mitigation M14-4 Implement alternative barn swallow nests should also include bat boxes for endangered bat species found roosting on the Project site. Barn owl nesting boxes would also be appropriate offsetting measures as the Project will be impacting nesting and foraging areas for this listed species as well;
- Mitigation for the permanent loss of 41 ha of habitat should include habitat enhancements to other similar habitat to improve its capacity to support displaced wildlife and migratory populations.

14.4.3.1 Summary of Effects to be Carried Forward

- The EEE should note there will likely be a residual effect in wildlife mortality due to potential bird strikes during operation, permanent loss of habitat and diminished habitat quality, which will result in permanent population declines;
- Change in wildlife use due to habitat loss will not just impact the LEA, the EEE should acknowledge habitat loss will have ripple effects into the REA, some wildlife populations, and similar habitat areas further out due to increased competition;
- Change in mortality of at-risk species mitigation should also include bat boxes and barn owl boxes. Note that a residual effect of population declines may still exist, despite these mitigation measures, since population densities and distribution of suitable habitat elsewhere were not adequately reviewed in the study;
- Sensory disturbance will have a residual effect from ongoing impacts to the quality of nearby habitat areas. This will permanently impact local foraging and breeding behaviours, potentially leading to population changes.

14.4.4.1 Residual Effects for Wildlife

- The magnitude of the impacts should have been rated as 'High' as by the EEE's own definition they include "measurable change to wildlife reproductive capacity, survival, or extent of suitable habitat; population within the LEA is not expected to recover, resulting in a net loss of wildlife present". Given that the LEA will be almost entirely cleared and paved, there is clearly a measurable change to the extent of suitable habitat and populations within the LEA will be affected;
- By the EEE's own definition, the residual effects are 'Significant' since they are "local to regional in scope and long term, occur with regularity, and are consequential in structural and functional changes in populations, communities, and ecosystems." Habitat loss will very likely cause some population loss,

particularly if the cumulative impacts of the other projects listed in table 14.12 are considered.

14.5 Cumulative Effects Evaluation

- The Siding and Lead track will interact due to some vegetation removal (i.e., further habitat loss) plus additional sensory disturbance from the additional train operations.

14.5.1 Cumulative Effects Evaluation for Change in Terrestrial Wildlife and Migratory Bird Use due to Habitat Loss

- The North Lougheed Area Plan (should it proceed in its current form) will have potential cumulative interaction; however, the draft policies include measures to protect and improve habitat quality, diversity, and connectivity throughout the entire 51 ha. The study falsely assumes no habitat offset or enhancement would occur, if the North Lougheed Area Plan were to proceed with the current draft policies;
- While some conventional agricultural practices are considered a threat to birds and biodiversity, there are programs and strategies for working with producers to increase biodiversity and habitat value of agricultural areas (see www.deltafarmland.ca). Industrial development of the agricultural land would eliminate this potential to improve biodiversity on this site;
- The EEE misleadingly suggests 545 ha of recreational lands in the REA, some of which includes natural vegetation, is of higher quality use for wildlife and migratory birds without considering habitat types, species preference, and existing population densities. While agricultural land is not ideal for all wildlife or bird species, there are some that prefer or only inhabit agricultural land in this region (e.g., the western meadowlark, snow goose, northern harriers).

14.5.1.1 Additional Mitigation Measures

- The EEE should discuss habitat enhancement of off-site grassland, hedgerow, and riparian habitats to increase capacity elsewhere to support displaced and resident populations. Some species are territorial and will not tolerate increased population densities, so this will only partially reverse population impacts of permanent habitat loss.

14.7 Conclusion

- As per the above comments, the impacts to wildlife of 41 ha of lost habitat and decreased quality of surrounding habitat due to the Project should be reported as ‘High’ in magnitude and ‘Significant.’

## EEE Section #6 – Summary of Community Consultation

Feedback on Consultation – Rounds 1, 2, and 3

With respect to feedback for CP's Round 1 & 2 engagement, please refer to the City's letters to CP dated February 16, 2021 and July 29, 2021.

With respect to CP's round 3 engagement, CP did not allocate enough time for stakeholders, rightholders, and other interested parties to thoroughly review the EEE documentation and provide meaningful feedback to CP for consideration and incorporation into their Proposed Project plans/documentation prior to their submission to the Canadian Transportation Agency (CTA). Twenty-eight days is an insufficient amount of time to adequately review 800 pages of information, nor is three - 1 hour virtual sessions enough to qualify as meaningful engagement activities. Furthermore, a mere two days prior to the conclusion of CP's Round 3 engagement, and after the conclusion of CP's virtual sessions, CP quietly posted another 1300 pages of project documentation on their website, following multiple requests from the City to do so. The proposed Logistics Park is a large and permanent change to the community, with substantial adverse impacts; not providing enough time or information to understand that change or to provide meaningful feedback is contrary to general engagement practices as well as CTA requirements.

The City recognizes that there will be additional opportunities to provide feedback during the CTA review process; however, the CTA outlines that CP has an obligation to conduct meaningful public engagement prior to their CTA application in order to receive and consider feedback, work collaboratively to address concerns raised, and to use the feedback received to inform their submission. The City argues that CP has not sufficiently complied with this requirement.

Referring to the Canadian Transportation Agency website, it states that "The timing, approach, materials provided, and any other aspect of the engagement activities should ensure that people can…thoroughly review and consider information…ask questions and receive and consider any additional details/answers…formulate their views; and… submit their comments and concerns." It is the City's conclusion that this did not occur.

Insufficient Documentation Supplied by CP

Although CP has provided some draft technical documentation including transportation, stormwater, and geotechnical studies, at least 10 critical documents, including studies for noise, vibration, air quality, human health, drainage, vegetation, fish, and wildlife have not been provided by CP, despite multiple requests for them from the City. CP should immediately release these documents to be fully transparent, as well as, to provide valuable context to the EEE and allow the City to be more thorough in the feedback provided. Contrary to CP's assertion that the EEE suffices as a standalone document, evaluation by City and its consultants have concluded that the EEE is fundamentally deficient and reliant on undisclosed information. A list of documentation that the City has requested, but not yet received, is shown below in Figure 10, with the most critical studies identified in red:

Hemmera Envirochem Inc. (Hemmera). 2020. Phase I Environmental Site Assessment: Vancouver Logistics Park.

Hemmera Envirochem Inc. (Hemmera). 2021b. Draft Phase II Environmental Site Assessment CP Logistics Park: Vancouver, BC: Draft Report. Hemmera Envirochem Inc. (Hemmera).

Hemmera Envirochem Inc. 2018. Canadian Pacific Pitt Meadows Auto Transload Facility – Noise Assessment. Prepared for Canadian Pacific Railway Company (CP).

Hemmera Envirochem Inc. 2021. Draft Noise and Vibration Baseline Report – CP Logistics Park: Vancouver. Prepared for CP.

Hemmera Envirochem Inc. (Hemmera). 2021a. Vegetation and Wetlands Baseline Report. CP Logistics Park: Vancouver. Prepared by Hemmera Envirochem Inc. for Canadian Pacific Railway Company. February 2021.

Hemmera Envirochem Inc. (Hemmera). 2021b. Draft Terrestrial Fish and Fish Habitat Baseline Report CP Logistics Park: Vancouver. Prepared for: Canadian Pacific Railway Company. January 23, 2021.

Hemmera Envirochem Inc. (Hemmera). 2021. Terrestrial wildlife baseline report: CP logistics park: Vancouver. Prepared for Canadian Pacific Railway.

Hemmera Envirochem Inc. (Hemmera). 2021. Socio-economic Baseline Report: CP Logistics Park: Vancouver. Hemmera Envirochem Inc. (Hemmera).

Ausenco. 2021. Draft Rail Simulation Study, Canadian Pacific Logistics Park: Vancouver.

Hemmera 2021. Katzie Watershed Drainage Modeling. Prepared for Canadian Pacific Railway Company.

Figure 10 – Studies Referenced in the EEE that the City has Requested

In addition to sharing the above requested studies, the City believes that as the design progresses and technical work is updated/created for the LPV, that CP should share these updated technical documents with the City in a timely manner. Although the City opposes the proposed LPV, it is the City's intention to continue to provide feedback to ensure the baseline conditions and impacts are understood, fully evaluated and ultimately mitigated in the best interest of the community.

## EEE Section #17 / CP Valued Component #9 – Employment and Regional Economy

General Errors, Omissions, Concerns and Feedback

- The EEE does not provide evidence to support its claims of potential economic benefits from the LPV. Preliminary review of the available information and claims instead suggests all phases of the Project could have neutral to negative impacts on local employment and economy, and the impacts to the regional employment and economy will be inconsequential;

- The study does not adequately explore the net costs or benefits of the Project. For example, while the study acknowledges there will be costs to local and regional governments due to the Project, it does not attempt to articulate the nature or magnitude of these costs;
- The EEE should acknowledge that, under provincial legislation, CP pays a reduced property tax rate compared to other comparable industrial businesses. This difference amounts to a subsidy to CP by other city taxpayers and should be considered in discussions of net costs/benefits;
- The study indicates that the Project will result in regional economic growth and resolve capacity constraints; however, this contradicts key claims and assumptions in other EEE studies that the LPV (and LPV-related traffic) will only replace existing transloading activity occurring at other operations in the region. Intentional or not, the EEE as a whole is misleading by trying to claim both growth and no-growth will occur in order to support different benefit claims;
- Careful review of the relevant provincial, regional, and City plans and policies indicates the Project is generally inconsistent with the stated goals, objectives, and strategies of these levels of government. CP should voluntarily follow the same regulatory review process that nearly all other development proposals must comply with to verify their proposal is consistent with all relevant plans and strategies;
- For clarity and transparency, the EEE should provide clear analysis of how much economic benefit from the Project will go to local, regional, and provincial economies versus international corporations (e.g., car manufacturers, oil companies, and CP);
- The EEE should acknowledge that VIF, VAC, and the Maersk Facility (74.4 Ha) were all built on agricultural land, in addition to the 41 Ha of prime agricultural land that CP is proposing to consume for the LPV. This has cumulative impacts on agricultural goods and service providers, plus agricultural jobs;
- The EEE states CP is required to have adequate facilities under the federal common carrier mandate; however, as outlined in 'EEE Section #2 – Overview', CP has previously submitted to the CTA the argument (supported with Supreme Court case precedent) that they are not obligated under the relevant legislation to accommodate current demand, with the CTA supporting this argument.

<u>Specific Errors, Omissions, Concerns and Feedback</u>

17.2.4 Regulatory and Policy Context

- The EEE briefly identifies relevant policies, plans, and strategies of multiple levels of government, but should also explain how the LPV relates or responds to these. Careful review of the listed plans and strategies indicates the LPV is generally inconsistent with the stated goals, objectives, and strategies outlined in the referenced documents.

17.3 Existing Conditions

- The EEE incorrectly identifies the LPV site as 'new land'. The Project site is 41 ha of prime agricultural land within the traditional territories of local First Nations. An effects evaluation should be considerate of the study site's past and current context.

17.3.2.6 Economic Prospects

- The EEE incorrectly identifies Highway 7 Improvements between 266 Street and 287 Street as being partially within Pitt Meadows. That portion of Highway 7 is well outside the City's borders;
- The EEE incorrectly suggests there has been a push for new industrial parks in Pitt Meadows;
- The EEE should acknowledge that all of the identified major projects went through local, regional, and (often) provincial, regulatory review and approvals to ensure they were consistent with planning goals and objectives. CP should voluntarily follow the same regulatory review process to verify their proposal is consistent with all relevant plans and strategies.

17.3.2.7 Regional Government Finances

- The EEE appears to incorrectly state the role of the regional government in land use planning and development.

17.4.1 Project Interactions

- The EEE should explain how the LPV contributes to economic diversification when it appears to be just an expansion of existing industrial activity;
- Potential benefits appear to be over-emphasized in the reporting and negative impacts are not sufficiently discussed. For example, the potential effects for most of the project activities included in Table 17.18 should include:
    - Added costs to taxpayer for road and infrastructure maintenance;
    - Added costs to taxpayer for bylaw enforcement;
    - Added costs to taxpayer for emergency services;
    - Added time and fuel costs for local residents due to increased traffic congestion;
    - Impacts to surrounding property values;
    - Lost tourism and agri-tourism revenue for local businesses;
    - Lost agricultural productivity for surrounding producers.

17.4.2.1 Changes in Employment and Contracting Opportunities

- The projected operational job numbers are inconsistent with previous information and other sections of the EEE:
    - The previous draft Terms of Reference document from CP stated 150-250 construction and operation phase jobs, while this section of the EEE appears to inflate this figure to 150-250 for each phase of construction and operation for a total of 300-500 jobs total;
    - The EEE Transportation Section (see Section 16.4.2.2) used operational estimates to identify two shifts per day with 54 personnel on each shift entering and exiting the site. This suggests the project will employ roughly 108 personnel during operation, which is less than indicated in this section. If it will be more than 108 positions, the transportation modelling should be re-done with more accurate numbers.
- The EEE should clarify if the anticipated operational jobs will be all new positions for CP, or if some of these will be existing positions shifted from other facilities or shared with VIF;
- The EEE should also acknowledge that, in terms of job numbers, this is a relatively low-density industrial land use;
- The EEE states "a large proportion of Project employment needs is expected to be addressed within the LEA [i.e., Pitt Meadows and Katzie 1] and the rest within the REA [i.e., Metro Vancouver];" however, there is no commitment in the EEE to preferentially hire residents from Pitt Meadows. Instead, the relevant 'mitigation' measure identifies hiring will take place broadly in Metro Vancouver:
    - The EEE should examine the expected roles needed in relation to the presented data on workforce breakdown to estimate how many local (i.e., Pitt Meadows and Katzie 1) jobs the Project will actually generate. The EEE's presentation of broad numbers to justify a claim of local benefits is misleading.
- Similarly, the EEE makes broad claims of indirect business benefits, but fails to provide clear data of how many local (i.e., Pitt Meadows and Katzie 1) businesses provide the types of goods and services that will be required by this Project. The EEE should commit to prioritizing local procurement of goods and services for all Project phases;
- The EEE provides broad claims of induced benefits through wage spending; however, it should provide supporting analysis;
- For clarity and transparency, the EEE should provide clear analysis of how much economic benefit from the Project will go to local, regional, and provincial economies versus international corporations (e.g., car manufacturers, oil companies, and CP);
- When discussing effects on agricultural employment, the EEE should clarify that the subject properties are also regionally and locally designated as agricultural land to prevent development that is inconsistent with relevant plans and policies;

- The EEE claims "the Project may increase agricultural opportunities locally, provincially, and nationally," but fails to explain how it will help local producers. Review of the Project suggests it will only have negative impacts on local and regional producers;
- The EEE claims, but provides no evidence, of capacity constraints that this Project will resolve. It only states CP's facilities are nearing capacity, but does not review the capacity of other facilities. In several other sections of the EEE, CP claims this project will only replace existing transloading activity, rather than generate new activity, which suggests there is no actual capacity constraint in the industry:
    - In addition, CP has not provided reports that looked at opportunities to intensify operations at their existing facilities; therefore, there is no justification for developing protected agricultural land.
- The EEE states CP is required to have adequate facilities under the federal common carrier mandate; however, CP has previously submitted to the CTA the argument (supported with Supreme Court case precedent) that they are not obligated under the relevant legislation to build new facilities. The CTA supported this argument (see CTA Letter Decision No. CONF-9-2019). That CP is aware of the legal nuance of the common carrier mandate, yet still claims this as a driver for needed rail yard expansion, is self-conflicting.

17.4.2.2 Changes in Economic Diversity

- The EEE should provide more detail on how, and at what scale, the Project operation will increase the transport and warehouse sector, plus related goods and service providers. A preliminary look at the regional numbers cited, suggests the Project's impacts on economic diversity will be largely inconsequential.

17.4.2.3 Changes in Local and Regional Government Finances

- The EEE should acknowledge that, under provincial legislation, CP pays a reduced tax rate compared to other comparable industrial businesses. This difference amounts to a subsidy to CP by other Pitt Meadows taxpayers and should be considered in discussions of net costs/benefits;
- The EEE does not adequately explore the net costs or benefits of the Project. For example, the study acknowledges there will be costs to local and regional governments due to the Project, but does not attempt to articulate the nature or magnitude of these costs.

17.4.3 Mitigation Measures

- Mitigation M17-1 promises lost local jobs will be offset, but does not commit to prioritizing local hiring or goods and services procurement. This disconnect does not mitigate the impacts of lost local jobs or economic activity due to the Project;

- Mitigation M17-2 should provide more details about how proposed ongoing engagement with agricultural stakeholders will help non-agricultural businesses affected by the Project. All phases of the Project will impact both agriculture and non-agriculture businesses that use the Kennedy Road truck route and to access Lougheed Highway. Aside from identifying some of the agricultural producers that will be impacted, the EEE does not provide analysis of what other local businesses will be impacted, how they will be impacted, or how they should be engaged:
    - Considering the engagement period on the EEE has been largely inadequate to allow the public time for a fulsome review of the documents, the EEE should provide details on what constitutes "an adequate notice period for their response."
- Mitigation M17-3 should provide more detail on how EEE mitigation measures will minimize additional costs to local and regional governments as this is not sufficiently articulated in the cited sections.

17.4.3.1 Summary of Effects to be Carried Forward

- The potential effects listed in Table 17.20 have not been sufficiently analyzed or explained in this study; therefore, identifying the residual effects as only positive without any discussion of negative impacts is unsupported by analysis or evidence.

17.4.4.1 Residual Effects on Employment and Regional Economy

- This section summarizes the Project benefit claims made earlier in the EEE. As noted above, the EEE provides insufficient analysis to support the stated claims. Preliminary review of the available information and claims instead suggests all phases of the Project may have neutral to negative impacts on local employment and economy, and impacts to the regional employment and economy will be inconsequential.

17.5 Cumulative Effects Evaluation

- The cumulative economic effects of the Project in relation to other infrastructure and industrial development projects in Pitt Meadows and the region should have been included with the analysis.

## EEE Section #4 – Project Description & EEE Section #5 – Purpose, Need, and Alternatives Considered

City Feedback on CP's Comparative Site Evaluation (CSE) and draft Terms of Reference (TOR)

The City provided comprehensive feedback regarding the substantial deficiencies contained within CP's Comparative Site Evaluation (CSE) and draft Terms of Reference (TOR) in the City's February 16, 2021 and July 29, 2021 letters to CP. It was the City's understanding that CP was seeking feedback in order to inform their assessments and better understand and mitigate the local issues and concerns of the community; however, the EEE and technical studies have not taken into account many of the key components contained within the City's previous feedback.

Examples include, but are not limited to:

- Failing to acknowledge and adequately identify LPV impacts to nearby residents, community amenities, and infrastructure, and propose adequate mitigation of these impacts;
- CP has neither recognized nor considered the impacts of the Proposed Project on the City's two unconstructed highways and future plans for the City's transportation network, including the McTavish Connector;
- CP has not addressed the impacts associated with the considerable increase in heavy truck traffic (stated to be 746 average daily truck trips);
- CP has failed to address impacts to emergency services caused by the storage and transportation of substantial quantities of dangerous goods;
- Failure to adequately consider and address impacts to the City's drainage systems including, but not limited to, Katzie Slough and Kennedy Pump Station, as well as, surrounding properties;
- CP has not identified or addressed the deleterious impacts of the Proposed Project with respect to noise and vibration, especially with respect to construction activities and cumulative effects.

Additional feedback on the above topics can be found in this document and within Appendices B-F.

CP's Incorrect Assessment that the Existing Vancouver Auto Compound (VAC) is at Capacity

Section 5.1 states that "CP opened its auto lot in 2019, and this facility has already reached capacity, receiving approximately 3,000 carloads (railway cars) in its first year".

However, when considering other excerpts from the EEE, as well as, additional information from CP's website, a different conclusion can be established.

CP lists on Table 4.5 that the capacity of an auto rail car ranges from 10-15 vehicles per rail car. Completing a quick calculation concludes that CP received approximately 30,000-45,000 vehicles at VAC in 2019. CP stated in their 2019 press release regarding the opening of the compound (https://www.cpr.ca/en/media/cp-celebrates-opening-of-vancouver-automotive-compound) that the auto compound has the "capacity to accommodate 168,000 vehicles annually".

This suggests that the actual usage of the VAC ranged somewhere between 17.9% - 26.8% in 2019 when considering the numbers provided by CP. Therefore, CP's assertion that the existing auto lot is nearing capacity is unsubstantiated and appears incorrect.

CP's Contradictory Statements Regarding Auto Demand and Transloading Volumes

In CP's 2019 press release regarding the opening of the VAC, it states that "the VAC will provide an important service to our customers while delivering sustainable, long-term growth". In addition, CP states in Section 5.1 that "There is significant interest from customers…requiring development of additional capacity"

These two statements are blatantly contradicted by Section 16.3.3, which states that "the new auto transloading facility is anticipated to relocate auto transloading activity with CP facilities in Pitt Meadows but not increase overall transloading volumes". CP also made a verbal statement during their open house on January 17, 2022 that they intended to shut down the existing VAC.

With the contradictory information, it is not unreasonable to conclude that at least one of the claims is erroneous. CP is claiming that:

- CP is expecting growth and increased demand for auto transloading & storage;
- Due to this growth and increased demand, CP needs to expand their auto facilities;
- Transloading volumes will somehow not increase despite increased demand and growth;
- The existing VAC will provide long-term growth;
- Despite increased demand and growth CP anticipates shutting down the existing VAC.

Inefficient Design of LPV

In addition to CP inadequately identifying Project impacts and proposing insufficient mitigation, the City asserts that CP's design of the LPV didn't incorporate innovative designs, which could have reduced overall Project impacts. Two examples include:

- CP's failure to condense the existing VAC and/or the proposed automobile transload subsite and satellite lots:
    - In the City's feedback to CP's TOR (dated July 29, 2021), the City noted that there was an opportunity for CP to reduce the footprint of the auto lot by implementing a multiple storey parking unit at the existing VAC rather than consuming agricultural lands to implement low density industrial use;
    - This strategy would better align with the Metro Vancouver Industrial Lands Strategy, which identifies the intensification and optimization of industrial lands as a key theme;
    - Metro Vancouver Industrial Lands Strategy is one of many provincial and municipal legislation which CP states that they "compl(y) with the spirit of";
    - This concept was brought up again to CP during one of their open houses during Round 3 engagement on January 17, 2022;
    - Despite this concept being proposed to CP as a reasonable option to condense the land use during both Round 2 and 3 of engagement by separate stakeholders, which would reduce LPV impacts while providing identical capacity, CP has not acknowledged nor incorporated this feedback into their design.
- CP's failure to integrate conveyors to transport agricultural materials rather than trucks:
    - CP's current proposal to locate their agricultural arrival transload and storage facilities at the LPV, south of their mainline tracks and locating their departure transload facility at VIF, north of their mainline tracks, is extremely inefficient;
    - This includes introducing an endless cycle of truck traffic that will move "empty containers…to the transload site from the VIF; loaded containers…back to the VIF";
    - Each truck contributes negative impacts to numerous valued components including, but not limited to, noise and vibration, human health, transportation, air quality, as well as, detrimental effects to climate change via the burning of diesel fuel;
    - On Table 4.4, CP estimates 372 average daily inbound and outbound agricultural trucks. Assuming a 0.75 hour round trip (2/3 of that time idling

in queue), Table 7 below shows the volume of fuel burned every 10 years to simply transport agricultural products from the LPV to VIF;

| Table 7 – Estimated Fuel Burned by Trucking Agricultural Products over 10 Years | | | |
|---|---|---|---|
| Equipment | Estimated Gallons Burned per Trip (Idling/Moving) | Round Trips per 10 years | Estimated Gallons Burned Total per 10 years |
| Truck | 0.75 / 0.75 | 1,357,800 | 2,036,700 |

To eliminate these impacts and the need for trucking, CP could have swapped the location of the auto transload facility and the agricultural transloading site (to lessen the distance from the agricultural transloading site to VIF, as well as lessen the distance from the auto transload facility to the satellite lots). This would have provided the opportunity for CP to implement either above surface or subsurface conveyors to transport the agricultural products from the LPV to VIF. This type of conveyor system is frequently used, including facilities at the port in North Vancouver.

<u>City Feedback on Other Topics Contained Within Sections 4 & 5</u>

- With respect to the City's feedback regarding the common carrier obligations, as well as CP's assessment of the need for the LPV, refer to 'EEE Section #2 – Overview';
- With respect to the City's feedback regarding CP's assessment that the LPV will have economic benefits, refer to 'EEE Section #17 / CP Valued Component #9 – Employment and Regional Economy';
- With respect to the City's feedback regarding CP's assessment that the LPV will have environmental benefits, refer to 'EEE Section #23 – Effects of the Environment on the Project & EEE Section #24 – Contributions to Climate Change Reductions'
- With respect to the City's feedback regarding CP's assessed duration of the pre-construction phase of the Project, refer to 'EEE Section #16 / CP Valued Component #8 – Transportation'.

## EEE Section #8 – Evaluation Scope and Methodology

<u>Valued Components and Evaluation Boundaries</u>

The City provided feedback on CP's CSE and TOR with respect to the Valued Components and Evaluation Boundaries, many of which have gone unaddressed, including, but not limited to:

- Air Quality VC:
    - The Local Evaluation Area (LEA) needs to be more constrained than 10km by 10km to effectively measure local effects;
    - The Regional Evaluation Area (REA) for greenhouse gas emission assessment needs to be smaller than all of BC. Metro Vancouver compiles and publishes regional and municipal GHG emission data; therefore a more detailed assessment is both suitable and feasible.
- Vegetation and Wetlands VC:
    - The LEA and REA should include the same spatial extent as groundwater and surface water as these are connected issues.
- Utilities and Community Services VC:
    - Port Coquitlam should to be included in the REA.
- Surface Water, Groundwater, and Drainage VC:
    - For adequate evaluation of surface water, groundwater, and drainage impacts caused by the proposed Logistics Park Project, the REA should be extended South to the Fraser River.

Cumulative Effects Evaluation & Project Inclusion List

For CP's cumulative effects evaluation, CP notes that "past, present, and reasonably foreseeable future projects and activities (are) included in the cumulative effects evaluation" and that "the VC effects assessment reports provide an evaluation of the potential interaction(s) between the Project's residual effects and those of the other projects and activities identified, and considers mitigation measures". CP erroneously excluded several critical projects from their cumulative effects evaluation; therefore, the cumulative impacts associated with the LPV are understated in the EEE, which resulted in insufficient mitigation measures. Projects CP omitted from their evaluation included:

- VIF
    - The Vancouver Intermodal Facility is a 66 ha rail facility, located just to the north of the proposed LPV
    - Current rail operations include:
        - Construction and departure of two eastbound intermodal trains to Toronto and Montreal;
        - Termination and disassembly of two westbound intermodal trains from Toronto and Montreal;
        - Construction, departure, termination, and disassembly of one daily shuttle train to Deltaport in Tsawwassen;
        - Departure and termination of substantial volumes of trucks.
    - The cumulative impacts of VIF and the LPV will be substantial due the extent of operations as well as the immediate vicinity of the proposed LPV.

Therefore, CP's evaluation of cumulative effects is deficient, and CP should revise their evaluation for all VCs considering VIF, namely noise, vibration, air quality, human health, surface water, groundwater, drainage, and transportation.

- CP Mainline Tracks
  - CP's mainline tracks accommodate up to 28 freight trains per 24 hours, with this quantity expected to double by 2030
  - The cumulative impacts of the mainline tracks and the LPV will be substantial due the extent of operations as well as the immediate vicinity of the proposed LPV. Therefore, CP's evaluation of cumulative effects is deficient, and CP should revise their evaluation for all VCs considering VIF, namely noise, vibration, air quality, human health, surface water, groundwater, drainage, and transportation.
- Maersk Facility
- Golden Ears Business Park
- Development of Pitt Meadows Airport

## EEE Section #18 / CP Valued Component #10 – Utilities and Community Service

<u>General Errors, Omissions, Concerns and Feedback</u>

- Pitt Meadows Fire and Rescue Services does not have the personnel, equipment, infrastructure, or specialized training to safely and adequately respond to the vast majority of emergency scenarios for the Logistics Park. For additional information, refer to 'EEE Section #22 – Accidents & Malfunctions';
- CP states in Section 18.4.3 that it will "…meet water supply demand for the Project including fire flow demands…" and states in Section 22.7.4.2.1 that "the fire services building will house the fuel facility pump…capable of providing the maximum flow requirement of 20,800 L per minute." CP also states in Section 18.4.2.1 that "CP is presently reviewing options for the potable and fire water supply…". Water supply requirements, especially for fire services, is a necessity in determining the functionality of the high hazard commodity facility such as the LPV. If a water supply that meets the demands of the LPV is not available, then the current site is not feasible for the Proposed Project.

<u>Specific Errors, Omissions, Concerns and Feedback</u>

18.4.2.3 Change in Demand for Emergency Services

- PMFRS' paid on call staffing model is taxed at current volumes. An increase in demand for service during pre-construction, construction and operations would require additional resourcing for PMFRS to be able to respond and handle this increase call volume;
- This section indicates response by Maple Ridge and impacts to their service levels. The City of Pitt Meadows cannot dictate operations for The City of Maple Ridge, and this increased call volume impact would need to be discussed with them directly.

18.4.5.1 Increase in the Demand for Emergency Services

- It is important to note that the service level of PMFRS is not to the same service level as other Fire Departments throughout the lower mainland. CP needs to conduct an emergency services specific gap analysis to determine who will be responding to incident types PMFRS does not provide, including, but not limited to, technical rescue, hazmat, and other services.

## EEE Section #2 – Overview

Throughout their engagement process, as well as in Sections 2 and 5 of the EEE, CP has referred to Sections 113-115 of the *Canada Transportation Act*, also informally known as 'common carrier obligations' to justify the Logistics Park.

This assertion appears contradictory to documentation submitted by CP for matters independent of the Logistics Park project, where it appears that CP has argued that not only is a railway company not bound to accommodate future speculative growth, but also that a railway company isn't bound to accommodate current demand.

On January 14, 2019, the CTA initiated an investigation into possible freight rail service issues in the Vancouver area, pursuant to subsection 116(1.11) of the Canada Transportation Act., 1996, c.10, as amended. In CP's response document, titled "*Canadian Pacific Railway Company Response Submitted March 26, 2019*" (https://otc-cta.gc.ca/sites/default/files/VFRI/vfri-cp-answer-20190326.pdf), CP refers to the Supreme Court of Canada's decision *Patchett & Sons Ltd. v Pacific Great Eastern Railway Co.*, (1959) S.C.R. 271, stating that:

- "In Patchett, Justice Rand stated that the governing principle of commercial reasonableness entailed that the economics of the railway company were always to be an essential consideration when determining level of service, and that a railway company was not bound to furnish cars at all times sufficient to meet all demands of its shippers but rather only to provide "a reasonable service" (Patchett pp. 274-5)"; and

- "There is no absolute obligation to furnish cars at all times sufficient to meet all demands."

If it is CP's assessment that a railway company has no obligation to furnish cars at all times sufficient to meet all demands, a logical determination is that this would also apply to rail yards that accommodate such rail cars, as well as, the commodities moved by these rail cars.

Furthermore, contained within the CTA's Letter Decision No. CONF-9-2019 ([https://otc-cta.gc.ca/eng/ruling/conf-9-2019](https://otc-cta.gc.ca/eng/ruling/conf-9-2019)), the CTA outlines that:

- "[37] Patchett establishes that the "statutory duty imposed upon the [railway company] is not an absolute duty but is only a relative one to provide service so far as it is reasonably possible to do so," that the duty is "permeated with reasonableness", and that "how each situation is to met depends on its total circumstances.""; and
- ""*In Canadian National Railway Company v. Northgate Terminals Ltd.*, 2010 FCA 147 (Northgate), the Federal Court of Appeal explained that the "propositions" laid out in Patchett "are guidelines that must inform any determination by the Agency of a service complaint, but they do not necessarily compel a particular outcome. That is because the determination of a service complaint requires the Agency to balance the interests of the railway company with those of the complainant in the context of the particular facts of the case.""

Based on the understanding of the Canada Transportation Act, as well as apparent positioning by both CP and the CTA, it is the City's assessment that the common carrier obligation does not necessarily require railway companies to expand operations based on speculative future growth nor current demand. Therefore, CP's continued reliance on the common carrier obligation to justify the Logistics Park appears unsubstantiated and contradictory.

Furthermore, CP has continued to state in their LPV documentation that that there is an 'increased rail demand' and 'significant additional interest' to justify the Logistics Park, but does not provide evidence to substantiate this statement. Instead, CP uses phrases such as 'it is anticipated that additional customers will react to the…opportunity" and that the LPV will "provide suppliers with additional capacity in the event of disruptions and outages". These phrases are qualitative and speculative, and in the absence of quantitative data, appear to suggest that there currently may not be enough customer demand to justify the proposed Logistics Park.

The ‘common carrier’ mandate does not appear to fully apply to CP’s justification for the Logistics Park, as:

- Transloading agricultural products is a diversification of current business offerings and not a core shipping service. This is shown by CP’s statement that “A key goal of the project is to give agricultural producers an alternative…model…”;
- The fuel handling component of the project is identified as providing fuel storage to buffer for hypothetical rail service disruptions (i.e. non-foreseeable and non-cyclical);
- The car lot is simply a relocation of existing services, rather than a providing a new service based on increased demand. As stated in Section 16.3.3, “The new auto transloading facility is anticipated to relocate auto transloading activity with CP facilities in Pitt Meadows but not increase overall transloading volumes.”

## EEE Section #3 – Regulatory Framework

Under Section 3, CP states that they “compl(y) with the spirit of provincial and municipal legislation and is applying for permits under specific legislation” and that “CP’s project team has fully considered provincial and municipal legislation and regulations”. The City disagrees with CP’s assessment, as it is clear that that the Logistics Park does not comply with the spirit of many provincial and municipal legislations, nor has CP provided adequate consideration of these legislation and regulations. This includes, but is not limited to:

- Pitt Meadows Policy No. C038: Fire & Rescue – Service Level Establishment & Limitations:
  - Refer to ‘EEE Section #22 – Accidents & Malfunctions’ for additional feedback.
- Pitt Meadows Fire Protection and Life Safety Bylaw No. 2405:
  - Refer to ‘EEE Section #22 – Accidents & Malfunctions’ for additional feedback.
- Pitt Meadows Extraordinary Traffic Bylaw No. 583:
  - Refer to ‘EEE Section #16 / CP Valued Component #8 – Transportation’ for additional feedback.
- Pitt Meadows Soil and Fill Deposit Regulation Bylaw No. 2593:
  - Refer to ‘EEE Section #16 / CP Valued Component #8 – Transportation’ for additional feedback.
- Pitt Meadows Drainage System Protection Bylaw No. 2266:

  - Refer to 'EEE Section #11 / CP Valued Component #3 – Surface Water, Groundwater, and Drainage' for additional feedback.
- Pitt Meadows Subdivision & Development Servicing Bylaw No. 2589:
  - Refer to 'EEE Section #11 / CP Valued Component #3 – Surface Water, Groundwater, and Drainage' for additional feedback.
- Pitt Meadows Noise Control Bylaw No. 2138:
  - Language in Section 10 of the EEE suggests that work will be completed outside the hours specified in the City's Noise Control Bylaw
- Pitt Meadows Official Community Plan Bylaw No. 2352:
- Pitt Meadows Zoning Bylaw No. 2505:
- Agricultural Land Commission Act:
  - The ALC has stated that it "cannot support the CP Logistics Park Proposal because of the permanent loss of scarce highly capable agricultural land that would result and the disruptive effects of the development on surrounding agricultural lands and farm operations"
  - Refer to ALC's letter dated March 5, 2021
- Metro Vancouver Regional Industrial Lands Strategy:
  - CP's proposal to develop a low-density industrial use on greenfield agricultural land with a layout that is uncoordinated with existing operations does not appear to be consistent with the themes or recommendations identified in the Metro Vancouver Industrial Lands Strategy;
  - For additional feedback, refer to Pages 13-15 of Appendix A of the City's Assessment of the Draft Terms of Reference (dated July 29, 2021).
- Metro Vancouver – RGS amendment:
- Metro Vancouver – Air Quality Permit:
- Metro Vancouver – Water & Sewer service:

## EEE Section #25 – Summary of Residual Effects and Mitigation & EEE Section #26 – Environmental Management and Monitoring

It is the City's assessment that when considering the concerns outlined in this document and in Appendices B-F, that the EEE contains deficiencies of such a high volume and degree of magnitude that it is currently unreasonable to conclude that CP was able to accurately identify all impacts caused by the proposed Logistics Park and by extension, propose adequate mitigation to address these impacts.

**REVIEW REPORT**

# Third Party Review

## *Canadian Pacific (CP) - Environmental Effects Evaluation for Proposed CP Logistics Park: Vancouver Air Quality and Human Health Sections*

Prepared for:
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**Envirochem Project No.: 21162**

**Date January 2022**

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# REVIEW LIMITATIONS

This report (the "Report") was prepared for the exclusive use of the City of Pitt Meadows for the express purpose of providing a third-party review of specific components (Section 9.0 Air Quality, and Section 19.0 Human Health) of an Environmental Effects Evaluation (EEE) as described in the report. In assessing the components, Envirochem Services Inc. and associates (Envirochem) has relied in good faith on information provided by others. We have assumed that the information provided is factual and accurate. We accept no responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of omissions, misinterpretations or fraudulent acts of others.

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The scope of Envirochem's review is described in this Report, and are subject to restrictions, assumptions and limitations. Envirochem's opinions are based upon information that existed at the time of the writing of the Report and that was described by others in the documents reviewed. It is understood that the services provided for in the scope of work allowed Envirochem to form no more than an opinion of the actual conditions at the site and evaluations undertaken at the time the work was carried out, and cannot be used to assess the effect of any subsequent changes in any laws, regulations, the environmental quality of the site or its surroundings.

The results of an assessment of this nature should in no way be construed as a warranty that the remainder of the EEE, or its underlying data, which could not be reviewed, is free from any and all errors, omissions, or inconsistencies.

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# APPENDICES

# GLOSSARY OF TERMS

| Acronym | Definition |
|---|---|
| AAQO | Ambient Air Quality Objective |
| CAAQS | Canadian Ambient Air Quality Standards |
| CAC | Criteria Air Contaminant |
| COPC | Contaminant of Potential Concern |
| CP | Canadian Pacific Railway |
| DPM | Diesel Particulate Matter |
| EEE | Environmental Effects Evaluation |
| ENV | British Columbia Ministry of Environment and Climate Change Strategy |
| EPA | United States Environmental Protection Agency |
| HHRA | Human Health Risk Assessment |
| HQ | Hazard Quotient |
| ILCR | Incremental Lifetime Cancer Risks |
| LPV | CP Logistics Park: Vancouver |
| MOVES | MOtor Vehicle Emissions Simulator (US EPA Model) |
| MPOI | Maximum Point of Impingement |
| RAC | Railway Association of Canada |
| TC | Tolerable Concentration |
| TRV | Toxicity Reference Value |
| IUR | Inhalation Unit Risk |
| VFPA | Vancouver Fraser Port Authority |
| VOC | Volatile Organic Compounds |

# 1.0 INTRODUCTION AND BACKGROUND

Canadian Pacific Railway (CP) is proposing to construct a new transloading and logistics facility, CP Logistics Park: Vancouver (LPV), in Pitt Meadows, BC and have recently conducted an Environmental Effects Evaluation (EEE) of the project. The City of Pitt Meadows retained Envirochem Services Inc. and associates (Envirochem) to conduct a third party review of the version of the EEE publicly released on January 7th 2022. While the full EEE assessed many potential environmental impacts of the proposed project, Envirochem was asked to review the following specific sections:

- Volume 2 - Section 9.0 - Air Quality, and
- Volume 3 - Section 19.0 - Human Health.

Envirochem has assessed the approaches taken, assumptions made, and conclusions reached by the EEE. Findings and comments are detailed in **Section 2.0** for Section 9.0 Air Quality of the EEE, and **Section 3.0** for Section 19.0 Human Health of the EEE. Where comments are very specific in nature to sections of the reviewed EEE, these comments are presented in a table format in **Appendices A** and **B** for comments on Section 9.0 and 19.0 of the EEE, respectively.

# 2.0 REVIEW COMMENTS ON THE AIR QUALITY ASSESSMENT

The air quality impact assessment portion of the EEE is summarized in Volume 2 – Section 9.0 of the EEE Report. The methods, assumptions and findings outlined in Volume 2 – Section 9.0 of the EEE Report were reviewed and comments/suggestions are provided below. In addition to the comments presented in the following sections, lower priority detailed comments on specific aspects of the air quality assessment are provided in **Appendix A**.

In many cases the level of detail reported in the draft EEE was insufficient to assess and verify the suitability of the methods applied. This was most notably the case for the sections of the air quality assessment that explained the emissions calculations, and the inputs that were used in the dispersion modelling assessment. The limited ability to review the methods and approach of this study in detail is a common theme in this review as only high-level summaries of approaches are provided, or there is a lack of source citation (or cited sources are not publicly available) and/or justification in many areas of the EEE.

Similar to how the level of detail is often limited when describing specific methods applied in the draft EEE, limitations of the methods used, the data available, and assumptions made during this air quality assessment were often not stated or discussed. Findings were often presented as definitive and in some cases without adequate support. This lack of discussion of limitations does not allow for consideration of areas where uncertainty exists around the findings of this air quality assessment and how these limitations may impact the conclusions presented in this section of the EEE.

## 2.1 Selection of Pollutants and Thresholds for Assessment

No rationale is provided for why certain criteria air contaminants (CACs) (namely carbon monoxide and ozone) were excluded from this study. Additionally, the approach for identifying the additional non-CAC pollutants, including specific volatile organic compounds (VOCs), for inclusion in this study is discussed from a Human Health assessment standpoint in **Section 3.0** below. Rationale is not provided for the exclusion of other potentially relevant air contaminants from the evaluation (e.g., dioxins/furans, metals, other VOCs).

Where air quality objectives are not regionally available, the described approach applied in the study of identifying and using the most stringent air quality objectives from other jurisdictions (namely Alberta, Ontario, and Texas) to assess each contaminant and averaging period is typical for this type of study and conservative. However, for some of the contaminants evaluated, the EEE excluded some more stringent objectives from these jurisdictions without providing justification.

Table 9.4 includes a footnote identifying that the annual Ontario objectives presented for benzene and 1,3-butadiene have been adjusted; however, it is not clear what adjustment has been made here. The Ontario annual objectives for benzene and 1,3-butadiene are both an order of magnitude lower than the values presented in Table 9.4 at 0.45 µg/m$^3$, and 2 µg/m$^3$, respectively. Additionally, the 24-hour Ontario ambient air quality objectives of 2.3 µg/m$^3$ for benzene and 10 µg/m$^3$ for 1,3-butadiene are excluded from Table 9.4 without justification presented in the EEE. If the Ontario 24-hour and annual objectives for benzene were used to assess the benzene modelling results, exceedances of each of these values would be predicted at sensitive receptor locations.

The Texas Commission on Environmental Quality (TCEQ) presents multiple air quality threshold types for some of the VOCs and averaging periods included in this study. The approach used to select between these thresholds for each contaminant is not explained in the EEE. It appears the TCEQ thresholds that were selected are based on a hazard quotient (HQ) of 1 to be considered in the human health aspect of the EEE. Justification is not presented for why the TCEQ short-term and long-term Effects Screening Levels (ESLs) were not considered in Table 9.4 for identification of the most stringent air quality criteria and used for assessment of potential air quality exceedances. In more than one case the ESLs are lower than the most stringent air quality criteria identified for evaluation of a particular VOC and averaging period.

## 2.2 Existing Conditions Review

Within the description of the regional climate, the EEE identifies that the predominant wind directions in the vicinity of the LPV are from the northeast. This factor is important for a number of reasons related to the ambient air quality concentrations monitored by the Metro Vancouver (MV) air quality monitoring station in Pitt Meadows (Station T20). This monitoring station is located to the north of the proposed LPV location and the existing CP operations in Pitt Meadows (the Vancouver Intermodal Facility (VIF), and mainline freight trains). As a result of the winds at the station location predominantly coming from the opposite direction to the rail operations, the air quality captured by the monitoring instruments at this station are likely to not include the full impacts of existing rail operations. Assessment of air quality concentrations relative to wind directions at this monitoring station show when the wind direction is from the south, concentrations of air contaminants such as $PM_{2.5}$ and $NO_2$ are often higher that when the wind direction is from the north (land use to the northeast is predominantly agricultural or forested land with fewer transportation and industrial emission sources) [1]. Ambient air concentrations (especially for short-term periods) are also likely to be higher closer to the rail operations and emission sources than at the location of the T20 monitoring station due to dispersion of air contaminants from these emission sources prior to them reaching the monitoring station location.

This is also relevant to the suggestions in Section 9.6 of the EEE that this existing air quality monitoring station will sufficiently capture the impacts of emissions from this proposed project on local air quality. Monitoring of air quality closer to the rail operations and associated emission sources, or downwind (relative to predominant wind directions) of the proposed LPV are likely to capture higher air contaminant concentrations. It is recommended that CP conducts air quality monitoring of contaminants of concern at appropriate location(s) to assess air quality impacts of the project.

While the calculation of baseline concentrations is described to be in accordance with the BC Air Quality Dispersion Modelling Guideline (BCAQDMG 2015), no further detail is provided as to the approaches used to calculate the presented baseline concentrations for each contaminant. Missing details include:

- The source of data for contaminants that are not commonly monitored by the MV air quality monitoring network (i.e., DPM and individual VOCs),
- The years of monitored data considered,
- Whether any data periods were excluded, and
- The statistical approaches applied.

[1] https://www.pittmeadows.ca/our-community/city-planning-projects/air-quality-study-train-emissions

As discussed above, these baseline values are likely to be lower than the ambient air quality concentrations at locations closer to the rail operations. This factor is not discussed in the EEE as a potential limitation of the evaluation (both for evaluation of predicted air quality concentrations relative to air quality thresholds, and in the human health assessment of the air quality results).

## 2.3 Emissions Calculations

The calculation of air emissions from the proposed project is a key aspect of the air quality assessment. As one of the main inputs for dispersion modeling, it has a direct impact in determining the predicted air contaminant concentrations considered in the human health study. As discussed above, there was an insufficient level of information provided in the EEE to allow us to identify whether the project emissions were calculated appropriately. This is especially notable for transportation emissions such as those from locomotives and other vehicles, where multiple variables influence the emissions from their operation.

Activity levels used in the emission calculations are not clearly presented, especially for locomotive activities including operational times and distances. For example, it is stated that manifest trains are not included as they “will not operate for extended periods at the Project site”, however, emissions from these manifest trains will have a cumulative effect with other anticipated emissions from the LPV and should be considered. Likewise, the number of trucks included in the emissions calculations and operating times are not immediately clear and have to be inferred from other sections of the EEE.

Emission factors used for locomotive emissions are loosely described, and along with duty cycles for terminal switchers, are referenced to personal communication. As a result, it is therefore not possible to assess which year emission factors are based on (the predicted distribution of locomotive ages in the operational fleet has a large impact on anticipated emissions as average locomotive emissions are expected to reduce over time as newer locomotives with improved emission controls enter the fleet), and whether duty cycles or idling times appear reasonable. The report identifies that an assumption is made that all unit train locomotives will meet US EPA Tier 1+ emission standards by the expected project start date (2028), but also states that "a large portion will meet" the Tier 1+ standards by 2028, which seem to contradict this assumption. The assumption is based on CP’s modernization program, which aims to reduce emissions with emission reduction technologies. Although it is possible CP’s modernization program will allow their fleet to meet Tier 1+ standards by 2028, the details/feasibility for the implementation of the program is not disclosed or referenced. Further clarity/confirmation that these standards will be met by the project start date is needed to validate this assumption. Separate of this assumption of the lowest emission tier of the locomotives, it is unclear if all locomotives were therefore assumed to be Tier 1+, or if a fleet distribution was used with a proportion of locomotives of higher emission tiers.

Similarly, limited details are provided for how emission rates were extracted from the US EPA MOVES model to estimate emissions from vehicles associated with the project. One factor noted here is that the speed parameter used in this model is listed as being based on “the design speeds of the roads (i.e., 40 km per hour [km/h] for the CPLPV access road and 50 km/h for Kennedy Road)”. This appears to be an unrealistic assumption as it is unlikely that heavy trucks accessing and operating at the LPV will consistently operate at the 40 km/h speed identified, due to both the layout of the roads and intersections on site, and the likelihood of lower site speed limits being implemented for safety reasons. Likewise, trucks are unlikely to consistently operate at the 50 km/h speed limit on Kennedy Road; the average speed is likely lower due to the short distances between the LPV and VIF entrances (for the trucking of agricultural products), intersection controls, and the Kennedy Road at-grade rail crossing. The speed parameter used to extract the emission rates for these vehicles is a key variable in the MOVES model. At higher average speeds, the model assumes vehicles are cruising, thus predicting lower emission rates; at lower average speeds, the model factors in periods of acceleration and braking, thus predicting higher emission rates. Using lower average speeds for the vehicle movements would therefore lead to higher emission estimates. For example, if emission rates are extracted from the MOVES model for trucks with an average speed of 15 km/h (referenced in Mitigation Measure M19-4), the total exhaust particle emission rate would be approximately 40% higher, and the total hydrocarbon emission rate approximately 150% higher, than the emission rates that are extracted if the average speed applied in this project of 40 km/h is used.

Additionally, the scope of vehicle activities included in the emissions inventory and modelling, such as the spatial extent that was considered and the inclusion of idling emissions, is unclear from the level of detail presented. While it is stated that vehicle traffic on Lougheed Highway and beyond were not included, providing a spatial bound for trucks arriving and leaving CP's operations in Pitt Meadows, it is unclear to what extent the heavy truck traffic between the proposed LPV and existing VIF, and vehicle activities on site were considered.

When describing the emission calculation methodology from road dust re-entrainment, the in-text reference to the US EPA AP-42 document appears to refer to the unpaved roads emission factors rather than the applicable paved roads emission factor section. The silt loading factor used in this calculation is not specified other than "default silt loadings" were used. The silt loading factors recommended in this method are dependent on the number of vehicles using the road section. It is expected that the default silt loading factor used was likely 0.2 g/m$^2$ for all roads based on average daily traffic on Kennedy Road and on internal roads within the LPV both likely falling in the range of 500-5,000 vehicles a day (based on the US EPA AP-42 Paved Roads methodology). Following the finding that road dust is the largest contributor to predicted exceedances by the dispersion model, the EEE suggests this silt loading value is likely a conservative assumption. This could be true but without site-specific data this remains unclear.

There is not enough information presented to assess how additional emission source calculation methods (e.g., for fugitive dust and fugitive VOCs) were applied.

Table 9.7 presents a summary of emissions from project operation separated by emission calculation. As the particulate emissions from locomotives considered are all from diesel combustion, the predicted DPM emissions are equal to the $PM_{10}$ emissions (with the vast majority at 97% being smaller than 2.5 microns, i.e., $PM_{2.5}$). While other particulate emission pathways are considered from vehicle traffic such as brake wear and tire wear (using emission factors from the MOVES model), and some exhaust emissions are expected to be from gasoline vehicles, it is not clear why the DPM emissions relative to the $PM_{2.5}$ emissions predicted for vehicle traffic are only 5%, especially considering the large number of diesel-powered heavy trucks (approximately 748) which will service the project per day. Without further detail on which vehicle activities associated with the project were considered in the emissions calculations, it is not possible to evaluate why these DPM emissions appear lower than expected.

## 2.4 Air Quality Dispersion Modelling

The CALPUFF dispersion modelling system is the most common software used for air dispersion modelling studies in the Metro Vancouver region and is an appropriate choice for the air dispersion modelling study. In most air dispersion modelling projects, it is standard practice to outline important details regarding the setup of the model and inputs used, however, in this assessment the details provided are insufficient. Important methodological specifics required to adequately assess the modelling approach utilized in this study include, but are not limited to, the following:

- Which version of each model within the CALPUFF dispersion modelling system was used?
- Information on the meteorological modelling conducted such as:
  - What prognostic meteorological data was used?
  - Was CALMET ran in hybrid mode utilizing station observation data, and if so, which stations were included?
  - Which year(s) were modelled?
  - What size domain was used for meteorological modelling (was this large enough to capture the terrain features close to the LEA), and what grid resolution was used?
  - Were QA/QC checks performed to assess the validity of the CALMET input and output data and what were the findings?
- Identification of the receptors used in the CALPUFF model:
  - What was the size and density of the receptor grid?
  - Which sensitive receptors were considered? Some sensitive receptors are presented on the choice results figures included but these do not identify any residences other than two residences close to the project where exceedances are predicted.
- Maximum predicted dustfall is presented in Table 9.8 implies that deposition was modelled. However, this is not described in the body of the EEE, and it is not clear if wet and dry deposition was modelled, or whether deposition results were considered in the prediction of ground-level air contaminant concentrations. Considering deposition in predictions of air contaminant concentrations is not a common practice.
- What height above ground was used for receptors in the model? To model dustfall/deposition, a receptor height of 0 m is required, whereas to model ground-level concentrations of air contaminants, it is common practice to use a typical breathing height of 1.5 m. The difference in receptor height between 0 and 1.5 m can have meaningful impacts on the model results. For potential future development, and for potential multi-storey buildings, what considerations were made for potentially elevated receptors?
- What source types and parameters were used to characterize the emission sources in the model?
- Were multiple scenarios considered for the time periods relevant to the assessed air quality objectives? For example, were higher worst-case emission rates assessed for short-term 1-hour objectives, or were these predictions based on daily average emissions?
- The approach to convert model predicted concentrations of nitrogen oxides (NOx) to nitrogen dioxide concentrations ($NO_2$) is not described. A footnote on Table 9.5 suggests NOx baseline concentrations were added to the model predictions prior to the conversion of NOx to $NO_2$. This approach does not follow the most recent $NO_2$ modelling guidance published by the BC Ministry

of Environment and Climate Change Strategy (ENV) [2] which identifies that $NO_2$ baseline concentrations should instead be added to the $NO_2$ model predictions after the conversion is completed. The ENV approach would likely result in higher results for $NO_2$ than those presented in this section.

The $NO_2$ results are described in this section as not exceeding existing ambient air quality criteria, prior to comparison to the lower 2025 CAAQS. As this project is not proposed to begin operation until after 2025, the project should be reviewed relative to the 2025 CAAQS and results described as such. While background $NO_2$ concentrations may decrease due to the factors described in the EEE ahead of potential project operation, other factors may negate some of this decrease on a local level. Some changes in emission sources in the LEA are not considered in this assessment, specifically the anticipated doubling of mainline rail traffic from current operation to 2030 projections [3] which will occur adjacent to the proposed project location. Additionally, the Metro Vancouver area is expected to see a population increase ahead of the project operation timeline which could lead to a higher number of vehicles on local and regional roadways which could negate some of the potential reduction in background concentrations that could be achieved by a reduction in average NOx emission per vehicle due to the factors described in the EEE.

With regards to consideration of the predicted increases in mainline rail traffic, 9.4.2.3 of the EEE implies that increased rail traffic was considered as part of the Ausenco Rail Simulation Study and the assessment of indirect regional effects, therefore, it is notable that these predicted increases are not considered in the air quality assessment as they are relevant to this project.

## 2.5 Mitigation Measures

Section 9.4.3 of the EEE presents proposed mitigation measures to avoid or reduce adverse effects of the project on air quality. A number of the mitigation measures presented in this section will only be effective if employed correctly, are retained over the life of the project, and the daily operations of the proposed project follow these measures. While it is understandable at this stage of a project proposal to not have full details of these mitigation measures finalized, the operating procedures that govern their application directly impact potential emissions. Examples of this include:

- Mitigation M9-4 identifies that water will be applied to reduce dust generation and enhance particle deposition during construction phases. How will dry periods be identified and how frequently is this anticipated to be employed? More details should be provided on this mitigation measure.
- Mitigation M9-7 identifies an anti-idling policy will be in place for trucks accessing the facility in line with the City of Pitt Meadows policy for municipal vehicles (maximum idling time of 3 minutes). How will this anti-idling policy be enforced? Trucks are specifically mentioned in this description but will this policy also apply to other vehicles and equipment on site? Will this policy apply to all project related activity, such as the truck travel between the LPV and VIF when trucks

[2] *Guidance for $NO_2$ Dispersion Modelling in British Columbia* – British Columbia Ministry of Environment & Climate Change Strategy, 2021
[3] *Pitt Meadows Roald and Rail Improvements Project: Noise and vibration study results* – Vancouver Fraser Port Authority, 2021

are held at the Kennedy Road at-grade rail crossing of the mainline, or be restricted to within the LPV? As a related clarifying question, it is unclear if idling emissions were included in the air quality assessment as discussed in **Section 2.3** above, and if the calculation of these emissions was based on this anti-idling time limit.

- Mitigation M9-8 discusses vacuum sweeping of Kennedy Road. Will this measure also be employed on the internal LPV roads? No details are provided as to what will trigger the implementation of this mitigation measure. During the pre-construction and construction phases of the project specifically, considerable dirt and dust could be tracked onto the internal LPV roads and out onto Kennedy Road and this mitigation measure should be employed regularly to reduce silt loadings and therefore road dust emissions.

Additional mitigation measures relating to air quality are presented in the human health section of the EEE. As these are mitigation measures to reduce air quality impacts, it is unclear why they are not also presented in the air quality section of the EEE. Comments on these measures are included here:

- Mitigation M19-3 describes avoiding earth works during periods of high winds. Are there wind speed thresholds at which earth works would be halted? And are there plans for meteorological monitoring of wind speed on site, or how periods of high wind speeds will be identified?
- Mitigation M19-4 describes not operating vehicles and heavy equipment above speeds of 15 km/h where dust is a concern. This is notable relative to the discussion in **Section 2.3** above of the influence of vehicle speeds on emission rates. Emissions calculations in the air quality section describe using the design speed limits of the site roads for identification of appropriate emission factors using MOVES (i.e., 40 km/h for internal LPV roads and 50 km/h for Kennedy Road). Higher emissions would be predicted for lower operating speeds such as 15 km/h than those presented in the air quality section of the EEE.
- Mitigation M19-5 is identified in Table 19.18 as implementation of a fugitive dust monitoring program. No details are provided of what monitoring will be conducted as part of this plan and if this monitoring plan will include air quality monitoring, as Section 9.6 concludes that no air quality monitoring is required on site. It should be noted that the same mitigation identifier (M19-5) is described as reducing lighting in the text of Section 19.4.3.

## 2.6 Greenhouse Gases

Section 9.2.4.2 discusses greenhouse gases (GHGs) and targets including reference to the Metro Vancouver Climate 2050 Strategic Framework. As this framework is referenced, it would be beneficial for the EEE to outline how this project will align with objectives and strategies outlined in the Climate 2050 Roadmaps that are part of this framework (especially rail in the Transportation Roadmap, and non-road diesel equipment in the Industry Roadmap).

In the report, the organizational and operational boundaries used to calculate GHG emissions were inadequately defined. This impacts the activities included in the GHG inventory and allows for comparison against relevant standards such as those listed in ISO 14064, the GHG Protocol Corporate Standard developed by the WBCSD and WRI [4], and BC's GHG Reporting Regulation [5].

It is not clear what activity levels and what inventory boundaries are assumed for each of the three scenarios (existing conditions, base case, build case) in the assessment of regional effects. It is therefore not possible to evaluate whether the assumptions in terms of rail and truck activities etc. included in each of these scenarios are appropriate. While Scope 1 (direct emissions from site) and Scope 2 (emission from off-site energy consumption) may have been calculated, the projects impact on Scope 3 (indirect) emissions is not clear. In the GHG emissions presented in Table 9.7, and the predicted changes in regional emissions presented in Table 9.9, the GHGs attributable to direct or indirect emissions is not clear. Additionally, Section 9.4.2.1 identifies that a quantitative assessment of emissions during the pre-construction and construction phases of the project was not completed; therefore, direct and indirect emissions from these phases are not included in the cumulative assessment of the project's impact. Not including a quantitative assessment of emissions for the pre-construction and construction phases of the project underestimates the project's cumulative GHG impacts.

## 2.7 Residual Effects Conclusions

Comments on the residual effects conclusions discussed in Section 9.4.4 are provided below. The source of the effects and ratings definitions used to assess residual effects is not described.

The magnitude of the pre-construction and construction effects are described in Table 9.12 as low as they "are expected to be minor relative to baseline and remain below ambient air quality criteria". This study has not assessed the air quality expected due to pre-construction and construction activities and it should be highlighted here that this has not been directly assessed. The previous project experience described here is not identified in enough detail to support these conclusions with confidence. By not assessing the impacts of the pre-construction and construction phases of the project, the overall air quality impacts of the project could be underestimated.

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[4] *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* – World Business Council for Sustainable Development & World Resources Institute
[5] *Greenhouse Gas Industrial Reporting and Control Act, Greenhouse Gas Emission Reporting Regulation* – Government of British Columbia

Magnitude of effect during the Project Operation phase is deemed to be moderate in Table 9.13. Based on the definition of the low, moderate, and high ratings for magnitude presented in Table 9.11 this seems incorrect. Moderate effect is defined as no exceedances of ambient air quality criteria at sensitive receptors; however, in this study exceedances of the TSP objective was predicted at the nearby residences, as well as exceedances of the 2025 CAAQS for $NO_2$ (which will be in place ahead of the project operation time period). If the magnitude of effects is changed to high, this would require the conclusion of significance to be changed from “not significant” to “significant”. Table 9.13 also defines the confidence of the effects characterization as "high”. As mentioned throughout this review, based on the level of detail presented in the EEE, it is difficult to assess if the assumptions made in the air quality study are conservative enough to warrant high confidence in the results.

## 2.8 Cumulative Effects Evaluation

A considerable number of additional projects are described in the Table 9.17, without clear inclusion criteria. The projects vary in distance from the proposed LPV, with some within the LEA, and others much further away where they are unlikely to have overlapping effects. The projects considered are all proposed or future projects, while the effect of changes in existing nearby operations such as the anticipated doubling of mainline rail traffic from current operations to 2030 projections are not described.

# 3.0 REVIEW COMMENTS ON THE HUMAN HEALTH RISK ASSESSMENT

The primary technical focus of our review of Volume 3 – Section 19.0 Human Health of the EEE was on the evaluation of risks related to air quality, water quality, and traditional foods, given particular expertise in these areas. It is our understanding that an additional third party review is being conducted to evaluate the noise and vibration components of the EEE of the proposed LPV in more detail.

The following guidance documents were consulted to inform the review:

- *Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA)*. Version 3.0. Health Canada. March 2021.
- *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Air Quality.* Health Canada. December 2016.
- *Human Health Risk Assessment for Diesel Exhaust.* Health Canada. March 2016.

The key findings of our review are presented below. A completed Health Canada (2016 [6]) review checklist for the air quality component of the Environmental Effects Evaluation (EEE) is attached.

## 3.1 Air Quality, Water Quality and Traditional Foods

The assessment of human health risks related to air quality, water quality and traditional foods is missing important elements, including information or rationale required to determine the validity of the approaches taken and the conclusions made. Additional information or rationale on the following topics is required to determine the validity of the EEE assessment:

- Section 19.3.2.2: The air quality evaluation included diesel particulate matter, various criteria air contaminants, and VOCs. Rationale is not provided for the exclusion of other potentially relevant air contaminants from the evaluation (e.g., carbon monoxide, dioxins/furans, metals, other VOCs).

- Section 19.4.2: It is stated in this section that: "conservative assumptions were made to bias the conclusions in the direction of being fully protective of human health in the face of any uncertainties". As described throughout this review, limited details are provided in many sections describing the methodology and approaches applied in this study. The conservative assumptions made, and uncertainties that are referenced here are not discussed in the EEE.

- Section 19.4.2.1: Some risk assessment practitioners and Health Canada (2004[7]) have advocated for the estimation of increased mortality and morbidity rates for the criteria air contaminants (i.e., $PM_{2.5}$, $NO_2$, $SO_2$, CO) since air quality objectives for these substances are not purely health-based and may not be adequately protective in some cases. Rationale is not

[6] *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Air Quality.* Health Canada. December, 2016.
[7] *Estimated Number of Excess Deaths in Canada Due to Air Pollution.* Health Canada. 2004.

provided for why the EEE did not include such an evaluation of mortality/morbidity and/or for the protectiveness of the exposure limits applied for these parameters.

- Section 19.4.2.1: It is stated that: “In general, the most stringent exposure limit most scientifically defensible limit was applied”. It is not clear or discussed if there were any cases based on this description where the most stringent exposure limit for a substance was not applied due to a limit being deemed not “scientifically defensible”.

- Section 19.4.2.1: It is not clear whether predicted exposure concentrations for the various receptor types (e.g., child care, residence) were modified by the exposure time, frequency and duration that such a receptor would be present, or if the risk estimates assume fulltime presence regardless of receptor type. There is some qualitative discussion of likely exposure time for the locations where exceedances of ambient air quality objectives are predicted but limited discussion of the methodology is presented.

- Section 19.4.2.1: Risk quotients (RQs) were compared to an acceptability threshold of one (1). Rationale is not provided for why Health Canada’s threshold of acceptable non-cancer health risks (RQ = 0.2) was not applied, given that rail operations are federally regulated.

- Section 19.4.2.1: RQs greater than 1 are presented for all sensitive receptor categories for $NO_2$. Where this result is described, it is deemed to be unlikely to occur “give the conservative approach used in the air dispersion modelling for NOx” and references the Air Quality section of the EEE. There is currently no detail provided in the text of the EEE detailing the approach used for NOx modelling.

- Table 19.11: An acute inhalation exposure limit of 3,700 μg/m3 was used for 1,3-butadiene. The Risk Assessment Information System (RAIS) recommends 660 μg/m3 based on data from CalEPA. There is no apparent rationale as to why this more conservative value was not used.

- Table 19.12: Health Canada (2016 [8]) identifies DPM as a carcinogen, though does not provide a cancer TRV. It is not clear whether the EEE evaluates the cancer risks of DPM, despite the availability of cancer TRVs from other health agencies (e.g., CalEPA).

- Section 19.4.2.4: It is not clear whether impacts to water quality related to the deposition of contaminants in dust were considered in the evaluation of human health risks from changes to water quality.

- Section 19.4.2.5: It is not clear whether impacts to plant and animal tissues related to the deposition of contaminants in dust were considered in the evaluation of human health risks from changes to the quality of traditional foods.

- Section 19.4.4.1: Acute and chronic effects for $NO_2$ were identified at sensitive receptors and are discussed in this section. While it is reasonable to discuss the level of conservatism built into the modelling approach for the short-term modelling of NOx (i.e., applying the 98$^{th}$ percentile of

[8] *Human Health Risk Assessment for Diesel Exhaust.* Health Canada. March 2016.

background values to each hour of the year as recommended in the BC Air Quality Dispersion Modelling Guidelines (BC AQDMG), this is less applicable when reviewing the model predicted annual average concentrations and the subsequent assessment of chronic health effects. For assessment of the annual average model results, the annual average of background concentrations should be added, which is less conservative and impacted less by high individual hours than the 98th percentile approach recommended for the 1-hour results. Table 19.15 presents a chronic RQ of above 1 for non-carcinogenic effects at a residence (it is unclear if this would be the case for multiple residences), and likely challenges the conclusion that the magnitude of health effects is low. As discussed in **Section 2.4** above, the factors presented here that may lead to a decrease in the baseline $NO_2$ concentration prior to project operation are reasonable, however other local factors are not discussed such as the projected increase in mainline rail traffic adjacent to the proposed project location during this same time period.

- Section 19.6: It is stated that the existing monitoring station operated by Metro Vancouver will be sufficient to monitor changes in ambient concentrations of CACs due to the Project. As discussed in **Section 2.2** above, the predominant wind direction at this station relative to the rail operations in Pitt Meadows is likely to lead to lower measured concentrations of air contaminants at this location than at sensitive receptor locations closer to, or to the south of, the existing and proposed rail operations.

## 3.2 Noise and Vibration

It is our understanding that additional third party reviews are being conducted to evaluate these components of the EEE of the proposed LPV in more detail.

## 4.0 CLOSURE

We trust this report meets your requirements at this time. If you have any questions or comments regarding this report, please contact the undersigned.

Yours truly,

**ENVIROCHEM SERVICES INC.**

File: 2022-03-17 CP EEE Third Party Review.Docx

# APPENDIX A:

# DETAILED COMMENTS ON CP LPV EEE

# VOLUME 2 – SECTION 9.0 AIR QUALITY

| Tracking Number | EEE Section | Subheading/ Table | Comment/Finding |
|---|---|---|---|
| A1 | 9.0 | - | The following abbreviations used in this section of the report are missing in the "ACRONYMS AND ABBREVIATIONS" section of the report: CAAQS, AEP, ECCC and MOVES |
| A2 | 9.1 | - | The third bullet notes that ambient concentrations with project are expected to remain below relevant air quality criteria at sensitive receptors. However, this study finds multiple exceedances of ambient air quality objectives. The final bullet point therefore may oversimplify the findings of the air quality study. |
| A3 | 9.2.3.1 | LEA | No information/rationale is provided on the choice of size of the LEA or regarding the size of the modelling domain. It is unclear if the CALMET domain is large enough to capture the effects of significant terrain to the north of the project location on the typical wind flows that are experienced in the local region. |
| A4 | 9.2.4 | Table 9.2 | The Canadian Locomotive Emissions Regulations (enforced by Transport Canada) should be considered when referencing key policies/guidelines. |
| A5 | 9.2.4.1 | Table 9.3 | The air quality evaluation included diesel particulate matter, various common criteria air contaminants, and VOCs. Rationale is not provided for the exclusion of other potentially relevant air contaminants from the evaluation (e.g., carbon monoxide, dioxins/furans, metals, other VOCs). |
| A6 | 9.2.4.1 | Table 9.3 | It should be noted that DPM and dustfall are not categorized as CACs. |
| A7 | 9.2.4.1 | Table 9.3 | Table 9.3, footnote (e): "Based on the annual 98th percentile of daily average". For CAAQs annual averages, the 3-year average of the annual average of the daily 24-hour average concentrations should be calculated. The statistical approach used should be confirmed to ensure the calculated value is correct. |
| A8 | 9.2.4.1 | Table 9.4 | Table 9.4 includes a footnote identifying that the annual Ontario objectives presented for benzene and 1,3-butadiene have been adjusted. It is not clear what adjustment has been made here. The Ontario annual objectives for benzene and 1,3-butadiene are both an order of magnitude lower than the values presented in Table 9.4 at 0.45 $\mu g/m^3$, and 2 $\mu g/m^3$, respectively. Additionally, the 24-hour Ontario ambient air quality objectives of 2.3 $\mu g/m^3$ for benzene and 10 $\mu g/m^3$ for 1,3-butadiene are excluded from Table 9.4 without justification presented in the EEE. If the Ontario 24-hour and annual objectives for benzene were used to assess the benzene modelling results, exceedances of each of these values would be predicted at sensitive receptor locations. |
| A9 | 9.2.4.1 | Table 9.4 | The Texas Commission on Environmental Quality (TCEQ) presents multiple air quality threshold types for some of the VOCs and averaging periods included in this study. The approach used to select between these thresholds for each contaminant is not explained in the EEE. It appears the TCEQ thresholds that were selected are based on a hazard quotient (HQ) of 1 to be considered in the human health aspect of the EEE. Justification is not presented for why the TCEQ short-term and long-term Effects Screening Levels (ESLs) were not considered in Table 9.4 for identification of the most stringent air quality criteria to be used for assessment of potential air quality exceedances. In more than one case the ESLs are lower than the most stringent air quality criteria identified for evaluation of a particular VOC and averaging period. |
| A10 | 9.2.4.2 | Greenhouse Gases | Section 9.2.4.2 discusses greenhouse gases (GHGs) and targets including reference to the Metro Vancouver Climate 2050 Strategic Framework. As this framework is referenced, it would be beneficial for the EEE to outline how this project will align with objectives and strategies outlined in the Climate 2050 Roadmaps that are part of this framework (especially rail in the Transportation Roadmap, and non-road diesel equipment in the Industry Roadmap). |
| A11 | 9.3 | - | The basis of the list of air quality drivers listed as impacting local air quality in this section and the relative magnitude of each is unclear. |

| Tracking Number | EEE Section | Subheading/ Table | Comment/Finding |
|---|---|---|---|
| A12 | 9.3.2.1 | Regional Climate | Within the description of the regional climate, it is highlighted that the predominant wind directions in the vicinity of the LPV are from the northeast. This factor is important for a number of reasons related to the ambient air quality concentrations monitored by the Metro Vancouver (MV) air quality monitoring station in Pitt Meadows (Station T20). This monitoring station is located to the north of the proposed LPV location and the existing CP operations in Pitt Meadows (the Vancouver Intermodal Facility (VIF), and mainline freight trains). As a result of the winds at the station location predominantly coming from the opposite direction to the rail operations, the air quality captured by the monitoring instruments at this station often will likely not include the full impacts of existing rail operations. Assessment of air quality concentrations relative to wind directions at this monitoring station show when the wind direction is from the south, concentrations of air contaminants such as PM2.5 and $NO_2$ are often higher that when the wind direction is from the north (land use to the northeast is predominantly agricultural or forested land with fewer transportation and industrial emission sources). Ambient air concentrations (especially for short-term periods) are likely to be higher closer to the rail operations and emission sources than at the location of the T20 monitoring station. |
| A13 | 9.3.2.2 | Table 9-5 | Table 9-5 does not provide information on the statistical forms used for the calculation of baseline concentrations for the contaminants and averaging periods. There is a lack of definition presented for the baseline calculations other than BC guidelines being followed, including but not limited to years of data considered, methods for data QA/QC, and statistical approaches used. |
| A14 | 9.3.2.2 | Table 9.5 | The data sources for baseline concentrations of DPM and VOCs in the LEA, presented in Table 9.5 are unclear |
| A15 | 9.3.2.2 | Table 9.5 footnote a | Table 9.5, footnote (a): states that NOx background levels were added to project related results prior to conversion to $NO_2$ which is against the recently updated provincial $NO_2$ modelling guidance. Additionally, details on the NOx conversion approach used are not presented in the EEE. |
| A16 | 9.4.1 | Table 9.6 | Table 9.6 notes that fugitive dust is the potential effect from roadways and truck queuing zones. It should be noted that roadways and truck queuing zones will also result in other emissions (i.e., idling of generated truck traffic) in addition to fugitive dust. |
| A17 | 9.4.2 | Potential Effects - Emissions of GHGs | What is considered 'direct' and 'indirect' emissions in this study are unclear. The organizational and operational boundaries used for the calculation of GHG emissions are not clearly defined. Further details would be needed to confirm estimations align with standards listed in the GHG Protocol Corporate Standard developed by the WBCSD and WRI for Scope 1, Scope 2, and Scope 3 emissions. |
| A18 | 9.4.2.1 | Project Pre-Construction and Construction | There is not enough information presented in this section of the EEE to confirm the conclusion that air emissions during pre-construction and construction project phases are minor. This study has not assessed the air quality expected due to pre-construction and construction activities and it should be highlighted here that this has not been directly assessed. The previous project experience described here is not identified in enough detail to support these conclusions with confidence. |
| A19 | 9.4.2.2 | Air Emissions from Project Operation | It is unclear if locomotive idling emissions were included in emission estimates. |
| A20 | 9.4.2.2 | Air Emissions from Project Operation | It is unclear if truck idling emissions during onsite idling and/or Kennedy Road rail crossing closures were considered in emission estimates. Additionally, it is unclear if the time limit in Mitigation M9-7 – Anti-Idling Policy is considered if these potential emissions are calculated. |
| A21 | 9.4.2.2 | Air Emissions from Project Operation | Details/assumptions for the emission factors used are not provided |

| Tracking Number | EEE Section | Subheading/ Table | Comment/Finding |
|---|---|---|---|
| A22 | 9.4.2.2 | Air Emissions from Project Operation | Details for the activity estimates/assumptions used in calculating emission rates for each activity are not provided |
| A23 | 9.4.2.2 | Loco/Switchers | CAC emission factors referenced from personal communication ('Bajwa comm, June 2021') are not provided or available to review |
| A24 | 9.4.2.2 | Loco/Switchers | Duty cycle information referenced from personal communication ("Bajwa comm, June 2021") and duty cycle assumptions not provided or available to review |
| A25 | 9.4.2.2 | Loco/Switchers | The report states a large portion of the locomotive fleet will meet US EPA Tier 1+ emissions standards by 2028 and assumes that all train unit locomotives meet these standards. Additional detail/references supporting that all trains would meet this standard is needed to confirm the assumption is reasonable. The report also states that "a large portion will meet" the Tier 1+ standards by 2028, which seem to contradict the assumption. It is unclear if all locomotives were assumed to be Tier 1+ or if a fleet distribution was used with a proportion of locomotives of higher emission tiers. |
| A26 | 9.4.2.2 | Loco/Switchers | The reference link for 'CP Rail 2021' appears to be broken |
| A27 | 9.4.2.2 | Vehicles | The parameters used for extracting emission factors from the EPA MOVES model (identified as obtained from Metro Vancouver) were not presented in the report to allow for review. |
| A28 | 9.4.2.2 | Vehicles | The speed parameter used to extract emission factors form the US EPA MOVES model is identified as being based on "the design speeds of the roads (i.e., 40 km per hour [km/h] for the CPLPV access road and 50 km/h for Kennedy Road)". This appears to be an unrealistic assumption as it is unlikely that heavy trucks accessing and operating at the LPV are able to reach the 40 km/h speed identified here on site, due both to the layout of the roads and intersections on site, and the likelihood of lower site speed limits for safety reasons. Likewise, trucks are unlikely to spend much time at the 50 km/h speed limit on Kennedy Road; the average speed is likely lower due to the short distances between the LPV and VIF entrances, intersection controls, and the Kennedy Road at-grade rail crossing or incline of the proposed overpass. The speed parameter used to extract the emission rates for these vehicles is a key variable as the MOVES model assumes at higher speeds the vehicles are cruising and predicts lower emissions rates, while if lower average speeds are used, the model considers a likely scenario factoring in periods of acceleration and braking and predicts higher emission rates. Using lower average speeds for the vehicle movements would therefore lead to higher emission estimates. For example, if emission rates are extracted from the MOVES model for trucks with an average speed of 15 km/h (referenced in Mitigation Measure M19-4), the total exhaust particle emission rate would be approximately 40% higher, and the total hydrocarbon emission rate approximately 150% higher, than the emission rates that are extracted if the average speed applied in this project of 40 km/h is used. |
| A29 | 9.4.2.2 | Vehicles | The scope of the vehicle activity considered in the emission calculations is unclear from the level of detail presented regarding the modelling of vehicles. For example, whether idling emissions of vehicles were included in the assessment and the spatial extent that was considered. While it is stated that vehicle traffic on Lougheed Highway and beyond were not included, providing a spatial bound for trucks arriving and leaving CP's operations in Pitt Meadows, to what extent the heavy truck traffic between the proposed LPV and existing VIF is considered is unclear. |
| A30 | 9.4.2.2 | Road Dust | This section notes that mitigation of precipitation was considered on annual basis but not hour to hour. It is unclear if the precipitation correction was applied to the evaluation of short-term air quality criteria such as 1-hour and 24-hour averages, or if multiple scenarios were modelled for the short-term and annual averaging periods. |

| Tracking Number | EEE Section | Subheading/ Table | Comment/Finding |
|---|---|---|---|
| A31 | 9.4.2.2 | Road Dust | It is unclear what silt loading value was assumed as a default for road dust calculations |
| A32 | 9.4.2.2 | Road Dust | The US EPA 2011 reference used in this section references AP-42 'Chapter 13.2.2: Paved Roads'. It should be noted that '13.2.2' is the AP-42 section number for unpaved roads. It is unclear if paved or unpaved road emission factors were used in emission calculations. |
| A33 | 9.4.2.2 | Emissions Summary | Emissions inventory/calculations used in developing the emissions summary shown in Table 9.7 are not included in sufficient detail as part of the EEE to review the calculated emissions presented. |
| A34 | 9.4.2.2 | Table 9.7 | Direct' and 'indirect' GHGs were described earlier in this report. However, is it unclear if the GHG emission quantified in this table refer to direct or indirect emissions. |
| A35 | 9.4.2.2 | Table 9.7 | Table 9.7 presents a summary of emissions from project operation separated by emission calculation. As the particulate emissions from locomotives considered are all from diesel combustion, the predicted DPM emissions are equal to the PM10 emissions (with the vast majority at 97% being smaller than 2.5 microns, i.e., PM2.5). While other particulate emission pathways are considered from vehicle traffic such as brake wear and tire wear (using emission factors from the MOVES model), and some exhaust emissions are expected to be from gasoline vehicles, it is surprising that the DPM emissions relative to the PM2.5 emissions predicted for vehicle traffic are only 5%, especially considering the large number of diesel-powered heavy trucks which will service the project per day. Without further detail on which vehicle activities associated with the project were considered in the emissions calculations, it is not possible to evaluate why these DPM emissions appear lower than expected. |
| A36 | 9.4.2.2 | Change in… | Which version of each model in the CALPUFF modelling package (CALPUFF, CALMET, CALPOST) used for this study was not provided. |
| A37 | 9.4.2.2 | Change in… | Information on the meteorological modelling conducted was not provided such as:<br>• What prognostic meteorological data was used?<br>• Was CALMET ran in hybrid mode utilizing station observation data, and if so, which stations were included?<br>• Which year(s) were modelled?<br>• What size domain was used for meteorological modelling (was this large enough to capture the terrain features close to the LEA), and what grid resolution was used?<br>• Were QA/QC checks performed to assess the validity of the CALMET input and output data and what were the findings? |
| A38 | 9.4.2.2 | Change in… | The receptors used in the CALPUFF model were not identified:<br>• What was the size and density of the receptor grid?<br>• Which sensitive receptors were considered? Some sensitive receptors are presented on the choice results figures included but these do not identify residences other than two residences close to the project where exceedances are predicted. |
| A39 | 9.4.2.2 | Change in… | The height above ground for receptors in the model is not provided. To model dustfall/deposition, a receptor height of 0 m is required, whereas to model ground-level concentrations of air contaminants, it is common practice to use a typical breathing height of 1.5 m. The difference in receptor height between 0 and 1.5 m can have meaningful impacts on the model results. For potential future development, and for potential multi-storey buildings, what considerations were made for potentially elevated receptors. |

| Tracking Number | EEE Section | Subheading/ Table | Comment/Finding |
|---|---|---|---|
| A40 | 9.4.2.2 | Change in… | No information is provided on the source types and parameters used to characterize the emission sources in the model. |
| A41 | 9.4.2.2 | Change in… | It is not clear if multiple scenarios were considered for the time periods relevant to the assessed air quality objectives. For example, were higher worst-case emission rates assessed for short-term 1-hour objectives, or were these predictions based on daily average emissions? |
| A42 | 9.4.2.2 | Change in… | The approach to convert model predicted concentrations of nitrogen oxides (NOx) to nitrogen dioxide concentrations ($NO_2$) is not described in the EEE. A footnote on Table 9.5 suggests NOx baseline concentrations were added to the model predictions prior to the conversion of NOx to $NO_2$. This approach does not follow the most recent $NO_2$ modelling guidance published by the BC Ministry of Environment and Climate Change Strategy which identifies that $NO_2$ baseline concentrations should instead be added to the $NO_2$ model predictions after the conversion is completed. This recommended approach would likely result in higher results for $NO_2$ than those presented in this section. |
| A43 | 9.4.2.2 | Change in… | The $NO_2$ results are described in this section as not exceeding existing ambient air quality criteria, prior to comparison to the lower 2025 CAAQS. As this project is not proposed to begin operation until after 2025, the project should likely be reviewed relative to the 2025 CAAQS and results described as such. While background $NO_2$ concentrations may decrease due to the factors described ahead of potential project operation, other factors are likely to negate some of this decrease on a local level. Some changes in emission sources in the LEA are not considered in this assessment, specifically the anticipated doubling of mainline rail traffic from current operation to 2030 projections which will occur adjacent to the proposed project location. Additionally, the Metro Vancouver area is expected to see a population increase ahead of the project operation timeline which could lead to a higher number of vehicles on the road which could negate some of the reduction achieved in average NOx emission per vehicle due to the factors described in the EEE. |
| A44 | 9.4.2.2 | Table 9.8 | Maximum predicted dustfall is presented in Table 9.8 which implies that deposition was modelled. However, this is not described in the body of the EEE, and it is not clear if wet and dry deposition was modelled, or whether deposition results were considered in the prediction of ground-level air contaminant concentrations. Considering deposition in predictions of air contaminant concentrations is not a common practice. |
| A45 | 9.4.2.2 | Figures | Frequency of exceedances figures or results have not been provided to add context to the presented maximum results. This information is needed to inform decisions regarding residual effect magnitude and significance. |
| A46 | 9.4.2.2 | Figures | To note – figures are labelled as draft and residence locations are not presented. |
| A47 | 9.4.2.2 | Figures | Background values added for TSP indicated in the figures do not match background values in Table 9.5 – clarification for the correct background values that were used is needed. Additionally, the $NO_2$ background added does not match the $NO_2$ baseline presented in Table 9.5 – clarification on the methodology used to determine $NO_2$ background is needed. |
| A48 | 9.4.2.3 | Indirect Regional Effects | It is not clear what activity levels and what emission boundaries assumed for each of the three scenarios (existing conditions, base case, build case) or the assumptions that that were made in terms of rail, truck, and marine activities included in each of these scenarios. |
| A49 | 9.4.2.3 | Table 9.9 | “Direct' and ‘indirect' GHGs were described earlier in this report. However, the GHG emissions attributable to direct and indirect emissions are not clear. |

| Tracking Number | EEE Section | Subheading/ Table | Comment/Finding |
|---|---|---|---|
| A50 | 9.4.2.3 | Table 9.9 | With regards to consideration of the predicted increases in mainline rail traffic, 9.4.2.3 of the EEE implies that increases to rail traffic was considered as part of the Ausenco Rail Simulation Study and the assessment of indirect regional effects, therefore, it is notable that these predicted increases are not considered in the air quality assessment as they are relevant to this project. It should be noted that the Ausenco Rail Simulation Study referenced is not publicly available for review to be able to confirm what train volumes were considered. |
| A51 | 9.4.3 | Mitigation M9-4 | Mitigation M9-4 identifies that water will be applied to reduce dust generation and enhance particle deposition during construction phases. How will dry periods be identified and how frequently is this anticipated to be employed? More details should be provided on this mitigation measure. |
| A52 | 9.4.3 | Mitigation M9-7 | Mitigation M9-7 identifies an anti-idling policy will be in place for trucks accessing the facility in line with the City of Pitt Meadows policy for municipal vehicles (maximum idling time of 3 minutes). Limited information is provided on this policy. How will this anti-idling policy be enforced? Trucks are specifically mentioned in this description but will this policy also apply to other vehicles and equipment on site? Will this policy apply to all project related activity, such as the truck travel between the LPV and VIF when trucks are held at the Kennedy Road at-grade rail crossing of the mainline, or be restricted to within the LPV. |
| A53 | 9.4.3 | Mitigation M9-8 | Mitigation M9-8 discusses vacuum sweeping of Kennedy Road. Will this measure also be employed on the internal LPV roads? No details are provided as to what will trigger the implementation of this mitigation measure. During the pre-construction and construction phases of the project specifically, considerable dirt and dust could be tracked onto the internal LPV roads and out onto Kennedy Road and this mitigation measure should be employed regularly to reduce silt loadings and therefore road dust emissions. Limited detail is provided on when road sweeping will occur and who will be responsible. |
| A54 | 9.4.4 | Table 9-11 | The source of the effects and ratings definitions used to assess residual effects is not described. These definitions are used to determine if the residual effects are deemed to be significant. |
| A55 | 9.4.4 | Table 9-12 | The magnitude of the pre-construction and construction effects are described in Table 9.12 as low as they “are expected to be minor relative to baseline and remain below ambient air quality criteria”. This study has not assessed the air quality expected due to pre-construction and construction activities and it should be highlighted here that this has not been directly assessed. The previous project experience described here is not identified in enough detail to support these conclusions with confidence. |
| A56 | 9.4.4.1 | Project Operation | No quantitative evaluation is provided in the EEE to support the impact of the mitigation measures and support the statement: "*predicted ambient concentrations are expected to remain below relevant ambient air quality criteria at sensitive receptors with the implementation of mitigation measures*..." as exceedances of some ambient air quality criteria are presented in this air quality study. |
| A57 | 9.4.4 | Table 9-13 | Magnitude of effect during the Project Operation phase is deemed to be moderate in Table 9.13. Based on the definition of the low, moderate, and high ratings for magnitude presented in Table 9.11 this seems incorrect. Moderate effect is defined as no exceedances of ambient air quality criteria at sensitive receptors; however, in this study exceedances of the TSP objective was predicted at the nearby residences, as well as exceedances of the 2025 CAAQS for $NO_2$ which will be in place ahead of the project operation time period. If the magnitude of effects is changed to high, this would require the conclusion of significance to be changed from “not significant” to “significant”. Table 9.13 also defines the confidence of the effects characterization as "high”. As mentioned throughout this review, based on the level of detail presented in the EEE, it is difficult to assess if the assumptions made in the air quality study are conservative enough to warrant high confidence in the results. |

| Tracking Number | EEE Section | Subheading/ Table | Comment/Finding |
|---|---|---|---|
| A58 | 9.4.4.2 | Table 9.15 | Magnitude of effects is deemed to be low as: "Project-related GHG emissions are expected to be less than 0.1% of regional totals and less than 0.01% of provincial totals." A comparison of the GHG emissions to the regional and provincial totals does not appear to be provided. |
| A59 | 9.5 | Table 9.17 | It is unclear why projects/activities far from the proposed LPV are included in Table 9.17, especially when expected changes in adjacent operations such as increases in mainline rail traffic, are not included. |
| A60 | 9.5.2.2 | Cumulative effects … GHGS | Limited detail is provided in this section to justify the ratings of the cumulative effects presented. The sources and definitions for the ratings used (e.g., NS, S, etc.) are not included to provide context to the reader. |
| A61 | 9.6 | Monitoring | It was noted in the report that "…the Project is expected to meet all ambient air quality criteria at sensitive receptors". This statement does not match the findings of the study as described in earlier sections. Model results show potential exceedances for TSP at residences as well as exceedances of the 2025 CAAQS for $NO_2$. There is no quantitative measure indicating that proposed mitigation will remove these exceedances. |
| A62 | 9.6 | Monitoring | Pitt Meadows station is T20 not T30. This monitoring station is currently surrounded by agricultural land and concentrations observed are likely to be different to those observed at sensitive receptors close to the project. The prevailing wind direction at the station location is from the northeast therefore this station is unlikely to capture the full impacts of this project on local air quality. |
| A63 | 9.7 | Conclusion | Mainline rail traffic is a notable local emission source that should be included in the list of sources deemed to have significant influence to air quality in the LEA. Cumulative effects should consider significant predicted increases in mainline rail traffic prior to the proposed operation timeline of this project. |
| A64 | 9.7 | Conclusion | Comments are provided on this subject in other sections but the conclusions that air quality will remain below relevant air quality criteria does not match the results presented in other sections of this study. Therefore, the rating of the project effects as moderate in magnitude would not be correct based on the definitions presented in Table 9.11 of low, moderate, and high magnitude of effects. |

# APPENDIX B:

# DETAILED COMMENTS ON CP LPV EEE

# VOLUME 3 – SECTION 19.0 HUMAN HEALTH

| Tracking Number | EEE Section | Subheading/ Table | Comment/Finding |
|---|---|---|---|
| B1 | 19.2.3.1 | Table 19.4 | The MV non-road diesel bylaw is an existing bylaw in this region which is not listed in this table. It is therefore not clear if it has been considered. This bylaw would likely cover equipment used during construction phases and some equipment during the operation phase such as on-site cargo handling equipment. |
| B2 | 19.3.2.1 | After Table 19.6 | The report states "Life expectancy in Pitt Meadows is slightly lower than in BC overall, as were rates of asthma, COPD and heart failure." however the presented asthma COPD and heart failure rates are higher in the LHA than BC in Table 19.6. |
| B3 | 19.3.2.2 | Air Quality | The air quality evaluation included diesel particulate matter, various common criteria air contaminants, and VOCs. Rationale was not provided for the exclusion of other potentially relevant air contaminants from the evaluation (e.g., carbon monoxide, dioxins/furans, metals, other VOCs). |
| B4 | 19.3.2.2 | Table 19.7 footnote | Please see Comment A18 in Appendix A of this report (as seen on page A3). |
| B5 | 19.3.2.2 | Table 19.7 footnote | Background data is described as being based on 5 identified MV stations however it is unclear which years were considered. The statistical approaches used are not identified and it is unclear if any periods were excluded for any of the contaminants considered. |
| B6 | 19.4.2 | Air Quality | It is stated in this section that: "conservative assumptions were made to bias the conclusions in the direction of being fully protective of human health in the face of any uncertainties". As described throughout this review, limited details are provided in many sections describing the methodology and approaches applied in this study. The conservative assumptions made, and uncertainties that are referenced here are not discussed in the EEE. |
| B7 | 19.4.2.1 | HHE from Air Quality | This section notes that an assessment of construction impacts was not completed due to data limitations. It is unclear if an assessment will be conducted in the future (following attainment of relevant data)., It is possible to review the impacts of the construction phase using conservative estimates of operating activity. |
| B8 | 19.4.2.1 | - | Some risk assessment practitioners and Health Canada (2004) have advocated for the estimation of increased mortality and morbidity rates for the criteria air contaminants (i.e., $PM_{2.5}$, $NO_2$, $SO_2$, CO) since air quality objectives for these substances are not purely health-based and may not be adequately protective in some cases. Rationale is not provided for why the EEE did not include such an evaluation of mortality/morbidity and/or for the protectiveness of the exposure limits applied for these parameters. |
| B9 | 19.4.2.1 | HHE from Air Quality | The report states "The exposure limits recommended for PM are therefore intended to reduce health effects to a minimum". However, details on how the exposure limit was selected are not disclosed. The BC and MV objectives chosen here (both short term and annual) are not purely health-based thresholds for PM. |
| B10 | 19.4.2.1 | Exposure Limits | It is stated that: "In general, the most stringent exposure limit most scientifically defensible limit was applied". It is not clear or discussed if there were any cases based on this description where the most stringent exposure limit for a substance was not applied due to a limit being deemed not "scientifically defensible". Clarification/ examples on any case(s) where the most stringent exposure limit was not applied is not provided for reader context. |

| Tracking Number | EEE Section | Subheading/ Table | Comment/Finding |
|---|---|---|---|
| B11 | 19.4.2.1 | Table 19.11 | An acute inhalation exposure limit of 3,700 mg/m$^3$ was used for 1,3-butadiene. The Risk Assessment Information System (RAIS) recommends 660 mg/m$^3$ based on data from CalEPA. There is no apparent rationale as to why this more conservative value was not used. |
| B12 | 19.4.2.1 | Table 19.12 | Health Canada (2016) identifies DPM as a carcinogen, though does not provide a cancer TRV. It is not clear whether the EEE evaluates the cancer risks of DPM, despite the availability of cancer TRVs from other health agencies (e.g., CalEPA). |
| B13 | 19.4.2.1 | Risk Characterization | It should be noted that Risk quotients (RQs) were compared to an acceptability threshold of one (1). Rationale is not provided for why Health Canada's threshold of acceptable non-cancer health risks (RQ = 0.2) was not applied, given that rail operations are federally regulated. |
| B14 | 19.4.2.1 | Results of Human Health Risk Assessment of Air Quality Effects | It is not clear whether predicted exposure concentrations for the various receptor types (e.g., child care, residence) were modified by the exposure time, frequency and duration that such a receptor would be present, or if the risk estimates assume fulltime presence regardless of receptor type. There is some qualitative discussion of likely exposure time for the locations where exceedances of ambient air quality objectives are predicted but limited discussion of the methodology is presented. |
| B15 | 19.4.2.1 | Results | This section states that "Acute inhalation of COPCs is expected to be generally below health-based exposure limits". Further clarification on the meaning of 'generally below' in this sentence should be provided for context. |
| B16 | 19.4.2.1 | Results | RQs greater than 1 are presented for all sensitive receptor categories for $NO_2$. Where this result is described, it is deemed to be unlikely to occur "give the conservative approach used in the air dispersion modelling for NOx" and references the Air Quality section of the EEE. There is currently no detail provided in the text of the EEE detailing the approach used for NOx modelling. |
| B17 | 19.4.2.1 | - | The location of residences and receptors used in the model are unclear. No figures or tables detailing the receptors used are presented in the EEE. |
| B18 | 19.4.2.1 | Table 19.16 | Health Canada (2016) identifies DPM as a carcinogen, though does not provide a cancer TRV. It is not clear whether the EEE evaluates the cancer risks of DPM, despite the availability of cancer TRVs from other health agencies (e.g., CalEPA). |
| B19 | 19.4.2.4 | HHR from Water Quality | It is not clear whether impacts to water quality related to the deposition of contaminants in dust were considered in the evaluation of human health risks from changes to water quality. |
| B20 | 19.4.2.5 | HHR from Quality of Traditional Foods | It is not clear whether impacts to plant and animal tissues related to the deposition of contaminants in dust were considered in the evaluation of human health risks from changes to the quality of traditional foods. |
| B21 | 19.4.3 | Air Quality | This sections states that conservative assumptions were made to bias conclusions to be protective, additional details/specific examples are needed to confirm this statement. |
| B22 | 19.4.3 | Air Quality Mitigation | M19-3 Avoiding earth works during periods of high winds is mentioned. Information is not provided on if there are plans for meteorological monitoring of wind speed on site and wind speed thresholds above which earth works would not be performed. |

| Tracking Number | EEE Section | Subheading/ Table | Comment/Finding |
|---|---|---|---|
| B23 | 19.4.3 | Air Quality Mitigation | M19-4 states that vehicles and heavy equipment should not be operated above speeds of 15 km/h where dust is a concern. However, it is noted in section 9.4.2.2 of the EEE that emissions are based on the design speeds of the roads (i.e., 40 or 50 km/h). It is unclear whether or not the lower speeds noted in Mitigation M19-4 were accounted for in the emissions modelling. Clarification is needed as higher emissions would be predicted at lower speeds. |
| B24 | 19.4.3 | Air Quality Mitigation | M19-5 It is unclear what items/initiatives will be included in the fugitive dust monitoring program identified in Table 19.18. Mitigation M19-5 is also separately identified as a lighting mitigation factor in the body of the report. |
| B25 | 19.4.4.1 | HHE from Air Quality | This section notes that background $NO_2$ is expected to decrease due to vehicle regulations. This section does not mention expected increases in rail traffic on the mainline (~2x) during the same period, which would add additional CAC emissions in the LEA immediately adjacent to the proposed LPV location. Projected population increases in Metro Vancouver also suggests that there would be increases in personal vehicle traffic, which could potentially offset some of the expected decreases in average emissions per vehicle. |
| B26 | 19.4.4.1 | HHE from Air Quality | Acute and chronic effects for $NO_2$ were identified at sensitive receptors and are discussed in this section. While it is reasonable to discuss the level of conservatism built into the modelling approach for the short-term modelling of NOx (i.e., applying the 98th percentile of background values to each hour of the year as recommended in the BC Air Quality Dispersion Modelling Guidelines (BC AQDMG), this is less of a justification when reviewing the model predicted annual average concentrations (where the background concentration should be calculated as an annual average following the BC AQDMG), and the subsequent assessment of chronic health effects. Table 19.15 presents a chronic RQ of above 1 for non-carcinogenic effects at a residence (it is unclear if this would be the case for multiple residences), and may challenge the conclusion that the magnitude of health effects is low. As discussed in Section 2.4 in this report, the factors presented here that may lead to a decrease in the baseline $NO_2$ concentration prior to project operation could be somewhat offset or negated by emissions from the projected increase in mainline rail traffic adjacent to the proposed project location during this same time period. |
| B27 | 19.4.4.1 | HHE from Air Quality | Description in this section of the NOx/$NO_2$ ratio implies the Ambient Ratio Method was applied for $NO_2$ conversion, however details are not provided as discussed in comment A18 in this report, and the methodology used remains unclear (for example, if a site-specific conversion curve was developed or if one of the recommended BC curves were used). |
| B28 | 19.6 | Monitoring | It is stated that the existing monitoring station operated by Metro Vancouver will be sufficient to monitor changes in ambient concentrations of CACs due to the Project. As discussed in Section 2.2 in this report, the predominant wind direction at this station relative to the rail operations in Pitt Meadows is likely to lead to lower measured concentrations of air contaminants at this location than at sensitive receptor locations closer to, or to the south of, the existing and proposed rail operations. |

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# MEMORANDUM

| | | |
|---|---|---|
| **DATE:** | 2022-03-17 | **RWDI Reference No.:** 2200754 |
| **TO:** | Justin Hart, P.Eng., GSI<br>Manager of Major Projects<br>City of Pitt Meadows | **EMAIL:** JHart@pittmeadows.ca |
| **FROM:** | Ben Coulson, P.Eng., MASc<br>Technical Director<br>RWDI | **EMAIL:** ben.coulson@rwdi.com |
| | Matthew Johnston, P.Eng.<br>Senior Noise Engineer<br>RWDI | **EMAIL:** matthew.johnston@rwdi.com |
| | Laura Dailyde, P.Eng., PMP<br>Senior Project Manager<br>RWDI | **EMAIL:** laura.dailyde@rwdi.com |
| **RE:** | **CP Logistics Park Noise and Vibration Assessment – Third Party Review<br>City of Pitt Meadows<br>Pitt Meadows, BC** | |

RWDI has been retained to assist The City of Pitt Meadows (the "City") in a review of all information relevant to Noise & Vibration within the Environmental Effects Evaluation (EEE)[1] conducted by Hemmera (Hemmera, 2021) on behalf of Canadian Pacific Railway (CP) for the addition of the Proposed Logistics Park (the Project) located south of the existing Vancouver Intermodal Facility (VIF). The EEE will inform CP's application to the Canadian Transportation Agency (CTA). RWDI's review of all information related to noise and vibration is based on the examination of the following EEE Sections and supporting documentation:

- EEE V1 Section 8 - Evaluation Scope and Methodology (Section 2.1);
- EEE V2 Section 10 - Noise, Vibration and Light (Section 2.2);
- EEE V3 Section 19 - Human Health (Section 2.3);
- EEE V4 Section 25 - Summary of Residual Effects and Mitigation (Section 2.4); and

[1] Hemmera. 2021. "Environmental Effects Evaluation CP Logistics Park: Vancouver". Burnaby, BC.

- Additional Supporting Information, including the facility general arrangement map, overall site vision map, a site preload traffic assessment, geotechnical design report, and a stormwater management report 30% design.

# 1 BACKGROUND

Pitt Meadows is a predominantly agricultural area, with most residents located in a suburban core. Two mainline rail tracks run through this area, and the VIF is located to the north of the main rail corridor near the Pitt River. Katzie Slough runs through Pitt Meadows, discharging to the Pitt River.

CP has proposed to expand the existing VIF to the south of the main rail corridor with a new logistics park (the Project), including on both sides of Katzie Slough. The components associated with this project include an agricultural hub, auto lot, liquid transload facility, and other rail support infrastructure, including a loop track extending from Harris Road to Kennedy Road.

As part of their most recent public engagement session (January 2022), CP indicated that a noise barrier is being considered between 188 Street and Harris Road along the southern side of the track as part of the mitigation of project impacts, with a final determination informed by the noise / vibration assessment completed by Hemmera. Mitigation is also proposed at the west and south ends of the new transload facility to shield specific homes as well as users of the Trans-Canada Trail.

Independent of the Logistics Park Project, CP has also proposed to build 5 km of new siding and lead track from Kennedy Road towards Golden Ears Way. This project is part of the Pitt Meadows Road and Rail Improvements Project, lead by the Vancouver Fraser Port Authority (VFPA). The Road and Rail Improvements Project also involves a new rail bridge over Katzie Slough, a new two-lane overpass at Kennedy Road (paused) and a new four-lane underpass at Harris Road.

In 2020, BKL Consultants Ltd. (BKL) prepared a technical report assessing the noise and vibration effects of the Road and Rail Improvements Project. In 2021, RWDI peer reviewed this technical report for the City of Pitt Meadows. RWDI then expanded on the BKL study and completed a Noise & Vibration study on behalf of the City, consisting of monitoring and modelling.

# 2 FINDINGS

The findings from RWDI's review of the noise and vibration portion of the EEE are provided in the sections below.

## 2.1 EEE V1 Section 8 - Evaluation Scope and Methodology

This section of the EEE provides the overall approach of the assessment. Aspects of this section that have significance to the assessment of noise and vibration are summarized as follows:

- Valued component rational;
- Spatial and temporal boundaries;
- Project effects evaluation;
- Recommended mitigation;
- Cumulative effects evaluation.

Key information related to noise and vibration within this section include:

- The noise and vibration valued component (VC) will assess the potential changes in noise level and vibration level.
- The human health VC will assess the potential effect of quality of life due to changes in noise and vibration.
- The spatial boundary for noise and vibration is defined as 2 km from the Project footprint.
- The temporal boundaries were determined based on the Project's temporal limits (i.e., timing and duration) for the major phases of pre-construction, construction, and operation.
- The EEE considers:
    i. Existing conditions;
    ii. Future conditions with the Project.
- Mitigation item M8-8 summarizes the proposed noise mitigation. Barrier heights for noise mitigation are described as approximately 6 m tall.
- A cumulative effects evaluation is included for a VC when 2 conditions are met:
    i. The Project effects evaluation indicates that the Project will result in adverse residual effects on the VC; and
    ii. The adverse residual effects of the Project could interact with residual effects of other past, present, or reasonably foreseeable future projects or activities.

Based on the above information provided, the following comments are provided:

1. Based on a review of the spatial boundary, the Project area is limited to the new proposed Project lands only which are south of the mainline as shown in Figure 1 below. However, the EEE states that, for CP, the proposed Project is: "…an expansion to its existing, adjacent Vancouver Intermodal Facility…". [2] The Minister of Environment and Climate Change's

[2] "Executive Summaries, Environmental Effects Evaluation, CP Logistics Park: Vancouver". Prepared by Hemmera for CP. January 4, 2022.

decision[3] to not designate this Project under the *Impact Assessment Act* was based on the proposed logistics hub being an expansion to the VIF resulting in a less than 50% increase in total area per the Impact Assessment Agency of Canada's Analysis Report[4]. As an expansion of the VIF, the VIF should be included within the Project area and be considered cumulatively along with the effects of the new logistics park.

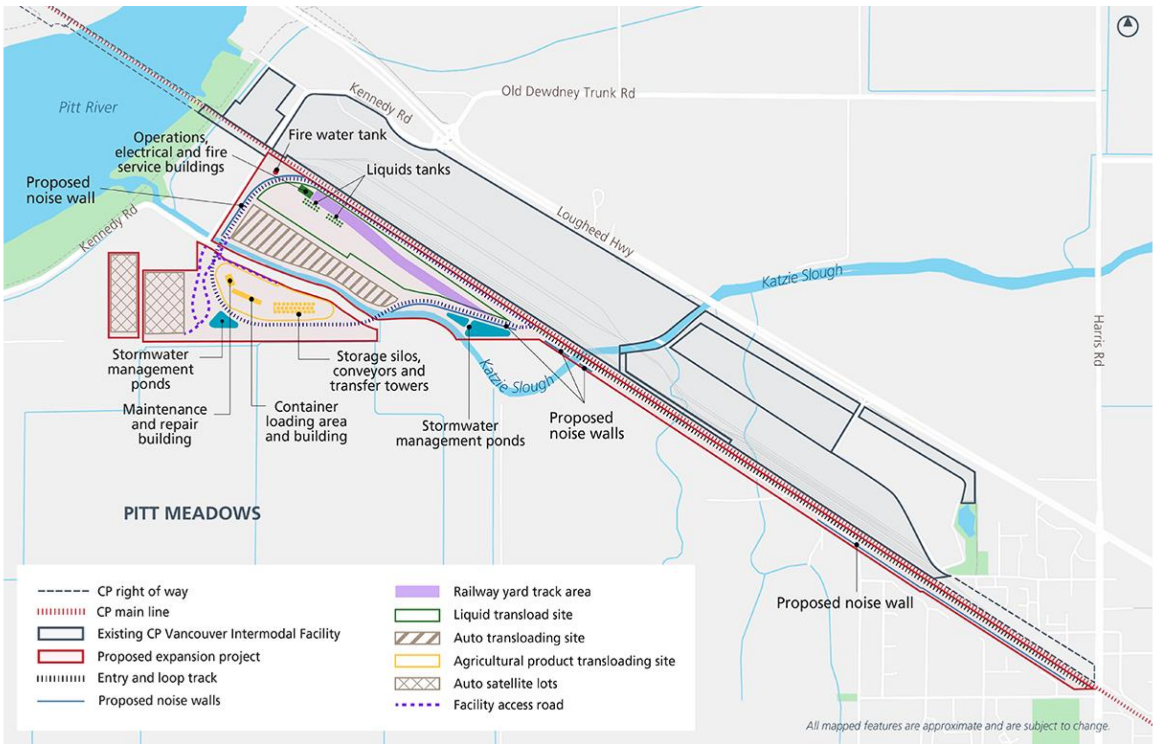


*Figure 1: CP's Proposed Logistics Park and Existing Intermodal Facility (from https://vancouverlogisticspark.ca/consultation-and-engagement/, visited Feb. 4, 2022)*

2. In Section 8.1.2.2 (Temporal Boundaries), existing conditions are defined as: "… the conditions that exist prior to Project construction and operation and comprise the effects to date of other projects and activities that have been carried out, including their cumulative effects". The EEE indicates that: "… Existing conditions reflect the current land use and are strongly influenced by transportation and agricultural activities." In Section 10 of the EEE, when describing existing

[3] Minister's Response – Logistics Park Vancouver Project. Impact Assessment Agency of Canada. https://iaac-aeic.gc.ca/050/evaluations/document/141661 visited Feb. 4, 2022.

[4] Analysis Report. "Whether to Designate the CP Logistics Park: Vancouver and Pitt Meadows Road and Rail Improvements Projects in British Columbia Pursuant to the *Impact Assessment Act*". November 2021. https://iaac-aeic.gc.ca/050/documents/p82818/141662E.pdf

noise baseline, the assessment mentions that: “Overall, baseline noise levels in the LEA vary depending on proximity to existing rail traffic along the CP mainline and to existing rail yard activities at the VIF as described below.” Hence, it appears the existing VIF noise contributions in the area are included in the baseline which forms the basis of the change assessment for noise.

Although existing VIF activities are included in baseline monitoring, measurements represent a “snapshot” in time and are only representative of the period in which they are taken; they may not represent the maximum operations scenario. It is not clear how or if the maximum operations from VIF were included in the assessment.

3. Noise and vibration VCs are evaluating the “change” which is typical for Environmental Assessments. Considering the existing noise and vibration levels are high, absolute criteria should be considered as well as relative change criteria.

## 2.2 EEE V2 Section 10 - Noise, Vibration and Light

This section of the EEE provides the detailed assessment of noise and vibration. The section includes an assessment related to light which was not included as part of this review.

Key information related to noise and vibration within this section include:

- Details for the determination of baseline noise and vibration levels.
- Key noise and vibration related policies and guidelines utilized included the following:
    i. The CTA’s “Railway Noise Measurement and Reporting Methodology” [5];
    ii. Health Canada’s “Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise” [6];
    iii. The U.S. FTA’s “Transit Noise and Vibration Impact Assessment Manual” [7];
    iv. British Standard 5228-2 [8];
    v. California’s “Transportation and Construction Vibration Guidance Manual” [9].

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[5] Canadian Transportation Agency (CTA). 2011. “Railway Noise Measurement and Reporting Methodology”. Gatineau, QC.

[6] Health Canada (HC). 2017. “Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise”. Ottawa, ON.

[7] U.S. Federal Transit Administration (FTA). 2018. “Transit Noise and Vibration Impact Assessment”. Washington, DC.

[8] British Standards Institute (BSI). 2008. “Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 2: Vibration”. BS 5228-2:2009.

[9] California Department of Transportation (CalTrans). 2020. “Transportation and Construction Vibration Guidance Manual”.

Based on the results of the noise and vibration evaluation, mitigation measures for noise and vibration are proposed. Noise and vibration mitigation for the pre-construction and construction phases include imposing truck speed limits, management of construction scheduling, advanced notification, and complaint management. Noise mitigation for operations includes imposing truck speed limits and the installation of right-of-way and main site noise walls. Vibration mitigation for operations includes the use of continuously welded rail. The inclusion of welded rail as mitigation is unusual as it tends to be conventional practice rather than a mitigation measure.

This section also includes a residual effects assessment and cumulative effect assessment.

## Assessment of Noise

The assessment of noise involved identifying baseline levels at critical receptors, which evaluated noise at four (4) receptors. The assessment did not provide details which would be needed to verify that monitoring meets the field measurement requirements per CTA 2011[5] (i.e. monitor locations and equipment used etc.). These details should be provided for independent verification.  Therefore, no comments are provided on the monitoring approach.  Comments are provided on monitoring results where possible.

The documented baseline sound levels presented in Table 10.11 at the four receptors (R1 to R4) were reviewed.  Table 1 below provides a comparison of monitoring conducted by RWDI, Hemmera, and BKL at a location representative of 13071 Kennedy Road.

*Table 1:  Comparison of RWDI, BKL and Hemmera Sound Monitoring at 13071 Kennedy Road*

| Receiver | | $L_{dn}$ |
|---|---|---|
| **Study** | **ID** | **dBA** |
| **BKL (2020)** | N1 | 66 |
| **RWDI (2021)** | R1 | 64 |
| **Hemmera (2021)** [1] | R1 | 64.9 |

Notes:

[1] Monitoring was conducted at the residence across Kennedy Road which was estimated to be representative of 13071 Kennedy Road. The actual monitoring location is identified as N1 within the assessment. Monitoring was conducted in August and September of 2020.

As shown in Table 1, there is good agreement with the monitored sound levels at 13071 Kennedy Road. In addition, RWDI used a Cadna/A noise model which was prepared for RWDI's 2021 assessment to compare the baseline levels at the remaining receptors. R2 is approximately 900 m from the mainline which is outside of the area previously assessed by RWDI, so it was not compared here. The remaining receptors (R3 and R4) were compared and receptor R3 is 2.7 dB higher than RWDI's predicted baseline sound level and receptor R4 varies by less than 1 dB. Based on the good correlation shown for 13071 Kennedy Road monitoring and RWDI's predicted baseline for the remaining receptors, the baseline levels presented in the EEE are expected to be appropriate.

Assessing the maximum 1-hour $L_{eq}$ for the Trans Canada Trail receptors is consistent with the U.S. FTA Manual for sensitive lands during daytime only. No comparison of these 1-hour baseline noise levels is made because RWDI's baseline data includes overall day/night levels only as opposed to the 1-hour values used here.

For the pre-construction and construction noise effects evaluation, the assessment indicates that a quantitative evaluation of potential noise effects was <u>not completed</u> since full information on plans and equipment was not available.

The following comments on the assessment are provided:

4. The EEE qualitatively assessed construction noise and did not provide information to validate the effects characteristics ratings and significance for construction presented in Table 10.22. It is not clear what is meant by "modelling of mobile equipment across the Project Area would not provide meaningful results for the EEE". This type of assessment is common and expected for a project of this scale. Quantitative results for pre-construction and construction activities are needed to identify sources that require mitigation. Mitigation measures such as shrouds for pile drivers, temporary construction noise barriers, and/or administrative controls should be identified at this stage of the Project. This information will inform the Construction Environmental Management Plan (CEMP). At a minimum, this Section does not even identify which construction activities will happen in which location.

5. Given that activities during this phase could include notable noise and vibration sources (e.g., pile driving, compaction) this lack of any kind of assessment is a large void and significant oversight. Projects of this scope and size include an assessment of construction since it may include the most limiting effects and may establish the need for mitigation that can be difficult or complex to implement given the nature of construction activities. The assessment suggestion that previous experience is sufficient to neglect any assessment of construction noise, or that levels can be managed or would not be important, is inappropriate and neglects the potential significance of this phase of the project.

6. Based on the information provided, the construction assessment confidence should be rated "low" (no data) not "medium". The magnitude could be "high", particularly for noise from pile driving given the proximity to homes to the Project area (i.e., homes are within 16 m of the proposed loop track and even closer to proposed retaining walls). An excerpt from the Project's Facility General Arrangement Plan is provided in Figure 2 which shows the proximity of the closest identified home (12548 188 St., Pitt Meadows, BC) to the proposed retaining/noise wall and the proposed loop track. There is no indication of the location, type, or duration of piled driving in the EEE, and insufficient discussion or rationale to justify these ratings.

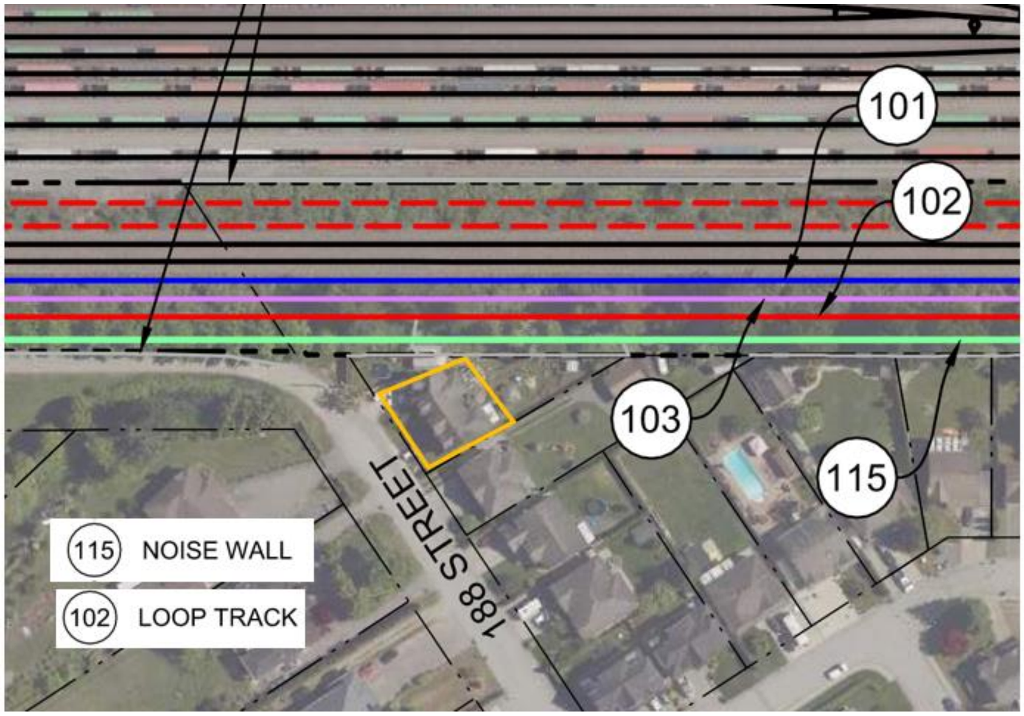


*Figure 2: Excerpt from Facility General Arrangement Plan (dated 11/04/2021)*

For the operations noise effects evaluation, the assessment indicates that the detailed quantitative evaluation was completed using DataKustik Cadna/A software and methodology described in the FTA Manual. Roadway modelling was completed using NMPB-Routes-1996 Cadna/A implementation. Prediction modelling was conducted for train movements (including within the proposed facility and on the proposed loop track), shunting, road traffic, and transloaded equipment such as pumps, conveyors, and dust control systems. This appears to be an appropriate technical approach. No validation of the results was possible due to a lack of information.

7. Based on a review of the noise contour plots (Figures 10.4 – 10.7), it appears that there may be noise sources modelled within the existing VIF. An excerpt of Figure 10.4 from the EEE is provided in Figure 3 below (see faint yellow areas within the existing VIF which appears to identify a 70 – 80 dBA region).

   All noise sources within the Project area should be defined. In addition, given the proposed Project is an expansion of the existing VIF, future VIF operations should be incorporated into the analysis. Only the existing VIF contributions appear to be included in the analysis as part of the existing baseline and are not included as part of the project contributions.

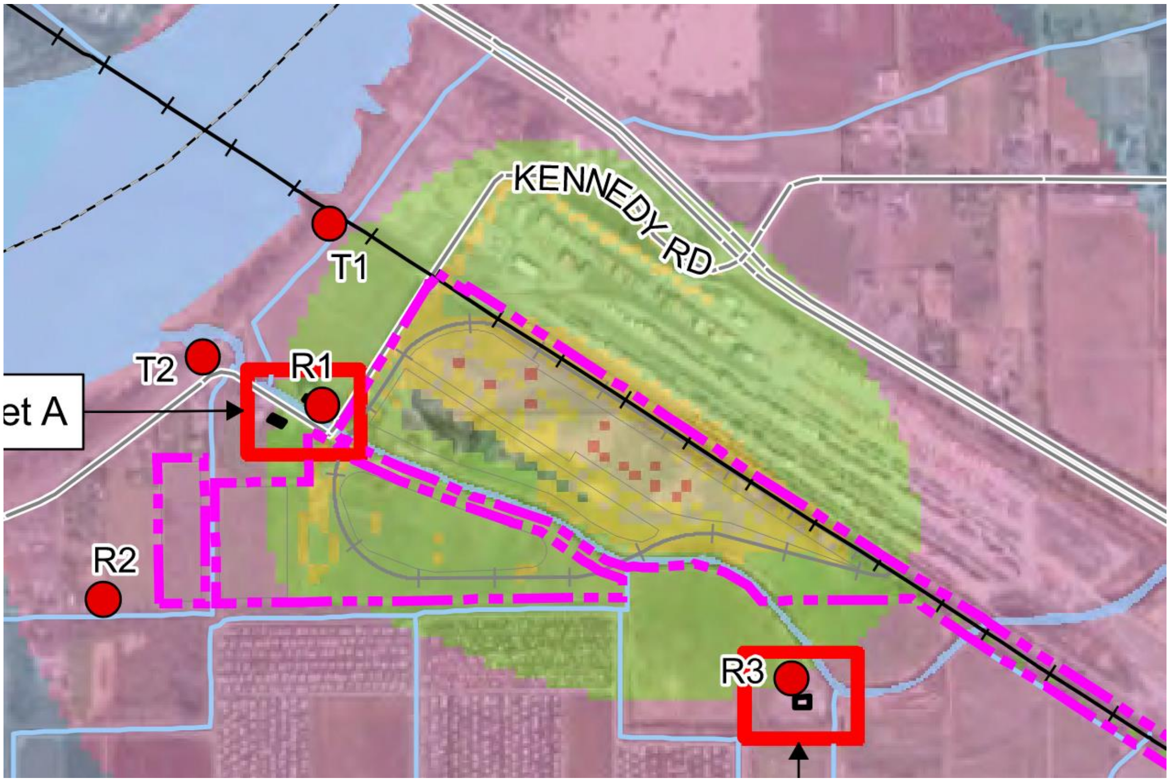


*Figure 3: Excerpt from EEE Figure 10.4 showing potential noise contours within the Exiting VIF.*

Some modelling information on source levels is included in Appendix A of this section. The following comments are provided based on this information:

8. Based on a review of Appendix A, the sources levels do not appear to be reliable. Parameters such as the definition of "daytime" or "nighttime" are not defined, and given they have equivalent sound levels in the table, do not appear properly defined. Normally a 15-hour day and 9-hour night are used in the determination of the day-night sound level ($L_{dn}$) in accordance with Health Canada (HC) guidelines[6] and international standards. When time adjustments are applied to the train movements, the reduction from the peak hour levels to the average daytime and nighttime sound levels are notably reduced by 8 to 20 dB which seem very low. For example, for train movements on the main receiving/departure track with a peak hour level of 66.8 dBA, to achieve the stated average daytime or nighttime levels of 47.3 dBA trains would only operate for 10 minutes of a 15-hour day or 6 minutes of a 9-hour night. It seems improbable that this is the expectation for this facility, or else the values are not properly quantified or expressed.

9. Further, for many activities, the peak hour sound power levels do not appear to be realistic based on our experience. For example, the CTA guidance[5] indicates an idling locomotive has a sound power level of 107 dBA, or a sound pressure level of 69 dBA at 25 m. The values

presented in Appendix A for train movements are labelled as "sound power levels" yet seem more aligned to expected sound pressure level values which is how some entries are described in the "Adjustment" column. Assuming "sound power level" is labelled in error and these are actually sound pressure levels, the sound pressure levels identified at 25 m for ***moving*** trains are still lower than a single ***idling*** locomotive per the CTA guidance. Train movements would be expected to have higher sound levels than an idling locomotive as they generally include multiple locomotives acting at higher throttle and many moving rail cars. Similarly, the shunting sound levels seem more indicative of sound power levels (albeit low compared to our experience), yet these are potentially indicated as "sound exposure levels" in the last column. A sound exposure level applies at a distance and yet no distance is noted.

10. Other inconsistencies in Appendix A include whether the impulsive penalty noted is included in the reference levels or if they are applied in addition.

11. No information is provided to substantiate the values in Appendix A and there is no indication of the source of the sound data which would be required to comment on the appropriateness of the levels. Given the wide range of inconsistencies in the source data presented, we do not have confidence in the source information used, which therefore also extends to the modelling approach and efficacy of any of the results presented.

The modelling results were further considered relative to the various criteria considered.

12. The application of the HC guideline[6]:
    a) The assessment applies a change assessment using the HC and FTA indicators for operations. Additional impacts associated with noise such as noise-induced sleep disturbance, interference with speech comprehension, and low-frequency noise should be evaluated as well per the HC Guideline. Some of these are discussed in the Human Health effects Section 19 of the EEE. According to the HC Guideline, mitigation may be considered where additional indicators are exceeded.

    b) HC's absolute criteria for potential effects such as sleep disturbance, interference with speech comprehension, and low-frequency noise should be incorporated more transparently into the assessment. According to the CTA[5], an absolute assessment and a relative change assessment are both acceptable. Given the existing noisy environment, an assessment to absolute criteria such as those noted would be appropriate.

    c) This section of the EEE does not specify that there will be an environmental management plan for operations. Volume 4 of the EEE (Section 26.3 page 26-2) indicates that no noise or vibration considerations are included in the post construction and operations management and monitoring requirements. Given some residual effects exist post-mitigation (i.e., for Trans Canada Trail), it would seem noise and vibration should be considered. According to the HC Guideline, "Noise management and noise monitoring plans, including complaint resolution plans, are often incorporated as part of the EA's Environmental Management Plan. When health effects from project-related noise are possible, Health Canada prefers that a noise management plan detailing the actions that will be taken to minimize human health impacts due to project noise (mitigation measures) be developed and included in the EA."

13. The application of the FTA Manual[7]:
    a) The noise criteria chosen for the assessment is consistent with the FTA noise criteria "Option A" as detailed in the FTA Manual Section 4.1. However, "Option B" appears to be more appropriate considering "Option A" is applicable where "the project noise source is a new source of transit noise in the community, such as a new project in an area currently without transit". "Option B" criteria is most appropriate for evaluating cumulative noise impacts where "changes are proposed to an existing transit system, as opposed to a new project in an area previously without transit. Such changes might include operations of a new type of vehicle, modifications of track alignments within existing transit corridors, or changes in facilities that dominate existing noise levels".

14. The application of CTA guidelines[5]:
    a) CTA guidance indicates that an assessment based on absolute and change criteria may be appropriate. The assessment was carried out primarily using a relative change assessment per the HC Guidance and the FTA Manual. Given the prevalence of existing rail sources in the area, inclusion of absolute assessment criteria in addition would be appropriate as they incorporate additional parameters that would more appropriately assess the impact on the community.

    b) Within the evaluation of noise, there is a discussion of a change in representative community type based on the ambient noise environment. These community types/classifications are based on those provided by the CTA for different ambient noise levels. It's unclear what role the change in representative community plays in the overall evaluation of noise.

       The assessment uses the $L_{dn}$ sound level to define the community type, but the intent of the CTA guidance is to use the community type to define the potential ambient sound level when baseline monitoring hasn't occurred. The community type is defined based on the description and population density, not sound level. It is misleading for the assessment to say that the receptors are classified "in accordance with descriptors from the Canadian Transportation Agency". This suggests that the sound levels are based on the community type when in fact the $L_{dn}$ is inflated due to the existing influence from local rail sources (i.e., the VIF and CP mainline), rather than typical ambient sounds that would be experienced in those communities.

For example, in Section 10.3.2.1, the assessment defines the community type of the residences near Advent Road and 188 Street as “very noisy urban residential”. As per the CTA (and HC), the community type is actually defined as a major population centre typically with a population density of 24,324 people per square kilometer. In the lower mainland, only downtown Vancouver would have a population density close to this value so this categorization is inappropriate.

c) Low-frequency noise should be considered as part of a rail assessment according to Section 2.2.2 of CTA 2011. As noted above, low frequency noise was not considered in the noise evaluation, although it is noted later in the Human Health (Section 19) chapter. Given the prevalence of low frequency sound from the rail sources and trucks involved in this project, a more rigorous review is warranted. Low frequency sound, especially from locomotives, is particularly challenging to mitigate or reduce at receptors.

d) Tonal or impulsive sounds should be considered as part of a rail assessment according to Section 2.2.2 of CTA guidelines[5]. From Appendix A of the assessment, it is apparent that impulsive penalties according to HC guidance[6] were applied to some sources but there is no mention of tonal noise.

15. Considering deficiencies around the application of criteria as detailed above, there is insufficient rationale to validate the effects characteristics ratings and significance presented in Table 10.22 and Table 10.23 for pre-construction / construction noise and operations noise, respectively.

## Assessment of Vibration

The assessment only monitored at one location and then relied on the assessment completed by BKL for another project independent of the Logistics Park to establish the baseline levels. This seems inadequate given the scope of the project and the potential myriad of vibration sources (see Section 19.3.2.3).

For baseline vibration levels, the assessment references the BKL report in Table 10.13.

16. RWDI has previously compared[10] the vibration levels and found that RWDI-measured vibration levels in the area are higher than those reported by BKL, in some cases notably higher (i.e., typically 10 VdB re: 1 nm/s at representative monitoring locations). The difference is speculated to be related, in part, to BKL averaging train passby levels rather than considering the maximums.

17. The assessment acknowledges that baseline vibration levels are already high and even "exceed the US FTA criteria for vibration" but then proceeds to justify those levels will only be "slightly perceptible" and that they "remain below those that cause public annoyance". Exceeding the FTA criteria would be evidence that annoyance is expected. In general, vibration perceptibility is linked to public annoyance in the literature; hence this conclusion seems ill-conceived and not supported.

For Project pre-construction and construction, a detailed analysis was not completed. The assessment provided required setback distances from various activities to demonstrate that vibration will not result in building damage. Annoyance thresholds were not considered or discussed. Construction activity details such as equipment and location were not provided.

18. The level of detail and assessment are lacking for a construction assessment. For this type of project, construction may become the limiting scenario particularly since mitigation measures are not installed and heavy activities may be prevalent in proximity to receptors.

19. For construction vibration, setback distances are provided for certain activities to prevent building damage. However, the lack of consideration of annoyance effects due to construction vibration is an oversight. Given annoyance occurs at thresholds below building damage onset, complaint issues would be expected at lower levels of vibration than those that would cause damage.

20. Within Table 10.15, a worst-case setback distance of 19 m is shown for impact pile driving. Based on a review of a preliminary geotechnical report prepared by Golder, there appears to be retaining walls planned along the mainline right-of-way to support the loop track, which are within 8 m of some dwellings. It is reasonable to assume that pile driving, caisson installation, compaction or other heavy vibration activities will likely occur within this area to construct the retaining walls and tracks. The assessment should verify where these activities will occur and assess and mitigate their influence.

To assess the change in operations vibration levels, the assessment used the methodology provided in the FTA manual[7]. They provided setback distances required to demonstrate compliance. No additional

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[10] RWDI. Sept. 20, 2021 memorandum from Matthew Johnston to Justin Hart. "Re: Noise and Vibration Monitoring Summary". RWDI #2104113.

information such as assumed ground conditions were provided. The level of detail and rationale is insufficient to validate the conclusions of the assessment.

The following comments are provided based on the finding of the operations vibration evaluation:

21. Per Section 10.3.2.2 it is noted that peak ambient vibration levels reach 1.2 mm/s (PPV) near 13071 Kennedy Road which is said to be "well below levels that may cause public annoyance or building damage". Table 10.5 indicates that levels of 1 mm/s PPV can be perceptible but tolerated. These values appear to derive in part from the Caltrans document[9] referenced but refer to historical data (1931) the document presents based on parameters that are generally no longer used for annoyance. The Caltrans document cites ISO 2631 as the modern references, which relies on RMS velocity (sometimes expressed in VdB) as the most appropriate metric to use for annoyance, not PPV. These RMS metrics are consistent with FTA and other vibration criteria. Conversion of criteria from RMS to PPV requires certain assumptions which are not always appropriate hence such levels may be misconstrued. The threshold in PPV for annoyance is thus not clearly determined for this assessment.

22. For vibration during operations, the application of criteria according to FTA[7], BSI[8] and CalTrans[9] is somewhat confusing. The criteria give only absolute thresholds and then within the evaluation section provides an evaluation applying baseline vibration levels. Table 10.18 provides setback distances to avoid annoyance, disturbance or building damage. These setback distances could not be validated due to a lack of information provided. Within this table, the worst-case setback distance of 25 m is provided for residential receptors based on FTA criteria. There are homes within 16 m of the mainline where the proposed loop track starts which the assessment acknowledges. Yet the assessment comes to the conclusion that operational vibration would only be "slightly perceptible" and would not lead to annoyance or damage. Where the setback distance is not met, an effect is expected. It is not sufficient to simply neglect demonstrated results as insignificant.

23. There is not enough information or rationale to justify the Project operations vibration residual effects ratings presented in Table 10.25. Given the preceding comments, the conclusion that that magnitude of effects will only be moderate given the assessment is not consistent with the fact it exceeds criteria. Per Table 10.21, a "moderate" magnitude is associated with results that are below criteria. A "high" magnitude is associated with levels above criteria.

## Proposed Mitigation

The following comments are directed to proposed mitigation strategies.

24. Proposed mitigation M8-8 (Noise Walls on the Right-of-Way) and M10-3 (Noise Walls for Main Site):
    a) The rationale for where mitigation is required is not clear. Within the criteria section, the only instance where mitigation is mentioned is as follows: "A Project-related change in %HA of more than 6.5% represents a severe impact, and noise mitigation measures are recommended".

    b) Based on the assessment, the desired effectiveness of the barrier walls "should be of a height sufficient to reduce noise effects". The design criteria for the barrier walls should be better defined. According to this guidance, a <1 dB reduction in noise level could be considered sufficient. However, noise walls must typically achieve a minimum 5 dB reduction at the closest homes to be considered effective.

    c) The length of recommended walls is not defined. The extent of the sound walls is only shown on figures. It is recommended that a table be included to provide details for each recommended sound wall including expected dimensions, type (e.g., reflective vs absorptive), and comments on local topography that could affect installation.

    d) It is recommended that final engineering design include detailed noise modelling to verify the design criteria is met. This commitment does not appear to be made.

    e) Mitigation is proposed to protect a number of receptors, however it is unclear what criteria or methodology was used to determine where barriers were warranted since the results do not appear to align to the impact assessment (e.g. Table 10.16) and no rationale or discussion is provided.

    f) Given a noise wall is necessary to protect the residences represented by receptor R4 from noise, then a new barrier wall north of the CP's loop track and mainline should also be included to protect the residences to the north of the corridor. These north residences are within 50 m of the proposed loop track and even closer to the two mainline tracks.

    g) As per Table 10.16, there is an assumed sound reduction due to mitigation of 10 dB at R4. This result appears to be an overly optimistic noise reduction for a 6 m barrier wall. In practice, the wall will likely have to be higher to achieve this type of reduction, likely over 8 m above top-of-rail. As per the note above, the design criteria should be a minimum of 5 dB and the appropriate height should be determined through detailed design. The rationale for the proposed mitigation should be better substantiated and explained.

25. Proposed mitigation M10-1 (Advanced notification and complaint management):
    a) Without providing construction activity details, it's unclear what construction activities will occur and what is considered "noisy activity".

    b) There is a commitment to provide a "timely" response. The response time should be defined in the CEMP.

    c) A complaint should trigger a complaint investigation which may result in monitoring to determine if additional mitigation is required. More adaptive management details should be included in the CEMP.

26. Proposed mitigation M10-2 (Manage Construction Scheduling):
    a) This mitigation measure indicates that construction will occur during the daytime only, in accordance with the City Noise Control Bylaw. However, it also mentions that there will be nightwork (i.e. outside of the City allowable construction hours) which is contradictory. To construct outside the allowable construction hours, the contractor needs to apply for a variance. That should be clearly stated.

27. Table 10.20 identified the need for a Construction Environmental Management Plan (CEMP) which will clearly outline how noise and vibration will be managed throughout construction. There is no mention of a noise and vibration environmental management plan for operations. It is recommended that CP commit to a noise and vibration environmental management plan for operations, including conducting publicly available noise audits to ensure that the actual sound levels emitted from the Project's operation matches predicted levels or installing permanent continuous monitoring around the site such as that used at various facilities by VFPA in the region.

28. The mitigation measures proposed above alone will likely not be effective enough to minimize the effects of noise and vibration within the community based on the information provided for the pre-construction, construction and operation phases. It is assumed that the assessment included all significant sources of noise and vibration, however there is also an assumption that general good practice is being applied. To ensure good practices are followed, additional mitigative measures should be considered in the CEMP for the pre-construction and construction phases as well as in an environmental management plan for the operation phase. These measures include:

    a) Use of adaptive equipment alarms (i.e. backup alarms) particularly for nighttime construction;

b) Develop and implement an idle reduction policy that focuses on reducing noise and vibration emissions from construction equipment and vehicles;

c) Awareness training for all workers on potential disturbance from impulsive events.

29. For the cumulative effects assessment, the existing VIF, mainline tracks, and Maersk facility are not noted as a additional sources. This seems to indicate that the existing VIF is a part of the Project, and there is a suggestion its noise levels were included in the baseline sound levels. If that is the case, the existing VIF should have been included in the Project Area and evaluated cumulatively with the proposed new Project. This represents an inconsistency in how the assessment is presented.

## 2.3 EEE V3 Section 19 Human Health

This section of the EEE provides a human health assessment (Section 19) related to noise and vibration.

Within this section, the key indicators of human health effects are identified as per the HC guideline. As detailed in Section 19.4.2.2, the noise criteria is based on sleep disturbance, speech comprehension, and the change in %HA. In addition, low frequency noise (LFN) rattle criterion was evaluated within this section.

30. As per HC guideline, complaint criteria is also an indicator of potential human health effects. This section provides the criteria for when complaints are expected but does not incorporate this criterion into the evaluation.

31. As mentioned, LFN is evaluated. The LFN rattle criterion is not clearly stated however and the predicted LFN level at each receptor is not documented.

32. The assessment indicates that "Low-frequency noise was not monitored". The assessment did not provide details on the monitoring methods used. However, most type 1 or type 2 sound level meters (SLM), as recommended by the CTA guidelines for noise monitoring, are capable of filtering octave band levels into the LFN range. In the absence of monitoring data, an assessment should be conducted, and rationale provided to support any conclusions. Considering that LFN is a major concern within communities in close proximity to rail lines, this is a significant oversight.

33. For the pre-construction and construction phases, based on the assessment reporting, noise is predicted to "remain below the Health Canada guidelines for %HA, Ld, and Ln at all sensitive receptors." There is no quantitative support for this statement.

34. For the operation phase, based on the assessment reporting “While no health risks are anticipated, noise levels are anticipated to be above both the speech comprehension (3 receptor locations, including R1, R3, and R4) and sleep disturbance criteria (all 4 receptor locations), which indicates that some individuals may be adversely affected by the increase in noise from the Project (Table 19.17).” It’s not clear how the assessment can conclude there are no health risks anticipated when various human health effects criteria are exceeded. This seems like a contradiction. Note that this statement is related to sound levels without mitigation.

35. Within the residual effects section (19.4.4.2), it was found that with mitigation, “Residual effects are expected to be moderate in magnitude and localized with the potential to disrupt speech comprehension and sleep for some individuals at residences located west of the North Lot, west of South Lot, on McTavish Road, and near Advent Road and 188 Street. While such disturbance could cause annoyance, the effect is not at the level that is anticipated to pose a health risk. No significant adverse effects on human health are expected.” Even with mitigation, it is found that they are exceeding human health criteria but acknowledging adverse effects within the residual effects ratings for operation noise. This conclusion is contradictory to the results.

36. The assessment of vibration pre-construction /construction and operation phases of the Project which regards to human health effects is not robust. The assessment reports that: “…there is no widely accepted approach to quantitatively assess the associated potential health effects beyond the results and details presented in Section 10.0 – Noise, Vibration, and Light.” Methods to assess and quantify construction vibration, including its potential effects on people do exist and have been validated in many previous projects such as the Milton Logistics Hub[11] in Milton, Ontario or the Trans Mountain Expansion Project[12] in the BC Lower Mainland. Further, based on this statement, it does not seem like the proponent can provide residual effects ratings for human health effects from vibration as presented in Table 19.22. An assessment should be conducted and then evaluated based on the results, not merely considered qualitatively without supporting rationale or demonstrated outcomes, otherwise the evaluation appears to be merely conjecture.

[11] Stantec. “Milton Logistics Hub – Technical Data Report, Noise Effects Assessment”. Appendix E.10 of the EIS. December 7, 2015.

[12] TransMountain. https://www.transmountain.com/regulatory-process visited Feb. 4, 2022.

## 2.4 EEE V4 Section 25 Summary of Residual Effects and Mitigation

This section of the EEE includes Table 25.1 (Summary Table of Potential Effects, Proposed Mitigation Measures, Residual Effects and their Significance).

Based on a review of noise and vibration related information provided in Table 25.1, the following comments are provided:

37. Table 25.1 indicated residual effects for noise but indicates that the effects are not significant. There is no supporting rationale for this judgment.

38. Table 25.1 indicates that a noise wall for wildlife is "along the south side of the property", but it is not clear which noise wall is referenced or if such a wall exists in the assessment. There is no discussion of a noise assessment on wildlife in the noise sections of the EEE that were reviewed. In addition, in some cases, the effects of blasting and pile driving can be an important consideration for fish and aquatic receptors.

39. It's not clear how potential changes to local transportation was considered for local receptors. For example, the proposed Project will attract trucks using the facility (i.e., its purpose to integrate trucking and rail). There should be clarification around how these potential effects were considered.

# CONCLUSIONS

Based on RWDI's review of the noise and vibration assessment within the EEE, a summary of the key conclusions are as follows:

- The assessment is not robust. The document does not provide enough technical detail to validate many of the findings. Further, the criteria presented are not clearly connected to the effects evaluation and prescribed mitigation measures which raises confusion and doubt on the efficacy of the analysis.
- The assessment is not transparent. The document does not provide the required rationale to support many key findings. At times, key findings such as residual effects ratings are contradictory to the findings of the effects evaluation.
- The assessment does not inspire confidence. Information gaps and a non-explicit assessment approach at times do not inspire trust that the key findings of the assessment are appropriate.

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| | | | |
|---|---|---|---|
| To: | **City of Pitt Meadows** | Date: | **March 17, 2022** |
| Attention: | **Justin Hart, P. Eng. – Manager of Major Projects** | Project No.: | **33123** |
| Cc: | **Samantha Maki, P. Eng. – Director of Engineering & Operations** | | |
| Reference: | **Canadian Pacific Railway – Proposed Logistics Park Vancouver Project – Third Party Review** | | |
| From: | **Matt Gibson, E.I.T., Project Engineer**<br>**Chris Boit, P. Eng., Senior Project Engineer**<br>**Dave Neufeld, R.P. Bio., P. Bio., Environmental Lead**<br>**Soren Poschmann, P. Geo., Hydrogeology Lead** | | |

The following information is provided in response to the City of Pitt Meadows' request for a third-party review of Canadian Pacific Railway's Logistics Park Vancouver project documentation. Additional comments and concerns are included in the attached comment log sheet and have been sorted by document and discipline, where applicable.

## 1.0 Introduction and Background

Canadian Pacific Railway (CP) is looking to expand their existing Vancouver Intermodal Facility park in the City of Pitt Meadows (the City) consuming 41 acres of agricultural land within the City of Pitt Meadows to create a transload facility. The City requested that ISL Engineering and Land Services Ltd. (ISL) provide a third-party review of design documentation provided by CP. ISL understands that CP will be including feedback from the City in their application to the Canadian Transportation Agency (CTA). The following documents were reviewed:

- Facility General Plan (dated November 4th, 2021)
- Hemmera Environmental Effects Evaluation
  - Volume 1 Section 8 Evaluation Scope and Methodology (dated December 10th, 2021)
  - Volume 2 Section 11 Surface Water, Groundwater, and Drainage (dated December 10th, 2021)
  - Volume 2 Section 12 Fish and Fish Habitat (dated December 10th, 2021)
  - Volume 2 Section 13 Vegetation and Wetlands (dated December 10th, 2021)
  - Volume 2 Section 14 Wildlife (dated December 10th, 2021)
  - Volume 3 Section 15 Agriculture Use & Soil (dated December 14th, 2021)
  - Volume 4 Section 25 Summary of Residual Effects and Mitigation (dated December 14th, 2021)
  - Volume 4 Section 26 Environmental Management and Monitoring (dated December 14th, 2021)
- Hatch Stormwater Management Report 30% Design including Appendices A, B, C, and D (dated June 10th, 2021)
- Hatch Stormwater Management Report 60% Preload Design including Appendices A, B, and C (dated October 28th, 2021)
- Golder Preliminary Geotechnical Design Report (dated June 4th, 2021)

# 2.0 Findings

## 2.1 General

- Generally, we found there were inconsistences and contradictions through the differing reports. It appears there needs some additional coordination between CP and their consultants to ensure continuity between the documentation and clarity overall about the project.
- References made in reports to specific items and details such as cross sections and sampling locations were not included or accurately labelled. The reports should include additional drawings complete with stationing as it relates to each report.
- Proposed mitigation of potential effects is generally insufficient. The reports clearly identify impacts to City assets and private assets but there is a general lack of detail or information that demonstrates how CP will manage and mitigate these impacts appropriately.
- CP should provide the City with all referenced documentation within the EEE, as well as further submissions as the project progresses

## 2.2 Civil

- Pre-development and post-development runoff should be calculated using one of the hydrograph methods outlined in the City's bylaw (Section E.3.1 (b)). CP should provide clarification as to why Unit Area Release Rates were used as a method to establish pre- and post-development runoff rates, as this is not common practice within Lower Mainland. If using Unit Area Release Rates (UARR) for this project, CP should provide a site-specific pre-development UARR. Where no specific criteria are included in a Municipal Bylaw, or master drainage plan, best practices indicate estimating a site pre-development UARR by performing a frequency assessment using relative information from several nearby and comparative watersheds and watercourses, not just one. CP should provide any calculations or analysis that supports their proposed pre-development rate of 10 L/s/ha or further justification as to why the UARR from ‘West Creek’ satisfies these best practices. The current information provided is insufficient.
- No detailed calculations or analysis have been provided demonstrating that there is sufficient attenuation of runoff that would result in post-development rates being less than or equal to pre-development runoff. The designer should provide analysis of stormwater detentions and how they satisfy the storage requirements under the necessary critical storm events.
- Information provided outlines the requirement to place significant quantities of fill to raise the site grade for drainage and flood protection purposes. This placed material is predicted to result in settlements in the order of 2.0m during preloading/surcharging phases and in the order of approximately 0.5m for long-term post-construction settlement. As it is expected that preload/surcharging and ultimate build out are to be constructed within proximity to residential properties, City assets, and water courses, the potential impacts of such settlements, both within and outside the project site, should be assessed and discussed in detail. Mitigative measures should be provided. The Preliminary Geotechnical Design Report notes that that the settlement can be reduced but not eliminated due to the depth of compressible sub-surface layers at the LPV site.

## 2.3 Hydrogeological

- Preloading impacts to groundwater is only considered in the context of impacting groundwater quality by importing contaminated fill or aggregate. There is no apparent mention or assessment of impacts to groundwater levels, which will be impacted by preloading and dewatering activities. A thorough assessment of groundwater level changes during and following preloading is required to evaluate impacts to surrounding areas given the naturally high groundwater levels. The impacts in turn to Katzie Slough and surrounding surface water bodies should also be assessed in the context of groundwater level changes. It should be noted that Hatch's 60% Preload Design report predicts "During the preload program, the groundwater level will tend to mound above the existing ground level, probably in the order of 1 to 2 m." and "Ground water levels within the permanent grade fills will likely stabilize at a higher elevation than current levels, and almost certainly higher than the current ground surface." The on- and off-site impacts from this need to be assessed.
- Hatch noted that existing groundwater levels could potentially stabilize 1 to 2m above existing ground elevation because of the preload design. The lateral extent of settlements due to the depth of the compressible soils is identified in the preliminary Geotech report as being significant. Given the hydrogeological conditions in the area (compressible soils and a high groundwater table), presumably groundwater levels will rise in the area surrounding the preloading. Golder should predict the groundwater level changes over time with preloading and evaluate the impacts to both the groundwater table within and outside the site, as well as to the Katzie Slough and other surface water bodies. Groundwater level monitoring before, during and following preloading should be completed to verify any predictions. CP should confirm any dewatering and treatment plans with the City prior to preloading, construction, or operation.

## 2.4 Environmental

### Comprehensiveness of the Environmental Effects Assessment

- The environmental volume's layout, and broad analysis of Valued Components, Interactions, Potential Risk, Cumulative Effects and Residual Effects align with other federal submissions ISL is familiar with. However, the lack of design details, lack of details informing baseline condition assessment and the paucity of details on mitigation and offsetting, and commitments to implement mitigation and offsetting does not allow the reader to conclude with confidence that mitigation /offsetting will be effective. This report appears to be closer to a Preliminary Environmental Assessment than an Environmental Effects Evaluation (EEE).

### Point and Non-Point Discharge Risk Assessment

- An area of the EEE lacking details is related to point and non-point stormwater quality discharge. The EEE is very hazy with respect to that aspect of the project, focusing more on erosion and sediment control and stormwater volume considerations with very little description of possible treatment options for contaminants run-off from site. However, the Hatch stormwater design reports flesh out considerable detail on how point and non-point discharges will be managed. The EEE should be updated to match the current design effort. It would be appropriate for the City to receive design and report updates through CP's review with the federal regulators.

### Scope of Aquatic and Baseline Assessment

- The EEE scope of assessment does not appear to meet the threshold for comprehensive baseline investigation. The field work for fish, aquatic and wildlife seems closer to reconnaissance level investigation. The consultant reaches the same conclusion as ISL on fish habitat quality, but there is perhaps an over-reliance on data by others (or the Consultant has other data points not yet shared). The baseline is insufficient to draw fulsome conclusions about fish habitat quality because the sampling was reported to have been completed in August. This is arguably the period of worst water quality in Katzie Slough. A more comprehensive and updated baseline investigation, with sampling in Katzie Slough in late fall, winter and spring would have likely returned data that would have identified some limited seasonal potential use by salmonids. It would then have been the Consultants next step to discuss implications of that finding.

- Similarly, the wildlife and agricultural assessments describe potential effects of light in night migrating birds, bats and pollinating insects and proposes mitigation to address those effects. However, it is unclear how the effectiveness of the mitigation treatments would be evaluated without some understanding of baseline condition (Numbers, species, behaviors of bird, bat, and pollinating insects that might be affected by the increased light source).

### Offsetting & Mitigation

- All volumes make reference to mitigation, and within the category of mitigation, the Consultant has identified that offsetting (habitat compensation) would be required for aquatic effects and agricultural land effects. The report largely concludes that through the effects of mitigation the project will have no significant residual or cumulative effects. However, in two cases (aquatic and agricultural) that conclusion appears to be because offsetting has been prescribed. In the context of federal assessment, it is our understanding that mitigation is not offsetting. Offsetting is what is done when mitigation efforts are unsuccessful in addressing the impact. The EEE provides very few details on what mitigation or offsetting would look like, and the language within the EEE is non-committal. This makes it difficult to provide analysis regarding the effectiveness of mitigation and offsetting.
- Offsetting within Katzie Slough and tributaries may have direct implications for City drainage maintenance operations and indirect effects related to habitat conditions inside the managed drainage system.

### Aquatic Habitat Balance and Aquatic Habitat Setbacks

- It appears that the Project intends to utilize a 15 m setback, although confusingly elsewhere there are references to at least the concept of a 30 m setback. There is no analysis of how the Consultant has derived the prescribed setback. While the Riparian Area Protection Regulation is provincial legislation, Fisheries and Oceans Canada (DFO) has acquiesced to that standard for riparian protection in urban BC. Presumably, DFO would expect the current project to at least meet this standard or have the consultant provide rationale for a reduced setback, unless the intent is to vary below the prescribed setback. Irrespective of RAPR standards, a report of this kind should provide the justification for the proposed riparian setback.
- It is unclear whether consideration for offsetting the effects of encroachment into the 15-30 m riparian area was considered or incorporated into the habitat balance.

### Environmental Effects Evaluation and City's Drainage Operations

- The EEE often references the "pump stations" and flood gate operation as the cause for poor water quality, lack of fish presence, poor habitat quality. These statements demonstrate that CP does not fully understand how the existing network functions, as there are other factors contributing to poor water quality (lack of natural headwaters, limited riparian cover, etc.) and poor fish habitat in Katzie Slough.

- The CP Logistics Park would also potentially deny Operations Maintenance crews in this part of Katzie Slough and the tributary sloughs. Some arrangement for access or transference of responsibility to CP appears appropriate. Note to, that if there is some form of enhancement proposed to offset project effects, that enhancement needs to be cognizant of access requirements for City Operations Maintenance crews.

Additional comments and concerns are included in the attached comment log sheet and have been sorted by document and discipline, where applicable.

## 3.0 Closure

We trust you find this memorandum in accordance with your request. Should you require clarification, please contact the undersigned at your earliest convenience

Sincerely,
**ISL Engineering and Land Services**

Written by:

Matt Gibson, E.I.T.
Project Engineer

Reviewed by:

Chris Boit, P.Eng
Senior Project Engineer

PROFESSIONAL PROVINCE OF BRITISH COLUMBIA ENGINEER
C.N. BOIT
# 42221
2022-03-17
Permit to Practice: 1000419

**Attachments**
1. Comment Log

**ISL ENGINEERING AND LAND SERVICES LTD.**
**Canadian Pacific Rail Railway - Logistics Park Vancouver Project - Third Party Review**
**March 15th, 2022**

## COMMENT LOG

| Item No. | Document Name | Page # | Section Reference | Reviewer Initials | ISL Discipline | Reviewer Comments |
|---|---|---|---|---|---|---|
| 1.01 | General Comment | - | - | MG | Civil | CP and their respective consultants (the developer) should provide the City with all future design documentation and technical reports as it is indicated throughout several documents that further information and details for site components will be provided in future documents. |
| 1.02 | Hatch Stormwater Management Report 30% Design | - | General Comment | MG | Civil | Generally, the report is hard to follow as the cross sections provided throughout note mile markings (such as Figures 3-12 to 3-14) however no drawings are provided showing these locations or noting mile markings. Additionally, ditches and other stormwater infrastructure (such as JT11, JT10) are mislabelled or are not included in the model results. The developer should revise this report to clarify all general inconsistencies and note mile markings on a general layout for the purpose of review and coordination. |
| 1.03 | Hatch Stormwater Management Report 30% Design | - | General Comment | MG | Civil | Approvals from environmental authorities will be required. Provincial and municipal policies should be followed and adhered to. |
| 1.04 | Hatch Stormwater Management Report 30% Design | - | General Comment | MG | Civil | SWMP Plan drawings should include 1.0m contours and note any major flow paths as per the City of Pitt Meadows Subdivision and Development Servicing Bylaw no. 2589 |
| 1.05 | Hatch Stormwater Management Report 30% Design | - | Executive Summary | MG | Civil | The report notes that ongoing studies to be completed by Hemmera will aid in quantifying any potential impacts to the Katzie Slough System but these studies were either not ready for review, or not made available for review at the time of submission to the City. The developer should confirm what studies are being completed and results should be provided for City review prior to CP's submission to the Canadian Transportation Agency. Other sections of this SWMP report note that portions of Hemmera's analysis have been completed and included in this report. For clarity, the report should be revised to clarify what analysis is still to be completed and what analysis has been completed. If these studies include sections in the EEE then please refer to comments relating to those studies. |
| 1.06 | Hatch Stormwater Management Report 30% Design | 3 | Stormwater Network Design Objectives, 2.1 | MG | Civil | The developer should confirm ground water infiltration will have no negative impacts to adjacent waterbodies or downstream infrastructure. Most notably through dry detention ponds where water could likely be contaminated with hydrocarbons. |
| 1.07 | Hatch Stormwater Management Report 30% Design | 3 | Stormwater Network Design Objectives, 2.1 | MG | Civil | Pre-development and post-development runoff should be calculated using the hydrograph method outlined in the City's bylaw no. 2589 (Section E.3.1) and the runoff coefficients should be taken from the City's bylaw (Section E.3.5). The developer should provide clarification as to why Unit Area Release Rates (UARR) were used as a method to establish pre and post development runoff rates, as this is not common practice within Lower Mainland British Columbia. |

| COMMENT LOG | | | | | | |
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| **Item No.** | **Document Name** | **Page #** | **Section Reference** | **Reviewer Initials** | **ISL Discipline** | **Reviewer Comments** |
| 1.08 | Hatch Stormwater Management Report 30% Design | 4 | Stormwater Network Design Objectives, 2.1 | MG | Civil | If using Unit Area Release Rates (UARR) for this project, the developer should provide a site specific pre-development UARR. Where no specific criteria is included in a municipal bylaw, or master drainage plan, best practices indicate estimating a site pre-development UARR by performing a frequency assessment using relative information from a number of nearby and comparative watersheds and watercourses. The developer should provide any calculations or analysis that supports their proposed pre-development rate of 10 L/s/ha or further justification as to why the UARR from 'West Creek' satisfies these best practices. The current information provided is insufficient. |
| 1.09 | Hatch Stormwater Management Report 30% Design | 7 | Post-Development Conditions, 3.1 | MG | Civil | The report notes that runoff generated by the LPV will be captured on each sub-site and directed to one of three ponds. No design is provided for this ponds and it does not mention if groundwater infiltration will be utilized. The developer should confirm whether or not ground water infiltration will be required and confirm there are no negative impacts to downstream watercourses or infrastructure as a result. |
| 1.10 | Hatch Stormwater Management Report 30% Design | 7 | 3.2.1.1 | MG | Civil | The developer should outline their plan for treatment and disposal of the oil/gas/diesel collected in the oil/water separators. |
| 1.11 | Hatch Stormwater Management Report 30% Design | 15 | 3.2.6.2 | MG | Civil | The developer should ensure that the Liquid Staging area and all other track yard sections are sloped towards their necessary and required containment areas. |
| 1.12 | Hatch Stormwater Management Report 30% Design | 16 | 3.2.6.3 | MG | Civil | This section notes that overland ditches are to drain proposed tracks and adjacent residential properties with a conceptual image provided in Figure 3-12. The developer should confirm that there will be no impact to the existing drainage ditch or flood levels as a result of Figure 3-12, and demonstrate that residential and post development flow rates at different design storms, can be accommodated within the drainage ditch. Additionally, the developer should comment on maintenance access to prevent issues with conveyance over time as well as maintenance procedures to ensure debris blockages and excessive overgrowth, both of which could impact drainage over the long term. |
| 1.13 | Hatch Stormwater Management Report 30% Design | 17 | 3.2.6.3 | MG | Civil | Similar comment as above, Figure 3-13 notes "V ditch" and a storm sewer. The developer should provide a site plan with layout noting mile markings for easier review of conceptual cross section. The developer should confirm that there will be no impact to the existing drainage ditch or flood levels, and demonstrate that residential and post development flow rates can be accommodated within the proposed infrastructure. Furthermore, CP provides no detail on how CP intends to protect private property of adjacent residents when constructing right up to the property line. |
| 1.14 | Hatch Stormwater Management Report 30% Design | 18 | 3.2.7 | MG | Civil | The developer should confirm that all ponds include a restricted outlet designed to maintain the discharge to the downstream drainage system at a rate of the pre-development run-off for a ten-year return period. Outlet controls for these onsite storage facilities should be design using the standard orifice and/or weir equations and the designer should provide calculations and information pertaining to the flow control devices mentioned in the report. |

## COMMENT LOG

| Item No. | Document Name | Page # | Section Reference | Reviewer Initials | ISL Discipline | Reviewer Comments |
|---|---|---|---|---|---|---|
| 1.15 | Hatch Stormwater Management Report 30% Design | 18 | 3.2.7 | MG | Civil | Ditches including JT10 and JT11 appear to be mislabelled in appendix B or are not included in the model results (Appendix C). |
| 1.16 | Hatch Stormwater Management Report 30% Design | 19 | 3.2.7.1 | MG | Civil | Per the City's bylaw, Section E.3.20, the maximum depth for a dry detention basin is to be 1.0m max. |
| 1.17 | Hatch Stormwater Management Report 30% Design | 19 | 3.2.7.2 | MG | Civil | Per the City's bylaw, Section E.3.20, the maximum depth for a dry detention basin is to be 1.0m max. |
| 1.18 | Hatch Stormwater Management Report 30% Design | 20 | 3.2.7.3 | MG | Civil | Per the City's bylaw, Section E.3.20, the maximum depth for a dry detention basin is to be 1.0m max. |
| 1.19 | Hatch Stormwater Management Report 30% Design | 22 | 4.2 | MG | Civil | In recent months, the lower mainland has experienced record levels of rainfall. Has the designer considered this in their climate change factor of 1.15 for rainfall intensities and hyetographs? Pitt Meadows received 90.7mm of rain on November 14, and 72.1mm on November 15, for a total of 162.8mm over 48 hours. Nearby locations received totals that were near (Agassiz - 127.3mm) or exceeded (Hope - 174mm) this value in a 24hr period as well. It should be noted that CP's calculated 100 year return period rainfall amount in 24 hours is shown as 130mm |
| 1.20 | Hatch Stormwater Management Report 30% Design | 23 | 4.2 | MG | Civil | In past experiences with development reviews in the City of Pitt Meadows the 10 year 2 hour storm event has been the critical storm event for minor systems. As such, the developer should provide a hyetograph for the 10 year 2 hour storm and confirm that the 10 year 6 hour storm event would still be the critical event. |
| 1.21 | Hatch Stormwater Management Report 30% Design | 23 | 4.2 | MG | Civil | It appears the designer has used two different critical storms to size different components of the minor system. The designer should provide clarification as to why different storms were selected. Further to the previous comment, past experience has identified the 10 year 2 hour storm as the critical storm event in Pitt Meadows. |
| 1.22 | Hatch Stormwater Management Report 30% Design | 27 | 4.6 | MG | Civil | Table 4-3 provides Katzie Slough Water levels for major storm events. The Hemmera report (EEE, Table 11.4 and 11.10) provides pre and post development water levels at 3 junctions along the Katzie and Cook Sloughs including the Kennedy Pump Station. It appears that the water levels used for post development boundary conditions of the SWMP outfall do not coincide with this analysis as the SWMP 30% report date precedes the date of the Hemmera report ISL has been asked to review. The designer should confirm that the most recent information is being used. With that being said, following recent record rainfalls on November 14th and November 15th, the Kennedy PS recorded a max water level of 1.44m. As such, the boundary conditions appear to be reasonable. |
| 1.23 | Hatch Stormwater Management Report 30% Design | 26 | 4.6 | MG | Civil | The developer should provide plan and profile drawings for all stormwater outfalls and pipe networks showing the 10 year HGL to determine whether or not the amount of flow in the piped system will surcharge on-site should for example a 10 year storm event occur at the same time as high water levels in the Katzie or Cook Slough. 100 year HGL should be provided to understand at what point overland flooding would occur and where. |

| COMMENT LOG | | | | | | |
|---|---|---|---|---|---|---|
| **Item No.** | **Document Name** | **Page #** | **Section Reference** | **Reviewer Initials** | **ISL Discipline** | **Reviewer Comments** |
| 1.24 | Hatch Stormwater Management Report 30% Design | 28 | 5.1.1 | MG | Civil | CP should provide and outline the operation and maintenance program for maintaining the Oil Grit Separators and Oil Water Separators. |
| 1.25 | Hatch Stormwater Management Report 30% Design | 30 | Impacts to the Katzie Slough Watershed, 6 | MG | Civil | While the report notes that post-development flow rates are equal to pre-development flow rates, section 11.4.2.1 of the provided Hemmera Environmental Effects Evaluation notes an increase in total water volume discharged into the slough post-development. This is a clear impact to the Katzie Slough water levels and volume as a result of the development. |
| 1.26 | Hatch Stormwater Management Report 30% Design | 31 | Groundwater, 7 | MG | Civil | Hatch noted that existing groundwater levels could potentially stabilize 1 to 2m above existing ground elevation as a result of the preload design. The lateral extent of settlements due to the depth of the compressible soils is identified in the preliminary Geotech report as being significant. Given the hydrogeological conditions in the area (compressible soils and a high groundwater table), presumably groundwater levels will rise in the area surrounding the preloading. Golder should predict the groundwater level changes over time with preloading and evaluate the impacts to both the groundwater table within and outside the site, as well as to the Katzie Slough and other surface water bodies. Groundwater level monitoring before, during and following preloading should be completed to verify any predictions. The developer should confirm any dewatering and treatment plans with the City prior to preloading, construction or operation. |
| 1.27 | Hatch Stormwater Management Report 30% Design | 31 | Groundwater, 7 | MG | Civil | The developer should complete a review of the dry detention ponds to ensure there is no uplift of the liner as a result of elevated ground levels when the pond is empty. The developer should also provide the City with a dewatering and treatment plan prior to preloading and construction. |
| 1.28 | Hatch Stormwater Management Report 30% Design | 31 | Groundwater, 7 | MG | Civil | The developer should provide the City with a report for review outlining any subsurface drainage systems that are developed as the design progresses. |
| 1.29 | Hatch Stormwater Management Report 30% Design | 32 | Model Results, 8 | MG | Civil | Refer to similar comment from section 2.1. This section of the report notes that pre-development rates for all outfall locations are provided although Table 8-1 notes that these rates are post-development. The designer should clarify and provide further information on how the pre and post development rates were calculated. The designer should also provide further clarification as to how the max flow rates and contributing areas were calculated for table 8-1 as there appears to be general inconsistencies between other information provided in this report and appendices. |
| 1.30 | Hatch Stormwater Management Report 30% Design | 32 | Model Results, 8 | MG | Civil | No quantitative information has been provided demonstrating that there is sufficient attenuation of runoff that would result in post-development runoff being less than or equal to pre-development runoff. The designer should provide information and calculations for detention pond storage and how it satisfies the requirements under the 100 year critical storm event. More modelling may be required. |
| 1.31 | Hatch Stormwater Management Report 30% Design | 33 | Summary and Conclusions, 9 | MG | Civil | The developer should identify at what point overland flooding would occur throughout the site. 10 year and 100 year HGL to be provided on design drawings and submitted to the City for review |

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| 1.32 | Hatch Stormwater Management Report 30% Design | 34 | Summary and Conclusions, 9 | MG | Civil | As part of the next stages of design, the developer should address those comments noted above including but not limited to how the pre-loading, final design elevations and settlement will impact future groundwater levels and ultimately water levels within adjacent water courses. |
| 1.33 | Hatch Stormwater Management Report 30% Design | 34 | Summary and Conclusions, 9 | MG | Civil | CP should provide the future detailed design SWMP reports for City of Pitt Meadows review as the design has significant impact on downstream water courses and infrastructure. |
| 1.34 | Hatch Stormwater Management Report 30% Design | APX C | Table C-2 | MG | Civil | The developer should provide culvert sizes/diameters to ensure they meet City of Pitt Meadows minimum requirements. |
| 1.35 | Hatch Stormwater Management Report 30% Design | APX C | Table C-3 | MG | Civil | The developer should confirm that the water level in any ditches adjacent to traveled roadways does not exceed 1 metre in depth as per City of Pitt Meadows requirements. |
| 1.36 | Hatch Stormwater Management Report 30% Design | APX C | Table C-4 | MG | Civil | The developer should confirm the pipe materials, sizes and rationale for varying roughness coefficients. |
| 1.37 | Hatch Stormwater Management Report 30% Design | APX C | Table C-4 | MG | Civil | Storm sewers are shown at < 1.0%. Minimum grades of storm sewers are as required to obtain the minimum velocity of 0.6m/s. Per table C-4, a significant portion of the storm pipe network has a max velocity < 0.6m/s. A minimum of 1% is recommended. |
| 1.38 | Hatch Stormwater Management Report 60% Preload Design | 4 | Executive Summary | MG | Civil | Design criteria should note the designer is to Limit the post-development peak rate of runoff to the pre-development peak rate of runoff for the 10-year design storm. This should be proved using the hydrograph method as provided in the City's development and servicing bylaw. |
| 1.39 | Hatch Stormwater Management Report 60% Preload Design | 4 | Executive Summary | MG | Civil | The City should be provided with a detailed erosion and sediment control plan for review. |
| 1.40 | Hatch Stormwater Management Report 60% Preload Design | 9 | 2.1 | MG | Civil | Pre-development and post-development runoff should be calculated using the hydrograph method outlined in the City's bylaw (Section E.3.1) and the runoff coefficients should be taken from the City's bylaw (Section E.3.5). The developer should provide clarification as to why Unit Area Release Rates were used as a method to establish pre and post development runoff rates, as this is not common practice within Lower Mainland British Columbia. |
| 1.41 | Hatch Stormwater Management Report 60% Preload Design | 9 | 2.1 | MG | Civil | Similar comment as the 30% design report. If using Unit Area Release Rates for this project, the developer should provide a site specific pre-development UARR. Where no specific criteria is included in a municipal bylaw, or master drainage plan, best practices indicate estimating a site pre-development UARR by performing a frequency assessment using relative information from a number of nearby and comparative watersheds and watercourses. The developer should provide any calculations or analysis that supports their proposed pre-development rate of 10 L/s/ha or further justification as to why the UARR from ‘West Creek’ satisfies these best practices. The current information provided is insufficient. |

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| 1.42 | Hatch Stormwater Management Report 60% Preload Design | 9 | 2.2 | MG | Civil | Silt fencing is noted in the drainage ditches and swales every 100m to 200m. Best practices would include silt fencing along the top of bank outside the riparian buffer/setback for all drainage ditches and watercourses as well as where the toe of preload material is in proximity to the Katzie and Cook Sloughs. The developer should provide the City with a detailed erosion and sediment control plan for review which includes and outlines how the silt fence will be installed and maintained over the preload duration. All ESC monitoring reports should be shared with the City. This applies to all phases of construction where fill material can be washed into watercourses by surface runoff. |
| 1.43 | Hatch Stormwater Management Report 60% Preload Design | 9 | 2.2 | MG | Civil | As per City bylaw Section E.3.20 (b), ground water infiltration shall be used where site-specific studies determine this practice is appropriate. The developer should confirm that any ground water infiltration will have no negative impacts to adjacent waterbodies or downstream infrastructure. |
| 1.44 | Hatch Stormwater Management Report 60% Preload Design | 10 | 3.1 | MG | Civil | The preliminary Geotech report notes that fill material required to raise the site grade for drainage and flood protection purposes, is predicted to result in settlements in the order of 2.0m during the preloading/surcharging phase. Offsite impacts as a result of the preload should be assessed. The developer should demonstrate and confirm that there is no impact to the pre-development drainage conditions or flood levels for residential lots on 124 Ave and 124a Ave as well as the agricultural property adjacent to the rail ditch along and west of Advent Road. |
| 1.45 | Hatch Stormwater Management Report 60% Preload Design | 13 | 3.2 | MG | Civil | Figure 3-4, Does the designer have any concern that the preload design is insufficient with respect to erosion protection? If settlement occurs unevenly across the pre-load is it possible that pooling would occur in outer areas and result in potential over-topping of the 300mm berm thus releasing a higher rate of surface runoff? |
| 1.46 | Hatch Stormwater Management Report 60% Preload Design | 14 | 3.2.1 | MG | Civil | Figure 3-5, the developer should consider and address ponding between the preload toe and the existing track. Nothing is specified or provided outlining how ponding in this area will be alleviated. In other cross sections, such as Figure 3-10 for the MSE walls, 100mm HDPE drains are noted. It should be noted that these drains are shown as CSP in other cross sections. |
| 1.47 | Hatch Stormwater Management Report 60% Preload Design | 15 | 3.2 | MG | Civil | For all lots and preload areas, it is recommended that the minimum slope for any drainage ditch or swale be 0.5% (per City Bylaw section E.3.22 (b)) to ensure positive conveyance and reduce the risk of flooding |
| 1.48 | Hatch Stormwater Management Report 60% Preload Design | 18 | 3.2.4 | MG | Civil | For all cross sections where stripping and grubbing is required, the designer should consider immediately placing topsoil, hydroseed and erosion control blankets to ensure the risk for erosion of adjacent banks is minimized This information should be included in a detailed sediment and erosion control plan. |
| 1.49 | Hatch Stormwater Management Report 60% Preload Design | 19 | 3.2.5 | MG | Civil | Figure 3-10, the developer should confirm long term maintenance access and management plans for the drainage ditches. If these drainage ditches are not properly maintained and cleared of overgrown vegetation, conveyance issues will lead to ponding and potential flooding of adjacent lots. |

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| 1.50 | Hatch Stormwater Management Report 60% Preload Design | 19 | 3.2.5 | MG | Civil | As a large portion of the preload material is expected to be retained, the developer should consider benching in the preload material to ensure proper compaction between proposed material and existing material. This applies to all cross sections and preloading areas where fill is to be retained. |
| 1.51 | Hatch Stormwater Management Report 60% Preload Design | 21 | 3.2.5 | MG | Civil | The developer should provide plan and profile drawings for all stormwater outfalls and pipe networks showing the 10 year HGL to determine whether or not the amount of flow in the piped system will back up and surcharge on-site causing overland flow if for example a 10 year storm event occurs at the same time as high water levels in the Katzie or Cook Slough. 100 year HGL should be provided to understand at what point overland flooding would occur and where. |
| 1.52 | Hatch Stormwater Management Report 60% Preload Design | 24 | 3.4 | MG | Civil | In recent months, the lower mainland has experienced record levels of rainfall. Has the designer considered this in their climate change factor of 1.15 for rainfall intensities and hyetographs? Pitt Meadows received 90.7mm of rain on November 14, and 72.1mm on November 15, for a total of 162.8mm over 48 hours. Nearby locations received totals that were near (Agassiz - 127.3mm) or exceeded (Hope - 174mm) this value in a 24hr period as well. It should be noted that CP's calculated 100 year return period rainfall amount in 24 hours is shown as 130mm |
| 1.53 | Hatch Stormwater Management Report 60% Preload Design | 24 | 3.4 | MG | Civil | In past experiences with development reviews in the City of Pitt Meadows the 10 year 2 hour storm event has been the critical storm event for minor systems. As such, the developer should provide a hyetograph for the 10 year 2 hour storm and confirm that the 10 year 6 hour storm event would still be the critical event. |
| 1.54 | Hatch Stormwater Management Report 60% Preload Design | 24 | 3.4 | MG | Civil | Accordingly to the City's bylaw (Section E.2.1 (a) and (b), minor systems shall be designed to convey flows of a 10 year return flow frequency while major systems should be designed to carry flows of a 100 year system. In the 30% SWMP, it is noted that the critical storm for the outlet pipes from ponds and ditches into major watercourses was determine to be a 10 year frequency. In this report, the critical storm for outlet pipes from ponds and ditches into major watercourses is noted to be a 100 year frequency. The designer should confirm the critical storms for all outlet pipes from ponds and ditches. Hyetographs for all durations should be provided. |
| 1.55 | Hatch Stormwater Management Report 60% Preload Design | 33 | Boundary Conditions, 3.7 | MG | Civil | Table 3-8 provides Katzie Slough Water levels for major storm events. The Hemmera report (EEE, Table 11.4 and 11.10) provides pre and post development water levels at 3 junctions along the Katzie and Cook Sloughs including the Kennedy Pump Station. It appears that the water levels used for post development boundary conditions of the SWMP outfall do not coincide with this analysis as the SWMP 60% preload design report date precedes the date of the Hemmera report ISL has been provided to review. |
| 1.56 | Hatch Stormwater Management Report 60% Preload Design | 33 | Boundary Conditions, 3.7 | MG | Civil | The developer should confirm what climate change factor was included or used to determine these boundary condition water levels. Has the designer taken into account the recent atmospheric rivers? Kennedy Pump Station recorded a max water level for the Katzie Slough of 1.44m on November 16th. |

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| 1.57 | Hatch Stormwater Management Report 60% Preload Design | 34 | Groundwater, 4 | MG | Civil | Hatch noted that existing groundwater levels could potentially stabilize 1 to 2m above existing ground elevation as a result of the preload design. The lateral extent of settlements due to the depth of the compressible soils is identified in the preliminary Geotech report as being significant. Given the hydrogeological conditions in the area (compressible soils and a high groundwater table), presumably groundwater levels will rise in the area surrounding the preloading. Golder should predict the groundwater level changes over time with preloading and evaluate the impacts to both the groundwater table within and outside the site, as well as to the Katzie Slough and other surface water bodies. Groundwater level monitoring before, during and following preloading should be completed to verify any predictions. CP should confirm any dewatering and treatment plans with the City prior to preloading, construction, or operation |
| 1.58 | Hatch Stormwater Management Report 60% Preload Design | 34 | Model Results, 8 | MG | Civil | Refer to similar comment from section 2.1. This section of the report notes that pre-development rates for all outfall locations are provided although Table 8-1 notes that these rates are post-development. Additionally, the report notes that "By meeting this criterion, no downstream detrimental impacts are expected, although these impacts have not yet been full quantified". The designer should clarify and provide further information on how the pre and post development rates were calculated. The designer should also provide further clarification as to how the max flow rates and contributing areas were calculated for table 8-1 as there appears to be general inconsistencies between other information provided in this report and appendices. Furthermore, the designer should quantify all downstream impacts for review to determine whether or not they can be classified as detrimental. |
| 1.59 | Hatch Stormwater Management Report 60% Preload Design | 35 | Model Results, 8 | MG | Civil | Can the designer clarify why the post-development contributing area (17.08ha) in Table 5-1 of this report is significantly lower than the post-development contributing area (55.33ha) in Table 8-1 of the 30% SWMP report? No quantitative information has been provided demonstrating that there is sufficient attenuation of runoff that would result in post-development runoff being less than or equal to pre-development runoff. The designer should provide information and calculations for detention pond storage and how it satisfies the requirements under the 100 year critical storm event. More modelling may be required. |
| 1.60 | Hatch Stormwater Management Report 60% Preload Design | 35 | Model Results, 8 | MG | Civil | For all lots and preload areas, it is recommended that the minimum slope for any drainage ditch or swale be 0.5% (per City Bylaw Section E.3.22 (b)) to ensure positive conveyance and reduce the risk of flooding |
| 1.61 | Hatch Stormwater Management Report 60% Preload Design | 35 | Model Results, 8 | MG | Civil | All slopes for culverts are very flat. Minimum slope of 0.5% is recommended but it is understood that there is constraints with tie-in elevations and cover. |
| 1.62 | Hatch Stormwater Management Report 60% Preload Design | 35 | Model Results, 8 | MG | Civil | It is understood that some of the infrastructure installed as part of the pre-load design will remain for ultimate build out, however information for these items provided in Tables 5-2, and 5-3 does not appear to match information provided in the SWMP 30% report for the same items. Can the designer clarify? |
| 1.63 | Hatch Stormwater Management Report 60% Preload Design | 36 | Summary and Conclusions, 6 | MG | Civil | The information provided does not address the requirements of the local jurisdictions. |

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| 1.64 | Hatch Stormwater Management Report 60% Preload Design | 36 | Summary and Conclusions, 6 | MG | Civil | Future refined design information should be provided to the City for review including riprap sizing/layer thickness, culvert/ditch installation details, etc. |
| 1.65 | Hatch Stormwater Management Report 60% Preload Design | APX A | Available Data | MG | Civil | The City's most recent drainage and irrigation study was not included or referenced in this report. |
| 1.66 | Golder Preliminary Geotechnical Design Report | iv | Exec Summary - Key Design Issues | SP | Hydrogeology | Golder identified "significant consolidation settlements within the compressible clayey deposits", with preloading/surcharging identified to limit long-term settlements. The lateral extent of settlements due to the depth of the compressible soils is identified as being significant.<br>Golder and Hemmera both did not consider the impacts to groundwater levels due to the extensive preloading. Given the hydrogeological conditions in the area (compressible soils and a high groundwater table), presumably groundwater levels will rise in the area surrounding the preloading. Golder should predict the groundwater level changes over time with preloading and evaluate the impacts to both the groundwater table within and outside the site, as well as to Katzie Slough and other surface water bodies. Groundwater level monitoring before, during, and following preloading should also be completed to verify any predictions. |
| 1.67 | Golder Preliminary Geotechnical Design Report | xi | Exec Summary - Conceptual (10%) Geotechnical Design Recommendations | SP | Hydrogeology | Excavations for some structures are noted to extend below the groundwater table, but there is no discussion of dewatering plans or impacts to groundwater, surface water, and the Katzie Slough expected during dewatering. Groundwater levels during preloading conditions should also be considered. |
| 1.68 | Golder Preliminary Geotechnical Design Report | 10 | 4.3 Groundwater Conditions | SP | Hydrogeology | Upward gradients are predicted when the permanent grade fills are placed and during consolidation. This further highlights the need for an assessment on groundwater level impacts to off-site properties. |
| 1.69 | Golder Preliminary Geotechnical Design Report | 61 | 7.4 Drainage Considerations | SP | Hydrogeology | Groundwater levels are predicted to rise within the new fills, above the natural levels. This amount of rise and locations of rise should be presented along with an assessment of this impact to surrounding properties and to surface water and the Katzie Slough. |
| 1.70 | Golder Preliminary Geotechnical Design Report | 3 (Appendix A, Preliminary Pavement Design) | 1.0 Introduction | SP | Hydrogeology | Pavement design assumes groundwater levels will be maintained at least 1 m below the base of sub-base layer, but groundwater levels are predicted to rise into fill areas. The designer should confirm if groundwater conditions and impacts to levels have been considered in the pavement design. |
| 1.71 | Golder Preliminary Geotechnical Design Report | iv | Key Design Issues | MG | Civil | The report mainly looks at impacts within CP's ROW and the project area. Off-site impacts to adjacent properties and watercourses are not adequately discussed or reviewed. |
| 1.72 | Golder Preliminary Geotechnical Design Report | vi | Executive Summary - Seismic Review | MG | Civil | Mainline stationing differs between Hatch report and provided drawings making report hard to follow. |

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| 1.73 | Golder Preliminary Geotechnical Design Report | xi | Executive Summary - Construction Considerations | MG | Civil | The City should be provided with a copy of the 60% detailed design report once it is developed and updated. Our understanding is this report will include advancement of the current design with respect to feasibility, constructability and schedule considerations. Further details, recommendations, and specifications will be developed and updated by Golder and Hatch during this stage. Dewatering should be assessed due to excavations below the water table. Golder should comment on the effects that dewatering will have to adjacent properties, and watercourses. |
| 1.74 | Golder Preliminary Geotechnical Design Report | 15 | 5.4, Frost Depth | MG | Civil | It is recommended that buried pipes have a minimum cover of 1.2m. |
| 1.75 | Golder Preliminary Geotechnical Design Report | 23 | 5.5.7, Liquefaction Assessment | MG | Civil | The report mentioned that no site-specific seismic response analysis has been completed east of Katzie Slough and is considered outside the current scope of the project, however further down in this section it notes that liquefaction is more prominent east of Cook Slough. It is recommended that a seismic response analysis be completed for the entirety of the project area including where it extends east past the Katzie slough and into residential areas. Where the project area is adjacent to residential properties STA172 + 800 to 173 +800, the report notes 270mm to 650mm of estimated settlement. Has there been any consideration as to the potential impact to adjacent residential properties from settlements and lateral displacements as a result of liquefaction? Are mitigative measures included in retaining wall designs? The designer should confirm the extents of the seismic review that was completed. |
| 1.76 | Golder Preliminary Geotechnical Design Report | 40 | 5.8.1, Discussion | MG | Civil | The report notes that the placement of significant quantities of fill, which will be required to raise the site grade for drainage and flood protection purposes, is predicted to result in settlements in the order of 2.0m during preloading/surcharging phases and in the order of approximately 0.5m for long-term post-construction settlement. As it is expected that preload/surcharging and ultimate build out is expected to be constructed within close proximity to adjacent properties, city assets, and water courses, the potential impacts of such settlements should be assessed in detail and mitigative measures developed. The report goes on to note that that the settlement can be reduced but not eliminated due to the depth of compressible sub-surface layers at the LPV site. |
| 1.77 | Golder Preliminary Geotechnical Design Report | 51 | 5.9.8.1.2 | MG | Civil | The City should be provided with a revised report which includes detailed mitigation measures. |
| 1.78 | Golder Preliminary Geotechnical Design Report | 54 | 5.10, Kennedy McTavish Connector Road | MG | Civil | The City should be provided with a detail design of the Kennedy McTavish Connector Road ("Private Extension of Kennedy Road") for review as CP is suggesting that it may tie into existing Roadways and potential future alignments. |
| 1.79 | Golder Preliminary Geotechnical Design Report | 56 | 6.1, Liquid Tanks | MG | Civil | CP should confirm design mitigation measures for the Liquid Tanks to ensure settlement tolerances are met as any leaks from the fuel tanks has the potential to impact storm and groundwater. |

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| 1.80 | Golder Preliminary Geotechnical Design Report | 59 | 6.5, Cook Slough Relocation | MG | Civil | No additional information has been provided for the potential relocation of Cook Slough in any of the documents provided to ISL including the 30% and 60% reload SWMPS. CP should provided any relevant information on these discussions and any design/report information for the City's review. |
| 1.81 | Golder Preliminary Geotechnical Design Report | 60 | 7.0 Construction Considerations | MG | Civil | No mention of preloading or dewatering impacts. As noted in other areas, these impacts should be assessed. A copy of Golder's 60% preload design should be provided for the City's review. |
| 1.82 | Golder Preliminary Geotechnical Design Report | 60 | 7.2 Excavation | MG | Civil | No mention of  dewatering impacts to neighboring properties and watercourses as a result of significant dewatering required for deep excavations. As mentioned, in other sections, these potential impacts should be assessed. |
| 1.83 | Hemmera EEE Volume 1 Section 8 Evaluation Scope and Methodology | 8-1 | Table 8.1, Value Components Selected for the Project | MG | Civil | Valued component number 3 "Surface water, groundwater and drainage" should note "change in surface water quantity" as a potential project effect. Groundwater impacts are not fully outlined in the EEE / reports. Additional information and documentation should be provided outlining full comprehension of the groundwater impacts. Further modelling may be required. |
| 1.84 | Hemmera EEE Volume 1 Section 8 Evaluation Scope and Methodology | 8-9 | Table 8.2 | SP | Hydrogeology | Valued component number 3 "Surface water, groundwater and drainage" - Indicating that the Regional Evaluation Area ends to the south at Ford Rd and not the Fraser River is in conflict with Section 11. The Fraser River clearly is a hydrological divide that would be a logical boundary for groundwater and surface water impacts |
| 1.85 | Hemmera EEE Volume 1 Section 8 Evaluation Scope and Methodology | 8-11 | Table 8.3 | SP | Hydrogeology | Preloading is noted to take three years from 2023-2026 but unclear if this is considered in the Existing Conditions or Future Conditions |
| 1.86 | Hemmera EEE Volume 1 Section 8 Evaluation Scope and Methodology | 8-5 | Table 8.1 Valued Components Selected for the Project (Wildlife) | DEN | Environmental | Lighting risk defined, but pollinator insects described in agricultural assessment volume not discussed here. Reader should at least be referenced to the discussion on pollinator insects in the agriculture volume. |
| 1.87 | Hemmera EEE Volume 1 Section 8 Evaluation Scope and Methodology | 8-9 | Table 8.2 Local and Regional Evaluation Area Boundaries (Surface water groundwater and drainage) | DEN | Environmental | Since drainage in Katzie Slough is complex, a solely downstream look is not entirely appropriate. |
| 1.88 | Hemmera EEE Volume 1 Section 8 Evaluation Scope and Methodology | 8-9 | Table 8.2 Local and Regional Evaluation Area Boundaries (Fish and fish habitat) | DEN | Environmental | Depending on project components, the project could potentially affect habitats well upstream of the 300 m boundary cited, depending on the layout, design, as well as the flow and water quality impacts of all LPV phases. |
| 1.89 | Hemmera EEE Volume 1 Section 8 Evaluation Scope and Methodology | 8-13 | 8.3.3 Mitigation Measures | DEN | Environmental | M8-2 - Refers to emergency response, but not spill response. CP needs to clarify commitment to spill response for all phases of construction and operation. |
| 1.90 | Hemmera EEE Volume 1 Section 8 Evaluation Scope and Methodology | 8-13 | 8.3.3 Mitigation Measures | DEN | Environmental | In the context of federal assessment, it is our understanding that mitigation is not offsetting. Offsetting (habitat compensation) is what is done when mitigation efforts are unsuccessful in addressing the impact. |

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| 1.91 | Hemmera EEE Volume 1 Section 8 Evaluation Scope and Methodology | 8-14 | Table 8.5 Project Mitigation | DEN | Environmental | M8-11 - Difficult to see how a rail crossing yard upgrade could maintain navigation given current high water elevations, low overhead clearance. |
| 1.92 | Hemmera EEE Volume 1 Section 8 Evaluation Scope and Methodology | 8-14 | Table 8.5 Project Mitigation (LIGHT) | DEN | Environmental | M8-14 /8-15 This mitigation suggests benefits for residents and wildlife, however impacts to birds/bats/insects is not mentioned. What is the baseline that effectiveness performance would be compared against? When would that data be collected? Current baseline as presented seems inadequate to undertaken before and after comparisons. Starting to run out of time given Proponents permit timeline (late 2022-early 2023) Quantitative metrics for determining effectiveness? |
| 1.93 | Hemmera EEE Volume 1 Section 8 Evaluation Scope and Methodology | 8-14 | Table 8.5 Project Mitigation | DEN | Environmental | M8-16 - Unclear how the site layout is mitigation. Claim of existing industrial lands seems off given considerable part of project is productive agricultural lands. |
| 1.94 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-1 | 12.0 Fish and Fish Habitat, 12.1 Overview | DEN | Environmental | Reference to diked Katzie Slough. Katzie Slough is surrounded by dikes on the Pitt River, Fraser River and Alouette River but not all banks of Katzie Slough are diked. |
| 1.95 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-1 | 12.0 Fish and Fish Habitat, 12.1 Overview | DEN | Environmental | Salmonids were not detected, but the sampling period was August. This is the least likely time to find salmonids. However there is potential for salmonids in fall, winter and spring. They have been captured in south Katzie as late as July |
| 1.96 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-1 | 12.0 Fish and Fish Habitat, 12.1 Overview | DEN | Environmental | Reference to term 'small area of potential fish habitat' is unusual here. The impacts presented later in the EEE are considerable compared to some projects. |
| 1.97 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-1 | 12.0 Fish and Fish Habitat, 12.1 Overview | DEN | Environmental | Reference to mitigation, but we disagree with the author on whether mitigation is offsetting, so suggest that offsetting should be referenced separately. See also Item 1.90. |
| 1.98 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-1 | 12.2.1 Selection as a Valued Component | DEN | Environmental | Report references to watercourses as a filterer of pollutants. It is not appropriate to think of watercourses as receivers and treaters of pollution. Goal would be to treat at source. |
| 1.99 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-1 | 12.2.1 Selection as a Valued Component | DEN | Environmental | Reference to commercial value of fish. This seems unlikely given Katzie Slough condition, drainage system operation, slough conditions and overall low numbers of salmonids and in fact fish that could be forage species. |
| 2.00 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-2 | 12.2.1 Selection as a Valued Component | DEN | Environmental | Reference to aquatic biota being sensitive to changes in environmental conditions. This is not true for all species, including several that are in Katzie Slough. |
| 2.01 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-2 | 12.2.1 Selection as a Valued Component | DEN | Environmental | Reference to riparian effects being indirect effects. Labelling riparian effects as indirect solely because it is not instream appears to be an artificial delineation. Note in Table 12.1 (page 12-2) the author links the two closely. |
| 2.02 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-2 | 12.2.2 Selection of Indicators | DEN | Environmental | The list of fish habitat attributes (Water quality, substrate composition, fish cover, habitat complexity), and statement that these are required for fish habitation, is incorrect. Fish habitat complexity, cover and substrate do not determine whether a population can be supported, but they certainly can affect local abundance. |

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| 2.03 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-2 | Table 12.1 Selection of Indicators | DEN | Environmental | Here and in contrast to material presented in last sentence of 12.2.1 indicating riparian effects are indirect, instream and riparian effects are seen as so closely linked they fall under the same indicator review and rationale. |
| 2.04 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-3 | Table 12.1 Selection of Indicators | DEN | Environmental | Table 12.1 references water quality with respect to turbidity and TSS but nothing on potential changes in volume or on water quality related to runoff during operations. If these are covered in other volumes it would be good to include table 12.1 in those areas as well. |
| 2.05 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-5 | 12.2.4 Regulatory and Policy Context | DEN | Environmental | Reference to regulatory process being a federal mandate, and provincial legislation merely as guidelines. Federal and provincial governments have shared jurisdiction of water. Presumably province would be a stakeholder in any kind of federal review process. |
| 2.06 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-7 | 12.3 Existing Conditions | DEN | Environmental | Reference to the slough not being tidally influenced. It is, but it is under less tidal influence than historically. The flood gates can be opened to allow water to flood into the slough for irrigation. |
| 2.07 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-7 | 12.3 Existing Conditions | DEN | Environmental | Reference to the flows being cut off by the Kennedy pump station. This is a common misconception. It is not the pump station that cuts off fish passage per se, the cut-off conditions is a function of the way the entire diking and water management system was originally designed. There are floodgates that allow water ingress and egress and fish may pass when the gates are open. |
| 2.08 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-7 | 12.3 Existing Conditions | DEN | Environmental | Reference to channel dredging. Reviewer has worked with City on channel maintenance activities throughout Katzie Slough. The activities do not meet the threshold of dredging and are in fact channel vegetation maintenance. Certainly silts are pulled up along with the rafts of invasive aquatics, but to date there is no need to dredge back to ARSDA channel design depths and widths upon removal of the vegetation. |
| 2.09 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-8 | 12.3.1.2 Field Surveys | DEN | Environmental | Salmonids were not detected, but the sampling period was August. This is the least likely time to find salmonids. However there is some potential for salmonids in fall, winter and spring. They have been captured in limited quantities south Katzie as late as July. |
| 2.10 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-9 | Fish and Fish Habitat Survey Locations Map | DEN | Environmental | Weakness of the aquatic field survey is the sampling has been done only at limited mainstem areas and then just two sites in the project area. There is the potential for refugia habitats in tributaries to Katzie Slough. Assessment to negate that potential is warranted. |
| 2.11 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-10 | 12.3.1.3 Fish Sampling | DEN | Environmental | Methodology information, including number of traps, and trap spacing is missing. With respect to bait, dry cat food can be used, but is less effective than wet food, and certainly less effective than roe. For population level assessments a more fulsome trapping program should have been used. |
| 2.12 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-10 | 12.3.1.3 Fish Sampling | DEN | Environmental | eDNA will likely not be definitive in the context of Katzie Slough. CP didn't provide an opportunity to see the raw data to understand their findings |

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| 2.13 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-10 | 12.3.2.1 Desktop Analysis | DEN | Environmental | Reference again to the pumps being the barrier to fish passage. There are other things going on in the slough that limit productive capacity. The pumps don't draw water from the Pitt or Fraser, so the only exchange of fresh water is through flood boxes. When the flood boxes close they become obstacles to fish egress. |
| 2.14 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-10 | 12.3.2.1 Desktop Analysis | DEN | Environmental | Too much focus on the idea that the pump stations are the barrier. This paints to narrow a picture of how the system operates. It is a dyked system with control gates (floodgates), which restrict water exchange with rivers outside of the dyke. Pumps are responsible for one direction flow (out of slough). There are other factors affecting productivity of fish habitat in the slough (lack of natural headwaters, poor riparian cover, poor water quality, etc.). A permanent barrier is something entirely impassable to fish, the flood gates appear to allow passage under certain conditions. |
| 2.15 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-11 | 12.3.2.1 Desktop Analysis | DEN | Environmental | To be clear cutthroat trout have been captured in Harris Ditch and that appears to be in the REA |
| 2.16 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-11 | 12.3.2.1 Desktop Analysis | DEN | Environmental | Reference to 1968 Kennedy pump station as affecting Indigenous preferred fish species. To be clear, the diking system is at least a century old, and there have been impellor style pumps in service since that time. It is unclear why the report references this specific late date, other than that time was the construction /reconstruction of original pump stations. Prior to that time there would have been other non fish friendly pumps in service. |
| 2.17 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-11 | Table 12.4 Historical Fish Species Presence in Katzie Slough | DEN | Environmental | Cutthroat trout referenced as absent from 'project area'. There is definitely cutthroat trout potential in south Katzie Slough. The CP assessment has not described why this species would not be present in the project area if present in south Katzie Slough ( perhaps seasonal use). Also, in the table there is a reference to cutthroat trout as listed. I believe the listed species is the subspecies coastal cutthroat trout, not cutthroat trout generally. |
| 2.18 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-11 | Table 12.4 Historical Fish Species Presence in Katzie Slough | DEN | Environmental | Brassy minnow. Species is blue listed in the CWHdm and xm. |
| 2.19 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-11 | 12.3.2.1 Desktop Analysis, Water Quality | DEN | Environmental | Reference to high water temperatures in mainstem. While this is entirely true, there is suitable water quality in portions of the slough through to early summer. Also known that cutthroat trout could find refuge in off-channel tributaries. |
| 2.20 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-11 | 12.3.2.2 Field Surveys, Fish Sampling | DEN | Environmental | Weather loach referenced as invasive. It is actually regulated as an alien invasive. |
| 2.21 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-12 | 12.3.2.2 Field Surveys, Fish Sampling | DEN | Environmental | Fish species captured (warm water invasives) is not surprising given the timing of CP's survey, but does not quite paint an accurate picture of potential species use. |
| 2.22 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-12 | Table 12.5 Summary of Minnow Trap Sampling in Katzie Slough and Cook Slough, August 2020 | DEN | Environmental | No control fish samples are referenced. |
| 2.23 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-12 | Table 12.5 Summary of Minnow Trap Sampling in Katzie Slough and Cook Slough, August 2020 | DEN | Environmental | Fish trapping results presented. The study methods are not sufficiently explained for this and other study components. How many fish traps? CPUE is catch per unit effort, but we don't know if it is one, six traps or different per site? |

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| 2.24 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-13 | 12.3.2.2 Field Surveys, Fish Habitat | DEN | Environmental | Reference to dikes, but the ones alongside Katzie Slough are not formal dikes. True dikes are on the perimeter of the Fraser River, Pitt River, and Alouette River. |
| 2.25 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-13 | 12.3.2.2 Field Surveys, Fish Habitat | DEN | Environmental | There is an inference that the pump stations are causing fines and organics, however this can also be the natural condition. We have found geotechnical boreholes with peat soils that would have been laid down hundreds of years ago, before pump stations were in place. |
| 2.26 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-15 | 12.3.2.2 Field Surveys, Fish Habitat | DEN | Environmental | Reference to potential for overwintering east of the project area (but not in the project area). This conclusion is not appropriate given the data collected. If there is rearing habitat east then there is potential here (at certain times of the year). The situation is simply that not enough data has been collected by the assessment team to confirm this. This is not to say there is good habitat, but the author has drawn conclusions about the site not supported by the data they collected. |
| 2.27 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-15 | Table 12.7 Potential Project Interactions with Fish and Fish Habitat and Potential Effects | DEN | Environmental | Reference to "pre-construction" phase is odd, given there are a lot of key construction activities associated with pre-loading. Not clear why the preload phase has been designated as pre-construction. |
| 2.28 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-16 | Table 12.7 Potential Project Interactions with Fish and Fish Habitat and Potential Effects | DEN | Environmental | In Table 12.7 under 'operations', it seems that the effects of "Spills" could interact with fish habitat? No mitigation with respect to that is developed in this volume. |
| 2.29 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-17 | 12.4.2.1 Changes in Fish Habitat, Change in Access to Habitats | DEN | Environmental | Bullet list misses water quality effects related to operations (contaminants). |
| 2.30 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-18 | 12.4.2.1 Changes in Fish Habitat, Change in Habitat Structure and Cover | DEN | Environmental | Generic reference to swift currents, but this is not applicable at the project site, nor 99% of Katzie Slough. Only place of swift currents is near the pump stations when the pumps turn on. |
| 2.31 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-19 | 12.4.2.1 Changes in Fish Habitat, Change in Habitat Structure and Cover | DEN | Environmental | Reference to the general function of riparian areas. Unfortunately the key limiting factor in Katzie Slough is a lack of riparian cover and its relationship to increased solar insolation is missing. Some expansion on this ecological limited state and associated temperature moderation/dissolved oxygen issues, and biological oxygen demand could inform mitigation and offsetting prescriptions. |
| 2.32 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-19 | 12.4.2.1 Changes in Fish Habitat, Change in Habitat Structure and Cover | DEN | Environmental | Reference to LWD loading in pools and stream channels in WRP manual. This is somewhat out of context. This reference is from WRP Tech Circ 9 and that density is what was observed in natural forested settings. Katzie Slough, even prior to disturbance would have been more of a lentic system than lotic system. LWD function and processes for LWD recruitment quite different than forested uplands. |
| 2.33 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-19 | 12.4.2.1 Changes in Fish Habitat, Change in Habitat Structure and Cover | DEN | Environmental | Reference to boulder cover is not really applicable to the historic project context, but perhaps boulders could be used to introduce some complexity. Risk is they hang up debris, creating a maintenance or conveyance issue, or simply sink into the soft peaty channel beds. |

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| 2.34 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-19 | 12.4.2.1 Changes in Fish Habitat, Change in Habitat Structure and Cover | DEN | Environmental | Statement that Katzie Slough provides flows and food and nutrient is problematic. Pre-diking, the slough would have been in constant tidal exchange between Fraser River, Pitt River and slough. Not about discharge provisions since the slough itself has no headwater source, more of back and forth tidal exchange. Now, outflow is provided when the pumps turn on, or when flap gates are open on a falling hydrograph. The volumes of the Pitt-Fraser, and tidal exchanges are so large compared to pump discharges as to render the latter negligible as 'food and nutrient" provision. As for the flow providing 'significant' food and nutrients that seems tenuous because of the above noted volumes, but also from the fact discharge from the slough at certain time of year may be more akin to pollution (low DO, temperature, eutrophic conditions) then food and nutrients. |
| 2.35 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-20 | Table 12.8 Fish Habitat Area Affected by the Project | DEN | Environmental | The report does not define 'riparian' with reference to relevant legislation. CP should provide clarification. |
| 2.36 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-20 | Table 12.8 Fish Habitat Area Affected by the Project | DEN | Environmental | Reference to fish use of Katzie Slough being warm water and invasive species. However that description is only partially accurate and it is unclear on what actual data the consultants conclusion is based on. Our findings are not dissimilar but there remain data gaps on salmonid use at certain times of year, and that should be discussed /elaborated upon by the consultant. Later in the report, the consultant indicates their is potential for Coho over-wintering. |
| 2.37 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-21 | 12.4.2.1 Changes in Fish Habitat, Change in Habitat Structure and Cover | DEN | Environmental | Reference to the word 'direct' with respect to riparian effects. Elsewhere riparian effects were described by the consultant as being 'indirect'. |
| 2.38 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-21 | 12.4.2.1 Changes in Fish Habitat, Change in Food and Nutrient Concentrations | DEN | Environmental | The report provides lots of general background material, that does not directly apply to the project site or project context. |
| 2.39 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-21 | 12.4.2.1 Changes in Fish Habitat, Change in Access to Habitats | DEN | Environmental | Reference to coho salmon moving into off-channel areas to overwinter. This is possible, the problem is the reports earlier descriptions cite only warm water fish and invasive species. Report needs elaborate on potential species use in winter not just rely on August sampling. |
| 2.40 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-21 | 12.4.2.1 Changes in Fish Habitat, Change in Access to Habitats | DEN | Environmental | Issue of contaminants raised but none of the mitigation in this volume addresses potential effects of contaminants from operations on water quality. Noted that the HATCH report does speak to stormwater WQ treatment. This volume of the report should be brought into alignment for clarity. |
| 2.41 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-22 | 12.4.2.2 Changes in Fish Health, Changes in Mortality of Fish and Eggs | DEN | Environmental | Reference to the use of pumps for temporary bypasses during construction. This will entail a potential restriction in reaches upstream of the work site, potential restricting functionality of drainage system that the City is responsible for maintaining (i.e. drainage during rainy periods and irrigation water during the growing and harvesting seasons). CP will need to further assess the impacts to operations and provide mitigation/solutions to engage with the City to confirm that potential risks to the City's operational requirements are addressed. |
| 2.42 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-22 | 12.4.2.2 Changes in Fish Health, Changes in Mortality of Fish and Eggs | DEN | Environmental | Reference to fish burst speeds. A continually operating pump can overcome not only a fish's burst speed but also its sustained swimming speed. |

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| 2.43 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-22 | 12.4.2.2 Changes in Fish Health, Changes in Contaminant Concentrations | DEN | Environmental | Contaminants could reach fish habitat not only through seeps, but directly through a heavy spill /malfunction discharging to catch basins |
| 2.44 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-23 | 12.4.3 Mitigation Measures | DEN | Environmental | Reference to the implementation of mitigation in a CEMP; however, a CEMP does not actually implement any measures. The CEMP merely lays out commitments by Owner to Regulatory agencies (i.e. Project EMP) or by Contractor to Owner (CEMP). |
| 2.45 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-23 | 12.4.3 Mitigation Measures | DEN | Environmental | More detail is extremely important to demonstrate spill response has been sufficiently considered and planned for. It would be appropriate to reference key provisions of the spill response program, either here or in an Appendix. |
| 2.46 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-23 | 12.4.3 Mitigation Measures, Mitigation M8-11 Project Design - Free Span Watercourse Crossing | DEN | Environmental | Mitigations in this list lack detail and do not align with the level of detail usually provided for assessments of projects of this scope and size. |
| 2.47 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-23 | 12.4.3 Mitigation Measures, Mitigation M12-2 Reduce Riparian Disturbance and Maintain Riparian Buffers | DEN | Environmental | Reference to a 15 m setback. No explanation on derivation, of appropriateness with respect to ecological limiting factors. No reference to setback with respect to legislation or guidelines. Compare and contrast to 30 m setbacks elsewhere in Katzie Slough pursuant to RAPR (while this is provincial legislation, it establishes DFO threshold for riparian HADD generally). Also setback appears to be different than the DFO Land Development Guidelines. Note that with of riparian corridor and treatment of riparian has potential implications for City drainage operations maintenance. It would be useful for the report to provide more detail on footprint impact locations with the output being the proposed offsetting. Where riparian buffers are too be reduced from the established standard the report should identify, at least conceptually, the form and location for the offsetting. |
| 2.48 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-24 | 12.4.3 Mitigation Measures, Mitigation M12-2 Reduce Riparian Disturbance and Maintain Riparian Buffers | DEN | Environmental | Reference to Coarse Woody Debris (CWD) in the riparian area. CWD in the 15 m setback will not meet City drainage maintenance operations requirements. No reference to vegetation replanting or enhancements. |
| 2.49 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-24 | 12.4.3 Mitigation Measures, Mitigation M12-3 Conduct Erosion and Sediment Control | DEN | Environmental | Peculiar reference to installation of ESC measures per QEP. Appropriate erosion and sediment control plan design requires planning, schedule considerations and actual design. Suggesting that ESC would be solely the responsibility of a project QEP is not appropriate for a project of this scale and intensity. The report reference to a line drawn at 30 m appears to be at odds with riparian setbacks elsewhere in the report that cite a 15 m setback/riparian area. |
| 2.50 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-24 | 12.4.3 Mitigation Measures, Mitigation M12-3 Conduct Erosion and Sediment Control | DEN | Environmental | Reference to water quality monitoring programs, but only for instream works. Water quality monitoring should also be conducted for all upland work that could impact riparian and instream areas through spills or sedimentation. |
| 2.51 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-24 | 12.4.3 Mitigation Measures, Mitigation M12-3 Conduct Erosion and Sediment Control | DEN | Environmental | Reference to QEP response expected as undefined WQ thresholds approached. The report should identify what water quality standards and thresholds will be used and compare them applicable standards. Note that If sediment laden water is pouring into an upland catch basin then a monitoring program focussed only on instream works would not detect this condition. |

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| 2.52 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-25 | 12.4.3 Mitigation Measures, Mitigation M12-4 Manage Vehicle and Equipment Access | MG | Civil | The City's bylaw Section E.2.1 (b) notes that roadway culverts should be sized to carry flows of a 100 year return frequency. Section B.6.1 of the bylaw notes that all bridge design shall be in accordance with the Canadian Bridge Code. Under the Navigation Protection Act (NPA), for small watercourses caring only canoes, kayaks and other small craft, a vertical clearance of 1.7m above the 100-year flood level is considered to be adequate. CP should confirm design elevations, design water levels and clearance for all bridge structures crossing the Katzie and Cook Sloughs. |
| 2.53 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-25 | 12.4.3 Mitigation Measures, Mitigation M12-4 Manage Vehicle and Equipment Access | DEN | Environmental | Reference to avoiding fueling in riparian areas. What standard/distance is intended here? |
| 2.54 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-25 | 12.4.3 Mitigation Measures, Mitigation M12-5 Spill Prevention and Response | DEN | Environmental | The report has referenced corporate spill response as the overarching way spills would be managed, but no details are provided to the reader on what that response actually looks like. It appears to be at the level of small truck sized spill response equipment. This is not enough for a project of this size, scope and intensity. The lack of detail on spill response in the volumes reviewed is troubling. |
| 2.55 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-25 | 12.4.3 Mitigation Measures, Mitigation M12-6 Avoidance of Environmentally Sensitive Areas | DEN | Environmental | Flagging of sensitive areas, rootwads overhangs, etc. The report should clarify the intended purpose of this proposed mitigation measure. If the rootward or overhang is in an area that will be destroyed by a crossing, what will flagging do from a mitigation standpoint? |
| 2.56 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-25 | 12.4.3 Mitigation Measures, Mitigation M12-7 High Flow Mitigations | DEN | Environmental | Report reference to postponement of works if excessive flows or flood. Instream works could span many weeks. It is not possible to always predict these conditions. There should be multiple planning steps before postponement is relied upon. Seasonal timing, storm event modelling, ensuring adequate bypass capacity, duplicate pumps. |
| 2.57 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-25 | 12.4.3 Mitigation Measures, Mitigation M12-8 Conduct Restoration and Reclamation Activities | DEN | Environmental | Report reference to QEP 'choice' for impact mitigation and restoration. It is hard to conceive of a project review process that would rely on QEP choice to decide appropriateness, scope and scale of mitigation and restoration, and that this would be acceptable to federal regulators. The QEP should know footprint, mitigation and offset, well before construction so referencing the requirement to fall during onsite work is off-the-mark. Perhaps something else was intended by the author(s). |
| 2.58 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-26 | 12.4.3 Mitigation Measures, Mitigation M12-9 Implement Habitat Offsetting | DEN | Environmental | Offsetting is discussed, but there are virtually no details of what would be done or where it would be done. Usually at a concept stage the consultant would put that forward as a working environmental design concept. Offsetting requirements should be developed with input from DFO, KFN, City and other impacted stakeholders and rightsholders to ensure it addresses the overall impacts and interests. |
| 2.59 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-26 | 12.4.3 Mitigation Measures, Mitigation M12-9 Implement Habitat Offsetting | DEN | Environmental | Installation of rootwads is impractical in City maintained Katzie Slough reaches. The risk that LWD would create better habitat for bass populations at the expensive of native species would need to be considered. |

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| 2.60 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-26 | 12.4.3 Mitigation Measures, Mitigation M12-10 Follow Least-risk Windows for Instream Works | DEN | Environmental | Reference to least risk timing windows. This is an unusual prescription given the report conclusions that only warm water and invasive species are present. If that is the case what specific species risks are thought to be in play. Certainly there is no spawning or eggs in gravel at the project site. |
| 2.61 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-26 | 12.4.3 Mitigation Measures, Mitigation M12-11 Isolate Instream Works and Conduct Fish Salvage | DEN | Environmental | "Release fish unharmed' is a generic prescription that fails to consider the Project's context and study's own finding. Weather loaches for instance are required to be euthanized as part of fish collection permits. |
| 2.62 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-30 | 12.4.4 Characterization of Residual Effects, Significance | DEN | Environmental | Definition of significance of a change in fish habitat based on turbidity, returning to 'background' levels after construction. This is not valid. There is nothing in the Fisheries Act that gives the project a time frame during construction for the deposition of deleterious substances (including turbidity). The project does not have a carte blanche to fill up drainage systems maintained by the City with sediments during construction. Note too a reference to a return to baseline, but as of this reading it is unclear what the baseline would be since that varies seasonally and only limited WQ data is presented. |
| 2.63 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-30 | 12.4.4 Characterization of Residual Effects, Significance | DEN | Environmental | To know if there has been change, then there would need to be a baseline. But the work referenced in this report is inadequate as a baseline for this project. It only collected samples in August. A proper baseline would entail data collection over multi-seasons, because the effects can be multiseasonal. |
| 2.64 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-31 | 12.4.4.1 Residual Effects on Fish and Fish Habitat, Change in Fish Habitat | DEN | Environmental | Crossing methods and BMP's mitigating loss of habitat. This may be true for well designed bridges not true for culvert infills/culvert crossings. BMPs do not mitigate loss of habitat in culverts. What can help mitigate effects on fish (i.e. passage, food and nutrients, rearing) is well designed crossings. Culvert infills are likely not mitigatable and instead require offsetting. |
| 2.65 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-31 | 12.4.4.1 Residual Effects on Fish and Fish Habitat, Change in Fish Habitat | DEN | Environmental | ESC BMPs. For a project of this size, scale and intensity BMP's, are not the solution to mitigate risk. This project requires fulsome phased ESC Plans, with an accompanying monitoring program. This volume should clearly indicate that as a requirement. |
| 2.66 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-31 | 12.4.4.1 Residual Effects on Fish and Fish Habitat, Change in Fish Habitat | DEN | Environmental | Change in water temperature not predicted. The reports conclusion is spurious since it is not based on any data analysis that the reader can review. This is the clearing and then creation of tarmac and railyard with entirely different albedo than current context. Blazing hot conditions in late spring into early fall could affect water in detention ponds and depending on degree of solar insolation The lack of any detail on restoration of stream channels after construction could mean that there is substantially more risk related to temperature (there is the risk is that a bad situation is made even worse). The report should include far more detail of riparian upland and channel restoration concepts to help clarify potential impacts. |

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| 2.67 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-31 | 12.4.4.1 Residual Effects on Fish and Fish Habitat, Change in Fish Habitat | DEN | Environmental | Food and nutrient significance. It is unclear how the conclusion is derived since there is no work up to the conclusion, and the reasons for not carrying this through to significance determination is not appropriate given the lack of reasoning for the conclusion. Reference to BMP's is so ubiquitous as to render that mitigation meaningless. |
| 2.68 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-31 | 12.4.4.1 Residual Effects on Fish and Fish Habitat, Change in Fish Habitat | DEN | Environmental | The conclusion that a change in water quality/residual effect is not anticipated, seems spurious and without justification. Had there been reference to the SWMP treatment chain (per HATCH) then this could be construed as reasonable, but in this volume the risk is not analysed and mitigated. The development has significant risk of WQ changes if operational water quality is not addressed through design. |
| 2.69 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-32 | Table 12.11 Summary of Residual Effects Characteristics Ratings and Significance for Change in Fish Habitat | DEN | Environmental | Report reference to the concept that suspended solids will return to baseline after construction. There is no Authorization "window" for deposition of deleterious substances for a project of this type. That is the point of mitigation, to prevent deposition of deleterious substances. |
| 2.70 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-36 | Table 12.13 Potential for Interaction between Other Projects/Activities and Project Residual Effects | DEN | Environmental | City Drainage Maintenance Operations and cumulative effects interaction should have been considered. |
| 2.71 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-37 | 12.5.1.1 Potential Cumulative Effects, Changes in Fish Habitat | DEN | Environmental | Reference in report to 'upgrades to the pump station may improve flushing flows'. Upgrades to pump stations may improve flushing flows, but more assessment is needed to determine the veracity of this statement. Flood gate management could also potentially improve water exchange, but more assessment would be needed on that as well. A fish-friendly pump would not be the sole mechanism for improved flushing flows and recolonization'. Fish friendly pumps can often be less efficient than impellor styles. Fish friendly pumps can be less efficient than impellor styles. Lastly, the inference that just installing a fish friendly pump could lead to recolonization is wrong. There are multiple ecological limiting factors that could affect successful 'recolonization' (water temperature, low dissolved oxygen, pollution from agriculture), and there would need to be risk management assessment for proponents of fish friendly pump installation. |
| 2.72 | Hemmera EEE Volume 2 Section 12 Fish and Fish Habitat | 12-37 | 12.5.1.2 Additional Mitigation Measures | DEN | Environmental | Unmitigated HADD's will be offset. This is contrary to statements earlier in this report that describe offsetting as mitigation |
| 2.73 | Hemmera EEE Volume 2 Section 13 Vegetation and Wetlands | 13-2 | 13.2.2 Selection of Indicators | DEN | Environmental | Riparian area. This report does not adequately define or provide a reference of meant by riparian area/boundary. How is this defined by the authors? |
| 2.74 | Hemmera EEE Volume 2 Section 13 Vegetation and Wetlands | 13-3 | 13.2.3.1 Spatial Boundaries | DEN | Environmental | RAPR requiring a 30 m is not universally true (i.e. if using detailed assessment methodology). It is true that the Riparian Assessment Area in RAPR is 30 m from top of bank. Buffers (SPEA's) are variable and dependent on channel width, solar angle and measures. The report should provide a more accurate explanation of what they feel constitute riparian areas and expected riparian buffers. |

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| 2.75 | Hemmera EEE Volume 2 Section 13 Vegetation and Wetlands | 13-3 | 13.2.3.1 Spatial Boundaries | DEN | Environmental | The report references residual effects as not being considered likely. If fully explained through the analysis in the report that analysis should speak for itself in the appropriate section. By placing that reference here it appears the author is drawing conclusions before the analysis is presented. |
| 2.76 | Hemmera EEE Volume 2 Section 13 Vegetation and Wetlands | 13-5 | Table 13.2 Key Federal Legislation Summary | DEN | Environmental | Vegetation removal would also be subject to Fisheries Act considerations of HADD and should be acknowledged in this section of the report. |
| 2.77 | Hemmera EEE Volume 2 Section 13 Vegetation and Wetlands | 13-5 | 13.3.2.1 Desktop Analysis | DEN | Environmental | Reference to Letter Report from the Kwantlen. Is there a reason it was not included as an Appendix? Would there be something similar from the Katzie FN ? |
| 2.78 | Hemmera EEE Volume 2 Section 13 Vegetation and Wetlands | 13-18 | Table 13.9 Ecosystem Management Concern Area Summaries by Spatial Boundary | DEN | Environmental | Reference to wetland size in ha. With these very small wetlands the appropriate scale is probably m2 |
| 2.79 | Hemmera EEE Volume 2 Section 13 Vegetation and Wetlands | 13-20 | 13.3.2.2 Field Surveys, Wetland Function | DEN | Environmental | Fish would potentially have access to wetlands at least at high during high rainfall events and surcharge. |
| 2.80 | Hemmera EEE Volume 2 Section 13 Vegetation and Wetlands | 13-26 | Table 13.12 Potential Project Interactions with Vegetation and Wetlands and Potential Effects | DEN | Environmental | Project phases appear arbitrarily defined. Unclear how vegetation stripping is not considered part of construction. |
| 2.81 | Hemmera EEE Volume 2 Section 13 Vegetation and Wetlands | 13-29 | 13.4.2.1 Ecosystems of Management Concern, Change in Abundance of Ecosystems of Management Concern | DEN | Environmental | Using m2 would be better at this small scale. A 3x7 wetland is better described as 20 m2 rather than 0.002 ha as it is easier to visualize. |
| 2.82 | Hemmera EEE Volume 2 Section 13 Vegetation and Wetlands | 13-30 | 13.4.2.1 Ecosystems of Management Concern, Change in Abundance of Ecosystems of Management Concern | DEN | Environmental | The report should explain how a 3x7 wetland supports Great Blue Heron, preferentially over the existing open ditches and canals of Katzie Slough and its tributaries. The small patch doesn't offer nesting, so presumably it is forage area. Great blue heron (including the fannini sub-species, which is listed as a species of conservation concern) have been observed around thesechannelized reaches of Katzie Slough. |
| 2.83 | Hemmera EEE Volume 2 Section 13 Vegetation and Wetlands | 13-31 | 13.4.3 Mitigation Measures, Mitigation M8-16 Project Design: Site Layout | DEN | Environmental | The report should clarify how and where there have been design efforts to minimize edge effects. What were the original concept designs that did not minimize edge effects? |
| 2.84 | Hemmera EEE Volume 2 Section 13 Vegetation and Wetlands | 13-31 | 13.4.3 Mitigation Measures, M13-1 Integrated Vegetation Management | DEN | Environmental | Reference to CP management practice (IVMP) and BC Integrated Pest Management Regulation. The report should clarify how the IVMP will effect riparian impact, offsetting and function of riparian areas. The report should clarify the built out condition of the south bank of canal. Could veg affects through IVMP/IPMR be mitigated there, or will it be in a continual state of maintenance and covered with blackberries? |

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| 2.85 | Hemmera EEE Volume 2 Section 13 Vegetation and Wetlands | 13-31 | 13.4.3 Mitigation Measures, Mitigation M13-2 Construction Environmental Management Plan | DEN | Environmental | Very generic environmental management mitigation is proposed. Complete lack of detail in the mitigation specifications (i.e. "proper handling" of noxious weeds). This is not a viable prescription. Reference to "prompt" action is meaningless if not attached to an actual schedule or response timelines. Similarly, reference to "Meets all relevant industry standards and regulatory standards" begs the question what standards? The language suggests no real thought has been given to specific mitigation measures on this specific project, and what are being thrown out is generic prescriptions more typical of an Preliminary Environmental Assessment as opposed to an evaluation of effect. |
| 2.86 | Hemmera EEE Volume 2 Section 13 Vegetation and Wetlands | 13-32 | 13.4.3 Mitigation Measures, Mitigation M13-3 Wetland Compensation | DEN | Environmental | Agree that this effect is so small, the impact can in fact be readily mitigated (not offset) through good design rather than requiring offsetting. However the report should clarify and provide a reasonable offsetting proposal that includes design information. |
| 2.87 | Hemmera EEE Volume 2 Section 14 Wildlife | 14-4 | 14.2.3.2 Temporal Boundaries | DEN | Environmental | Pre-construction phase includes activities that are clearly construction activities. |
| 2.88 | Hemmera EEE Volume 2 Section 14 Wildlife | 14-4 | 14.2.3.2 Temporal Boundaries | DEN | Environmental | "Wildlife species use habitat seasonally". Perhaps true of some migratory birds but what about Great Blue Heron and non-avian species use including small mammals, muskrat, coyote, amphibians etc. They are essentially resident if they take up occupancy or use the habitat for food procurement and cover. |
| 2.89 | Hemmera EEE Volume 2 Section 14 Wildlife | 14-6 | 14.2.4.2 Migratory Birds Convention Act | DEN | Environmental | While it would appear that the project would be federally legislated CP should confirm whether provincially listed species would not be a management concern. Example Mountain Beaver, are blue listed in BC but special concern per COSEWIC but have required considerable management planning through federal environmental approval processes. |
| 2.90 | Hemmera EEE Volume 2 Section 14 Wildlife | 14-9 | Table 14.5 Species of Concern with the Potential to Interact with the Project Local Evaluation Area | DEN | Environmental | Long list of species of concern with potential to occur in the LEA/REA. Later this is followed up with observations of a subcomponent of that list. However, there is no analysis of many of the species of concern and why they have potential/no potential. PWS is so cryptic, that it would not be observed during this assessment work. The report is silent on certain risks to certain species. |
| 2.91 | Hemmera EEE Volume 2 Section 14 Wildlife | 14-16 | 14.4.21 Increase of risk of direct mortality | DEN | Environmental | The report claims that effects on upland vegetation are expected to be negligible (since it is similar to agricultural activity). This statement is not wholly true. The site is not often tilled, and species could use this area without much risk until mowing. If Owner begins work in winter (likely to avoid nesting bird conditions) those fallow hay fields could support numerous species and individuals when work commences. For very cryptic species, like PWS, this is a very big risk. If adequate baseline work was done to refute presence of potential species of concern (i.e. ones the regulators care about) then the idea of minimal effect would make more sense. |
| 2.92 | Hemmera EEE Volume 2 Section 14 Wildlife | 14-17 | 14.4.2.2 Decrease in terrestrial habitat | DEN | Environmental | The idea that the effects of the project are not very significant due to their being lots of other habitat in the REA is misleading. This is the heart of cumulative effects evaluation (assessment). Incremental losses can ultimately lead to no available habitat. The area located at the remnant mouth of Katzie Slough and Pitt River is probably more dissimilar than similar to the balance of the REA. |

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| 2.93 | Hemmera EEE Volume 2 Section 14 Wildlife | 14-17 | 14.4.2.2 Decrease in terrestrial habitat | DEN | Environmental | Reference to a lack of observations of amphibians/baseline, yet conclusion is drawn that the risk is low. Later in the report salvage of amphibians is referenced as a mitigation measure. The report needed to outline the methodology, level of effort undertaken, data gaps, additional study needed to address the gaps, before drawing such broad conclusions. |
| 2.94 | Hemmera EEE Volume 2 Section 14 Wildlife | 14-18 | 14.4.2.4 Sensory disturbance | DEN | Environmental | The study did not investigate pollinating insects as per agricultural section. It would be useful for this section to define wildlife as all vertebrates excluding invertebrates and then direct the reader to the appropriate section in he agricultural EEE for interpretation of effects of lighting on nocturnal, pollinating insects. |
| 2.95 | Hemmera EEE Volume 2 Section 14 Wildlife | 14-19 | Mitigation M14-1 Vegetation stripping | DEN | Environmental | The mitigation would be unlikely to work for small mammals or amphibians which could be active and using the site by mid February. There is a paucity of assessment data (evidence) to support the idea that small mammals would not be using the long grass habitats in February. The peer reviewer is unaware of any other projects where pushing soil out of the way in one direction was a BMP for limiting death and injury to small animals during site clearing activities (i.e. PWS). |
| 2.96 | Hemmera EEE Volume 2 Section 14 Wildlife | 14-19 | Mitigation M8-15 Directional lighting | DEN | Environmental | How would the effectiveness of this treatment be evaluated. Wouldn't there need to be a baseline established as to current ambient light, followed by post construction ambient light readings. What if the treatment didn't work? |
| 2.97 | Hemmera EEE Volume 2 Section 14 Wildlife | 14-20 | Mitigation M14-2 Amphibian salvage | DEN | Environmental | Earlier the report said that no native amphibians of concern were observed, so effects were deemed not very significant, but here the author back-tracks and includes more amphibian survey and salvage for native species. It appears the author is less confident here than earlier in the risk assessment. |
| 2.98 | Hemmera EEE Volume 2 Section 14 Wildlife | 14-20 | Mitigation M14-3 Re-Establish vegetation | DEN | Environmental | Here, a 10 m riparian zone adjacent to Katzie Slough is identified. Elsewhere 15 m and 30 m has been defined as the riparian area. The report should set out the rationale for riparian setback establishment, consistent with relevant legislation (i.e., perhaps the RAPR?) and /or Guidelines. If a lesser riparian setback distance is desired, it should be established based on a written QEP rationale.<br><br>There are recognized approaches for establishing a defensible riparian setback distance and this work should have been undertaken prior to drafting the EEE. What is the riparian area this project intends to establish and protect at the end of the project. |
| 2.99 | Hemmera EEE Volume 2 Section 14 Wildlife | 14-29 | Table 14.12 Potential Interactions | DEN | Environmental | A foreseeable, but difficult cumulative effect to assess would be the changeover to different crop type. Fallow hay fields, which will be removed as part of this project are quite different habitats to blueberry or cranberry fields. Some engagement between the agricultural specialist and wildlife specialist with respect to changing crops would be appropriate since continued loss of hay type crops, particularly in ecotone areas (like the LEA) may magnify project specific effects on wildlife and require a bit broader analysis. |
| 3.00 | Hemmera EEE Volume 2 Section 14 Wildlife | 14-33 | 14.6 Monitoring Program | DEN | Environmental | The proposed monitoring program for barn swallow lacks detail and appears to be inadequate for assessing whether the risks identified in this section have been fully mitigated (offsetting, vegetation planting, directional lighting, etc.) |

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| 3.01 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | All | All | SP | Hydrogeology | Global comment: preloading impacts to groundwater is only considered in the context of impacting groundwater quality by importing contaminated fill or aggregate. There is no apparent mention or assessment of impacts to groundwater levels, which will be impacted by preloading and dewatering activities. A thorough assessment of groundwater level changes during and following preloading is required to evaluate impacts to surrounding areas given the naturally high groundwater levels. The impacts in turn to Katzie Slough and surrounding surface water bodies should also be assessed in the context of groundwater level changes.<br><br>It should be noted that Hatch's 60% Preload Design report predicts "During the preload program, the groundwater level will tend to mound above the existing ground level, probably in the order of 1 to 2 m." and "Ground water levels within the permanent grade fills will likely stabilize at a higher elevation than current levels, and almost certainly higher than the current ground surface." The on- and off-site impacts from this need to be assessed. |
| 3.02 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-1 | 11.1 Overview | SP | Hydrogeology | Katzie Slough is also hydraulically connected to the shallow groundwater in the area |
| 3.03 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-2 | 11.2.3.1 Spatial Boundaries | SP | Hydrogeology | Discrepancy in this section with the REA description - this section indicates the south boundary is the Fraser River, but Volume 1 and Figure 11.1 illustrates the south boundary as being north of the Fraser River. |
| 3.04 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-3 | 11.2.3.2 Temporal Boundaries | SP | Hydrogeology | Unclear if preloading is considered in the Existing Conditions assessment |
| 3.05 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-7 | 11.3.1.2 Modelling of Hydrology and Hydrogeology | SP | Hydrogeology | The model and methods described in this section focuses solely on surface water and drainage modelling. Hydrogeological modelling is not described and is unclear if it was completed. |
| 3.06 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-8 | 11.3.1.3 Field Surveys | SP | Hydrogeology | Transducers were installed in four monitoring wells, but the data is not included nor discussed in this report. Temporal groundwater level data is crucial to evaluate baseline conditions and impacts. Results of hydraulic conductivity testing are also not mentioned again. |
| 3.07 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-22 | 11.3.2.3 Project Area - Baseline | SP | Hydrogeology | This section details the hydraulic connection between Katzie Slough and the shallow groundwater and illustrates the need for a more robust assessment of impacts to groundwater levels by the Project |
| 3.08 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-23; 11-24 | Table 11.7; 11.3.2.3 Groundwater Quality | SP | Hydrogeology | There is an inadequate discussion on the exceedances compared to the well depths. For example, presumably some of the wells with exceedances are shallow ('S' label in the well name). However, elevated chloride and sodium are interpreted to represent remnant seawater from deeper strata yet there is no way to confirm this by comparing well depths with exceedances. There is also an insufficient discussion regarding the source of the exceedances and the impacts that Existing Conditions groundwater quality exceeding guidelines has on the remaining Project effects evaluation. |

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| 3.09 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-26 to 11-29 | Table 11.9 | SP | Hydrogeology | There is no discussion surrounding the reasoning for the selection of these Project Activities to assess the Project interactions. Preloading is again not considered in terms of groundwater quantity. Transloading has the potential to impact groundwater quality if a spill occurs. |
| 3.10 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-30 | 11.4.2 Potential Effects | SP | Hydrogeology | Potential effects do not mention means that groundwater quantity could be impacted |
| 3.11 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-33 to 11-34 | 11.4.2.3 Temporary or Permanent Change in Groundwater Quantity or Quality | SP | Hydrogeology | No mention of preloading impacts, nor dewatering impacts, which is also likely needed during construction. No discussions of hydraulic connection to Katzie Slough if groundwater quality is impacted. Focus is on preferential pathways, but natural flow pathways exist as per the one regional cross section provided and the statement that the Katzie Slough is hydraulically connected to shallow groundwater. Additional inferences on natural pathways cannot be made due to the lack of borehole logs, temporal water level data, groundwater flow maps, and hydraulic conductivity analyses included in the report. |
| 3.12 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-38 | 11.4.3.2 Groundwater Quantity and Quality Mitigation Measures | SP | Hydrogeology | The proposed mitigation for temporary or permanent changes to groundwater quantity or quality are insufficient. Changes to groundwater levels by preloading or dewatering were not adequately assessed and there are no mitigation measures proposed to reduce or eliminate impacts. Due to the inadequate assessment a determination of no residual effects cannot be made. |
| 3.13 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-40 | 11.4.3.3 Summary of Effects to be Carried Forward | SP | Hydrogeology | No discussion whether reduced infiltration will have an effect on shallow groundwater, the Katzie Slough or adjacent properties. |
| 3.14 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-41 | 11.5 Monitoring | SP | Hydrogeology | Additional information regarding the groundwater quality frequency and locations should be provided. Further, groundwater levels should be incorporated into the monitoring plan, particularly during and following preloading. |
| 3.15 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-41 | 11.6 Conclusion | SP | Hydrogeology | Level of confidence is not groundwater specific, as there was no modelling completed that was demonstrated. Further, key Project-specific hydrogeological information (well logs, water levels, groundwater flow maps and gradients, and hydraulic conductivity information) was not included to allow a reviewer to confirm the findings and conclusions. |
| 3.16 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-6 | 11.3, Existing Conditions | MG | Civil | Hemmera does not reference or include the most recent City of Pitt Meadows Drainage and Irrigation study completed by ISL |
| 3.17 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-8 | 11.3.1, Field Surveys | MG | Civil | Water level monitoring and measurements should be coordinated with the City to occur at times where water levels are expected to be at their highest levels. July and October are typically times where the water in the sloughs are at their lower levels. |
| 3.18 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-9 | 11.3.2.1, Drainage | MG | Civil | While at times the Katzie Slough acts as a closed system, the flood gates and the Kennedy Road Pump Station do accommodate some flow to occur. This should be acknowledged in the report. |

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| 3.19 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-25 | 11.4.1 Project Interactions | MG | Civil | A detailed Erosion and Sediment Control plan should be developed and provided to the City of Pitt Meadows for review as it will impact their flood infrastructure |
| 3.20 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-30 | 11.4.2.1, Temporary or Permanent change in the drainage system | MG | Civil | The report should mention preloading impacts to water levels in adjacent sloughs as a result of groundwater stabilization or settlement of preload/existing material. The report should also cover impact to operation of downstream pump stations as a result of increased water levels due to these potential impacts. Groundwater impacts also need to be assessed to better understand potential impacts. |
| 3.21 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-30 | 11.4.2.1, Temporary or Permanent change in the drainage system | MG | Civil | While Figure 11.8 confirms that the ARDSA criteria for conveyance is satisfied, it also confirms that the project has a permanent impact on drainage as it notes that there is an increase of 1.5 hours above baseline for each ARDSA storm event (10-year 2-day and 10-year 5-day) compared to existing conditions. The drainage system may be capable of removing runoff, and post-development runoff rates may be less than or equal to pre-development rates, however this clearly shows that there is an impact to the volume of water in the drainage system post-development. Further modelling may be required. |
| 3.22 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-35 | 11.4.3.1, Drainage and Surface Water Quality Mitigation Measures, Site management | MG | Civil | In additional to minimizing exposed soil, it is recommended that covering exposed areas, through the installation or implementation of erosion control blankets, polyethylene sheets etc., be included as a mitigation for reducing the erosion potential. As mentioned in previous comments, the City should be provided with a detailed Erosion and Sediment Control plan for all stages of the project. |
| 3.23 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-36 | 11.4.3.1, Drainage and Surface Water Quality Mitigation Measures, Site management | MG | Civil | A detailed dewatering and treatment plan should for construction be provided for the City's review. |
| 3.24 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-39 | 11.4.3.3, Drainage and Surface Water Quality Mitigation Measures, Summary of Effects to Be Carried Forward | MG | Civil | Table 11.11, notes that there will be no residual effects as a result of temporary or permanent changes in the drainage system, however it is our understanding that there are residual effects as compaction and introduction of impermeable surfaces will permanently affect the surface and subsurface drainage during operation. At this time there not enough information was provided to determine with a high level of confidence that these are not residual effects. |
| 3.25 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-40 | 11.4.3.3, Drainage and Surface Water Quality Mitigation Measures, Summary of Effects to Be Carried Forward | MG | Civil | This section notes that the proposed stormwater management ponds as a mitigation measure would reduce the increased water levels from the post-development condition to those of pre-development conditions and that water levels can be effectively managed. However, similar to comments stemming from the review of the two SWMPs, no calculations or analysis has been shown by the designer outlining the attenuation of these ponds except for a comparison between pre and post development unit area release rates. The designer should provide further information on the development of these unit area release rates, stormwater management ponds, and their respective onsite storage capacities |
| 3.26 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-41 | 11.5, Monitoring | MG | Civil | Water level monitoring and measurements should be coordinated with the City to occur at times where water levels are expected to be at their highest levels so they can be compared to historical and modelled information. |

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| 3.27 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-42 | 11.6, Conclusion | MG | Civil | The level of confidence, that potential effects of the Project on drainage are expected to be effectively managed and mitigated, is not high. Impacts are evident and there is little modelling or quantitative information provided that demonstrates these effects will be managed or mitigated appropriately. |
| 3.28 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-1 | 11.0 Surface Water, Groundwater, and Drainage, 11.1 Overview | DEN | Environmental | Reference to large stormwater ponds. These large open water bodies can act as heat sinks. If this is discharged to the slough it could worsen already marginal conditions in spring, early summer and fall. |
| 3.29 | Hemmera EEE Volume 2 Section 11 Surface Water, Groundwater, and Drainage | 11-1 | 11.2.1 Selection as a Valued Component | DEN | Environmental | Fisheries Act prohibition against deposition of deleterious substances should also be cross referenced as should BC Water Quality Guidelines |
| 3.30 | Hemmera EEE Volume 4 Section 25 Summary of Residual Effects and Mitigation | 25-2 | Effects Table, Surface Water, Groundwater and Drainage | SP | Hydrogeology | The proposed mitigation for temporary or permanent changes to groundwater quantity or quality are insufficient, see notes for Section 11.4.3.2. Unclear what "Review Project design" is referring to and how specifically that would be considered a mitigation measure without further description or context. |
| 3.31 | Hemmera EEE Volume 4 Section 26 Environmental Management and Monitoring | 26-2 | 26.2 Construction Environmental Management Plan | SP | Hydrogeology | Groundwater levels should also be monitored at purpose-specific groundwater monitoring wells. Also no mention of how groundwater quality within the LEA will be assessed - will offsite monitoring wells be used? If so a more robust groundwater monitoring plan should be completed such that groundwater level impacts can also be monitored and assessed. |
| 3.32 | Hemmera EEE Volume 4 Section 26 Environmental Management and Monitoring | 26-2 | 26.3 Post Construction and Operations Management and Monitoring Requirements | SP | Hydrogeology | Groundwater levels and quality should be assessed continuously throughout operation of the project as part of an annual groundwater monitoring program. |
| 3.33 | Hemmera EEE Volume 4 Section 25 Summary of Residual Effects and Mitigation | 25-2 | Effects Table, Surface Water, Groundwater and Drainage | MG | Civil | The proposed mitigations for temporary or permanent change in the drainage system are insufficient, see notes for Section 11.4.2.1. Further modelling and assessment may be required. |

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| 3.34 | Hemmera EEE Volume 3 Section 15 Agriculture Use & Soil | 15-13 | 15.3.2.2 Drainage and Irrigation | DEN | Environmental | Reference to Katzie Slough providing fish habitat in the past tense. Katzie Slough still provides fish habitat but it is certainly much reduced from its former productive capacity. The report documents fish use and potential use. |
| 3.35 | Hemmera EEE Volume 3 Section 15 Agriculture Use & Soil | 15-16 | 15.3.2.2 Drainage and Irrigation | DEN | Environmental | Metals pollution identified. This is interesting from a City ISWMP perspective/sourcing. Have not seen the Phase I and Phase II to understand this risk. |
| 3.36 | Hemmera EEE Volume 3 Section 15 Agriculture Use & Soil | 15-31 | 15.4.21. Agricultural Use - Offsite effects on agricultural production | DEN | Environmental | Artificial light and risk to nocturnal pollinators. This risk did not find its way into the environmental section of the report. Ultimately mitigation is proposed, but how would it be known if the mitigation was effective without some kind of baseline assessment of current species and conditions. |
| 3.37 | Hemmera EEE Volume 3 Section 15 Agriculture Use & Soil | 15-33 | 15.4.3 Mitigation measures | DEN | Environmental | Idea of mitigating intermixed with offsetting. I do not believe these concepts align exactly. Offsetting would be those things that could not be effectively mitigated |
| 3.38 | Hemmera EEE Volume 3 Section 15 Agriculture Use & Soil | 15-33 | 15.4.3 Mitigation measures | DEN | Environmental | Light management. Would shading and possible dimming mitigate this sufficiently. What evidence is there for the effectiveness of this treatment for nocturnal pollinating insects. How would effectiveness be derived if no baseline. What happens if it is not effective? |
| 3.39 | Hemmera EEE Volume 3 Section 15 Agriculture Use & Soil | 15-33 | 15.4.3 Mitigation measures | DEN | Environmental | Reference to possible mitigation. There is really no commitment to implementing any of the identified mitigation measures or offsetting (which are not the same thing). This is concerning in the context of an Environmental Effects Evaluation (Assessment?). Less so if the report is intended merely as a Preliminary Environmental Assessment. |
| 3.40 | Hemmera EEE Volume 3 Section 15 Agriculture Use & Soil | 15-34 | Mitigation 8-15 and 8-15 Light Management | DEN | Environmental | Monitoring. It is proposed but there are no details of how this would be done or the baseline condition they would be monitoring to. No nocturnal pollinating insect data is presented. |
| 3.41 | Hemmera EEE Volume 3 Section 15 Agriculture Use & Soil | 15-34 | Mitigation 11-1 - Surface Water Management | DEN | Environmental | Ponds only appear to function as detention facilities. The report should reference to water quality management as well (oil water separators, treatment swales and the like). These details appear to have been captured in the HATCH report but not entirely captured here. |
| 3.42 | Hemmera EEE Volume 3 Section 15 Agriculture Use & Soil | 15-35 | Mitigation M15-2 Site Monitoring | DEN | Environmental | Reference to 'Develop a site monitoring plan'. Since there is offsetting for fish habitat, that implies DFO Authorization would be required. Offsetting requires a monitoring program to be submitted. Reports of this kind would usually provide at least a preliminary layout of how Effectiveness Monitoring would be approached (typical parameters, time-scale, etc.). |
| 3.43 | Hemmera EEE Volume 3 Section 15 Agriculture Use & Soil | 15-35 | Mitigation 15-4 Soil Salvage and Reuse | DEN | Environmental | As above, the mitigation here is quite conditional, and far less than a commitment to actually to do it. |

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|---|---|---|---|---|---|---|
| 3.44 | Hemmera EEE Volume 3 Section 15 Agriculture Use & Soil | 15-36 | Mitigation 15-5 Agricultural Benefits Fund | DEN | Environmental | Of all the mitigation proposed (and really this is offsetting as stated not mitigation), the idea of a Benefits Fund has the least commitment to it. The report is unclear whether the accounting used in valuation is appropriate for this kind of offset. Concern regarding the deduction for other offsets? Would this be all offsets or just the agricultural ones? |
| 3.45 | Hemmera EEE Volume 3 Section 15 Agriculture Use & Soil | 15-36 | 15.4.3.1 Summary of Effects to be Carried forward (Table 15.8) | DEN | Environmental | Reference to a CEMP, as the document that informs Environmental Management. This requires more details and explanation in the report. Our understanding is that there is usually a Project EMP which is formulated for regulatory submission then a version of the EMP is derived as a supplementary specification to Tender. The CEMP is usually prepared by a QEP working for the Contractor who successfully bids the job. In that context, the CEMP is too late in the review, permitting process to be the sole document for 'Environmental Management' |
| 3.46 | Hemmera EEE Volume 3 Section 15 Agriculture Use & Soil | 15-36 | 15.4.3.1 Summary of Effects to be Carried forward (Table 15.8) | DEN | Environmental | Table references water volume but not water quality. The mitigation of contaminants from operations is not addressed effectively. Of note the HATCH report does provide details on WQ treatment in its designs. This report should be brought into alignment with the design work HATCH is undertaking. |
| 3.47 | Hemmera EEE Volume 3 Section 15 Agriculture Use & Soil | 15-40 | 15.4.4.1 Agricultural use | DEN | Environmental | The phrase "may include funding", is well below a commitment to offset. The report is consistently vague in its proposition to offset and commitment to offset. |
| 3.48 | Hemmera EEE Volume 3 Section 15 Agriculture Use & Soil | 15-47 | 15.5.1.2 Cumulative Effects Categorization | DEN | Environmental | A cumulative effect is identified. It is deemed of moderate significance if the effect is mitigated through the measures identified. However the mitigation treatments including the funding are all referenced by "ifs" and could, and without a commitment then the question is "Will the mitigation be implemented", or "when would the City, public FN, Regulators know about this commitment". |
| 3.49 | Hemmera EEE Volume 3 Section 15 Agriculture Use & Soil | 15-48 | 15-7 Conclusions | DEN | Environmental | Reference to water quality, but this is not discussed in any detail in this part of the Environmental Effects Evaluation |

Date: March 16, 2022 Project Number: OT54

Attention: Colin O'Byrne: Project Manager, Community Development City of Pitt Meadows

**Re: Peer review of the CP Logistics Park Environmental Effects Evaluation Section on Agricultural Use and Soil**

## 1.0 Introduction

The following document has been prepared at the request of the City of Pitt Meadows by Bruce McTavish and Stacy Boczulak of McTavish Resource & Management Consultants Ltd. (McTavish). This document provides a peer review of Volume 3 – Section 15.0 of the Agricultural Use and Soil section of the Environmental Effects Evaluation (EEE) of the CP Logistics Park Vancouver (Project) proposed within the City of Pitt Meadows.

This peer review involves a discussion of gaps, errors and omissions pertaining to the documented existing conditions, project effects, proposed mitigation measures, residual and cumulative effects as described for the Project. Minor comments are tabulated after discussion items.

## 2.0 Peer Review Discussion Items

We believe that (1) the analysis of potential effects is inadequate in its review and mitigation of potential impacts, (2) the discussion of impacts on agriculture are tentatively phrased, when several identified impacts are known to likely occur, (3) there are gaps in the assessment, particularly in regard to socio-economic impacts to agriculture, (4) the report cites information that is not available for public review to support the stated findings. Several aspects of the EEE and findings are not sufficiently explained, and a revised report would provide a more informative assessment. A discussion of our peer-review is organized below by section within the EEE.

### *2.1 Overview (Section 15.1)*

This Section states that there are no significant Project-related residual or cumulative effects on agricultural use and soils following application of mitigation. However, at least two residual effect items are identified in Section 15.4.4 and two cumulative effects are identified in Section 15.5 (i.e., loss of Class 1 to 3 agricultural land and change in soil quantity available for agricultural production).

### *2.2 Introduction (Section 15.2)*

The use of "potential effects" throughout document should be revised. Although there are some evaluated effects with a potential to occur (e.g., effects to water quality), we know the Project will affect agricultural uses and soils (i.e., footprint effects are not potential).

This Section should include definitions of "Class" of land. This definition is in Section 15.3; however, it should be introduced before "Class" of land is used. CP should clarify what the improved vs. unimproved Class means.

In Table 15.1, the indicators selected do not include agricultural- specific socio-economic indicators except for traffic, light and noise. Other Socio-economic concerns that should be considered include agritourism, agricultural land value, and health of farm workers.

### *2.3 Existing Conditions (Section 15.3)*

There is no discussion around whether land capability Class is affected by the filling activities noted on the South Lot.

Water quality in sloughs is noted as low; however, the referenced document comments on water quality from an ecological perspective. Clarify whether the water quality is sufficient for agricultural/ irrigation purposes (e.g., low dissolved oxygen or flows do not generally affect the suitability for irrigation).

In Table 15.5, this report should acknowledge that ornamental nursery stock is shipped all year, not just April to August. Peak shipping is typically from March to June. Construction and interference with road infrastructure could have a short-term negative impact on the Large Nursery (Specimen Trees) that is south of the Logistics Park. This should be better described or expanded in future work. Shipping of nursery products is very time sensitive and delays in shipping due to construction and road closures can have significant negative impacts on nursery businesses.

### *2.4 Project Effects Evaluation (Section 15.4)*

Several Project activities and interactions listed in Table 15.6 and discussed in this Section require re-evaluation and discussion.

#### *2.4.1 Vegetation, soil stripping, excavation, granular fill placement and grading*

The ALC and Metro Vancouver have documented that the majority of filling project have negatively impacted surrounding property drainage[1]. Not considered in the evaluation are potential impacts to drainage and soil capability due to raising groundwater tables in surrounding Properties of the LEA by fill placement/compaction. Reference to the geotechnical sections should be provided to detail the level of impact.

Flood mitigation is also a huge benefit of agricultural land, and the Project will reduce the LEA and REA's buffering capacity for flooding events without proper mitigation.

#### *2.4.2 Construction of agricultural products transload infrastructure*

Looking at published media information this means "*Agricultural hub where Canadian agricultural products will be received by rail and transloaded to shipping containers for distribution in custom allotments around the world*". This should be better defined in the document, and address the following points:

- How will construction improve transportation of local agricultural goods and services as noted in table 15.6?
- Is there a demand for this project at the local or regional level or is this demand only national and international?

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[1]https://www.alc.gov.bc.ca/assets/alc/assets/library/agricultural-capability/agricultural_land_soil_investigation_report_2018.pdf

- Will other products (i.e., other than peas, beans and lentils) be stored at the facility?

If this is only for products from outside the Lower Mainland, this should be explained better in the document, along with a clear discussion of whether there will be any positive impact within the REA or LEA.

### *2.4.3 Agricultural Products Transload Operations*

The document states "*Auto transload operations may result in the accidental release of pests and adverse vectors. The potential effect is a change in agricultural products or production".* This should be explained in detail as this could have serious implications to local producers. How would pests be released, what types of crops would be affected, and what would the impact be at the local level (REA or LEA)?

### *2.4.4 Revegetation*

It is unclear what the revegetation plan is, but for revegetation efforts to result in an improvement, efforts would have to be substantial (e.g., including a mix of shrubs and trees rather than just grass) and weed management over the life of the facility would have to be implemented. Otherwise, it is likely to be neutral or negative rather than a benefit.

### *2.4.5 Change in Agricultural Products or Production*

It is stated that the loss of forage and berry production is considered a minor effect and therefore it is not discussed as a residual effect. Is the residual effect in Table 15.8 a "*no*" because the plan is to use the Agricultural Benefit Fund to increase production elsewhere? If so, this argument is only valid if the fund is confirmed, adequately funded, and its use fully offsets lost productivity. Justification on why they did not include the loss of production as a residual effect should be stronger. Alternatively, this potential effect should be added to the below sections (i.e., residual/cumulative effects sections). It is a permanent loss and there are cumulative impacts regarding changes to production on neighboring properties (e.g., land values, buffering against flooding). Arguably, the effect is just as substantial or greater than the loss of topsoil.

### *2.4.6 Mitigation Measures (Section 15.4.3)*

Mitigation was modeled after a MOTI application to the ALC. Given this statement, CP should clearly show how the Project serves public interest and how development of ALR lands could not be avoided. Otherwise, the impacts and mitigation should be evaluated differently for this Project.

The document describes the permanent loss of prime agricultural land and the plan to salvage topsoil for reuse in Pitt Meadows. This is the only alternative to the permanent loss of productive soil when an area is taken out of production. It will be important to find a site for this soil to go where it will improve agricultural productivity and potential relatively equal to the extent that will be lost. There is no agricultural gain to haul and spread the soil on a site/farm that already Class 1 – 3.

Surface Water Management mitigation is critical and the history of developments affecting drainage and hydrology of agricultural land is poor. There are typically issues with storing storm water on site and attempting to release it at a rate that does not negatively impact drainage infrastructure. The site will be covered with impermeable hard surface versus the present permeable surface with soil water storage capacity. This will result in a significant increase in peak flows in a much shorter time period then takes place now. CP will need to demonstrate that the Project is able to fully manage the amount of stormwater runoff that will be generated from a site this size in a matter that does not negatively impact surrounding agricultural lands and the drainage system.

CP should discuss agricultural impacts related to weed/disease spread. Especially with the movement of soils and plants (e.g., blueberry scorch or blueberry shock), this is a potential negative impact introduced by the proposed mitigation. There should also be mitigation measures included to address the accidental release of pests and vectors from facility operations (mentioned in Table 15.6).

Mitigation M15-4 (Soil Salvage and Re-use) partially offsets the loss of forage and berry production by salvaging blueberry plants. More details on how soils and plants will be advertised/made available to farmers should be included. In addition, CP should consider committing to the responsibilities of consulting with the ALC and City on pairing clean fill sources to fill applications, adequately notifying nearby farmers of the salvaged blueberries, accepting the responsibility for the cost of relocation, and checking for disease prior to moving to other properties.

Mitigation M15-5 (Agricultural Benefit Fund) states that the fund's magnitude will consider the present value of the land, but it should also consider the productivity losses for the long-term future as well as other negative impacts to surrounding producers and larger impacts to farming in the REA (e.g., land affordability, increased wildlife crop damage due to displacement).

Summary Table 15.8 should include the residual effect of loss of production; this production loss is permanent and only partially mitigated by salvaging plants. Unless (as described above), the fund results in increased production on other properties.

#### *2.4.7 Residual Effects (Section 15.4.4)*

If taking a conservative approach, based on the uncertainty around the demand for topsoil, the magnitude should remain high.

### *2.5 Cumulative Effects Evaluation (Section 15.5)*

This Section was reviewed, and we have no feedback of substance at this time. Considerations for effects to be added to this Section are included in the above comments.

### *2.6 Monitoring (Section 15.6)*

This Section was reviewed, and we have no feedback of substance at this time.

#203 – 19292 60 Avenue
Surrey BC
V3S 3M2

## 3.0 Minor Edits and Comments within Document

**Table 1.** Minor edits and comments within the document that do not require a discussion.

| Section | Comment/Edit |
|---|---|
| 15.2 | **Wording change**: "this evaluation considers the potential ~~environmental~~ agricultural effects from the Project" |
| 15.4.3 | **Clarification**: The document states the Agricultural Benefit Fund contributions ***may*** be used to provide an agricultural benefit. If this is used as mitigation, CP should have committed to this action. Is this fund confirmed? |
| 15.4.3.1 | **Error**: Section "0" is cited, this should be updated with the correction Section #. |
| 15.4.4.1 | **Clarification:** G. Hazaparu personal communication is cited on what appears to be a calculation/fact. Is this citation incorrect? |

## 4.0 Closing

We trust this is the information that you require at this time. Should you have any questions regarding this report please contact the undersigned.

Sincerely,

**McTavish Resource & Management Consultants Ltd.**

**Per**

Bruce McTavish, MSc, MBA, PAg
Senior Agrologist
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Stacy Boczulak, MSc, PAg
Technical Lead
stacy@mctavishconsultants.ca

Our File: 2111-05996-00

# FINAL TECHNICAL MEMO

| **To** | **Prepared By:** |
| --- | --- |
| Justin Hart, P.Eng., GSI, Manager of Major Projects<br>City of Pitt Meadows | Bob Bigelow, P.Eng., Senior Traffic Engineer<br>Traffic & Road Safety Division<br><br>**Reviewed By:**<br>Basse Clement, P.Eng., M.A.Sc., Division Manager<br>Strategic Transportation Planning Division |
| **Re** | **Date** |
| CP Logistics Park: Vancouver – Third Party Transportation Review | March 10, 2022 |

## 1. Introduction

The proposed expansion of the existing Vancouver Intermodal Facility, which is titled CP Logistics Park: Vancouver, will be located immediately to the south of the existing intermodal facility and CP Rail mainline. Primary access to/from the proposed expansion will be via Kennedy Road and Lougheed Highway to the north. As part of the federal application and approval process, CP has released assessments for several 'valued components,' including transportation.

The City of Pitt Meadows (the City) has retained McElhanney Ltd. (McElhanney) to complete a third party review of CP's transportation effects evaluation as it is related to this proposed expansion. The purpose of this technical memo is to present the findings of this third party review. The documents that were reviewed as part of this assignment include:

- **Transportation Impact Study Report – H361772-0010-228-066-001** (Hatch, April 4, 2021)
- **Volume 3 – Sections 15.0 to 21.0 – Environmental Effects Evaluation CP Logistics Park: Vancouver** (Hemmera, December 13, 2021, Draft)
    - Section 16 – Transportation
- **Volume 4 – Sections 22.0 to 26.0 – Environmental Effects Evaluation CP Logistics Park: Vancouver** (Hemmera, December 13, 2021, Draft)
    - Section 25 – Summary of Residual Effects & Mitigation (Transportation)

- CP Logistics Park Facility Site Plan, Figure Number H361772-0010-224-292-003 (Hatch, November 4, 2021)
- City's feedback on the above listed documents (January 18, 2022)

# 2. Overall Findings

A summary of our review comments is included in **APPENDIX B**. The "Report Section" and "Table / Figure #" columns are references to the *Transportation Impact Study Report* (TIS Report) specifically as that was the most logical place for us to record our feedback. However, several of these comments also apply to the other documents that were reviewed. We have also included a copy of the TIS Report with our comments embedded throughout in **APPENDIX C**.

Each comment has been separated into one of three tiers:

- **Tier 1** – these are important comments that should be discussed/reviewed with the City
- **Tier 2** – there are relevant comments, and CP / Hatch should provide a response
- **Tier 3** – these are minor comments and consist mostly of spelling, grammar, and presentation of findings

As the Tier 1 comments are deemed most important, we have provided a specific write-up to discuss these in **SECTION 3** of this memo.

# 3. Specific Findings – Tier 1 Comments

The following sections provide a more detailed discussion related to our Tier 1 comments.

## 3.1. TRAFFIC PROJECTIONS

The TIS Report states that an annual growth rate of 1.0% has been used to project traffic volumes to the various horizon years. However, limited information is provided on how this growth rate is derived. Historical growth on the Pitt River Bridge is 0.4% between 2015 and 2019 and likely constrained due to the signalized intersection at Lougheed Hwy/Old Dewdney Trunk Rd. Suggest using a 0.5% growth rate along Lougheed Hwy and 1% for Kennedy Rd. A high rate of growth on an already congested corridor could over-estimate congestion effects for the background scenario. Additional information should be provided to help us understand the assumptions that were used to estimate this number.

As part of the background traffic volumes, the TIS Report does account for the Golden Ears Business Park (GEBP). However, trips that will result from the North Lougheed Area Plan (NLAP) have not been accounted for. The NLAP will generate traffic and should be considered.

## 3.2. TRANSIT

As part of the "assumptions and variances," the TIS Report states that lane utilization of the bus and HOV lanes were ignored as information was not available. Bus schedules and ridership information is publicly available on TransLink's website and their public Tableau site (https://public.tableau.com/app/profile/translink/viz/2019TSPR-BusSeaBusSummaries/TheWorkbook). In addition, the impacts of these lanes on operations should be included in their assessment as the R3 RapidBus was launched in January 2020.

To help understand lane utilization, a site visit / field survey could be conducted to better understand the current traffic operations within the study area.

A section is also included in the TIS Report that discussed the current transit services in the study area. However, no information was provided on transit ridership as part of their existing conditions summary. It is noted that this information is publicly available in TransLink's 2019 Service Performance Review.

The TIS Report states that employees of the site would be discouraged from taking transit due to the distance to bus stops and the lack of pedestrian facilities along Kennedy Road. In an effort to promote transit usage, the study could provide some accommodations for these users such as a safe and well connected walking path.

## 3.3. ACTIVE MODES

Given the more industrial nature of the additional traffic that will be added to the study area, a bigger focus should be given to active modes within the TIS Report. Especially with the various facilities around the site and that Kennedy Road is designated as Neighbourhood Bikeway south of Ferry Slip Road, safety and comfort of the more vulnerable road users should be a primary consideration for the study. Further, the Pitt Meadows Master Transportation Plan prioritizes pedestrians, bicycles and transit over cars and the analysis should reflect these priorities.

The traffic counts that were used for the TIS Report included information on pedestrian and cyclists. Some commentary discussing this information should be included as part of the existing conditions assessment within the report.

However, later in the report it is noted that the traffic counts at the midblock pedestrian crossing on Kennedy Road were conducted during the winter season. Based on this, the actual pedestrian and cyclist volumes are expected to be much higher during the spring/summer months. As this crossing provides a key connection between multiuse paths and the Trans Canada Trail, a more detailed assessment of the volumes at this crossing is likely warranted (i.e. assess how usage varies on the weekends as well as seasonally).

## 3.4. TRAFFIC OPERATIONS

The TIS Report states that signal timing plans for the study area were not provided by the City. As a result, signal information was obtained from another consultant's Synchro worksheets. The TIS Report states that signal timing plans have been optimized, but it is unknown if the actual phases, splits, pedestrian clearance times, etc. match the current conditions.

The highest traffic volumes at Highway 7 / Old Dewdney Trunk Road are for the eastbound/westbound through, eastbound left turn, and southbound right turn movements. The current signal timing plan is likely optimized to reduce delays for these key movements.  The proposed development will add traffic to the movements that directly compete with these for green time at the signal, namely the westbound left turn and the northbound though/left turn movements. Therefore, the current signal timing plans, which could be requested from the Ministry, should be used for analysis to gain a better understanding of the current conditions and the impacts the development trips will have if the signal timing plans are remained unchanged. This will also allow for a better understanding of the potential impacts the development will have on the existing traffic operations in light of the current and future predicted issues regarding the westbound and eastbound left turns at the Highway 7 / Old Dewdney Trunk Road intersection.

The following inconsistencies / issues were noted with the existing traffic volumes that were used:

- There is an imbalance of northbound traffic volumes on Highway 7 of approximately 300 vehicles during the AM peak and 90 vehicles during the PM peak.
    - Some of this traffic could be diverting to Allen Way.  However, during the Highway 7 / Harris Road Planning Study, we saw that only minimal volumes (i.e. approximately 10 vehicle per hour) are travelling to/from Allen Way
    - This traffic imbalance is not expected given that seven day counts were conducted providing a reasonable average and there are minimal access points between the Harris Rd and Old Dewdney Trunk Rd intersections.
- It should be noted that the traffic counts represent throughput, and not necessarily total demand. This is a key item to consider in a location like this as demand exceeds capacity, and queues start to form. It is possible that the current operating conditions and issues may be under-represented. Some commentary on this based on a site visit would be very insightful.
- The TIS Report has assumed 10 vehicles per hour to/from the CP VIF Parking Lot Access. However, the parking lot in this area appears to have a capacity greater than 80 vehicles. The TIS Report should include an assessment of this access as it will be directly impacted by the increase in traffic from the development.
- As a follow up to the previous bullet, the TIS Report assumed volumes for locations where traffic counts were not available.  In addition, Highway 7 / Allen Way was not included as a study intersection because data was not available. The study should include actual traffic counts at these locations if they are deemed critical.

The following items were noted regarding the results of the traffic operations analysis:

- The TIS Report states that a peak hour factor (PHF) of 1.0 was assumed for the Highway 7 / Kennedy Road and Highway 7 / Harris Road intersection. A PHF of 1.0 assumes that traffic volumes are consistent across the entire hour (i.e. each 15-minute interval has the same traffic volume). Typically, if the PHF is not known, the default value for urban intersections is 0.92. However, the actual PHF should be used where it is known. Note that the traffic data provided in the appendix shows PHFs for each of the intersections.
- Figures are provided in the TIS Report that show the level of service (LOS) for turning movements. However, given the high volumes that are currently within the study area, it is difficult to understand the impacts the development will have on operations. Stating that "minimal impacts will occur" or "movements continue to operate over capacity" is not sufficient. Tables and/or graphics could be added to summarize additional measures, such as queue lengths and volume-to-capacity (v/c) ratios. The reader could then more easily understand the actual impacts. For example, a movement might remain at LOS E, but the additional volume from the development might push it over capacity (i.e. v/c > 1.0). This would then indicate that queueing could likely become a concern for that movement.
- For rail crossing events, the estimated queue lengths from the analysis appear to be shorter than the actual observations that were recorded in Bunt & Associates *Harris Road & Kennedy Road Traffic & Rail Data Collection Study (Draft V02, January 10, 2020)*, particularly in the southbound direction. If queue lengths are longer than anticipated, especially with an increase in truck traffic as a result of the development, there could be further impacts to nearby accesses and intersections.

## 3.5. STUDY AREA / ROAD NETWORK

Highway 7 is a provincial truck route and this site is a key goods movement hub. As such, a discussion on the existing and future conditions for trucks should be included.

The TIS Report also mentions that the future plans for the Kennedy-McTavish Connector but does not include it as part of the analysis. An assessment should be done to understand how this future connection would be accommodated with the proposed development and any potential impacts to the study intersections (e.g. does the access point with Kennedy Road need to be signalized when this connector goes ahead?). Also, there is potential diversion of trips to the Harris Road intersection with this connection altering the turn movement projections significantly.

## 3.6. PROPOSED MITIGATION MEASURES

Overall, the TIS Report appears to be lacking in terms of providing feasible mitigation measures that address the potential impacts of the development. Stating that the development will have a "minimal" impact because a turning movement or intersection is already operating poorly under current conditions does not address the problem. In many cases, the development will actually make the movements and intersection perform worse. Similarly with active modes, the TIS Report suggest very little to mitigate the discomfort these modes may face as a result of development traffic. Some specific comments regarding the proposed mitigation measures (or lack thereof) are as follows:

- One of the recommended mitigation measures is that queues lengths should be monitored, and signal timings be adjusted if queueing exceeds available storage lengths. There are several questions / concerns with this statement:
  - Who will do this monitoring and make the changes?
  - Sensitivity scenarios should be conducted to understand the potential implications of this. The Highway 7 intersections are at / close to capacity under the existing conditions. Changing the timing plan slightly could cause significant issues with other movements. The actual current timing plans should also be used for this analysis.
- For the westbound left turn movement at Highway 7 / Kennedy Road, the TIS Report states that queues will be longer than the available storage but can be accommodated within the current taper length for the left turn lane. This should not be considered as a viable option. The taper lengths are to provide deceleration distance for vehicles entering the turn lane and should not be used for storage. Also, this movement will consist of large trucks, which will take up more of the storage length and lane width.
- The TIS Report states that the number of pedestrian, cyclist and transit trips generated by the development will be minimal. However, no mitigation measures have been recommended to accommodate the users that will choose these travel modes. If safe routes are provided for these modes, then more people would choose to walk, bike or take transit to work.
- The TIS Report recognizes that Kennedy Road is designated as a Neighbourhood Bikeway. It also states that the addition of development traffic on Kennedy Road will "pose a safety risk for cyclists" and cause cyclist "discomfort." However, the report's recommendation is for the City to review the bikeway classification after the full build out of the development. It should be the developers responsibility to propose mitigation measures to address the noted safety concerns with increased auto and truck traffic. Diverting cyclists to the Trans Canada Trail will result in out of the way travel for cyclists and put them on a gravel pathway, which is likely not acceptable.
- One of the main road network assumptions for the TIS Report was that the Kennedy Road rail overpass would be in place at full build out of the development. A sensitivity analysis was conducted for the at-grade rail crossing in the event that this project was delayed or did not proceed. Although queues were shown to potentially extend into upstream intersections/access points, no mitigation measures were recommended. Impacts related to this crossing will be worse if the actual queues are longer than the estimated as part of the analysis. In addition, the platooning caused by a rail crossing event could have a negative impact on the operations at Highway 7 / Kennedy Road.

# 4. Summary / Closing

As a result of our review of the TIS Report, several issues and questions have been identified. Additional analysis should be completed, and more details provided regarding viable mitigation measures to address the impacts the development will have on the surrounding road network and various road users including pedestrians, cyclists and transit users.

If you have any questions or concerns regarding this analysis, please contact the undersigned.

Sincerely,
McElhanney Ltd.

Prepared by:

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604-674-6738

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2022-03-10

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Appendices: A – Statement of Limitations
B – McElhanney Comment Log
C – Copy of the TIS Report with McElhanney's Comments

CC: Samantha Maki, City of Pitt Meadows
Denny Leung, McElhanney

# APPENDIX A

Statement of Limitations

# Statement of Limitations

***Use of this Report.*** This report was prepared by McElhanney Ltd. ("**McElhanney**") for the particular site, design objective, development and purpose (the "**Project**") described in this report and for the exclusive use of the client identified in this report (the "**Client**"). The data, interpretations and recommendations pertain to the Project and are not applicable to any other project or site location and this report may not be reproduced, used or relied upon, in whole or in part, by a party other than the Client, without the prior written consent of McElhanney. The Client may provide copies of this report to its affiliates, contractors, subcontractors and regulatory authorities for use in relation to and in connection with the Project provided that any reliance, unauthorized use, and/or decisions made based on the information contained within this report are at the sole risk of such parties. McElhanney will not be responsible for the use of this report on projects other than the Project, where this report or the contents hereof have been modified without McElhanney's consent, to the extent that the content is in the nature of an opinion, and if the report is preliminary or draft. This is a technical report and is not a legal representation or interpretation of laws, rules, regulations, or policies of governmental agencies.

***Standard of Care and Disclaimer of Warranties.*** This report was prepared with the degree of care, skill, and diligence as would reasonably be expected from a qualified member of the same profession, providing a similar report for similar projects, and under similar circumstances, and in accordance with generally accepted engineering/planning and scientific judgments, principles and practices. McElhanney expressly disclaims any and all warranties in connection with this report.

***Information from Client and Third Parties.*** McElhanney has relied in good faith on information provided by the Client and third parties noted in this report and has assumed such information to be accurate, complete, reliable, non-fringing, and fit for the intended purpose without independent verification. McElhanney accepts no responsibility for any deficiency, misstatements or inaccuracy contained in this report as a result of omissions or errors in information provided by third parties or for omissions, misstatements or fraudulent acts of persons interviewed.

***Effect of Changes.*** All evaluations and conclusions stated in this report are based on facts, observations, site-specific details, legislation and regulations as they existed at the time of the report preparation. McElhanney should be requested to re-evaluate the conclusions of this report and to provide amendments as required prior to any reliance upon the information presented herein upon any of the following events: a) any changes (or possible changes) as to the site, purpose, or development plans upon which this report was based, or b) any changes to applicable laws subsequent to the issuance of the report.

***Independent Judgments.*** McElhanney will not be responsible for the independent conclusions, interpretations, interpolations and/or decisions of the Client, or others, who may come into possession of this report, or any part thereof. This restriction of liability includes decisions made to purchase, finance or sell land or with respect to public offerings for the sale of securities.

# APPENDIX B

McElhanney Comment Log

| Comment ID | Page Number PDF | Document | Rpt Section | Table / Figure # | Comments | Comment Tier |
|---|---|---|---|---|---|---|
| 1 | 11 | ix | Executive Summary / Existing Transportation Conditions | Table ES-1: The Existing Transportation Network | Should note if these are TransLink MRN roads and if they are designated truck routes. | 2 |
| 2 | 11 | ix | Executive Summary / Existing Transportation Conditions / Intersection Capacity Analysis | | For MoTI intersections, LOS threshold is LOS D for highway movements. *Comment attached to highlighted text that reads:* For this analysis, critical intersections were identified when the overall volume to capacity (v/c) ratio exceeds 0.85 or has a Level of Service (LOS) of E or F | 2 |
| 3 | 12 | x | Executive Summary / Existing Transportation Conditions / Transit Services | | peak direction only | 3 |
| 4 | 14 | xii | Executive Summary / Background Future Conditions / Road network upgrades | | NLC and Kennedy-McTavish Connector will have impacts on the results of this TIS. Sensitivity analysis should be included. *Comment attached to highlighted text that reads:* Due to the uncertainty in the timelines, the future background conditions were analyzed without these improvements | 2 |
| 5 | 15 | xiii | Executive Summary / Background Future Conditions / Road network upgrades | | locations or extents? | 3 |
| 6 | 16 | xiv | Executive Summary / Background Future Conditions / Future Developments | | NLAP will add EB/WB trips to Hwy 7, so the TIS is likely under-representing trips. *Comment attached to highlighted text that reads*: As no proposed developments are publicly available at the time of writing this report, additional trips generated from the NLAP were not considered in the analysis of the future background conditions | 1 |
| 7 | 16 | xiv | Executive Summary / Background Future Conditions / Background Traffic Growth | | What is the basis for this? Historical growth on Pitt River Bridge is only 0.4% between 2015 and 2019 and constrained by the Lougheed/ODTR signalized intersection. | 1 |
| 8 | 16 | xiv | Executive Summary / Background Future Conditions / Transit Upgrades | | Was this considered in the mode share analysis? | 2 |
| 9 | 18 | xvi | Executive Summary / CPLPV Impact Assessment / Impact Assessment on access intersections | | which leg(s) is stop controlled? 3-way stop proposed *Comment attached to highlighted text that reads:* a three-legged stop-controlled intersection | 2 |
| 10 | 18 | xvi | Executive Summary / CPLPV Impact Assessment / Impact Assessment on access intersections | | A sensitivity analysis should have been completed as part of this report. *Comment attached to highlighted text that reads:* However, the warrants for signalization should be re-assessed if the Kennedy-McTavish Connector is to be constructed in the future. | 2 |
| 11 | 19 | xvii | Executive Summary / Mitigation / CPLPV Full-build out | | This TIS should provide a recommendation on a timing plan that could be used. Analysis should be completed to determine if LOS for the other movements is compromised. *Comment attached to highlighted text that reads:* It is recommended that the queue lengths be monitored and signal timings be adjusted if queueing exceeds storage length | 1 |
| 12 | 19 | xvii | Executive Summary / Mitigation / CPLPV Full-build out | | CoPM has designated Kennedy Road a neighbourhood bikeway already. This TIS should provide recommendations based on the impacts the proposed development will have. *Comment attached to highlighted text that reads:* A review of Kennedy Road, south of Ferryslip Road, should be conducted by the City of Pitt Meadows to verify if the road should be classified as a neighbourhood bikeway after the full build-out of the facility | 1 |
| 13 | 24 | 5 | 2.0 Existing Conditions | | Need a section on trucks given that Lougheed is a provincial highway/truck route and this site is a goods movement hub. *Comment attached to Existing Conditions 2020 section.* | 1 |
| 14 | 26 | 7 | 2.1.2.1 Background Traffic Growth | | Historical growth on Pitt River Bridge is only 0.4% between 2015 and 2019 and constrained by the Lougheed/ODTR signalized intersection. | 1 |
| 15 | 27 | 8 | 2.1.2.3 Assumptions and Variances TMC Data | | Counts should have been conducted at locations where data was not available. Parking lot can hold 100+ vehicles. *Comment attached to highlighted text that reads:* Traffic counts were not available for the intersections of Kennedy Road with Ferryslip Road and the CP VIF Parking Lot. | 2 |
| 16 | 27 | 8 | 2.1.2.3 Assumptions and Variances / TMC Data / Signal Timings | | Signal timing plans for intersections on Hwy 7 can be obtained from MoTI and should have been considered as part of this analysis. *Comment attached to highlighted text that reads:* Traffic signal timing plans for the two signalized intersections in study area were not provided by the City of Pitt Meadows. | 1 |

| Comment ID | Page Number | | Rpt Section | Table / Figure # | Comments | Comment Tier |
|---|---|---|---|---|---|---|
| | PDF | Document | | | | |
| 17 | 27 | 8 | 2.1.2.3 Assumptions and Variances / TMC Data / Peak Hour Factor (PHF) | | Typically, a default PHF of 0.92 would be used if it is not known. Traffic data in the appendix shows actual PHFs - these should be used for analysis. | 1 |
| 18 | 28 | 9 | 2.1.2.3 Assumptions and Variances / TMC Data / Bus/HOV Lanes | | Bus schedules and ridership are available on TransLink's public tableau: https://public.tableau.com/app/profile/translink/viz/2019TSPR-BusSeaBusSummaries/TheWorkbook | 1 |
| 19 | 28 | 9 | 2.1.2.3 Assumptions and Variances / TMC Data / Bus/HOV Lanes | | Should be included since the R3 rapidbus was launched in Jan 2020. | 1 |
| 20 | 28 | 9 | 2.1.2.3 Assumptions and Variances / TMC Data / Bus/HOV Lanes | | Site surveys should have been conducted to estimate lane utilization. Bus schedules are available on Translink's webiste. *Comment attached to highlighted text that reads* : Since lane utilization of this lane was not available, the impact of this type of lane upon traffic operations was ignored | 2 |
| 21 | 28 | 9 | 2.1.2.3 Assumptions and Variances / TMC Data / COVID-19 | | Any commentary on potential long term effects of Covid? | 2 |
| 22 | 28 | 9 | 2.1.2.4 Traffic Operations Analysis | | Need to note that traffic counts represent throughput, and not necessarily demand. Where demand exceeds capacity, queues start to form. | 1 |
| 23 | 29 | 10 | 2.1.2.4 Traffic Operations Analysis | Figure 2-1: Traffic Volumes for Existing Conditions (2020) | Google earth show 80+ vehicles in the parking lot but the TIS assumes only 10 arrive/depart during peak hours. | 1 |
| 24 | 29 | 10 | 2.1.2.4 Traffic Operations Analysis | Figure 2-1: Traffic Volumes for Existing Conditions (2020) | NB imbalance of 300 vehicles in the AM peak. About 90 vehicle imbalance in the PM peak. | 1 |
| 25 | 33 | 14 | 2.1.2.4 Traffic Operations Analysis | Figure 2-3: 2020 Existing Conditions Traffic Operation during the PM Peak Hour | Surprised that the PM peak performs better than AM when the volumes are 610 vs 190 respectively. Possibly because the WB volumes are lower during the PM peak, which gives more green time to the EB LT. Also possibly due to the use of optimized timing plans versus the actual timing plans. | 1 |
| 26 | 37 | 18 | 2.1.2.5.2 Scenario 2: 15 minutes Duration | | Would expect the SB queue to be higher since there are 88vph SB and 72vph NB during PM peak. *Comment attached to highlight text that reads:* 145 metres in the northbound direction and 135 meters in the southbound direction during the P.M. peak period | 2 |
| 27 | 37 | 18 | 2.1.2.5.2 Scenario 2: 15 minutes Duration | | Increase in volumes from development increase the likelihood of these impacts. *Comment attached to highlighted text that reads:* The northbound queues may impact driveway access to a residential<br>property located on the east side of Kennedy Road while the southbound queues may impact access to the CP VIF parking lot located on the east side of Kennedy Road | 2 |
| 28 | 38 | 19 | 2.1.2.5.2 Scenario 2: 15 minutes Duration | Figure 2-5: Kennedy Road Rail Crossing Queue Lengths under Existing Conditions (2020) for a 15-minute rail event duration | As part of the Harris Road & Kennedy Road Traffic & Rail Data Collection Study prepared by Bunt & Associates (Draft V02, January 10, 2020), rail events were observed which showed the maximum southbound queue extended close to Ferryslip Road during the PM peak hour. This graphic shows the queue only extending to the CP VIF Parking Lot Access. Site investigations should be conducted to verify the findings of the analysis. Adding trucks to this road as a result of the development will further extend these queue lengths | 2 |
| 29 | 39 | 20 | 2.2 Transit Services | | No information provided on transit ridership to summarize existing conditions. This is available in TransLink's 2019 Service Performance Review: https://public.tableau.com/app/profile/translink/viz/2019TSPR-BusSeaBusSummaries/TheWorkbook | 1 |
| 30 | 40 | 21 | 2.2 Transit Services / R3 Lougheed Highway RapidBus | | RapidBus | 3 |
| 31 | 40 | 21 | 2.2 Transit Services / West Coast Express | | in the peak direction | 3 |
| 32 | 42 | 23 | 2.3 Active Transportation Facilities | | Peds and bikes were included in the traffic counts and some commentary on active mode volumes should be included in the existing conditions assessment. | 1 |
| 33 | 44 | 25 | 3.1.1.1 Road Network Upgrades | | At-grade crossing is already an issue - development traffic will make this worse. *Comment attached to teach that reads:* Rail traffic was identified that results in congestion and delays at the at-grade crossings on Harris Road and Kennedy Road. Safety concerns were identified relating to vehicles making illegal maneuvers to avoid waiting at the crossing | 2 |

| Comment ID | Page Number PDF | Page Number Document | Rpt Section | Table / Figure # | Comments | Comment Tier |
|---|---|---|---|---|---|---|
| 34 | 46 | 27 | 3.1.1.1 Road Network Upgrades | | These will have an impact on the study area. The NLC and development will increase traffic EB/WB on Hwy 7. The Kennedy-McTavish Connector will increase volumes through the Kennedy Road. *Comment attached to highlighted text that reads:* The timelines for the implementation of the various road network improvement strategies by the City of Pitt Meadows have not been confirmed. Due to the uncertainty in the timelines, the 2025 site preload program year, the 2030 full build-out year and 2040 planning horizon were analyzed without these improvements. The proposed strategies are illustrated in Figure 3-1 | 1 |
| 35 | 54 | 35 | 3.1.1.2.2 North Lougheed Area Plan | | This development will add trips to the network. The TIS should include some form of estimate in the background volumes. *Comment attached highlight text that reads:* As no proposed developments are publicly available at the time of writing this report, additional trips generated from the NLAP were not considered in the analysis of the future background conditions. | 1 |
| 36 | 55 | 36 | 3.1.1.3 Background Traffic Growth | | Difficult to support since growth between 2015 and 2019 was running at 0.4%. | 1 |
| 37 | 55 | 36 | 3.1.1.3 Background Traffic Growth | | Employment growth will result in redistribution and internalization of trips resulting in lower growth rates on the regional road network. Further, there will be some mode shift further suppressing regional traffic growth rates. | 2 |
| 38 | 57 | 38 | 3.1.2 Site Preload Program Year (2025) | | We know there is congestion and development will make it worse. We need diagrams that show queues and v/c ratios to really understand impacts to capacity. *Comment attached to highlighted text that reads:* As some intersections and movements are already operating over or near capacity under existing conditions, increases in background traffic volumes for future scenarios will cause operations at these intersections to worsen by the site preload program year of 2025. | 1 |
| 39 | 59 | 40 | 3.1.2 Site Preload Program Year (2025) | Figure 3-10: 2026 Background Conditions Traffic Operation during the A.M. peak hour | Queue lengths would help illustrate traffic conditions here. Saying "increased delays and continue operating over capacity" doesn't help quantify the impact of growth. | 1 |
| 40 | 62 | 43 | 3.1.3 Full Build-Out Year (2030) | Figure 3-12: Traffic Volumes for Future Background Conditions (2030) | The parking lot access has been removed, likely because of CP's assumption that the Kennedy Road O/P would be complete by 2030. However, a sensitivity analysis was also run without the O/P. A volume figure for this scenario should be included. | 2 |
| 41 | 62 | 43 | 3.1.3 Full Build-Out Year (2030) | Figure 3-12: Traffic Volumes for Future Background Conditions (2030) | More information is needed regarding the traffic re-distribution that was done. In 2025 there were 87vph SB during the PM peak travelling towards the rail crossing. In 2030 there are only 46vph. 51vph turn right at Ferryslip Rd. | 2 |
| 42 | 63 | 44 | 3.1.3 Full Build-Out Year (2030) / Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road | | Same comment as above "increased delays and continue operating over capacity" doesn't help quantify or visualize the impact of growth. Need to show queuing diagrams. | 1 |
| 43 | 65 | 46 | 3.1.3 Full Build-Out Year (2030) | Figure 3-13: 2030 Background Conditions Traffic Operation during the A.M. peak hour | Sensitivity analysis of the parking lot access assuming the Kennedy Road O/P is not complete by 2030? | 2 |
| 44 | 66 | 47 | 3.1.3 Full Build-Out Year (2030) | Figure 3-14: 2030 Background Conditions Traffic Operation during the P.M. peak hour | Sensitivity analysis of the parking lot access assuming the Kennedy Road O/P is not complete by 2030? | 2 |
| 45 | 68 | 49 | 3.1.3 Full Build-Out Year (2030) | Figure 3-15: Traffic Volumes for Future Background Conditions (2040) | Same comment as 2030. | 2 |
| 46 | 69 | 50 | 3.1.3 Full Build-Out Year (2030) / Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road | | Need queuing diagram, same as above. | 2 |
| 47 | 71 | 52 | 3.1.3 Full Build-Out Year (2030) | Figure 3-16: 3040 Background Conditions Traffic Operations during the A.M. peak hour | Same comment as 2030. | 2 |
| 48 | 72 | 53 | 3.1.3 Full Build-Out Year (2030) | Figure 3-17: 3040 Background Conditions Traffic Operations during the P.M. peak hour | Same comment as 2030. | 2 |
| 49 | 73 | 54 | 3.1.5.1 Site Preload Program Year (2025) | | These are the same assumptions as the 2020 existing conditions. However, information from the Vancouver Fraser Port Authority suggests that by 2030, total daily train activity at Kennedy Road (i.e. the time that vehicles are blocked by a crossing) will triple. This will impact the assessment of queue lengths for future horizon years. There will be more crossing events, which could be longer in duration and more closely spaced. Increase in train activity should be accounted for in the TIS. | 1 |

| Comment ID | Page Number PDF | Document | Rpt Section | Table / Figure # | Comments | Comment Tier |
|---|---|---|---|---|---|---|
| 50 | 74 | 55 | 3.1.5.1.1 Scenario 1: 5 minutes Duration | | Similar comment as before - SB PM volume of 92vph vs NB of 75vph - expect SB queue to be higher. *Comment attached to highlighted text that reads:* approximately 145 metres in the northbound direction and 135 meters in the southbound direction during the P.M. peak period. | 1 |
| 51 | 79 | 60 | 3.2 Active Transportation Conditions | | What about the marked crossing on Kennedy Rd? *Comment attached to highlighted text that reads:* The intersection of Harris Road and Lougheed Highway was identified as a dangerous crossing for cyclists. Collaborative efforts between the City, MOTI and CP Rail to address these concerns is recommended. Additionally, it is recommended that a pedestrian/bicycle overpass be built over Lougheed Highway | 2 |
| 52 | 79 | 60 | 3.3 Transit Conditions | | What about growth in transit ridership, and impacts to service utilization and service levels? | 2 |
| 53 | 79 | 60 | 3.3. Transit Conditions | | It already exists. The R3 rapidbus already provides this connection. | 2 |
| 54 | 84 | 65 | 4.2 Trip Distribution and Assignment | | Would expect a higher proportion using Lougheed Highway since ODTR only provides access to residential and agricultural areas. | 2 |
| 55 | 85 | 66 | 4.2 Trip Distribution and Assignment | Figure 4-2: Truck Trip Distribution during the Site Preload Program | Surely some trucks would use the Pitt River Bridge to provide site preload? Does Golder have insight into locations of preload suppliers? | 2 |
| 56 | 88 | 69 | 5.1.1 Site Preload Program year Traffic Operations (2025) | | Were heavy vehicle auto equivalence factors applied to account for larger and slower vehicles? | 2 |
| 57 | 89 | 70 | 5.1.1 Site Preload Program year Traffic Operations (2025) | Figure 5-2: Preload Program Construction Traffic Volumes (2025) | Will all trucks entering the site be staged on site? Or is it anticipated that staging will occur on the roadway? A review of this should be included as part of the TIS. If staging is to occur on the roadway, there will be impacts to traffic operations of the road, which will be further complicated during a railway crossing event. | 2 |
| 58 | 90 | 71 | 5.1.1 Site Preload Program year Traffic Operations (2025) | Table 6-1: Percent contribution from the construction traffic in 2026 on Lougheed Highway | Should measure this using the auto equivalence factors for heavy vehicles. | 2 |
| 59 | 90 | 71 | 5.1.1 Site Preload Program year Traffic Operations (2025) | | Were optimized timing plans used? 2025 is only 3 years away and existing timing plans should have been used for analysis. *Comment attached to highlighted text that reads:* The impact of the traffic volumes generated by the site preload program on the operation of signalized intersections is described below: | 2 |
| 60 | 94 | 75 | 5.1.2 Impact on Queueing | | The results are based on optimized timing plans. What are the impacts with the current timing plans? Or will new timing plans be submitted to MoTI before proceeding with the preload program? *Comment attached to highlighted text that reads:* Based on the optimized timing assume | 2 |
| 61 | 94 | 75 | 5.1.2 Impact on Queueing | | Queues will consist of more heavy vehicles - shouldn't assume that they can be accommodated within the taper. *Comment attached to highlighted text that reads:* Hence, the queues are expected to be accommodated within the taper length. | 1 |
| 62 | 98 | 79 | 5.2 Pedestrian, Cycling and Transit Assessment | | Analysis / backup information to support this? There will also be safety concerns due to increased truck traffic and pedestrian/cyclist activity. *Comment attached to highlighted text that reads:* The increased number of trucks are not expected to trigger upgrades at the pedestrian and cycling midblock crossing on Kennedy Road between the CP VIF Driveway and Ferryslip Road. | 2 |
| 63 | 99 | 80 | 6. Site-Generated Traffic | | How will this be accommodated? Figure 6-1 doesn't show the connector alignment. *Comment attached to highlighted text that reads:* The new road is anticipated to ultimately form part of the proposed Kennedy McTavish Connector. | 2 |
| 64 | 100 | 81 | 6. Site-Generated Traffic | Figure 6-1: Access intersections to the CPLPV | This is currently a free flow movement for EB Kennedy Road. Adding a stop control will add delays here. | 2 |
| 65 | 102 | 83 | 6.1.1 Trip Generation | | This seems too low since the port and railways have defined operating hours. | 3 |
| 66 | 102 | 83 | 6.1.1 Trip Generation | | Is this based on rail schedules or something else? | 3 |
| 67 | 103 | 84 | 6.1.1 Trip Generation | Table 6-3: AM and PM Peak Hour Truck Trips Summary | Is this the combined 2-way volume (i.e. inbound + outbound) or is it meant to show 8 inbound and 8 outbound? The 2-way daily agricultural trips were shown to be 372, distributed evenly across 24 hours. That would equal approximately 16 2-way trips during each peak hour. | 3 |
| 68 | 105 | 86 | 6.2.1 Trip Generation | | How many stalls will be provided? Helps understand the potential in/out volumes during peak hours. *Comment attached to highlighted text that reads:* Employee parking will be provided within the facility | 3 |

| Comment ID | Page Number | | Rpt Section | Table / Figure # | Comments | Comment Tier |
|---|---|---|---|---|---|---|
| | PDF | Document | | | | |
| 69 | 105 | 86 | 6.2.2 Trip Distribution and Assignment | | Maybe also look at current traffic volumes during peak hours (minus trucks) to get a sense of where employees are coming from? *Comment attached to highlighted text that reads:* The employee trips were distributed based on the spatial distribution of residential neighborhoods in the surrounding area. | 2 |
| 70 | 106 | 87 | 6.2.2 Trip Distribution and Assignment | Figure 6-3: Employee Trip Distribution | Surely some employees would use ODTR to access the site? | 2 |
| 71 | 107 | 88 | 7. Impact Assessment | | Can be obtained from MoTI. *Comment attached to highlighted text that reads:* It should be noted that the impact of the CPLPV on the intersection of Lougheed Highway and Allen Way was not analyzed since the TMC data for this intersection was not available. | 1 |
| 72 | 107 | 88 | 7. Impact Assessment | | Increase in EB through will require more green time. WB Left (protected) and NB Left movements may be impacted as a result. The TIS should confirm the impacts. *Comment attached to highlighted text that reads:* expected to be minimal since there will be no increase in site-generated turning volumes at this intersection | 2 |
| 73 | 111 | 92 | 7.1.1 Full Build-Out Year Traffic Operations (2030) | Table 7-1: Percent contribution from the CPLPV in 2030 on Lougheed Highway | Need to confirm if auto equivalence factors were applied for heavy vehicles. | 2 |
| 74 | 111 | 92 | 7.1.1 Full Build-Out Year Traffic Operations (2030) / Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road | | But the figure shows this as a critical movement? Similar comment for other critical movements. Need to also better explain minimal impact; what does this mean? A table or figure that shows the before and after LOS, queueing, v/c is required to make it easier to compare the differences. | 1 |
| 75 | 120 | 101 | 7.1.3 Impact on Queueing | | This could potentially block access to the NB right turn lane *Comment attached to highlighted text that reads:* This queue could potentially be larger in the event that the Kennedy Overpass is not completed 60 metres in the P.M. peak hour | 1 |
| 76 | 120 | 101 | 7.1.3 Impact on Queueing | | Once again, more large trucks here - should not assume the taper can accommodate them. *Comment attached to highlighted text that reads:* Hence, the queues are expected to be accommodated within the taper length. | 1 |
| 77 | 120 | 101 | 7.1.4 Impact on Access Intersections | | A sensitivity scenario is required to determine impact of the Kennedy-McTavish connector, including warrants for signalization. *Comment attached to highlighted text that reads:* However, the warrants for signalization should be re-assessed if the Kennedy-McTavish Connector is to be constructed in the future. | 2 |
| 78 | 120 | 101 | 7.1.5 Impact on Kennedy Road railway crossing | | Are mitigation measures required as a result? *Highlighted text - no comment:* The CPLPV is expected to significantly increase the number of vehicles crossing the Kennedy Road at-grade railway crossing, as shown in Table 7-3 | 2 |
| 79 | 121 | 102 | 7.1.5 Impact on Kennedy Road railway crossing | | See previous comment regarding information from the Vancouver Fraser Port Authority. Daily train activity is expected to triple by 2030. The increase shown here is less than double. | 2 |
| 80 | 124 | 105 | 7.1.5.2 Scenario 2: 15 minutes Duration | Figure 7-9: Kennedy Road Rail Crossing Queue Lengths under Total Conditions (2040 for a 15 Minute Rail Event Duration | Queue spillback to new intersection. | 2 |
| 81 | 124 | 105 | 7.2 Pedestrian, Cyclist and Transit Assessment | | Should also consider pick up/drop off space for ride share services such as Uber and Lyft. | 2 |
| 82 | 127 | 108 | 7.2.1 Active Transportation Mode Share / Cyclist Conditions | | This could change significantly with the adoption of e-bikes and e-scooters. | 2 |
| 83 | 128 | 109 | 7.2.1. Active Transportation Mode / Transit Conditions | | Why would some accommodation not be provided for these people along Kennedy Rd? | 1 |
| 84 | 129 | 110 | 7.2.2 Impact on the midblock crossing on Kennedy Road | | Active modes data over the summer time period is required to determine seasonal impacts. *Comment attached to highlighted text that reads:* During the weekend, the number of pedestrians and cyclists are significantly higher with a maximum of 30 observed during the midday peak hour. It should be noted that these volumes are likely underestimated since it was collected during the winter season. | 1 |
| 85 | 132 | 113 | 7.2.2.1 Pedestrian Crossing Control Manual for British Columbia | Figure 7-14: Estimate Crossing Opportunities for a Two Lane Cross-Section (BC Highway Safety Branch, 1994) | Rail crossing will develop platoons, which will likely impact crossing opportunities once the train is clear. Also have significant heavy truck volumes here - not typical conditions. | 2 |
| 86 | 134 | 115 | 7.2.2.2 TAC's Pedestrian Crossing Control Guide, 3rd Edition | Table 7-8 Decision Support Tool - Treatment Selection Matrix (Transportation Association of Canada, 2018) | Even if you assume 3-lanes (total exposed crossing distance is about 11m), GM is only recommended. *Relates to highlighted text that reads:* Table 7-6 indicates that a Ground Mounted System (GM) | 2 |

| Comment ID | Page Number | | Rpt Section | Table / Figure # | Comments | Comment Tier |
|---|---|---|---|---|---|---|
| | PDF | Document | | | | |
| 87 | 134 | 115 | 7.2.2.2 TAC's Pedestrian Crossing Control Guide, 3rd Edition | | A lot of these items are "desirable components" for GM. *Comment attached to highlighted text that reads:* side-mounted signs with zebra pavement and elephant's feet marking along with specific upgrades such as advanced warning signs and speed limit reductions to account for the limited visibility in the area. | 2 |
| 88 | 135 | 116 | 8.1 Mitigation Measures for the Site Preload Program | | There will be an impact during rail crossing events, particularly if the actual queue lengths are longer than what has been estimated. See previous comment regarding discrepancies between estimated and observed queues. | 2 |
| 89 | 135 | 116 | 8.1 Mitigation Measures for the Site Preload Program | | This is based on optimized timings - what about the current timing plan? Who will monitor and implement changes during preload? *Comment attached to highlighted text that reads:* It is recommended that the queue lengths for this movement be monitored and signal timings be adjusted if queueing exceeds storage length. | 2 |
| 90 | 135 | 116 | 8.2 Mitigation Measures for the CPLPV Full-build out | | But the background growth and congestion levels are high, so even a small increase in vehicles will result in increases to queuing and delays. | 1 |
| 91 | 135 | 116 | 8.2 Mitigation Measures for the CPLPV Full-build out | | The TIS previously stated that queues will back into tapers, which is not acceptable given high truck volumes. *Comment attached to highlighted text that reads:* The CPLPV is expected to increase the queues on the westbound left turn movement at the intersection of Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road. The queue lengths for this movement is very sensitive to the green time provided for this movement | 1 |
| 92 | 135 | 116 | 8.2 Mitigation Measures for the CPLPV Full-build out | | What about provision for transit users? | 1 |
| 93 | 135 | 116 | 8.2 Mitigation Measures for the CPLPV Full-build out | | Why not provide a bike lane along Kennedy Rd to separate vehicles from cyclists? | 1 |
| 94 | 136 | 117 | 8.2 Mitigation Measures for the CPLPV Full-build out | | RRFB doesn't seem to be warranted based on Ped Crossing Control Guide, but we do have a special case here - limited sight distance, high truck volumes, platooning from signal and/or rail crossing. It is a good idea to include RRFB to enhance visibility and safety at this crossing, which does connect to the Trans Canada Trail. | 2 |
| 95 | 137 | 118 | 9. Findings and Conclusions / 3. | | If this development pushes the LOS F further, shouldn't a mitigation for the Lougheed/Kennedy intersection be proposed? At least mitigations should be proposed to address queues from spilling outside storage lengths - it is not acceptable to have queues in tapers. | 1 |
| 96 | 137 | 118 | 9. Findings and Conclusions / .6 | | Mitigations should be proposed. *Comment attached to highlighted text that reads:* The increased number of trucks during the site preload program may cause cyclist discomfort on Kennedy Road | 1 |
| 97 | 138 | 119 | 9. Findings and Conclusions / 8. | | How will it tie in? *Comment attached to highlighted text that reads:* Kennedy McTavish Connector. | 2 |
| 98 | 138 | 119 | 9. Findings and Conclusions / 9. | | This should be further clarified, since the intersection is already at LOS F. | 2 |
| 99 | 138 | 119 | 9. Findings and Conclusions / 11. | | What about mitigations for queues from rail crossing events? The queues will likely spillback and block accesses / intersections. This will be made worse by the development. What is being proposed for this? | 2 |
| 100 | 138 | 119 | 9. Findings and Conclusions / 12. | | What about the optimized timing plans that were used? Shouldn't a mitigation be developing these timing plans and submitting to Moti? Maybe more detail needed here as well - who will monitor the queues? Who will determine the timing plans? | 2 |
| 101 | 138 | 119 | 9. Findings and Conclusions / 13. | | This presumes that people will not take transit or active modes and concludes too prematurely that no facilities should be provided. If safe routes for peds and cyclists are provided, then more people would use these modes. This doesn't seem to provide enough choice for mode of travel. | 1 |

# APPENDIX C

Copy of the TIS Report with McElhanney Comments

# Report

# Transportation Impact Study

## H361772-0010-228-066-0001

McElhanney 3rd Party Review

March 10, 2022

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| 2021-04-20 | D | Client Review | V. Zacharia | S. McMillan | M. Griffin | Not Required |
| DATE YYYY-MM-DD | REV. | STATUS | PREPARED BY | CHECKED BY | APPROVED BY | APPROVED BY |
| HATCH | | | | | | Client |

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# Executive Summary

## Study Background

Hatch was retained by Canadian Pacific Railway (CP) to provide a Transportation Impact Study (TIS) for the proposed Canadian Pacific Logistics Park: Vancouver (CPLPV), a multi-commodity transload facility in the City of Pitt Meadows, British Columbia. The CPLPV is to be located on the vacant lands immediately south of the CP Rail Mainline on the Cascade Subdivision at Mile 109 (approximately) and the existing CP Vancouver Intermodal Facility (VIF).

The CPLPV will receive shipments of agricultural products, automobiles, and liquids via rail and transfer these products to containers (agricultural products) for international export, or directly to trucks (automobiles and liquids) for distribution to the local market. Containers with agricultural products will be transported to the CP VIF by truck, and then to ocean terminals via rail for export. The CPLPV can be accessed through Kennedy Road from Lougheed Highway in the north. A new road will be built connecting the CPLPV to Kennedy Road. The new road is anticipated to ultimately form part of the proposed Kennedy McTavish Connector. A three-leg stop controlled intersection will be created at the intersection of the Kennedy Road bend and the new road, approximately 300 metres south of the Kennedy Road rail crossing. Access to the CPLPV will be provided through a new three-legged intersection. An Auto Satellite Lot will be located on the west side of the new intersection while the Agricultural Product Transload Site, Auto Transload Site and the Liquid Transload Site can be accessed through the east leg. The development is expected to be open in 2028 pending a final investment decision by CP, and approval by the Canadian Transportation Agency. The CPLPV is expected to achieve maximum productivity, two years after opening, in 2030.

The purpose of the TIS is to:

- Determine the anticipated impact for the construction of the site preload program on the surrounding road network during the latest year of the preload program (2025).
- Determine the anticipated net impact of the CPLPV on the surrounding road network during the full build-out year (2030) and ten years after full build out (2040).
- Identify and assess remedial measures to reduce the impact on vehicular movement.

This TIS examines the effects of the CPLPV on the local road network. Transportation analysis was undertaken for the existing year (2020), site preload program year (2025), full build-out year (2030) and ten years after full build out (2040). The transportation impacts of the CPLPV for the horizon years were assessed by comparing the traffic operations of the road network with background growth, with the traffic operations of the road network with background growth and the CPLPV. The TIS assessed the following scenarios:

- Existing Conditions: 2020 A.M. and P.M. Peak Hour
- Site Preload Program Year Background Conditions: 2025 A.M. and P.M. Peak Hour with Background Traffic Growth
- Full Build-Out Year Background Conditions: 2030 A.M. and P.M. Peak Hour with Background Traffic Growth
- 10-Year Horizon Year Background Conditions: 2040 A.M. and P.M. Peak Hour with Background Traffic Growth
- Site Preload Program Year Construction Conditions: 2025 A.M. and P.M. Peak Hour with Background Traffic Growth and Construction Traffic
- Full Build-Out Year with CPLPV Conditions: 2030 A.M. and P.M. Peak Hour with Background Traffic Growth and the CPLPV
- 10-Year Horizon Year with CPLPV Conditions: 2040 A.M. and P.M. Peak Hour with Background Traffic Growth and the CPLPV

The study area for the TIS is shown in Figure ES- 1.

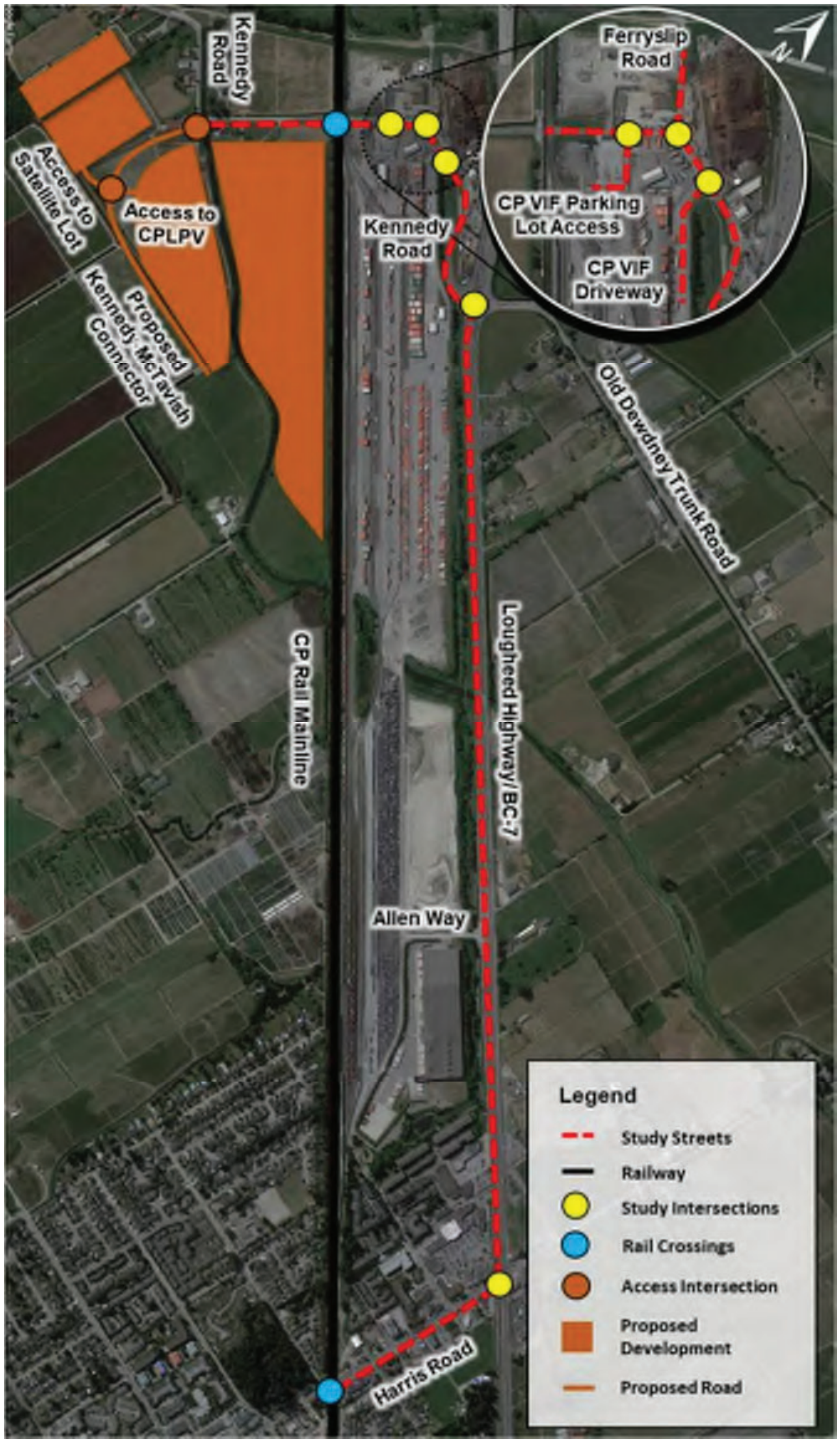



**Figure ES- 1: Study Area**

## Existing Transportation Conditions

The existing road network within the study area is comprised of arterial, collector and local roads. The classifications (City of Pitt Meadows, 2014) and speed limits of the key streets within the study area are summarized in Table ES-1.

Should note if these are TransLink MRN roads and if they are designated truck routes.

**Table ES-1: The Existing Transportation Network**

| Road | Primary Direction | Classification | Speed Limit |
|---|---|---|---|
| Lougheed Highway | East-West | Provincial Highway | 80 km/hr |
| Harris Road | North-South | Arterial Road | 50 km/hr |
| Kennedy Road | North-South | Collector Road | 30/50 km/hr[1] |
| Old Dewdney Trunk Road | East-West | Major Road | 50 km/hr |
| Ferryslip Road | East-West | Local Road | No posted SL |
| CP VIF Driveway | East-West | Local Road | No posted SL |
| CP VIF Parking Lot | East-West | Access Road[2] | No posted SL |

[1] The posted speed limit of the road is generally 50 km/hr except at both approaches to the railway crossing where warning speed limit signs of 30 km/hr are present.
[2] Road is not identified on the City of Pitt Meadows Transportation Master Plan (2014)

For MoTI intersections, LOS threshold is LOS D for highway movements.

### Intersection Capacity Analysis

Intersection operations and capacity analysis was undertaken using existing traffic volumes and road network configuration. For this analysis, critical intersections were identified when the overall volume to capacity (v/c) ratio exceeds 0.85 or has a Level of Service (LOS) of E or F. The intersections analyzed for this study include the signalized intersections of Lougheed Highway with Kennedy Road/Old Dewdney Trunk Road and Harris Road, and the unsignalized intersections along Kennedy Road.

The existing vehicle volumes in the road network are high, with intersections along Lougheed Highway operating with delays and with multiple critical movements during the weekday A.M. and P.M. peak hours. The unsignalized intersections on Kennedy Road were not found to have any critical movements under existing conditions.

### Impact of existing traffic on the Kennedy Road railway crossing

The Kennedy Road at-grade railway crossing is signed and has flashing lights, and a crossing gate. Signage in advance of both the approaches posts a warning speed reduction to 30 km/h in the vicinity of the crossing. There was observed to be an average of 36 freight trains and 9 passenger trains on a typical weekday (Bunt & Associates, 2020). An average maximum frequency of 5 events per hour was observed during the A.M. peak hour and 3 events per hour was observed during the P.M. peak hour.

The existing traffic is anticipated to cause short queues in the northbound and southbound direction of the railway crossing with no accesses on Kennedy Road expected to be impacted during a short duration rail event of 5 minutes or less. Long-duration rail events are expected to impact a few of the unsignalized intersections along Kennedy Road.

Peak direction only

**Transit Services**

Local transit service operates in the study area with frequent service provided. Bus routes operated by TransLink run along Lougheed Highway and Harris Road. The TransLink routes include Route 701, Route 791, Route 722 and the R3 Lougheed Highway RapidBus. The West Coast Express train service operates in the study area providing service between Downtown Vancouver and the Municipality of Mission via the CP Rail Mainline. The existing transit routes serving stops in the study area are illustrated in Figure ES-2.

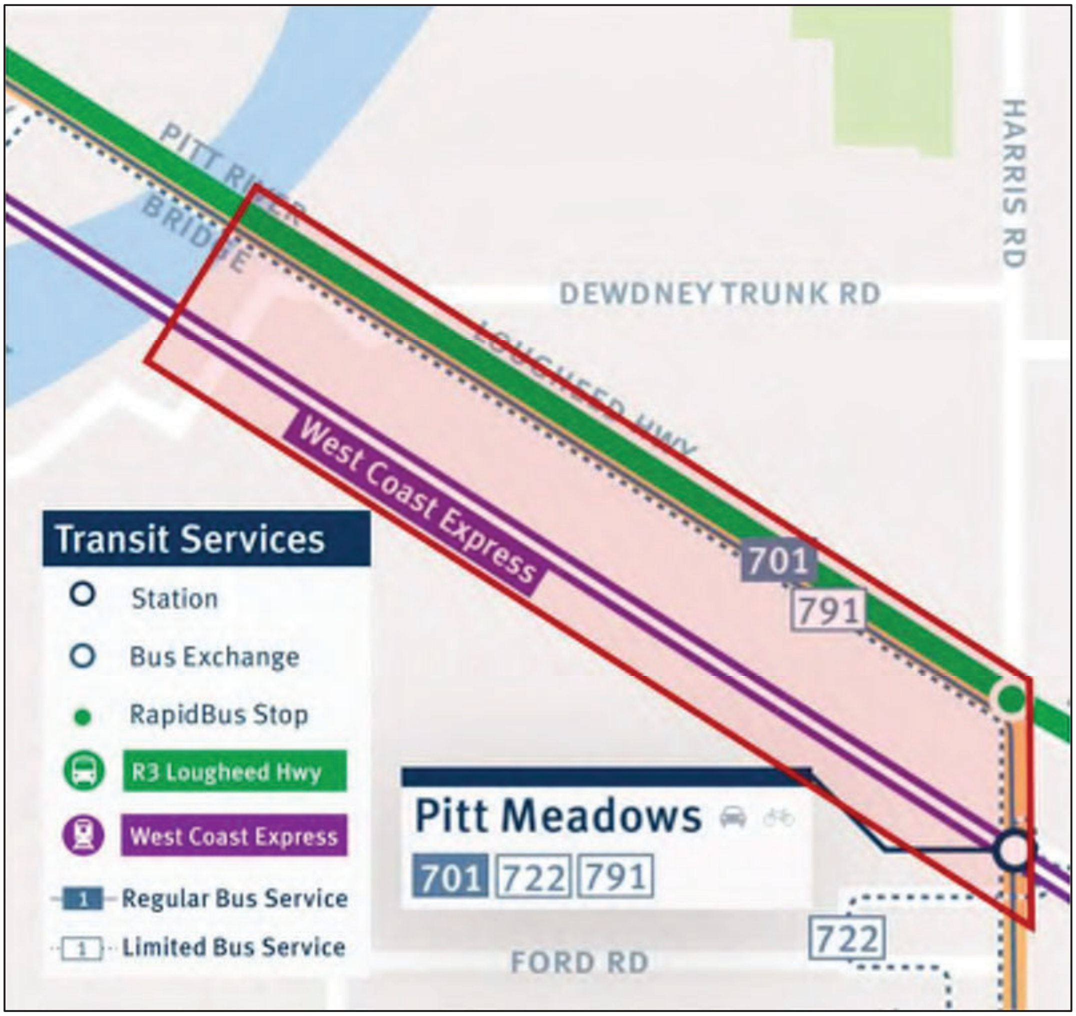



**Figure ES-2: Existing Transit Services in the Study Area (TransLink, 2020)**

**Active Transportation Services**

The road network in the study area provides active transportation facilities through a provision of a paved multi-use trail on Lougheed Highway and on Kennedy Road between Lougheed Highway and the CP VIF Driveway. A pedestrian/cyclist crossing is provided on Kennedy Road which connects the paved-multi use trail along Kennedy Road with the shared bike lane on Ferryslip Road. The shared bike lane on Ferryslip Road connects cyclists to the TransCanada Trail which runs along the shoreline of the Pitt River. The existing cycling network and corresponding infrastructure in the study area are shown in Figure ES-3.

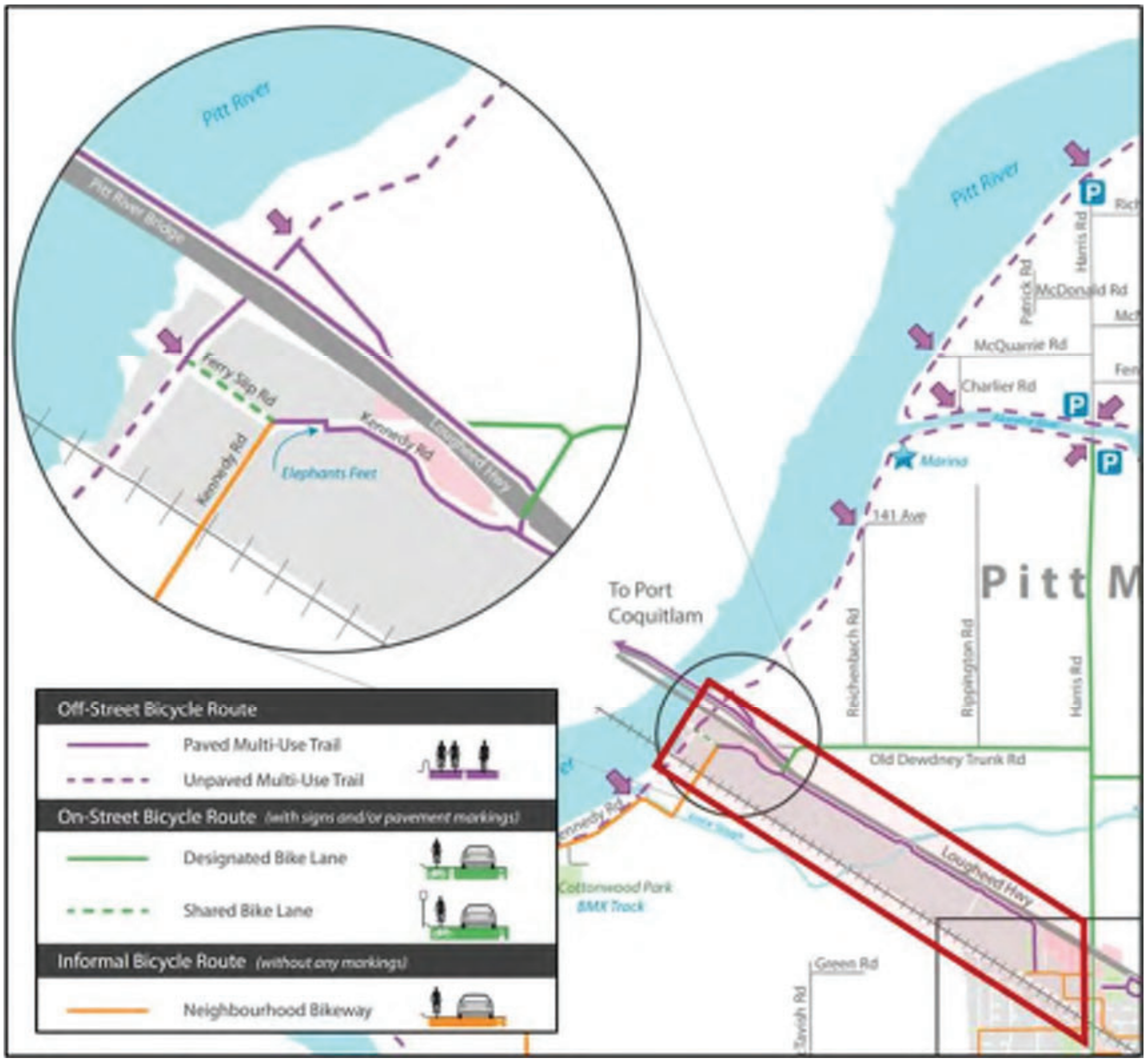



**Figure ES-3: Existing and Proposed Cycling Network (City of Pitt Meadows, 2013)**

NLC and Kennedy-McTavish Connector will have impacts on the results of this TIS. Sensitivity analysis should be included.

## Background Future Conditions

### Road network upgrades

The City of Pitt Meadows TMP (Transportation Master Plan) has identified the following road network improvement strategies to alleviate the existing and future network issues (City of Pitt Meadows, 2014):

- A potential future roadway connector between Pitt Meadows and Golden Ears Way in Maple Ridge termed the North Lougheed Connector.
- A traffic calming plan for Old Dewdney Trunk Road.
- A proposed two-lane road connecting Kennedy Road to Ford Road, termed the Kennedy-McTavish Connector.
- Identifying improvement strategies to mitigate congestion and delay for the Lougheed Highway intersections with Kennedy Road/Old Dewdney Trunk Road and Harris Road through coordination between the City of Pitt Meadows and the province (BC MOTI).

The timelines for the implementation of the various road network improvement strategies by the City of Pitt Meadows have not been confirmed. Due to the uncertainty in the timelines, the future background conditions were analyzed without these improvements. The proposed strategies are illustrated in Figure ES-4.

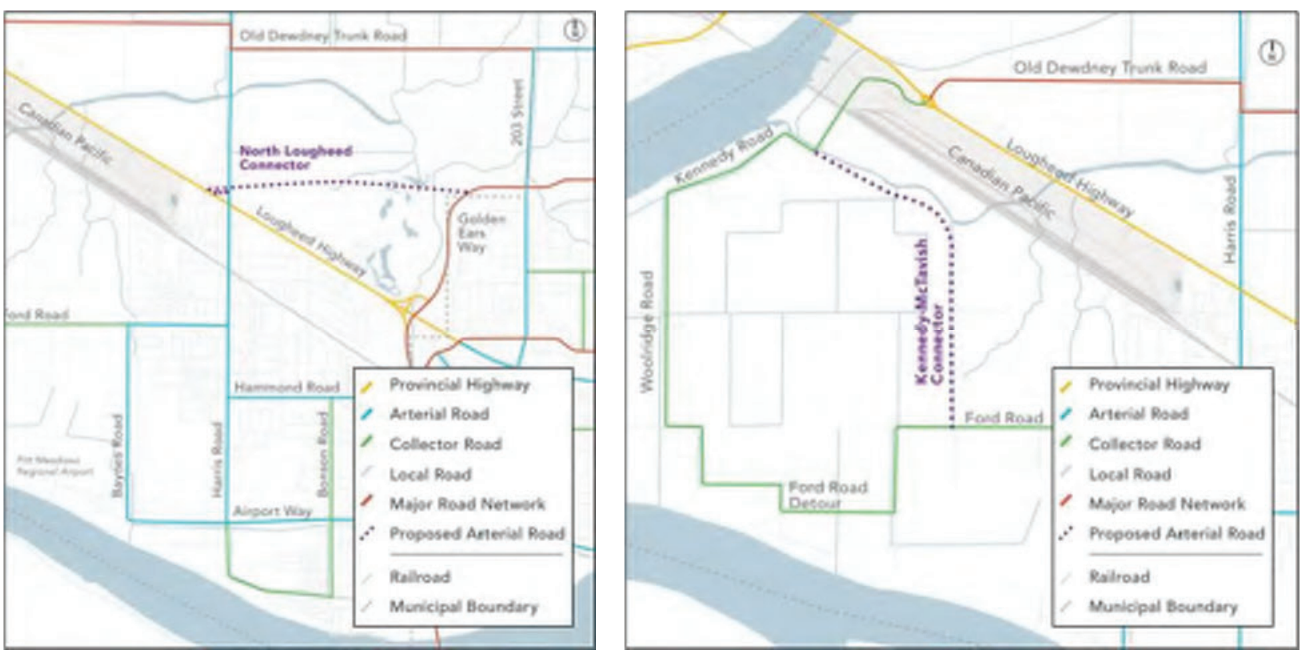



**Figure ES-4: Proposed Road Network Improvements (City of Pitt Meadows, 2014)**

In addition to the above road network upgrade strategies put forth by the City of Pitt Meadows, the Vancouver Fraser Port Authority (VFPA) is undertaking the Pitt Meadows Road and Rail Improvements Project (PMRRIP) as part of the Greater Vancouver Gateway 2030 Program. The project includes the following upgrades:

- Construction of a two-lane overpass above the CP Rail Mainline crossing Kennedy Road (led by VFPA).
- Construction of a four-lane underpass beneath the CP Rail Mainline crossing Harris Road (led by VFPA).
- Construction of an extension of one of CP's existing rail tracks, currently serving the VIF (led by CP).

The timeline for the construction of the Kennedy Road Overpass is unclear. The Kennedy Road Overpass is not expected to be completed prior to the site preload program, and hence, was not incorporated in the analysis of the 2025 site program year. The Kennedy Road Overpass and the Harris Road Underpass were assumed to be completed prior to the implementation of the CPLPV and thus, was incorporated in the traffic analysis for the 2030 full build-out year and the 2040 planning horizon. A sensitivity analysis was also conducted to assess the impact of the CPLPV on the Kennedy Road at-grade crossing in the 2040 planning horizon in the event that the implementation of the Kennedy Road Overpass is delayed. A summary of the project goals are illustrated in Figure ES-5.

Locations or extents?

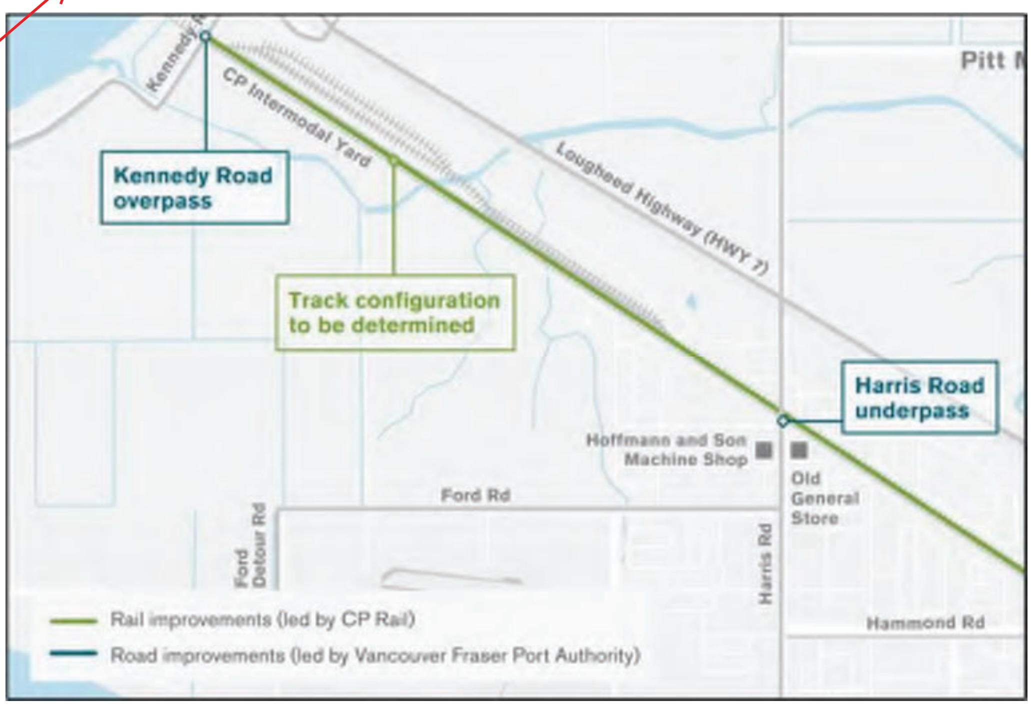



**Figure ES-5: Pitt Meadows Road and Rail Improvements Project Summary (Vancouver Fraser Port Authority, 2020)**

NLAP will add EB/WB trips to Hwy 7, so the TIS is likely under-representing trips.

**Future Developments**

The following developments have been identified in the study area:

- Golden Ears Business Park (GEBP): The GEBP development is located west of Golden Ears Bridge and east of Pitt Meadows Regional Airport. For the purposes of this analysis, this development was incorporated in the traffic analysis of the future background conditions.
- North Lougheed Area Plan (NLAP): The NLAP is a proposed development plan that combines both land use planning and development policies for the North Lougheed Area, located on the north side of Lougheed Highway between Harris Road and Meadows Gardens Gold Course. The proposed plan features a combination of medium and high-density residential options, employment lands, as well as a strip of mixed-use commercial and residential lands along Lougheed Highway and Harris Road. As no proposed developments are publicly available at the time of writing this report, additional trips generated from the NLAP were not considered in the analysis of the future background conditions.

**Background Traffic Growth**

A traffic growth rate of one percent per annum for all movements was used for the purposes of this analysis. The traffic volumes for the site preload program year (2025), full build-out year (2030) and the planning horizon (2040) were estimated using a one percent growth per annum in addition to the site trips estimated by the GEBP.

What is the basis for this? Historical growth on Pitt River Bridge is only 0.4% between 2015 and 2019 and constrained by the Lougheed/ODTR signalized intersection.

**Intersection Capacity Analysis**

As the movements on the Lougheed Highway intersections are already operating over or near capacity under existing conditions, increases in background traffic volumes will cause operations at these intersections to worsen in the horizon years. The unsignalized intersections along Kennedy Road are not anticipated to have any critical movements in the background future conditions.

**Impact of future background traffic on the Kennedy Road railway crossing**

The background traffic is anticipated to cause short queues in the northbound and southbound direction of the railway crossing with no accesses on Kennedy Road expected to be impacted during a short duration rail event of 5 minutes or less. Long-duration rail events are expected to impact a few of the unsignalized intersections along Kennedy Road.

**Active Transportation Upgrades**

The City of Pitt Meadows Pedestrian and Cycling Master Plan (City of Pitt Meadows, 2012) has identified improvements to the intersection of Lougheed Highway and Harris Road. The timeline for these improvements to the active transportation network within the study area is unclear at the time of this analysis and were not considered in the analysis of the future background conditions.

**Transit Upgrades**

The City of Pitt Meadows TMP has identified strategies to enhance bus service and frequency, improve regional connections and improve customer experience.

Was this considered in the mode share analysis?

## Site Preload Program Impact Assessment

The site preload program is anticipated to generate a total of approximately 56 bi-directional trips (100 percent truck trips) in the A.M. peak hour and the P.M. peak hour. The trips are expected to be distributed along Lougheed Highway, Old Dewdney Trunk Road and Kennedy Road.

**Impact Assessment on road network**

It was found that additional traffic from the site preload program has a small effect on the local road network. The signalized intersections on Lougheed Highway in the study area perform almost identically to the background conditions and no additional critical movements have been identified following the addition of the truck traffic. In addition, the unsignalized intersections along Kennedy Road are not anticipated to have any critical movements during the site preload program.

The site preload program is expected to increase the queue length on the westbound left turn movement at the intersection of Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road. The westbound left turn movement has a storage length of 105 metres with a taper length of 55 metres. Based on the optimized signal timing assumed for this intersection, the 95$^{th}$ percentile queue length for this movement is expected to be approximately 145 metres during the A.M. peak hour and approximately 100 metres during the P.M. peak hour. Hence, the queues are expected to be accommodated within the taper length.

**Impact Assessment on staging access**

The staging accesses are to be located on Kennedy Road, south of the rail crossing. The staging access along Kennedy Road is anticipated to operate at LOS B or better during the site preload program assuming a stop sign is placed at the access approach for trucks exiting the staging area. Queuing is expected to be minimal at all approaches to the staging access intersection.

**Impact Assessment on Kennedy Road railway crossing**

The Kennedy Road Overpass is not expected to be completed prior to the site preload program. In addition, it is assumed that the construction of the Kennedy Road Overpass will not coincide with the site preload program. The additional traffic is estimated to contribute approximately 35 percent of the total traffic on the Kennedy Road railway crossing during the A.M. peak hour and 25 percent during the P.M. peak hour. The addition of site traffic is anticipated to cause increased queues in the northbound and southbound direction of the railway crossing during a rail event. Long-duration rail events are expected to impact a few of the unsignalized intersections along Kennedy Road.

**Active Transportation Impact Assessment**

There are expected to be minimal impacts on pedestrians and transit trips since facilities for these modes of trips are not provided on this section of the road. However, Kennedy Road, south of Ferryslip Road, is classified as a neighbourhood bikeway where cyclists are expected to share the road with traffic. The increased number of trucks may cause cyclist discomfort on Kennedy Road. The increased number of trucks are not expected to trigger upgrades at the pedestrian and cycling midblock crossing on Kennedy Road between the CP VIF Driveway and Ferryslip Road.

## CPLPV Impact Assessment

The CPLPV is anticipated to generate a total of approximately 180 bi-directional trips (41 percent truck trips) in the A.M. peak hour and 155 bi-directional trips (31 percent truck trips) in the P.M. peak hour. The trips are expected to be distributed along Lougheed Highway and Kennedy Road.

### Impact Assessment on road network

It was found that site-generated traffic has a small effect on the local road network after accounting for future background traffic growth that will occur in conjunction with and subsequent to site development. The signalized intersections on Lougheed Highway in the study area perform almost identically to the background conditions and no additional critical movements have been identified following the addition of the site traffic. In addition, the unsignalized intersections along Kennedy Road are not anticipated to have any critical movements after the CPLPV development is completed.

The CPLPV is expected to increase the queue length on the westbound left turn movement at the intersection of Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road. The westbound left turn movement has a storage length of 105 metres with a taper length of 55 metres. Based on the optimized signal timing assumed for this intersection, the 95$^{th}$ percentile queue length for this movement is expected to be approximately 150 metres during he A.M. peak hour and approximately 115 metres during the P.M. peak hour. Hence, the queues are expected to be accommodated within the taper length.

### Impact Assessment on access intersections

which leg(s) is stop controlled? 3-way stop proposed?

The CPLPV will lead to the creation of a three-legged stop-controlled intersection at the intersection of the Kennedy Road bend and the southward extension of Kennedy Road, approximately 300 metres south of the Kennedy Road rail crossing. Access to the site will be provided through a new stop-controlled three-legged intersection. Signalization of the CP Logistics Park access intersection is not warranted for both the 2030 full build-out year and 2040 horizon year. However, the warrants for signalization should be re-assessed if the Kennedy-McTavish Connector is to be constructed in the future.

### Impact Assessment on Kennedy Road railway crossing

The site traffic is estimated to contribute approximately 60 percent of the total traffic on the Kennedy Road railway crossing during the A.M. peak hour and 45 percent during the P.M. peak hour. The Kennedy Road Overpass is expected to be completed prior to full build-out year. A sensitivity analysis was conducted to assess the impact of the CPLPV on the Kennedy Road at-grade crossing in the 2040 planning horizon in the event that the implementation of the Kennedy Road Overpass is delayed. In this scenario, the addition of site traffic is anticipated to cause increased queues in the northbound and southbound direction of the railway crossing during a rail event. Long-duration rail events are expected to impact a few of the unsignalized intersections along Kennedy Road, with significant queuing expected in the northbound direction.

A sensitivity analysis should have been completed as part of this report

**Active Transportation Impact Assessment**

The CPLPV will not provide active transportation facilities as part of the internal road network due to the industrial nature of the site and the absence of direct active transportation connections to the local road network surrounding the facility. It is expected that there will be minimal pedestrian, cyclists and transit trips generated by the development due to the lack of a direct pedestrian and safe cyclist connection to the facility. The site-generated traffic volumes are not expected to trigger upgrades at the pedestrian and cycling midblock crossing on Kennedy Road.

This TIS should provide a recommendation on a timing plan that could be used. Analysis should be completed to determine if LOS for the other movements is compromised.

## Mitigation

### Site Preload Program

The following mitigation measure should be considered for the site preload program:

- The queue length for the westbound left turn movement at the intersection of Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road is very sensitive to the green time provided for this movement. It is recommended that the queue lengths be monitored and signal timings be adjusted if queueing exceeds storage length during the site preload program.

### CPLPV Full-build out

The following mitigation measure should be considered following the completion of the CPLPV:

- The queue length for the westbound left turn movement at the intersection of Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road is very sensitive to the green time provided for this movement. It is recommended that the queue lengths be monitored and signal timings be adjusted if queueing exceeds storage length.

Consideration should be given for the following mitigation measures to alleviate impacts to active transportation following the completion of the CPLPV:

- A review of Kennedy Road, south of Ferryslip Road, should be conducted by the City of Pitt Meadows to verify if the road should be classified as a neighbourhood bikeway after the full build-out of the facility.
- The midblock pedestrian and cyclist crossing on Kennedy Road should be monitored closely so that appropriate and timely mitigation measures (ensuring adequate illumination is provided, faded pavement markings are painted, upgrading the type of crossing treatment etc) can be developed.
- An additional 'Crosswalk Ahead Warning Sign' (W-129-2 and W-129-T) should be provided on the northbound approach at a distance of approximately 70 metres from the midblock crossing on Kennedy Road to enhance visibility of the crossing (BC Ministry of Transportation and Infrastructure, 2021).

CoPM has designated Kennedy Road a neighbourhood bikeway already. This TIS should provide recommendations based on the impacts the proposed development will have

# 1. Introduction

## 1.1 Purpose

Hatch was retained by the Canadian Pacific Railway (CP) to provide a Transportation Impact Study (TIS) for the proposed Canadian Pacific Logistics Park: Vancouver (CPLPV), a multi-commodity transload facility in the City of Pitt Meadows, British Columbia. The CPLPV is to be located on the vacant lands immediately south of the CP Rail Mainline on the Cascade Subdivision at Mile 109 (approximately) and the existing CP Vancouver Intermodal Facility (VIF) as illustrated in Figure 1-1.

The CPLPV will receive shipments of agricultural products, automobiles, and liquids via rail and transfer these products to containers (agricultural products) for international export, or directly to trucks (autos and liquids) for distribution to the local market. The containers with agricultural products will be transported to the CP VIF by truck, and then to ocean terminals, via rail, for export. The CPLPV will be accessible through a proposed private access road from Kennedy Road. The proposed layout for site access is shown in Appendix A. The development is expected to be open in 2028, pending a final investment decision by CP, and approval by the Canadian Transportation Agency. The CPLPV is expected to achieve maximum productivity, two years after opening, in 2030.

The purpose of the TIS is to:

- Determine the anticipated impact for the construction of the site preload program on the surrounding road network during the latest year of the preload program (2025).
- Determine the anticipated net impact of the CPLPV on the surrounding road network during the full build-out year (2030) and ten years after full build out (2040).
- Identify and assess remedial measures to reduce the impact on vehicular movement.

## 1.2 Study Area

The site location and study roads are shown in Figure 1-1. The study area road network considered in this TIS include Lougheed Highway in the north, Harris Road in the east, and Kennedy Road in the west. The roads for the TIS were selected considering the potential effects to the road network incurred as a result of traffic generated by the site preload program and the CPLPV.

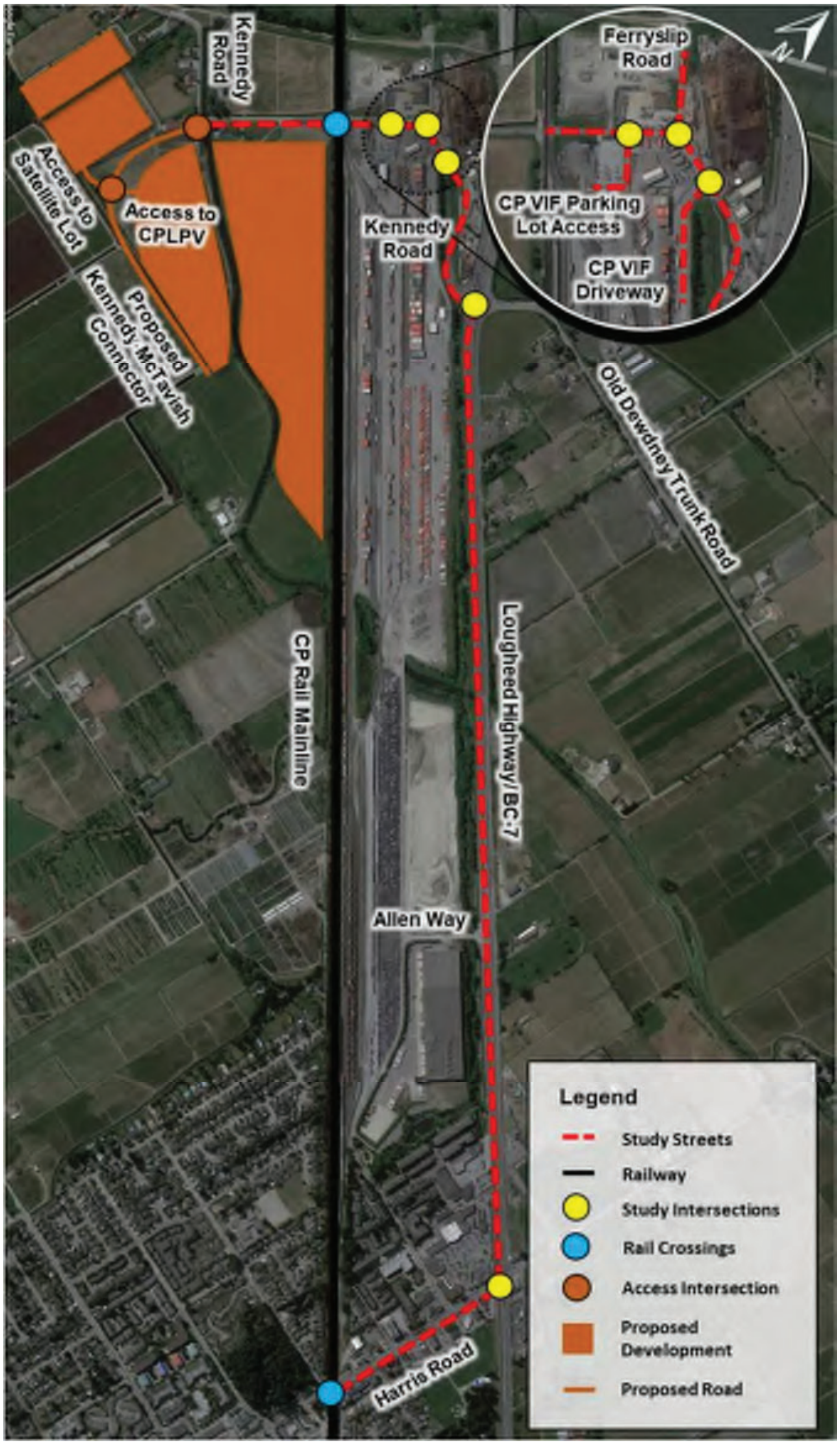



**Figure 1-1: Study Area**

## 1.3 Methodology

The existing traffic operations were characterized in the weekday morning (A.M.) and afternoon (P.M.) peak hours using hourly traffic volume data and traffic control information at each intersection in the study area. The A.M. and P.M. peak hours are generally the time periods during which the highest traffic volumes occur on a road network and are a 'worst case' for analysis purposes. The traffic conditions in the horizon years were investigated by accounting for projected traffic growth in the area.

Transportation analysis was undertaken for the existing year (2020), site preload program year (2025), full build-out year (2030) and ten years after full build out (2040). The transportation impacts of the CPLPV for the horizon years were assessed by comparing the traffic operations of the road network with background growth, with the traffic operations of the road network with background growth and the CPLPV. The TIS assessed the following scenarios:

- Existing Conditions: 2020 A.M. and P.M. Peak Hour
- Site Preload Program Year Background Conditions: 2025 A.M. and P.M. Peak Hour with Background Traffic Growth
- Full Build-Out Year Background Conditions: 2030 A.M. and P.M. Peak Hour with Background Traffic Growth
- 10-Year Horizon Year Background Conditions: 2040 A.M. and P.M. Peak Hour with Background Traffic Growth
- Site Preload Program Year Construction Conditions: 2025 A.M. and P.M. Peak Hour with Background Traffic Growth and Construction Traffic
- Full Build-Out Year Total Conditions: 2030 A.M. and P.M. Peak Hour with Background Traffic Growth and the CPLPV
- 10-Year Horizon Year Background Conditions: 2040 A.M. and P.M. Peak Hour with Background Traffic Growth and the CPLPV.

For the study area intersections, a capacity and Level of Service (LOS) operational analysis was completed using Synchro 10 traffic analysis software which implements methodologies defined in the Highway Capacity Manual (HCM 2000) (Transportation Research Board, 2010). Capacity is assessed based on the volume-to-capacity (v/c) ratio, which is the ratio of demand flow rate to the available capacity at the intersection. The v/c ratio provides an estimate of capacity sufficiency based on the specific geometry and control design of an intersection. A v/c ratio equal to or greater than 1.0 indicates that a lane group, an approach or the overall intersection is operating at effective capacity and that congestion is present.

Operations are defined by the concept of LOS, which is a key measure of effectiveness for both signalized and unsignalized intersections and is based on the average stopped delay per vehicle, in seconds. It is a qualitative measure of the intersection's (or individual movement's) ability to accommodate traffic volumes. There are six levels of service defined with LOS A to LOS D representing satisfactory traffic operations, and LOS E and LOS F representing congested traffic operations. For signalized and all-way stop-controlled intersections, the LOS is presented. For unsignalized intersections that are not all-way stop-controlled, all movements are considered on an individual basis. The LOS criteria as defined in the HCM are summarized in Table 1-1.

**Table 1-1: Level of Service Definitions**

| Level of Service | Signalized Intersection Control Delay per Vehicle (seconds/vehicle) | Unsignalized Intersection Control Delay per Vehicle (seconds/vehicle) |
|---|---|---|
| A (FREE FLOW) | ≤ 10 | ≤ 10 |
| B | > 10 and ≤ 20 | > 10 and ≤ 15 |
| C | > 20 and ≤ 35 | > 15 and ≤ 25 |
| D | > 35 and ≤ 55 | > 25 and ≤ 35 |
| E (CAPACITY) | > 55 and ≤ 80 | > 35 and ≤ 50 |
| F (FORCED FLOW) | > 80 | > 50 |

Currently, the City of Pitt Meadows does not have publicly available guidelines and standards for undertaking transportation impact studies, however, the British Columbia Ministry of Transportation and Infrastructure (BC MOTI) presents the following criteria for “critical” intersections or turning movements (BC Ministry of Transportation and Infrastructure, 2006):

- Intersections are “critical” when the overall v/c exceeds 0.85 or LOS D in urban areas and v/c 0.80 for suburban and rural areas
- Individual movements are “critical” when the v/c ratio exceeds 0.90 in urban areas and 0.80 in suburban or rural areas.

For the purposes of this analysis, the study intersections were assumed to be in urban areas, and hence, critical intersections were identified when the overall v/c exceeds 0.85 or LOS D and critical movements were identified when the v/c ratio exceeds 0.90. It is also common industry practice to consider turning movements operating at LOS E or F to be critical, although this is not required as per the above-mentioned guidelines.

Need a section on trucks given that Lougheed is a provincial highway/truck route and this site is a goods movement hub.

# 2. Existing Conditions (2020)

This section summarizes the existing transportation system in the vicinity of the CPLPV, including parts of the City of Pitt Meadows and BC MOTI's road network, and numerous transit and active transportation facilities. The existing transportation facilities within the study area were identified to inform the analysis of potential impacts following full build-out.

## 2.1 Traffic Conditions

### *2.1.1 Existing Road Network*

The existing road network within the study area is comprised of arterial, collector and local roads. The classifications (City of Pitt Meadows, 2014) and speed limits of the key streets within the study area are summarized in Table 2-1.

**Table 2-1: The Existing Transportation Network**

| Road | Primary Direction | Classification | Speed Limit |
|---|---|---|---|
| Lougheed Highway | East-West | Provincial Highway | 80 km/hr |
| Harris Road | North-South | Arterial Road | 50 km/hr |
| Kennedy Road | North-South | Collector Road | 30/50 km/hr[1] |
| Old Dewdney Trunk Road | East-West | Major Road Network | 50 km/hr |
| Ferryslip Road | East-West | Local Road | No posted SL |
| CP VIF Driveway | East-West | Local Road | No posted SL |
| CP VIF Parking Lot Access | East-West | Access Road[2] | No posted SL |

1. The posted speed limit of the road is generally 50 km/hr except at both approaches to the railway crossing where warning speed limit signs of 30 km/hr are present.
2. Road is not identified on the City of Pitt Meadows Transportation Master Plan (2014)

The existing conditions of the key roads in the study area are described in the following sections.

#### *2.1.1.1 Lougheed Highway*

Lougheed Highway is a provincial highway that runs in the east-west direction within the study area and consists of three lanes in each direction with shoulders on both sides of the road. The highway has a rural cross section without curb and gutter except near Harris Road, where the highway has an urban cross section. A multi-use path is provided on the north side of the road west of Old Dewdney Trunk Road and on the south side of the road from Kennedy Road to west of Harris Road. A curbside lane in the westbound direction designates travel for buses and Higher Occupancy Vehicles (HOV) during the A.M. and P.M. peak period on weekdays from the Golden Ears Highway to east of Kennedy Road/Old Dewdney Trunk Road. An additional bus lane is also provided on the eastbound and westbound approaches to the intersection of Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road. The posted speed limit in the study area is 80 km/hr between Kennedy Road and Harris Road.

Lands to the north of Lougheed Highway are primarily agricultural in nature, while the lands south of Lougheed Highway are comprised of mixed land uses including industrial, commercial, and residential. On-street parking is not permitted at any time along Lougheed Highway in the study area.

#### 2.1.1.2 *Harris Road*

Harris Road runs in the north-south direction and consists of two lanes in each direction south of Lougheed Highway and one lane in each direction north of Lougheed Highway. South of Lougheed Highway, the roadway has an urban cross section with curb and gutter with sidewalks and in-boulevard bicycle lanes provided along both sides of the road. The speed limit is 50 km/hr, except in school zones where the speed limit is reduced to 30 km/hr. Limited use of heavy vehicles are permitted on Harris Road.

The CP Rail Mainline crosses Harris Road at grade between Advent Road and Davison Road. The adjacent land use along Harris Road is primarily commercial and residential in nature. Accesses to several commercial and residential properties are provided along the roadway. On-street parking is permitted between the at-grade rail crossing and Davison Road on the east side of the road.

#### 2.1.1.3 *Kennedy Road*

Kennedy Road primarily runs in a north-south direction and consists of one lane in each direction. The roadway has a rural cross section without curbs and gutter. A multi-use path is provided on the east side of Kennedy Road between Lougheed Highway and the CP VIF Driveway. A pedestrian/bicycle crossing is provided on Kennedy Road between the CP VIF Driveway and Ferryslip Road which connects the multi-use path on the east side of Kennedy Road to the Trans-Canada Trail to the west of Kennedy Road. The speed limit is 50 km/hr except at both approaches to the railway crossing where warning speed limit signs of 30 km/hr are present.

The CP Rail Mainline crosses Kennedy Road at grade just south of the CP VIF Parking Lot. Lands adjacent to Kennedy Road are primarily industrial in nature, when approaching Lougheed Highway. On-street parking is not permitted at any time along Kennedy Street in the study area.

#### 2.1.1.4 *Old Dewdney Trunk Road*

Old Dewdney Trunk Road primarily runs in the east-west direction and consists of one lane in each direction. The roadway has a rural cross section without curbs and gutter. No sidewalks are present on either side of the roadway, however, signed bicycle routes run along both sides of the road. The posted speed limit is generally 60 km/hr except near Lougheed Highway where it reduces to 50 km/hr in the westbound direction.

The surrounding land use is primarily agricultural in nature with portions of land being greenfield space. On-street parking is not permitted at any time on this section of roadway.

Historical growth on Pitt River Bridge is only 0.4% between 2015 and 2019 and constrained by the Lougheed/ODTR signalized intersection.

### 2.1.2 Existing Traffic Operations

#### 2.1.2.1 Background Traffic Growth

The available traffic data was gathered in 2019. In order to perform the analysis of existing traffic conditions in the study area, the traffic volumes were adjusted to a 2020 base year by applying an annual growth rate of one percent. The selection of the annual growth rate is further discussed in Section 3.1.1.3.

#### 2.1.2.2 Traffic Data

Turning Movement Count (TMC) data at each of the key intersections identified in the study area were obtained from the results of a traffic and rail data collection study completed by Bunt & Associates Engineering Ltd. (Bunt) in a report titled "Pitt Meadows Road and Rail Improvement Project (PMRR) Harris Road and Kennedy Road Traffic & Rail Data Collection Study" (Bunt & Associates, 2020).

The TMC data was collected over a seven-day period during the daily peak periods only. The weekday AM and PM peak hour data was averaged to obtain the traffic volumes used for this analysis.

Sketch 1 in Appendix B illustrates the existing lane configuration of the study intersections. Sketches 2, 3 and 4 in Appendix B illustrate the raw traffic volumes, truck composition and peak hour factors at the study intersections. The TMC information is summarized in Table 2-2, and included in Appendix C of this Report. It should be noted that the TMC counts were collected in 2019 which was during pre-covid conditions.

**Table 2-2: Turning Movement Count Information**

| Intersection Name | Day | Count Date | AM Peak Hour | PM Peak Hour |
|---|---|---|---|---|
| Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road | Monday – Friday | November 1 – November 7, 2019 | 7:45 AM – 8:45 AM | 4:00 PM – 5:00 PM |
| Kennedy Road and CP VIF Driveway | Monday – Friday | November 1 – November 7, 2019 | 7:45 AM – 8:45 AM | 4:00 PM – 5:00 PM |
| Lougheed Highway and Harris Road | Monday – Friday | November 15 – November 21, 2019 | 7:45 AM – 8:45 AM | 4:00 PM – 5:00 PM |

### *2.1.2.3 Assumptions and Variances*

The BC MOTI Planning and Designing Access to Developments guidelines were used to guide the TIS, where applicable (BC Ministry of Transportation and Infrastructure, 2006). The assumptions and variances from the guidelines made for this analysis include:

- TMC Data
  - The guidelines identify the need for additional traffic counts at locations where traffic counts received are more than three years old (BC Ministry of Transportation and Infrastructure, 2006). As TMC data retrieved from the Bunt report was collected within the last one year, the TMC values were utilized in the analysis.
  - Traffic counts were not available for the intersections of Kennedy Road with Ferryslip Road and the CP VIF Parking Lot. These intersections were assumed to have 10 inbound and outbound vehicles per hour which is consistent with the Kennedy Overpass traffic analysis report (Stantec Consulting Ltd., 2020a).

Counts should have been conducted at locations where data was not available. Parking lot can hold 100+ vehicles.

- Signal Timings
  - Traffic signal timing plans for the two signalized intersections in study area were not provided by the City of Pitt Meadows.
  - The amber time, all-red time, cycle length and the phase type for the intersection of Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road were taken from the Synchro worksheets provided in the Kennedy Overpass traffic analysis report (Stantec Consulting Ltd., 2020a). The split timings were optimized based on these parameters.

Signal timing plans for intersections on Hwy 7 can be obtained from MoTI and should have been considered as part of this analysis.

  - The amber time, all-red time, cycle length and the phase type for the intersection of Lougheed Highway and Harris Road were taken from the Synchro worksheets provided in the Harris Underpass traffic analysis report (Stantec Consulting Ltd., 2020b). The split timings were optimized based on these parameters.
- Saturation Flow Rate
  - No saturation flow rate was provided by the BC MOTI Planning and Designing Access to Developments guidelines, thus, a default ideal saturation flow rate of 1,900 passenger cars per hour of green per lane (pcphgpl) was used for all movements within the study area. This assumption is consistent with the ideal saturation flow rates used in the traffic analysis reports conducted for the Harris Underpass and Kennedy Overpass studies.
- Peak Hour Factor (PHF)
  - The PHF's for the study intersections were calculated using the available count data from the Bunt Report.
  - An overall intersection PHF of 1.0 for the intersections of Lougheed Highway with Kennedy Road/Old Dewdney Trunk Road and Harris Road was used due to the poor

Typically, a default PHF of 0.92 would be used if it is not known. Traffic data in the appendix shows actual PHFs - these should be used for analysis.

Bus schedules and ridership are available on TransLink's public tableau: https://public.tableau.com/app/profile/translink/viz/2019TSPR-BusSeaBusSummaries/TheWorkbook

operations of these intersections under existing conditions as discussed in Section 2.1.2.4.

- Lane Widths
  - Actual lane widths are unknown. Default values of 3.7 metres were used for all movements.
- Bus/HOV Lanes
  - A curbside bus lane is provided on the eastbound and westbound approaches to the intersection of Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road. Since bus occupancy on Lougheed Highway was not available, the impact of this lane to traffic operations was ignored.
  - A curbside bus and HOV lane (applicable during the A.M. and P.M. peak period on Monday to Friday only) is provided on the westbound approach to the intersection of Lougheed Highway and Harris Road. Since lane utilization of this lane was not available, the impact of this type of lane upon traffic operations was ignored.
  - The northbound approach of the intersection of Lougheed Highway and Harris Road provides two left turn lanes, a through lane and channelized right turn lane. During the A.M. and P.M. peak period on Monday to Friday, the through lane allows left turn movement for buses and HOV vehicles only. Since lane utilization of this lane was not available, the impact of this type of lane upon traffic operations was ignored.

Should be included since the R3 rapidbus was launched in Jan 2020.

Site surveys should have been conducted to estimate lane utilization. Bus schedules are available on Translink's webiste.

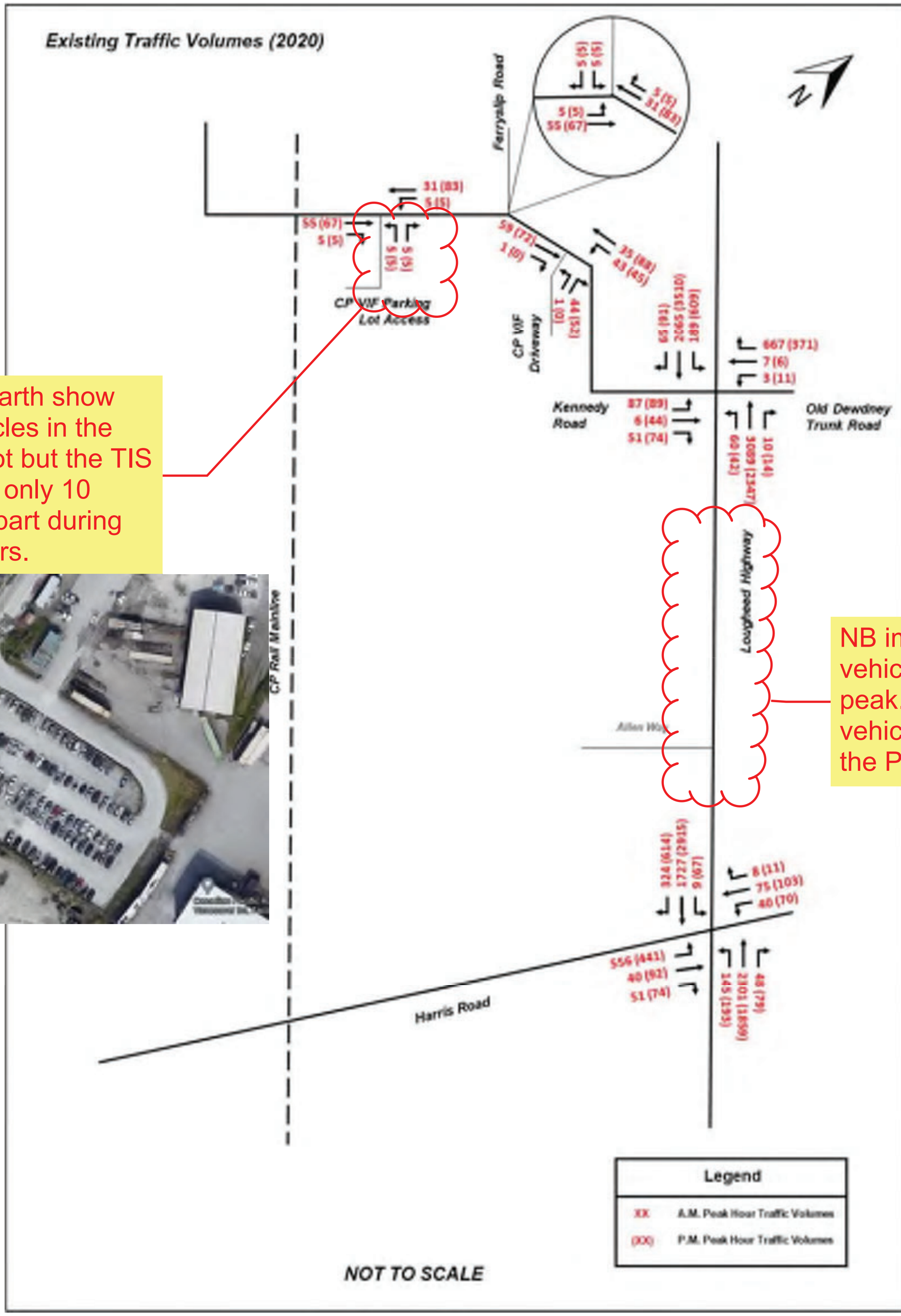
- Bus Blockage
  - Near side bus stops were analyzed for bus blockages using the A.M. and P.M. peak hour transit frequency for all routes.
- COVID-19:
  - The COVID-19 pandemic is expected to cause a reduction of traffic volumes in the study area. For the purposes of this study, the possible traffic effects have been based on pre-COVID-19 conditions.

Any commentary on potential long term effects of Covid?

### 2.1.2.4 *Traffic Operations Analysis*

Traffic volumes were reviewed for consistency and adjusted to represent a balanced road network where appropriate. The traffic volumes used for the analysis of the 2020 existing conditions are shown in Figure 2-1 and also illustrated in Sketch 5 of Appendix B.

Need to note that traffic counts represent throughput, and not necessarily demand. Where demand exceeds capacity, queues start to form.




Google earth show 80+ vehicles in the parking lot but the TIS assumes only 10 arrive/depart during peak hours.

NB imbalance of 300 vehicles in the AM peak. About 90 vehicles imbalance in the PM peak.

**Figure 2-1: Traffic Volumes for Existing Conditions (2020)**

The signalized intersections in the study area generally perform at LOS E under existing conditions during the weekday A.M. and P.M. peak hours. The following movements and intersections are identified as critical:

- Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road:
  - The eastbound left turn movement is operating with high delays during the A.M. and P.M. peak hour due to high demand for this movement. In addition, delays can be attributed to the provision of a protected phasing for this movement as vehicles must wait for the next cycle to make the left turn if they arrive immediately after the completion of the left-turn phase.
  - The eastbound through movement is operating with high delays and above capacity in the P.M. peak hour due to high demand for this movement.
  - The westbound left turn movement is operating with high delays during the A.M. and P.M. peak hour. Delays can be attributed to the provision of a protected phasing for this movement as vehicles must wait for the next cycle to make the left turn if they arrive immediately after the completion of the left-turn phase.
  - The westbound through movement is operating with high delays and above capacity in the A.M. peak hour and near capacity in the P.M. peak hour due to high demand for this movement.
  - The northbound left turn, shared through/left turn and right turn movements are operating with high delays during the A.M. and P.M. peak hour. The provision of a split phase timing causes delay for this approach as vehicles will need to wait for the next cycle if they arrive immediately after the completion of this phase.
  - The southbound shared through/left turn movement is operating with high delays during the A.M. and P.M. peak hour. The provision of a split phase timing causes delay for this approach as vehicles must wait for the next cycle if they arrive immediately after the completion of this phase.
  - The southbound right turn movement is operating with high delays and at capacity in the A.M. peak hour due to high demand for this movement. In addition, the provision of a split phase timing causes delay for this approach as vehicles must wait for the next cycle if they arrive immediately after the completion of this phase.
- Lougheed Highway and Harris Road:
  - The eastbound left turn movement is operating with high delays during the A.M. and P.M. peak hour. The delays can be attributed to the provision of a protected phasing for this movement as vehicles must wait for the next cycle to make the left turn if they arrive immediately after the completion of the left-turn phase.
  - The eastbound through movement is operating with high delays and above capacity during the P.M. peak hour due to high demand for this movement.

- The westbound left turn movement is operating with high delays during the A.M. peak hour and is operating with delay and above capacity during the P.M. peak hour due to high demand for this movement. In addition, the delay can be attributed to the provision of a protected phasing for this movement as vehicles must wait for the next cycle to make the left turn if they arrive immediately after the completion of the left-turn phase.
- The northbound left turn movement is operating with high delays during the A.M. peak hour and is operating with delay and at capacity during the P.M. peak hour due to high demand for this movement. In addition, the provision of a split phase timing causes delay for this approach as vehicles must wait for the next cycle to make the left turn if they arrive immediately after the completion of this phase.
- The northbound through and right turn movements are operating with high delays during the P.M. peak hour. The provision of a split phase timing causes delay for this approach as vehicles will need to wait for the next cycle if they arrive immediately after the completion of this phase.
- The southbound left, through and right turn movements are operating with high delays during the A.M. and P.M. peak hour. The provision of a split phase timing causes delay for this approach as vehicles will need to wait for the next cycle if they arrive immediately after the completion of this phase.

The traffic analysis is consistent with findings of the City of Pitt Meadows TMP which identified traffic congestion on Harris Road, Lougheed Highway and Old Dewdney Trunk Road in existing conditions (City of Pitt Meadows, 2014).

Figure 2-2 and Figure 2-3 present the intersection weekday A.M. and P.M. peak hour levels of service and displays the critical movements for each intersection under existing conditions. Full tabulated results and the associated Synchro worksheets are included in Appendix D.

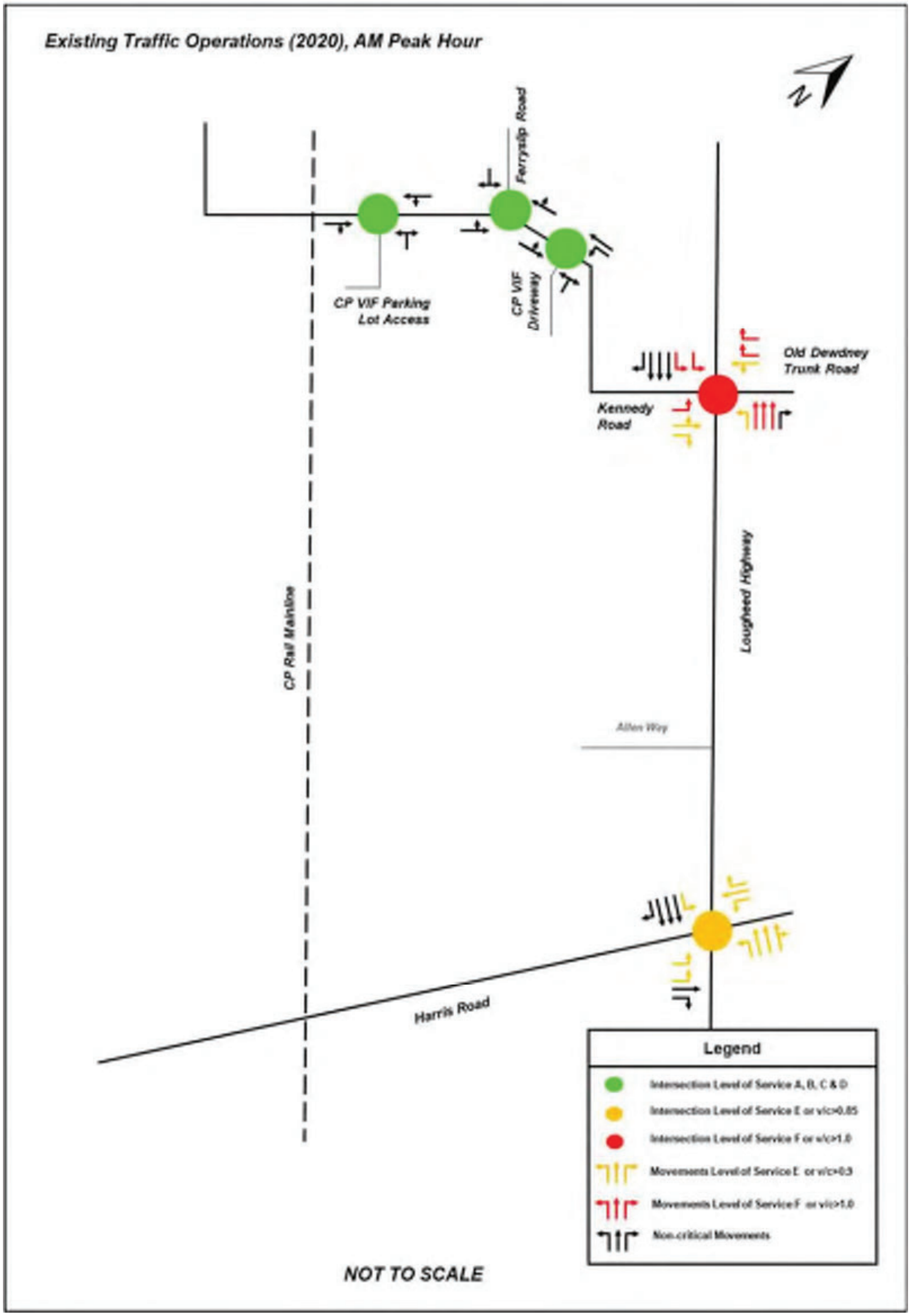
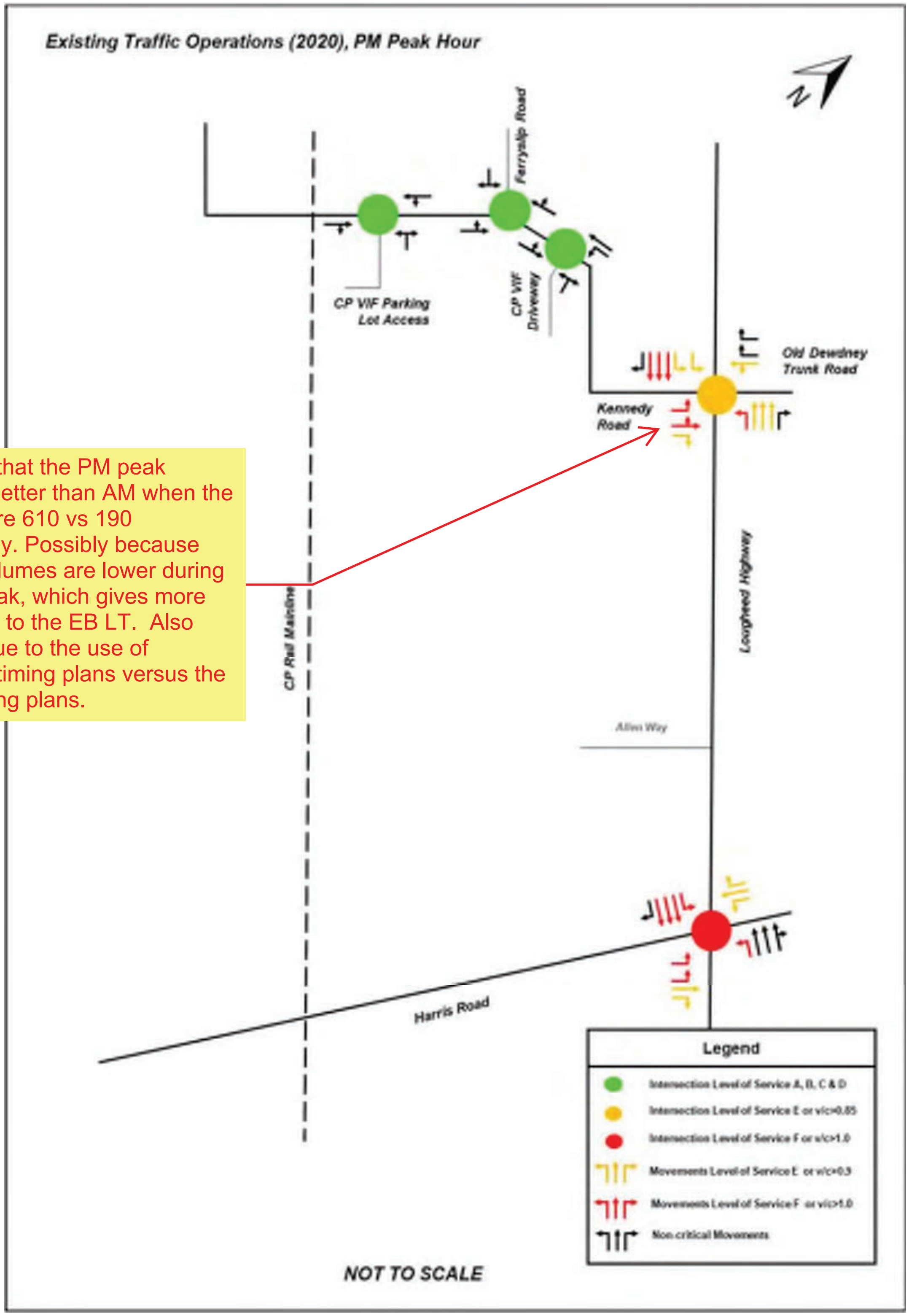



**Figure 2-2: 2020 Existing Conditions Traffic Operation during the AM Peak Hour**




Surprised that the PM peak performs better than AM when the volumes are 610 vs 190 respectively. Possibly because the WB volumes are lower during the PM peak, which gives more green time to the EB LT.  Also possibly due to the use of optimized timing plans versus the actual timing plans.

**Figure 2-3: 2020 Existing Conditions Traffic Operation during the PM Peak Hour**

### *2.1.2.5 Impact on Kennedy Road railway crossing*

The Kennedy Road at-grade railway crossing is signed and has flashing lights, and a crossing gate. Signage in advance of both the approaches posts a warning speed reduction of 30 km/h in the vicinity of the crossing. There are no sidewalks provided on both sides of the crossing. Road Rail event information at the Kennedy Road Rail Crossing was obtained from the results of the Road Traffic & Rail Data Collection Study by Bunt (Bunt & Associates, 2020). There was observed to be a total of 36 freight trains and 9 passenger trains on a typical weekday. An average maximum frequency of 5 events per hour was observed during the A.M. peak hour and 3 events per hour was observed during the P.M. peak hour. Table 2-3 summarizes these results.

**Table 2-3: Number of Railroad Crossing Events**

| Date | Freight Train | Passenger Train | False Starts | Total | Maximum frequency* | |
|---|---|---|---|---|---|---|
| | | | | | AM Peak Hour | PM Peak Hour |
| **Friday, Nov 1** | 39 | 10 | 6 | 55 | 4 | 3 |
| **Monday, Nov 4** | 29 | 9 | 6 | 44 | 4 | 3 |
| **Tuesday, Nov 5** | 39 | 8 | 6 | 53 | 6 | 2 |
| **Wednesday, Nov 6** | 39 | 9 | 11 | 59 | 7 | 2 |
| **Thursday, Nov 7** | 34 | 11 | 8 | 53 | 4 | 5 |
| Average | 36 | 9 | 7 | 53 | 5 | 3 |

* Maximum frequency is defined as the maximum number of trains passing through the rail crossing during the peak hour in the A.M. peak period (6:00 A.M. – 9:00 A.M.) and the P.M. peak period (3:00 P.M. – 6:00 P.M.).

Data regarding the duration of each rail event at the Kennedy Road Rail Crossing was also collected by Bunt. The average rail event duration at the crossing was found to be approximately 5 minutes and the maximum duration was found to be over 15 minutes during the A.M. and P.M. peak periods. Table 2-4 summarizes the average, median, 95$^{th}$ percentile and maximum duration of weekday rail events during the A.M. and P.M. peak periods.

**Table 2-4: AM Peak Period (6:00 A.M. – 9:00 A.M.) & PM Peak Period (3:00 P.M. – 6:00 P.M.) Railroad Durations (mm:ss)**

| Date | Average Duration | | Median Duration | | 95th Percentile Duration | | Maximum Duration | |
|---|---|---|---|---|---|---|---|---|
| | AM Peak Period | PM Peak Period | AM Peak Period | PM Peak Period | AM Peak Period | PM Peak Period | AM Peak Period | PM Peak Period |
| **Friday, Nov 1** | 02:26 | 03:30 | 01:05 | 02:01 | 07:52 | 09:09 | 10:40 | 10:46 |
| **Monday, Nov 4** | 03:25 | 01:18 | 01:15 | 01:18 | 09:23 | 01:42 | 10:42 | 01:42 |
| **Tuesday, Nov 5** | 05:53 | 07:50 | 04:00 | 08:23 | 13:30 | 14:22 | 16:16 | 13:32 |
| **Wednesday, Nov 6** | 04:54 | 08:16 | 05:02 | 07:41 | 10:41 | 15:10 | 11:24 | 15:45 |
| **Thursday, Nov 7** | 06:20 | 04:29 | 04:33 | 03:02 | 14:23 | 11:20 | 16:28 | 13:11 |
| **Overall** | **04:44** | **05:02** | **02:56** | **03:04** | **11:23** | **13:32** | **16:28** | **15:45** |

Synchro does not have an explicit procedure to analyze rail crossings or its associated impacts on traffic operations. Therefore, to ensure proper evaluation of the impacts, the railroad crossing was simulated by creating a fictitious signalized intersection with a pretimed traffic signal control type. Synchro provides macro level LOS, delays and queues at intersections and is limited by the fact that it considers only one cycle in its output and hence, does not take into account the frequency of the rail events per hour. A microsimulation analysis was conducted using SimTraffic to better match real world conditions and get a better estimate of the queue length during a rail event since it calculates the queue lengths through multiple cycles in an hour. The queue lengths under existing conditions were calculated for the following scenarios:

- Scenario 1: Assuming an average rail event duration of 5 minutes with a frequency of 4 rail events per hour for both the A.M. and P.M. peak periods.
- Scenario 2: Assuming a $95^{th}$ percentile rail event duration of 15 minutes with a frequency of 2 rail events per hour for both the A.M. and P.M. peak periods. The queue lengths determined through this scenario are very conservative since it represents the worst-case scenario.

#### 2.1.2.5.1 Scenario 1: 5 minutes Duration

A pretimed signal for the rail crossing was modelled in Synchro where Kennedy Road was closed for 5 minutes during a rail event. A 10-minute gap was assigned between rail events. The 95$^{th}$ percentile queue lengths were determined by averaging the results of five simulation runs using SimTraffic.

The results show that the vehicles experience 95$^{th}$ percentile queues of approximately 45 metres in the northbound direction and 25 meters in the southbound direction during the A.M. peak period, while the vehicles experience 95$^{th}$ percentile queues of approximately 50 metres in the northbound direction and 60 meters in the southbound direction during the P.M. peak period. The simulation shows that the queue clears during the 10-minute gap between the rail events. The existing queues do not block any accesses in either direction. The queue lengths calculated were found to be similar to the queue length observations made in the Bunt report during an average rail event duration on Kennedy Road (Bunt & Associates, 2020).

Figure 2-4 illustrates the existing 95$^{th}$ percentile queue lengths during railway events of a duration of 5 minutes. The results of the microsimulation queue length study are shown in Appendix G.

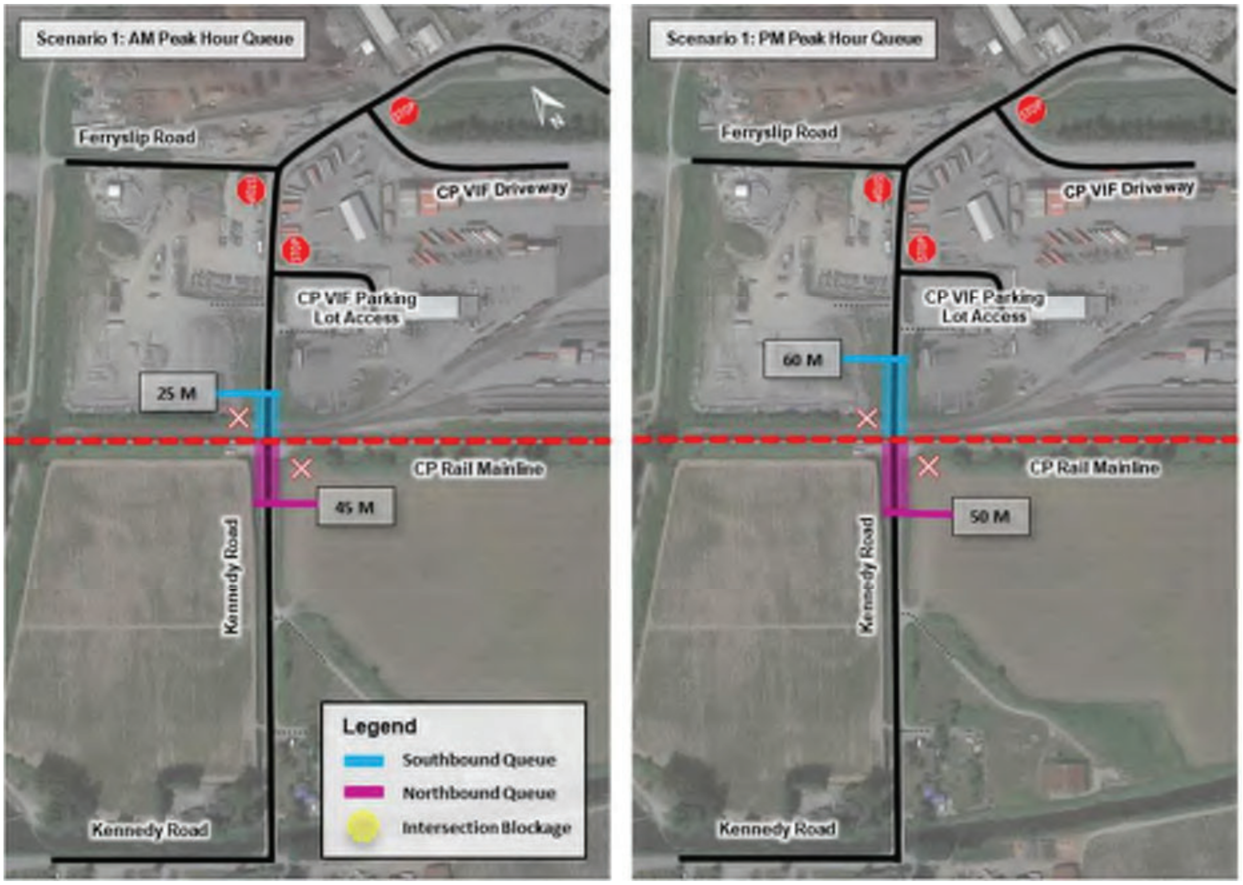



**Figure 2-4: Kennedy Road Rail Crossing Queue Lengths under Existing Conditions (2020) for a 5-minute rail event duration**

### 2.1.2.5.2 Scenario 2: 15 minutes Duration

A pretimed signal for the rail crossing was modelled in Synchro where Kennedy Road was closed for 15 minutes during a rail event. A 10-minute gap was assigned between rail events. The 95th percentile queue lengths were determined by averaging the results of five simulation runs using SimTraffic.

The results show that the vehicles experience 95th percentile queues of approximately 130 metres in the northbound direction and 70 meters in the southbound direction during the A.M. peak period, while the vehicles experience 95th percentile queues of approximately 145 metres in the northbound direction and 135 meters in the southbound direction during the P.M. peak period. The simulation shows that the queue clears during the 10-minute gap between the rail events. The northbound queues may impact driveway access to a residential property located on the east side of Kennedy Road while the southbound queues may impact access to the CP VIF parking lot located on the east side of Kennedy Road. The queue lengths calculated were found to be similar to the queue length observations made in the Bunt report during a long rail event duration on Kennedy Road (Bunt & Associates, 2020).

Would expect the SB queue to be higher since there are 88vph SB and 72vph NB during PM peak.

Increase in volumes from development increase the likelihood of these impacts.

It should be noted that the northbound queues at the Kennedy Road rail crossing during a long duration event is expected to have negative impacts on the intersection of Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road. A long duration rail event would lead to a platoon of vehicles arriving at the intersection which would worsen the operation of the northbound movements at the intersection.

Figure 2-5 illustrates the existing 95th percentile queue lengths during railway events of a duration of 15 minutes. The results of the microsimulation queue length study are shown in Appendix G.

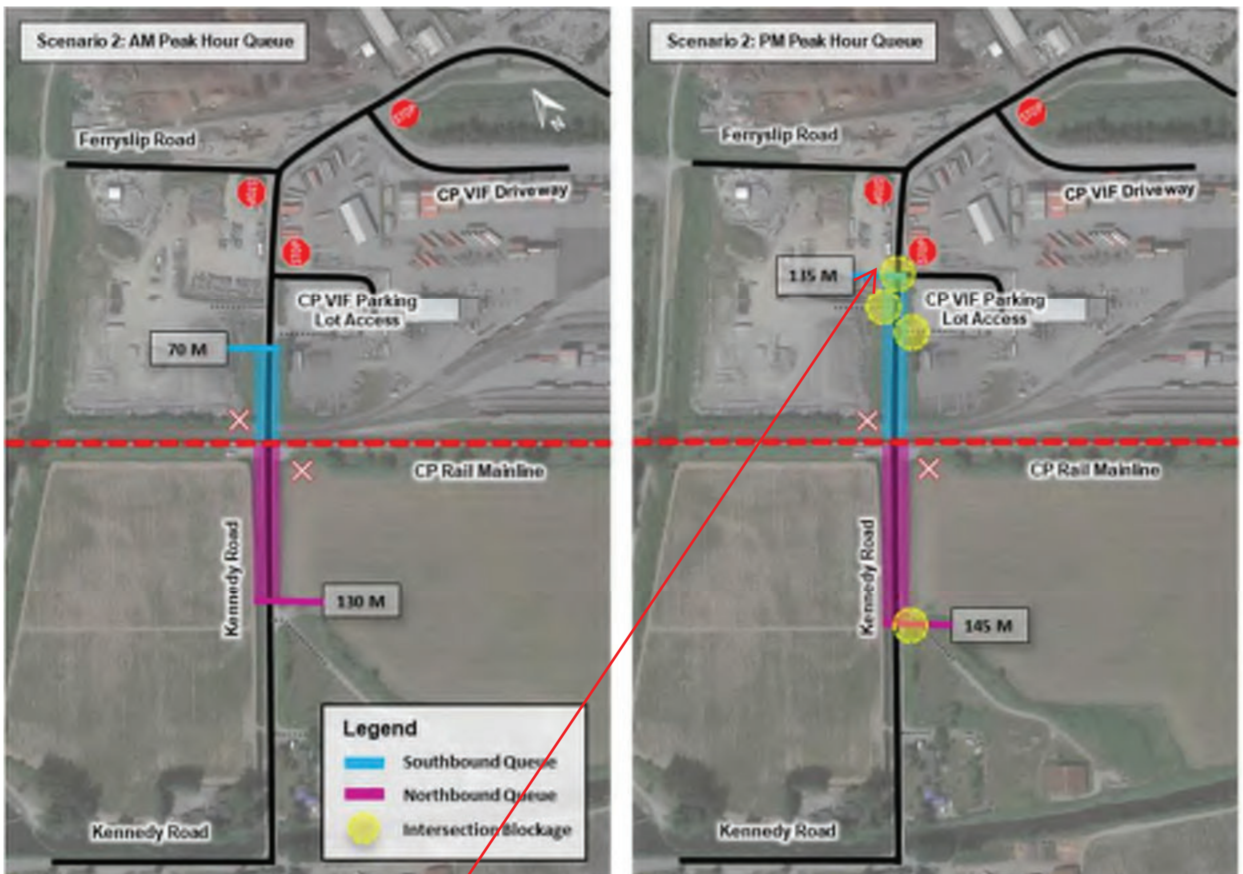



**Figure 2-5: Kennedy Road Rail Crossing Queue Lengths under Existing Conditions (2020) for a 15-minute rail event duration**

As part of the Harris Road & Kennedy Road Traffic & Rail Data Collection Study prepared by Bunt & Associates (Draft V02, January 10, 2020), rail events were observed which showed the maximum southbound queue extended close to Ferryslip Road during the PM peak hour. This graphic shows the queue only extending to the CP VIF Parking Lot Access. Site investigations should be conducted to verify the finding of the analysis. Adding trucks to this road as a result of the development will further extend these queue lengths.

No information provided on transit ridership to summarize existing conditions. This is available in TransLink's 2019 Service Performance Review: https://public.tableau.com/app/profile/translink/viz/2019TSPR-BusSeaBusSummaries/TheWorkbook

## 2.2 Transit Services

Bus routes operated by TransLink run along Lougheed Highway and Harris Road in the study area. The existing transit routes serving stops in the study area are illustrated in Figure 2-6. The following TransLink routes operate in the study area:

- Route 701 Haney/Maple Ridge East/Coquitlam Station:
  - This route connects the City of Port Coquitlam, City of Maple Ridge and the Municipality of Mission via Lougheed Highway.
  - Route 701 is a designated Frequent Transit Network (FTN), which has a frequency of four to five buses per hour during the A.M. and P.M. peak periods on weekdays and weekends in the study area (City of Pitt Meadows, 2014).
  - This route operates along Lougheed Highway and Harris Road which provides service to the eastbound and westbound bus stops at the intersection of Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road and the westbound bus stop at the intersection of Lougheed Highway and Harris Road. This route also services bus stops along Harris Road, south of Lougheed Highway.
- Route 791 Haney Place/Braid Station:
  - This route connects the City of Maple Ridge and the eastern edge of the City of New Westminster via Lougheed Highway.
  - This route has limited service and operates in the study area on weekdays only between the hours of 4:30 A.M. to 7:20 P.M. The route has a frequency of three buses per hour during the A.M. and P.M. peak periods.
  - This route operates along Lougheed Highway and Harris Road which provides service to the eastbound and westbound bus stops at the intersection of Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road and the westbound bus stop at the intersection of Lougheed Highway and Harris Road. This route also services bus stops along Harris Road, south of Lougheed Highway.
- Route 722 Meadowtown/Bonson:
  - This route is a community shuttle that connects Meadowtown Centre, Pitt Meadows Station and Roundabout Park via Harris Road in the study area.
  - This route has a peak frequency of 2 to 3 buses per hour during the A.M. and P.M. peak periods on weekdays. On Saturday, this route runs once every two hours. This route does not have service on Sundays or holidays.
  - This route provides service to the bus stops along Harris Road between 124 Avenue and 122A Avenue.

RapidBus

- R3 Lougheed Highway RapidBus:
  - This route is a rapid transit route that connects the City of Port Coquitlam, City of Pitt Meadows, and City of Maple Ridge via Lougheed Highway.
  - As part of the FTN, this route has a frequency of five to six buses per hour during the A.M. and P.M. peak periods on weekdays and weekends.
  - This route operates along Lougheed Highway which provides service to the eastbound and westbound bus stops at the intersection of Lougheed Highway and Harris Road.

In addition to the TransLink transit routes, the following train service operates in the study area:

- West Coast Express:
  - This route is a commuter railway operating between Downtown Vancouver and the Municipality of Mission via the CP Rail Mainline.
  - This route operates in the study area on weekdays during peak periods only. The route has a frequency of one to two trains per hour during the A.M. and P.M. peak periods.
  - This route provides service to the Pitt Meadows Train Station located near the intersection of Harris Road and 122A Avenue.

in the peak direction

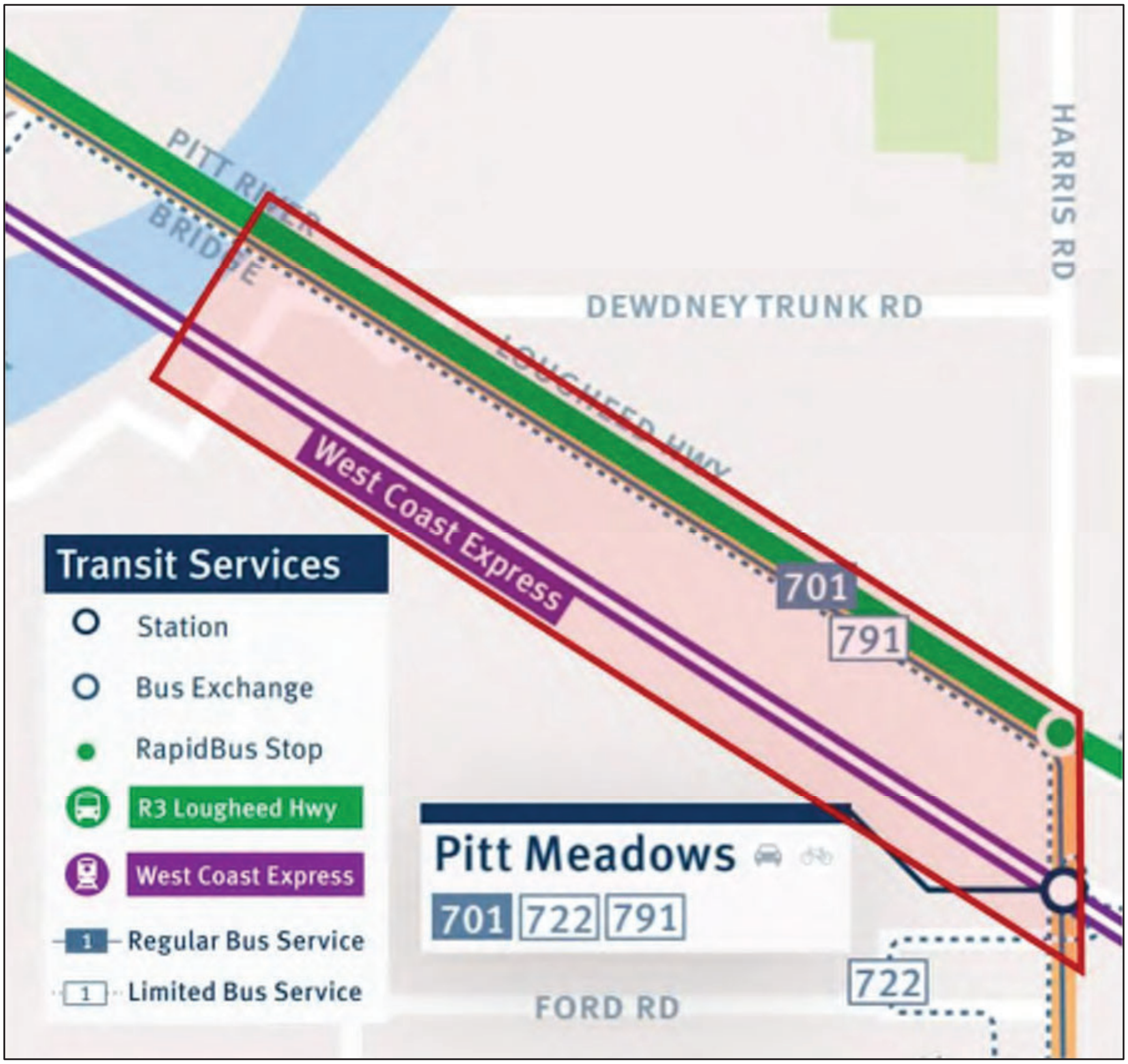



**Figure 2-6: Existing Transit Services in the Study Area (TransLink, 2020)**

Peds and bikes were included in the traffic counts and some commentary on active mode volumes should be included in the existing conditions assessment



## 2.3 Active Transportation Facilities

Sidewalks are present on both sides of Harris Road, south of Lougheed Highway. No sidewalks are present on Lougheed Highway and Kennedy Road in the study area. The existing dedicated cycling infrastructure in the study area, some of which is also shared with pedestrians, includes:

- Designated bike lanes are provided along both sides of Harris Road, south of Lougheed Highway in the study area.
- A paved multi-use trail is provided on the north side of Lougheed Highway, west of Kennedy Road/Old Dewdney Trunk Road.
- A paved multi-use trail is provided on the south side of Lougheed Highway from Kennedy Road/Old Dewdney Trunk Road to west of Harris Road.
- A paved multi-use trail is provided along Kennedy Road on the east side between Lougheed Highway and CP VIF Driveway.
- A shared bike lane is provided along Ferryslip Road between Kennedy Road and the Trans-Canada Trail.
- A pedestrian/bicycle crossing is provided on Kennedy Road connecting the paved multi-use trail on Kennedy Road and the shared bike lane on Ferryslip Road.
- An informal neighborhood bikeway is provided along Kennedy Road south of Ferryslip Road.
- The TransCanada Trail is located west of Kennedy Road, and runs along the shoreline of the Pitt River.

The existing cycling network and corresponding infrastructure in the study area are shown in Figure 2-7.

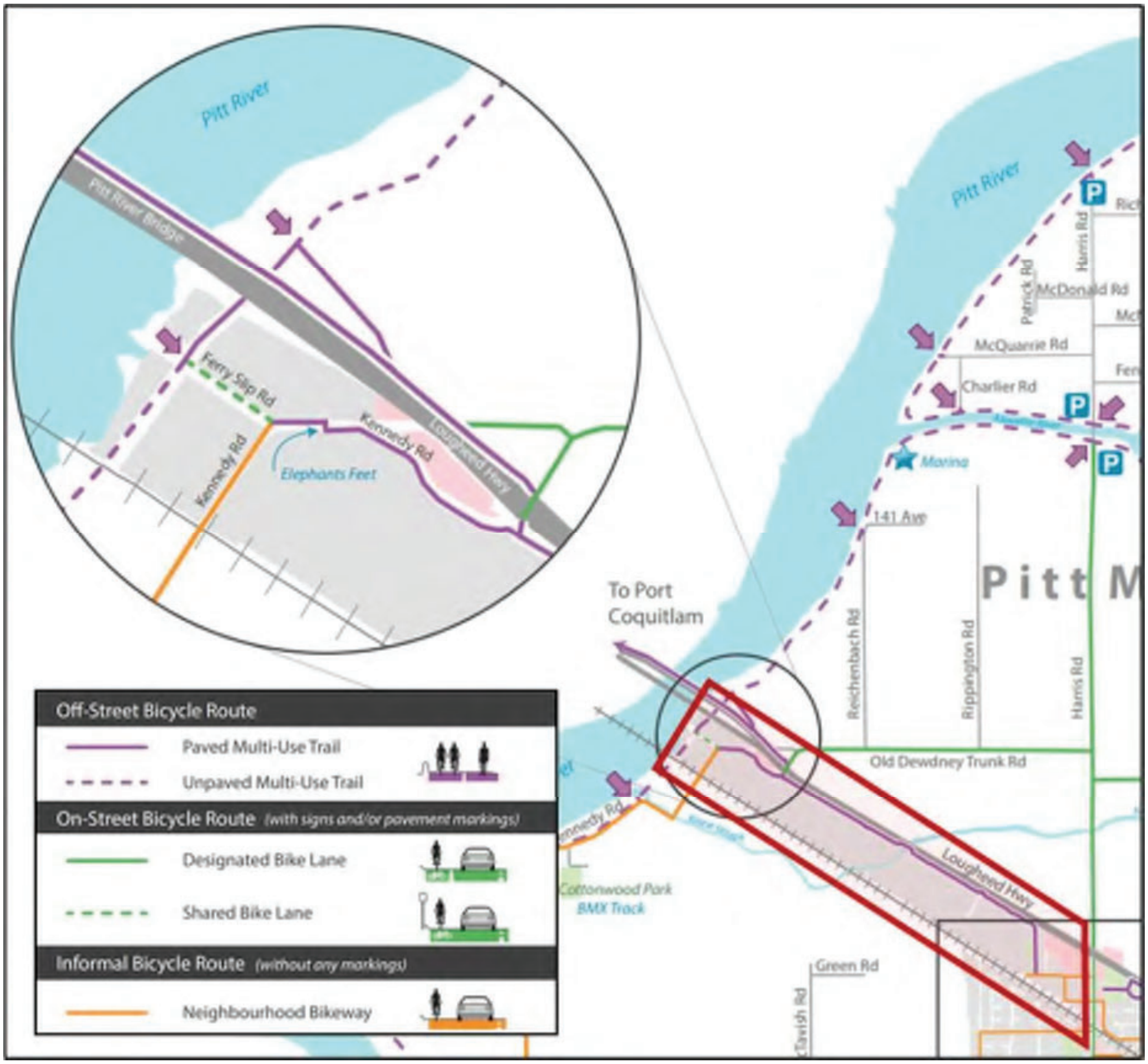



**Figure 2-7: Existing and Proposed Cycling Network (City of Pitt Meadows, 2013)**

# 3. Background Future Conditions

## 3.1 Traffic Operations

### *3.1.1 Determining Future Background Traffic Conditions*

The future background traffic conditions were analyzed by taking into account any major land use or transportation system changes that are approved or are anticipated to occur in the study area within the planning horizons. This section summarizes any adjacent planned developments and road network upgrades in the study area that were considered to derive appropriate traffic growth rates and traffic forecasts for the planning horizon of the study. Transportation analysis was undertaken for the existing year (2020), site preload program year (2025), full build-out year (2030), and ten years after full build out (2040).

#### *3.1.1.1 Road Network Upgrades*

The City of Pitt Meadows TMP has identified the following network issues in the study area:

- Traffic congestion on several major roads, such as Harris Road, Lougheed Highway, and Old Dewdney Trunk Road exists. In particular, congestion and delay at the Lougheed Highway intersections with Old Dewdney Trunk/Kennedy Road and Harris Road exists and is projected to worsen in the future.
- Rail traffic was identified that results in congestion and delays at the at-grade crossings on Harris Road and Kennedy Road. Safety concerns were identified relating to vehicles making illegal maneuvers to avoid waiting at the crossing.
- Harris Road was identified as having a number of issues such as congestion during peak periods particularly at the rail crossing and at the intersection of Lougheed Highway and Harris Road. Safety concerns were identified for non-motorists on Harris Road due to the high speeds and volumes on Harris Road.

At-grade crossing is already an issue - development traffic will make this worse.

The City of Pitt Meadows TMP projects growth in the road and rail traffic on some of the key road corridors, which is expected to worsen traffic operations of the Lougheed Highway intersections and increase delay at the rail crossings. A Road Network Plan was developed which identified road network strategies to accommodate more efficient movements of automobiles and truck traffic. These include:

- The TMP has identified a potential future roadway connector (as shown in Figure 3-1) between Pitt Meadows and Golden Ears Way in Maple Ridge termed the North Lougheed Connector (City of Pitt Meadows, 2014). This proposed roadway will facilitate east-west movement between the two cities as well as provide access to the future commercial developments proposed on the north side of Lougheed Highway. The timeline for this strategy is unclear at the moment. Components for this strategy include:
    - Construction of a new interchange where the proposed North Lougheed Connector meets Harris Road, north of Lougheed Highway, to facilitate traffic flow between the proposed connection and Lougheed Highway. The two potential options for the interchange include a signalized intersection or a roundabout, with the roundabout being the preferred alternative. The potential roundabout configuration consists of two lanes with four exit and entry points at the North Lougheed Connector, Harris Road North, Lougheed Highway entrance/exit, and Harris Road south.
    - Construction of two travel lanes in each direction as well as a Right-of-Way (ROW) preservation for three travel lanes on the North Lougheed Connector.
- The TMP has identified a strategy to ease the eastbound traffic on Lougheed Highway (City of Pitt Meadows, 2014). The strategy proposes to widen Lougheed Highway to provide a dedicated eastbound priority lane to access Harris Road. This entails extending the right-turn lane further westward to Allen Way. This would allow eastbound vehicles on Lougheed Highway destined for Harris Road to bypass queues on Lougheed Highway. This strategy has already been implemented and has been reflected in the existing conditions.
- The TMP has identified the need for a traffic calming plan for Old Dewdney Trunk Road (City of Pitt Meadows, 2014). Approval for the land exclusion required for the North Lougheed Connector is dependent on the plan and the removal of Old Dewdney Trunk Road from TransLink's Major Road Network (MRN). Potential considerations in the traffic calming plan include conversion of the existing eastbound dual left-turn to a single left turn lane at the intersection of Old Dewdney Trunk Road and Lougheed Highway. No official timeline has been released for this strategy, however it was recommended that this strategy be prioritized.
- The TMP has identified the need for an alternate route through the southwest quadrant of Pitt Meadows (City of Pitt Meadows, 2014). The proposed route, termed the Kennedy-McTavish Connector (as shown in Figure 3-1) would see the construction of a two-lane road, one lane in each direction connecting Kennedy Road to Ford Road. The Kennedy-McTavish Connector would have significant benefits to truck traffic since it would provide

These will have an impact on the study area. The NLC and development will increase traffic EB/WB on Hwy 7. The Kennedy-McTavish Connector will increase volumes through the Kennedy Road.



a much more direct connection between the Pitt River Bridge, CP VIF, Pitt Meadows Regional Airport and Pitt Meadows industrial areas. The timeline for this alternative is unclear at this time.

- The TMP encourages coordination between the City of Pitt Meadows and the province (BC MOTI) to mitigate congestion and delay at the Lougheed Highway intersections with Old Dewdney Trunk/Kennedy Road and Harris Road.

The timelines for the implementation of the various road network improvement strategies by the City of Pitt Meadows have not been confirmed. Due to the uncertainty in the timelines, the 2025 site preload program year, the 2030 full build-out year and 2040 planning horizon were analyzed without these improvements. The proposed strategies are illustrated in Figure 3-1.

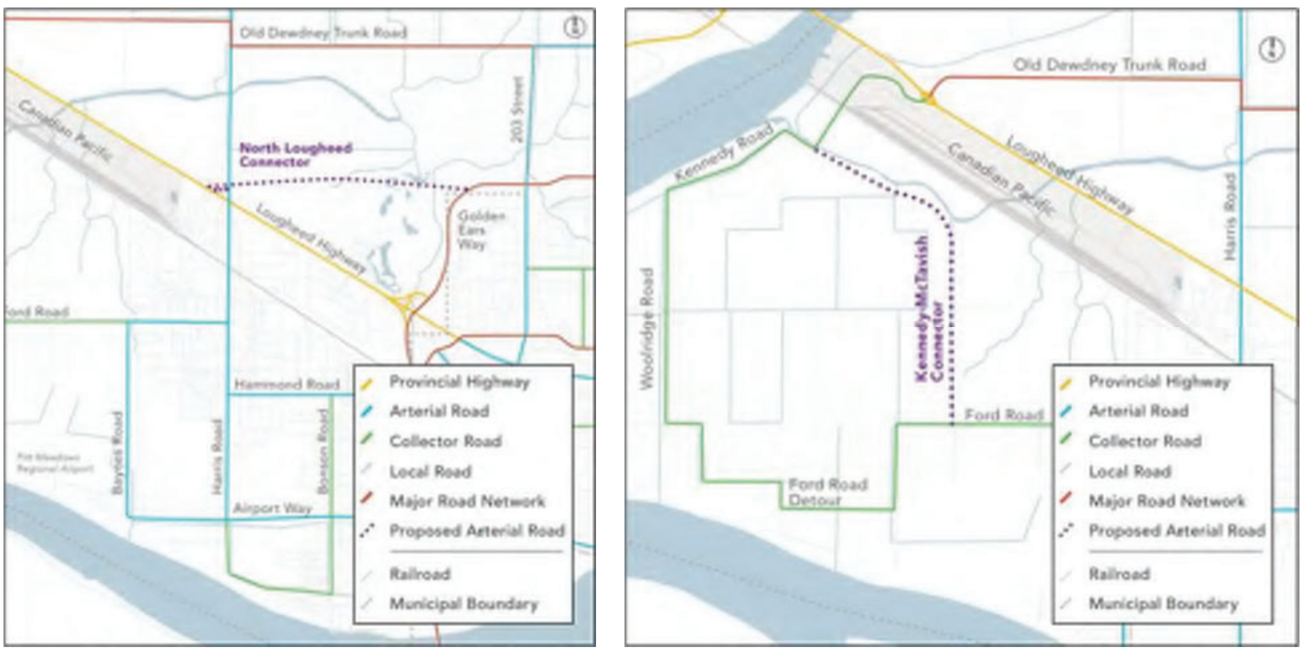



**Figure 3-1: Proposed Road Network Improvements (City of Pitt Meadows, 2014)**

In addition to the above road network upgrade strategies put forth by the City of Pitt Meadows, the Vancouver Fraser Port Authority (VFPA) is undertaking the Pitt Meadows Road and Rail Improvements Project (PMRRIP) as mandated by the Greater Vancouver Gateway 2030 Program. The project includes the following upgrades:

- Construction of a two-lane overpass above the CP Rail Mainline crossing of Kennedy Road. The preferred design is the Kennedy Road Offline East Alignment (Stantec Consulting Ltd., 2020a). The Offline East Kennedy Overpass option proposes an eastward shift of the existing Kennedy Road alignment as it passes over the railroad crossing. Going northward, the overpass will remain parallel to the existing Kennedy Road and form a raised three-leg intersection at Ferryslip Road and Kennedy Road. A new access to the CP VIF Parking Lot will be provided via Ferryslip Road underneath the proposed overpass. The preferred alignment for Kennedy Road is shown in Figure 3-2.

**Figure 3-2: Kennedy Overpass Preferred Option - Offline East Alignment (Stantec Consulting Ltd., 2020a)**

- Construction of a four-lane underpass beneath the CP Rail Mainline crossing of Harris Road. Two future potential design options were proposed by Stantec: Online Harris Underpass and Offline Harris Underpass (Stantec Consulting Ltd., 2020b). Key construction elements for the Online Harris Underpass include: a multi-use path spanning both sides of the underpass with widths of 4 metres each, a tie in to the existing intersections of 124 Avenue and 122A Avenue and Harris Road, and removal to the accesses along Harris Road at Davison Road and Pitt Meadows Coast Express Driveway. The Offline Harris Underpass option proposes shifting the existing Harris Road alignment west to form an "S" shape geometry. Harris Road will descend below grade immediately north of 122A Avenue, curve to the west until the railroad crossing and curve back to tie into the existing intersection of 124 Avenue and Harris Road. Access removals for the option will be the same as the Online Harris Underpass option. The potential design options for the Harris Road Underpass are shown in Figure 3-3.

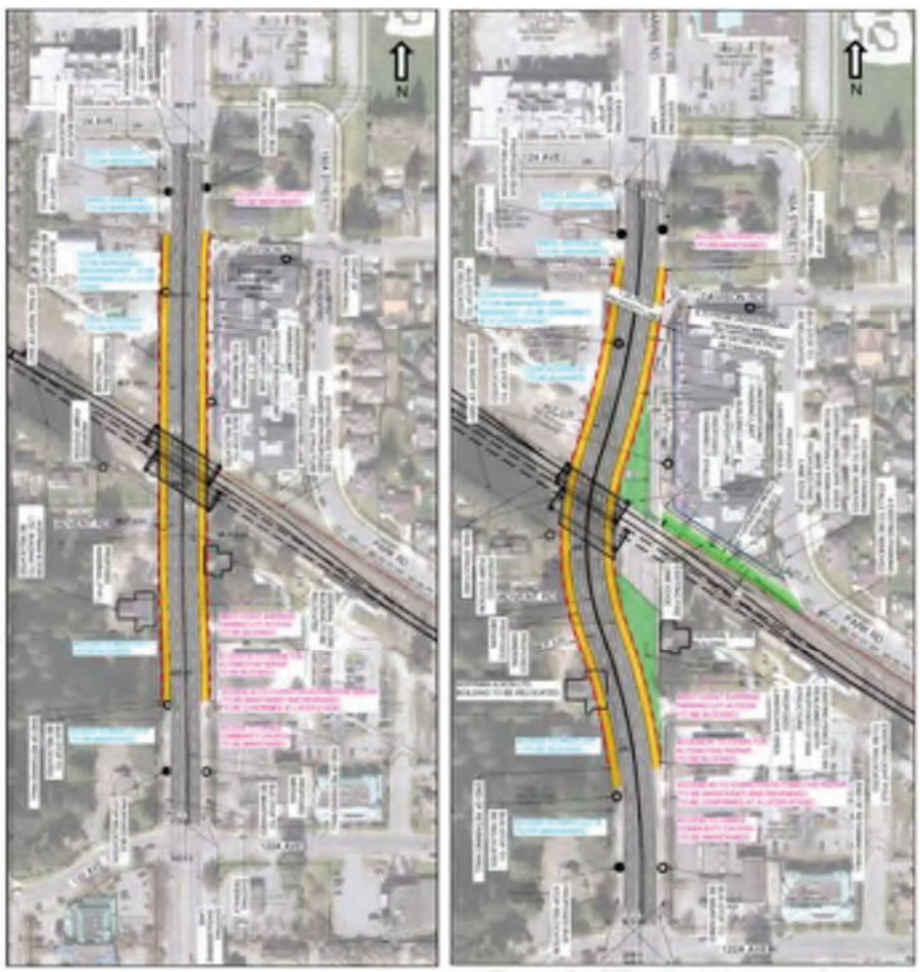


**Figure 3-3: Harris Road Underpass - Online Option Alignment (left) and Offline Option Alignment (right) (Stantec Consulting Ltd., 2020b)**

- Construction of an extension of one of CP's existing rail tracks, currently serving the VIF.

The construction of the Harris Road Underpass is anticipated to begin in 2021, with an estimated project completion by 2024 (Vancouver Fraser Port Authority, 2020). As this project will be fully constructed before the full build-out year of the CPLPV (2030), network changes from the project were taken into consideration for the purposes of the analysis. The timeline for the construction of the Kennedy Road Overpass is unclear. The Kennedy Road Overpass is not expected to be completed prior to the site preload program, and hence, was not incorporated in the analysis of the 2025 site program year. The Kennedy Road Overpass is expected to be completed prior to full build-out year and hence, was incorporated in the analysis of the 2030 full build-out year and the 2040 horizon year. A sensitivity analysis was also conducted to assess the impact of the CPLPV on the Kennedy Road at-grade crossing in the event that the implementation of the Kennedy Road Overpass is delayed. A summary of the project goals are illustrated in Figure 3-4.

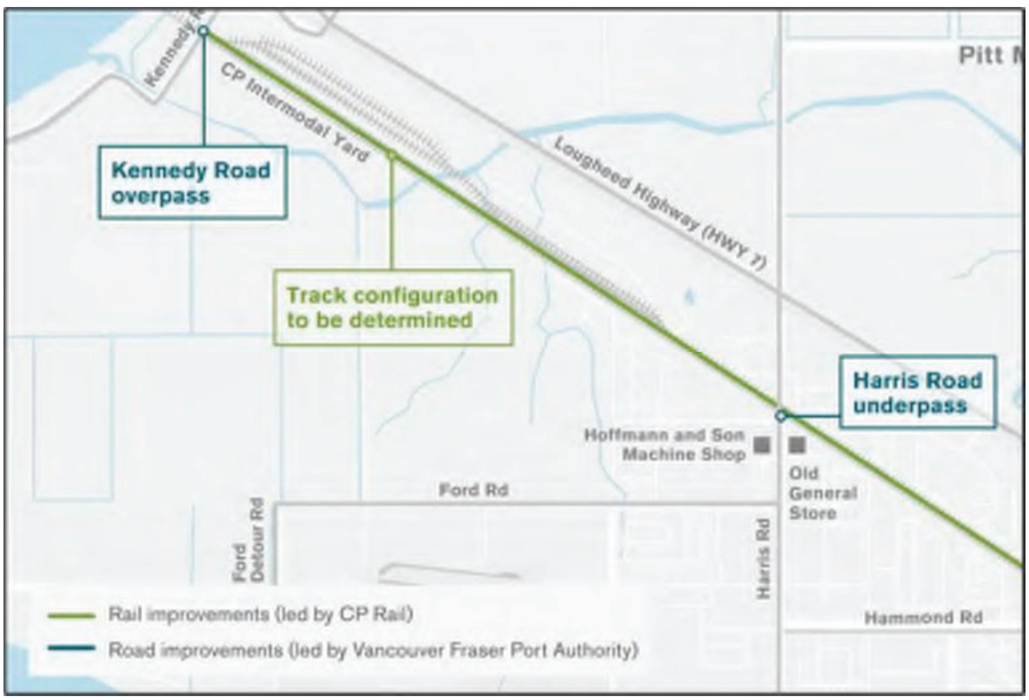



**Figure 3-4: Pitt Meadows Road and Rail Improvements Project Summary (Vancouver Fraser Port Authority, 2020)**

### *3.1.1.2 Future Developments*

#### 3.1.1.2.1 Golden Ears Business Park (GEBP)

The City of Pitt Meadows has provided background reports on the proposed Golden Ears Business Park (GEBP) development that is located west of Golden Ears Bridge and east of Pitt Meadows Regional Airport. A report titled “South Bonson Traffic Study” was completed by McElhanney Consulting Services Ltd. (McElhanney) in April 2016 (McElhanney Consulting Services Ltd., 2016). The study assessed the impacts of five future developments on the South Bonson Area, focusing on the development of the GEBP. Two horizon years were analyzed, 2021 and 2031. The following developments and development phasing included in the South Bonson Traffic Study were included in this analysis:

- **GEBP Phase 2**: It is assumed that 100 percent of GEBP Phase 2 will be completed by 2021.
- **GEBP Phase 3**: It is assumed that 50 percent of GEBP Phase 3 will be completed by 2021, and it will be fully completed by 2031.
- **GEBP Phase 4**: It is assumed that 50 percent of GEBP Phase 4 will be completed by 2021, and it will be fully completed by 2031.
- **19451 Sutton Avenue Residential**: It is assumed that 100 percent of the proposed residential development will be completed by 2021.
- **School at SW Quadrant of Airport Way/Bonson Road**: It is assumed that 100 percent of the proposed institutional development will be completed by 2031.

The number of vehicular trips generated by these developments for the A.M. peak hour and P.M. peak hour for both the 2021 and 2031 horizon years are shown in Table 3-1. The location of the developments in the South Bonson Report are illustrated in Figure 3-5.

**Table 3-1: South Bonson Traffic Study Trip Generation**

| Land Use Description | Size | Units | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | Total | In | Out | Total | In | Out |
| **2021 Trip Generation** | | | | | | | | |
| GEBP Phase 2 | 1,156 | 1000 sq. ft. | 653 | 535 | 118 | 932 | 196 | 736 |
| GEBP Phase 3 | 443 | 1000 sq. ft. | 306 | 251 | 55 | 376 | 79 | 297 |
| GEBP Phase 4 | 491 | 1000 sq. ft. | 332 | 272 | 60 | 413 | 87 | 326 |
| 19451 Sutton Avenue | 248 | DU[1] | 110 | 19 | 91 | 129 | 86 | 43 |
| | | Total | 1401 | 1077 | 324 | 1850 | 448 | 1402 |
| **2031 Trip Generation** | | | | | | | | |
| GEBP Phase 2 | 1,156 | 1000 sq. ft. | 653 | 535 | 118 | 932 | 196 | 736 |
| GEBP Phase 3 | 886 | 1000 sq. ft. | 529 | 434 | 95 | 722 | 152 | 570 |
| GEBP Phase 4 | 981 | 1000 sq. ft. | 573 | 470 | 103 | 796 | 167 | 629 |
| 19451 Sutton Avenue | 248 | DU[1] | 110 | 19 | 91 | 129 | 86 | 43 |
| School | 15 | 1000 sq. ft. | 78 | 44 | 34 | 47 | 21 | 26 |
| | | Total | 1943 | 1502 | 441 | 2626 | 622 | 2004 |

1. DU = Dwelling Units


**Figure 3-5: GEBP Location and Trip Distribution**

The trip distribution in the study conducted by McElhanney assumed that 30 percent of the trips generated by the developments in the South Bonson Area would travel north on Harris Road toward Lougheed Highway. The GEBP development was incorporated into the Harris Underpass Traffic Study by Stantec which distributed the trips generated by the development at the intersection of Lougheed Highway and Harris Road (Stantec Consulting Ltd., 2020b). For the purpose of consistency, the same trip distributions were used for the Lougheed Highway and Harris Road intersection for 2021 and 2031, and are illustrated in Figure 3-5.

For the purposes of this analysis, the traffic volumes generated by this development in 2021 and 2031 were incorporated into the background analysis for the site preload program year (2025), full build-out year (2030) and the 10-year horizon (2040). The traffic volumes generated by this development in 2021 and 2031 are shown in Figure 3-6 and Figure 3-7, and illustrated in Sketch 6 and Sketch 7 of Appendix B of this Report.

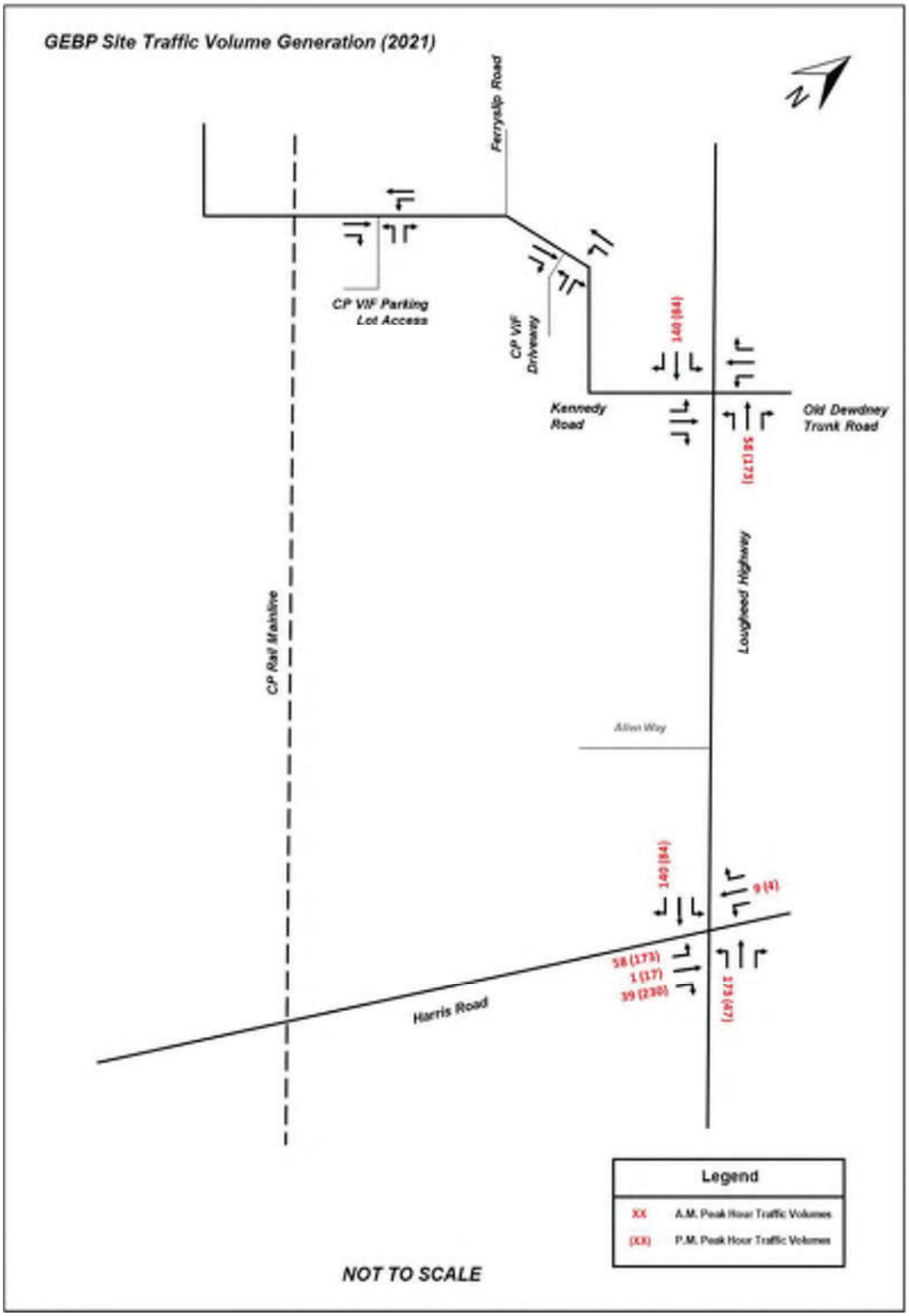



**Figure 3-6: GEBP Site Traffic Volume Generation (2021)**

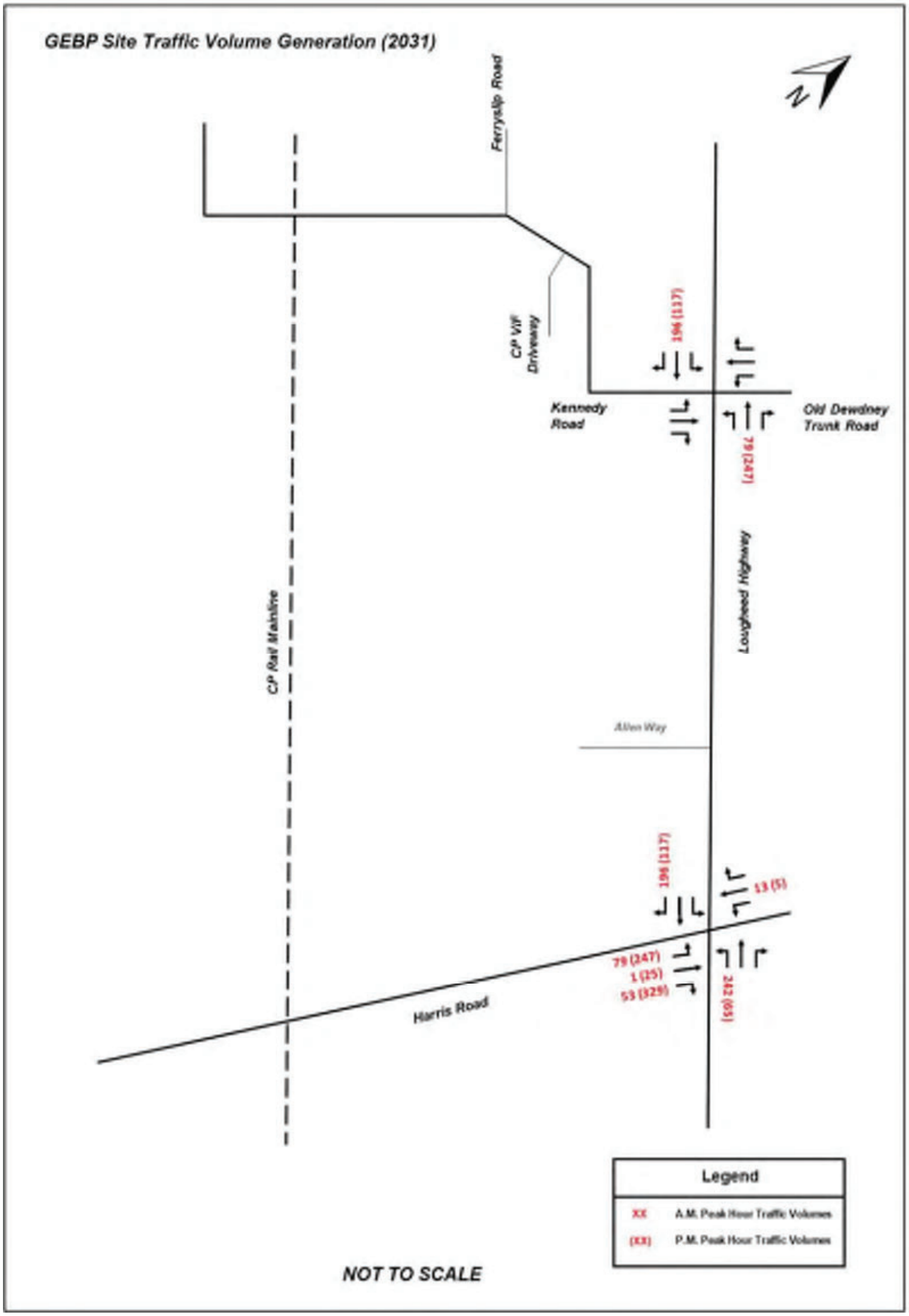



**Figure 3-7: GEBP Site Traffic Volume Generation (2031)**

This development will add trips to the network. The TIS should include some form of estimate in the background volumes.



### 3.1.1.2.2 North Lougheed Area Plan (NLAP)

The North Lougheed Area Plan is a proposed development plan that combines both land use planning and development policies for the North Lougheed Area, located on the north side of Lougheed Highway between Harris Road and Meadows Gardens Golf Course (City of Pitt Meadows, 2020). The proposed land use schematic is illustrated in Figure 3-8. Currently the land is comprised of a mix of agricultural and commercial land uses. The proposed plan features a combination of medium and high-density residential options, employment lands, as well as a strip of mixed-use commercial and residential lands along Lougheed Highway and Harris Road. Development application submissions for the NLAP are scheduled to occur between the years of 2020 and 2022. As no proposed developments are publicly available at the time of writing this report, additional trips generated from the NLAP were not considered in the analysis of the future background conditions.

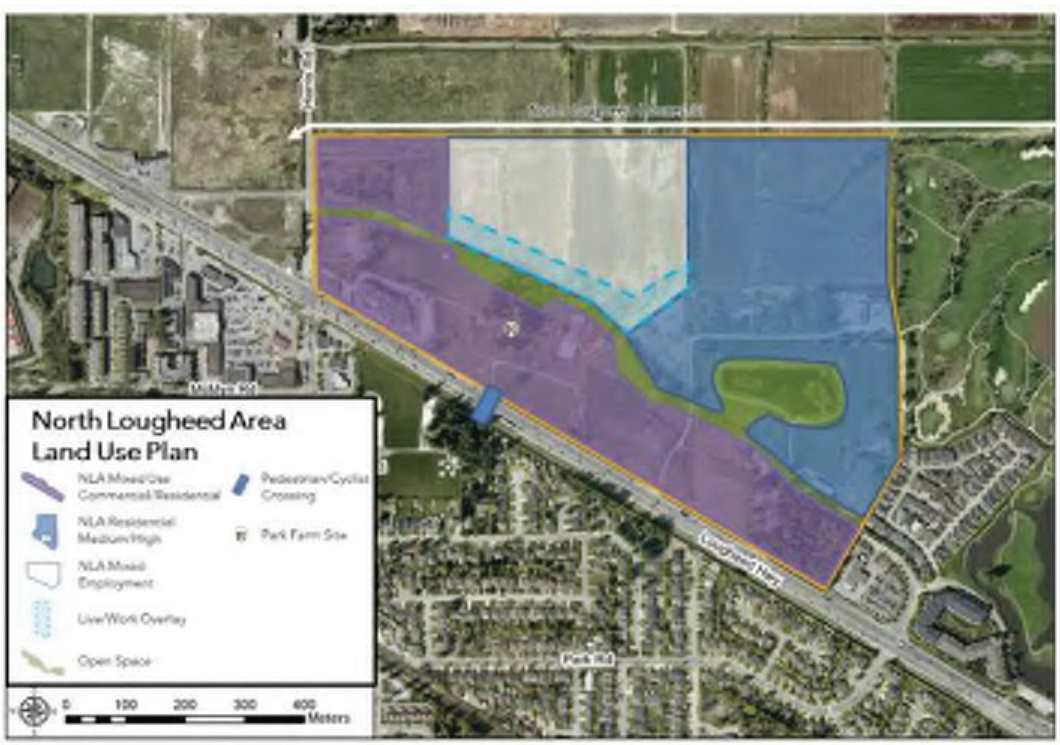



**Figure 3-8: Proposed North Lougheed Land Use Plan**

Difficult to support since growth between 2015 and 2019 was running at 0.4%.

#### *3.1.1.3 Background Traffic Growth*

The City of Pitt Meadows TMP projects a 30 percent increase in traffic on Lougheed Highway during the peak hours between 2014 and 2041. This translates to a growth of 1.1 percent compounded annually. Between 2011 and 2016, the population growth in Metro Vancouver was 1.3 percent per year, with the highest growth experienced in the Township of Langley and Surrey. Population growth in the City of Pitt Meadows was 0.94 percent per year. Based on the population growth, as well as proposed developments in the surrounding area, a traffic growth rate of one percent per annum for all movements was used for the purposes of this analysis. This rate of growth is consistent with the rate of growth used in previous traffic analysis reports conducted in the vicinity of the study area including:

- Kennedy Overpass Study Traffic Analysis Report (Stantec Consulting Ltd., 2020a)
- Harris Underpass Traffic Analysis Report (Stantec Consulting Ltd., 2020b).

The traffic volumes for the site preload program year (2025), full build-out year (2030) and the planning horizon (2040) were estimated using a one percent growth per annum in addition to the site trips estimated by the South Bonson Traffic Study.

### *3.1.2 Site Preload Program Year (2025)*

The traffic volumes used for the analysis of 2025 background conditions are shown in Figure 3-9 and also illustrated in Sketch 8 of Appendix B of this Report.

Employment growth will result in redistribution and internalization of trips resulting in lower growth rates on the regional road network. Further, there will be some mode shift further suppressing regional traffic growth rates.

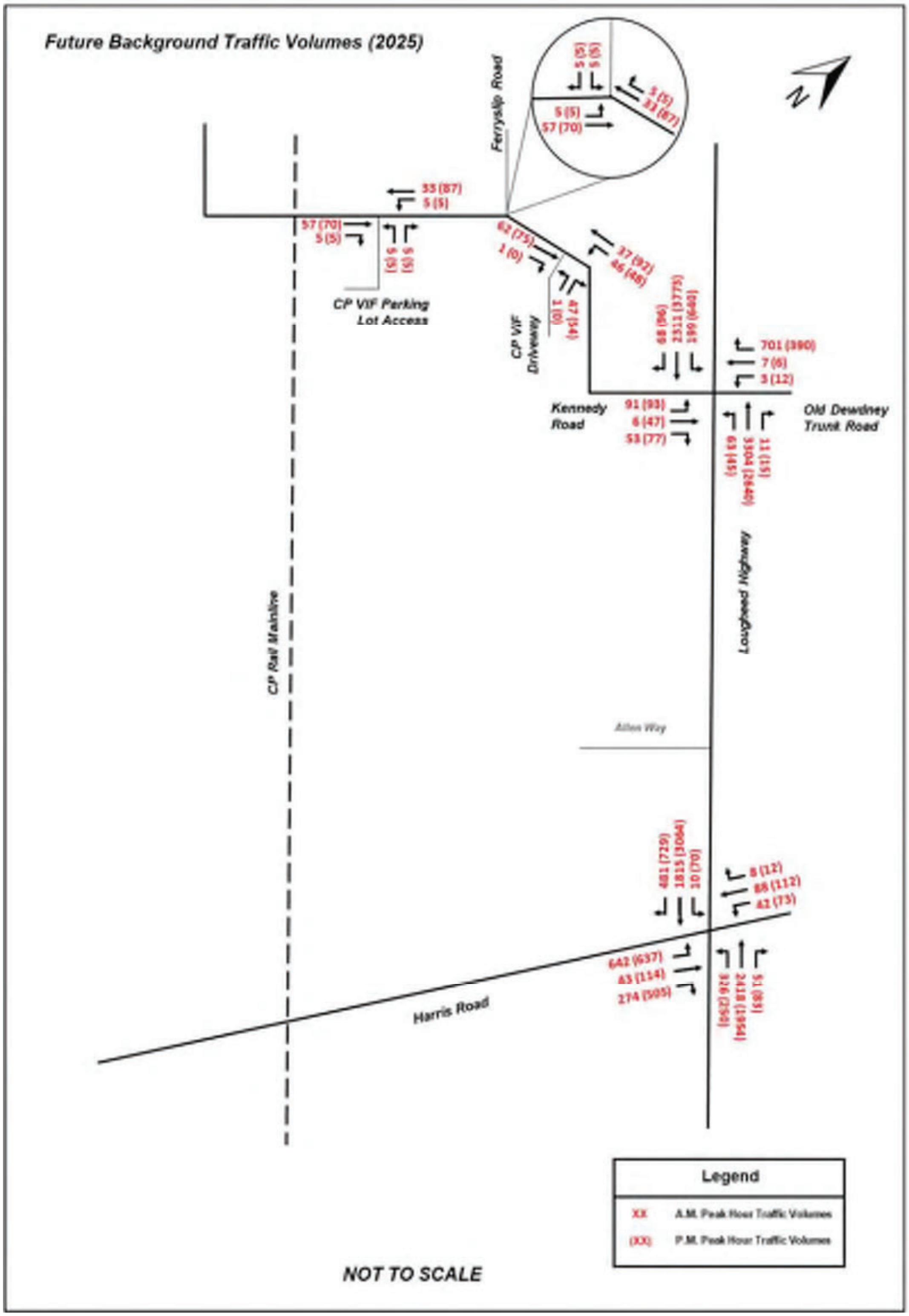


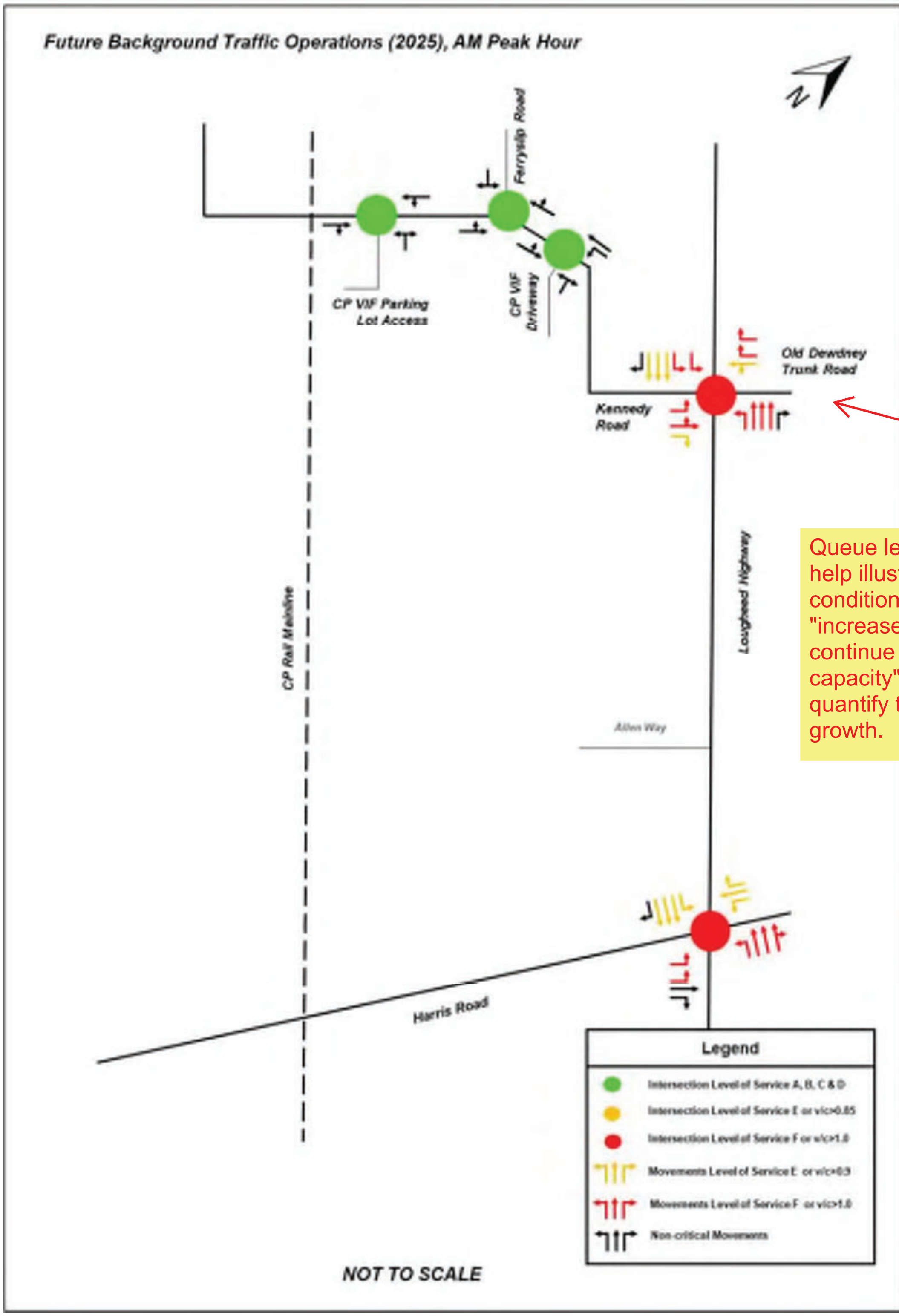

**Figure 3-9: Traffic Volumes for Future Background Conditions (2025)**

As discussed in Section 3.1.1.1, timelines for the improvements to the road network in the study area have not been confirmed. Thus, the 2025 road network is assumed to be the same as the road network modelled under 2020 conditions. As discussed in Section 3.1.1.2, the additional site-generated traffic from the proposed GEBP in 2021 has been incorporated into the 2030 background conditions. As some intersections and movements are already operating over or near capacity under existing conditions, increases in background traffic volumes for future scenarios will cause operations at these intersections to worsen by the site preload program year of 2025. The movements that are expected to operate over capacity in the 2025 background conditions (in comparison to the 2020 existing conditions) are identified below:

We know there is congestion and development will make it worse. We need diagrams that show queues and v/c ratios to really understand impacts to capacity.

- Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road:
  - The eastbound through movement is expected to operate with increased delays and continue operating over capacity during the P.M. peak hour due to the additional traffic generated from background growth
  - The westbound through movement is expected to operate with increased delays and continue operating over capacity during the A.M. peak hour and begin operating over capacity during the P.M. peak hour due to the additional traffic generated from background growth
  - The southbound right-turn movement is expected to operate with increased delay and begin operating over capacity during the A.M. peak hour due to the additional traffic generated from background growth.
- Lougheed Highway and Harris Road:
  - The eastbound through movement is expected to operate with increased delays and continue operating over capacity during the P.M. peak hour due to the additional traffic generated from background growth
  - The westbound left turn movement is expected to operate with increased delays and begin operating over capacity during the A.M. peak hour and is expected to operate with increased delays and continue operating over capacity during the P.M. peak hour primarily due to additional traffic generated from the GEBP development
  - The westbound through movement is expected to operate with increased delays and begin operating over capacity during the A.M. peak hour due to the additional traffic generated from background growth
  - The northbound left turn movement is expected to operate with increased delays and continue operating over capacity during the P.M. peak hour primarily due to additional traffic generated from the GEBP development
  - The northbound right turn movement is expected to operate with increased delays and begin operating over capacity during the P.M. peak hour primarily due to additional traffic generated from the GEBP development.

Figure 3-10 and Figure 3-11 illustrate the intersection weekday AM and PM peak hour levels of service and display the critical movements for each intersection under future 2025 background conditions. Full tabulated results and the associated Synchro worksheets are included in Appendix E of this Report.




Queue lengths would help illustrate traffic conditions here. Saying "increased delays and continue operating over capacity" doesn't help quantify the impact of growth.

**Figure 3-10: 2025 Background Conditions Traffic Operation during the A.M. peak hour**

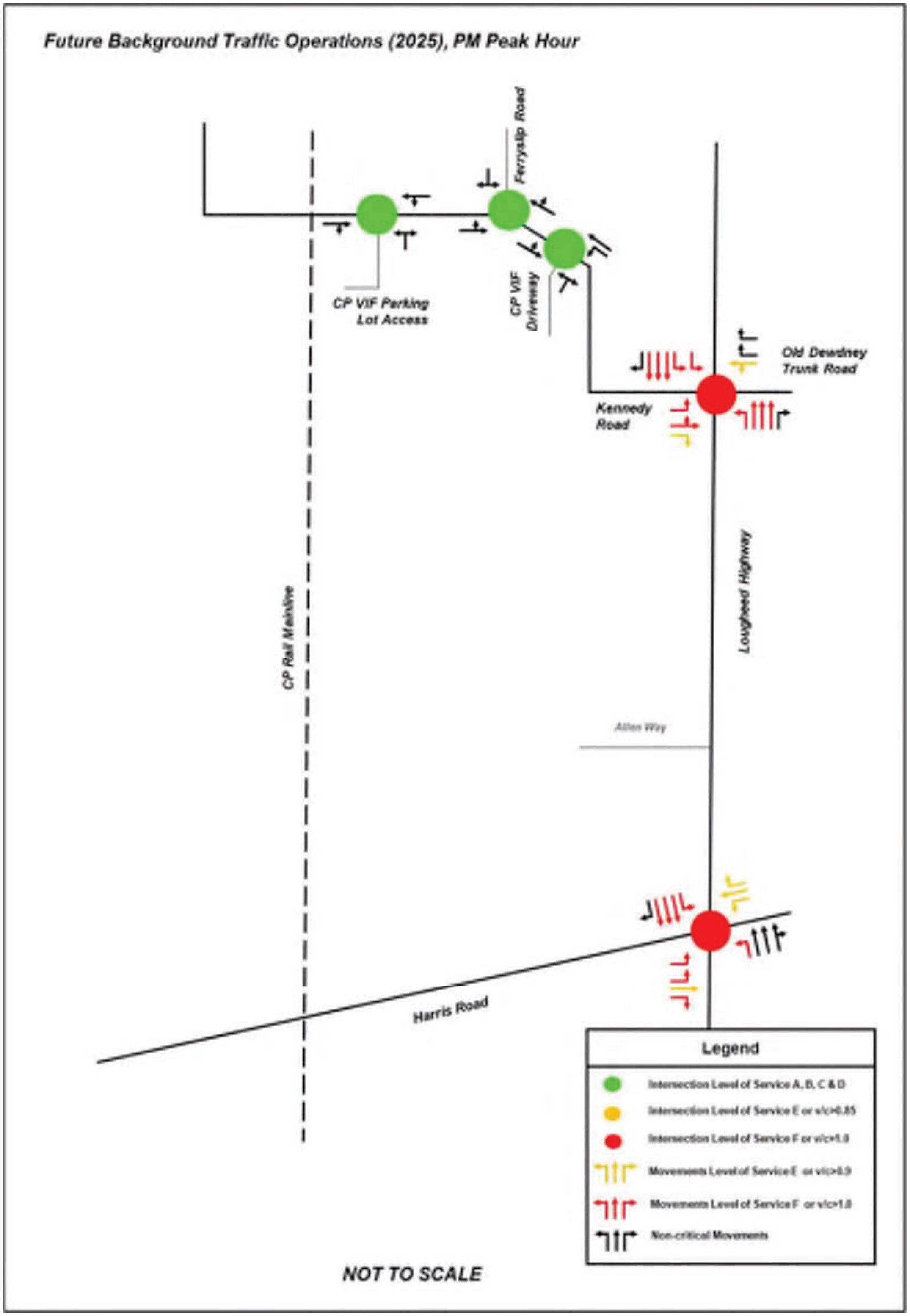
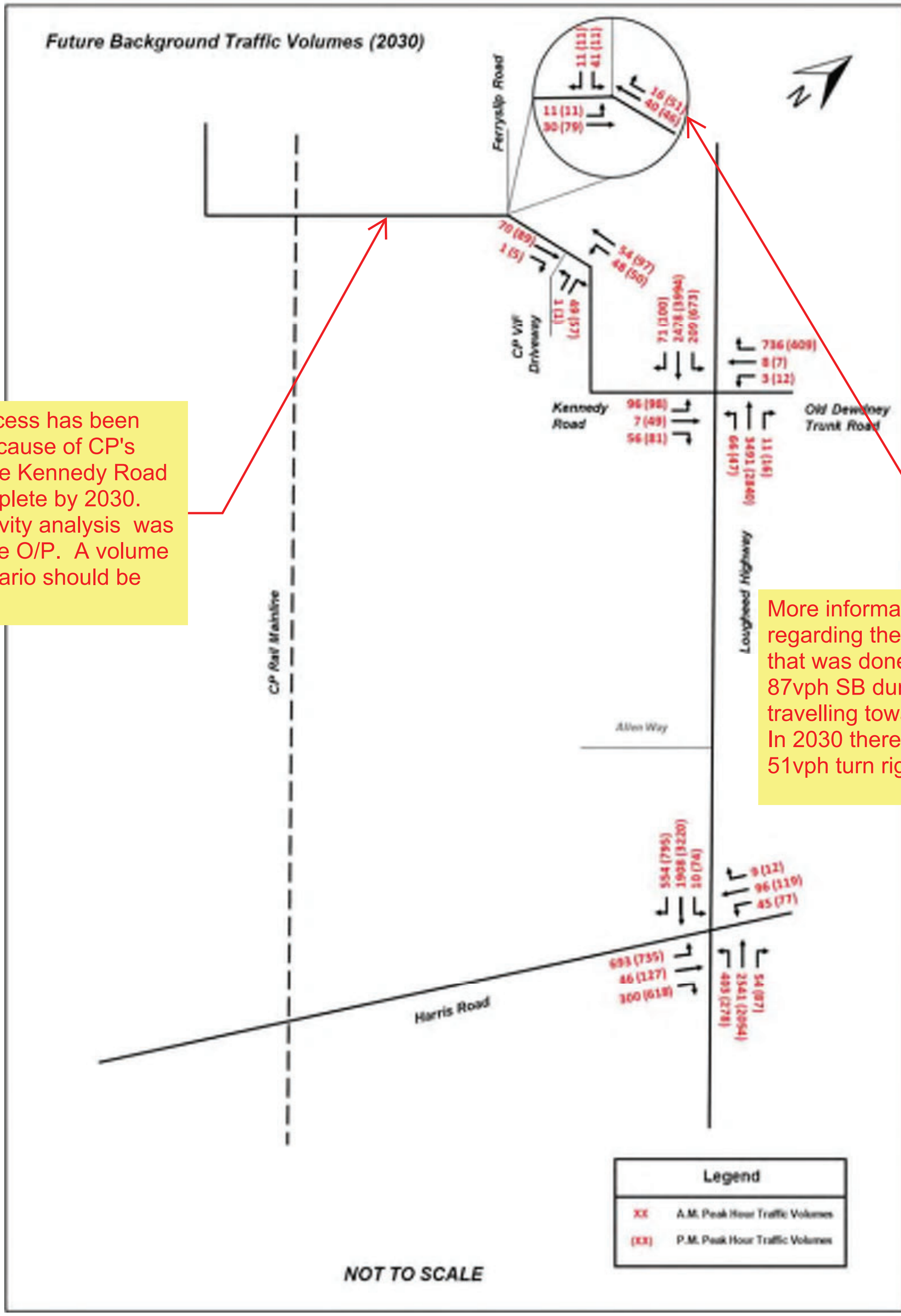



**Figure 3-11: 2025 Background Conditions Traffic Operation during the P.M. peak hour**

### *3.1.3 Full Build-Out Year (2030)*

The traffic volumes used for the analysis of 2030 background conditions are shown in Figure 3-12 and also illustrated in Sketch 9 of Appendix B of this Report.




The parking lot access has been removed, likely because of CP's assumption that the Kennedy Road O/P would be complete by 2030. However, a sensitivity analysis was also run without the O/P. A volume figure for this scenario should be included.

More information is needed regarding the traffic re-distribution that was done. In 2025 there were 87vph SB during the PM peak travelling towards the rail crossing. In 2030 there are only 46vph. 51vph turn right at Ferryslip Rd.

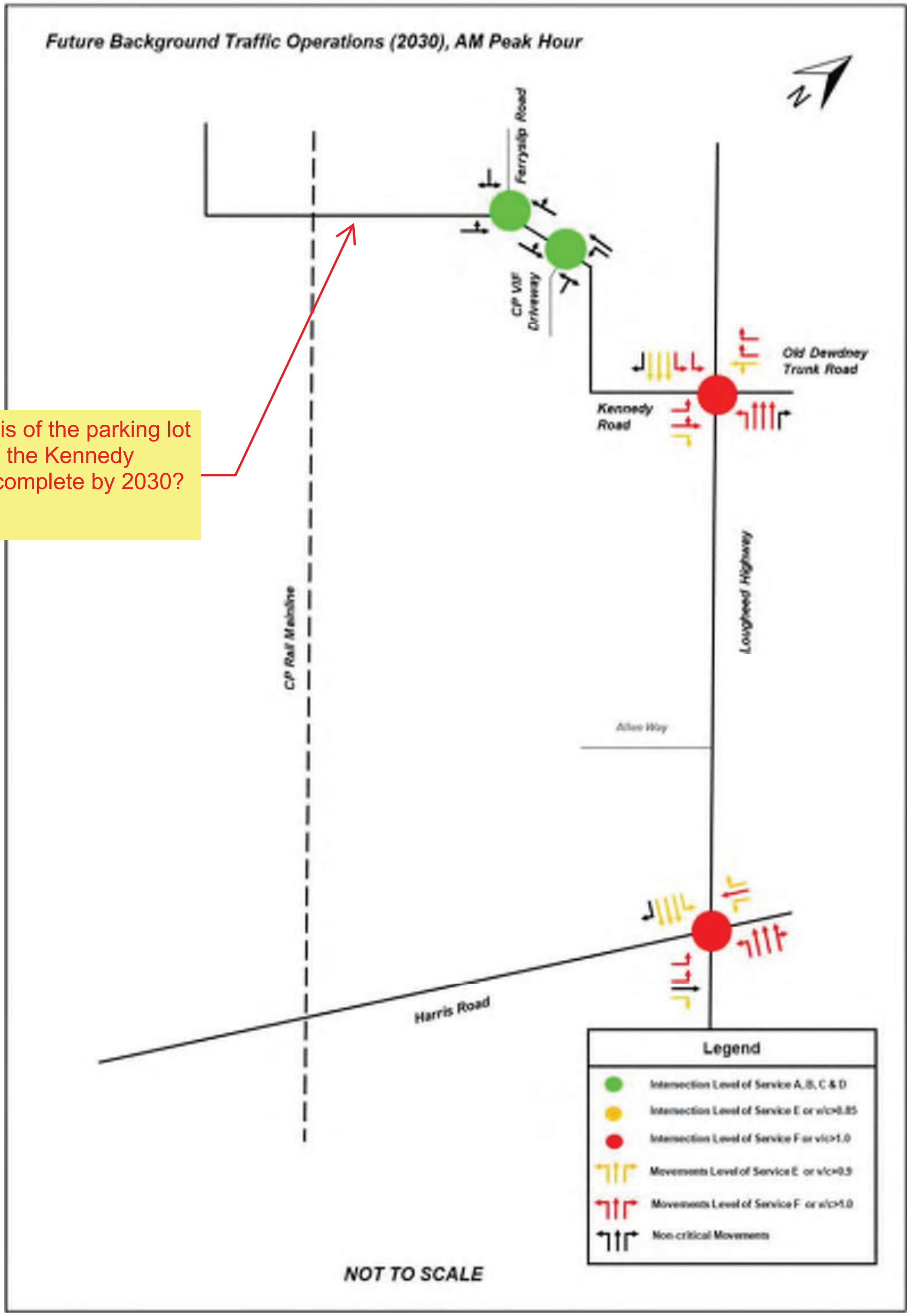
**Figure 3-12: Traffic Volumes for Future Background Conditions (2030)**

Same comment as above "increased delays and continue operating over capacity" doesn't help quantify or visualize the impact of growth. Need to show queuing diagrams.

As discussed in Section 3.1.1.1, timelines for the improvements to the road network in the study area have not been confirmed. Thus, the 2030 road network is assumed to be the same as the road network modelled under 2020 conditions. As discussed in Section 3.1.1.2, the additional site-generated traffic from the proposed GEBP in 2031 has been incorporated into the 2030 background conditions. As some intersections and movements are already operating over or near capacity under existing conditions, increases in background traffic volumes for future scenarios will cause operations at these intersections to worsen by the full build-out year of 2030. The movements that are expected to operate over capacity in the 2030 background conditions (in comparison to the 2025 background conditions) are identified below:

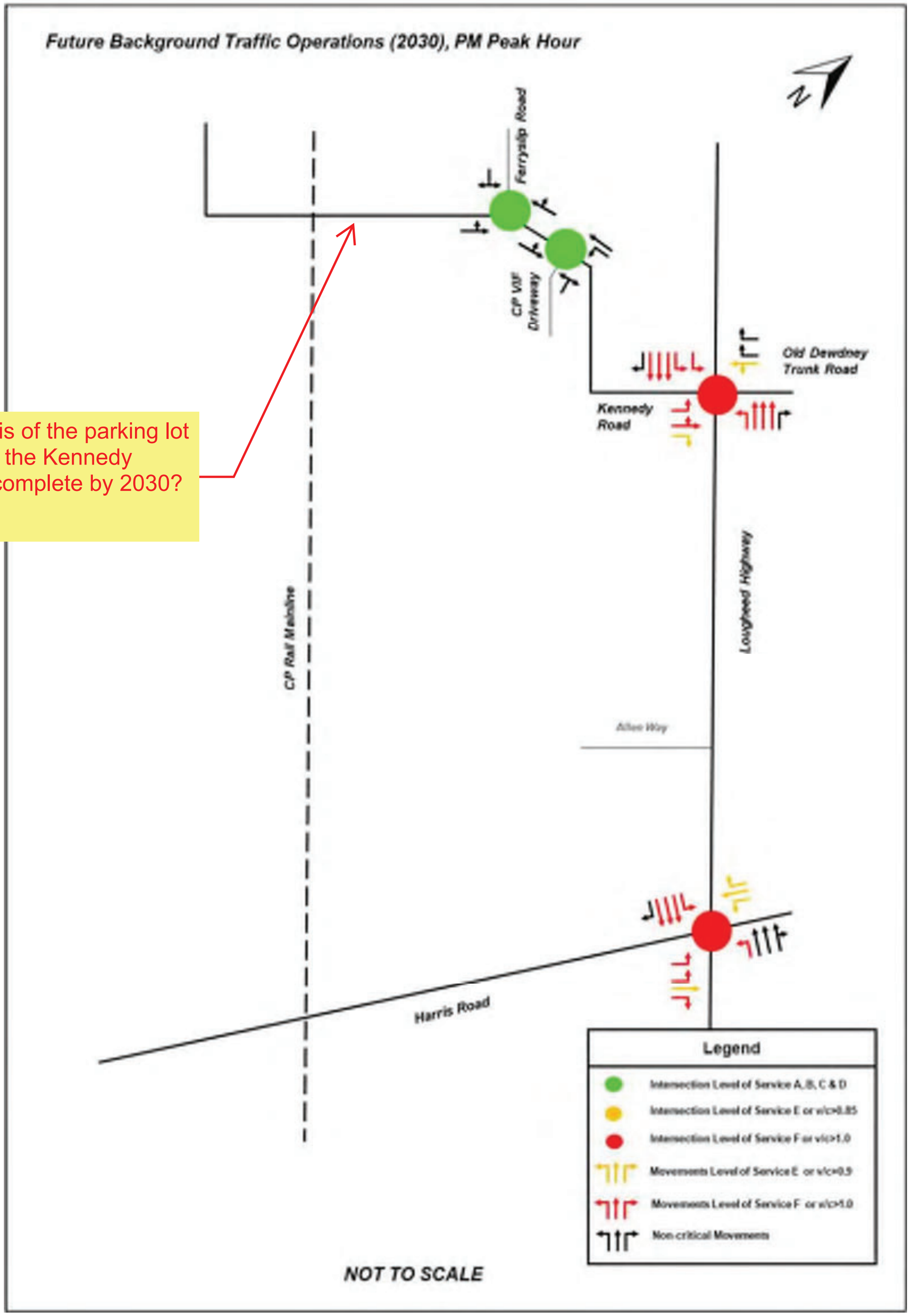
- Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road:
  - The eastbound through movement is expected to operate with increased delays and continue operating over capacity during the P.M. peak hour due to the additional traffic generated from background growth
  - The westbound through movement is expected to operate with increased delays and continue operating over capacity during the A.M. peak hour and the P.M. peak hour due to the additional traffic generated from background growth
  - The southbound right-turn movement is expected to operate with increased delay and continue operating over capacity during the A.M. peak hour due to the additional traffic generated from background growth.
- Lougheed Highway and Harris Road:
  - The eastbound through movement is expected to operate with increased delays and continue operating over capacity during the P.M. peak hour due to the additional traffic generated from background growth
  - The westbound left turn movement is expected to operate with increased delays and continue operating over capacity during the A.M. and P.M. peak hour primarily due to additional traffic generated from the GEBP development
  - The westbound through movement is expected to operate with increased delays and continue operating over capacity during the A.M. peak hour due to the additional traffic generated from background growth
  - The northbound left turn movement is expected to operate with increased delays and begin operating over capacity during the A.M. peak hour and continue operating over capacity during the P.M. peak hour primarily due to additional traffic generated from the GEBP development.
  - The northbound right turn movement is expected to operate with increased delays and continue operating over capacity during the P.M. peak hour primarily due to additional traffic generated from the GEBP development.

Figure 3-13 and Figure 3-14 illustrate the intersection weekday AM and PM peak hour levels of service and display the critical movements for each intersection under future 2030 background conditions. Full tabulated results and the associated Synchro worksheets are included in Appendix E of this Report.




Sensitivity analysis of the parking lot access assuming the Kennedy Road O/P is not complete by 2030?

**Figure 3-13: 2030 Background Conditions Traffic Operation during the A.M. peak hour**

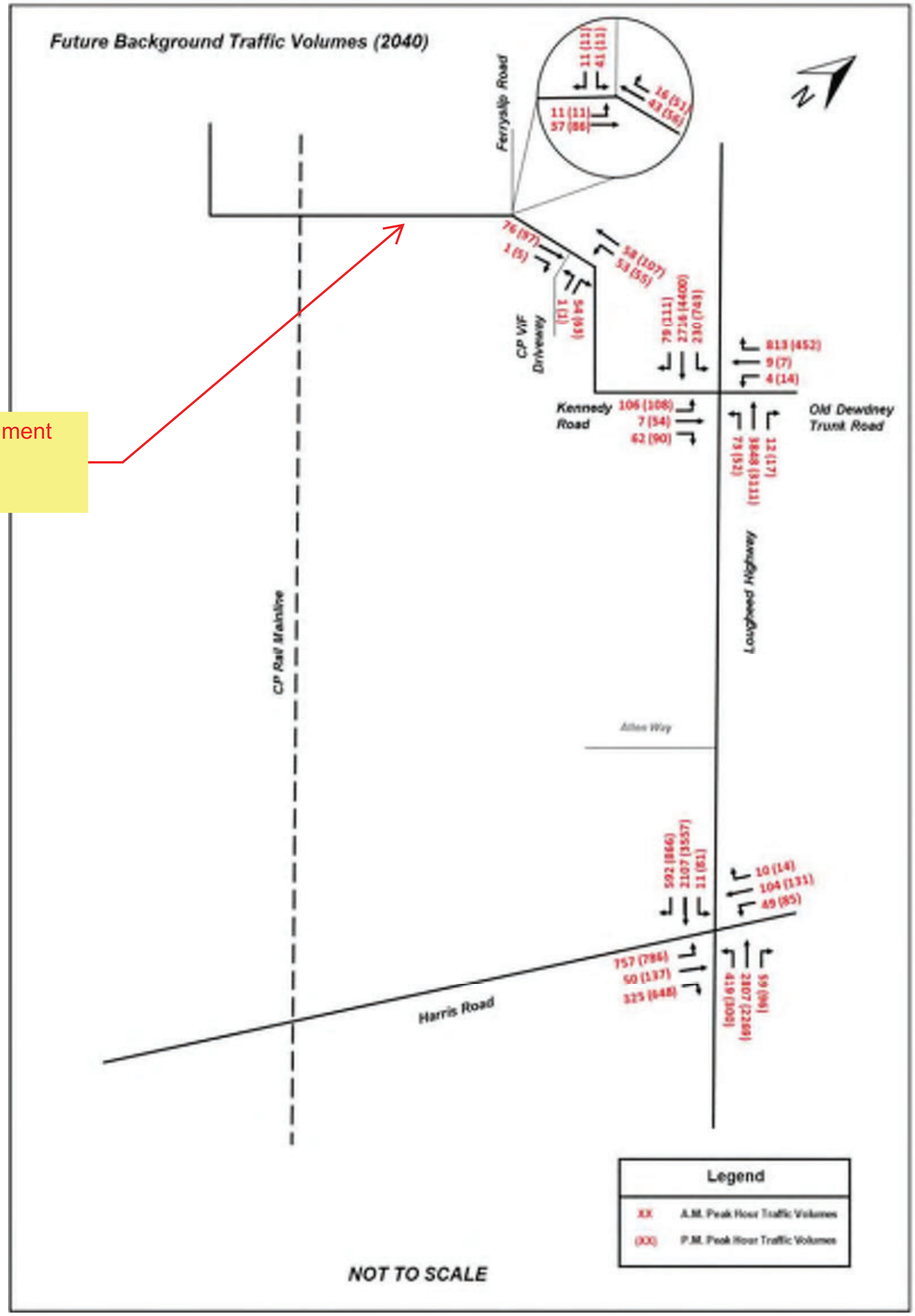



Sensitivity analysis of the parking lot access assuming the Kennedy Road O/P is not complete by 2030?

**Figure 3-14: 2030 Background Conditions Traffic Operation during the P.M. peak hour**

### *3.1.4 10-Year Horizon Year (2040)*

The traffic volumes used for the analysis of 2040 background conditions are shown in Figure 3-15 and also illustrated in Sketch 10 of Appendix B of this Report.




Same comment as 2030.

**Figure 3-15: Traffic Volumes for Future Background Conditions (2040)**

As discussed in Section 3.1.1.1, timelines for the improvements to the road network in the study area have not been confirmed. Thus, the 2040 road network is assumed to be the same as the road network modelled under 2020 conditions. As discussed in Section 3.1.1.2, the additional site-generated traffic from the proposed GEBP in 2031 has been incorporated into the 2040 background conditions. As some intersections and movements are already operating over or near capacity under existing conditions, increases in background traffic volumes for future scenarios will cause operations at these intersections to worsen by 2040. The movements that are expected to operate over capacity in the 2040 background conditions (in comparison to the 2030 background conditions) are identified below:

Need queuing diagram, same as above.

- Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road:
  - The eastbound left turn movement is expected to operate with increased delays and begin operating over capacity during the A.M. and P.M. peak hour due to the additional traffic generated from background growth.
  - The eastbound through movement is expected to operate with increased delays and begin operating over capacity during the A.M. peak hour and continue operating over capacity during the P.M. peak hour due to the additional traffic generated from background growth.
  - The westbound through movement is expected to operate with increased delays and continue operating over capacity during the A.M. and P.M. peak hour due to the additional traffic generated from background growth.
  - The southbound right-turn movement is expected to operate with increased delay and continue operating over capacity during the A.M. peak hour due to the additional traffic generated from the background growth.
- Lougheed Highway and Harris Road:
  - The eastbound through movement is expected to operate with increased delays and begin operating over capacity during the A.M. peak hour and continue operating over capacity during the P.M. peak hour due to the additional traffic generated from background growth.
  - The westbound left turn movement is expected to operate with increased delays and continue operating over capacity during the A.M. and P.M. peak hour primarily due to additional traffic generated from the GEBP development.
  - The westbound through movement is expected to operate with increased delays and continue operating over capacity during the A.M. peak hour due to the additional traffic generated from the background growth.

- The northbound left turn movement is expected to operate with increased delays and continue operating over capacity during the A.M. and P.M. peak hour primarily due to additional traffic generated from the GEBP development.
- The northbound right turn movement is expected to operate with increased delays and continue operating over capacity during the P.M. peak hour primarily due to additional traffic generated from the GEBP development.

The findings of the traffic analysis are consistent with findings of the City of Pitt Meadows TMP which predicts that the Lougheed intersections will operate at LOS F in 2041 without any road upgrades (City of Pitt Meadows, 2014). Figure 3-16 and Figure 3-17 illustrate the intersection weekday AM and PM peak hour levels of service and display the critical movements for each intersection under future 2040 background conditions. Full tabulated results and the associated Synchro worksheets are included in Appendix E of this Report.

Same comment as 2030.

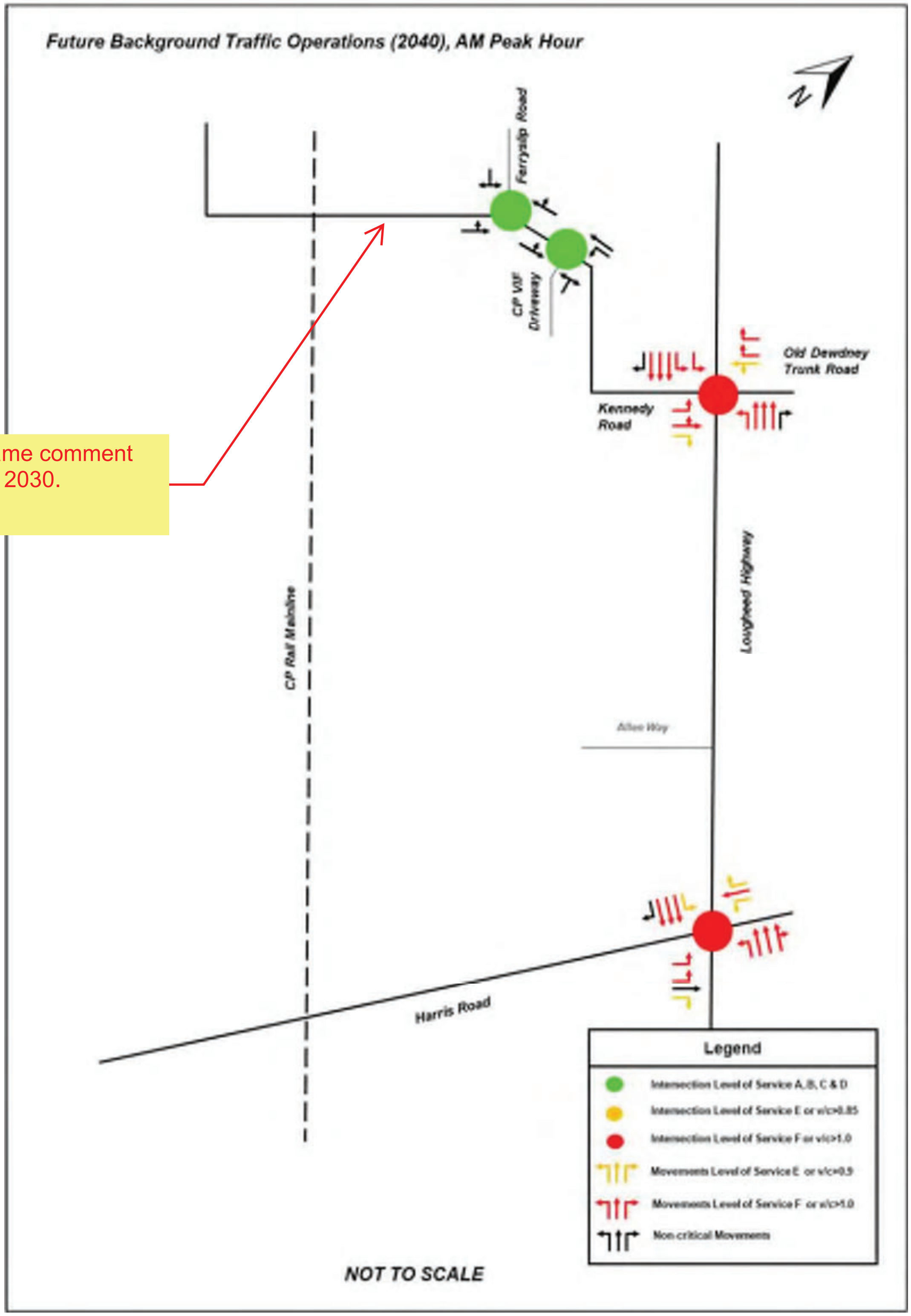
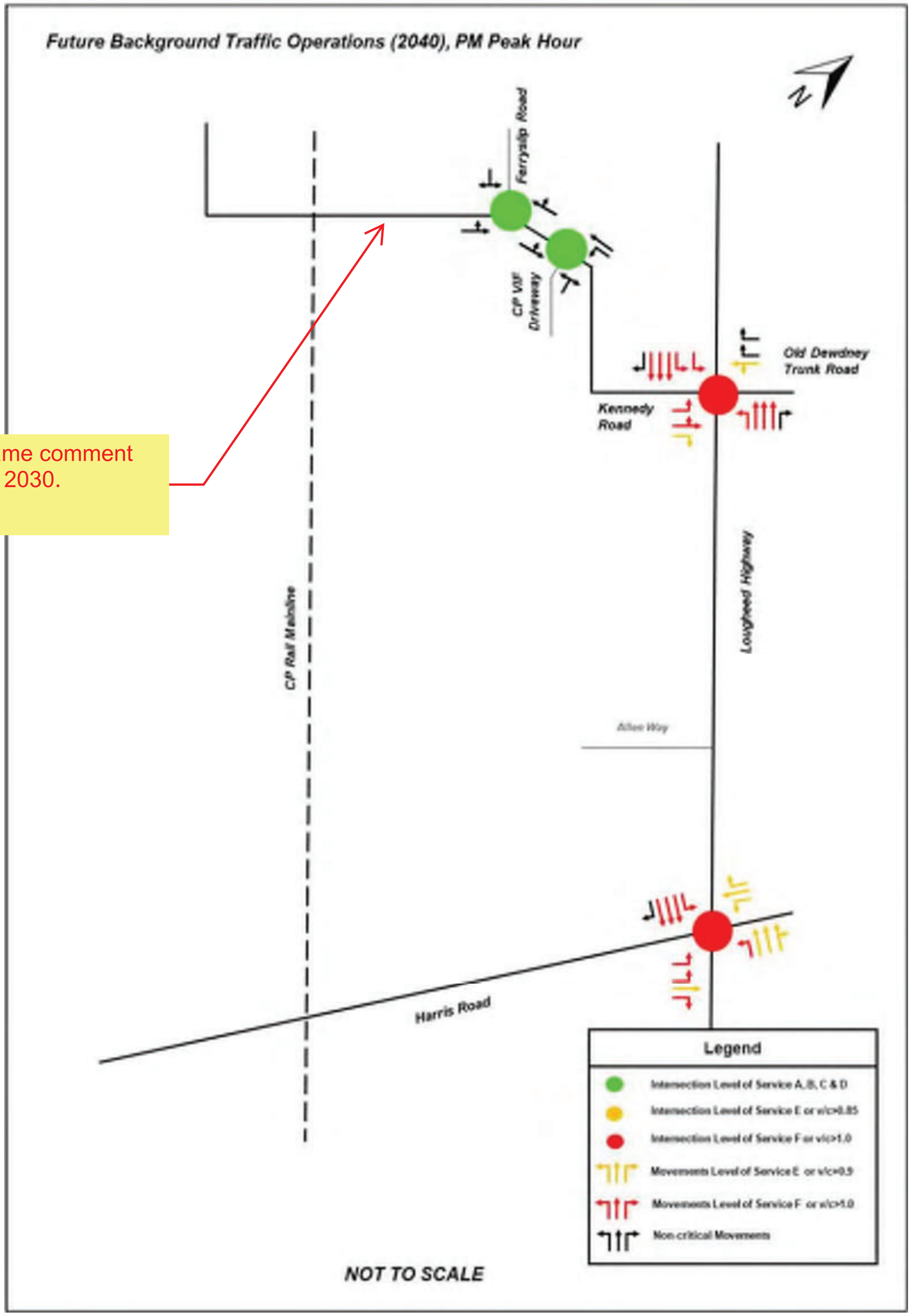



**Figure 3-16: 2040 Background Conditions Traffic Operation during the A.M. peak hour**




Same comment as 2030.

**Figure 3-17: 2040 Background Conditions Traffic Operation during the P.M. peak hour**

### 3.1.5 Impact on Kennedy Road railway crossing

#### 3.1.5.1 Site Preload Program Year (2025)

This section evaluates the impact of background traffic in the 2025 site preload program year on the Kennedy Road railway crossing. As described in Section 2.1.2.5, the railroad crossing was simulated by creating a fictitious signalized intersection with a pretimed traffic signal control type. The queue lengths under the 2025 background conditions were calculated for the following scenarios:

- Scenario 1: Assuming an average rail event duration of 5 minutes with a frequency of 4 rail events per hour for both the A.M. and P.M. peak periods.
- Scenario 2: Assuming a 95th percentile rail event duration of 15 minutes with a frequency of 2 rail events per hour for both the A.M. and P.M. peak periods.

##### 3.1.5.1.1 Scenario 1: 5 minutes Duration

A pretimed signal for the rail crossing was modelled in Synchro where Kennedy Road was closed for 5 minutes during a rail event. A 10-minute gap was assigned between rail events. The 95th percentile queue lengths were determined by averaging the results of five simulation runs using SimTraffic.

The results show that the vehicles experience 95th percentile queues of approximately 50 metres in the northbound direction and 30 meters in the southbound direction during the A.M. peak period, while the vehicles experience 95th percentile queues of approximately 50 metres in the northbound direction and 60 meters in the southbound direction during the P.M. peak period. The simulation shows that the queue clears during the 10-minute gap between the rail events. The queues are not expected to block any accesses in either direction.

Figure 3-18 illustrates the 95th percentile queue lengths during railway events of a duration of 5 minutes. The results of the microsimulation queue length study are shown in Appendix G.

These are the same assumptions as the 2020 existing conditions. However, information from the Vancouver Fraser Port Authority suggests that by 2030, total daily train activity at Kennedy Road (i.e. the time that vehicles are blocked by a crossing) will triple. This will impact the assessment of queue lengths for future horizon years. There will be more crossing events, which could be longer in duration and more closely spaced. Increase in train activity should be accounted for in the TIS.

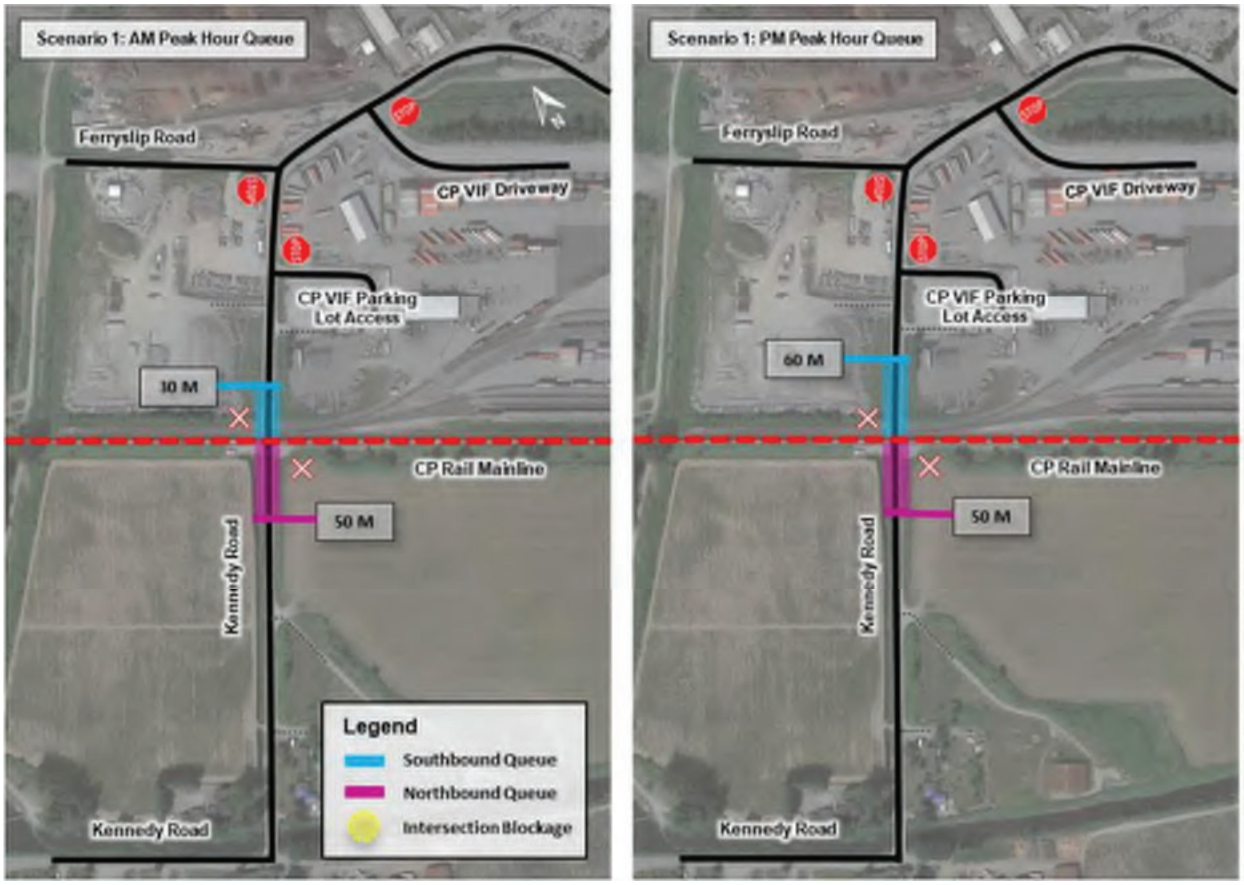



**Figure 3-18: Kennedy Road Rail Crossing Queue Lengths under Background Conditions (2025) for a 5-minute rail event duration**

### 3.1.5.1.2 Scenario 2: 15 minutes Duration

A pretimed signal for the rail crossing was modelled in Synchro where Kennedy Road was closed for 15 minutes during a rail event. A 10-minute gap was assigned between rail events. The 95$^{th}$ percentile queue lengths were determined by averaging the results of five simulation runs using SimTraffic.

The results show that the vehicles experience 95$^{th}$ percentile queues of approximately 140 metres in the northbound direction and 85 meters in the southbound direction during the A.M. peak period, while the vehicles experience 95$^{th}$ percentile queues of approximately 145 metres in the northbound direction and 135 meters in the southbound direction during the P.M. peak period. The simulation shows that the queue clears during the 10-minute gap between the rail events. The northbound queues may impact driveway access to a residential property located on the east side of Kennedy Road during the both the A.M. and P.M. peak periods while the southbound queues may impact access to the CP VIF parking lot located on the east side of Kennedy Road during the P.M. peak period.

Similar comment as before - SB PM volume of 92vph vs NB of 75vph - expect SB queue to be higher.

It should be noted that the northbound queues at the Kennedy Road rail crossing during a long duration event is expected to have negative impacts on the intersection of Lougheed

Highway and Kennedy Road/Old Dewdney Trunk Road. A long duration rail event would lead to a platoon of vehicles arriving at the intersection which would worsen the operation of the northbound movements at the intersection.

Figure 3-19 illustrates the 95th percentile queue lengths during railway events of a duration of 15 minutes. The results of the microsimulation queue length study are shown in Appendix G.

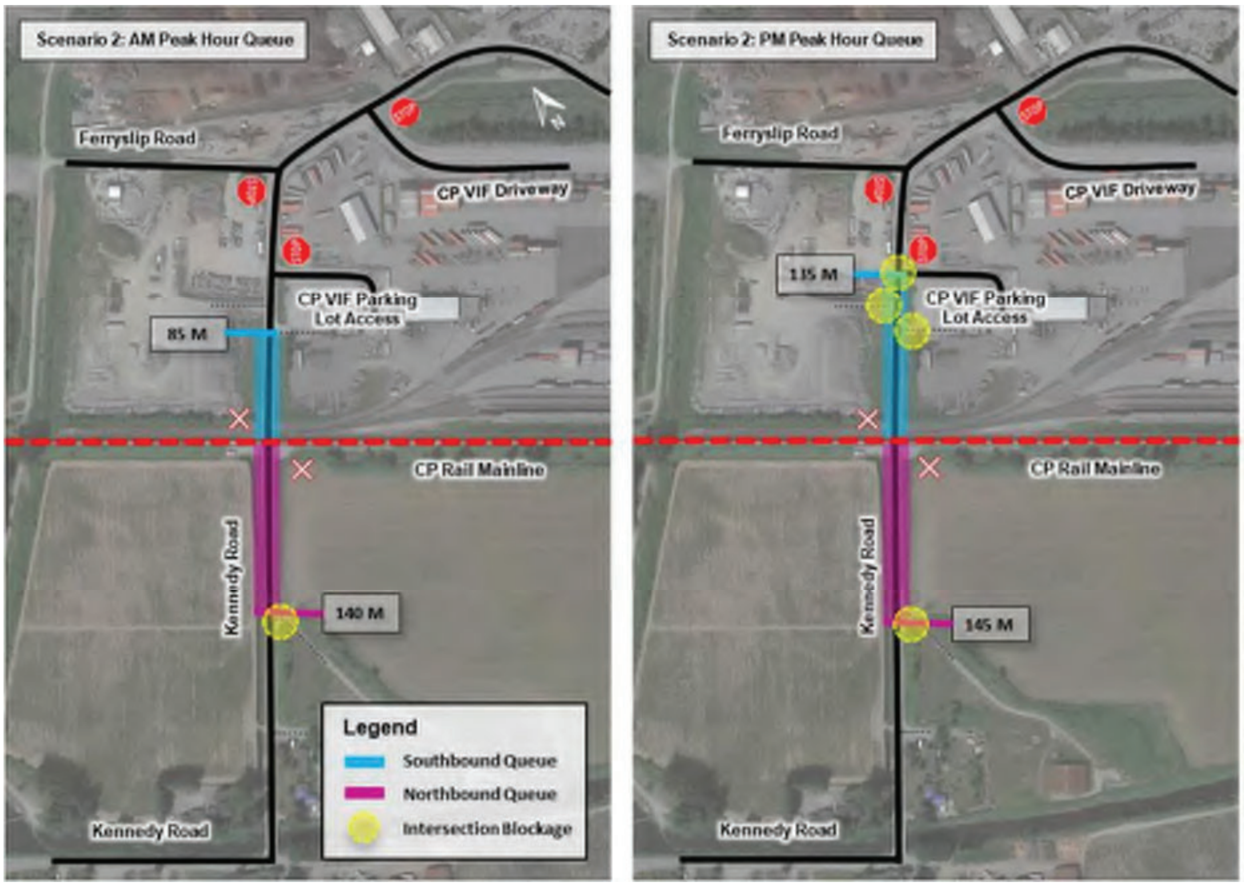



**Figure 3-19: Kennedy Road Rail Crossing Queue Lengths under Background Conditions (2025) for a 15-minute rail event duration**

### 3.1.5.2 *10-Year Horizon Year (2040)*

This section evaluates the impact of background traffic in the 2040 horizon year on the Kennedy Road railway crossing in the event that the implementation of the Kennedy Road Overpass project is delayed. The analysis of the 2040 horizon year is expected to be similar to the 2030 full build-out year since there is expected to be a small difference in the traffic volumes crossing Kennedy Road between the full build-out year and the 10-year horizon. As described in Section 2.1.2.5, the railroad crossing was simulated by creating a fictitious signalized intersection with a pretimed traffic signal control type. The queue lengths under the 2040 background conditions were calculated for the following scenarios:

- Scenario 1: Assuming an average rail event duration of 5 minutes with a frequency of 4 rail events per hour for both the A.M. and P.M. peak periods.
- Scenario 2: Assuming a 95$^{th}$ percentile rail event duration of 15 minutes with a frequency of 2 rail events per hour for both the A.M. and P.M. peak periods.

##### 3.1.5.2.1 Scenario 1: 5 minutes Duration

A pretimed signal for the rail crossing was modelled in Synchro where Kennedy Road was closed for 5 minutes during a rail event. A 10-minute gap was assigned between rail events. The 95$^{th}$ percentile queue lengths were determined by averaging the results of five simulation runs using SimTraffic.

The results show that the vehicles experience 95$^{th}$ percentile queues of approximately 70 metres in the northbound direction and 35 meters in the southbound direction during the A.M. peak period, while the vehicles experience 95$^{th}$ percentile queues of approximately 65 metres in the northbound and the southbound direction during the P.M. peak period. The simulation shows that the queue clears during the 10-minute gap between the rail events. The queues are not expected to block any accesses in either direction.

Figure 3-20 illustrates the 95$^{th}$ percentile queue lengths during railway events of a duration of 5 minutes. The results of the microsimulation queue length study are shown in Appendix G.

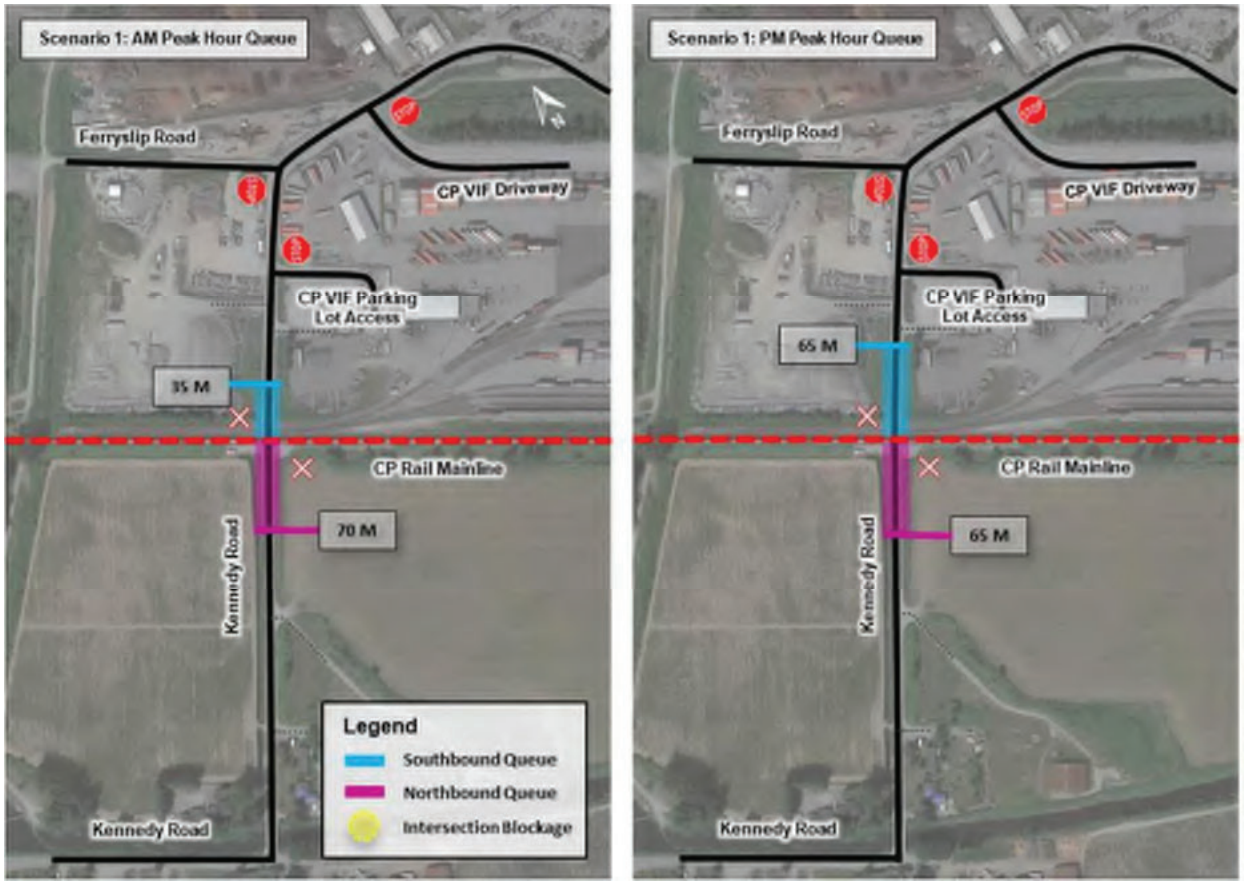



**Figure 3-20: Kennedy Road Rail Crossing Queue Lengths under Background Conditions (2040) for a 5-minute rail event duration**

#### 3.1.5.2.2 Scenario 2: 15 minutes Duration

A pretimed signal for the rail crossing was modelled in Synchro where Kennedy Road was closed for 15 minutes during a rail event. A 10-minute gap was assigned between rail events. The 95$^{th}$ percentile queue lengths were determined by averaging the results of five simulation runs using SimTraffic.

The results show that the vehicles experience 95$^{th}$ percentile queues of approximately 165 metres in the northbound direction and 95 meters in the southbound direction during the A.M. peak period, while the vehicles experience 95$^{th}$ percentile queues of approximately 200 metres in the northbound direction and 150 meters in the southbound direction during the P.M. peak period. The simulation shows that the queue clears during the 10-minute gap between the rail events. The northbound queues may impact driveway access to a residential property located on the east side of Kennedy Road during the both the A.M. and P.M. peak periods while the southbound queues may impact access to the CP VIF parking lot located on the east side of Kennedy Road during both the A.M. and P.M. peak periods.

It should be noted that the northbound queues at the Kennedy Road rail crossing during a long duration event is expected to have negative impacts on the intersection of Lougheed

Highway and Kennedy Road/Old Dewdney Trunk Road. A long duration rail event would lead to a platoon of vehicles arriving at the intersection which would worsen the operation of the northbound movements at the intersection.

Figure 3-21 illustrates the 95th percentile queue lengths during railway events of a duration of 15 minutes. The results of the microsimulation queue length study are shown in Appendix G.

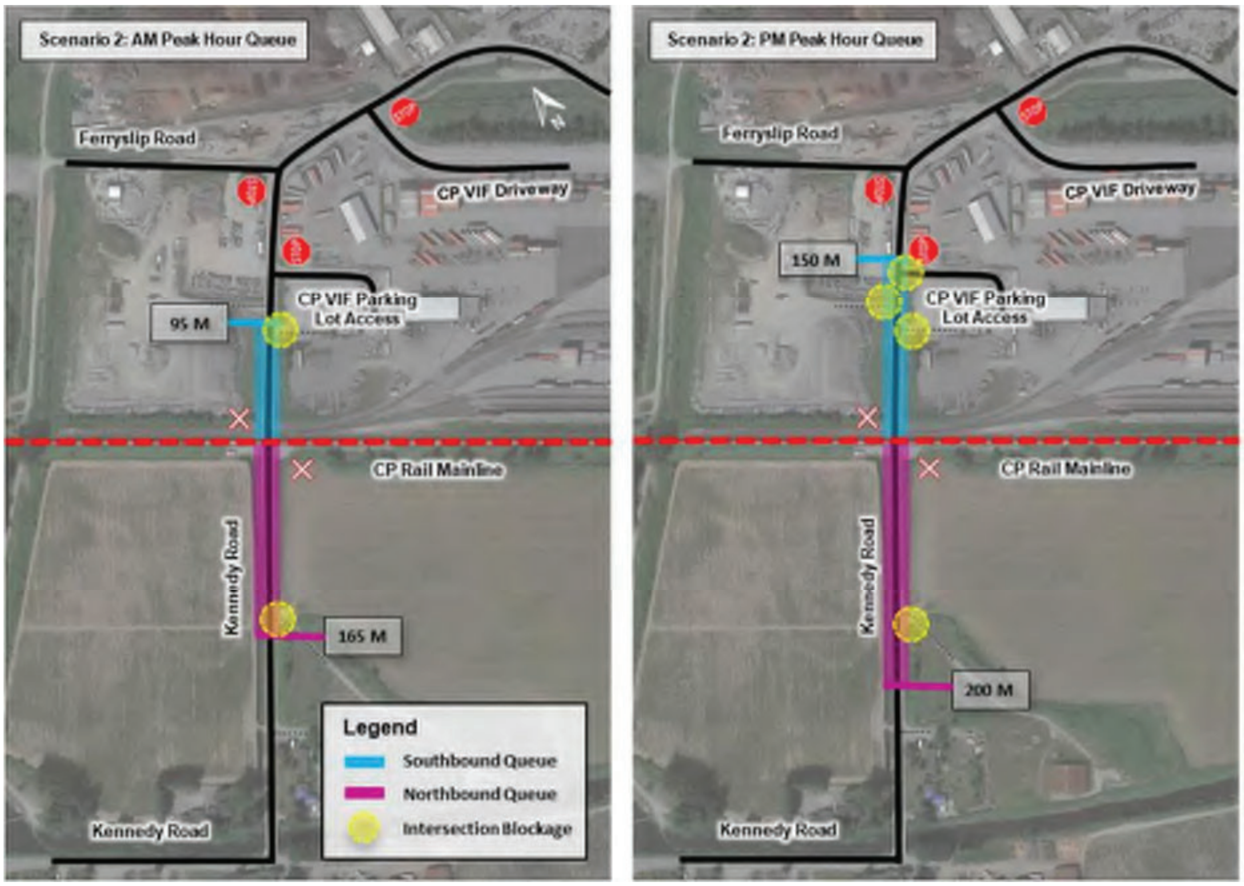



**Figure 3-21: Kennedy Road Rail Crossing Queue Lengths under Background Conditions (2040) for a 15-minute rail event duration**

## 3.2 Active Transportation Conditions

The City of Pitt Meadows is planning to support active transportation through the enhancement of network connectivity and increased safety measures throughout the city, including within the study area. The City of Pitt Meadows Pedestrian and Cycling Master Plan has identified the following improvements to the pedestrian and cycling network:

- The City of Pitt Meadows has established that all pedestrian crossings at signalized intersections should have the following treatments: pedestrian-activated pushbuttons, pedestrian countdown timers, audible pedestrian signals, and bollards. The intersection of Harris Road and Lougheed Highway is recommended to be equipped with pedestrian countdown timers and audible pedestrian signals.
- The intersection of Harris Road and Lougheed Highway was identified as a dangerous crossing for cyclists. Collaborative efforts between the City, MOTI and CP Rail to address these concerns is recommended. Additionally, it is recommended that a pedestrian/bicycle overpass be built over Lougheed Highway.

What about the marked crossing on Kennedy Rd?

The timeline for these improvements to the active transportation network within the study area is unclear at the time of this analysis and were not considered in the analysis of the future background conditions (City of Pitt Meadows, 2012).

What about growth in transit ridership, and impacts to service utilization and service levels?

## 3.3 Transit Conditions

The City of Pitt Meadows TMP defines three key action areas of improvement for transit within the study area (City of Pitt Meadows, 2014):

- Enhance bus service and frequency
- Improve regional connections
- Improve customer experience.

It already exists. The R3 rapidbus already provides this connection.

The TMP has identified the following strategies to enhance bus service and frequency during both peak and off-peak periods:

- **Establishing a frequent transit connection between Pitt Meadows and the proposed Evergreen Line**. The Evergreen Line will provide a direct rapid transit link from Coquitlam to Vancouver, thus, the provision of a connection between Pitt Meadows and the Evergreen Line Station will allow passengers to seamlessly connect to the Line, increasing the appeal of transit for intercity travel.
- **Maintaining the Frequent Transit Network routing in the City**. Currently, Harris Road and Hammond Road are designated as part of the FTN route. The TMP recommends the maintenance as well as the exploration of expanding the FTN route into the City's core to support the on-going development of that area. Additionally, it is recommended that TransLink explore the feasibility of designating the proposed North Lougheed Connector as an FTN route.

- **Supporting changes that aim to enhance service and connections in Pitt Meadows**. TransLink undertakes an annual service optimization review in which resources on transit routes with low productivity are reallocated to those with higher demand. The TMP recommends that the City of Pitt Meadows collaborate with TransLink to review areas in the City of Pitt Meadows that have an increased demand for transit and to improve service quality in those areas to increase the attractiveness of taking transit.
- **Improving periods of operation**. The TMP recommends TransLink consider expanding the operation period for non-FTN routes in Pitt Meadows to be able to meet passenger demand during non-peak times. Transit routes should be promoted to run all-day/every day to ensure that passengers can access destinations through transit at any time.

It should be noted that TransLink has launched the R3 Rapidbus in 2020 which travels along Lougheed Highway connecting the City of Port Coquitlam, City of Pitt Meadows, and City of Maple Ridge. The implementation of this route helps meet the TMP's goal of enhancing the bus service and frequency in the City of Pitt Meadows.

The TMP has identified the following strategies to improve regional connections and promote intercity travel to and from the City of Pitt Meadows through the use of transit:

- **Encouraging TransLink to expand the West Coast Express service to off-peak periods**. At present, the West Coast Express line that runs through the City of Pitt Meadows is a peak-hour, peak-direction only commuter rail. It is recommended to increase service on the West Coast Express to include additional peak-period service and off-peak service including additional mid-day, evening, and weekend service, and reverse peak service.
- **Working with the BC MOTI to establish and enhance transit priority along Lougheed Highway.** Currently, Lougheed Highway has HOV Lanes in both directions. It is recommended that the City of Pitt Meadows work with the province for the implementation of transit priority measures along Lougheed Highway such as enhanced bus shoulder lanes, transit signal priority measures, and queue jump lanes.

The TMP has identified the following strategies to improve the customer experience to enhance the attractiveness, safety, and comfort of transit to potential passengers:

- **Ensuring all FTN bus stops have amenities.** Approximately 23% of bus stops in the City of Pitt Meadows are equipped with shelters and benches. It is recommended that all bus stops along FTN corridors are provided with seating, shelter, and customer information. A suggested prioritization schedule for bus stop amenity improvements in order of importance includes:
  - Bus stops along FTN corridors
  - Bus stops near key existing or future employment areas
  - Bus stops servicing residential growth areas.

- **Improving the accessibility of transit routes.** The TMP recommends that the City of Pitt Meadows work with TransLink to provide residents with disabilities and seniors with access to TransLink's Access Transit program which includes bus training, orientation sessions, and one-on-one sessions about the transit system's accessibility features.
- **Provision of enhanced customer support.** The TMP recommends providing better customer support to passengers such as providing information on the City's website about transit and travel planning, real-time mobile applications, real-time transit information signs showing the next bus's time of arrival, customer outreach, and specialized training for passengers and staff to ensure transit system accessibility.
- **Developing transit wayfinding measures.** Currently, TransLink provides an online trip planner and mobile application that enables customers to plan their transit trips. Additional strategies to improve wayfinding in the City of Pitt Meadows include improved on-street signage to key transit areas and major stations and for TransLink to provide additional transit information at bus stops such as route maps and schedules at all FTN stops.

The action areas and corresponding strategies recommended by the City of Pitt Meadows TMP do not provide any concrete plans or timelines for implementation. However, the eventual execution of these strategies would greatly benefit the road network in the future.

# 4. Site Preload Program Traffic Generation

The following section describes the methodology for the truck traffic generation during the site preload program. The following two options have been proposed for the supply and placement of preload material:

- Option 1: all the preload material will be supplied by trucks.
- Option 2: 50% of preload material will be supplied utilizing hydraulic dredging and 50% will be supplied by trucks.

Assuming a 10-hour day and a 6 day working week, Option 1 is expected to start in 2023 and be completed in 2025 while Option 2 is expected to start in 2023 and be completed in 2024. Assuming a 14-hour day and a 7 day working week, both Option 1 and Option 2 are expected to start in 2023 and be completed in 2024 (Golder Associates Ltd., 2021). For the purposes of this analysis, a horizon year of 2025 was selected to represent the worst-case scenario. It was assumed the Kennedy Road Overpass will not be completed during the site preload program. In addition, it is assumed that the construction of the Kennedy Road Overpass will not coincide with the site preload program.

It should be noted that although the overall duration of the site preload program is expected to be shorter for Option 2, the rate of supply of preload material by trucks per day is expected to be identical for both options.

The staging access locations are expected to be located on Kennedy Road, south of the rail crossing. It is expected that the preload for the area east of Kennedy Road and north of Katzie Slough will be completed first. The existing driveway to a residential property east of Kennedy Road is proposed to be the staging access location for the preload works in this area. An access just west of the Kennedy Road bend is proposed to be provided for the preload works in the area south of the Katzie Slough. The staging area locations are shown in Figure 4-1.


**Figure 4-1: Staging Access Locations**

## 4.1 Trip Generation

Assuming a 10-hour day and a 6 day working week, it was estimated that approximately 5000 $m^3$ of preload placement would be required per day. A total of 272 trucks were estimated to be required per day to deliver the preload material to site for both options (Golder Associates Ltd., 2021). The preload materials are expected to be distributed evenly with trucks entering and leaving the facility uniformly throughout the day (10 hours/day). Therefore, a conversion factor of 10 percent was used to convert the daily trucks to A.M. and P.M. peak hour trips. For the purposes of a conservative analysis, it was assumed that the inbound and outbound truck trips are equal and occur during the same hour. This translates to 56 truck trips with 28 trucks entering and 28 trucks exiting the staging area during each of the A.M. and P.M. peak hour.

An estimate was also conducted assuming a work schedule of 14-hour day and a 7 day working week. In this scenario, a total of 380 trucks would be required per day to deliver 7000 $m^3$ of preload material to site for both options (Golder Associates Ltd., 2021). The preload materials are expected to be distributed evenly with trucks entering and leaving the facility uniformly throughout the day (14 hours/day). Therefore, a conversion factor of 7.2 percent was used to convert the daily trucks to A.M. and P.M. peak hour trips. This would also translate to 56 truck trips generated during each of the A.M. and P.M. peak hour.

## 4.2 Trip Distribution and Assignment

The trips were distributed based on the potential origin/destinations for the construction trucks. The following trip distribution pattern was applied:

- 50% of trucks were assumed to travel to/from the staging access on Kennedy Road from north of Lougheed Highway. These trucks are expected to utilize Old Dewdney Trunk Road to enter and exit the preload staging area.
- 50% of trucks were assumed to travel to/from the staging access on Kennedy Road from east of Harris Road. These trucks are expected to utilize Lougheed Highway to enter and exit the preload staging area.

It should be noted that Harris Road, south of Lougheed Highway prohibits heavy vehicle usage. Hence, the truck trips are not anticipated to increase traffic on Harris Road.

The trip assignment was developed by choosing the most logical route for vehicles in order to minimize travel time and distance. A schematic of the trip distribution and assignment for the construction trucks is illustrated in Figure 4-2.

Would expect a higher proportion using Lougheed Highway since ODTR only provides access to residential and agricultural areas.


Surely some trucks would use the Pitt River Bridge to provide site preload? Does Golder have insight into locations of preload suppliers?

**Figure 4-2: Truck Trip Distribution during the Site Preload Program**

# 5. Site Preload Program Impact Assessment

The site preload program is anticipated to generate a total of approximately 56 bi-directional trips (100 percent truck trips) in the A.M. peak hour and the P.M. peak hour. The trip volumes generated by the facility are shown in Figure 5-1 and also illustrated in Sketch 11 of Appendix B of this Report. The impact of these trips on the local road network is assessed in the following sections.

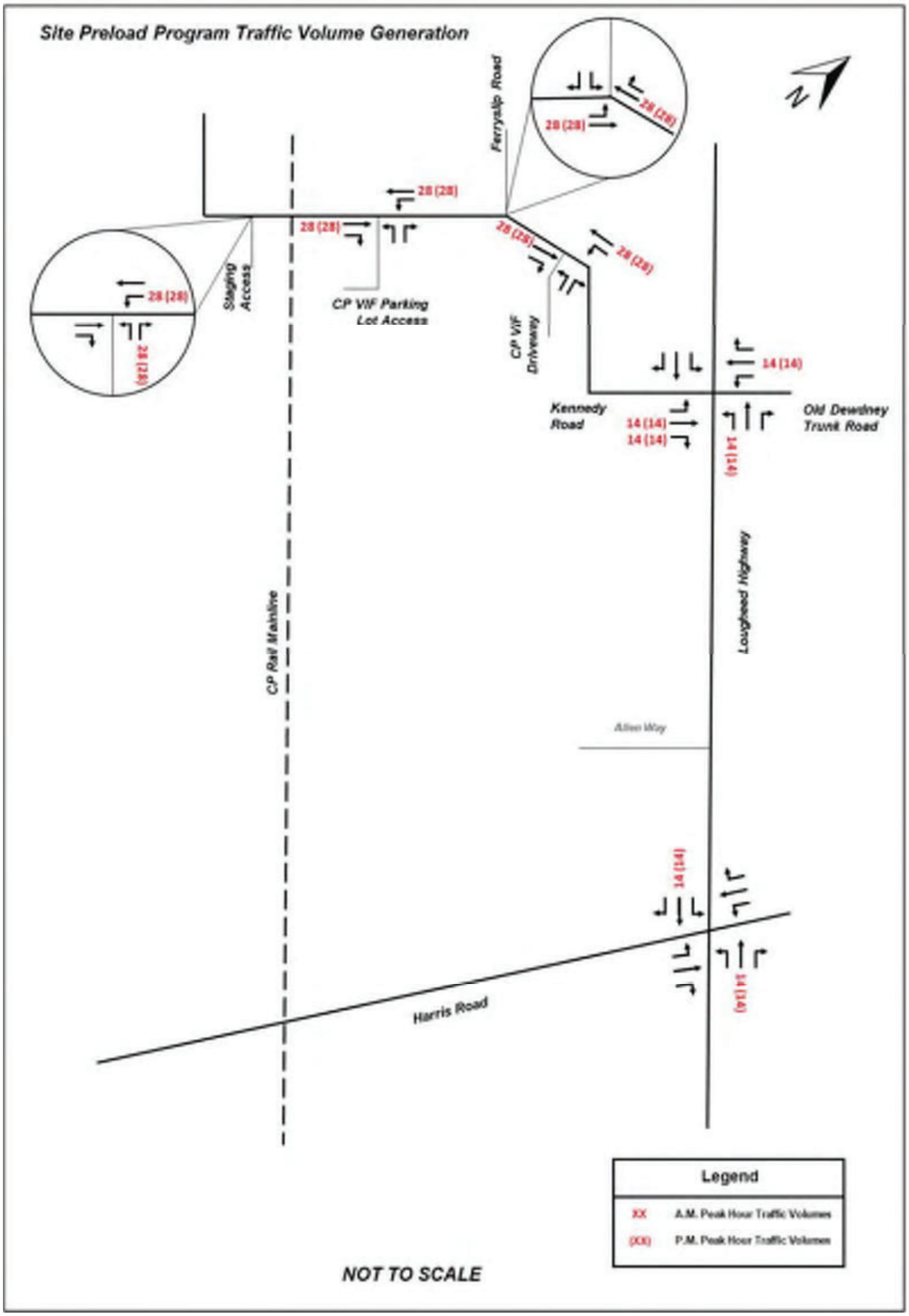


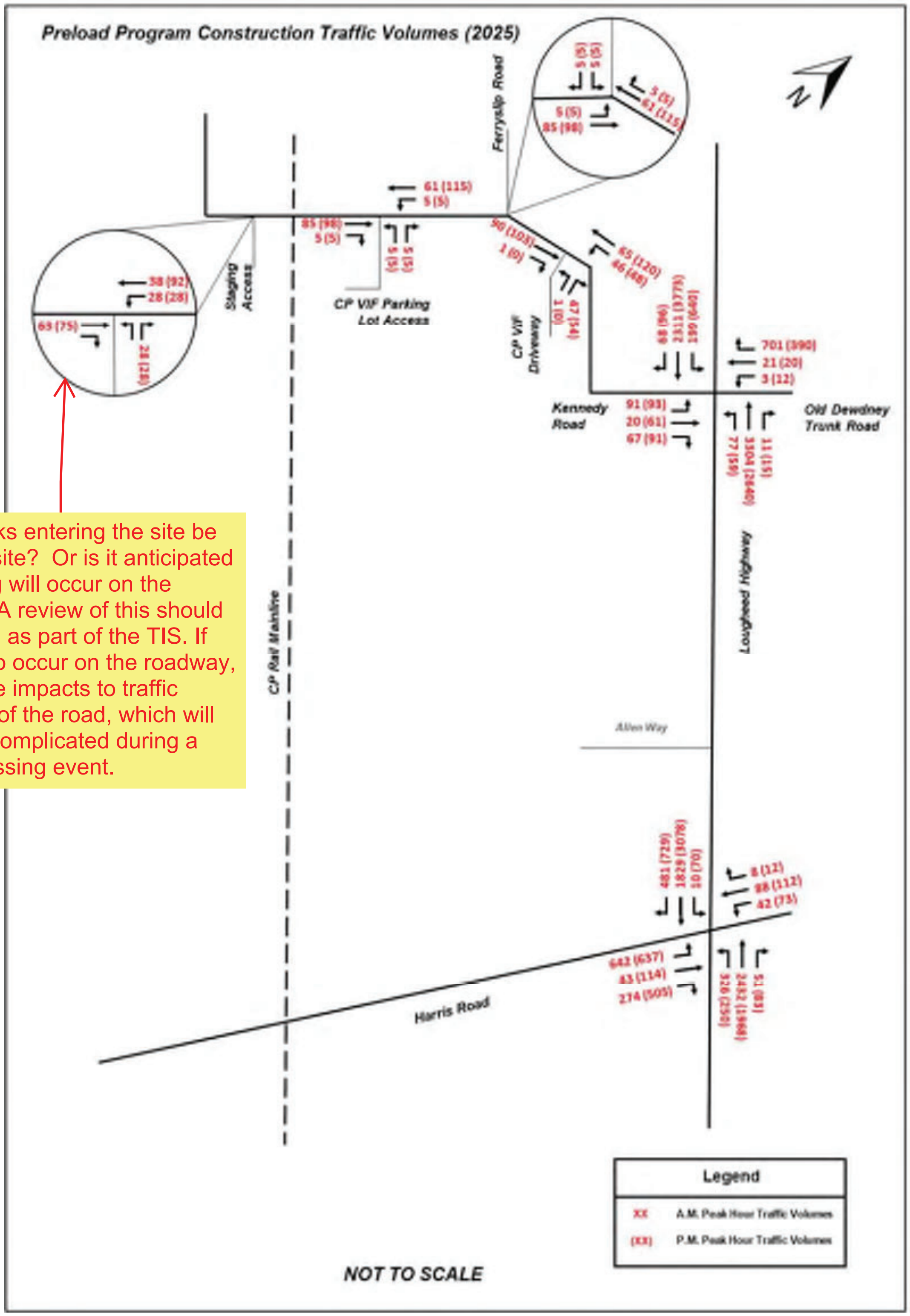

**Figure 5-1: Site Preload Program Traffic Volume Generation**

## 5.1 Traffic Assessment

### *5.1.1 Site Preload Program Year Traffic Operations (2025)*

The traffic volumes used for the analysis of 2025 site preload construction conditions are shown in Figure 5-2 and also illustrated in Sketch 12 of Appendix B of this Report.

Were heavy vehicle auto equivalence factors applied to account for larger and slower vehicles?




Will all trucks entering the site be staged on site? Or is it anticipated that staging will occur on the roadway? A review of this should be included as part of the TIS. If staging is to occur on the roadway, there will be impacts to traffic operations of the road, which will be further complicated during a railway crossing event.

**Figure 5-2: Preload Program Construction Traffic Volumes (2025)**

Should measure this using the auto equivalence factors for heavy vehicles.



The intersections in the study area perform almost identically to the background conditions and no additional critical movements have been identified following the addition of the construction traffic. This is due to the small number of trips generated by the preload program in relation to the background traffic on Lougheed Highway, as shown in Table 5-1.

**Table 5-1: Percent contribution from the construction traffic in 2025 on Lougheed Highway**

| Midblock Section | Bi-directional Volumes | | Percent Contribution (AM/PM) |
|---|---|---|---|
| | Generated during the preload program (AM/PM) | Total (AM/PM) | |
| Lougheed Highway west of Kennedy Road/Old Dewdney Trunk Road | 0/0 | 6,675 / 7,635 | 0.0%/0.0% |
| Lougheed Highway between Kennedy Road/Old Dewdney Trunk Road and Harris Road | 30/30 | 5,590 / 6,545 | 0.5%/0.5% |
| Lougheed Highway east of Harris Road | 30/30 | 4,955 / 5,960 | 0.6%/0.5% |

The impact of the traffic volumes generated by the site preload program on the operation of signalized intersections is described below:

Were optimized timing plans used? 2025 is only 3 years away and existing timing plans should have been used for analysis.

- Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road:
  - The westbound left turn movement: There are approximately 14 additional trucks during the A.M. peak hour and the P.M. peak hour expected to utilize this movement to enter the facility. The additional traffic is expected to cause this movement to operate with increased delays during the A.M. peak hour and the P.M. peak hour. However, this movement is expected to operate below capacity during both the peak hours.
  - The northbound through and right turn movements: There are approximately 14 additional trucks during the A.M. peak hour and the P.M. peak hour expected to utilize each movement to exit the facility. The additional traffic is expected to cause this movement to operate with increased delays during the A.M. and P.M. peak hour. However, this movement is expected to operate below capacity during both the peak hours.
  - The southbound through movement: There are approximately 14 additional trucks during the A.M. peak hour and the P.M. peak hour expected to utilize this movement to enter the facility. The additional traffic is expected to cause this movement to operate with increased delays during the A.M. peak hour and the P.M. peak hour.

However, this movement is expected to operate below capacity during both the peak hours.

- Lougheed Highway and Harris Road:
  - The eastbound through movement: There are approximately 14 additional trucks during the A.M. peak hour and the P.M. peak hour expected to utilize this movement to exit the facility. The additional traffic is anticipated to cause minimal increase in delay due to the high background traffic that is expected for this movement.
  - The westbound through movement: There are approximately 14 additional trucks during the A.M. peak hour and the P.M. peak hour expected to utilize this movement to enter the facility. The additional traffic is anticipated to cause minimal increase in delay due to the high background traffic that is expected for this movement.

Figure 5-3 and Figure 5-4 present the intersection weekday AM and PM peak hour levels of service and display the critical movements for each intersection under the 2025 preload program construction conditions. Full tabulated results and the associated Synchro worksheets are included in Appendix F of this Report.

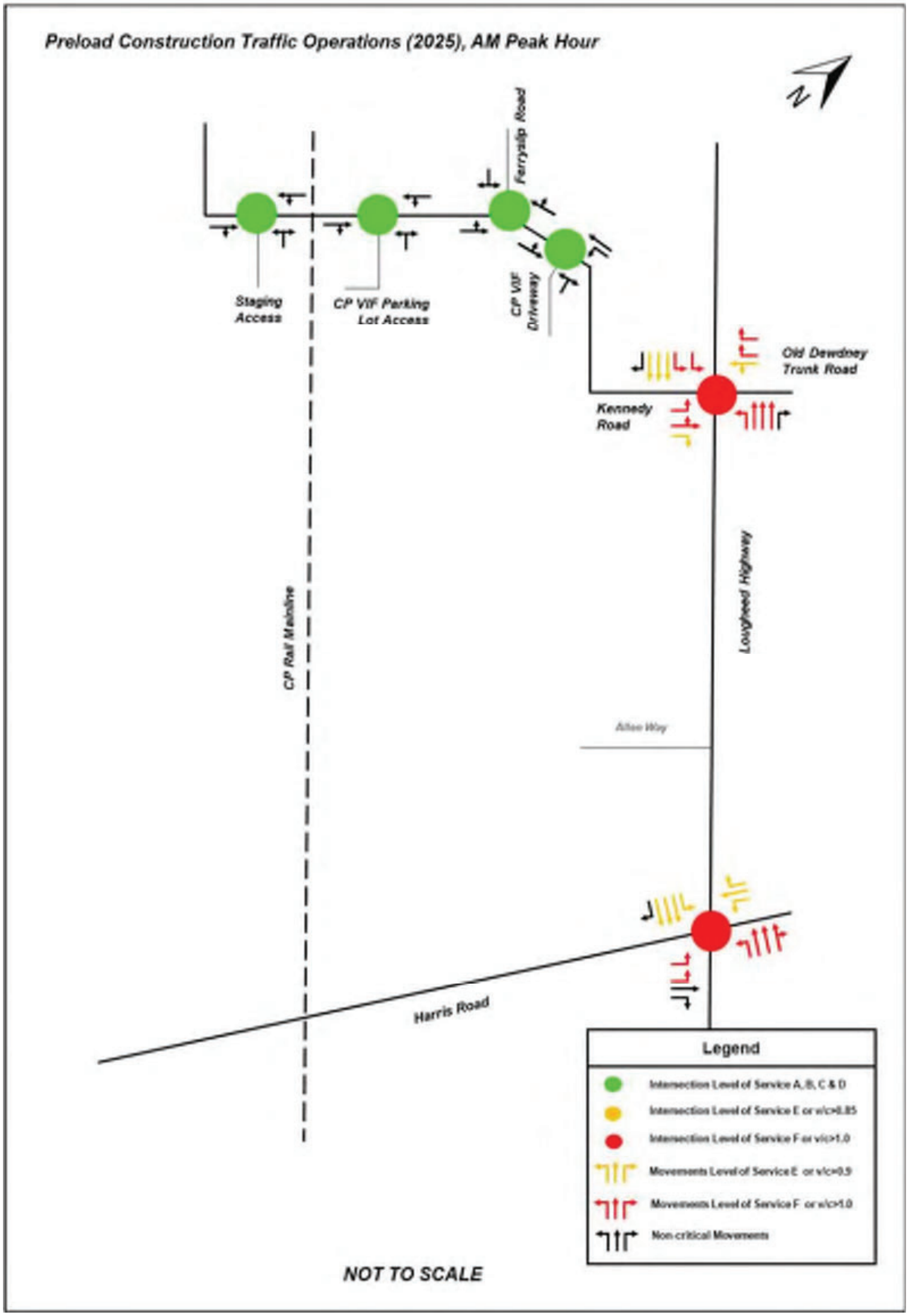



**Figure 5-3: 2025 Preload Construction Conditions Traffic Operation during the A.M. peak hour**

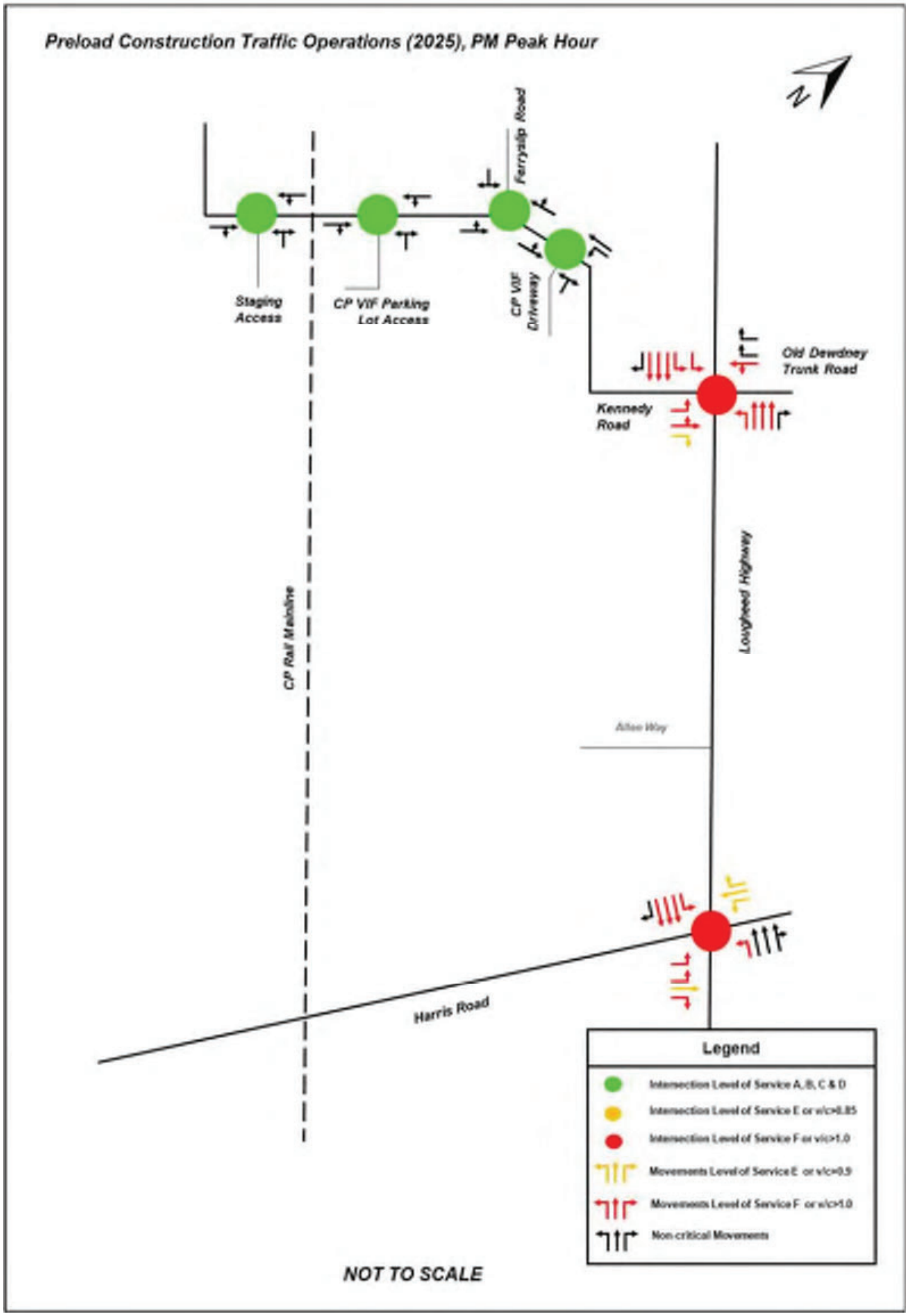



**Figure 5-4: 2025 Preload Construction Conditions Traffic Operation during the P.M. peak hour**

The results are based on optimized timing plans. What are the impacts with the current timing plans? Or will new timing plans be submitted to MoTI before proceeding with the preload program?

### 5.1.2 *Impact on Queueing*

The preload program is expected to increase the westbound left turning volumes at the intersection of Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road. A microsimulation analysis was conducted using SimTraffic to determine if the queues exceed the storage length provided for these movements in the 2025 site preload program year. The results of the queueing analysis are shown in Appendix G.

Queues will consist of more heavy vehicles - shouldn't assume that they can be accommodated within the taper.

The westbound left turn movement has a storage length of 105 metres with a taper length of 55 metres. Based on the optimized timing assumed for this intersection, the 95th percentile queue length for this movement is expected to be approximately 145 metres during he A.M. peak hour and approximately 100 metres during the P.M. peak hour. Hence, the queues are expected to be accommodated within the taper length. It should be noted that the westbound left turn movement is of protected phasing and the queues for this movement is very sensitive to the time given for this phase.

### 5.1.3 *Impact on Staging Access*

The staging access along Kennedy Road is anticipated to operate at LOS B or better during the site preload program assuming a stop sign is placed at the access approach for trucks exiting the staging area. Queuing is expected to be minimal at all approaches to the staging access intersection.

### 5.1.4 *Impact on Kennedy Road railway crossing*

This section evaluates the impact of construction traffic for the 2025 horizon year on the Kennedy Road at-grade railway crossing. The preload program is expected to increase the number of vehicles crossing the Kennedy Road at-grade railway crossing, as shown in Table 5-2.

**Table 5-2: Percent Contribution of the construction traffic during the preload program in 2025 on the Kennedy Road railway crossing during the peak hours**

| Midblock Section | Bi-directional Volumes | | Percent Contribution (AM/PM) |
|---|---|---|---|
| | Generated by CPLPV (AM/PM) | Total (AM/PM) | |
| Kennedy Road at CP Road Rail Crossing | 55/55 | 155/225 | 35.5%/24.5% |

As described in Section 2.1.2.5, the railroad crossing was simulated by creating a fictitious signalized intersection with a pretimed traffic signal control type. The queue lengths under the 2025 preload program construction conditions were calculated for the following scenarios:

- Scenario 1: Assuming an average rail event duration of 5 minutes with a frequency of 4 rail events per hour for both the A.M. and P.M. peak periods.

- Scenario 2: Assuming a 95th percentile rail event duration of 15 minutes with a frequency of 2 rail events per hour for both the A.M. and P.M. peak periods.

##### 5.1.4.1.1 Scenario 1: 5 minutes Duration

A pretimed signal for the rail crossing was modelled in Synchro where Kennedy Road was closed for 5 minutes during a rail event. A 10-minute gap was assigned between rail events. The 95th percentile queue lengths were determined by averaging the results of five simulation runs using SimTraffic.

The results show that the vehicles experience 95th percentile queues of approximately 80 metres in the northbound direction and 55 metres in the southbound direction during the A.M. peak period, while the vehicles experience 95th percentile queues of approximately 100 metres in the northbound direction and 85 metres in the southbound direction during the P.M. peak period. The simulation shows that the queue clears during the 10-minute gap between the rail events. The southbound queues may impact access to the CP VIF parking lot located on the east side of Kennedy Road during the P.M. peak period.

Figure 5-5 illustrates the 95th percentile queue lengths during railway events of a duration of 5 minutes. The results of the microsimulation queue length study are shown in Appendix G.

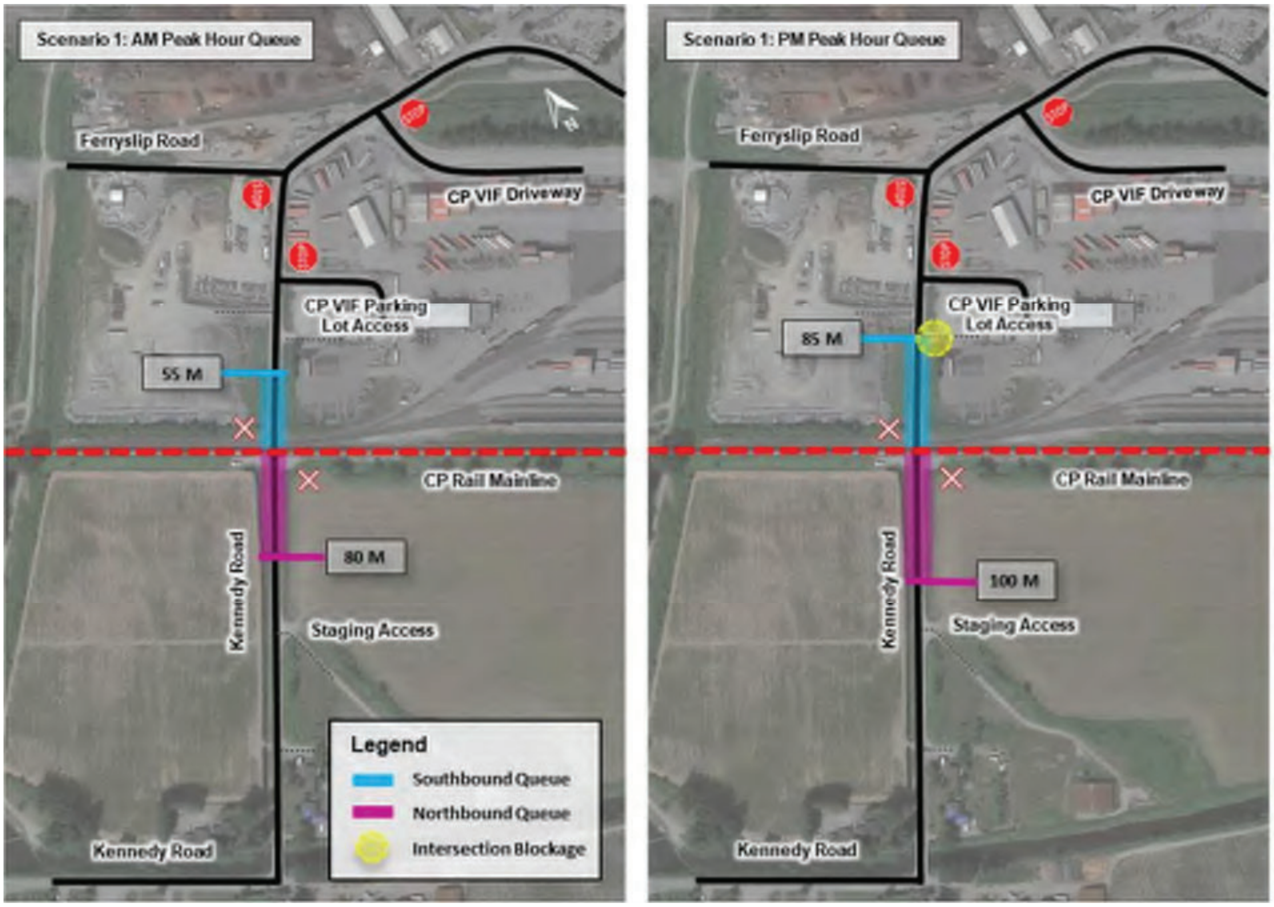



**Figure 5-5: Kennedy Road Rail Crossing Queue Lengths under the Site Preload Program Construction Conditions (2025) for a 5-minute rail event duration**

#### 5.1.4.1.2 Scenario 2: 15 minutes Duration

A pretimed signal for the rail crossing was modelled in Synchro where Kennedy Road was closed for 15 minutes during a rail event. A 10-minute gap was assigned between rail events. The 95$^{th}$ percentile queue lengths were determined by averaging the results of five simulation runs using SimTraffic.

The results show that the vehicles experience 95$^{th}$ percentile queues of approximately 180 metres in the northbound direction and 155 metres in the southbound direction during the A.M. peak period, while the vehicles experience 95$^{th}$ percentile queues of approximately 185 metres in the northbound direction and 175 meters in the southbound direction during the P.M. peak period. The simulation shows that the queue clears during the 10-minute gap between the rail events. The northbound queues may impact driveway access to a residential property (which will serve as an access to the staging area during the preload program) located on the east side of Kennedy Road during both the A.M. and P.M. peak periods. The southbound queues may impact access to the CP VIF parking lot located on the east side of Kennedy Road during both the A.M. and P.M. peak periods.

It should be noted that the northbound queues at the Kennedy Road rail crossing during a long duration event is expected to have negative impacts on the intersection of Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road. A long duration rail event would lead to a platoon of vehicles arriving at the intersection which would worsen the operation of the northbound movements at the intersection.

Figure 5-6 illustrates the 95$^{th}$ percentile queue lengths during railway events of a duration of 15 minutes. The results of the microsimulation queue length study are shown in Appendix G.

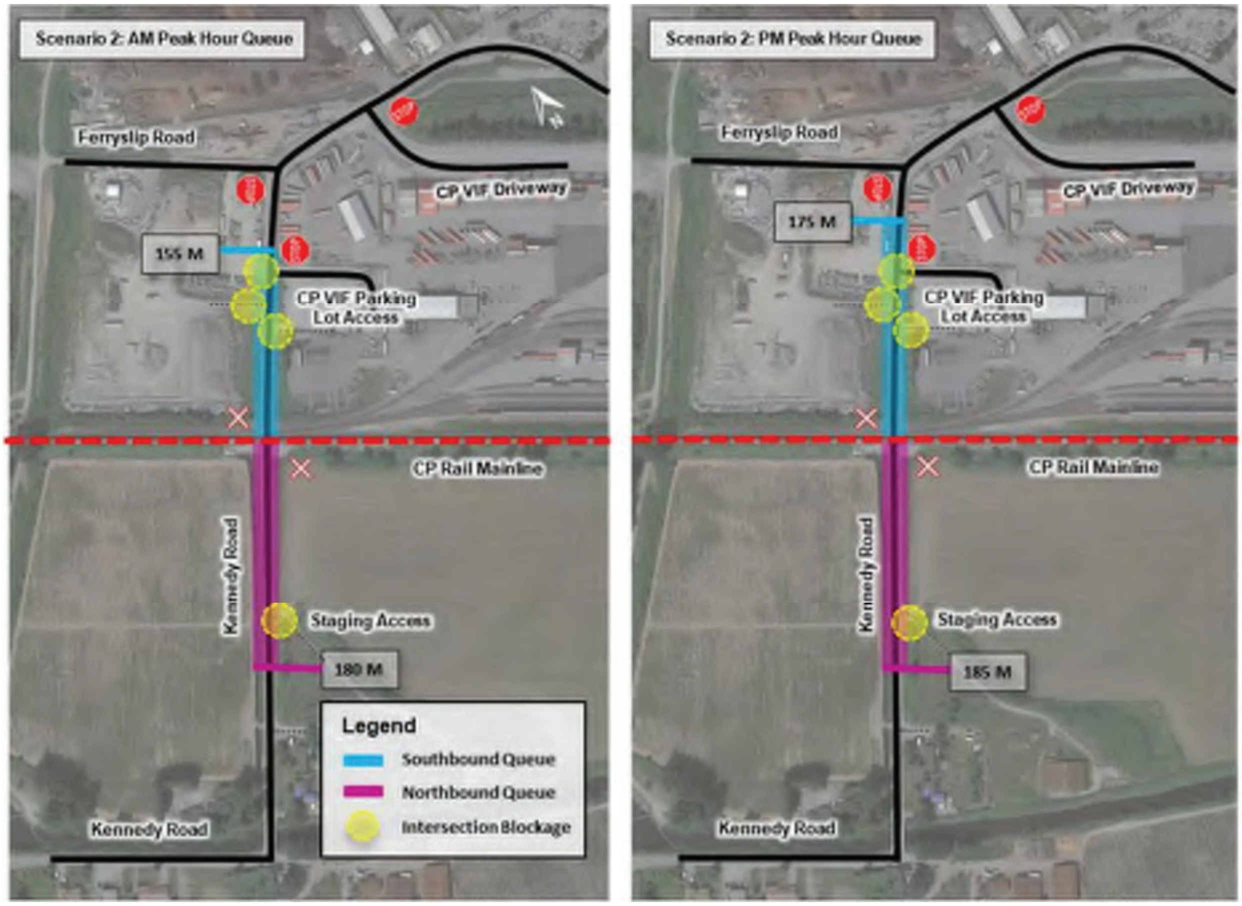



**Figure 5-6: Kennedy Road Rail Crossing Queue Lengths under the Site Preload Program Construction Conditions (2025) for a 15 minute rail event duration**

## 5.2 Pedestrian, Cycling and Transit Assessment

The proposed staging accesses are located on Kennedy Road, south of the rail crossing. There are expected to be minimal impacts on pedestrian and transit trips since facilities for these modes of trips are not provided on this section of the road. However, Kennedy Road, south of Ferryslip Road, is classified as a neighbourhood bikeway where cyclists are expected to share the road with traffic. The increased number of trucks may cause cyclist discomfort on Kennedy Road. The increased number of trucks are not expected to trigger upgrades at the pedestrian and cycling midblock crossing on Kennedy Road between the CP VIF Driveway and Ferryslip Road.

Analysis / backup information to support this? There will also be safety concerns due to increased truck traffic and pedestrian/cyclist activity.

# 6. Site-Generated Traffic

The following section describes the methodology for traffic generation and distribution to/from the CPLPV. As shown in the proposed site layout (see Appendix A), the CPLPV is a multi-commodity transload facility in Pitt Meadows, BC. The facility is located east of Kennedy Road, immediately south of the CP VIF. The development is expected to open in 2028 and achieve maximum productivity, two years after opening, in 2030. It is expected that the Kennedy Road Overpass and the Harris Road Underpass will be completed prior to the construction of this development.

The CPLPV will receive shipments of agricultural products , automobiles and liquids via rail, which will then be transferred to temporary storage. Ultimately, the liquids and automobiles will be transferred to outbound trucks for further distribution throughout greater Vancouver, while the agricultural products will be transferred from storage into export containers and transported via rail from CP's VIF facility to any of the four Vancouver Port international container terminals: Vanterm, Centerm, Deltaport or Fraser Surrey Docks. The facility is expected to operate 365 days a year, 24 hours a day.

A new road will be built connecting the CPLPV to Kennedy Road. The new road is anticipated to ultimately form part of the proposed Kennedy McTavish Connector. A three-leg stop controlled intersection will be created at the intersection of the Kennedy Road bend and the new road, approximately 300 metres south of the Kennedy Road rail crossing. Access to the CPLPV will be provided through a new three stop controlled intersection. An Auto Satellite Lot will be located on the west side of the new intersection while the Agricultural Product Transload Site, Auto Transload Site and Liquid Transload Site can be accessed through the east leg. The lane configuration and traffic control anticipated for the access intersections are shown in Figure 6-1.

How will this be accommodated? Figure 6-1 doesn't show the connector alignment.

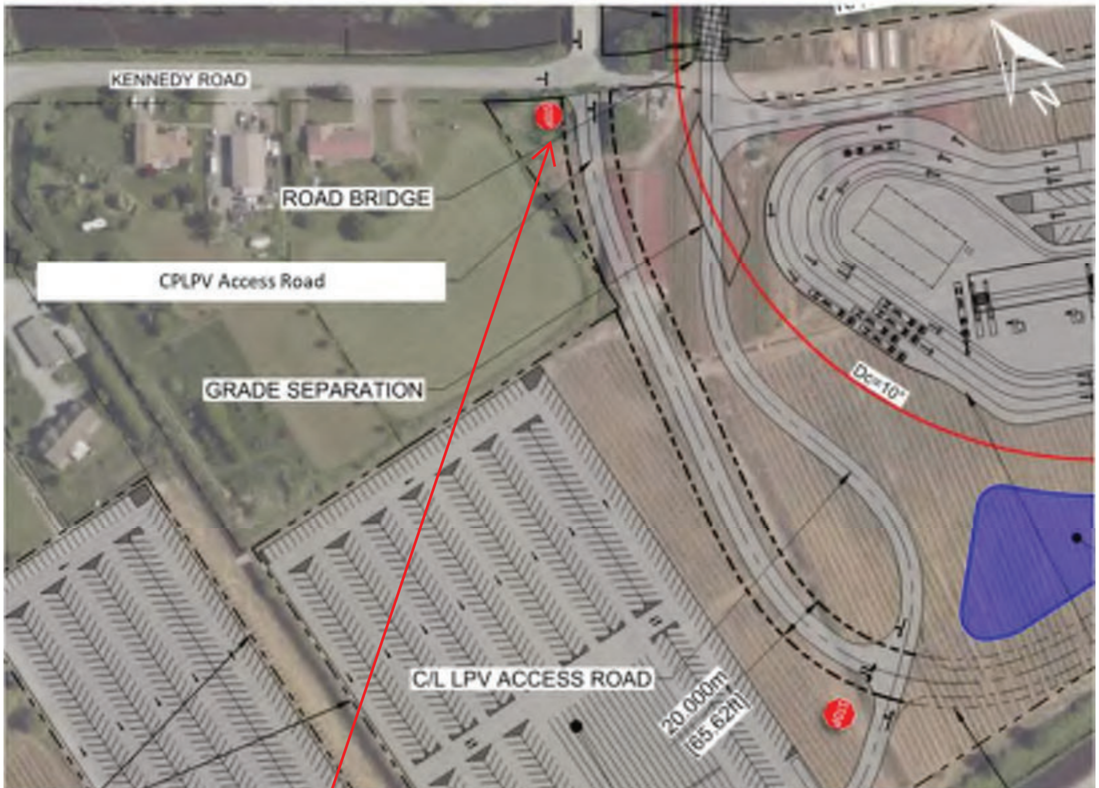



**Figure 6-1: Access intersections to the CPLPV**

The site-generated traffic volumes for the truck and the employee trips are discussed in the sections below. The facility is assumed to be achieve maximum productivity in 2030 and hence, the analysis assumes there will be no growth in site-generated volumes after 2030.

This is currently a free flow movement for EB Kennedy Road. Adding a stop control will add delays here.

## 6.1 Truck Trips

### *6.1.1 Trip Generation*

As discussed in Section 6, the CPLPV will receive shipments from railway cars which will be transferred to outbound trucks for further distribution. The amount of shipments expected to be received each day and the capacity of each truck are shown in Table 6-1.

**Table 6-1: Product Throughputs and Truck Capacity**

| Product | Railway Cars | Railway Car Capacity | Throughput per day | Truck Capacity |
|---|---|---|---|---|
| Agricultural Products | 147 railway cars / 3 days | 100 tonnes / railway car | 4,900 tonnes / day | 26.3 tonnes / truck |
| Automobiles | 24 railway cars / day | 15 vehicles / railway car | 360 vehicles / day | 8 vehicles / truck |
| Liquids | 80 railway cars / day | 24,000 gallons / railway car | 1,920,000 gallons / day | 13,500 gallons / truck |

The number of outbound trucks per day can be calculated using the following equation:

$$Number\ of\ outbound\ trucks\ per\ day = \frac{\begin{array}{c}Railway\ cars\ per\ day\ * \\ Railway\ Car\ Capacity\end{array}}{Truck\ Capacity} = \frac{Throughput\ per\ day}{Truck\ Capacity}$$

For the purposes of a conservative analysis, it was assumed that the inbound and outbound truck trips are equal and occur simultaneously. In addition, the trip generation assumes that the peak hours of the truck trips coincide with the background traffic peak hours for the purposes of a conservative analysis. The truck traffic movements generated from the CPLPV are summarized in Table 6-2.

**Table 6-2: Traffic Movements Summary**

| Product | Average Trucks Outbound/Day | Average Daily Truck Trips Inbound + Outbound |
|---|---|---|
| Agricultural Products | 186 | 372 |
| Automobiles | 45 | 90 |
| Liquids | 143 | 286 |
| Facility Total | 374 | 748 |

This seems low since the port and railway have defined operating hours.

The daily truck volumes were converted to A.M. and P.M. peak hour trips based on the expected distribution of products. The peak hours observed for existing traffic are 7:45 A.M. to 8:45 A.M. in the morning and 4:00 P.M. to 5:00 P.M. in the evening as shown in Table 2-2.

The agricultural products are expected to be distributed evenly with trucks entering and leaving the facility uniformly throughout the day (24 hours/day). Therefore, a conversion factor of 4.2 percent was used to convert the daily trucks distributing agricultural products to A.M. and P.M. peak hour trips.

The travel patterns for the trucks carrying automobiles are expected to be more concentrated during the peak hours. It is expected that 60 percent of these trucks enter and exit the facility during the hours of 7:00 A.M. to 10:00 A.M. in the morning while the remaining 40 percent of these trucks enter and exit the facility during the hours of 1:00 P.M. to 3:00 P.M. in the afternoon. A conversion factor of 20 percent was used to convert the daily trucks distributing automobiles to A.M. peak hour trips while it is expected that no trucks carrying automobiles would enter and leave the facility during the P.M. peak hour.

Is this based on rail schedules or something else?

Approximately 75 percent of the liquid products are expected to be distributed for retail consumption. The trucks distributing liquid products for retail uses are expected to observe the following patterns:

- 40 percent are expected to use the facility during the hours of 7:00 A.M. to 10:00 A.M.
- 30 percent are expected to use the facility during the hours of 3:00 P.M. to 5:00 P.M.
- 10 percent are expected to use the facility during the hour of 2:00 A.M. to 3:00 A.M.
- 20 percent are expected to use the facility in the remaining hours.

A conversion factor of 14 percent was used to convert the daily trucks distributing liquids for retail uses to A.M. peak hour trips and a conversion factor of 15 percent was used to convert the daily trucks distributing liquids for retail uses to P.M. peak hour trips.

Approximately 25 percent of liquid products are expected to be distributed for industrial uses. The trucks distributing liquid products to industrial clients are expected to be more concentrated during the hours of 7:00 A.M. to 3:00 P.M. in the day. A conversion factor of 12.5 percent was used to convert the daily trucks distributing liquids for industrial uses to A.M. peak hour trips while it is expected that no trucks distributing liquids for industrial uses would enter and leave the facility during the P.M. peak hour.

The A.M. and P.M. peak hour truck trips are summarized in Table 6-3.

**Table 6-3: A.M. and P.M. Peak Hour Truck Trips Summary**

| Product | Number of trucks entering and exiting during the AM Peak Hour | Number of trucks entering and exiting during the PM Peak Hour |
|---|---|---|
| Agricultural Products | 8 | 8 |
| Automobiles | 9 | 0 |
| Liquids | 20 | 16 |
| Facility Total | 37 | 24 |

### 6.1.2 *Trip Distribution and Assignment*

The truck trips were distributed based on the potential destinations for the agricultural products, automobiles and liquids. The following trip distribution pattern was applied:

- 100% of trucks carrying agricultural products in the CPLPV were assumed to travel to/from the CP VIF through the access off Kennedy Road. The agricultural products will eventually be transported via rail from the CP VIF facility.
- 50% of trucks carrying liquids and automobile products were assumed to travel to/from the gas stations and car dealerships respectively in the region west of Pitt River (west of Lougheed Highway and Old Dewdney Trunk Road/Kennedy Road).
- 50% of trucks carrying liquids and automobile products were assumed to travel to/from the gas stations and car dealerships respectively in the region east of Pitt River (east of Lougheed Highway and Harris Road).

It should be noted that Harris Road, south of Lougheed Highway prohibits heavy vehicle usage. Hence, the truck trips are not anticipated to increase traffic on Harris Road.

The trip assignment was developed by choosing the most logical route for vehicles in order to minimize travel time and distance. A schematic of the trip distribution and assignment for the different types of products serviced by the CPLPV is illustrated in Figure 6-2.

Is this the combined 2-way volume (i.e. inbound + outbound) or is it meant to show 8 inbound and 8 outbound? The 2-way daily agricultural trips were shown to be 372, distributed evenly across 24 hours. That would equal approximately 16 2-way trips during each peak hour.

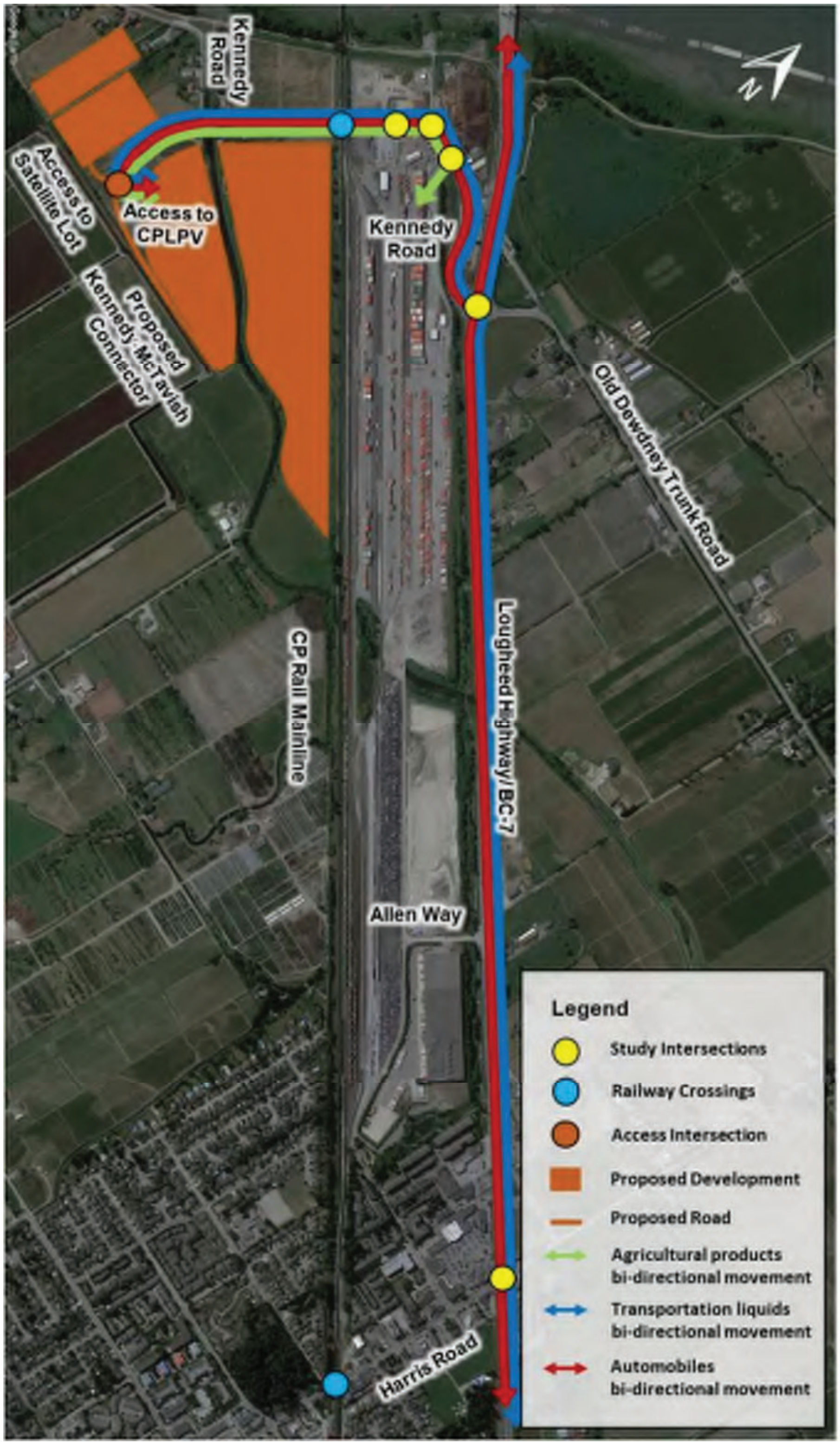



**Figure 6-2: Truck Trip Distribution**

How many stalls will be provided? Helps understand the potential in/out volumes during peak hours.

## 6.2 Employee Trips

### *6.2.1 Trip Generation*

The employee trips generated by the CPLPV during the weekday A.M. and P.M. peak hours were determined using the information provided by the design team regarding probable personnel counts and work shifts. Employee parking will be provided within the facility. The A.M. and P.M. peak hour trips generated by personnel accessing the CPLPV are summarized in Table 6-4.

**Table 6-4: A.M. and P.M. Peak Hour Personnel Trips Summary**

| Product | Number of vehicles entering and exiting during the AM Peak Hour | Number of vehicles entering and exiting during the PM Peak Hour |
|---|---|---|
| Agricultural Products | 22 | 22 |
| Automobiles | 15 | 15 |
| Liquids | 17 | 17 |
| Facility Total | 54 | 54 |

For the purposes of a conservative analysis, it was assumed that shifts start and end at the same time. Hence, the analysis assumes that the number of personnel entering the site at the start of a shift, and the number of personnel exiting the site at the end of a shift occur simultaneously. In addition, the trip generation assumes that the shift start and end times coincide with the background traffic peak hours for the purposes of a conservative analysis.

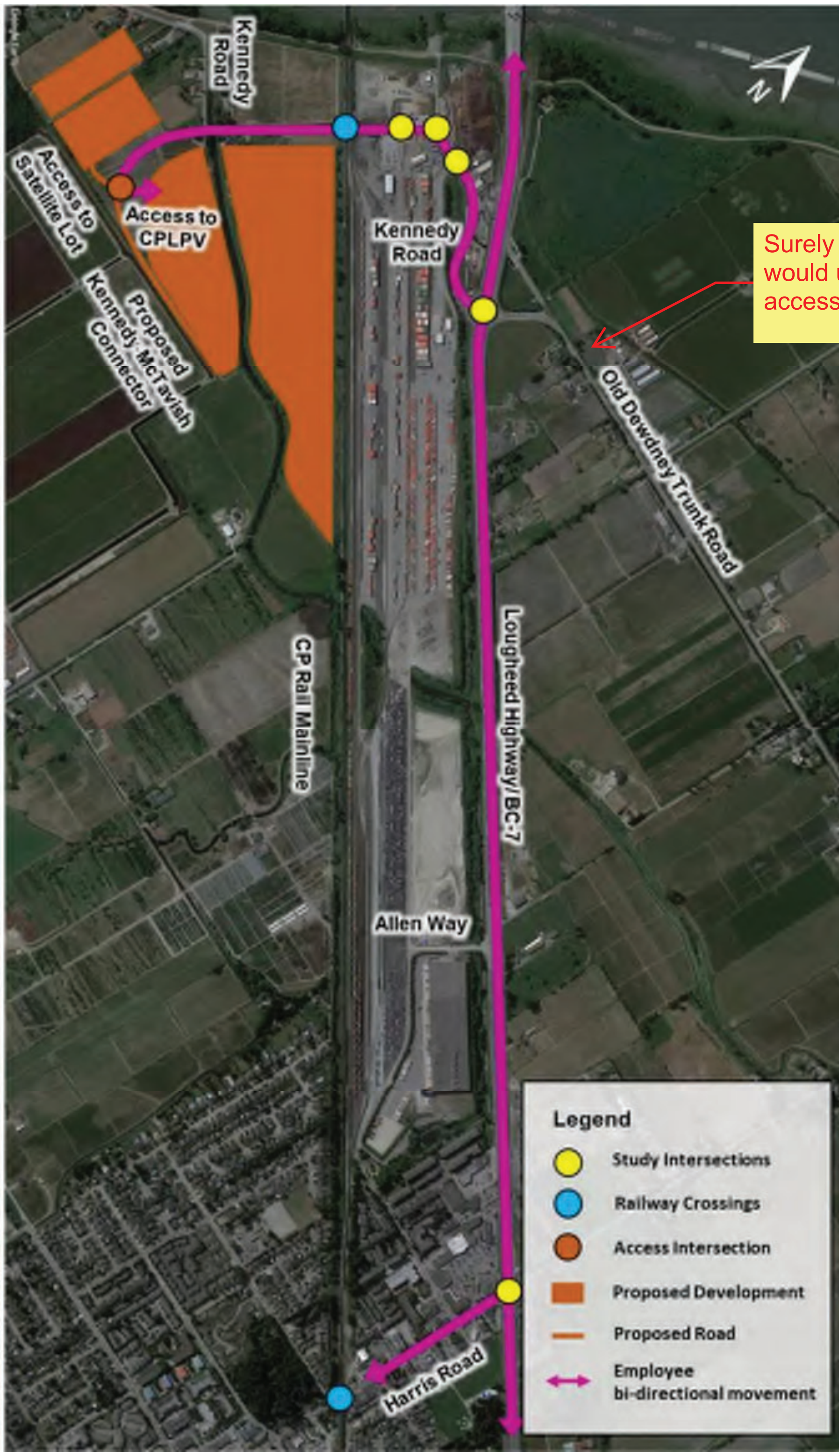
### *6.2.2 Trip Distribution and Assignment*

The employee trips were distributed based on the spatial distribution of residential neighborhoods in the surrounding area. The following trip distribution pattern was applied:

- 50% of employees were assumed to travel to/from residential areas in the region west of Pitt River (west of Lougheed Highway and Old Dewdney Trunk Road/Kennedy Road).
- 50% of employees were assumed to travel to/from residential areas in the region east of Pitt River (east of Lougheed Highway and Old Dewdney Trunk Road/Kennedy Road) with 40% assumed to travel to/from residential areas east of Harris Road and 10% assumed to travel to/from residential areas along Harris Road south of Lougheed Highway.

Maybe also look at current traffic volumes during peak hours (minus trucks) to get a sense of where employees are coming from?

A schematic of the trip distribution and assignment for employee trips at the CPLPV is illustrated in Figure 6-3.




Surely some employees would use ODTR to access the site?

**Figure 6-3: Employee Trip Distribution**

# 7. Impact Assessment

The CPLPV is anticipated to generate a total of approximately 180 bi-directional trips (41 percent truck trips) in the A.M. peak hour and 155 bi-directional trips (31 percent truck trips) in the P.M. peak hour. The trip volumes generated by the facility are shown in Figure 7-1 and also illustrated in Sketch 14 of Appendix B of this Report. The impact of these trips on the local road network is assessed in the following sections.

It should be noted that the impact of the CPLPV on the intersection of Lougheed Highway and Allen Way was not analyzed since the TMC data for this intersection was not available. The impact to this intersection is expected to be minimal since there will be no increase in site-generated turning volumes at this intersection.

Can be obtained from MoTI.

Increase in EB through will require more green time. WB Left (protected) and NB Left movements may be impacted as a result. The TIS should confirm the impacts.

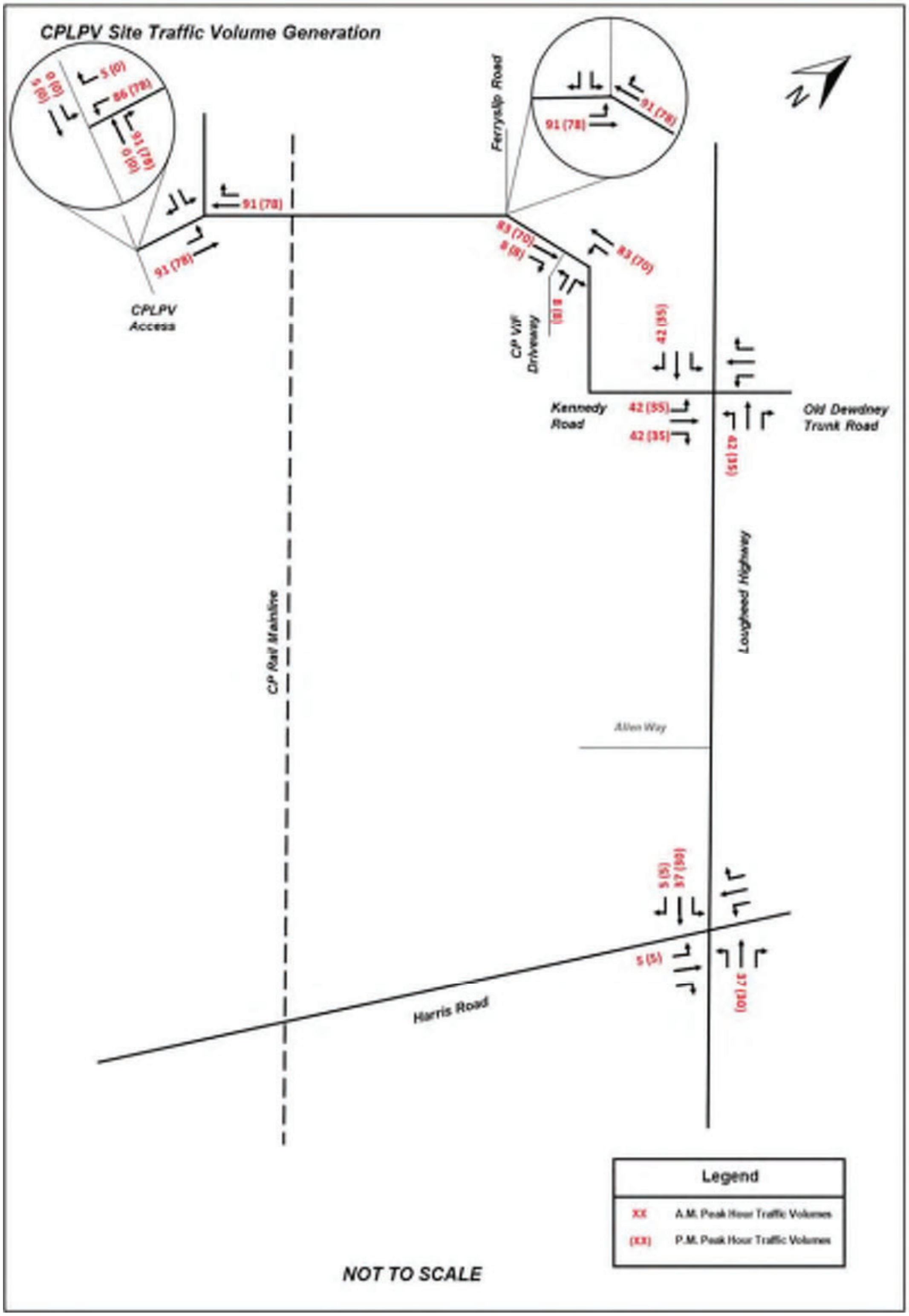



**Figure 7-1: CPLPV Site Traffic Volume Generation**

## 7.1 Traffic Assessment

### *7.1.1 Full Build-Out Year Traffic Operations (2030)*

The traffic volumes used for the analysis of 2030 total conditions are shown in Figure 7-2 and also illustrated in Sketch 15 of Appendix B of this Report.

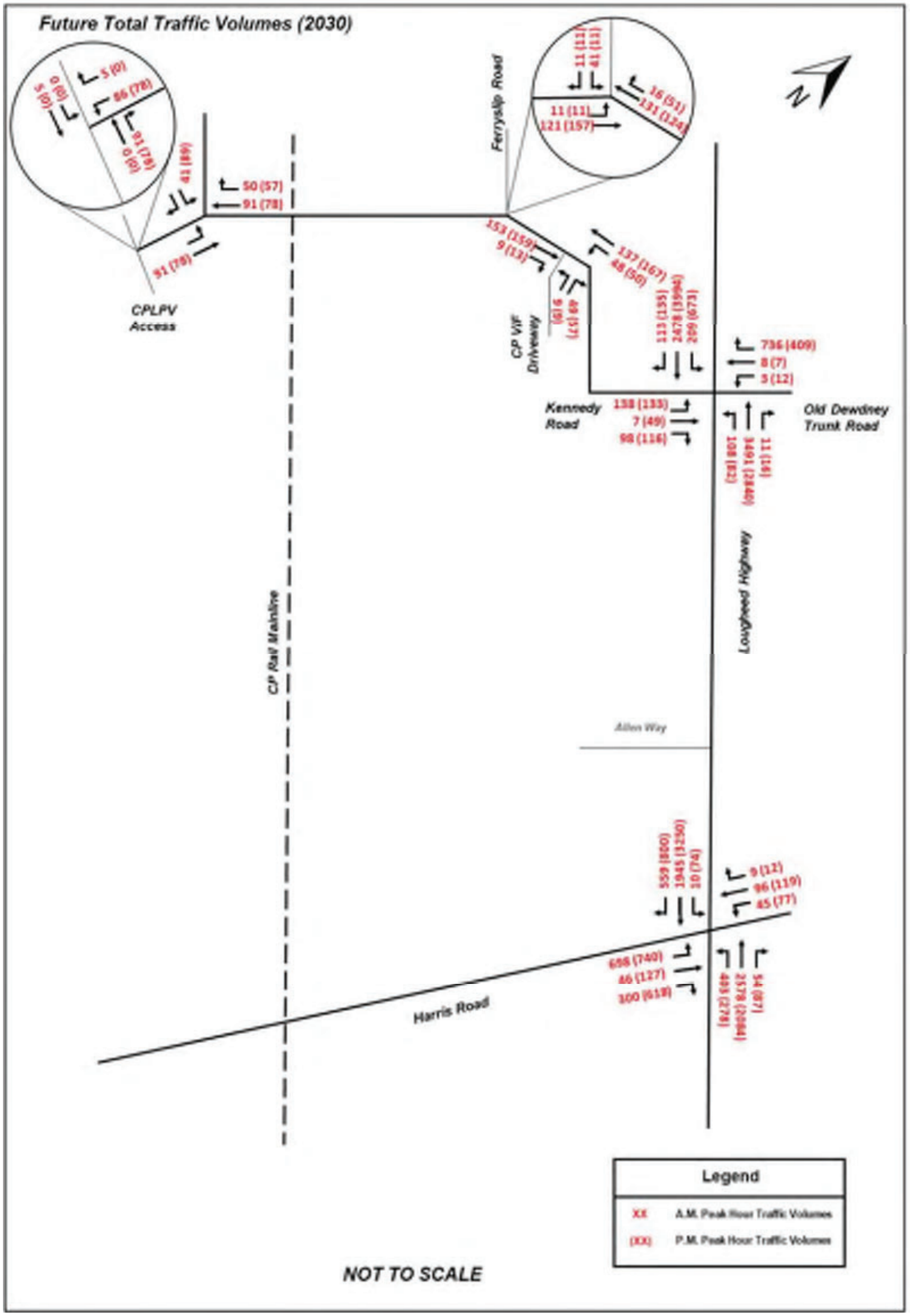



**Figure 7-2: Full Build-Out Year Future Total Traffic Volumes (2030)**

Need to confirm if auto equivalence factors were applied for heavy vehicles.

The intersections in the study area perform almost identically to the background conditions and no additional critical movements have been identified following the addition of the site traffic. This is due to the small number of trips generated by the CPLPV in relation to the background traffic on Lougheed Highway, as shown in Table 7-1.

**Table 7-1: Percent contribution from the CPLPV in 2030 on Lougheed Highway**

| Midblock Section | Bi-directional Volumes | | Percent Contribution (AM/PM) |
|---|---|---|---|
| | Generated by CPLPV (AM/PM) | Total (AM/PM) | |
| Lougheed Highway west of Kennedy Road/Old Dewdney Trunk Road | 85/70 | 7,165 / 8,185 | 1.2%/0.9% |
| Lougheed Highway between Kennedy Road/Old Dewdney Trunk Road and Harris Road | 85/70 | 5,995 / 7,010 | 1.4%/1.0% |
| Lougheed Highway east of Harris Road | 75/60 | 5,325 / 6,395 | 1.4%/0.9% |

The impact of the traffic volumes generated by the CPLPV on the operation of signalized intersections is described below:

But the figure shows this as a critical movement? Similar comment for other critical movements. Need to also better explain minimal impact; what does this mean? A table or figure that shows the before and after LOS, queueing, v/c is required to make it easier to compare the differences.

- Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road:
  - The eastbound right turn movement: There are approximately 42 additional vehicles during the A.M. peak hour and 35 additional vehicles during the P.M. peak hour expected to utilize this movement to enter the facility. The additional traffic is expected to cause minimal impact with the movement expected to operate with small delays and below capacity.
  - The westbound left turn movement: There are approximately 42 additional vehicles during the A.M. peak hour and 35 additional vehicles during the P.M. peak hour expected to utilize this movement to enter the facility. The additional traffic is expected to cause this movement to operate with increased delays during the A.M. peak hour and the P.M. peak hour. However, this movement is expected to operate below capacity during both the peak hours.
  - The northbound left and right turn movements: There are approximately 42 additional vehicles during the A.M. peak hour and 35 additional vehicles during the P.M. peak hour expected to utilize each movement to exit the facility. The additional traffic is expected to cause this movement to operate with increased delays during the A.M. and P.M. peak hour. However, this movement is expected to operate below capacity during both the peak hours.

- Lougheed Highway and Harris Road:
  - The eastbound through movement: There are approximately 37 additional vehicles during the A.M. peak hour and 30 additional vehicles during the P.M. peak hour expected to utilize this movement to exit the facility. The additional traffic is anticipated to cause minimal increase in delay due to the high background traffic that is expected for this movement.
  - The eastbound right turn movement: There are approximately 5 additional vehicles during the A.M. and P.M. peak hour expected to utilize this movement to exit the facility. The additional traffic is anticipated to cause minimal increase in delay due to the high background traffic that is expected for this movement.
  - The westbound through movement: There are approximately 37 additional vehicles during the A.M. peak hour and 30 additional vehicles during the P.M. peak hour expected to utilize this movement to enter the facility. The additional traffic is anticipated to cause minimal increase in delay due to the high background traffic that is expected for this movement.
  - The northbound left turn movement: There are approximately 5 additional vehicles during the A.M. and P.M. peak hour expected to utilize this movement to enter the facility. The additional traffic is anticipated to cause minimal increase in delay due to the high background traffic that is expected for this movement.

Figure 7-3 and Figure 7-4 present the intersection weekday AM and PM peak hour levels of service and display the critical movements for each intersection under future 2030 total conditions. Full tabulated results and the associated Synchro worksheets are included in Appendix F of this Report.

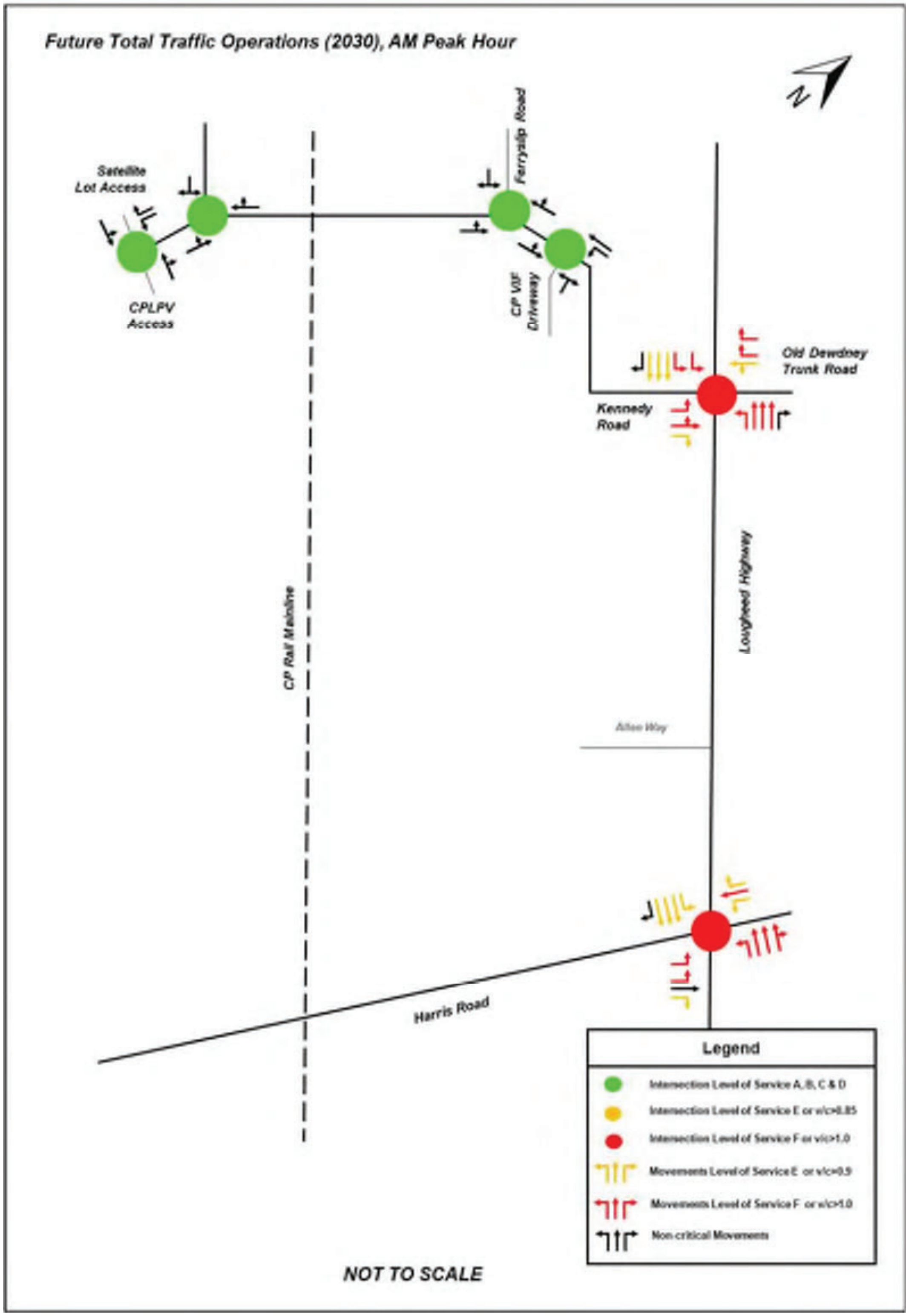



**Figure 7-3: 2030 Total Conditions Traffic Operation during the A.M. peak hour**

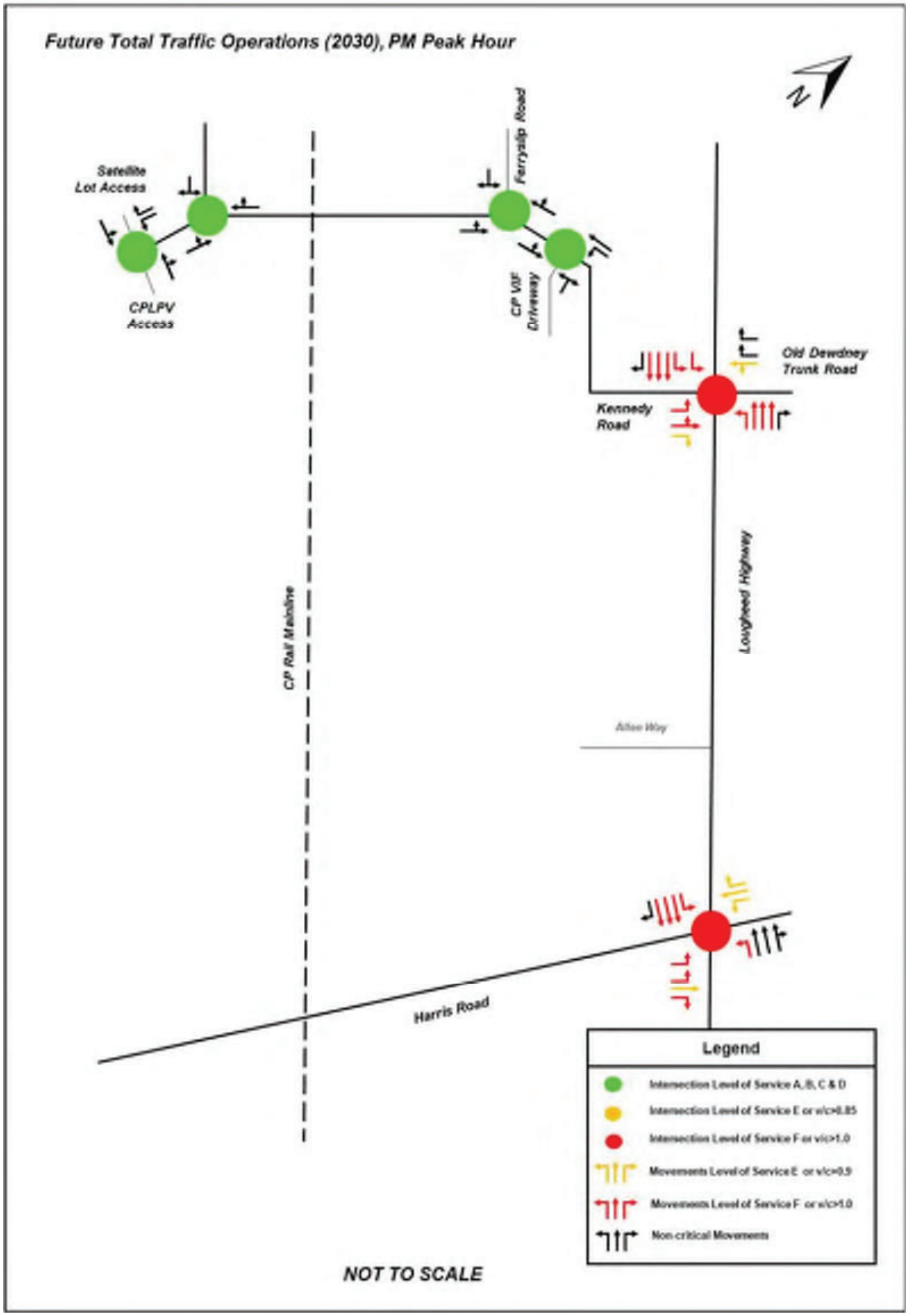



**Figure 7-4: 2030 Total Conditions Traffic Operation during the P.M. peak hour**

### *7.1.2 10-Year Horizon Year (2040)*

The traffic volumes used for the analysis of 2040 total conditions are shown in Figure 7-5 and also illustrated in Sketch 16 of Appendix B of this Report.

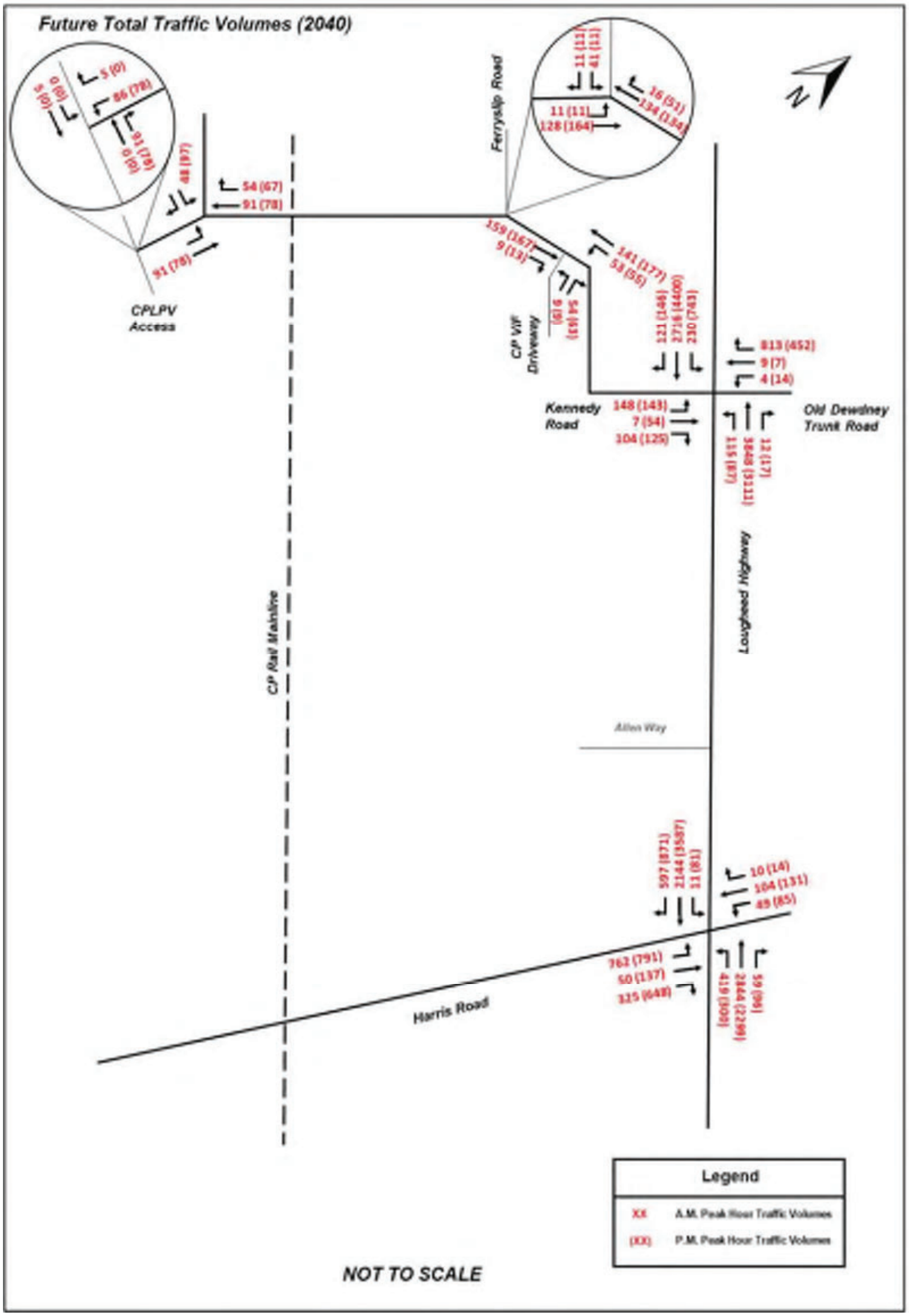



Figure 7-5: 10-Year Horizon Future Total Traffic Volumes (2040)

The intersections in the study area perform almost identically to the background conditions and no additional critical movements have been identified following the addition of the site traffic. This is due to the small number of trips generated by the CPLPV in relation to the background traffic on Lougheed Highway, as shown in Table 7-2.

**Table 7-2: Percent contribution from the development in 2040 on Lougheed Highway**

| Midblock Section | Bi-directional Volumes | | Percent Contribution (AM/PM) |
|---|---|---|---|
| | Generated by CPLPV (AM/PM) | Total (AM/PM) | |
| Lougheed Highway west of Kennedy Road/Old Dewdney Trunk Road | 85/70 | 7,880 / 8,995 | 1.1%/0.8% |
| Lougheed Highway between Kennedy Road/Old Dewdney Trunk Road and Harris Road | 85/70 | 6,585 / 7,700 | 1.3%/0.9% |
| Lougheed Highway east of Harris Road | 75/60 | 5,840 / 7,015 | 1.3%/0.9% |

The impact of the traffic volumes generated by the CPLPV on the traffic operations of the signalized intersections in the 2040 horizon year is expected to be similar to the impacts expected in the 2030 horizon year described in Section 7.1.1.

Figure 7-6 and Figure 7-7 present the intersection weekday AM and PM peak hour levels of service and display the critical movements for each intersection under future 2040 total conditions. Full tabulated results and the associated Synchro worksheets are included in Appendix F of this Report.

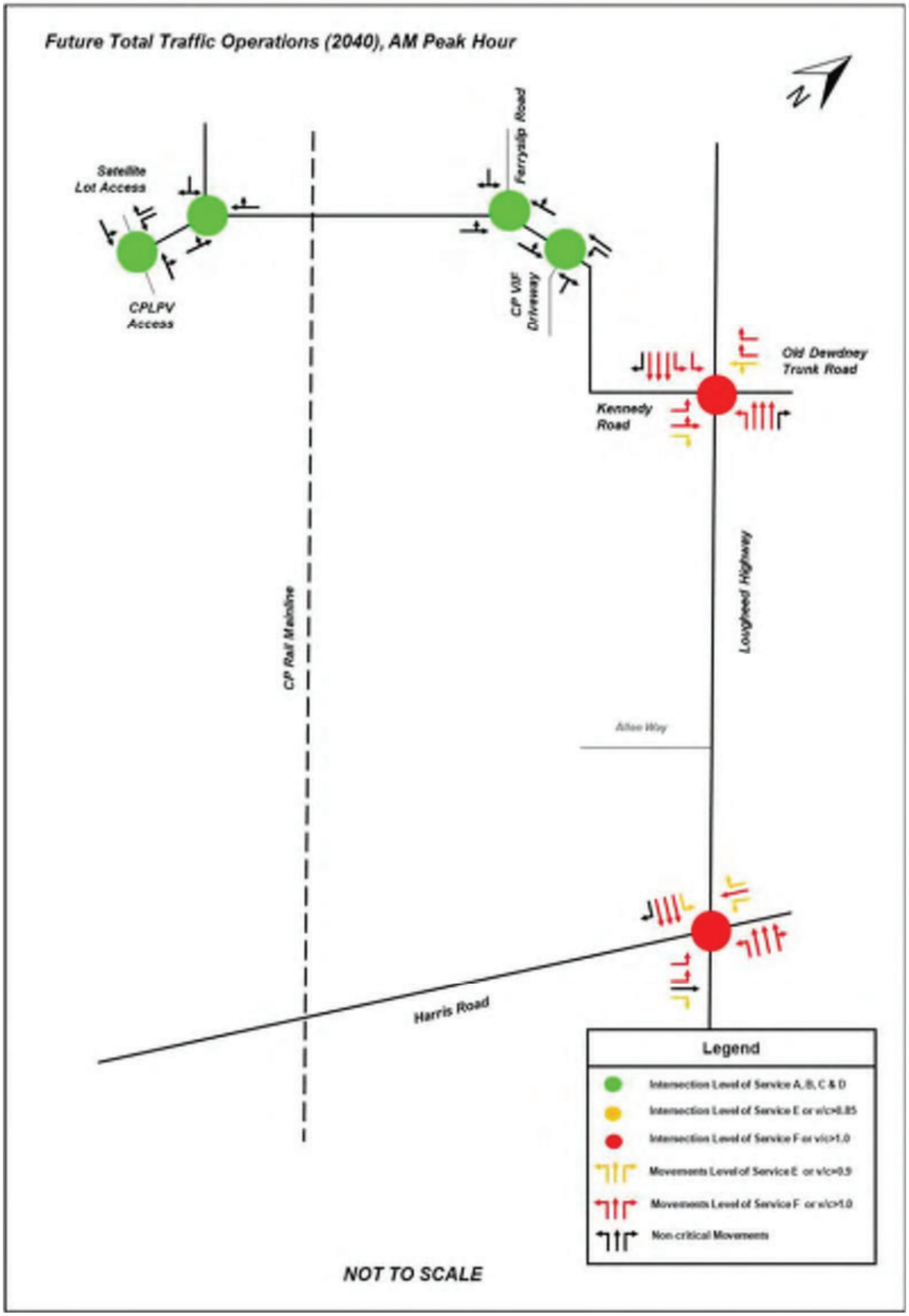



**Figure 7-6: 2040 Total Conditions Traffic Operation during the A.M. peak hour**

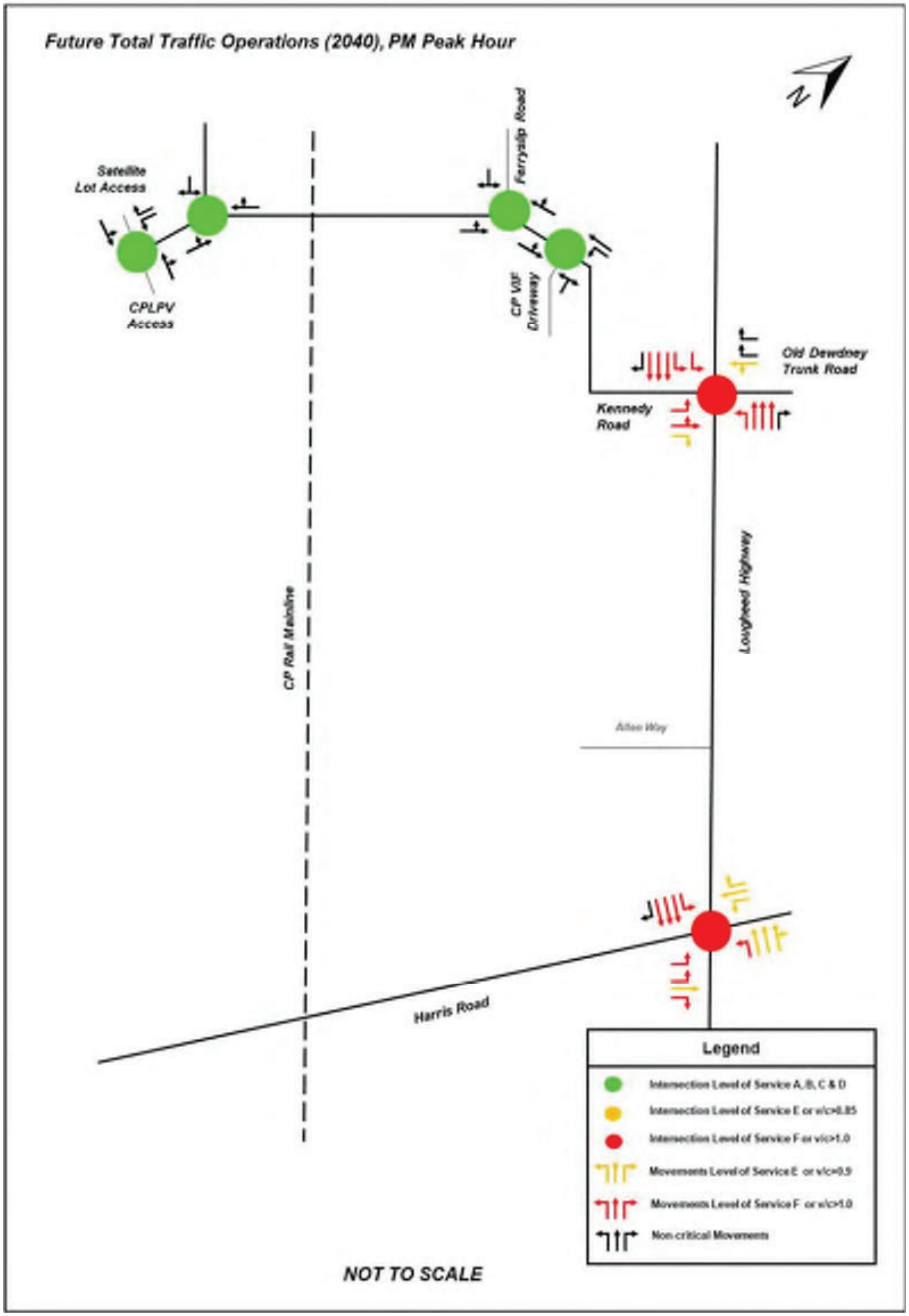



**Figure 7-7: 2040 Total Conditions Traffic Operation during the P.M. peak hour**

### 7.1.3 *Impact on Queueing*

The CPLPV is expected to increase the northbound left, eastbound right and westbound left turning volumes at the intersection of Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road. A microsimulation analysis was conducted using SimTraffic to determine if the queues exceed the storage length provided for these movements in the 2040 horizon year. The results of the queueing analysis are shown in Appendix G.

This could potentially block access to the NB right turn lane

The analysis showed that the queues for the eastbound right turn movement are expected to be accommodated in the 400 metres storage length, with the 95th percentile queue lengths expected to be approximately 145 metres in the A.M. peak hour and 120 metres in the P.M. peak hour. The queues for the northbound left turn movement may exceed the storage length of 40 metres with the 95th percentile queue lengths expected to be approximately 50 metres in the A.M. peak hour and 60 metres in the P.M. peak hour. This queue could potentially be larger in the event that the Kennedy Overpass is not completed prior to the full build-out of the facility due to platooning of vehicles during a rail event. However, the northbound movement also includes a provision of a shared northbound left/through movement where the queues can be accommodated.

Once again, more large trucks here - should not assume the taper can accommodate them.

The westbound left turn movement has a storage length of 105 metres with a taper length of 55 metres. Based on the optimized timing assumed for this intersection, the 95th percentile queue length for this movement is expected to be approximately 150 metres during he A.M. peak hour and approximately 115 metres during the P.M. peak hour. Hence, the queues are expected to be accommodated within the taper length. It should be noted that the westbound left turn movement is of protected phasing and the queues for this movement is very sensitive to the time given for this phase.

### 7.1.4 *Impact on Access Intersections*

A sensitivity scenario is required to determine impact of the Kennedy-McTavish connector, including warrants for signalization.

The unsignalized intersections along Kennedy Road including the two new access intersections are anticipated to operate at LOS B or better for both the 2030 full build-out year and 2040 horizon year. The recommended lane configuration and traffic control for the access intersections are shown in Figure 6-1.

Based on the Synchro analysis, signalization of the CP Logistics Park access intersection is not warranted for both the 2030 full build-out year and 2040 horizon year. However, the warrants for signalization should be re-assessed if the Kennedy-McTavish Connector is to be constructed in the future.

### 7.1.5 *Impact on Kennedy Road railway crossing*

Are mitigation measures required as a result?

This section evaluates the impact of future total traffic for the 2040 horizon year on the Kennedy Road at-grade railway crossing in the event that the implementation of the Kennedy Road Overpass project is delayed. The analysis of the 2040 horizon year is expected to be similar to the 2030 full build-out year since there is expected to be a small difference in the traffic volumes crossing Kennedy Road between the full build-out year and the 10-year horizon. The CPLPV is expected to significantly increase the number of vehicles crossing the Kennedy Road at-grade railway crossing, as shown in Table 7-3.

See previous comment regarding information from the Vancouver Fraser Port Authority. Daily train activity is expected to triple by 2030. The increase shown here is less than double.

**Table 7-3: Percent Contribution from the CPLPV in 2040 on the Kennedy Road Railway Crossing During the Peak Hours**

| Midblock Section | Bi-directional Volumes | | Percent Contribution (AM/PM) |
|---|---|---|---|
| | Generated by CPLPV (AM/PM) | Total (AM/PM) | |
| Kennedy Road at CP Road Rail Crossing | 180/155 | 300/350 | 60.0%/44.3% |

As described in Section 2.1.2.5, the railroad crossing was simulated by creating a fictitious signalized intersection with a pretimed traffic signal control type. Based on information obtained from CP, the number of trains crossing Kennedy Road is expected to increase from approximately 35 freight trains in existing conditions to approximately 60 freight trains in 2030. The number of passenger trains is projected to remain the same as in existing conditions. For the purposes of this analysis, the frequency of rail events was increased to account for this growth in train numbers crossing Kennedy Road. The queue lengths under the 2040 future total conditions were calculated for the following scenarios:

- Scenario 1: Assuming an average rail event duration of 5 minutes with a frequency of 6 rail events per hour for both the A.M. and P.M. peak periods.
- Scenario 2: Assuming a 95th percentile rail event duration of 15 minutes with a frequency of 3 rail events per hour for both the A.M. and P.M. peak periods.

#### *7.1.5.1 Scenario 1: 5 minutes Duration*

A pretimed signal for the rail crossing was modelled in Synchro where Kennedy Road was closed for 5 minutes during a rail event. A 5-minute gap was assigned between rail events. The 95th percentile queue lengths were determined by averaging the results of five simulation runs using SimTraffic.

The results show that the vehicles experience 95th percentile queues of approximately 150 metres in the northbound direction and 105 metres in the southbound direction during the A.M. peak period, while the vehicles experience 95th percentile queues of approximately 150 metres in the northbound direction and 125 metres in the southbound direction during the P.M. peak period. The simulation shows that the queue clears during the 5-minute gap between the rail events. The northbound queues may impact driveway access to a residential property located on the east side of Kennedy Road during both the A.M. and P.M. peak periods while the southbound queues may impact access to the CP VIF parking lot located on the east side of Kennedy Road during both the A.M. and P.M. peak periods.

Figure 7-8 illustrates the 95th percentile queue lengths during railway events of a duration of 5 minutes. The results of the microsimulation queue length study are shown in Appendix G.

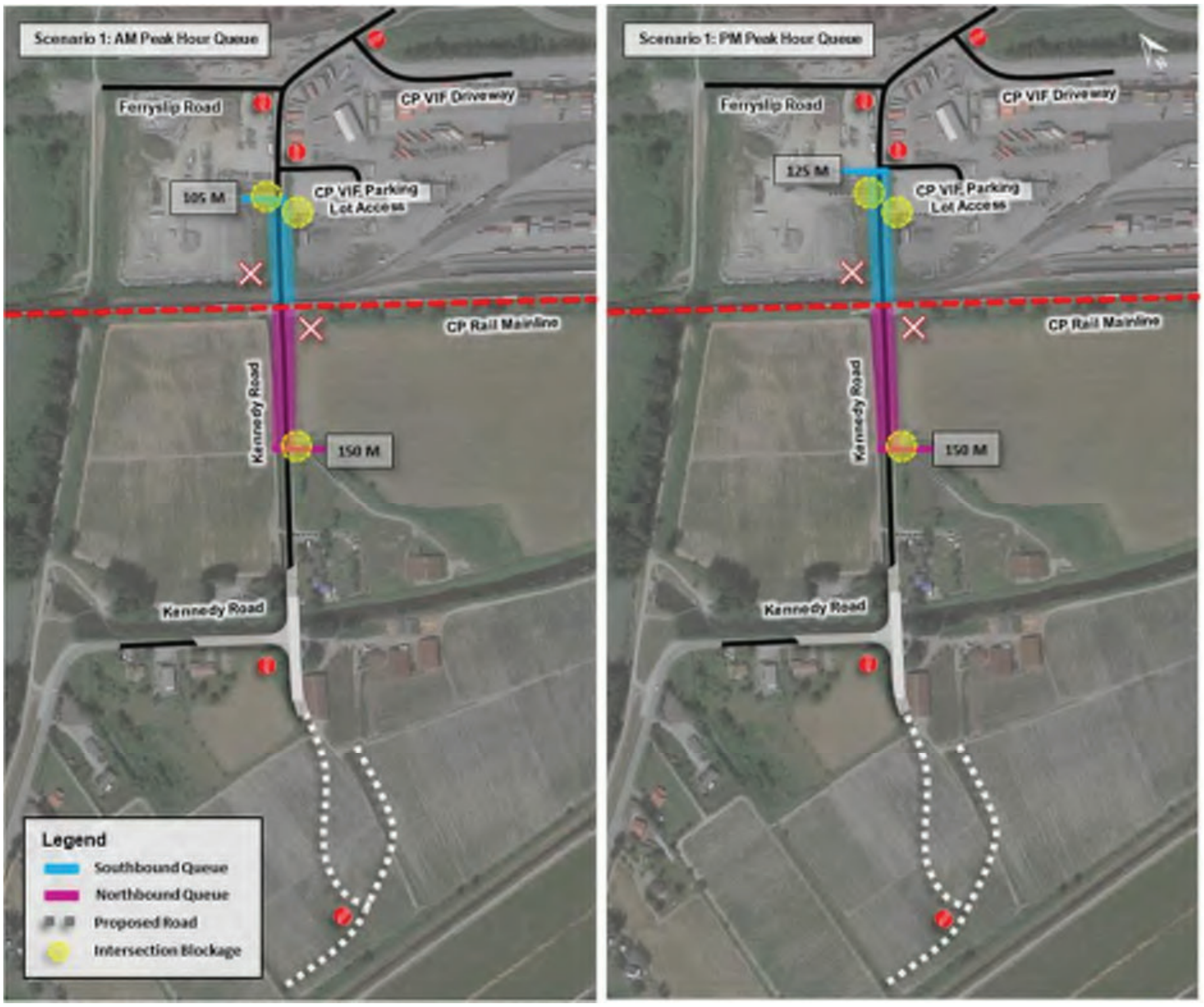



**Figure 7-8: Kennedy Road Rail Crossing Queue Lengths under Total Conditions (2040) for a 5-minute rail event duration**

#### *7.1.5.2 Scenario 2: 15 minutes Duration*

A pretimed signal for the rail crossing was modelled in Synchro where Kennedy Road was closed for 15 minutes during a rail event. A 5-minute gap was assigned between rail events. The 95$^{th}$ percentile queue lengths were determined by averaging the results of five simulation runs using SimTraffic.

The results show that the vehicles experience 95$^{th}$ percentile queues of approximately 390 metres in the northbound direction and 175 metres in the southbound direction during the A.M. peak period, while the vehicles experience 95$^{th}$ percentile queues of approximately 370 metres in the northbound direction and 175 meters in the southbound direction during the P.M. peak period. The simulation shows that the queue clears during the 5-minute gap between the rail events. The northbound queues may impact driveway access to a residential property located on the east side of Kennedy Road during both the A.M. and P.M. peak periods. Additionally, the northbound queues may extend further past the newly constructed three-leg stop controlled access intersection during both the A.M. and P.M. peak periods. It should be noted that in reality, it is anticipated that the northbound queues would be shorter since it is expected that vehicles in the CPLPV would not exit the facility during a long duration rail event. The southbound queues may impact access to the CP VIF parking lot located on the east side of Kennedy Road during both the A.M. and P.M. peak periods.

It should be noted that the northbound queues at the Kennedy Road rail crossing during a long duration event is expected to have negative impacts on the intersection of Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road. A long duration rail event would lead to a platoon of vehicles arriving at the intersection which would worsen the operation of the northbound movements at the intersection.

Figure 7-9 illustrates the 95$^{th}$ percentile queue lengths during railway events of a duration of 15 minutes. The results of the microsimulation queue length study are shown in Appendix G.

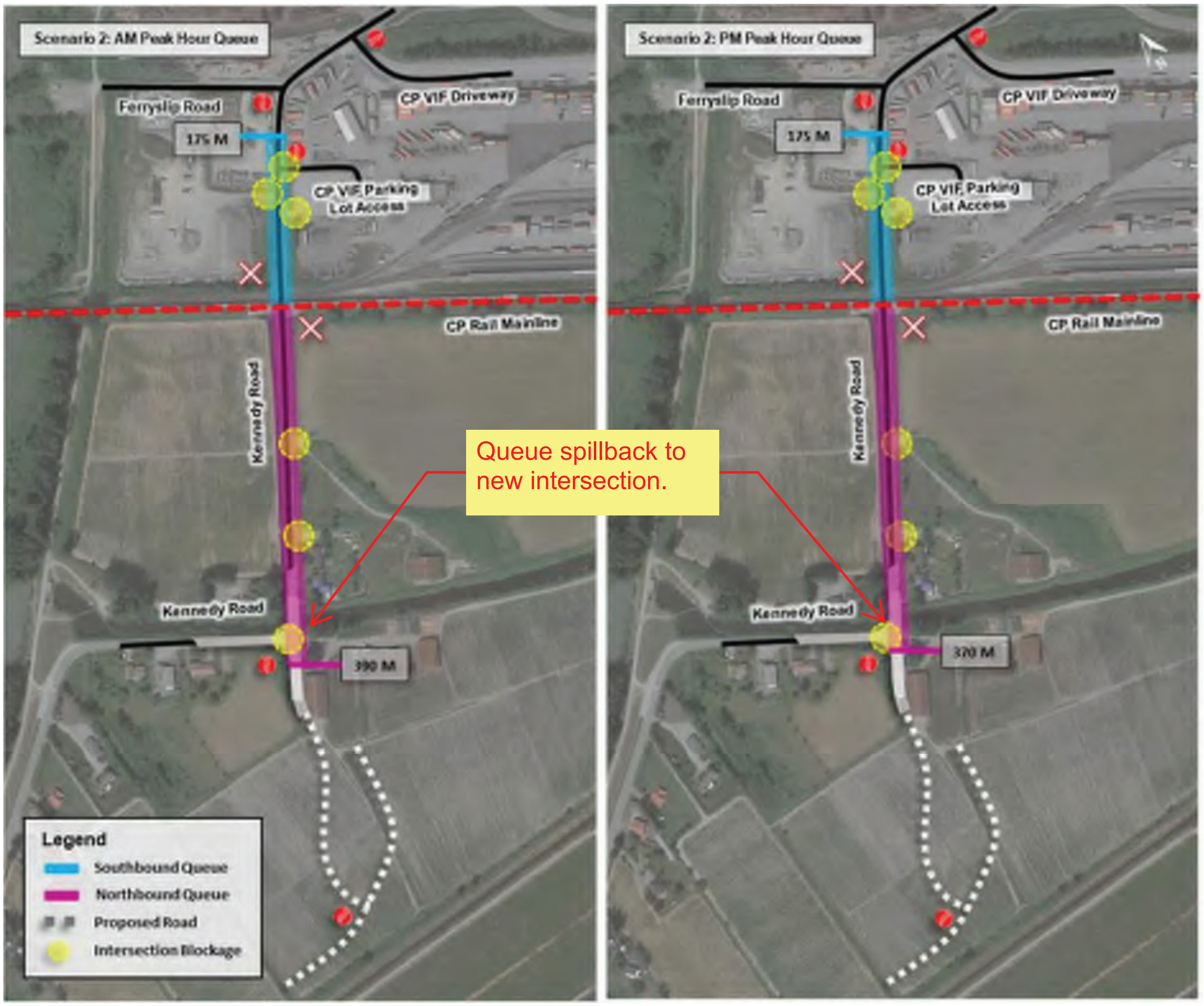



**Figure 7-9: Kennedy Road Rail Crossing Queue Lengths under Total Conditions (2040) for a 15 Minute Rail Event Duration**

## 7.2 Pedestrian, Cyclist and Transit Assessment

Should also consider pick up/drop off space for ride share services such as Uber and Lyft.

### *7.2.1 Active Transportation Mode Share*

The CPLPV will not provide active transportation facilities within the internal road network due to the industrial nature of the site and the absence of direct active transportation connections to the local road network surrounding the facility. The following section describes the mode share of trips expected for employees who enter and exit the facility.

TransLink has conducted a Trip Diary Survey in 2011 to gain insight into the transportation behaviour in the Metro Vancouver Region. The Trip Diary Survey also examines the travel behaviour for sub-regions within the Metro Vancouver Region, which includes the City of Pitt Meadows (Translink, 2013). The mode share of weekday trips and the average trip length for each mode in the City of Pitt Meadows are shown in Figure 7-10 and Figure 7-11 respectively.

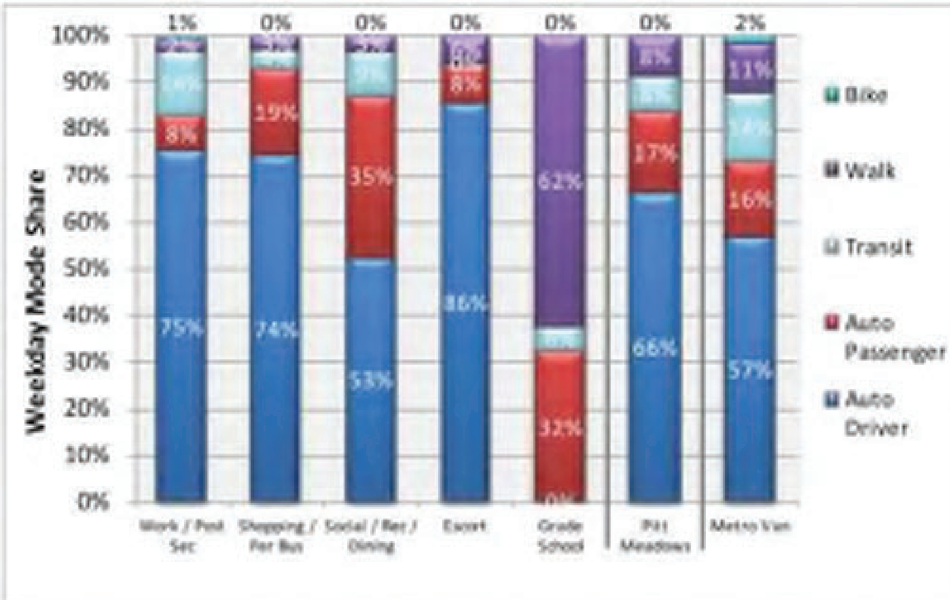



**Figure 7-10: Weekday Mode Share in the City of Pitt Meadows (Translink, 2013)**

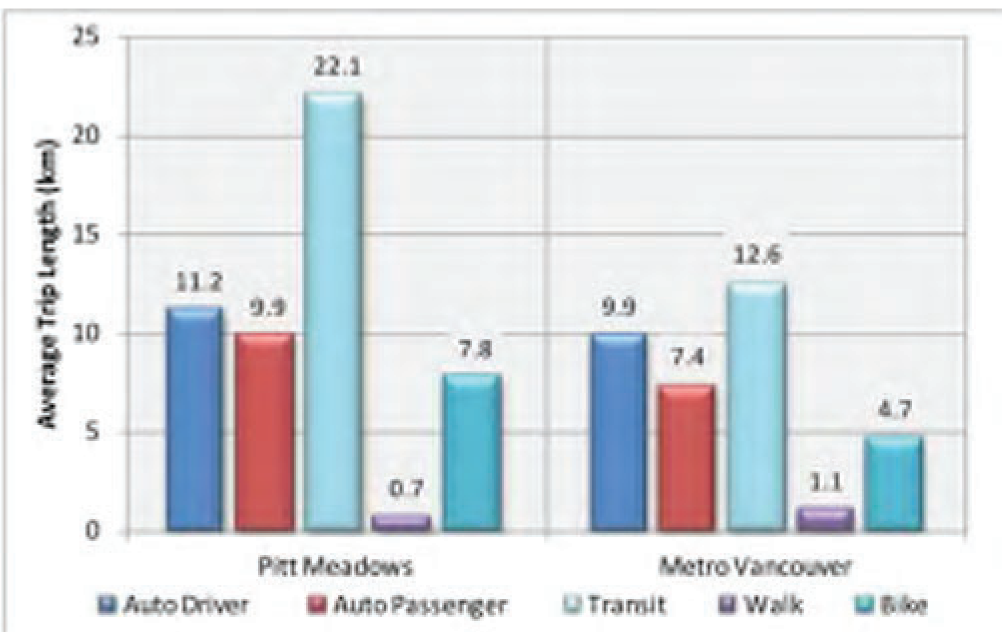



**Figure 7-11: Average Trip Length by Mode in the City of Pitt Meadows (Translink, 2013)**

As discussed in Section 6.2.1, there are 54 employees expected to use the facility after full build-out. The pedestrians, cyclists and transit conditions on the connecting road network are described below.

**Pedestrian Conditions:**

As shown in Figure 7-10, two percent of employees walk to work in the City of Pitt Meadows. This translates to approximately one employee that would walk to the CPLPV. However, upon further research, it is expected that no employees would walk to the CPLPV for the following reasons:

- ***Lack of pedestrian facilities connecting to the site***: Employees who reside in Port Coquitlam can use the pathway in the Pitt River Bridge and employees who reside in the residential developments near Harris Road can use the trail south of Lougheed Highway to walk to the CPLPV. Employees can also walk along the Trans Canada Trail at the shore of the Pitt River to access the CPLPV. However, all pedestrians have to walk along Kennedy Road to access the facility. Due to the lack of pedestrian facilities on Kennedy Road south of Ferryslip Road, it is expected that employees who would want to walk to work would be discouraged from doing so.
- ***Lengthy walking distances***: The average walking trip length is 0.7 kilometres in the City of Pitt Meadows as shown in Figure 7-11. The 85$^{th}$ percentile of walking trips was estimated to be approximately 1.8 kilometres (approximately 22 minute walking time) based on research conducted by McGill University (Larsen, J., El-Geneidy, A., & Yasmin, F., 2010). This walking distance does not capture the residential areas in Port Coquitllam and near Harris Road as shown in Figure 7-12.


**Figure 7-12: 85th Percentile Walking Distance (1.8 kilometre) around the CP Transload Facility**

This could change significantly with the adoption of e-bikes and e-scooters.

**Cyclist Conditions:**

As shown in Figure 7-10, one percent of employees cycle to work in the City of Pitt Meadows. This translates to approximately one employee that would cycle to the CPLPV. The average cycling trip length is 7.8 kilometres in the City of Pitt Meadows as shown in Figure 7-11. This distance covers the residential areas in the City of Port Coquitlam in the west, the City of Pitt Meadows, and the City of Maple Ridge in the east.

Employees who reside in Port Coquitlam can use the pathway in the Pitt River Bridge and employees who reside in the residential developments near Harris Road can use the trail south of Lougheed Highway to cycle to the CPLPV. Employees can also cycle on the Trans Canada Trail that runs along the shoreline of the Pitt River to access the CPLPV. All cyclists have to use Kennedy Road to access the facility. Kennedy Road is classified as a neighbourhood bikeway, south of Ferryslip Road, as shown in Figure 2-7. However, due to the significant increase in truck volumes expected along Kennedy Road due to the proposed facility and the lack of shoulders present on Kennedy Road, south of the rail crossing, it is expected that employees who would want to cycle to work would be discouraged from doing so due to safety concerns.

Why would some accommodation not be provided for these people along Kennedy Rd?

**Transit Conditions:**

As shown in Figure 7-10, 14 percent of employees take transit to work in the City of Pitt Meadows. This translates to approximately 8 employees that would take transit to the CP Transload Facility. The average transit trip length is 22.1 kilometres in the City of Pitt Meadows, as shown in Figure 7-11. This distance covers the residential areas in the City of Burnaby and the City of Port Coquitlam in the west, the City of Pitt Meadows, and the City of Maple Ridge in the east.

Employees taking transit would have to alight at the westbound or eastbound bus stop at the intersection of Lougheed Highway and Old Dewdney Trunk Road. The employees would have to walk approximately 1.2 kilometres (approximately 15 minute walking time) along Kennedy Road from the bus stop to the CPLPV. It is expected that these employees would be discouraged from taking transit due to the lack of pedestrian facilities on Kennedy Road, south of Ferryslip Road.

### *7.2.2 Impact on the midblock crossing on Kennedy Road*

The number of pedestrians and cyclists on the local road network are not expected to increase following the full build-out of the facility. However, the CPLPV is expected to significantly increase the number of vehicles using Kennedy Road which may impact the pedestrian and cycling midblock crossing located on Kennedy Road between the CP VIF Driveway and Ferryslip Road. The pedestrian and cycling crossing on Kennedy Road helps to connect the trail on the south side of Lougheed Highway to the Trans Canada Trail that runs along the shoreline of Pitt River. The signage on both approaches of the mid-block crossing on Kennedy Road are shown in Figure 7-13.

The midblock crossing on Kennedy Road has a zebra painted pavement marking with elephant's feet marking (which allows cyclists to use the crossing without dismounting) and side-mounted signs. The northbound and southbound approaches to the crossing consist of yellow solid lines which restrict vehicles from passing. The sigthlines for this crossing location are poor, especially in the northbound direction due to the sharp curve on Kennedy Road, just 50 metres south of the midblock crossing. To account for the restricted visibility, the southbound vehicles on Kennedy Road are advised to reduce their speed from 50 km/h to 30 km/h just prior to the midblock crossing while the northbound vehicles are advised to reduce their speed from 50 km/h to 30 km/h approximately 130 metres from the midblock crossing. In addition, a warning sign informing vehicles of the crossing is located approximately 70 metres from the midblock crossing on the southbound approach and approximately 35 metres from the midblock crossing on the northbound approach. The presence of the 'Crosswalk Ahead Warning Sign' is compliant with the recommendations outlined in the Pedestrian Crossing Control Manual for British Columbia (BC Highway Safety Branch, 1994) and the Transportation Associated of Canada (TAC) Pedestrian Crossing Control Guide (Transportation Association of Canada, 2018) at locations where the visibility of the crosswalk area is limited.

The mid-block crossing connects the paved multi-use trail on Kennedy Road with Ferryslip Road. The cyclists and pedestrians who use the paved multi-use trail on Kennedy Road are expected to use the green colored crosswalk (which indicates a location where motor vehicles may cross a bike lane) with elephant's feet marking at the intersection of Kennedy Road and CP VIF Driveway. Signage informing cyclists to watch for turning vehicles are present on both approaches to this intersection crossing. Ferryslip Road allows cyclists to share the road with motor vehicles where they will have to travel approximately 200 metres to access the Trans Canada Trail.


**Figure 7-13: Signage near Pedestrian and Cycling Crossing on Kennedy Road**

The number of pedestrians and cyclists using the Kennedy Road midblock crossing was obtained from the TMC data at the intersection of Kennedy Road and CP VIF Driveway (Bunt & Associates, 2020). The TMC data was collected over a seven-day period during the daily peak periods only. The active mode volumes using the crossing for the peak hours during each of the seven-day period are shown in Table 7-4. The active mode volumes are found to be low during the weekday with a maximum of 3 pedestrians and cyclists observed during the A.M. peak hour and a maximum of 8 pedestrians and cyclists ovserved during the P.M. peak hour. During the weekend, the number of pedestrians and cyclists are significantly higher with a maximum of 30 observed during the midday peak hour. It should be noted that these volumes are likely underestimated since it was collected during the winter season.

Active modes data over the summer time period is required to determine seasonal impacts.

**Table 7-4: Pedestrian and Cycling Volumes using the Kennedy Road Midblock Crossing**

| Date | Pedestrian and Cycling Volumes | | |
|---|---|---|---|
| | A.M. Peak Hour | P.M. Peak Hour | Midday Peak Hour |
| **Monday, November 4th, 2019** | 2 | 1 | - |
| **Tuesday, November 5th, 2019** | 1 | 3 | - |
| **Wednesday, November 6th, 2019** | 3 | 4 | - |
| **Thursday, November 7th, 2019** | 1 | 8 | - |
| **Friday, November 8th, 2019** | 0 | 6 | - |
| **Saturday, November 2nd, 2019** | - | - | 20 |
| **Sunday, November 3rd, 2019** | - | - | 30 |

The CPLPV is expected to increase the number of vehicles going through the midblock crossing on Kennedy Road. The total number of vehicles expected to pass through the midblock crossing for the 2040 horizon year are shown in Table 7-5.

**Table 7-5: Traffic Volumes Passing Through the Midblock Pedestrian and Cycling Crossing on Kennedy Road**

| Parameters | Existing Conditions | Background Conditions | Site-Generated Traffic | Total Conditions |
|---|---|---|---|---|
| | 2020 | 2040 | | 2040 |
| **A.M. Peak Hour (Heavy Vehicle Percentage)** | 100 (25%) | 140 (25%) | 180 (41%) | 320 (34%) |
| **P.M. Peak Hour (Heavy Vehicle Percentage)** | 160 (11%) | 210 (11%) | 155 (31%) | 365 (20%) |
| **AADT* (Heavy Vehicle Percentage)** | 1,600 (15%) | 2,100 (15%) | 1,070 (70%) | 3,170 (34%) |

*Note:
1. AADT for existing and background conditions assumed to be 10 times the P.M. peak hour traffic volumes.
2. Heavy vehicle percentages for the AADT for the existing and background conditions assumed to be similar to the heavy vehicle percentages at the Kennedy Road rail crossing.

The crossing warrant analyses to determine if the site-generated traffic on Kennedy Road would trigger upgrades at the pedestrian and cycling midblock crossing on Kennedy Road were conducted using the standards/guidelines discussed in the following sections.

#### 7.2.2.1 *Pedestrian Crossing Control Manual for British Columbia*

The warrants developed to determine if pedestrian crossing control is required as well as the type of treatment required are described in this manual (BC Highway Safety Branch, 1994). In the warrant procedure, pedestrian crossing control is classified according to the following hierarchy:

(a) Pedestrian crosswalks (signed and marked crossings): This type of crosswalk includes:

- side-mounted signs and marked crossings; and
- overhead signs and marked crossings.

(b) Special crosswalks: This type of crosswalk includes pavement markings, internally illuminated overhead signs, downlighting of crosswalk, pushbuttons, timers, and overhead flashing beacons.

(c) Pedestrian activated signals: This type of crosswalk includes all of the elements of a traffic control signal except for side street vehicle indications.

(d) Grade Separation: This type of crosswalk provides a physical separation between pedestrians and vehicles.

As per this standard, the type of pedestrian treatment to be used is based on factors such as the number of pedestrians during the peak period, the crossing opportunities per hour, population level, and the number and configuration of traffic lanes. For this analysis, the following information was assumed:

- The number of pedestrians during the peak period: The number of pedestrians and cyclists that would use the crossing in the 2040 horizon year is unknown. In the absence of the pedestrian/cyclist forecasts, a sensitivity analysis of equivalent adult unit (EAU) volumes ranging from 0 to more than 60 was undertaken for this analysis
- The number and configuration of lanes: Kennedy Road has a two-lane cross section.
- Crossing opportunities (i.e., the number of times a pedestrian can cross the roadway during a given period of time) is a function of the road cross-section, the vehicular volume and the vehicular arrival pattern. To estimate crossing opportunities, various curves are provided in the manual, which are based on different patterns. The crossing opportunities per hour were calculated to be 240 during the P.M. peak hour (highest peak hour traffic volume) as shown in Figure 7-14.

Rail crossing will develop platoons, which will likely impact crossing opportunities once the train is clear. Also have significant heavy truck volumes here - not typical conditions.

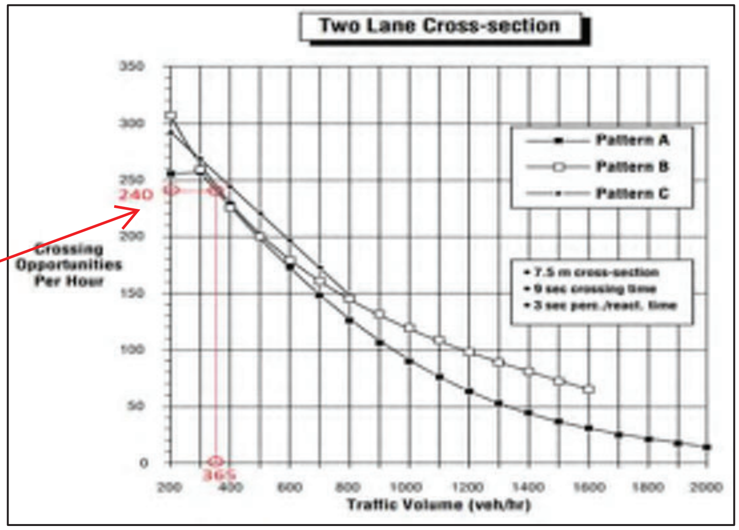



**Figure 7-14: Estimate Crossing Opportunities for a Two Lane Cross-Section (BC Highway Safety Branch, 1994)**

The Warrant Chart (Figure 7-15) shows that regardless of the number of pedestrians per hour crossing the road, a pedestrian crossing is not warranted if the crossing opportunities per hour is greater than 120. Hence, upgrades at the pedestrian and cycling midblock crossing on Kennedy Road are not justified by the site-generated volumes based on the warrant analysis developed by the Pedestrian Crossing Manual for British Columbia.

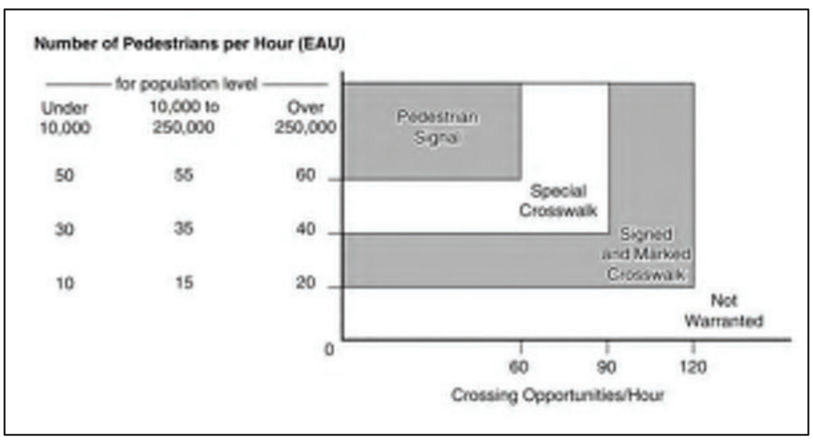



**Figure 7-15: Pedestrian Crossing Control Warrant Chart (BC Highway Safety Branch, 1994)**

The manual recommends that a ‘Crosswalk Ahead Sign’ should be installed in the advance of the crosswalk at the safe Stopping Sight Distance (SSD) when visibility is limited. This condition is met when the design speed of 30 km/h is assumed (SSD = 35 metres). However, if a design speed of 50 km/h is chosen, the condition is not met in the northbound approach since the SSD increases to 65 metres.

#### 7.2.2.2 *TAC's Pedestrian Crossing Control Guide, 3rd Edition*

The TAC's Pedestrian Crossing Control Guide was developed in 2018 and hence, provides more up-to-date standards compared to B.C.'s Pedestrian Crossing Control Manual which was developed in 1994. Similar to B.C.'s Pedestrian Crossing Control Manual, if the preconditions corresponding to safety issues are met, the type of pedestrian treatment to be used as per this guide is based mainly on the AADT values for the crossing road, speed limit, and the number and configuration of traffic lanes (Transportation Association of Canada, 2018). To conduct the warrant analysis, the minimum threshold for pedestrian demand is 25 pedestrians per hour for at least four hours of a typical day. In the absence of forecasted pedestrian traffic volumes for the 2040 horizon year, it has been assumed that this condition is met at this location.

Three possible treatment categories are provided in the Guide:

**(a)** ***Passive Crossing Treatment Systems***: There are two systems in this category:

- Ground Mounted Systems (G.M.): This system consists of passive signs (site-mounted signs) with crosswalk.
- Enhanced Ground Mounted Systems (GM+): This system consists of passive signs which include zebra pavement markings as a requirement along with specific upgrades to enhance the conspicuity of the crossing location.

**(b)** ***Active Crossing Treatment Systems***: These systems include pedestrian-activated warning devices. There are two systems in this category:

- Rectangular Rapid Flashing Beacons (RRFB): This is a pedestrian activated treatment system which consists of two rapidly alternating flashing rectangular amber beacons mounted above side-mounted pedestrian signs.
- Overhead Flashing Beacon System (OF) or Special Crosswalk: This is a pedestrian activated treatment system which consists of internally illuminated overhead mounted signs with alternating amber flashing beacons and down lighting.

**(c)** ***Traffic Signal Systems***: There are two systems in this category:

- Pedestrian signal
- Full traffic signal.

The Treatment Selection Matrix (Table 7-6) indicates the type of treatment system to use at a given site based on the AADT at the site, speed limit, number of lanes, and the presence of raised pedestrian refuge (i.e., refuge island or median).

**Table 7-6: Decision Support Tool - Treatment Selection Matrix (Transportation Association of Canada, 2018)**

| Average Daily Traffic | Speed Limit [2] (km/h) | Total Number of Lanes [1] | | | | |
|---|---|---|---|---|---|---|
| | | 1 or 2 lanes | 3 lanes (two-way) | 3 lanes (one-way) | 2 or 3 lanes/direction w/ raised refuge | 2 lanes/ direction w/o raised refuge |
| 1,500 < ADT ≤ 4,500 | ≤ 50 | GM | GM | GM | GM | GM+ |
| | 60 | GM+ | GM+ | OF | RRFB or OF [3] | RRFB |
| | 70 | RRFB | RRFB | OF | OF | OF |
| 4,500 < ADT ≤ 9,000 | ≤ 50 | GM | GM | GM | GM | RRFB |
| | 60 | GM+ | GM+ | OF | RRFB or OF [3] | OF |
| | 70 | RRFB | OF | OF | OF | TS |
| 9,000 < ADT ≤ 12,000 | ≤ 50 | GM | RRFB | OF | RRFB or OF [3] | OF |
| | 60 | RRFB | RRFB | OF | RRFB or OF [3] | TS |
| | 70 | OF | OF | OF | TS | TS |
| 12,000 < ADT ≤ 15,000 | ≤ 50 | RRFB | RRFB | OF | RRFB or OF [3] | OF |
| | 60 | RRFB | OF | OF | RRFB or OF [3] | TS |
| | 70 | OF | TS | TS | TS | TS |
| > 15,000 | ≤ 50 | RRFB | OF | OF | RRFB or OF [3] | TS |
| | 60 | RRFB | TS | TS | TS | TS |
| | 70 | OF | TS | TS | TS | TS |

Even if you assume 3-lanes (total exposed crossing distance is about 11m), GM is only recommended.

Table 7-6 indicates that a Ground Mounted System (GM) is required at the crossing location since the AADT will remain below 4,500 (see Table 7-5) and the speed limit on Kennedy Road is below 50 km/h. Hence, upgrades at the pedestrian and cycling midblock crossing on Kennedy Road are not justified by the site-generated volumes based on the warrant analysis developed by the TAC Pedestrian Crossing Control Guide. It should be noted that the existing treatment at the midblock crossing location can be classified as an Enhanced Ground Mounted System (GM+) due to the presence of side-mounted signs with zebra pavement and elephant's feet marking along with specific upgrades such as advanced warning signs and speed limit reductions to account for the limited visibility in the area.

The TAC guideline mentions that a 'Crosswalk Ahead Sign' must be installed 50 to 150 metres in the advance of the crosswalk when visibility is limited. It should be noted that this condition is not met in the northbound approach since the sign is placed 35 metres from the crossing.

A lot of these items are "desirable components" for GM.

There will be an impact during rail crossing events, particularly if the actual queue lengths are longer than what has been estimated. See previous comment regarding discrepancies between estimated and observed queues.



But the background growth and congestion levels are high, so even a small increase in vehicles will result in increases to queuing and delays.

# 8. Mitigation Measures

## 8.1 Mitigation Measures for the Site Preload Program

As discussed in Section 5.1, the trips generated by the site preload program is low when compared with the existing and expected future background traffic volumes on Lougheed Highway. Hence, the impact of the site preload program is expected to be minimal to the surrounding road network in Pitt Meadows.

This is based on optimized timings - what about the current timing plan? Who will monitor and implement changes during preload?

The site preload program is expected to increase the queues on the westbound left turn movement at the intersection of Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road. The queue lengths for this movement is very sensitive to the green time provided for this movement. It is recommended that the queue lengths for this movement be monitored and signal timings be adjusted if queueing exceeds storage length.

## 8.2 Mitigation Measures for the CPLPV Full-build out

As discussed in Section 7.1, the trips generated by the CPLPV are low when compared with the existing and expected future background traffic volumes on Lougheed Highway. Hence, the impact of the CPLPV is expected to be minimal to the surrounding road network in Pitt Meadows.

The TIS previously stated that queues will back into tapers, which is not acceptable given high truck volumes.

The CPLPV is expected to increase the queues on the westbound left turn movement at the intersection of Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road. The queue lengths for this movement is very sensitive to the green time provided for this movement. It is recommended that the queue lengths for this movement be monitored and signal timings be adjusted if queueing exceeds storage length.

As discussed in Section 7.2, the number of pedestrians, cyclists and transit trips generated by the CPLPV is expected to be minimal due to the lack of pedestrian and and safe cycling facilities provided on Kennedy Road that connects to the site. In addition, the internal road network of the CPLPV will not provide active transportation facilities. However, the following mitigation measures should be considered:

What about provision for transit users?

- Kennedy Road, south of Ferryslip Road is classified as a neighbourhood bikeway. Neighbourhood bikeways are defined as routes on street with low vehicle speeds and volumes, which include a range of treatments such as signage and pavement markings, to bikeways with varying degrees of traffic calming measures implemented to improve safety for cyclists and other road users (City of Pitts Meadow, 2012). Kennedy Road has a reduced warning speed limit of 30 km/hr and provides shoulders between Ferryslip Road and the rail crossing. South of the rail crossing, Kennedy Road does not provide shoulders and cyclists have to share the road with vehicles. Kennedy Road is expected to carry a significant amount of additional traffic (325 automobile trips and 750 truck trips daily) which may pose a safety risk for cyclists who share the road with vehicles using this bike route. It is recommended that the City of Pitt Meadows review if Kennedy Road, south of Ferryslip Road, should be classified as a neighbourhood bikeway after the full build-out of the facility. An alternate route can be provided where cyclists use the Trans Canada Trail that runs along the shoreline of the Pitt River.

Why not provide a bike lane along Kennedy Rd to separate vehicles from cyclists?

- The site-generated traffic volumes do not trigger upgrades at the pedestrian and cycling midblock crossing on Kennedy Road based on the standards/guidelines published in the Pedestrian Crossing Control Manual for British Columbia (BC Highway Safety Branch, 1994) and the TAC's Pedestrian Crossing Control Guide (Transportation Association of Canada, 2018). However, due to the presence of heavy vehicles at the midblock crossing location, it is recommended that the crossing be monitored closely so that appropriate and timely mitigation measures (such as: ensuring adequate illumination is provided, faded pavement markings are painted, potentially upgrading the type of crossing treatment to RRFB) can be developed as needed.
- An additional 'Crosswalk Ahead Warning Sign' (W-129-2 and W-129-T) should be provided on the northbound approach at a distance of approximately 70 metres from the midblock crossing on Kennedy Road to enhance visibility of the crossing (BC Ministry of Transportation and Infrastructure, 2021).

RRFB doesn't seem to be warranted based on Ped Crossing Control Guide, but we do have a special case here - limited sight distance, high truck volumes, platooning from signal and/or rail crossing. It is a good idea to include RRFB to enhance visibility and safety at this crossing, which does connect to the Trans Canada Trail.

# 9. Findings and Conclusions

The traffic operations within the study area were reviewed and traffic impacts associated with the background traffic growth and the CPLPV were assessed through a conservative analysis. The results of the traffic analysis are listed below:

1. Under existing conditions, the Lougheed Highway intersections in the study area perform at LOS E during the weekday A.M. and P.M. peak hours, with several movements operating with delay and a few movements exceeding capacity. The unsignalized intersections along Kennedy Road operate at LOS B or better.
2. A conservative annual growth rate of one percent was applied to all movements in the study area to account for background growth. In addition, the impacts of the GEBP Development were also explicitly accounted for in the background traffic forecast.
3. Under the site preload program year (2025), full build-out year (2030) and 10-year horizon (2040) background conditions, the Lougheed Highway intersections in the study area perform at LOS F and operate over capacity during the weekday A.M. and P.M. peak hours. The unsignalized intersections along Kennedy Road are anticipated to operate at LOS B or better.

If this development pushes the LOS F further, shouldn't a mitigation for the Lougheed/Kennedy intersection be proposed? At least mitigations should be proposed to address queues from spilling outside storage lengths - it is not acceptable to have queues in tapers.

4. The site preload program is anticipated to generate a total of approximately 56 bi-directional trips (100 percent truck trips) in the A.M. peak hour and the P.M. peak hour.
5. The additional traffic generated by the site preload program is estimated to be approximately 0.5 – 0.6 percent of the peak hour traffic on Lougheed Highway. The addition of the traffic is anticipated to cause no additional critical movements at the study intersections. The additional traffic is anticipated to cause increased queues in the northbound and southbound direction of the railway crossing during a rail event. Long duration rail events are expected to impact few of the unsignalized intersections along Kennedy Road.
6. The increased number of trucks during the site preload program may cause cyclist discomfort on Kennedy Road. The increased number of trucks are not expected to trigger upgrades at the pedestrian and cycling midblock crossing on Kennedy Road between the CP VIF Driveway and Ferryslip Road.

Mitigations should be proposed.

7. The CPLPV is a multi-commodity transload facility in Pitt Meadows. This facility will receive and distribute shipments of agricultural products (pulses), automobiles and liquids. The CPLPV is anticipated to generate a total of approximately 180 bi-directional trips (41 percent truck trips) in the A.M. peak hour and 155 bi-directional trips (31 percent truck trips) in the P.M. peak hour

This should be further clarified, since the intersection is already at LOS F.

How will it tie in?

8. A new road will be built from connecting the CPLPV to Kennedy Road. The new road is anticipated to ultimately form part of the proposed Kennedy McTavish Connector. A three-leg stop controlled intersection will be created at the intersection of the Kennedy Road bend and the new road, approximately 300 metres south of the Kennedy Road rail crossing. Access to the site will be provided through a new stop controlled three-legged intersection.

9. The additional site traffic is estimated to be approximately 0.9 – 1.5 percent of the peak hour traffic on Lougheed Highway. The addition of site traffic is anticipated to cause no additional critical movements at the study intersections. The cumulative effect resulting from addition of site development traffic will be small.

What about mitigations for queues from rail crossing events? The queues will likely spillback and block accesses / intersections. This will be made worse by the development. What is being proposed for this?

10. Signalization of the CP Logistics Park access intersection is not warranted for both the 2030 full build-out year and 2040 horizon year. However, the warrants for signalization should be re-assessed if the Kennedy-McTavish Connector is to be constructed in the future.

11. The site-generated traffic is estimated to contribute approximately 60 percent of the total traffic on the Kennedy Road railway crossing during the A.M. peak hour and 45 percent during the P.M. peak hour. In the event that the implementation of the Kennedy Road Overpass project is not completed prior to the full build-out year, the addition of site traffic is anticipated to cause increased queues in the northbound and southbound direction of the railway crossing during a rail event. Long duration rail events are expected to impact few of the unsignalized intersections along Kennedy Road.

12. Mitigation strategies for both the site preload program and the full build-out conditions include monitoring queuing at the westbound left turn movement at the intersection of Lougheed Highway and Kennedy Road/Old Dewdney Trunk Road. It is recommended that signal timings be adjusted if queueing exceeds storage length.

What about the optimized timing plans that were used? Shouldn't a mitigation be developing these timing plans and submitting to Moti? Maybe more detail needed here as well - who will monitor the queues? Who will determine the timing plans?

13. All employees are expected to drive to and from the facility after full build-out. It is expected that there will be minimal pedestrian, cyclist and transit trips generated by the development due to the lack of a direct pedestrian and safe cyclist connection on Kennedy Road to the facility.

14. The site-generated traffic volumes are not expected to trigger upgrades at the pedestrian and cycling midblock crossing on Kennedy Road based on the standards/guidelines published in the Pedestrian Crossing Control Manual for British Columbia (BC Highway Safety Branch, 1994) and the TAC's Pedestrian Crossing Control Guide (Transportation Association of Canada, 2018). An additional 'Crosswalk Ahead Warning Sign' (W-129-2 and W-129-T) should be provided on the northbound approach at a distance of approximately 70 metres from the midblock crossing on Kennedy Road to enhance visibility of the crossing.

This presumes that people will not take transit or active modes and concludes too prematurely that no facilities should be provided. If safe routes for peds and cyclists are provided, then more people would use these modes. This doesn't seem to provide enough choice for mode of travel.

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