



**CITY OF TERRACE**

**DEVELOPMENT SERVICES COMPONENT**

**OF THE COMMITTEE OF THE WHOLE REPORT**

**MEMO:** Kris Boland, CAO for Committee of the Whole  
**FROM:** David Block, Director of Development Services  
**DATE:** May 10, 2021  
**SUBJ:** **Amendments to Zoning Bylaw No. 2069-2014 for the properties at 4800 Keith Avenue and 4760 Keith Avenue**

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**RECOMMENDATIONS:**

That the City of Terrace consider amending at 2<sup>nd</sup> Reading a Bylaw to amend Zoning Bylaw No. 2069-2014 by changing the zoning designation from:

- M1 – Light Industrial to M2A – Heavy Industrial for a portion of the property legally described as Lot A, District Lot 362, Range 5, Coast District, Plan 12018 Except Part In Plan EPP42962 (4800 Keith Avenue)
- M1 – Light Industrial to P2 – Park for a 0.2 Hectare portion of the property legally described as Lot A, District Lot 362, Range 5, Coast District, Plan 12018 Except Part In Plan EPP42962 (4800 Keith Avenue)
- C3 – Service Commercial to M2A – Heavy Industrial for a portion of the property legally described as Lot A, District Lot 361, Range 5, Coast District, Plan 6510 Except Part In Plan EPP53069(4760 Keith Avenue)

**BACKGROUND:**

On June 8<sup>th</sup>, 2020, NSD Development Corporation (the Applicant) applied to amend Official Community Plan (OCP) Bylaw No. 2142-2018 and Zoning Bylaw No. 2069-2014 for 4800 Keith Avenue and 4760 Keith Avenue, to allow for the construction and operation of a new transload facility and mixed use commercial and light industrial service centre.

The Applicant requested amendments to Appendix 'H' (Keith Estate Neighborhood Concept Plan) of the Official Community Plan (OCP) Bylaw No. 2142-2018 to support limited heavy industrial uses on portions of the Keith Estates lands and to remove residential land uses for the portion of the Keith Estates lands specific to their proposed project. The Zoning Bylaw amendments requested a change from Light Industrial to Heavy Industrial for a portion of the lands.

*First readings of the bylaws were passed at the Council meeting held on July 13, 2020. At the October 9, 2020 Committee of the Whole meeting, staff recommended that the OCP Bylaw amendments move forward independently of the Zoning Bylaw amendments. Staff also recommended the consideration of drafting a new zone to be added to the Zoning Bylaw that would limit heavy industrial uses specific to logistics and intermodal transportation uses.*

*The OCP bylaw was amended at the Council meeting on October 26, 2020, while the rezoning bylaw was tabled at the applicant's request. In the Fall of 2020 staff conducted public engagement on the proposed amendments to Appendix 'H' – Keith Estates NCP of the OCP. At the Public Hearing held on January 14, 2021, and the special council meeting held on January 15, 2021, council considered these land use amendments and approved the application to remove multi-family residential use requirements and permit limited heavy industrial uses on a portion of the lands at 4760 and 4800 Keith Avenue.*

*Staff have prepared a bylaw to add a new M2A – Heavy Industrial zone to the Zoning Bylaw. This new zone is intended to provide for a mix of industrial uses that support logistics operations and transloading facilities, including the movement or transfer of a range of industrial and commercial materials and goods.*

*The proposed M2A zone incorporates some primary uses currently permitted in the M1 – Light Industrial and M2 – Heavy Industrial zones and adds a new primary use of Truck/Rail Transloading Facility. Staff researched other regional municipal zoning bylaws and in particular the industrial zones within the City of Prince George bylaw. Prince George has several industrial zones and the proposed new primary use of truck/rail transloading facility is similar to that found in their zoning regulations.*

*Hatha Callis, authorized agent for the applicant (Progressive Ventures Limited owners of the NSD Development Corporation) submitted a letter formally requesting the application for zoning amendments of the subject properties be amended to consider rezoning the lands from M1 – Light Industrial to the proposed new M2A – Heavy industrial zone. The initial application had requested rezoning to M2 – Heavy Industrial and the bylaw passed 1<sup>st</sup> and 2<sup>nd</sup> readings on July 13, 2020.*

*The applicant has also submitted a letter dated April 29, 2021 outlining the "NSD Inland Port and Developments, Project Update Prior to Resuming Rezoning". This document provides some background on the project and speaks to the applicants timeline and intentions for advancing this project should their rezoning application be approved. The update document also addresses the public engagement throughout their OCP amendment process and addresses what they understand to be the key concerns that have been raised by the community about this proposed transloading facility.*

The applicant has provided a Traffic Impact Assessment (TIA) prepared by Watt Consulting on July 28, 2020. The TIA considered the impacts from a transloading facility on the proposed site. The study is based on accepted standards for traffic volume (vehicle trips/per day) generated by the most intensive uses that could occur on a transloading facility. The TIA identifies recommended road network improvements that will be required to be completed for the proposed transloading use to be developed at this site. The key recommendation requires physical design improvements to Keith Avenue at the main site access. These improvements to the municipal road network will be required as a condition of subdivision to create the parcel designated for the portion of the subject lands to be rezoned as M2A for the NSD Inland Port and Developments parcel.

Following an amendment at 2<sup>nd</sup> Reading of the Bylaw a public hearing is proposed to be scheduled to be held on June 14, 2021. Council may proceed to consider 3<sup>rd</sup> reading after the public hearing has closed. As the subject properties are located within 800 metres of a Controlled Access Highway, adoption of the bylaw amendments must follow the legislated referral requirement under the Transportation Act for review and approval by the Ministry of Transport and Infrastructure (MOTI).

The following items are included and form part of this report:

- April 16, 2021 letter from applicant requesting application to be amended to rezone portions of the subject lands to the proposed M2A zone.
- April 29, 2021 project update letter to resume rezoning application provided by the applicant.
- 4800 Keith Avenue Transload Facility Traffic Impact Assessment (TIA) – prepared by Watt (July 28, 2020)

  
Submitted by  
David Block, Dir. of Development Services

  
Approved for Submission to Council  
Kris Boland, CAO

DB/dk

April 16, 2021

City of Terrace  
Development Services, Planning  
5003 Graham Avenue  
Terrace, BC V8G 1B3

Attention: Dave Block and Tara Irwin

**Re: NSD Inland Port and Developments Project Rezoning Application**

NSD Development Corporation submitted an application to rezone the transload portion of 4800 Keith Avenue & a portion of 4760 Keith Avenue to M2 Heavy Industrial and amend the City of Terrace Official Community Plan (2018) in the spring of 2020. The City of Terrace passed 1<sup>st</sup> and 2<sup>nd</sup> reading of the Project's rezoning application on July 13<sup>th</sup>, 2020. In September 2020 we requested the City delay our rezoning application while the OCP amendment moved ahead and to concurrently move forward with the rezoning application "in a way that grants the appropriate use for the site." It was later determined to draft a new zone. The OCP amendment was passed on January 15, 2021.

We are now in agreement with the new M2a – Heavy Industrial zone as drafted. We request that the City of Terrace resume our rezoning application to change the transload facility portion of 4800 Keith Avenue & a portion of 4760 Keith Avenue to the new M2a – Heavy Industrial zone.

Sincerely,

**NSD Development Corporation**



Hatha Callis  
Vice President, Real Estate and Developments

April 29, 2021

Mayor and Council  
City of Terrace  
5003 Graham Avenue  
Terrace, BC, V8G 1B3

**Dear Mayor and Council,**

RE: NSD Inland Port and Developments, Project Update Prior to Resuming Rezoning

In July of 2020 we submitted an OCP amendment and rezoning application for the NSD Inland Port and Developments project proposed at 4800 Keith Ave and a portion of 4760 Keith Ave. This application was accompanied by a Project Development Plan (PDP) prepared by Allnorth, an executive summary, and conceptual site plans. Since July of 2020 significant progress has been made towards realizing this project including a public consultation phase, separating the rezoning from the OCP amendment, a public consultation performed by the City of Terrace, passing of the OCP amendment, and drafting of a new zone.

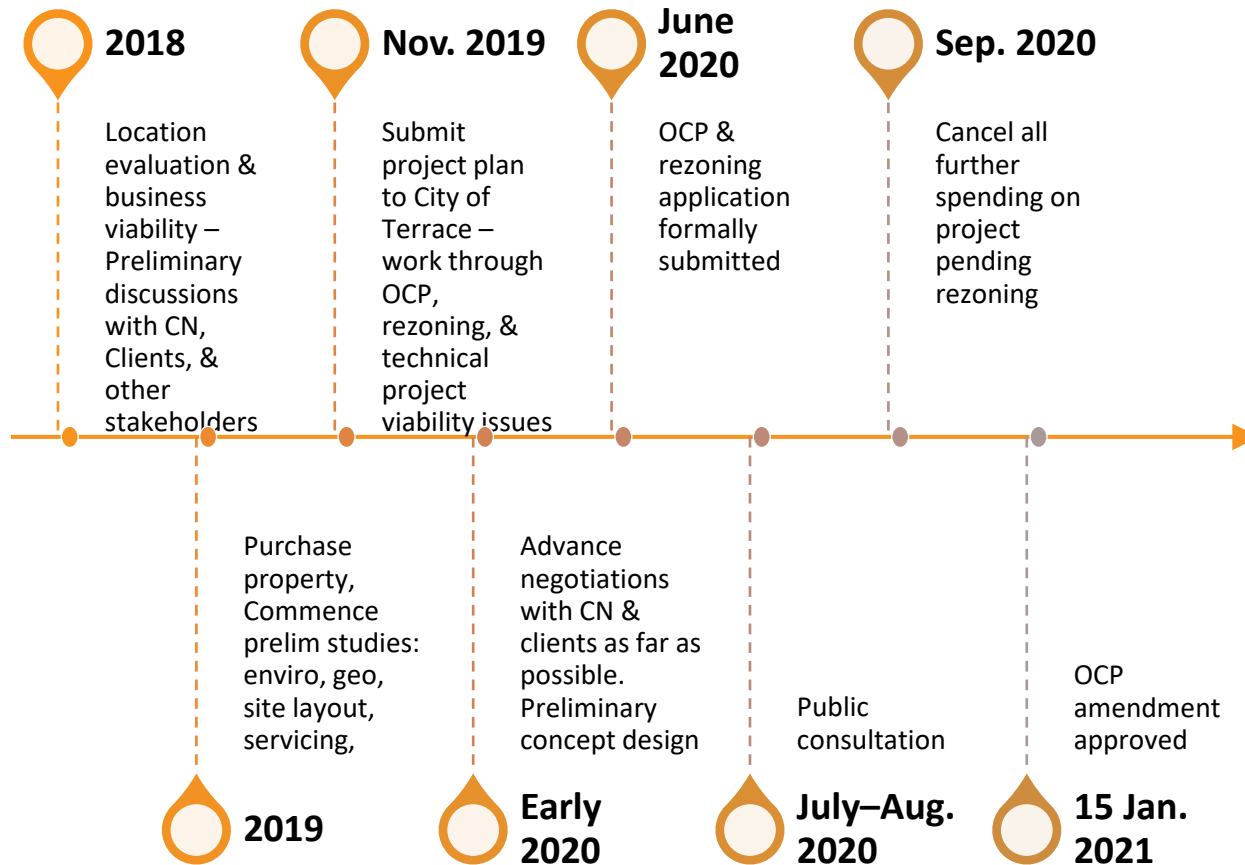
Considerable time has passed since we provided information about our proposed project to Council and this letter is intended as a project update leading into the next step which is to resume the rezoning application. We will address the following topics:

- A brief history of the project
- A summary of our project plan moving forward
- A summary of how and when key concerns are intended to be addressed

There has been considerable public commentary about Progressive Ventures possibly addressing various concerns at the rezoning stage. We recognize the desire to know the end outcome as soon as possible however until we have an appropriately zoned property, there are many aspects of the project that we simply cannot even start. There is a thorough approvals process established in provincial legislation and municipal bylaws that must be followed and key milestones that need to be accomplished before answers to these questions can be provided. We want to assure you that this process will be diligently followed, and that appropriate information will be brought forward at appropriate times.

Despite the majority of this letter focusing on details and addressing potential negative concerns, I want to take this opportunity to remind you of the overwhelming support in our community for this project and the many benefits it will bring to Terrace.

## PROJECT HISTORY



### Current Status

Since the OCP amendment was approved in January the City of Terrace has been drafting a new heavy industrial zone appropriate to a transloading facility. This is now complete, and we are requesting City Staff to resume our formal rezoning application.

All other spending remains on hold.

## PROJECT PLAN AFTER REZONING

- Resume environmental remediation from historical site uses
  - Investigations, testing, monitoring and evaluations ongoing since 2013
  - Ministry Release expected in Spring of 2021.
    - This is a milestone requirement prior to subdivision
  - Actual remediation to occur in stages ahead of developing specific portions of the land.
    - Portions of this are a milestone requirement prior to subdivision of buffer ring properties
- Resume technical preparations such as servicing plans, grading and drainage plans, geotechnical investigations, Keith ave cross section, etc.
- Resume Commercial / Stakeholder Negotiations
  - All stakeholder negotiations are paused until the property is rezoned. After rezoning, discussions with CN and potential transload facility users can resume.
- Based on the commercial negotiations above, determine commodities planned for the facility
- Begin site design and engineering based on the intended commodities.
- Prepare and submit a subdivision application to separate the transload facility property from the frontage properties.
  - Dedication of the NW corner park space and commitment to its grading happen at this phase
- Buffer Ring Properties Development
  - Customer-specific light industrial or mixed use developments along Keith Avenue, requiring subdivision, development permit and building permits.
  - Can commence after rezoning is complete and Ministry Release is received for environmental remediation
- Prepare and submit development permit application for transload facility.
- Commence with transload facility construction

A far more detailed flowchart showing the various project milestones is attached.

### Special Mention of Project Viability:


It is important to highlight that achieving appropriate zoning on this property is a go/no-go milestone for us on this entire project (both the transload facility and the frontage ring properties). We cannot invest further in this project in Terrace until we have certainty that it can be done here. Without this certainty that the entire property can be developed once again into a productive contributor to our community we cannot advance any individual portion of the project forward.

We are not a big multi-nation corporation with the ability to wait for years and years. If the requested rezoning is not advanced in a timely manner we will be forced to cancel this project.

## ADDRESSING KEY CONCERNS


Through various stakeholder engagements including our public consultation activities, the City of Terrace’s public consultation activities, and various Council meetings we have heard some common concerns. Many of these concerns already have proposed mitigation measures or will be addressed at a future regulatory milestone such as sub-division stage or development permit stage. Please find a summary of stakeholder concerns below:

### Traffic

Plans to address concern	Timeline and approvals stage	Images
<p>A Traffic Impact Assessment was completed and key recommendations include:</p> <ul style="list-style-type: none"> <li>• Center left turn lanes at the Molitor entrance</li> <li>• Molitor entrance construction as outlined below</li> <li>• Possible signalization of Keith/Kenney but not until the 15-year future mark and pending development activity on the frontage lots</li> <li>• Improvement of cycling and pedestrian infrastructure on Keith Ave.</li> </ul>	<p>Turn lanes should be done as one of the first site servicing and construction activities. Commitments will be stipulated at Sub-division</p>	 <p>Keith Ave cross section per Option B in City of Terrace’s Transportation Master Plan</p>



Site Access

Plans to address concern	Timeline and approvals stage	Images
<p>The Molitor street entrance will be constructed to municipal standards and provide holding space for large vehicles so they can get off Keith Ave.</p> <p>The entrance gate will be designed to accommodate the level of traffic entering the site such that long wait times to enter the site are not encountered.</p>	<p>Entrance should be done as one of the first site servicing and construction activities. Commitments will be stipulated at Sub-division</p>	 <p>Molitor entrance to the Transload facility</p>

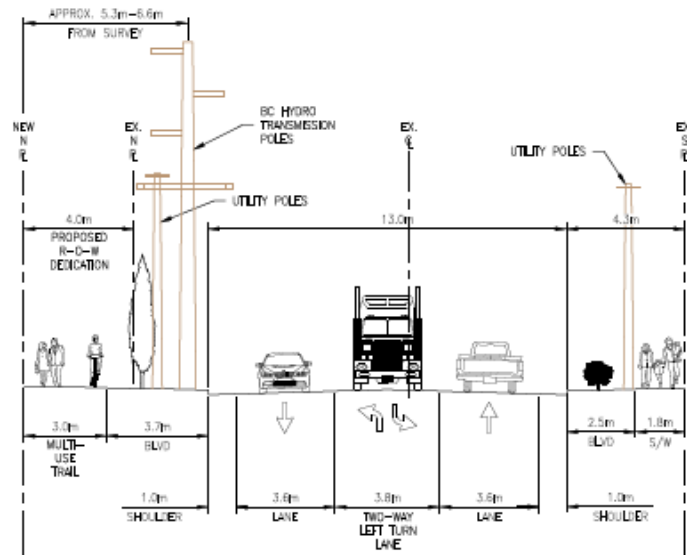
**Pedestrian & Cycling Infrastructure on Keith Ave**

A revised cross section for Keith Ave is being drafted which includes a landscaped median which aligns with the hydro poles and a combined walking/cycling path that is separated from the vehicle lanes

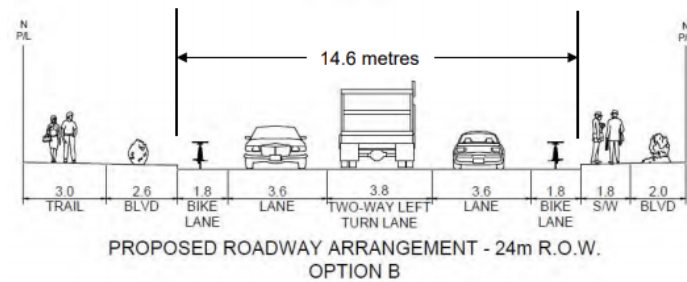
The City of Terrace has requested to construct this to their preferred specifications and on their timeline.

At the time of Sub-division we will dedicate 4 meters of land along the frontage of Keith Ave so that the City has the full 24m right-of-way required to construct it's planned Keith Ave.

As the frontage properties develop we will contribute funds to the upgrading of Keith Ave.



Preliminary concept for new Keith Ave cross section by Allnorth and Progressive Ventures



Keith Ave cross section as presented in City of Terrace Transportation Master Plan

**Noise Attenuation**

Plans to address concern	Timeline and approvals stage	Images
<p><b>South Boundary –</b>            Buildings along Keith Ave will largely buffer the sound impacts in that direction.</p> <p>Where parking lots or other open areas exist enhanced fencing, hedges, and other landscaping may be used as in-fill</p>	<p>We have significant demand for light industrial properties to be available for development.</p> <p>After the zoning is complete, we can resume the environmental remediation to achieve a Ministry Release. After this we can sub-divide and begin developing these properties</p>	<div data-bbox="1024 407 1896 834" data-label="Image"> <p>A 3D architectural rendering of a modern, single-story industrial building with a red roof and large windows. The building is situated behind a paved road labeled 'KEITH AVE.'. The background shows rolling green hills under a clear sky.</p> </div> <p data-bbox="1276 854 1644 878">Concept image of South boundary</p> <div data-bbox="1031 919 1890 1317" data-label="Image"> <p>A photograph of a real-world industrial building on Keith Ave East. The building is yellow with a green roof and has signs for 'ANDREWS MET LIMITED' and 'Bath &amp; Kitchen'. A paved road is in the foreground, and trees and utility poles are visible between the road and the building, illustrating the effectiveness of building buffers.</p> </div> <p data-bbox="1150 1341 1770 1365">Keith Ave East, depicting effectiveness of building buffers</p>

**West Boundary –**

The south half will be buildings as above and the north half will be a 15m wide park area. Design of this park is pending input from the City of Terrace but there is opportunity for berms, trees, landscaping, etc

We have significant demand for light industrial properties to be available for development.

After the zoning is complete, we can resume the environmental remediation to achieve a Ministry Release. After this we can sub-divide and begin developing these properties.

Development of the park is pending input from the City of Terrace



Concept image of West boundary

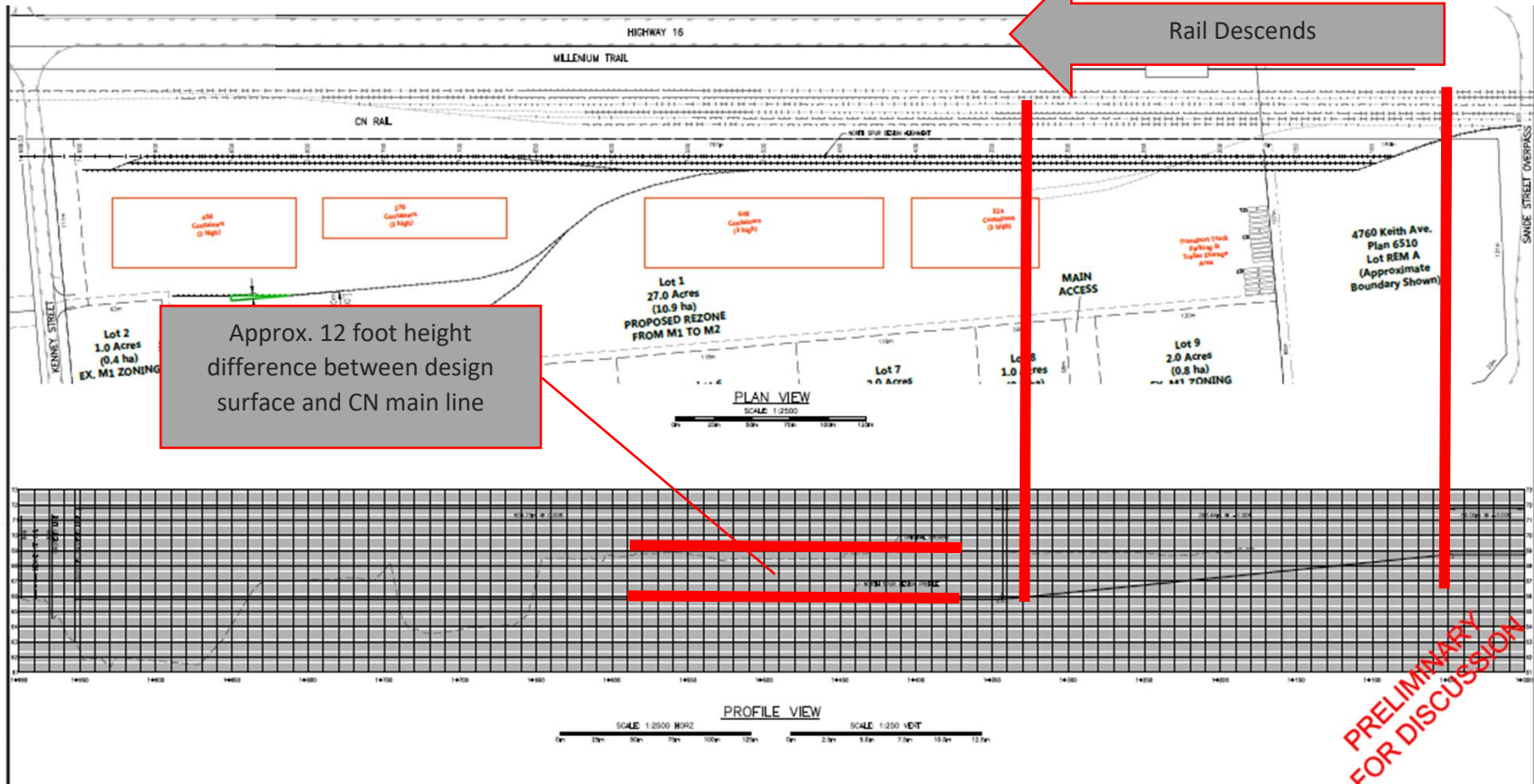
**North Boundary** – There is a significant grade separation between the design elevation of the transload facility and CN’s tracks. When looking south from the Millennium Trail one will be looking at the upper portion only and/or over the top of train cars. This elevation separation will provide significant sound attenuation. Additionally, existing evergreen trees at the top of the bank will be left to grow.

This grading will be done at the beginning of construction prior to any significant rail expansion. Detailed designs submitted at Development Permit stage will outline exactly what is proposed



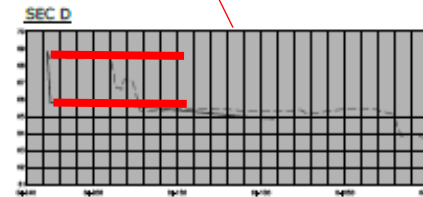
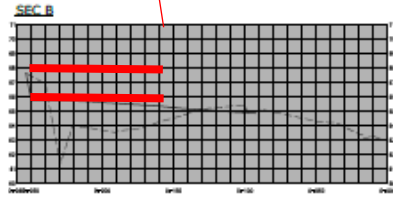
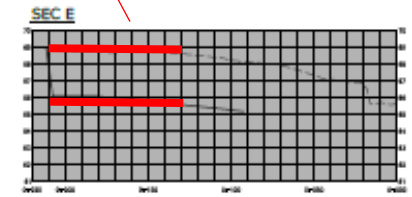
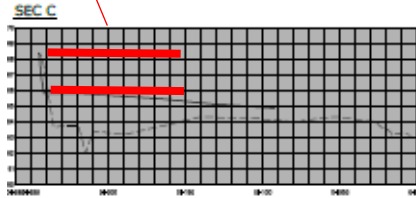
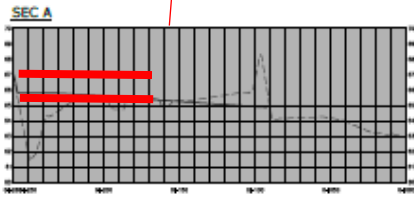
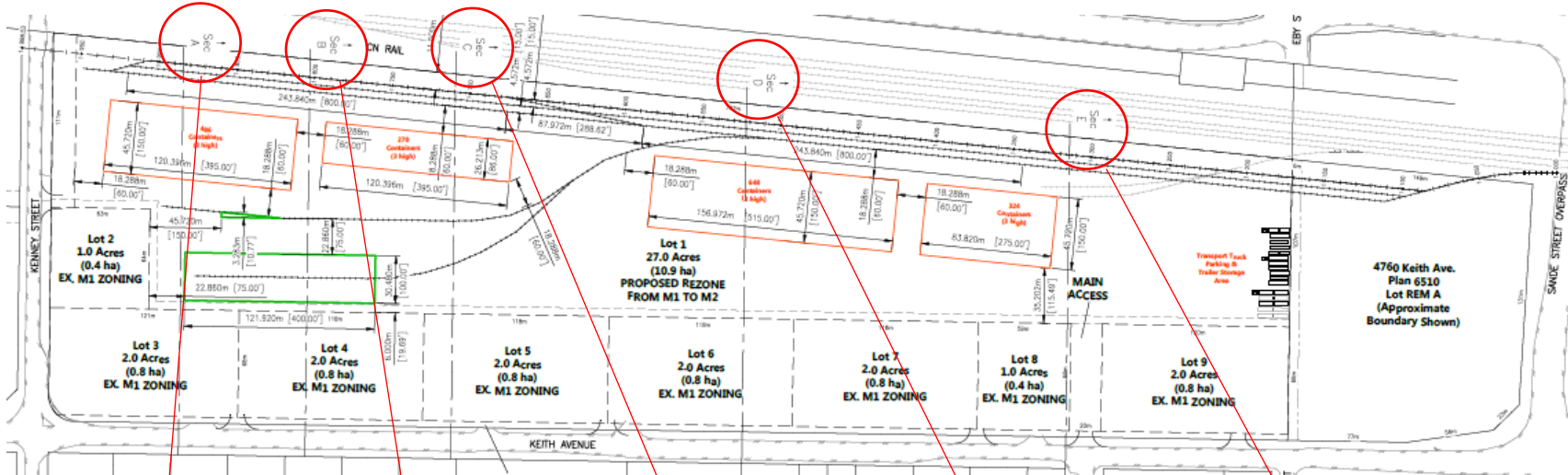
Grade separation between CN mainline & transload design surface

North Boundary - Continued



PRELIMINARY  
FOR DISCUSSION

North Boundary - Continued

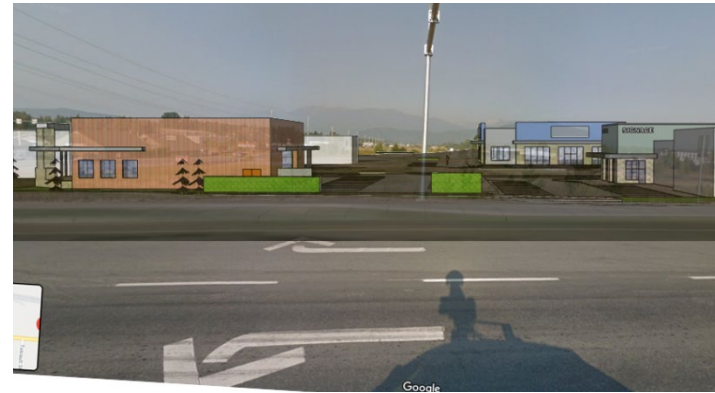


Height difference between design surface and CN main line transitions from approx. 12' on East end to 4' on West end

**East Boundary** – Existing evergreen trees at the base of the Sande Overpass will be left to grow. Buildings will be constructed in the south 2/3 of the property and provide a buffer as outlined above.

Final layout and design of the transload portion of this boundary will be submitted at development permit stage.

The South 2/3 of the property is available for development now and we are actively marketing this. The zoning however is C3 – Highway Commercial which currently has far lower demand than light industrial zoned land so we don't have an anticipated timeline for development.







Proposed development at 4760 Keith



View into Transload facility from Sande Overpass



**Noise – Equipment**

Discussion	Timeline and approvals stage	Images
<p>Minimal equipment or mechanized processes are proposed as part of the transload facility operations.</p> <p>Possible equipment includes:</p> <ul style="list-style-type: none"> <li>• Track Mobile</li> <li>• Reach Stacker</li> <li>• Forklifts</li> <li>• Conveyors</li> <li>• Pumps</li> </ul>	<p>Pending rezoning and commercial negotiations commodities will be known. After that we can design the facility, including the equipment intended to be used. This will be included in our development permit submission.</p>	   

## Noise – Comparison to Background and Discussion

- Existing Baseline Background Noise
  - Rail locomotive (moving) – 90dBa at 30m \*
  - “Chain Reaction” when train stops or starts – 92dBa at 30m \*
  - Lafarge existing cement transload pumps – 101 dBa at pump, 73dBa at 30m (physically measured in Terrace yard)
    - Note, this noise has been existing in operation for the past 8 years – no complaints have been received
  
- Anticipated operational noise
  - Track mobile - 79dBa measured at the machine (unknown at 30m but expected to be approx. 49dBa) \*\*
  - Forklifts – 102dBa - as stated by local dealer (Unknown at 30m but expected to be approx. 72dBa)
    - Note, this noise has been existing in operation for the past 1.5 years – no complaints have been received
  - Reach stacker – 107dBa measured at the machine (unknown at 30m but expected to be approx. 77dBa)\*\*
  - Pumps – 70dBa at the machine (unknown at 30m but expected to be approx. 50 dBa) \*\*
  - Train noise – Minimal compared to existing background. Noise the community is currently accustomed to hearing such as full-sized engines at high speeds and the “chain reaction” when trains start and stop are NOT noises that will be generated from our site. We can only generate very short trains and we can only move at very slow speeds.
  - Backup alarms – Safety is not negotiable for PVL so best practices must be adhered to; however, “white noise” alarms are more and more common. They focus the noise more on the immediate area. Use of these alarms instead of tonal alarms will be supported by PVL as long as they meet best practices and regulatory standards
  - Site design – we intend to design the site for maximum forward traffic movements
  
- Anticipated hours of operation
  - Transloading and internal railyard activity
    - Regular business hours, conforming to City of Terrace noise bylaws
  - Dispatching/receiving trains from CN’s main line
    - Possible movements 24/7 (except for unusual circumstances, activity outside of the hours outlined above is intended to be limited to interfacing with CN to dispatch or receive a train only, and associated activities such as parking and securing the train for the night).

\* Per the Guidelines for new development in Proximity to Railway Operations by Federation of Canadian Municipalities and Railway Association of Canada

\*\* Per manufacturer specifications for commonly used equipment that is representative of equipment we expect to use

**Lighting**

Discussion	Timeline and approvals stage
<p>For safety and security, the site must be lit. Potential mitigations to minimize offsite light impacts include the following:</p> <ul style="list-style-type: none"> <li>• Directional lights</li> <li>• Shielding on lights</li> <li>• More lights so that individual light brightness can be reduced.</li> <li>• Motion sensors so that only the areas being used are lit.</li> </ul> <p>It should be noted for comparison that a development of almost any nature will require lighting. Large format retail for example would require a fully lit parking lot and most other commercial or light industrial uses would be similar.</p>	<p>After site design is completed an engineered lighting plan will be completed and submitted as part of the Development Permit application</p>

**Landscaping**

Discussion	Timeline and approvals stage
<p>Buffer ring properties will conform to KENCP development guidelines.</p> <p>Transload facility will have green space on the west, slope and trees on the north, and trees on the east. Otherwise, it will be buffered by buildings.</p> <p>The green space at the northwest corner will be a 15m wide area. Design of this green space is pending input from the City of Terrace but there is opportunity for berms, trees, landscaping, etc</p> <p>The transload facility requires further site design prior to determining landscaping opportunities</p>	<p>All landscaping plans will be submitted as part of the Development Permit application</p>

**Airshed Emissions**

Discussion	Timeline and approvals stage
<p>In general, a transition to the use of rail in our economy contributes to an overall reduction in airshed emissions. Replacing long haul truck transport with rail transport is a net reduction in energy use.</p> <p>Trucks that distribute goods within the region will still distribute within the region. The change is that they will originate here instead of Prince George, Prince Rupert or elsewhere.</p> <p>Locating the transload facility central to our community means transport is not required through outlying neighborhoods back into our community.</p> <p>Dust control measures during construction and dry times during ongoing operations will be implemented. We will also investigate the viability of implementing the engine idling reduction program in our ongoing operations.</p>	<p>Additional information can be provided after commercial negotiations have commenced and proposed commodities are known, however no further studies are proposed.</p> <p>Details of whether more or less trucking in a specific location will occur is not known at this time and is completely dependent on final commodities handled and the nature of the supply chain.</p>

**Dangerous Goods**

Discussion	Timeline and approvals stage
<p>Transportation of dangerous goods is strictly regulated. Progressive Ventures maintains a strong safety culture, commits to industry best practices, and commits to operating within all relevant regulations.</p> <p>Setback distances for large storage tanks such as those seen across from Walmart cannot be met on this property and as such, are not proposed. Setback distances for transloading are easily met and are therefore proposed. Overall, the use of rail instead of trucks to bring fuel to our community contributes to a more efficient and safe economy.</p> <p>Risk to various nearby community assets has been highly politicized without much factual basis. The risk of a major incident in a low-speed, secured yard is significantly lower than the risks already posed with current through-traffic.</p>	<p>Approvals for the Transportation of Dangerous goods and various related rail operations come from a variety of rail and safety regulators.</p> <p>For the most part, other than the Fire Chief, most of these regulators are not associated with the municipal government and the process is not tied to the municipal development process, other than that business in general cannot happen until a business license is granted.</p> <p>Prior to the transport of any individual dangerous good, a complete approvals process from the relevant regulators is required.</p>

## CLOSURE

We would welcome the opportunity to answer questions or clarify anything about our proposed project. We will be available during the Council meeting when the rezoning application is presented. We are also available any time at the contact info below and would be happy to schedule any meeting requested to provide the City of Terrace staff or Council further information.

We would also like to remind you that there is a series of brief videos on our website speaking to common concerns and frequently asked questions located at <https://nsdinlandport.com/videos/>

Sincerely,

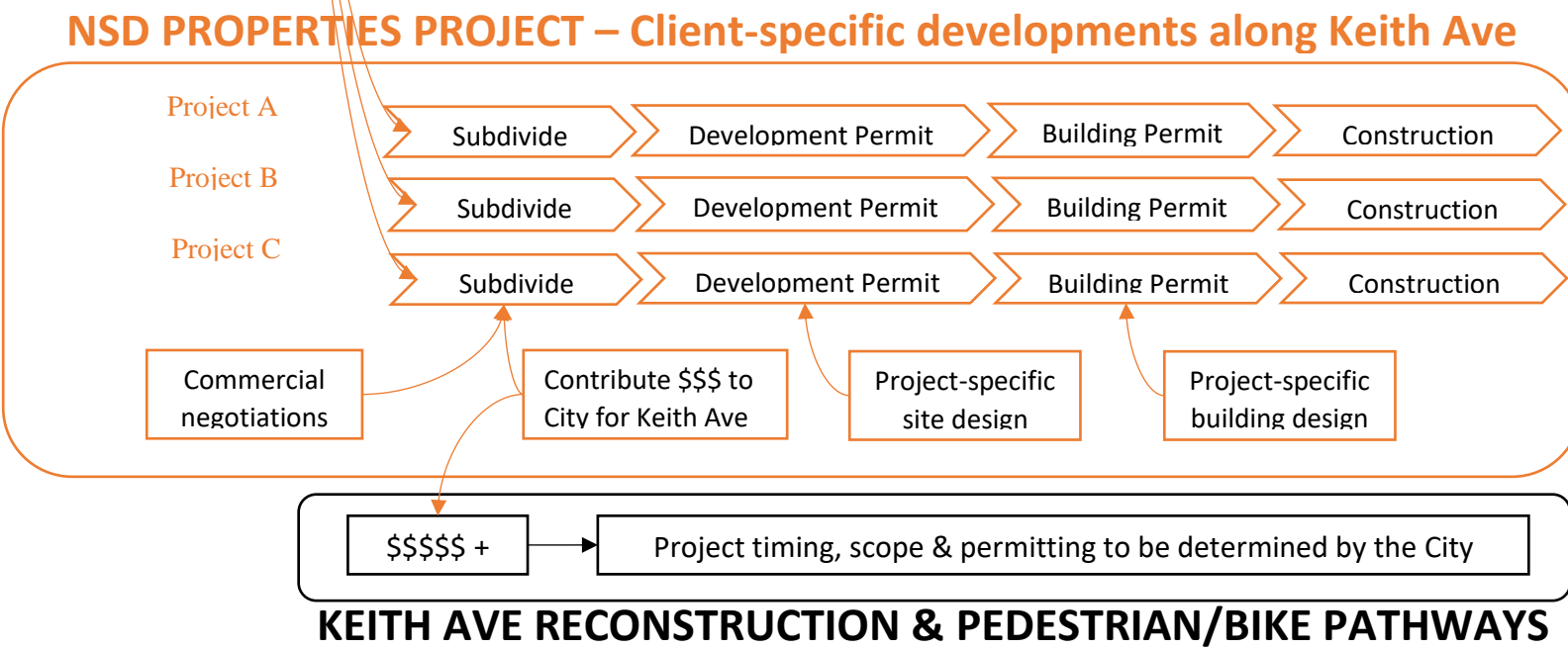
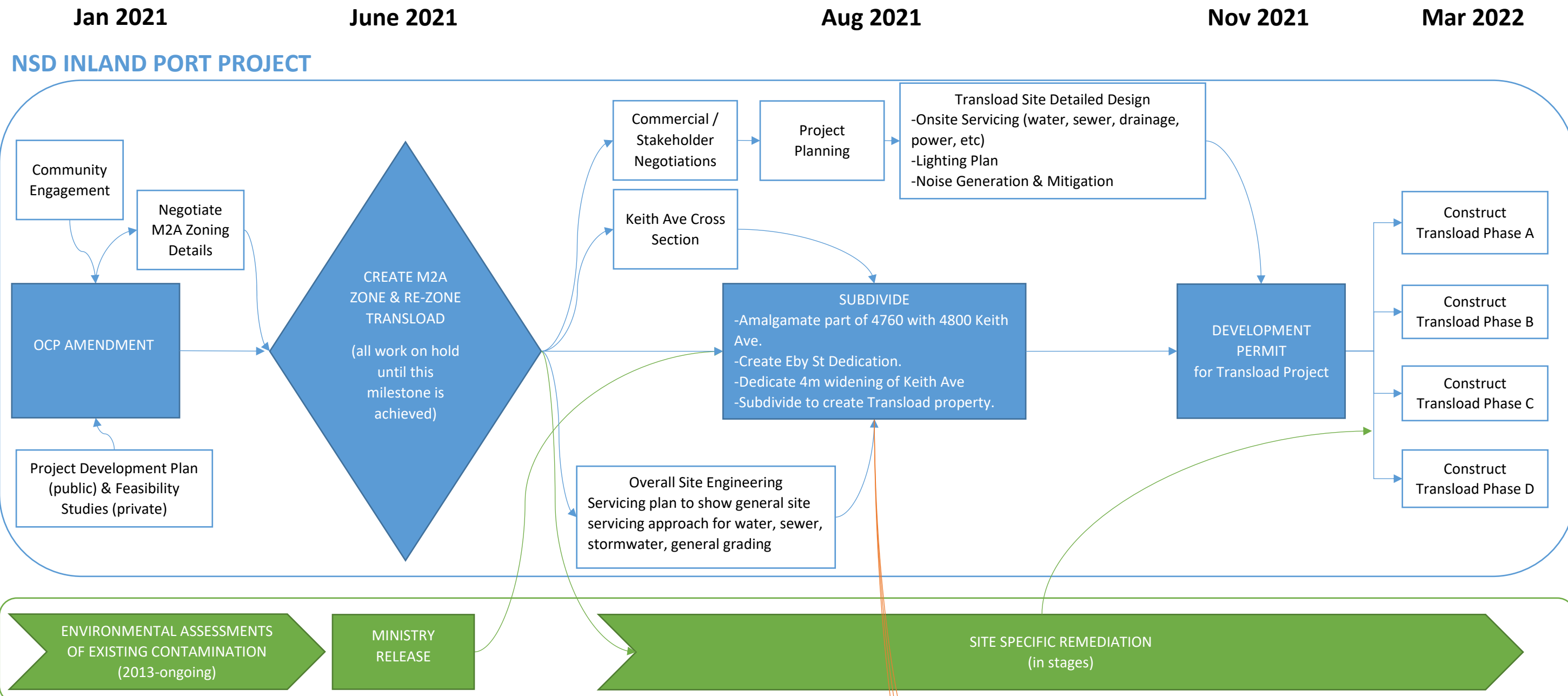


Hatha Callis  
VP, Real Estate & Development  
General Manager, NSD Inland Port  
(250) 641-1317  
[hatha@pvlgroup.com](mailto:hatha@pvlgroup.com)

## SUPPLEMENTARY INFORMATION

The following documents are included for reference:

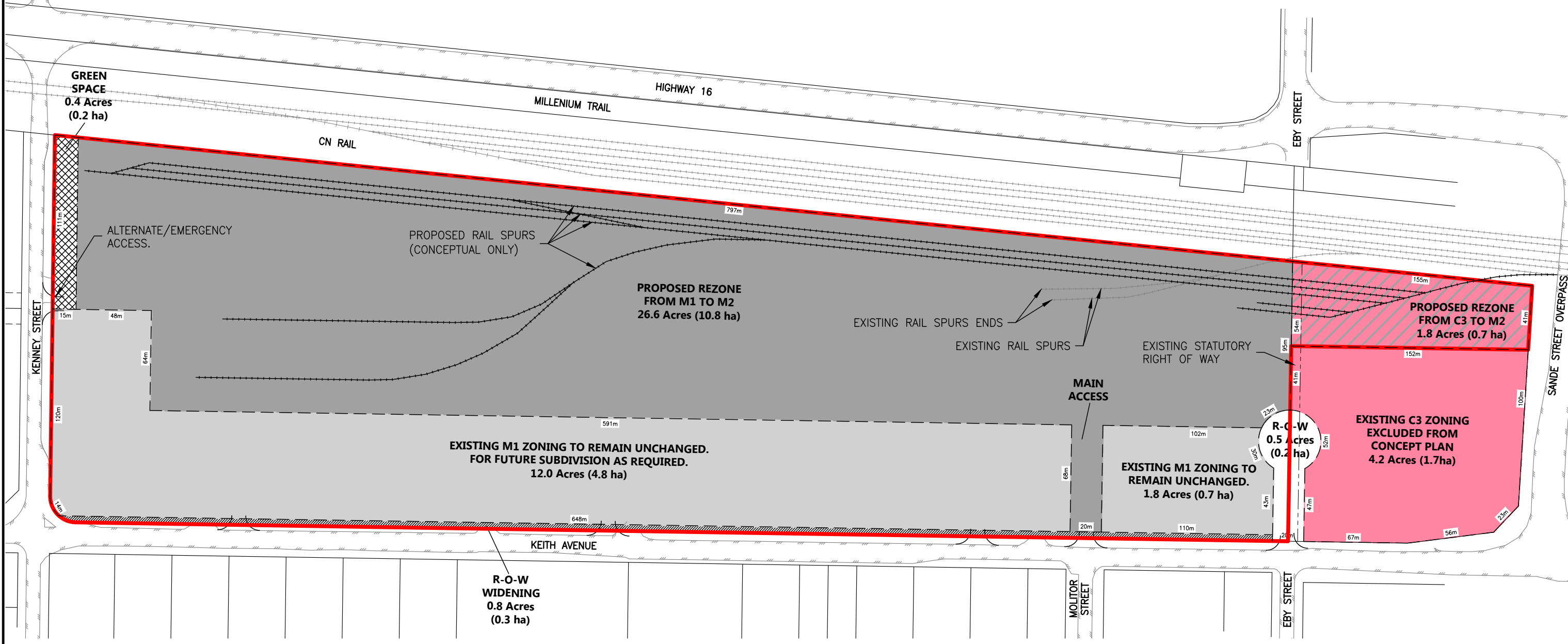
- NSD Project Flowchart
- Zoning Concept Plan
- Subdivision Concept Plan
- NSD Concept Plan – Preliminary Layout
- NSD Concept Plan – Profile
- NSD Concept Plan – Cross Sections



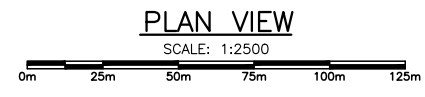
**KEITH AVE RECONSTRUCTION & PEDESTRIAN/BIKE PATHWAYS**

**NSD Inland Port & Developments - Project Flowchart**  
 Prepared by KY of Allnorth Consultants  
 13 April 2021  
 For Progressive Ventures

Date: 2020/06/30 5:48 PM | User: Olof Hultkrans | File: P:\TR\2020\000\20TR0013 - NSD - Keith Ave Dev\1000-Dwg\1011-Civil\01-Production\Figures\20TR0013-Keith Ave Yard-200630-Zoning Concept | Layout: Zoning\_Concept | Paper Size: 558.8mm x 431.8mm



- TOTAL SITE AREA = 48.2 Acres (19.5 ha)
- 4m R.O.W. WIDENING
  - PROPOSED GREEN SPACE
  - PROPOSED REZONE FROM M1 TO M2
  - EXISTING M1 ZONING. MAY BE REZONED FOR MIXED USES
  - PROPOSED REZONE FROM C3 TO M2
  - EXISTING C3 ZONING



**DRAFT**  
- FOR DISCUSSION

**LEGEND**

PROJECT BOUNDARY	
EDGE OF ASPHALT	
LEGAL LOT LINES	
PROPOSED BOUNDARY OF ZONING	

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REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
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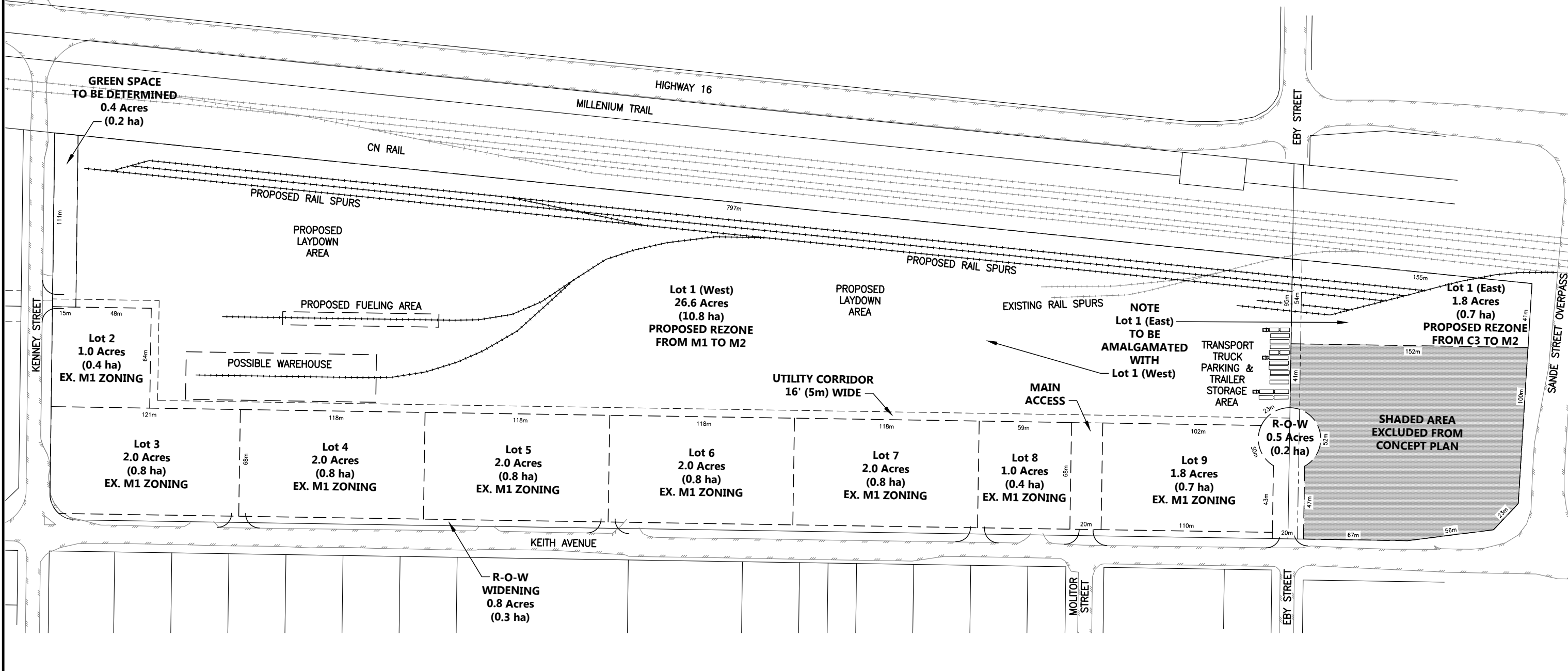
CLIENT:

**PROGRESSIVE VENTURES CONSTRUCTION**

<b>PRELIMINARY ZONING CONCEPT</b>			
CLIENT NO:	-	DRWN:	OTH
PROJECT NO:	20-TR-0013	DATE:	20/06/30
DRAWING SIZE:	ANSI "B"	CHKD:	-
SCALE:	1:2500	APVD:	KMY
		DATE:	20/06/30

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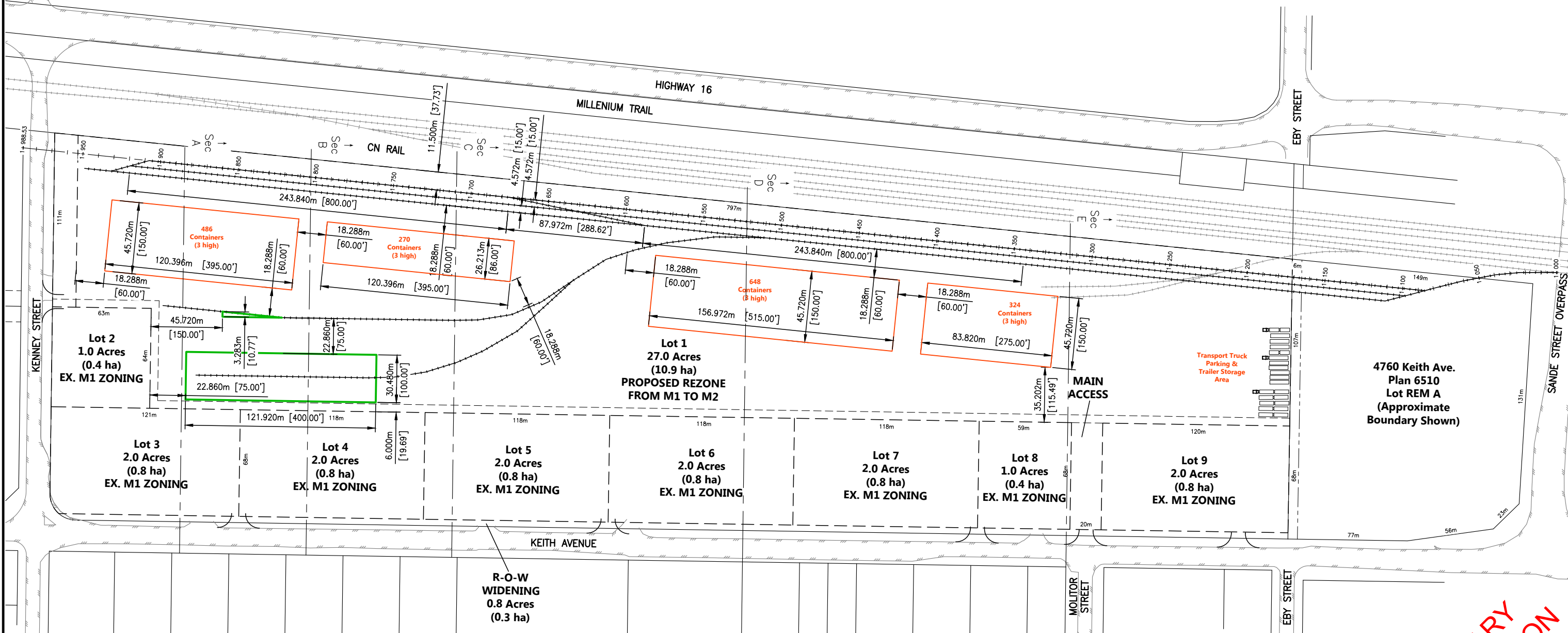
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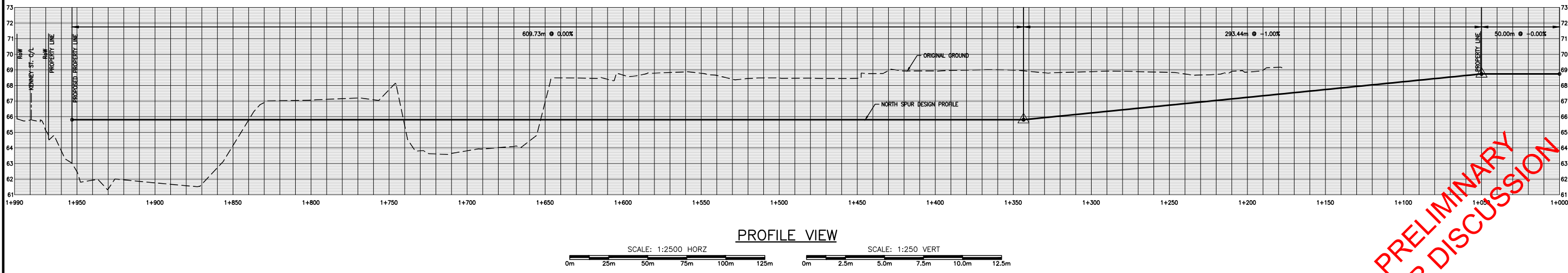
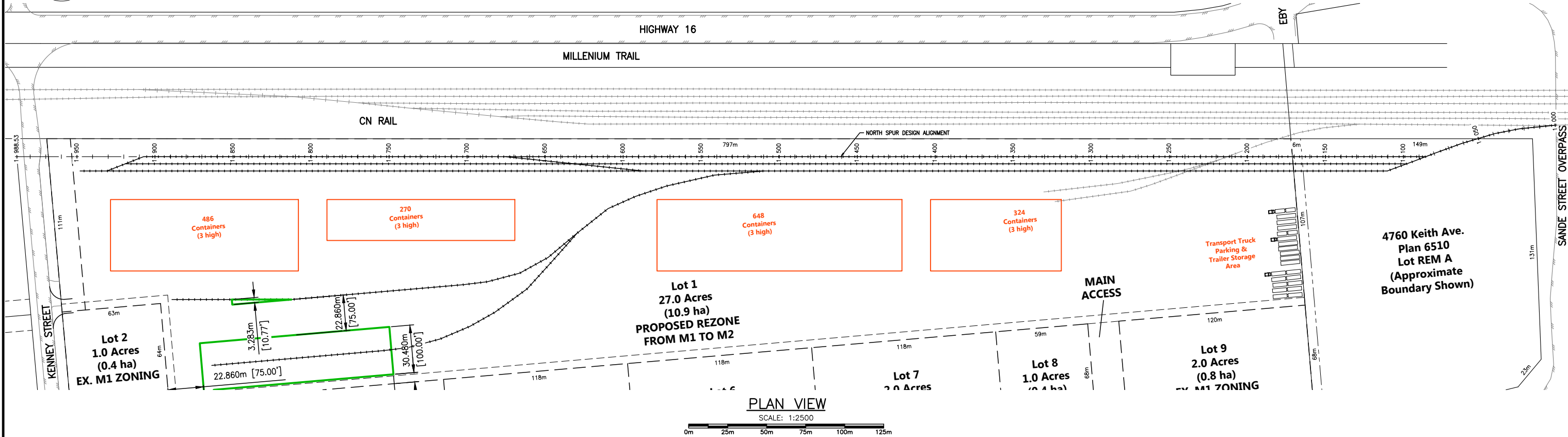
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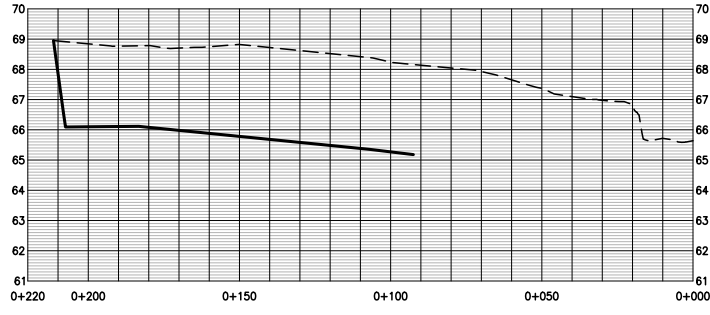
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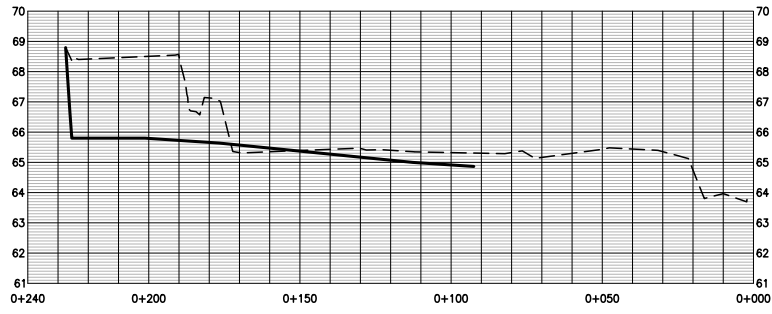
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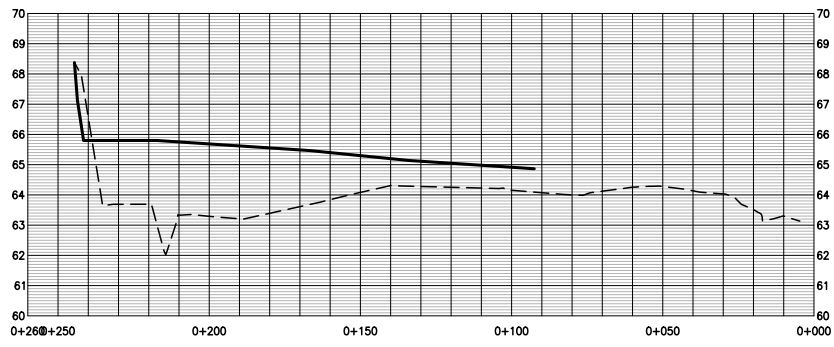
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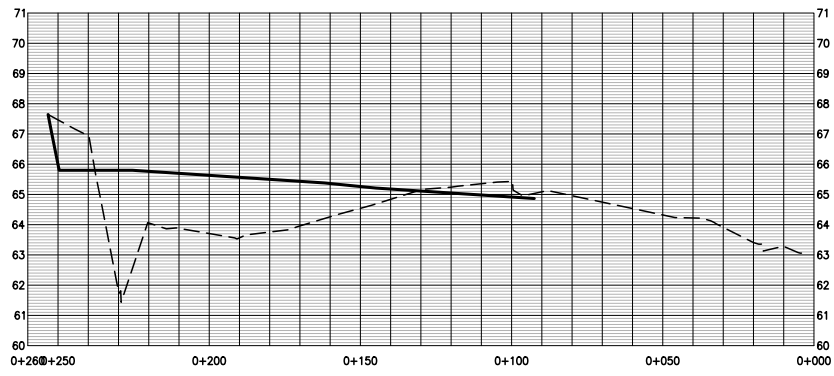
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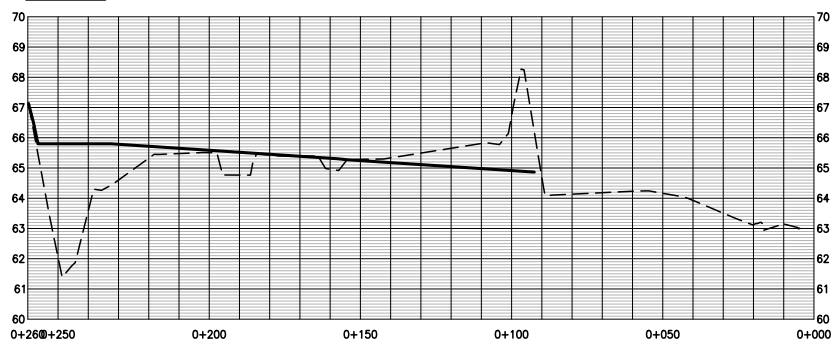
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**SEC B**



**SEC A**



**CROSS SECTIONS**



**PRELIMINARY  
FOR DISCUSSION**

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PROJECT: <b>4800 KEITH AVENUE PROPOSED LAND DEVELOPMENT</b>	
DWG NO: <b>OPTION A</b>	REV: <b>C</b>



# 4800 KEITH AVENUE TRANSLOAD FACILITY

## Traffic Impact Assessment

A handwritten signature in black ink that reads "Tanner Vollema".

---

Author: Tanner Vollema, EIT

---

Reviewer: Michael Skene, Eng.L.

Prepared for: Progressive Ventures Group.

Our File: 2791.B01

Date: July 28, 2020

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## 1.0 INTRODUCTION

Watt Consulting Group was retained by Progressive Ventures Group to conduct a traffic impact assessment (TIA) for the proposed 4800 Keith Road transload facility in the City of Terrace, BC. This report reviews the existing, post development, and long term conditions within the study area, highlights any potential operational issues, and (if necessary) recommends mitigation measures to ensure accommodation of development traffic. The study also includes a review of the alternative transportation networks (pedestrian, cycling, and transit) within the vicinity of the development site.

On March 4<sup>th</sup>, 2020 a meeting was held with the MOTI and the City of Terrace to discuss the terms of reference for the study. The resulting terms of reference are attached as **Appendix C**.

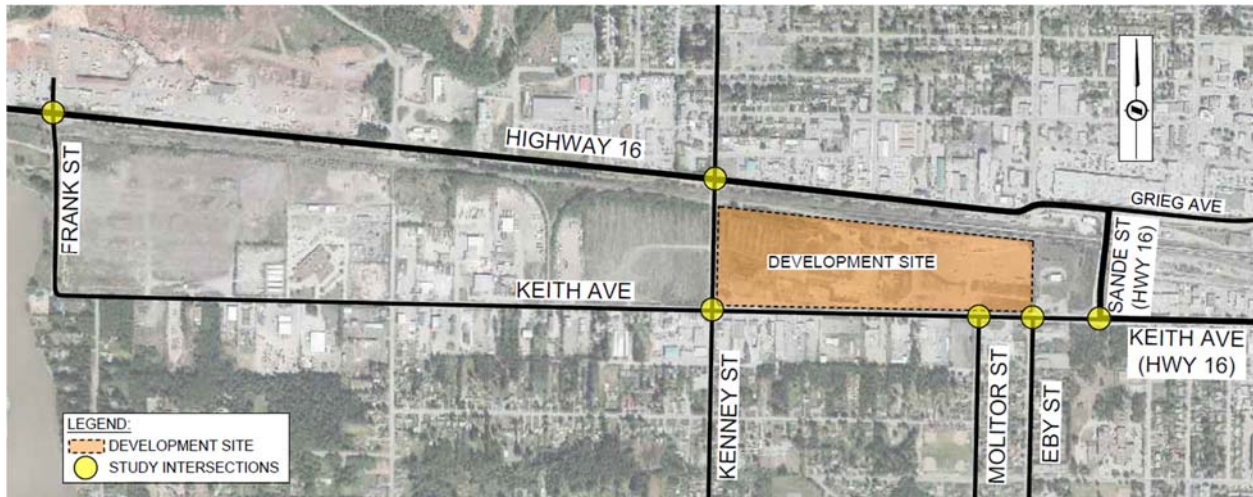
The commencement of this TIA coincided with the start of the COVID-19 pandemic in BC. The pandemic has dramatically affected traffic volumes as schools and workplaces closed down and many commuters began working from home. The long-term effects of COVID-19 is unknown; however, for the purposes of this study, it is assumed that pre-COVID volumes will return prior to opening day; as such, the volumes used in this study are based on counts conducted in early February 2020 (prior to COVID impacting volumes) and on intersection volumes found in the City of Terrace *Transportation Master Plan (2017)*.

### 1.1 STUDY AREA

The proposed development site is located on the north side of Keith Avenue between Kenney St and Eby St. The study area includes the development site as well as the following key intersections:

- Keith Ave / Sande St (Hwy 16);
- Keith Ave / Kenney St;
- Keith Ave / Molitor St;
- Keith Ave / Eby St;
- Hwy 16 / Kenney St; and
- Hwy 16 / Frank St

The study area and key intersections are shown in **Figure 1**.



**Figure 1: Study Area**

## 2.0 EXISTING CONDITIONS

### 2.1 LAND USE

The proposed site is currently zoned to M1 (Light Industrial) and undeveloped. The surrounding land use is comprised of industrial, commercial and community / public use along Keith Avenue.

### 2.2 ROAD NETWORK

**Highway 16** is under the Ministry of Transportation and Infrastructure’s jurisdiction. All other roadways are under the City of Terrace jurisdiction within the study area.

- **Highway 16 (Yellowhead Highway)** is an undivided four-lane highway, two-way arterial road within the study area.
- **Sande Street** is the railway overpass section of Highway 16 which has four lanes running north / south.
- **Keith Avenue** (west of Sande St) is a major collector road with a 2 / 3 lane cross section and runs east / west and passes through the industrial area in the south of Highway 16.
- **Molitor Street** is a collector road providing a connection to Keith Avenue in the west of Eby Street. It is proposed that Molitor St be extended north of Keith Ave to the boundary of the transload facility.
- **Eby Street** is a local road connected to Keith Avenue. It is expected that Eby Street will be extended north of Keith Avenue along existing right-of-way as part of the proposed development (and in conjunction with the adjacent 4760 Keith Ave development concurrently being proposed).
- **Kenney Street** is a two lane collector road that runs north / south through the commercial area north and industrial area south of Highway 16.



- **Frank Street** is a two lane collector road that runs north / south between Keith Ave and Highway 16.

The posted speed limit is 50 km/h on all roads within the study area.

### 2.3 TRAFFIC MODELLING – BACKGROUND INFORMATION

Analysis of the traffic conditions at the study intersections was undertaken using Synchro Studio (version 10). Synchro / SimTraffic is a two-part traffic modelling software that provides analysis of the traffic conditions based on the Highway Capacity Manual (2010) evaluation methodology. A detailed description is provided in **Appendix A**.

For unsignalized (stop-controlled) intersections, the level of service (LOS) is based on the computed delay on each of the critical movements. LOS A represents minimal delays for minor street traffic movements, and LOS F represents a scenario with an insufficient number of gaps on the major street for minor street motorists to complete their movements without significant delays.

For signalized intersections, the methodology considers the intersection geometry, traffic volumes, the traffic signal phasing / timing plan, and pedestrian volumes. The average delay for each lane group is calculated, as well as the delay for the overall intersection.

### 2.4 EXISTING TRAFFIC VOLUMES (2020)

Weekday AM and PM traffic counts were conducted at the Keith Avenue intersection on the following dates:

- Keith Ave / Sande St (Hwy 16) – February 06, 2020
- Keith Ave / Kenney St – February 10, 2020
- Keith Ave / Molitor St – February 10, 2020
- Keith Ave / Eby St – February 12, 2020

The Hwy 16 / Kenney St and Hwy 16 / Frank St intersections were added to the scope of this TIA after counts were conducted. Due to the COVID-19 pandemic, it has not been possible to conduct traffic counts at these intersections. As traffic volumes and patterns have been significantly disrupted by the pandemic, conducting traffic counts at this time would not provide reliable data and therefore is not recommended.

The 2017 Terrace TMP includes 2016 AM and PM volumes for the Hwy 16 / Kenney St and Hwy 16 / Frank St intersections as well as for the Keith Ave / Kenney St and Keith Ave / Sande St (Hwy 16) intersections. In order to determine a growth rate to use in adjusting the 2016 volumes at Hwy 16 / Kenney St and Hwy 16 / Frank St to 2020 volumes, the 2016 volumes for the Keith Ave / Kenney St and Keith Ave / Sande St intersections were compared to the 2020 traffic count volumes. Between 2016 and 2020, the volumes on Highway 16 (on Sande St north of Keith Ave) decreased by a rate of 2% per year in the AM peak hour and 7% per year in the PM peak hour.

Over the same time period, Keith Avenue volumes west of Kenney St shrank by 1-2% while Kenney St volumes north of Keith Ave shrank by 2-3%. It is therefore expected that the traffic volumes at Hwy 16 / Kenney St and Hwy 16 / Frank St have decreased since 2016; as such, the 2016 volumes at Hwy 16 / Kenney St and Hwy 16 / Frank St were used for the 2020 volumes without applying a growth rate (in fact, this should be considered a conservative estimate). As the resulting volumes were obtained on different dates, traffic volume balancing was applied to the study intersections. .

## 2.5 EXISTING TRAFFIC CONDITIONS (2020)

Based on the volumes in **Section 2.4**, the existing 2020 traffic conditions were analyzed in Synchro for the AM and PM peak hour. The existing traffic volumes and levels of service are shown in **Figures 2** and **3**.

At the Keith Ave / Sande St (Hwy 16) intersection, the eastbound movement is at LOS D during the AM peak; the remaining movements are at LOS C or better during both the AM and PM peak movements.

The remaining intersections operate well during both peak hours. At the Hwy 16 / Kenney St, Keith Ave / Kenney St, Keith Ave / Molitor St, and Keith Ave / Eby St intersections, all movements are at LOS A/B during both peak hours. The Hwy 16 / Frank St intersection operates with all movements at LOS A/B during both peak hours with the exception of the southbound movement in the PM peak which is at LOS C.

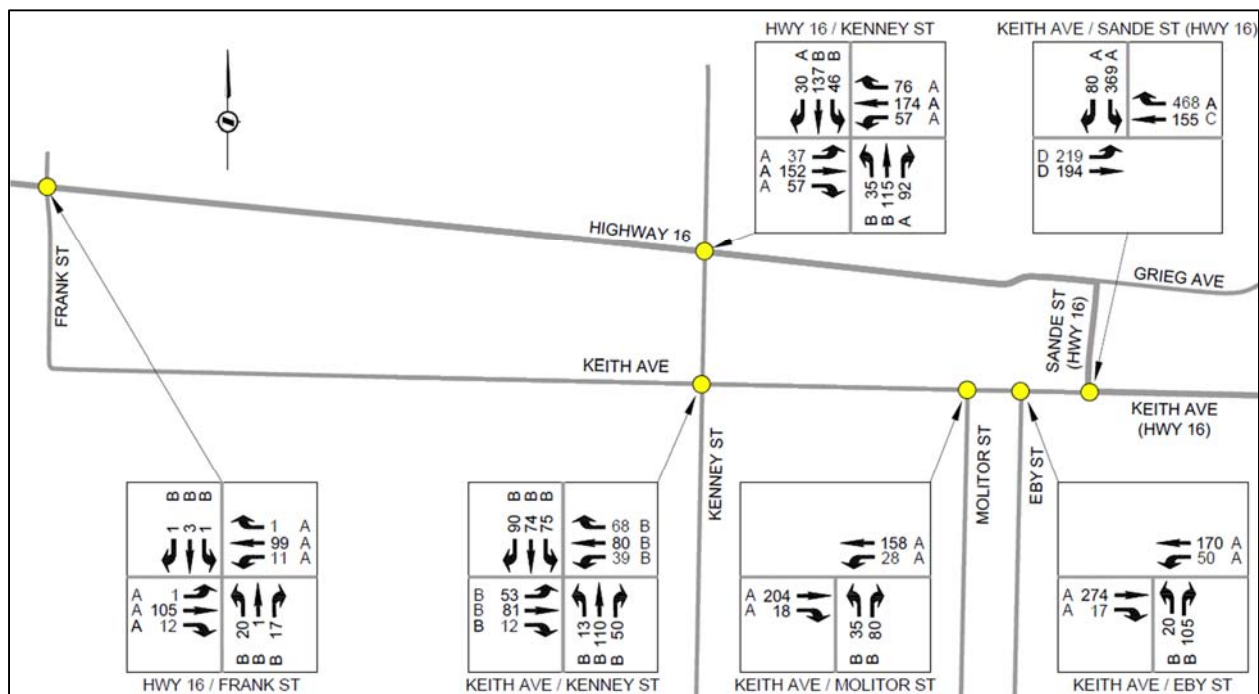


Figure 2: Existing (2020) Traffic Volumes and LOS - AM Peak Hour

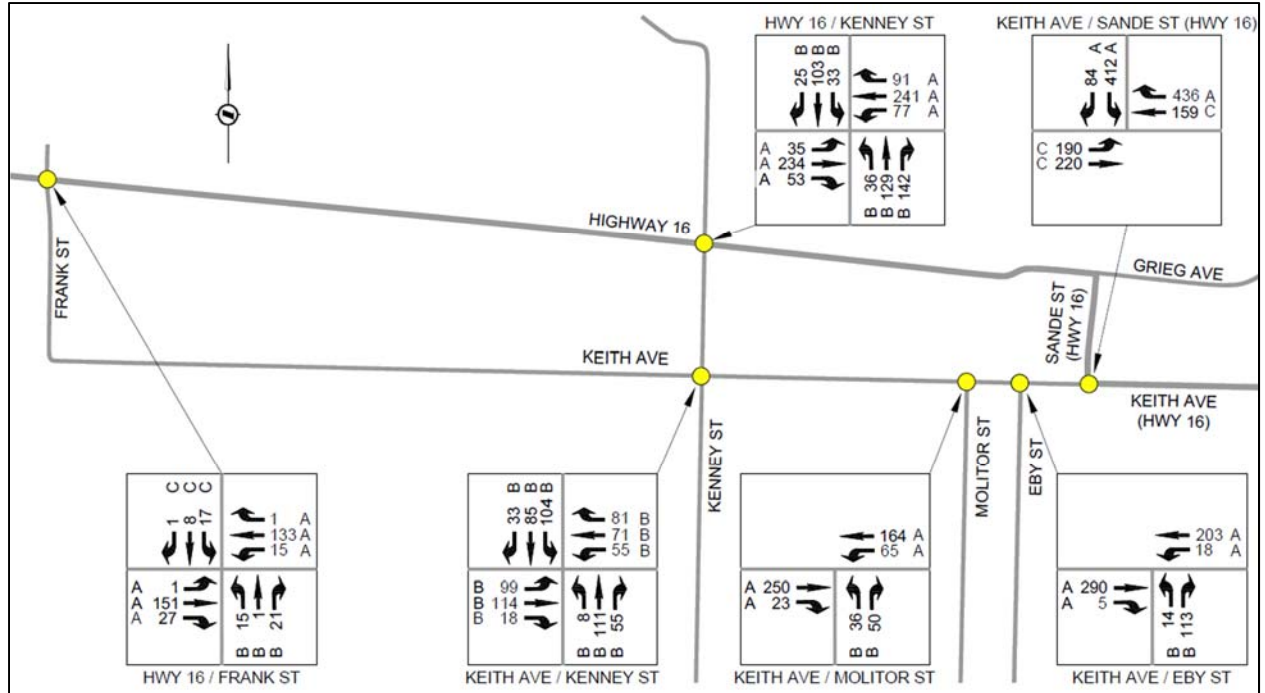


Figure 3: Existing (2020) Traffic Volumes and LOS - PM Peak Hour

### 3.0 POST DEVELOPMENT

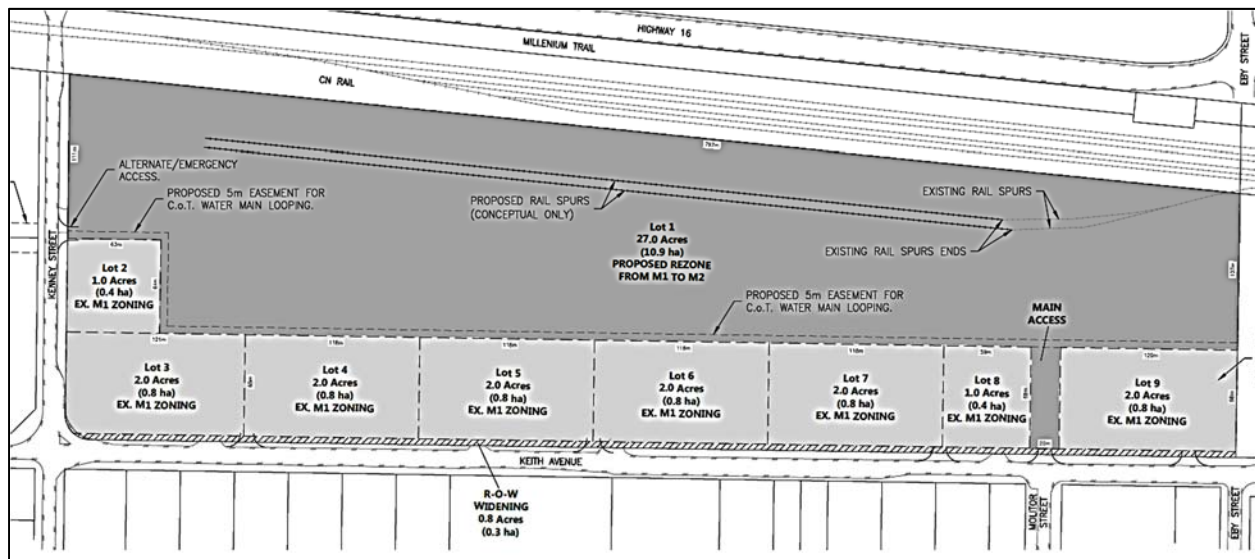
#### 3.1 PROPOSED LAND USE

The 4800 Keith Ave site is a 41 acre site which is currently zoned for light industrial use (M1). The developer is proposing to build a 27 acre transload facility, which will occupy the northernmost 2/3rds of the site (designated as Lot 1). The remaining lands are proposed to be split into 8 lots of 1 or 2 acres each (designated as Lots 2-9). At present, only the transload facility on Lot 1 is proposed to be developed; the future land use of Lots 2-9 are not yet determined. However, for the purposes of this TIA, it is assumed that Lots 2-9 will have a mix of land uses that is appropriate to the current Light Industrial zoning, including industrial park, gas station, and car wash land uses and is based off the development density proposed in the *4800 Keith Ave Development Plan* draft report (draft rev. A, dated November 4, 2019).

Sector	Land Area	Building Area
North – transload facility	24.6 acres / 9.9 ha	45,000 ft <sup>2</sup> 4,180 m <sup>2</sup>
South – mixed use	15.3 acres / 6.2 ha	71,000 ft <sup>2</sup> 6,600 m <sup>2</sup>
Park – Little Trunk Pathway	2 acres 0.8 ha	-
<b>Development Total</b>	<b>41.8 acres</b> <b>16.9 ha</b>	<b>116,000 ft<sup>2</sup></b> <b>10,800 m<sup>2</sup></b>

*Proposed Development Summary (4800 Keith Ave Development Plan – Draft RevA)*

The site plan is shown below in **Figure 4**.



**Figure 4: 4800 Keith Ave Proposed Development Plan**

### 3.2 SITE ACCESS

The main access to the Lot 1 is proposed to be via an extension of Molitor St north of Keith Ave to the site. A Kenney St access is also proposed for emergency access only and is not intended for daily use.

For Lots 2-9, the ultimate access locations are expected to be determined as part of future development proposals for these lands. For the purposes of this TIA, it was assumed that there will be three full-movement accesses onto Keith Ave between Molitor St and Kenney St, each spaced approximately 150m apart which will provide access to Lots 2-7. Lot 8 was assumed to use the Molitor St extension, and Lot 9 was assumed to use both Molitor St and Eby St. The Molitor St and Eby St extensions were modelled in Synchro as two-lane two-way stop-controlled north legs of the Keith Ave / Molitor St and Keith Ave / Eby St intersections respectively.

### 3.3 TRIP GENERATION

The trips expected to be generated by the proposed development are estimated using trip generation rates found in the ITE *Trip Generation Manual (10<sup>th</sup> Edition)*. For the transload facility (Lot 1 in Figure 1), the Intermodal Truck Terminal land use (ITE Code 030) was applied.

Although Lots 2-9 are not included in the transload facility development proposal, it is expected that they will be developed in the future; as such, a high-level trip generation for Lots 2-9 was included in this TIA. The current Light Industrial zoning includes a mix of potential land uses; as such, the Industrial Park land use (ITE Code 130) was considered appropriate to apply to Lots 2-9 as the ITE land use description (“*contains a number of industrial or related facilities...characterized by a mix of manufacturing, services, and warehouse facilities...contain[ing] highly diversified facilities – some with a large number of small businesses*”) closely matches the mix of land uses permitted in the M1 zoning. However, there are some land uses permitted in M1 zoning with trip rates significantly higher than the Industrial Park land use, particularly the Gas Bar / Service Station and Vehicle Wash land uses. Therefore, a gas station and a self-service car wash were included in the trip generation along with the Industrial Park land use.

The proposed development is expected to generate 214 trips (114 inbound / 100 outbound) during the AM peak hour and 289 trips (140 inbound / 149 outbound) during the PM peak. The trip generation results are summarized in **Table 1**.

**TABLE 1: WEEKDAY PEAK HOUR TRIP GENERATION**

ITE Code	Land Use	Units	Trip Rate	Trips In	Trips Out	Total Trips
<b>AM Peak Hour</b>						
030	Intermodal Truck Terminal	45,000 sq. ft.	1.72 / 1000 sq. ft.	37	40	77
130	Industrial Park	67,000 sq. ft.	0.40 / 1000 sq. ft.	22	5	27
944	Gas Bar / Service Station	8 pumps	10.28 / pump	41	41	82
947	Self Service Car Wash	10 wash stalls	5.54 / stall*	14	14	28
<b>AM Peak Total:</b>				114	100	214
<b>PM Peak Hour</b>						
030	Intermodal Truck Terminal	45,000 sq. ft.	1.87 / 1000 sq. ft.	44	40	84
130	Industrial Park	67,000 sq. ft.	0.40 / 1000 sq. ft.	6	21	27
944	Gas Bar / Service Station	8 pumps	14.03 / pump	56	56	112
947	Self Service Car Wash	10 wash stalls	5.54 / stall	34	32	66
<b>PM Peak Total:</b>				140	149	289

### 3.4 TRIP ASSIGNMENT

The trip assignment for the development trips was based on the existing traffic patterns and the key origins and destinations for traffic in the area. The transload facility is assumed to have a higher proportion of traffic coming from or heading to out of town along, compared to the other land uses which are expected to have a higher percentage of local traffic staying within the City of Terrace. Therefore, separate trip distribution ratios were used to assign traffic from the transload facility and from Lots 2-9.

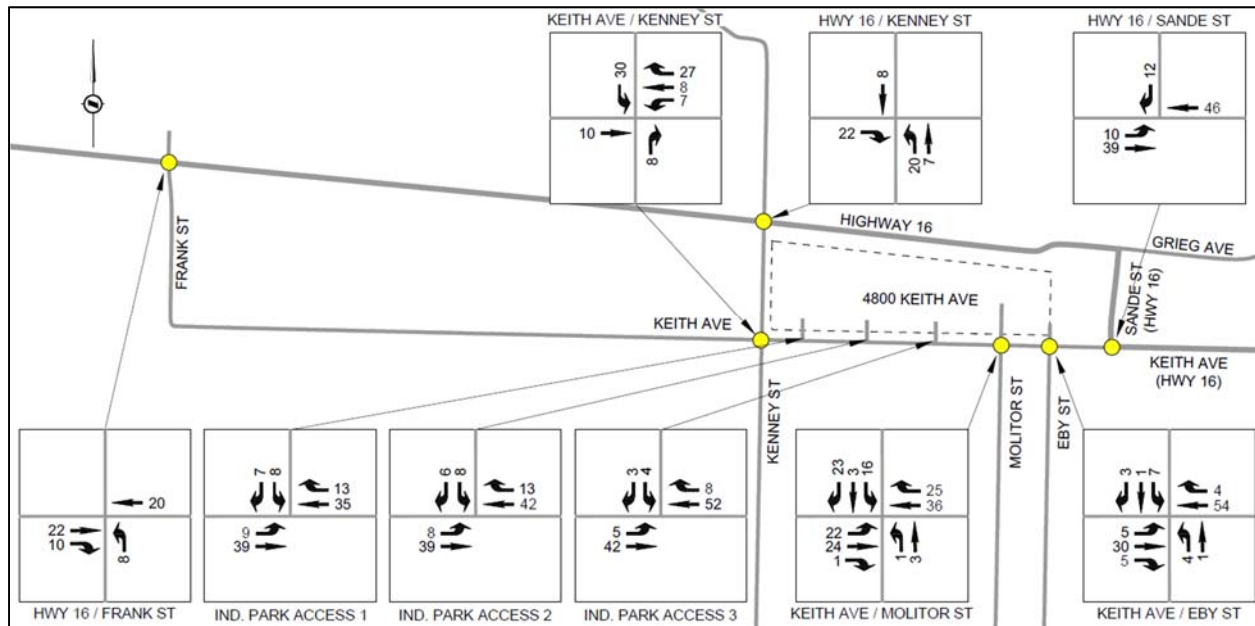
The transload facility site trips generated during the AM and PM peak hours will be assigned to the road network based on the following distribution:

- 20% to / from the west on Highway 16 via Kenney St;
- 10% to/ from the west on Highway 16 via Frank St;
- 45% to / from the east on Highway 16;
- 10% to / from the north-east (downtown) via Sande St;
- 5% to / from the north via Kenney St;
- 5% to / from the south via Kenney St;
- 2.5% to / from the south via Molitor St; and
- 2.5% to / from the south via Eby St.

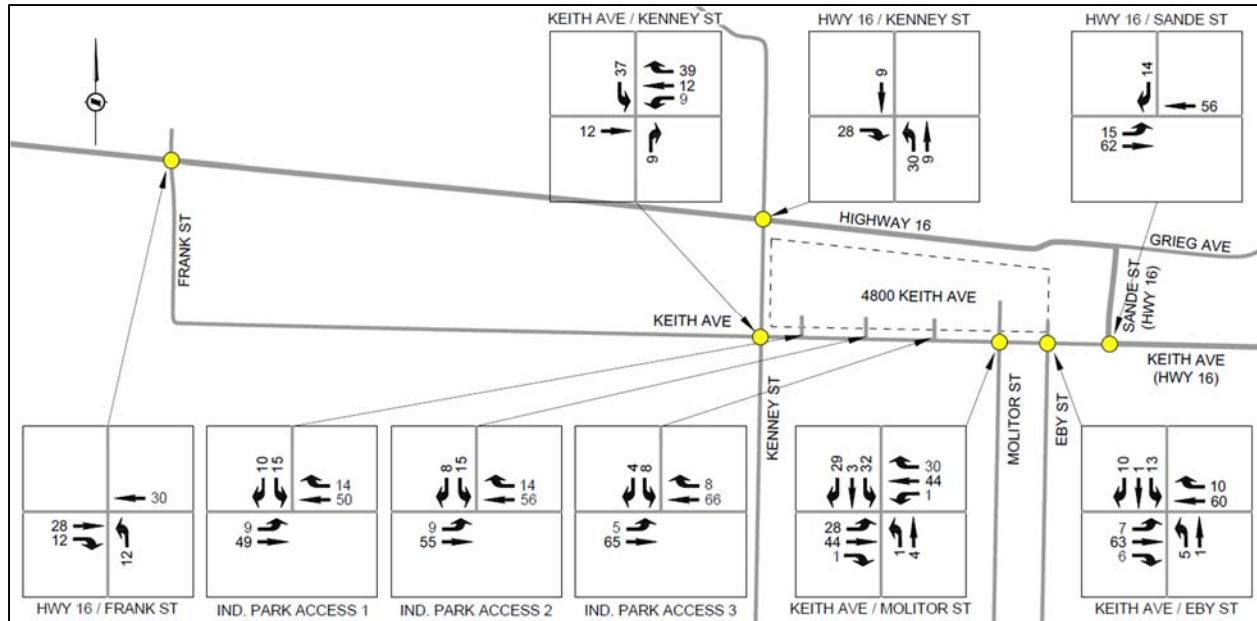
The site trips generated from Lots 2-9 during the AM and PM peak hours will be assigned to the road network based on the following distribution:

- 20% to / from the west on Highway 16 via Kenney St;
- 5% to/ from the west on Highway 16 via Frank St;
- 30% to / from the east on Highway 16;
- 10% to / from the north-east (downtown) via Sande St;
- 10% to / from the north via Kenney St;
- 10% to / from the south via Kenney St;
- 6% to / from the south via Molitor St; and
- 9% to / from the south via Eby St.

The resulting trip assignments are shown in **Figure 5** and **Figure 6** for the AM and PM peak hours respectively.



**Figure 5: Trip Assignment - AM Peak Hour**



**Figure 6: Trip Assignment - PM Peak Hour**

### 3.5 2022 BACKGROUND VOLUMES

For the purposes of this TIA, opening day of the proposed development is estimated to be in 2022. According to the Terrace Transportation Master Plan (2017), the population of Terrace has been stable for many years, which matches the flat / negative traffic volume growth observed between 2016 and 2020 (see **Section 2.4**). However, the TMP predicts the population growth to substantially increase in the next decade, which is reflected in the 2% growth rate used to predict future traffic volumes in the TMP. Therefore, to account for the expected population growth, a 2% annual growth rate was applied to the existing traffic volumes (see **Figures 2 and 3**) to estimate the future background volumes.

### 3.6 OPENING DAY CONDITIONS (2022)

The 2022 post development traffic conditions were analyzed in Synchro / SimTraffic during the AM and PM peak hours and compared to the 2022 background conditions to determine the impact of the proposed development on the study intersections.

#### 3.6.1 AM PEAK HOUR ANALYSIS RESULTS

The 2022 post development volumes and LOS during the AM peak hour are shown in **Figure 7**. The background and post development analysis results are summarized in **Table 2**.



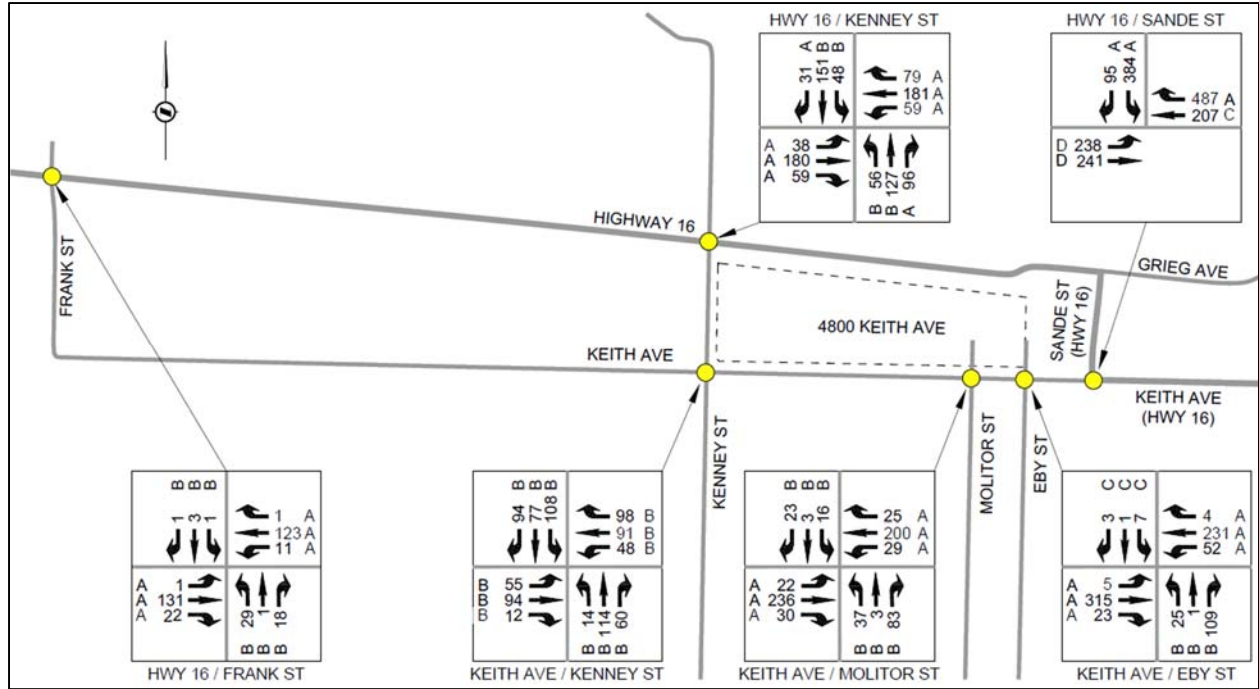


Figure 7: Opening Day (2022) Post Development Volumes & LOS – AM Peak

**TABLE 2: 2022 BACKGROUND AND POST DEVELOPMENT CONDITIONS – AM PEAK**

Intersection	Movement	Background Conditions – AM Peak			Post Development Conditions – AM Peak		
		LOS	Delay (s)	95 <sup>th</sup> % Queue (m)	LOS	Delay (s)	95 <sup>th</sup> % Queue (m)
Keith Ave / Sande St (Hwy 16)	EB L/T	D	35.4	70.4	D	37.5	78.6
	WBT	C	27.9	47.5	C	28.5	57.3
	WBR	A	0.6	0.0	A	0.6	2.7
	SBL	A	7.9	40.6	A	9.0	44.9
	SBR	A	2.3	4.0	A	2.4	0.0
Keith Ave / Eby St	EB L/T/R	A	0.0	0.0	A	0.2	6.7
	WB L/T/R	A	2.0	16.2	A	1.7	54.3
	NB L/T/R	B	12.4	14.7	B	14.6	16.6
	SB L/T/R	N/A	N/A	N/A	C	18.3	9.1
Keith Ave / Molitor St	EB L/T/R	A	0.0	0.0	A	0.7	10.6
	WB L/T/R	A	1.3	9.1	A	1.0	12.5
	NB L//TR	B	11.5	16.1	B	14.1	20.4
	SB L/T/R	N/A	N/A	N/A	B	13.7	14.5
Keith Ave / Kenney St	EB L/T/R	B	10.4	21.4	B	11.2	18.6
	WB L/T/R	B	10.7	34.4	B	11.9	34.1
	NB L/T/R	B	10.3	19.2	B	11.0	21.0
	SB L/T/R	B	11.3	22.7	B	12.8	61.0
Hwy 16 / Kenney St	EBL	A	8.2	10.4	A	8.3	10.4
	EBT	A	7.3	12.9	A	7.4	13.9
	EBR	A	3.2	2.1	A	3.2	4.3
	WBL	A	8.3	16.5	A	8.4	175
	WB T/R	A	5.3	22.5	A	5.4	22.0
	NB L/T	B	15.3	26.9	B	16.6	29.5
	NBR	A	4.0	0.0	A	3.9	0.0
	SB L/T	B	16.9	31.3	B	16.7	34.5
	SBR	A	4.8	12.5	A	4.7	13.5
Hwy 16 / Frank St	EB L/T/R	A	3.7	13.1	A	3.7	13.5
	WB L/T/R	A	3.9	14.6	A	4.0	15.8
	NB L/T/R	B	17.6	16.7	B	19.0	16.5
	SB L/T/R	B	18.8	8.9	B	18.4	6.5

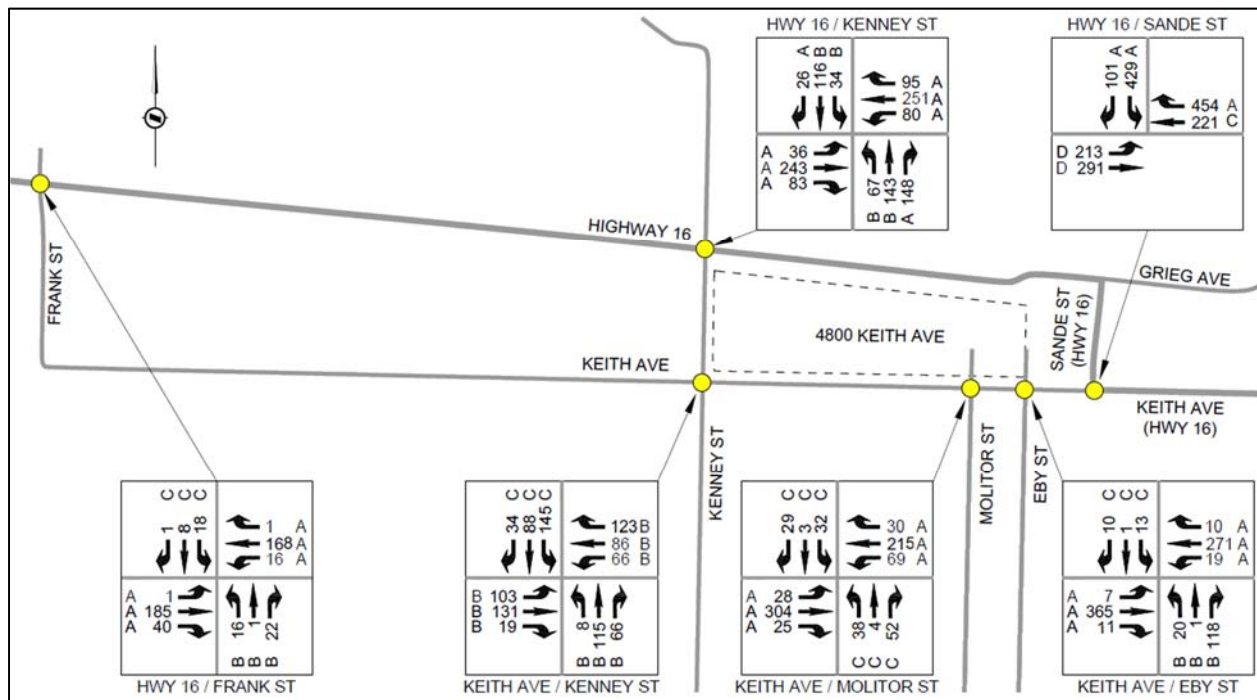
With the completion of the development in 2022, the addition of site traffic did not result in any changes to the LOS of any of the study intersections during the AM peak hour (compared to 2022 background conditions).

At the Keith Ave / Sande St (Hwy 16) intersection, during the AM peak period the eastbound left / through movement is at LOS D under both background and post development conditions (the LOS D on the eastbound movement is due to signal timing which prioritizes Highway 16 traffic over Keith Ave traffic; optimization of the signal results in all movements operating at LOS A/B). With the existing signal timing, the remaining movements are at LOS C or better.

The remaining study intersections operate well during the AM peak hour, with all movements at LOS C or better and the majority of movements at LOS A/B.

### 3.6.2 PM PEAK HOUR ANALYSIS RESULTS

The 2022 post development volumes and LOS during the PM peak hour are shown in **Figure 8**. The background and post development analysis results are summarized in **Table 3**.



**Figure 8: Opening Day (2022) Post Development Volumes & LOS – PM Peak**

**TABLE 3: 2022 BACKGROUND AND POST DEVELOPMENT CONDITIONS – PM PEAK**

Intersection	Movement	Background Conditions – AM Peak			Post Development Conditions – AM Peak		
		LOS	Delay (s)	95 <sup>th</sup> % Queue (m)	LOS	Delay (s)	95 <sup>th</sup> % Queue (m)
Keith Ave / Sande St (Hwy 16)	EB L/T	D	35.2	57.7	D	38.3	74.5
	WBT	C	28.4	46.4	C	28.8	58.0
	WBR	A	0.5	0.0	A	0.5	0.0
	SBL	A	7.9	41.5	A	9.4	45.3
	SBR	A	2.2	0.0	A	2.4	0.0
Keith Ave / Eby St	EB L/T/R	A	0.0	0.0	A	0.2	4.1
	WB L/T/R	A	0.8	27.3	A	0.6	40.1
	NB L/T/R	B	12.0	16.5	B	14.4	16.9
	SB L/T/R	N/A	N/A	N/A	C	17.9	12.0
Keith Ave / Molitor St	EB L/T/R	A	0.0	1.0	A	0.7	12.0
	WB L/T/R	A	2.5	15.4	A	2.0	21.0
	NB L//TR	B	13.0	16.0	C	19.2	18.4
	SB L/T/R	N/A	N/A	N/A	C	19.6	16.7
Keith Ave / Kenney St	EB L/T/R	B	12.6	24.7	B	14.5	23.6
	WB L/T/R	B	11.6	35.4	B	14.3	46.1
	NB L/T/R	B	11.1	19.3	B	12.4	21.5
	SB L/T/R	B	12.4	22.2	C	15.1	61.6
Hwy 16 / Kenney St	EBL	A	8.1	11.7	A	8.9	10.8
	EBT	A	7.0	14.9	A	7.9	16.6
	EBR	A	3.3	2.3	A	3.1	3.9
	WBL	A	8.5	19.0	A	9.3	17.7
	WB T/R	A	5.4	26.9	A	6.0	25.1
	NB L/T	B	16.1	27.9	B	18.2	32.5
	NBR	A	4.1	0.0	A	3.8	0.0
	SB L/T	B	15.2	25.7	B	14.6	28.9
	SBR	A	4.7	12.8	A	4.5	12.2
Hwy 16 / Frank St	EB L/T/R	A	3.8	18.1	A	3.9	22.4
	WB L/T/R	A	4.1	19.2	A	4.2	19.8
	NB L/T/R	B	15.1	15.3	B	15.1	14.8
	SB L/T/R	C	22.8	18.0	C	22.8	18.5

The addition of site traffic in 2022 did not result in any changes to the LOS of any of the study intersections during the PM peak hour when compared to 2022 background conditions, with the exceptions of the Keith Ave / Molitor St northbound movement and the Keith Ave / Kenney St southbound movement which drop for LOS B to C.

At the Keith Ave / Sande St (Hwy 16) intersection, during the PM peak period the eastbound left / through movement is at LOS D under both background and post development conditions (the LOS D on the eastbound movement is due to signal timing, which prioritizes Highway 16 traffic over Keith Ave traffic; optimization of the signal results in all movements operating at LOS A/B). With the existing signal timing, the remaining movements are at LOS C or better.

The remaining study intersections operate well during the PM peak hour, with all movements at LOS C or better and the majority of movements at LOS A/B.

### **3.7 CONCURRENT DEVELOPMENT (4760 KEITH AVE)**

In addition to the 4800 Keith Ave TIA, Watt Consulting is conducting a TIA for a development proposal on the adjacent 4760 Keith Ave property which includes general commercial / retail, office building, and restaurant land uses. While each TIA examines the impact of the respective developments on the area road network separately, an analysis was also conducted of the post development conditions in the event that both developments are constructed.

The 4760 Keith Ave development is expected to generate 157 external trips (93 inbound / 64 outbound) during the AM peak hour and 184 external trips (88 inbound / 96 outbound) during the PM peak hour (the trip assignment for the 4760 Keith Ave development can be found in **Appendix B**). The trips generated by full build-out of both developments were added to the 2022 background traffic to provide the post development volumes used; the analysis results are summarized in **Table 4**.

**TABLE 4: 2022 POST DEVELOPMENT CONDITIONS (INCLUDING 4760 KEITH AVE TRIPS)**

Intersection	Movement	Post Development Conditions – AM Peak			Post Development Conditions – PM Peak		
		LOS	Delay (s)	95 <sup>th</sup> % Queue (m)	LOS	Delay (s)	95 <sup>th</sup> % Queue (m)
Keith Ave / Sande St (Hwy 16)	EB L/T	D	39.7	81.3	D	41.2	74.7
	WBT	C	29.3	61.2	C	29.2	62.0
	WBR	A	0.5	0.0	A	0.5	0.0
	SBL	A	9.5	41.3	B	10.1	46.2
	SBR	A	2.4	0.0	A	2.3	31.9
Keith Ave / Eby St	EB L/T/R	A	1.0	13.9	A	1.0	19.4
	WB L/T/R	A	1.5	16.7	A	0.5	11.4
	NB L/T/R	B	12.9	20.2	C	17.7	19.2
	SB L/T/R	D	29.2	17.6	D	34.9	20.7
Keith Ave / Molitor St	EB L/T/R	A	0.6	9.2	A	0.6	9.9
	WB L/T/R	A	1.0	9.8	A	1.9	16.8
	NB L/T/R	B	14.6	20.6	C	21.3	19.1
	SB L/T/R	B	14.4	14.2	C	21.6	16.5
Keith Ave / Kenney St	EB L/T/R	B	11.7	19.8	C	15.5	26.8
	WB L/T/R	B	12.9	51.5	C	16.5	56.8
	NB L/T/R	B	11.6	20.9	B	13.3	23.5
	SB L/T/R	B	14.1	61.8	C	17.0	24.2
Hwy 16 / Kenney St	EBL	A	8.4	11.4	A	9.1	11.3
	EBT	A	75	13.3	A	8.2	15.1
	EBR	A	2.9	5.9	A	3.0	3.7
	WBL	A	8.5	16.1	A	9.6	18.2
	WB T/R	A	5.5	23.9	A	6.2	26.1
	NB L/T	B	17.3	34.1	B	19.2	37.3
	NBR	A	3.9	0.0	A	3.7	0.0
	SB L/T	B	16.7	33.5	B	14.3	28.9
	SBR	A	4.7	12.0	A	4.4	14.0
Hwy 16 / Frank St	EB L/T/R	A	4.1	19.6	A	3.8	17.9
	WB L/T/R	A	4.3	21.8	A	4.1	16.2
	NB L/T/R	B	18.0	19.6	B	19.6	19.4
	SB L/T/R	C	21.9	17.6	B	18.2	6.8

When the 4760 Keith Ave site traffic is added to the 2022 post development volumes, during both peak hours the eastbound approach of the Keith Ave / Sande St signal remains at LOS D and the southbound approach of the Keith Ave / Eby St intersection drops to LOS D; all other movements at the study intersections are at LOS C or better with most at LOS A/B.

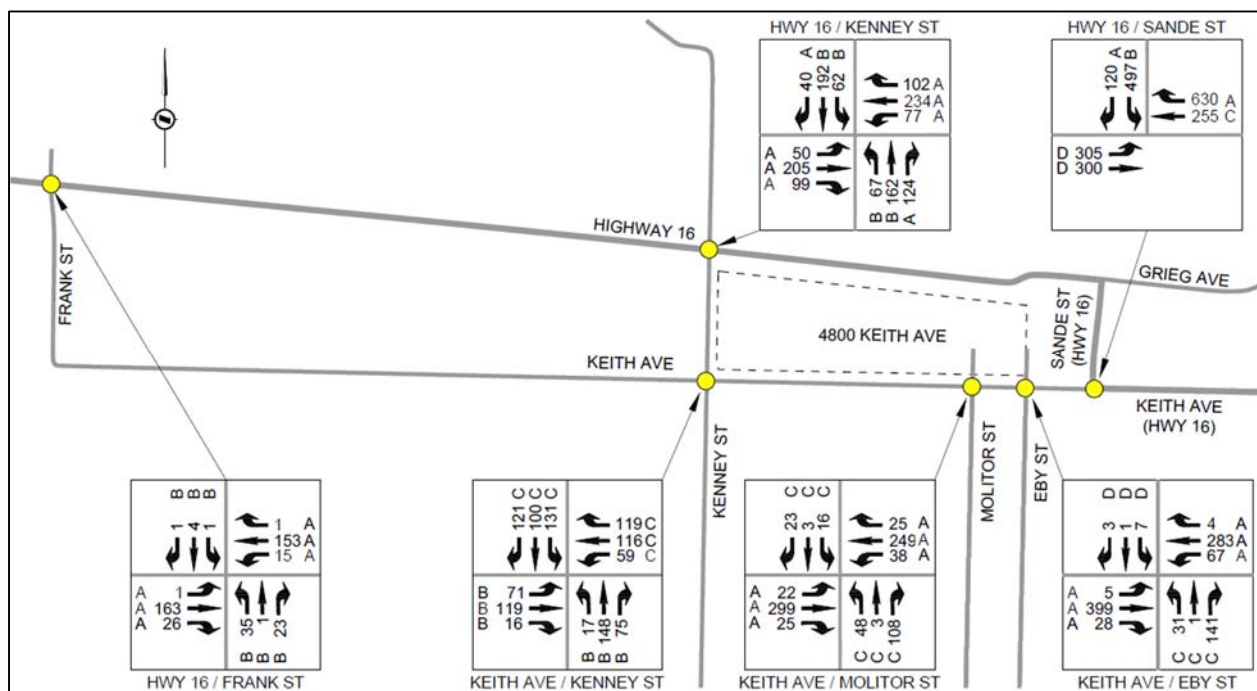
## 4.0 LONG TERM POST OPENING DAY HORIZON ANALYSIS (2035)

### 4.1 2035 POST DEVELOPMENT CONDITIONS

The 2035 background and post development traffic conditions were analyzed during the AM and PM peak hours and the results were compared to determine the long-term impact of the proposed development on the traffic operations at the study intersections. In order to estimate 2035 background traffic volumes, a 2% growth rate was applied to the existing volumes (see **Section 3.5** for growth rate determination).

#### 4.1.1 AM PEAK HOUR ANALYSIS RESULTS

The 2035 post development volumes and LOS during the AM peak hour are shown in **Figure 9**. The background and post development analysis results are summarized in **Table 5**.



**Figure 9: Long Term (2035) Post Development Volumes & LOS – AM Peak**

**TABLE 5: 2035 BACKGROUND AND POST DEVELOPMENT CONDITIONS – AM PEAK**

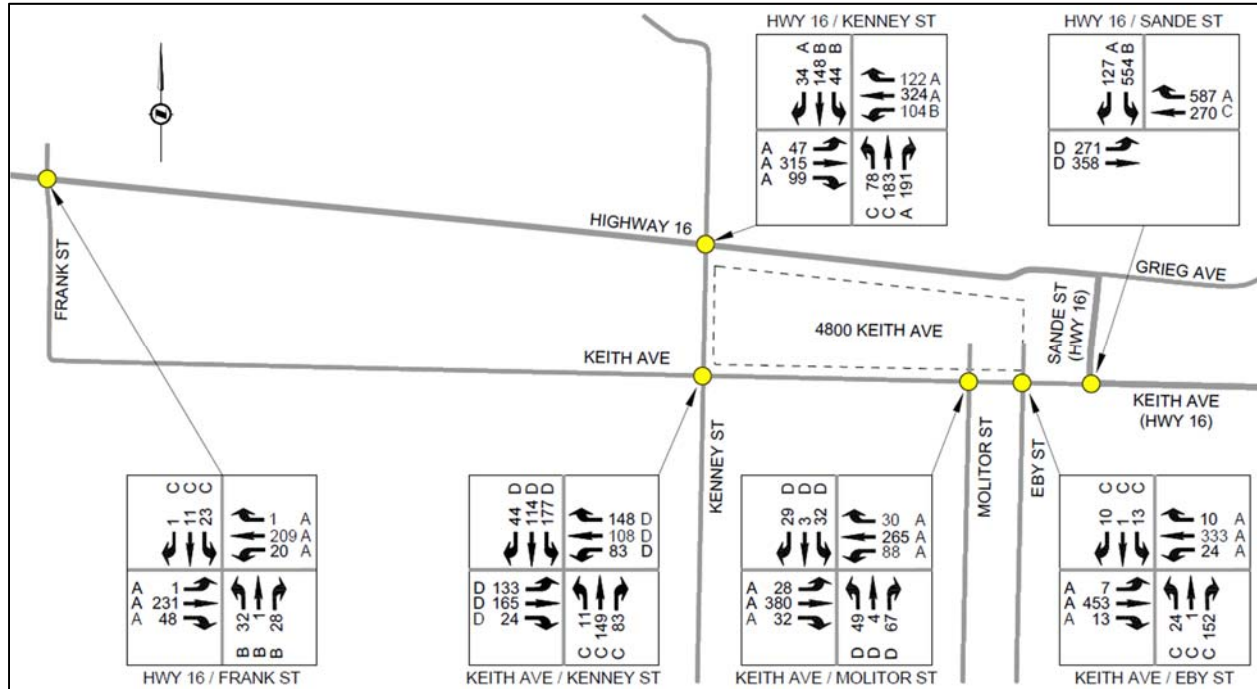
Intersection	Movement	Background Conditions – AM Peak			Post Development Conditions – AM Peak		
		LOS	Delay (s)	95 <sup>th</sup> % Queue (m)	LOS	Delay (s)	95 <sup>th</sup> % Queue (m)
Keith Ave / Sande St (Hwy 16)	EB L/T	D	40.6	126.6	D	47.6	147.7
	WBT	C	27.1	55.7	C	28.2	66.1
	WBR	A	0.9	0.0	A	0.9	0.0
	SBL	B	10.5	50.9	B	11.2	51.2
	SBR	A	2.4	4.0	A	2.3	4.9
Keith Ave / Eby St	EB L/T/R	A	0.0	0.0	A	0.1	18.4
	WB L/T/R	A	2.1	22.4	A	1.8	62.4
	NB L/T/R	C	15.4	22.3	C	19.9	36.0
	SB L/T/R	N/A	N/A	N/A	D	25.5	10.0
Keith Ave / Molitor St	EB L/T/R	A	0.0	0.0	A	0.6	7.2
	WB L/T/R	A	1.4	13.6	A	1.1	14.7
	NB L/T/R	B	13.5	22.4	C	18.3	21.3
	SB L/T/R	N/A	N/A	N/A	C	16.4	14.2
Keith Ave / Kenney St	EB L/T/R	B	13.2	21.4	B	14.7	22.7
	WB L/T/R	B	14.2	43.6	C	17.3	47.7
	NB L/T/R	B	13.4	22.0	B	15.0	25.5
	SB L/T/R	C	16.2	62.9	C	20.4	29.8
Hwy 16 / Kenney St	EBL	A	9.3	12.5	A	9.4	11.7
	EBT	A	8.0	15.8	A	8.2	14.5
	EBR	A	3.1	4.5	A	3.0	4.4
	WBL	A	9.4	19.0	A	9.5	17.7
	WB T/R	A	5.8	26.5	A	9.5	27.9
	NB L/T	B	16.6	32.9	B	19.9	33.7
	NBR	A	3.8	0.0	A	3.7	0.0
	SB L/T	B	19.4	38.7	B	19.6	47.0
	SBR	A	4.3	14.6	A	4.3	15.2
Hwy 16 / Frank St	EB L/T/R	A	3.8	16.4	A	3.9	18.2
	WB L/T/R	A	4.1	17.7	A	4.2	18.6
	NB L/T/R	B	17.7	18.4	B	18.9	20.0
	SB L/T/R	B	18.8	6.7	B	18.3	6.6

In the long term, the study intersections continue to operate adequately during the AM peak hour. The Keith Ave / Sande St eastbound left / through movement remains at LOS D under both background and post development conditions; the southbound movement at Keith Ave / Eby St is also at LOS D. All other movements at the study intersections are at LOS C or better under 2035 post development conditions.



#### 4.1.2 PM PEAK HOUR ANALYSIS RESULTS

The 2035 post development volumes and LOS during the PM peak hour are shown in **Figure 10**. The background and post development analysis results are summarized in **Table 6**.



**Figure 10: Long Term (2035) Post Development Volumes & LOS – PM Peak**

**TABLE 6: 2035 BACKGROUND AND POST DEVELOPMENT CONDITIONS – PM PEAK**

Intersection	Movement	Background Conditions – PM Peak			Post Development Conditions – PM Peak		
		LOS	Delay (s)	95 <sup>th</sup> % Queue (m)	LOS	Delay (s)	95 <sup>th</sup> % Queue (m)
Keith Ave / Sande St (Hwy 16)	EB L/T	D	40.0	82.6	D	50.9	111.6
	WBT	C	27.5	58.5	C	28.7	65.1
	WBR	A	0.8	0.0	A	0.8	0.0
	SBL	B	10.6	52.3	B	11.6	54.4
	SBR	A	2.3	0.0	A	2.3	0.0
Keith Ave / Eby St	EB L/T/R	A	0.0	0.0	A	0.2	8.6
	WB L/T/R	A	0.8	41.6	A	0.6	30.4
	NB L/T/R	B	14.4	18.2	C	19.3	21.7
	SB L/T/R	N/A	N/A	N/A	C	24.8	12.9
Keith Ave / Molitor St	EB L/T/R	A	0.0	1.0	A	0.6	12.8
	WB L/T/R	A	2.6	20.1	A	2.2	22.6
	NB L/T/R	C	16.4	21.2	D	31.3	23.6
	SB L/T/R	N/A	N/A	N/A	D	28.7	16.3
Keith Ave / Kenney St	EB L/T/R	C	20.9	26.3	D	29.4	31.1
	WB L/T/R	C	18.0	45.4	D	29.3	75.3
	NB L/T/R	C	16.1	20.6	C	20.6	26.3
	SB L/T/R	C	20.1	23.9	D	31.5	65.3
Hwy 16 / Kenney St	EBL	A	9.3	14.6	A	9.9	14.3
	EBT	A	8.0	17.0	A	8.6	18.7
	EBR	A	3.2	2.7	A	3.1	4.8
	WBL	A	10.1	22.3	B	10.9	22.0
	WB T/R	A	6.1	31.2	A	6.6	31.5
	NB L/T	B	17.8	34.0	C	20.0	40.4
	NBR	A	3.9	0.0	A	3.6	0.0
	SB L/T	B	16.1	31.9	B	15.4	32.9
	SBR	A	4.6	12.9	A	4.4	11.4
Hwy 16 / Frank St	EB L/T/R	A	4.2	23.8	A	4.3	22.8
	WB L/T/R	A	4.4	24.3	A	4.5	25.7
	NB L/T/R	B	14.5	16.1	B	16.8	22.0
	SB L/T/R	C	23.4	19.6	C	23.1	18.3

In the long term, during the PM peak hour the Keith Ave / Sande St eastbound left / through movement remains at LOS D under both background and post development conditions while the north- and southbound movements of Keith Ave / Molitor St and the east-, west-, and southbound movements of Keith Ave / Kenney St drop to LOS D. All other movements at the study intersections are at LOS C or better under 2035 post development conditions.

#### 4.1.3 KEITH AVE / KENNEY ST SIGNAL WARRANT ANALYSIS

As the Keith Ave / Kenney St 4-way stop-controlled intersection is reduced to LOS D in three of the four directions during the 2035 PM peak hour, a signal warrant analysis was conducted to determine if a signal is warranted. Using the PM peak hour post development traffic volumes, Warrant 8: Peak Hour Delay (Section 402.3.9) and Warrant 9: Peak Hour Volume (Section 402.3.10) from the MOTI *Electrical & Traffic Engineering Design Guidelines (2013)* were reviewed. Based on Warrant 8, the peak hour delay does not warrant a signal; based on Warrant 9, due to the peak hour volumes a traffic signal is warranted. As the warrant analysis was inconclusive, and as the post development volumes include trips from Lots 2-9 which are not included in this development proposal, further analysis recommended as part of the future development proposal(s) for Lots 2-9.

#### 4.2 CONCURRENT DEVELOPMENT (4760 KEITH AVE)

As done in the opening day (2022) post development analysis (see **Section 3.7**), the trips generated by the proposed adjacent 4760 Keith Ave development were added to the long term (2035) post development volumes and analyzed in Synchro to determine the post development conditions in the event that both developments are constructed.

The 4760 Keith Ave development is expected to generate 157 external trips (93 inbound / 64 outbound) during the AM peak hour and 184 external trips (88 inbound / 96 outbound) during the PM peak hour (the trip assignment for the 4760 Keith Ave development can be found in **Appendix B**). The trips generated by full build-out of both developments were added to the 2035 background traffic to provide the post development volumes used; the analysis results are summarized in **Table 7**.

**TABLE 7: 2035 POST DEVELOPMENT CONDITIONS (INCLUDING 4760 KEITH AVE TRIPS)**

Intersection	Movement	Post Development Conditions – AM Peak			Post Development Conditions – PM Peak		
		LOS	Delay (s)	95 <sup>th</sup> % Queue (m)	LOS	Delay (s)	95 <sup>th</sup> % Queue (m)
Keith Ave / Sande St (Hwy 16)	EB L/T	<b>E</b>	<b>55.4</b>	106.0	<b>E</b>	<b>65.1</b>	108.5
	WBT	C	29.3	74.2	C	29.8	75.7
	WBR	A	0.8	0.0	A	0.7	0.0
	SBL	B	11.4	48.0	B	11.8	54.6
	SBR	A	2.2	0.0	A	2.2	0.0
Keith Ave / Eby St	EB L/T/R	A	0.8	99.6	A	0.7	82.4
	WB L/T/R	A	1.7	28.9	A	0.6	21.2
	NB L/T/R	D	26.1	61.0	C	24.4	78.5
	SB L/T/R	<b>E</b>	<b>48.0</b>	29.5	<b>F</b>	<b>68.5</b>	137.7
Keith Ave / Molitor St	EB L/T/R	A	0.5	82.9	A	0.5	21.0
	WB L/T/R	A	1.1	17.6	A	2.1	29.4
	NB L/T/R	C	18.3	45.8	D	32.3	25.3
	SB L/T/R	C	17.4	15.7	D	30.2	17.7
Keith Ave / Kenney St	EB L/T/R	C	16.3	23.5	<b>E</b>	<b>37.4</b>	31.4
	WB L/T/R	C	20.8	60.6	<b>E</b>	<b>44.9</b>	72.6
	NB L/T/R	C	16.8	24.0	C	24.5	27.4
	SB L/T/R	D	25.9	65.1	<b>E</b>	<b>44.7</b>	98.3
Hwy 16 / Kenney St	EBL	A	9.6	12.6	B	10.1	15.3
	EBT	A	8.3	15.5	A	8.8	17.5
	EBR	A	3.0	7.5	A	3.0	5.4
	WBL	A	9.7	19.5	B	11.1	23.1
	WB T/R	A	6.0	25.8	A	6.7	31.3
	NB L/T	C	22.1	38.7	C	21.6	42.9
	NBR	A	3.7	0.0	A	3.6	0.0
	SB L/T	B	19.7	42.9	B	15.2	35.7
	SBR	A	4.2	13.0	A	4.4	15.4
Hwy 16 / Frank St	EB L/T/R	A	4.0	19.4	A	4.9	26.3
	WB L/T/R	A	4.3	21.3	A	5.0	26.7
	NB L/T/R	B	19.3	19.5	B	18.2	20.9
	SB L/T/R	B	18.2	9.2	C	23.3	22.3

With both developments at full build-out, in 2035 the eastbound movement of the Keith Ave / Sande St signal drops to LOS E. Optimization of the signal timing results in the operations improving to LOS C or better for all movements in the AM and PM peak hours; no additional mitigation measures are recommended at the Keith Ave / Sande St intersection.

The southbound movement of the Keith Ave / Eby St intersection is at a failing level of service (LOS E/F). The Keith Ave / Kenney St intersection is also failing (LOS E) on the eastbound, westbound, and southbound approaches during the PM peak hour. In the long term, signalization of these intersections may be required if the predicted traffic volumes occur.

## **5.0 GEOMETRICS AND SAFETY**

### **5.1 LEFT TURN LANE WARRANT (MOLITOR ST EXTENSION)**

Based on MOTI left turn warrants, under 2022 PM peak hour conditions a westbound left turn lane is warranted at the Keith Ave / Molitor St intersection. An eastbound left turn lane at Molitor St is not warranted but should be included along with the westbound left turn lane to keep the west- and eastbound through lanes aligned through the intersection.

Based on MOTI left turn warrants, left turn lanes on Keith Ave into the Eby St extension are not warranted under either opening day (2022) or long term (2035) post development conditions.

### **5.2 ACCESS REVIEW**

The access for the transload facility is located 70m north of the Keith Ave / Molitor St intersection at the north end of the new Molitor St extension; the access therefore exceeds the corner clearance distance of 15m from a stop-controlled intersection on a local road that is suggested by the *TAC Geometric Design Guide for Canadian Roads (2017)* (Figure 8.8.2). Vehicles will exit the site in a southbound direction directly onto Molitor St, turning sight distances are not required.

For the purposes of this review, it was assumed that Lots 2-9 included three (3) Keith Ave accesses approximately 150m apart between Kenney St and Molitor St. The ultimate access locations will be proposed as part of development proposals for Lot 2-9 and are therefore not included in the access review.

## **6.0 ALTERNATIVE TRANSPORTATION MODES**

### **6.1 PEDESTRIAN FACILITIES**

There are sidewalks on both sides of Sande St for the entire length of the road including the overpass. There are sidewalks on both sides of Keith Ave east of Sande St; west of Sande St, there is a sidewalk on the south side of Keith Ave between Sande St and Eby St and a gravel path on the south side of Keith Ave between Eby St and Molitor St. There is currently no sidewalk on the north side of Keith Ave west of Sande St. The transload facility (Lot 1) is located on the north portion of the development site and does not include Keith Ave frontage; therefore Installation of a sidewalk on Keith Avenue along the south property frontage should be included in the development of Lots 2-9.

There are marked crosswalks across the west and north legs of the signalized Keith Ave / Sande St intersection, 270m east of the Keith Ave / Molitor St intersection. As the number of pedestrians accessing the transload facility by crossing Keith Ave at Molitor St is expected to be very low, a

marked crosswalk is not recommended as part of the transload facility development. The number of pedestrians expected to be accessing the future Lot 2-9 development is dependent on the ultimate land use; therefore the need for a pedestrian crossing across Keith Ave should be reviewed as Lots 2-9 are developed.

## 6.2 CYCLING FACILITIES

There are no bicycle facilities on Keith Ave, Sande St, Eby St, or Molitor St; cyclists must share the road with motorists. According to the City of Terrace *Active Transportation Plan (2009)*, Keith Ave and Eby St (south of Keith Ave) are designated as proposed signed road bicycle routes with bike route signage and painted bicycle symbols (sharrows). Based on Google Streetview archives, bike route signage was previously installed on Keith Avenue west of Sande St and on Eby St south of Keith Ave but the signage has since been removed (sometime between 2012 and 2018). It is unknown if the bike route signage was intentionally removed by the City; the developer should therefore discuss with the City regarding whether it is still desired to have Keith Ave as a designated bike route; if so, bike route signage and markings should be installed along the Keith Ave property frontage as per the *Active Transportation Plan*.

## 6.3 TRANSIT FACILITIES

The closest transit stop to the development site is a 260m walk west Molitor St on Keith Avenue at UNBC. The stop is serviced by Terrace Regional Transit Route 3 (Southside) which stops 15 times daily at this location. The Skeena Mall Exchange is a 1km walk northeast of the property; the Exchange is serviced by Route 1, 2, 3, 5, 6, 11, 13, and 14.

## 7.0 CONCLUSIONS

Under existing and 2022 background traffic volumes, the study area intersections operate well with all movements at LOS C or better during both the AM and PM peak hours with the exception of the eastbound movement at the signalized Keith Ave / Sande St intersection, which operates at LOS D as a result of the signal timing prioritizing Highway 16 traffic (signal timing optimization results in all approaches operating at LOS A/B).

Under opening day (2022) post development conditions, no changes to the LOS of any of the study intersections occur as a result of the addition of development traffic, with the exceptions of the Keith Ave / Molitor St northbound movement and the Keith Ave / Kenney St southbound movement which drop for LOS B to C.

In the long term (2035), the Keith Ave / Kenney St four-way stop drops to LOS D in the PM peak hour. The remaining study area intersections continue to operate adequately under both background and post development conditions with all movements at LOS C or better with the exception of the Keith Ave / Sande St eastbound movement and the Keith Ave / Eby St southbound movement which are at LOS D.

A warrant analysis was conducted for the Keith Ave / Kenney St intersection. Based on peak hour delays, a signal is warranted; however, based on peak hour volumes, a signal is not warranted. The warrants used volumes and delays that were based on high-level assumptions for the land use of Lots 2-9; these volumes are subject to change when development of these lots are proposed. Therefore the need for a signal should be examined as part of future development proposals expected for Lots 2-9.

The main access to the transload facility will be provided by an extension of Molitor St, which will be extended approximately 70m north of Keith Ave to the site access. No issues with corner clearance or sightlines were identified.

A westbound left turn lane is warranted on Keith Ave at Molitor St. Left turn lanes are not warranted at Keith Ave / Eby St; an eastbound left turn lane is not required but may be installed in order to maintain alignment of the east / west through lanes.

As Lot 1 does not include Keith Ave frontage, installation of sidewalks along the south property frontage should be done as part of development of Lots 2-9. Keith Ave and Eby St are designated as signed road bicycle routes in the City of Terrace *Active Transportation Plan (2009)*; however, existing bike route signage was removed from Keith Ave and Eby St at some point between 2012 and 2018, which could be an indication that the bicycle route designation is no longer desired by the City. The developer should discuss with the City regarding whether bike route signage and pavement markings on the property frontage are desired.

## 8.0 RECOMMENDATIONS

The following recommendations are made regarding the 4800 Keith Ave development:

- The Molitor St extension should be connected as a new north leg of the Keith Ave / Molitor St intersection as a full movement approach with stop control on Molitor St. A westbound left turn lane on Keith Ave is required; an opposing eastbound left turn lane is also recommended.
- Discuss with the City of Terrace regarding the City's desire for bike route signage and pavement markings on Keith Ave. If desired by the City, bike route signage and painted bicycle symbols should be installed on Keith Ave along the property frontage.

## APPENDIX A: SYNCHRO BACKGROUND



## SYNCHRO MODELLING SOFTWARE DESCRIPTION

The traffic analysis was completed using Synchro and SimTraffic traffic modelling software. Results were measured in delay, level of service (LOS), 95th percentile queue length and volume to capacity ratio. Synchro is based on the Highway Capacity Manual (HCM) methodology. SimTraffic integrates established driver behaviours and characteristics to simulate actual conditions by randomly “seeding” or positioning vehicles travelling throughout the network. The simulation is run ten times (ten different random seedings of vehicle types, behaviours and arrivals) to obtain statistical significance of the results.

### Levels of Service

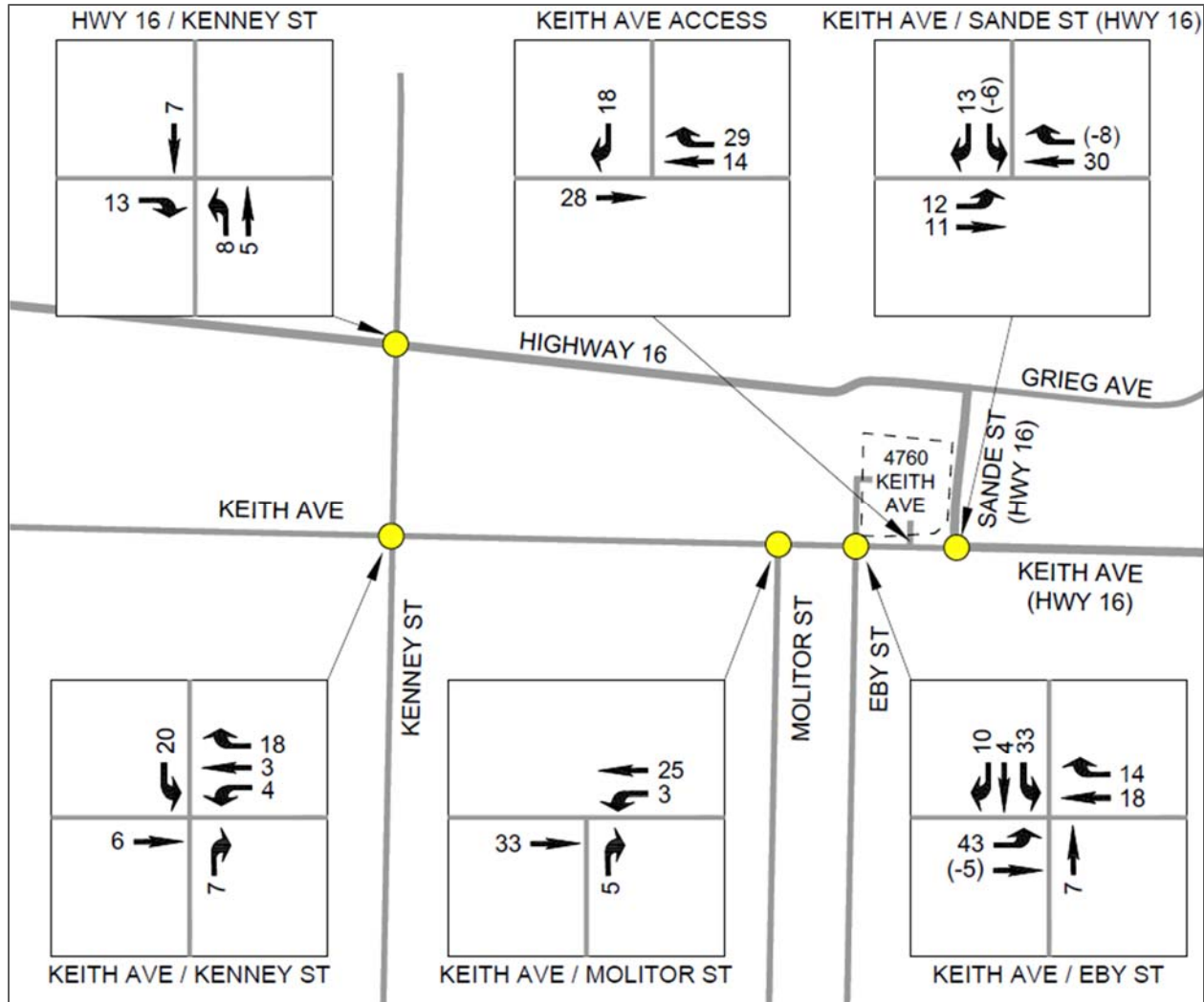
Traffic operations are typically described in terms of levels of service, which rates the amount of delay per vehicle for each movement and the entire intersection. Levels of service range from LOS A (representing best operations) to LOS E/F (LOS E being poor operations and LOS F being unpredictable/disruptive operations). LOS E/F are generally unacceptable levels of service under normal everyday conditions. A LOS C or better is considered acceptable operations, while D is considered to be on the threshold between acceptable and unacceptable operations. Highway operations will typically need to operate at LOS C or better for through movements and LOS E or better for other traffic movements with lower order roads.

The hierarchy of criteria for grading an intersection or movement not only includes delay times, but also takes into account traffic control type (stop signs or traffic signal). For example, if a vehicle is delayed for 19 seconds at an unsignalized intersection, it is considered to have an average operation, and would therefore be graded as an LOS C. However, at a signalized intersection, a 19 second delay would be considered a good operation and therefore it would be given an LOS B. The table below indicates the range of delay for LOS for signalized and unsignalized intersections.

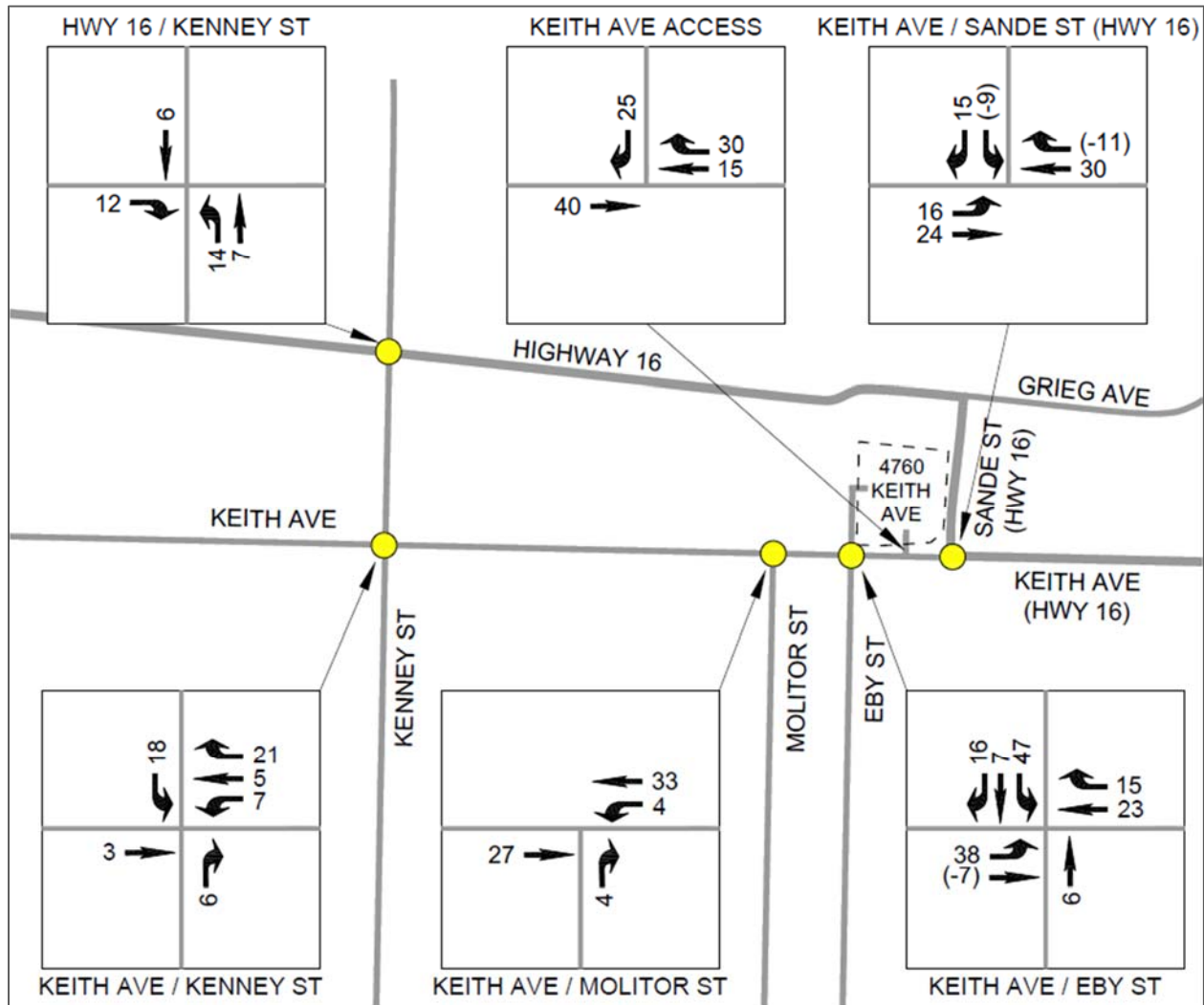
**Table A1: LOS Criteria, by Intersection Traffic Control**

Level of Service (LOS)	Unsignalized Intersection Average Vehicle Delay (sec/veh)	Signalized Intersection Average Vehicle Delay (sec/veh)
A	0 – 10	0 – 10
B	> 10 – 15	> 10 – 20
C	> 15 – 25	> 20 – 35
D	> 25 – 35	> 35 – 55
E	> 35 – 50	> 55 – 80
F	> 50	> 80

## **APPENDIX B: 4760 KEITH AVE TRIP ASSIGNMENT**



**4760 Keith Ave Trip Assignment - AM Peak Hour**



**4760 Keith Ave Trip Assignment - PM Peak Hour**

## APPENDIX C: TERMS OF REFERENCE

## MEMORANDUM

**To:** City of Terrace and Ministry of Transportation  
**Copy:** Hatha Callis, Progressive Ventures Group; Tanner Vollema, EIT, Watt  
**From:** Michael Skene Eng.L., Senior Transportation Engineer  
**Our File #:** 2791.B01  
**Project:** 4800 Keith Rd Transload Facility Development  
**Date:** March 6, 2020  
**RE:** TIA Terms of Reference

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Watt Consulting Group was retained by Progressive Ventures Group to undertake a Traffic Impact Study for the Transload Facility being proposed at 4800 Keith Rd in Terrace.

A meeting was held on March 4<sup>th</sup> to discuss the terms of reference for this study. The following are the make-up meeting notes and the proposed Terms of Reference.

### ATTENDANCE:

Norm Shein, P.Eng, Transportation Engineer MOTI  
Mahesh Tripathi, P.Eng, Transportation Engineer MOTI  
Amber Olsen, MOTI  
Corrine Ellerman, MOTI  
David Block, City of Terrace  
Chris Cordts, City of Terrace  
Rob Schilbli, City of Terrace  
Hatha Callis, PVG  
Michael Skene, Eng.L., Senior Transportation Engineer, Watt Consulting Group

Development site plan is appended

### PROJECT BACKGROUND

The proposed development is at 4800 Keith Road and is a transload facility. Keith Road is a Municipal road which is being considered by the road authorities to be a future Hwy 16 alignment. The City will require 4m along the Keith Road frontage for widening of Keith Road. While the MOTI would like a 30m ROW, the City will be seeking a 24m ROW, widening on the north side by 4m. The development will contribute 4m along its entire Keith Road frontage.

References were made to a number of documents including the Hospital Traffic Impact Study, the City Master Transportation Plan, the Transload Facility Feasibility study commissioned by the City, and studies undertaken by MOTI regarding the feasibility of realigning Hwy 16 onto Keith Road.

## **PROJECT STUDY AREA AND DATA COLLECTION**

Collect AM and PM peak hour traffic volumes from the City's 2017 Transportation Master Plan or count as necessary for:

- Keith Ave / Sande St (Highway 16)
- Keith Ave / Kenny St
- Keith Ave / Molitor St
- Keith Ave / Eby St
- Frank St / Hwy 16
- Kenney St / Hwy 16

(If commercial is being considered Saturday peak volumes and a Saturday peak hour analysis will be required.)

## **BACKGROUND TRAFFIC**

Background traffic will include new Hospital traffic numbers as well as the development at the east.

## **EXISTING CONDITIONS ANALYSIS**

Develop a base Synchro 9/10 models of existing conditions.

## **POST DEVELOPMENT ANALYSIS**

- Estimate trips generated by the proposed development using the ITE Trip Generation Manual. Trips generated by the transportation facility should be confirmed with a review of similar sites.
- A land use scenario for the entire site must be analyzed. The land use scenario must be full site coverage allowable by the zone or a practical and justifiable alternative.
- Assign trips generated by the development to the study area road network, based on existing traffic conditions and the City's Transportation Plan.
- Conduct traffic modelling/operational analysis using Synchro 9/10 and assess intersection performance with development traffic at full build out (opening day) and 15 years beyond full build out.
- Assessment of the spacing between proposed site access(es) and the Keith Ave / Kenney St and Keith Ave / Molitor St intersections. The Keith Ave / Molitor St intersection is

planned as the appropriate location if a future signalized intersection is required between Kenney and Sande, and will therefore be assessed. Intersection analysis will include signal warrant reviews at Molitor and Kenney on Keith.

- Review and assess the site's impact on pedestrian, bicycle, and transit facilities within proximity of the site and identify any requirements or mitigation measures to improve conditions for alternative travel modes.
- Review parking supply and demand using the City's zoning requirements.
- The report will specifically discuss:
  - the impacts to the rail crossing at Kenney;
  - potential of future signalization of Molitor; and,
  - accommodating access to adjacent parcels through internal road system.
- Road authorities will dictate the appropriate geometry standards for mitigation.
- Storage lane lengths will be determined by TAC nomographs, not Sychro results.
- The MOTI will require a functional design for all traffic mitigation. This functional design will be used to determine a cost estimate and ultimately a security deposit.
- Summarize results and findings in a draft report and submit to Client for review. Based on Client comments, the report will be finalized for Client submission to the City of Terrace and MOTI.

Please contact me at 250 686 3852 if there are any comments or questions. Thank you.

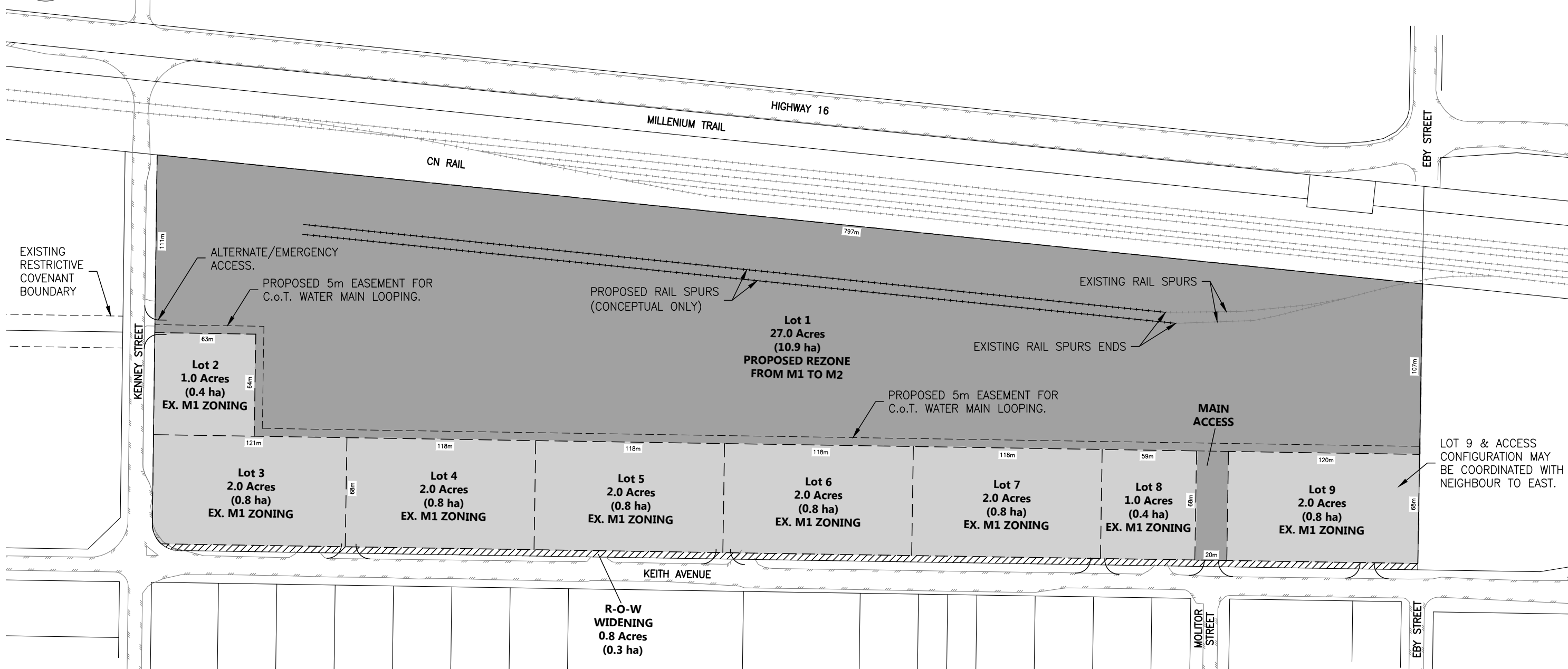
Sincerely,

**Watt Consulting Group**



Michael Skene, Eng.L,  
Senior Transportation Engineer





PLAN VIEW

SCALE: 1:2500



**DRAFT**  
- FOR DISCUSSION

Date: 2020/01/24 11:35 AM | User: Olof Hultkrans | File: E:\Projects\TR2019\19TR0023 - Keith Estates\19TR0023 - Keith Ave Yard-2001.24 | Layout: FIG 5 | Paper Size: 558.8mm x 431.8mm

**LEGEND**

PROJECT BOUNDARY	———
EDGE OF ASPHALT	———
LEGAL LOT LINES	———
POSSIBLE FUTURE LOT LINES	———
PROPOSED BOUNDARY OF ZONING	———

TOTAL SITE AREA = 41.8 Acres (16.9 ha)

4m R.O.W. WIDENING 0.8 Acres (0.3 ha)

PROPOSED REZONE FROM M1 TO M2

EXISTING M1 ZONING. MAY BE REZONED FOR MIXED USES

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REV	YY/MM/DD	DESCRIPTION	DRWN	APVD
C	20/01/24	ISSUED FOR REVIEW	OTH	KMY
B	20/01/22	ISSUED FOR REVIEW	OTH	KMY
A	19/08/12	ISSUED FOR REVIEW	OTH	KMY

CLIENT:

**PROGRESSIVE VENTURES CONSTRUCTION**

**Allnorth**

TITLE: **PRELIMINARY LAYOUT CONCEPT**

CLIENT NO:	-	DRWN:	OTH	DATE:	19/08/12
PROJECT NO:	19-TR-0023	DSGN:	-	DATE:	-
DRAWING SIZE:	ANSI "B"	CHKD:	-	DATE:	-
SCALE:	1:2500	APVD:	KMY	DATE:	19/08/12

PROJECT: **4800 KEITH AVENUE PROPOSED LAND DEVELOPMENT**

DWG NO: **FIGURE 5**

REV: **C**