

# ICE LAKE ROAD SOUTH MASTER PLAN

CITY OF WHITEHORSE

MAY 31, 2024



Prepared by 3Pikas with:

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**PREPARED FOR:**



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# I. VERSION HISTORY

VERSION	DATE	DESCRIPTION
1	2024/04/29	ISSUED FOR REVIEW
2	2024/05/31	DRAFT 2 – ISSUED FOR PUBLIC ENGAGEMENT

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# TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION .....</b>	<b>4</b>
1.1	PROJECT OVERVIEW .....	4
1.2	MASTER PLAN STUDY AREA .....	4
1.3	PLAN PURPOSE & SCOPE .....	5
1.4	INTERPRETATION OF THE PLAN .....	6
<b>2</b>	<b>PLANNING PROCESS.....</b>	<b>8</b>
2.1	PLANNING PHASES .....	8
2.1.1	CONCEPT DEVELOPMENT .....	9
2.1.2	PUBLIC ENGAGEMENT .....	11
<b>3</b>	<b>ICE LAKE ROAD SOUTH AREA.....</b>	<b>12</b>
3.1	POLICY CONTEXT .....	12
3.1.1	OFFICIAL COMMUNITY PLAN.....	12
3.1.2	ZONING BYLAW .....	16
3.1.3	KDFN SELF-GOVERNMENT AGREEMENT (2005) LANDS ACT (2020) & COMMUNITY LANDS PLAN (2020) .....	19
3.2	PLANNING AREA CONTEXT.....	19
3.2.1	THE SURROUNDINGS.....	19
3.2.2	THE PLANNING AREA TODAY.....	23
3.2.3	TOPOGRAPHY .....	24
3.2.4	HERITAGE RESOURCES.....	25
3.2.5	TRAILS .....	26
3.2.6	ENVIRONMENTAL CONTAMINATION STUDIES.....	26
3.2.7	SERVICING & INFRASTRUCTURE .....	26
3.3	OPPORTUNITIES AND CONSTRAINTS .....	29
3.3.1	OPPORTUNITIES.....	29
3.3.2	CONSTRAINTS .....	29
<b>4</b>	<b>THE MASTER PLAN .....</b>	<b>31</b>
4.1	VISION .....	31
4.2	INDUSTRIAL/COMMERCIAL AND PUBLIC SERVICE LAND USE PLAN.....	31
4.2.1	ALASKA HIGHWAY FRONTAGE AREA .....	32
4.2.2	UPPER DEVELOPMENT AREA .....	33
4.2.3	PUBLIC SERVICE AREA (WEIGH STATION).....	33
4.2.4	INDUSTRIAL/COMMERCIAL AND PUBLIC SERVICE LAND USE POLICIES .....	35
4.3	GREENSPACE & TRAILS PLAN .....	37
4.3.1	GREENSPACE & TRAILS POLICIES .....	38
<b>5</b>	<b>SERVICING PLAN .....</b>	<b>40</b>
5.1	TRANSPORTATION CONCEPT .....	40

5.1.1	ROAD DESIGN .....	41
5.1.2	TRANSPORTATION IMPACT ASSESSMENT .....	42
5.1.3	TRANSPORTATION POLICIES .....	44
<b>5.2</b>	<b>WATER .....</b>	<b>44</b>
<b>5.3</b>	<b>SANITARY SERVICING .....</b>	<b>44</b>
<b>5.4</b>	<b>STORMWATER MANAGEMENT .....</b>	<b>44</b>
<b>5.5</b>	<b>POWER &amp; COMMUNICATION .....</b>	<b>44</b>
<b>5.6</b>	<b>LOT GRADING .....</b>	<b>45</b>
5.6.1	SERVICING POLICIES .....	45
<b>6</b>	<b>IMPLEMENTATION &amp; PHASING .....</b>	<b>49</b>
6.1	SIGNALIZED INTERSECTION OR ROUNDABOUT AT THE ALASKA HIGHWAY .....	49
<b>6.2</b>	<b>DEVELOPMENT PHASING .....</b>	<b>50</b>
6.2.1	FULL SUBDIVISION DEVELOPMENT .....	50
6.2.2	UPPER DEVELOPMENT AREA FIRST (YG) .....	50
6.2.3	ALASKA HIGHWAY FRONTAGE AREA FIRST (KDFN) .....	51
<b>6.3</b>	<b>ADDITIONAL STUDIES .....</b>	<b>51</b>
<b>7</b>	<b>WORKS CITED .....</b>	<b>52</b>
<b>8</b>	<b>APPENDICES .....</b>	<b>53</b>
8.1	APPENDIX A: PRELIMINARY DESIGN REPORT – ICE LAKE ROAD SOUTH MASTER PLAN (GREENWOOD ENGINEERING SOLUTIONS, 2024) .....	54
8.2	APPENDIX B: TRANSPORTAION IMPACT ASSESSMENT (ISL, 2024) .....	55
8.3	APPENDIX C: WHAT WE HEARD REPORTS (CITY OF WHITEHORSE, 2023; 2024) .....	56

# I. EXECUTIVE SUMMARY

Ice Lake Road South is a undeveloped undeveloped swath of land located on the Traditional Territory of Kwanlin Dün First Nation and Ta'an Kwäch'än Council. The 32.42-hectare site is located a few kilometres southwest of the downtown core and is bounded by undeveloped land to the north, Ice Lake Road to the West, Metropolit Lane to the south, and the Alaska Highway to the east. Ice Lake Road South is comprised of unsurveyed Yukon Land and Kwanlin Dün First Nation Settlement Land.

The City of Whitehorse created the Ice Lake Road South Master Plan as part of their strategic vision to meet current and future needs for commercial and industrial lands. It is envisioned that the Ice Lake Road South area will connect to the Ice Lake Road North area (master planning anticipated to begin in 2024) as well, creating one of the primary future employment and commercial goods and services nodes in Whitehorse.

Following the process outlined in section 2.1, the plan progressed through strategic visioning, the development of preliminary planning concepts, stakeholder and public engagement and input, land use scenario assessment, and finally, arriving at a final Ice Lake Road South Master Plan.

Key objectives of the Ice Lake Road South Master Plan include:

- Creating employment lands;
- Taking advantage of the site's proximity to the Alaska Highway, which is a major transportation and shipping supply corridor, and opportunity for highway oriented commercial uses;
- Providing flexibility to meet evolving commercial and industrial needs;
- Achieving high standards in planning and sustainable development;
- Guiding long-term investment in infrastructure development; and
- Implementing an effective and efficient use of the site.

Using these and other considerations, the Ice Lake Road South Master Plan will guide the transformation of Ice Lake Road South from undeveloped undeveloped lands to Industrial/Commercial employment lands. The design is founded upon best practices to progressively integrate with the evolving surrounding land-use fabric, and provide high quality employment land for the broader community.

In meeting the above objectives, key features of the Ice Lake Road South Master Plan include:

- Approximately 10 highway-oriented Industrial/Commercial lots with direct visual and transportation connections to the Alaska Highway;

- Approximately 11 mixed Industrial/Commercial lots with direct transportation connection to the Alaska Highway corridor (21 lots in total)
- Employment opportunities for approximately 68 individuals;
- Land use offering opportunities to work within the City's Urban Containment Boundary (i.e., closer to primary residential areas);
- A large green space for active community uses, amenity and park space buffers, and habitat functions;
- A development strategy for that sensitively addresses adjacent land uses and trails;
- Built-in flexibility through recommended phasing to support development feasibility, industry needs, and address variations in market demands.

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# 1 INTRODUCTION

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## 1.1 PROJECT OVERVIEW

3PIKAS was retained by the City of Whitehorse to prepare an Industrial / Commercial Master Plan for the Ice Lake Road South. The Plan was completed under the direction of the project team that included, the City of Whitehorse–Planning and Sustainability (‘City of Whitehorse’), Kwanlin Dün First Nation–Heritage, Lands and Resource Department (‘Kwanlin Dün First Nation’), and the Government of Yukon–Community Services Land Development Branch (‘YG–Land Development Branch’).

The Master Plan represents a major milestone towards a multi-phase Industrial/Commercial development to meet the city’s demand for industrial land and population growth. The proposed land use concept reflects the shared vision articulated by the project team and the public.

This Master Plan also incorporates input from an interdisciplinary team of Yukon-based technical experts. Greenwood Engineering Solutions provided input on the civil engineering servicing during the plan preparation and has prepared a preliminary design report based on the Master Plan development concept (see Appendix A). ISL Engineering provided transportation planning support and a Traffic Impact Assessment (TIA) (Appendix B).

## 1.2 MASTER PLAN STUDY AREA

Ice Lake Road South is in the City of Whitehorse on the Traditional Territory of Kwanlin Dün First Nation and Ta’an Kwäch’än Council (see Figure 1).

The 32.42-hectare site is mostly forested and includes a distinct hill feature, several single-track trails and electrical utility easement and overhead powerline. It is bounded by undeveloped land to the north, Ice Lake Road to the West, Metropolit Lane and Garden Road to the south, and the Alaska Highway to the east.

Ice Lake Road South is comprised of unsurveyed Yukon Land and Kwanlin Dün First Nation Settlement Land C-86B. The planning area also encompasses the highway Weigh Sfacility (lot 1143), which is managed by Government of Yukon Highways and Public Works (YG–HPW).

For simplicity, the KDFN development area is referred to as ‘C-86B parcel’ or ‘Alaska Highway frontage’, while the YG development area is similarly referred to as the ‘YG area’ or ‘Upper Industrial/Commercial area’.

## 1.3 PLAN PURPOSE & SCOPE

The Ice Lake Road South Master Plan represents a comprehensive and long-range strategy designed to articulate and guide the vision, growth, and future development of the site. The Master Plan is crafted through research and analysis, offering recommendations that delineate, define, and structure growth and change.

This Plan strives to balance diverse and sometimes competing considerations into a consistent and structured way forward. These considerations include:

- natural environment and valued or sensitive features;
- development cost, market conditions, and economic viability;
- adjacent land use and zoning;
- heritage values and community amenities;
- existing and required transportation and servicing infrastructure;
- employment and population growth; and
- existing and desired land uses and compatibility.

At all stages, the Master Plan advanced to balance these and other considerations. They inform the overarching vision, key design elements / considerations, and concept options and policies for industrial and commercial use, greenspace, trails, and transportation and servicing aspects of the plan.

This plan was developed through input from the public, professional and technical experts, and government department guidance.

The plan identifies and attempts to address fundamental needs and factors that drive development. These include connecting the site with anticipated future local commercial and industrial nodes, and, at the same time incorporating and reflecting municipal objectives and broader aspirations.

The Plan is the product of an iterative conceptual design process. KDFN and City of Whitehorse reviewed successive conceptual options, accompanied by detailed background and technical analysis (Figure 2). The final Master Plan builds on this work and communicates the strategic vision and its implementation to developers, regulators, governments, business owners, and the public at large.

The purpose of this Master Plan is to articulate at a conceptual level how to proceed to:

- Create new industrial/commercial lands;
- Address physical and servicing constraints;
- Take advantage of the site's proximity to the Alaska Highway as a key development facilitator and opportunity for highway-oriented commercial uses;

- Provide flexibility to meet evolving commercial and industrial needs;
- Guide long-term investment in infrastructure development;
- Implement an effective and efficient use of the site; and
- Coordinate more cost effective construction for the land owners (KDFN and YG) either in tandem, or separately.

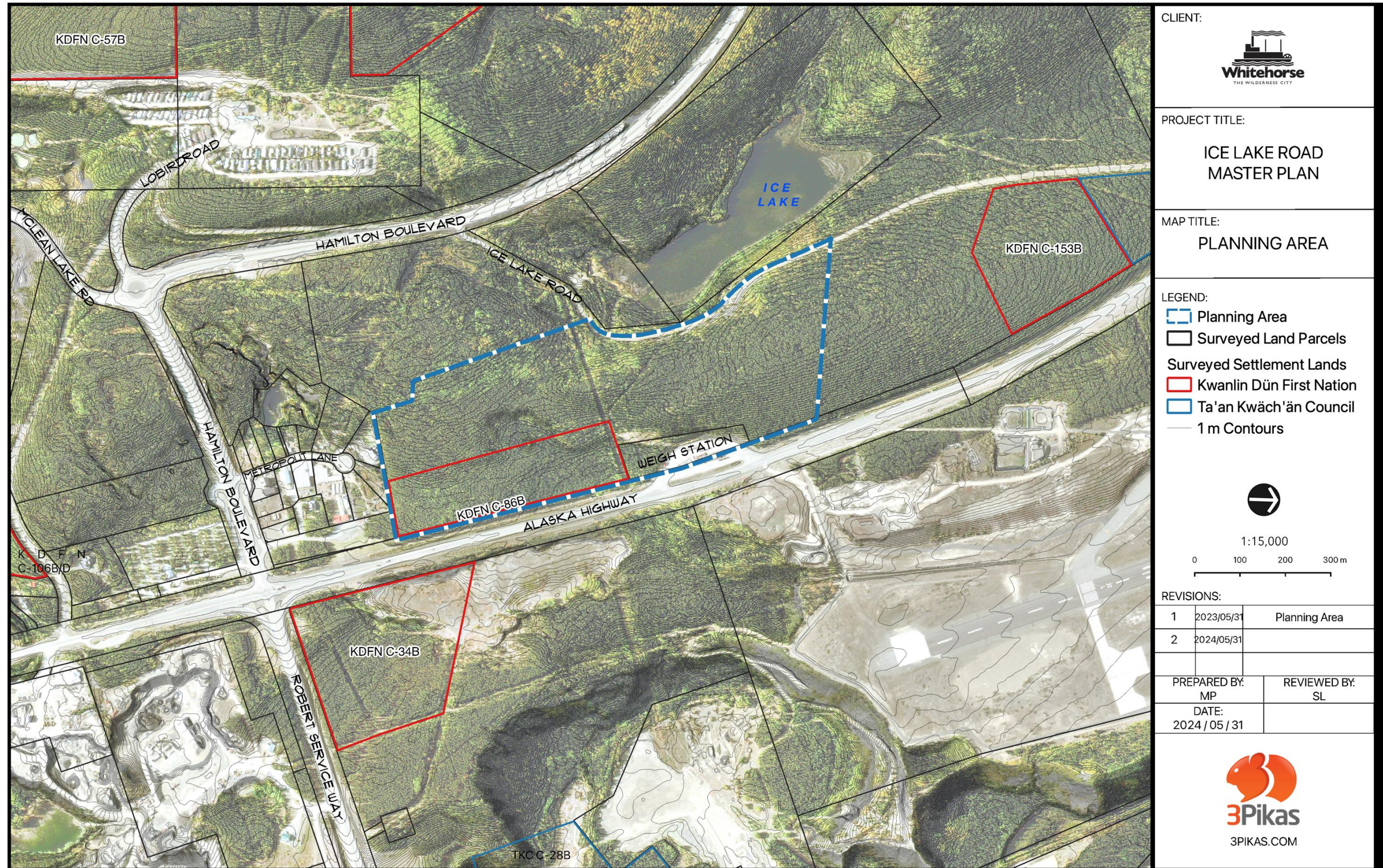
Ultimately, it will fall to the land owners to take the approved Master Plan forward to implementation. This may take time, and as with all conceptual level plans, new information and subsequent approvals will make minor adjustments. Major deviations from the approved Master Plan (i.e., significant change in Land Use) would trigger the need for a Master Plan review or update.

Either or both land owners (KDFN and YG) may re-initiate the Master Planning process with the City of Whitehorse in the future if they desire, based on evolving needs, objectives, financial considerations, or other changes.


## **1.4 INTERPRETATION OF THE PLAN**

The numerical and quantitative provisions, such as road right of ways, road alignment, lotting, and cut/fill presented in this Master Plan are subject to further detailed study and review. The proposed block sizes and configuration are subject to change following development approval process and detailed design. It is assumed that municipal piped water and sewer servicing will not be available in the near future (i.e., 5+ years) and that onsite servicing will be required.

FIGURE 1: PLANNING AREA



CLIENT:









PROJECT TITLE:


ICE LAKE ROAD  
MASTER PLAN

MAP TITLE:

PLANNING AREA

LEGEND:

-  Planning Area
-  Surveyed Land Parcels
-  Surveyed Settlement Lands
-  Kwanlin Dün First Nation
-  Ta'an Kwäch'än Council
-  1 m Contours



1:15,000


0 100 200 300 m

REVISIONS:

1	2023/05/31	Planning Area
2	2024/05/31	

PREPARED BY: MP      REVIEWED BY: SL

DATE: 2024 / 05 / 31



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# 2 PLANNING PROCESS

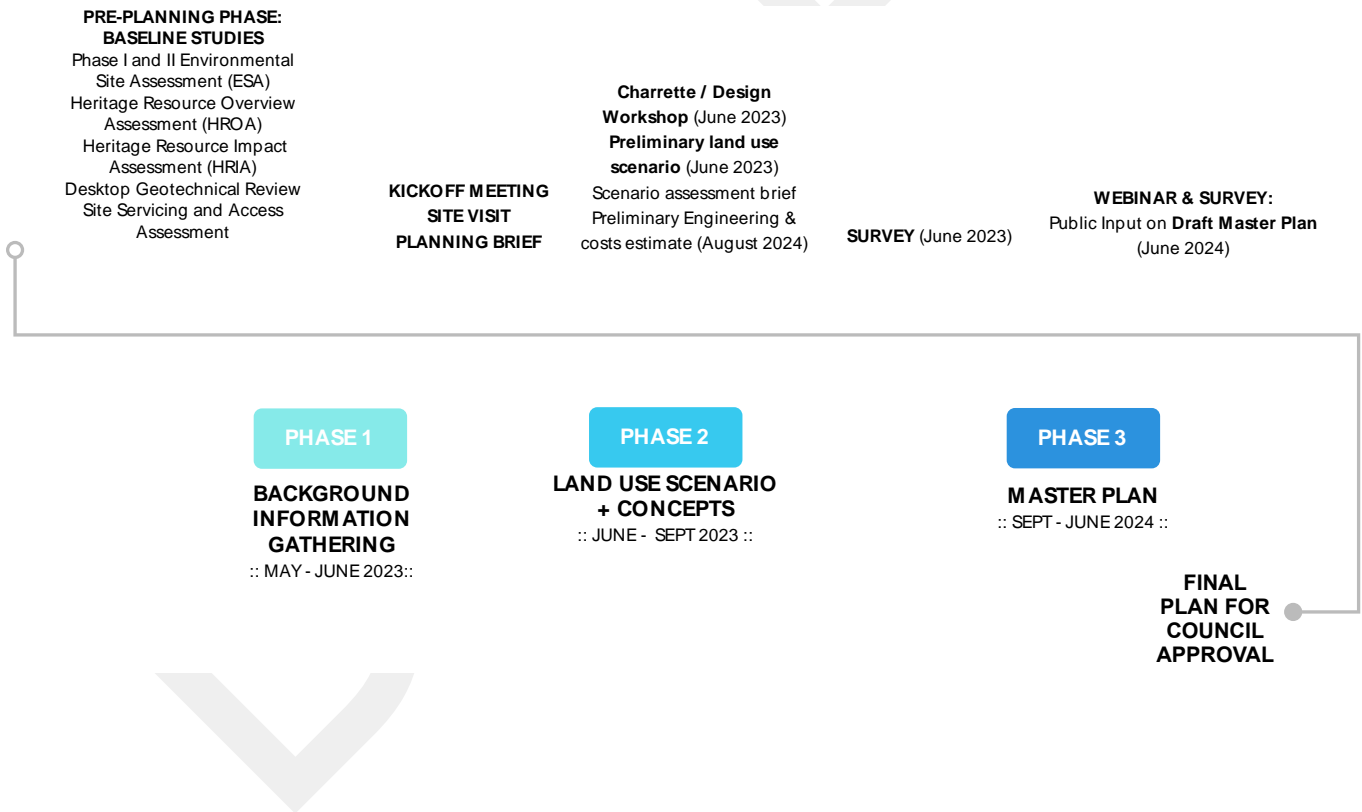
## 2.1 PLANNING PHASES

The Ice Lake Road South Master Plan is the culmination of a process that began in May 2023, with pre-planning studies being completed in 2022 prior to the process starting.

The Master Plan was developed over three phases:

- Phase 1: Background Information Gathering and Analysis
- Phase 2: Options Development (design workshop and public survey)
- Phase 3: Draft and Final Master Plan (online public webinar and public survey)

FIGURE 2: PLANNING PROCESS



### **2.1.1 CONCEPT DEVELOPMENT**

A key component of the plan is the development concept, which was prepared in iterations throughout the planning process. To kickstart the design process, two design workshops were held in close succession with the City Planners and Engineers, Government of Yukon and KDFN representatives. At the first meeting site conditions were reviewed and participants collaborated to create options. For the second workshop 3Pikas presented a refined concept and gathered input and feedback on the different aspects of the design.

Figure 3 illustrates the evolution of the concept from early sketches created at the first design workshop in June 2023 to the recommended land use concept.

Key insights during the iterations included:

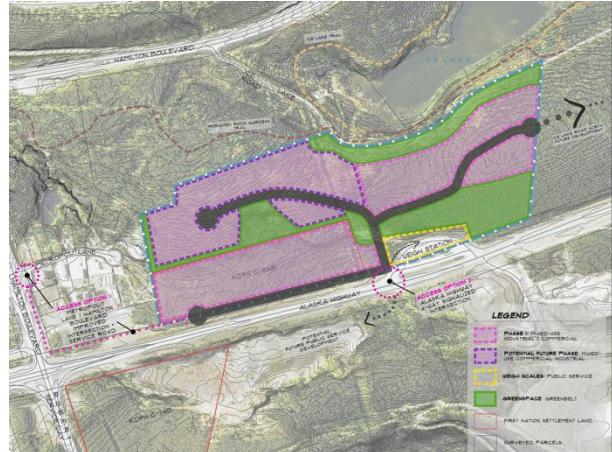
- Significant grades and shallow bedrock were constraints that would need to be addressed through the design.
- Economic opportunities related to removing and crushing bedrock for sale as fill were limited at this time.
- Due to cost concerns, none of the concepts entertained a comprehensive pre-grading of the entire site down to the elevation of Alaska Highway.
- Instead, options focused on working with the topography and utilizing the best lands for development, and retaining steep / shallow bedrock areas as greenspace.
- Future road network connection to the Ice Lake Road North area was also emphasized.

**FIGURE 3: DEVELOPMENT OF THE CONCEPT**

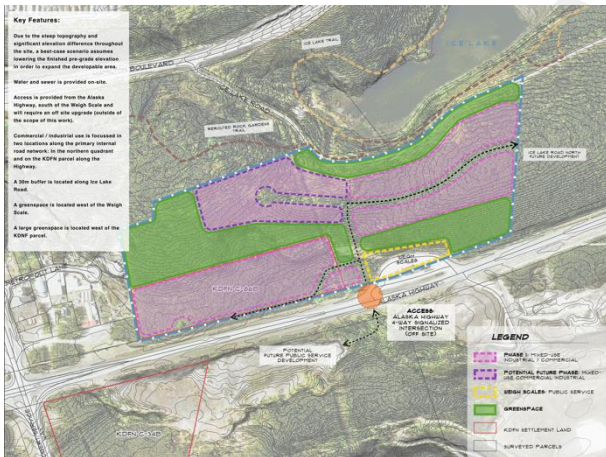
**1) SUBDIVISION SKETCH CO-DEVELOPED AT THE DESIGN WORKSHOP**



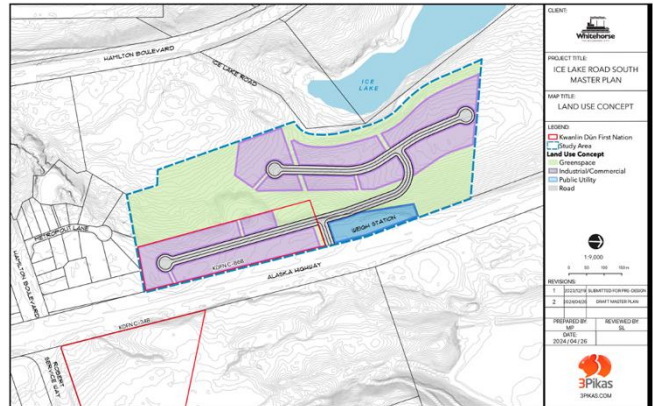
**2) PRELIMINARY LAND USE SCENARIO – SHARED IN PUBLIC SURVEY**



**3) LAND USE SCENARIO ASSESSMENT CONCEPT**



**4) RECOMMENDED LAND USE CONCEPT**



## 2.1.2 PUBLIC ENGAGEMENT

The public had the opportunity to give feedback on the preliminary land use concept through an online survey in August 2023, and again on the draft final concept in June 2024. The purpose of this engagement was to inform the public about the project and give opportunities to voice ideas, preferences, and concerns regarding the preliminary land use scenario and draft final designs.

The survey was hosted on Engage Whitehorse from August 14 to 28, 2023 and generated 93 responses. The What We Heard report from these events are included in Appendix C.

Key input from the public includes:

- Of those interested in a commercial industrial lot:
  - many were looking for one between 0.5 to 1.0 hectares.
  - most liked the Ice Lake Road South location.
- Many respondents had concerns about potential impacts of the development on existing recreational and ecological values.
- Some wanted the development to be focused only along the highway corridor, and not extend toward Ice Lake.
- Current use of the area by respondents was primarily for hiking, biking, and foraging.
- Some suggested that a mixed-use development with more residential would be preferable.
- The importance of well-designed road access, pedestrian connections, and active transportation options was highlighted to ensure safety, convenience, and minimize negative impacts on existing infrastructure.
- A key question in the survey asked participants if they preferred the access be located from Hamilton Boulevard, or the Alaska highway. Most respondents who identified as prospective buyers preferred the Alaska Highway entrance.

[Note to Draft: Summary of the anticipated engagement on the Draft Master Plan concept will be added to this section when completed. Anticipated date for the final public engagement is June 2024.]

# 3 ICE LAKE ROAD SOUTH AREA

## 3.1 POLICY CONTEXT

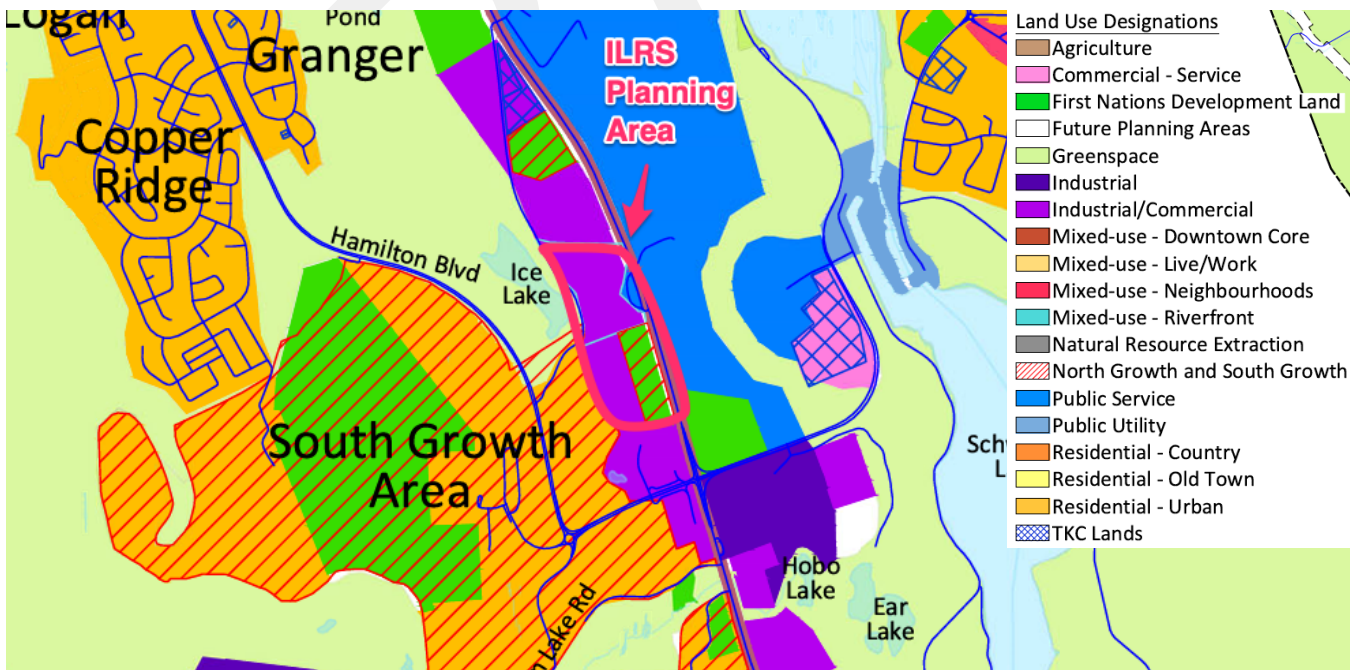
This section explores the key policy documents and planning initiatives that set the foundation for the Ice Lake Road South Master Plan.

### 3.1.1 OFFICIAL COMMUNITY PLAN

The City of Whitehorse Official Community Plan 2040 (OCP) is the primary over-arching tool for managing growth and development in the City of Whitehorse. The plan provides a vision of future growth for the City of Whitehorse and sets the policy framework to guide its physical development over the plan horizon to 2040.

The Ice Lake Road South area is part of the South Growth Area and currently designated Industrial/Commercial and First Nation Development Lands (Figure 4). The Industrial/Commercial designation applies to areas that have been identified as strategic locations for commercial and industrial activities such as Marwell and in several nodes along the Alaska Highway. Industrial/Commercial areas accommodate light industrial activities, and complementary commercial uses, that are primarily within enclosed buildings. Typical uses that may be suitable for inclusion in this designation include but are not limited to light manufacturing, processing, indoor agriculture, and warehousing. Ancillary commercial uses such as retail may also be considered.

FIGURE 4: OCP DESIGNATIONS (OCP, 2023)



### 3.1.1.1 RELEVANT OCP POLICIES

#### SLOPES

- 7.14 A professional geotechnical assessment will be required for all development on, or within 15 metres of slopes greater than 2 metres in height and in excess of 20% (5 horizontal to 1 vertical).
- 7.15 All development, including building, grading, and tree harvesting, will be prohibited on slopes that exceed 30% (3.3 horizontal to 1 vertical). The only exceptions will be for critical infrastructure, trails, and viewpoints, provided that a professional geotechnical assessment, accepted by the City Engineer, can demonstrate reasonably safe conditions.
- 7.16 All new development will be setback a minimum of 15 metres or 1.25 metres multiplied by the height of slope, whichever is greater, from the top or bottom bank of any slope over 30%, as illustrated on Figure 7 - Illustration of Escarpment Setbacks. The only exceptions will be for critical infrastructure, trails, and viewpoints.

#### WETLANDS AND RIPARIAN AREAS

- 7.7 A 30 metre riparian setback (“Riparian Setback”) is established to protect riparian areas. Areas along both sides of all rivers, streams, lakes, and wetlands must be protected from development and remain in a natural condition along both sides of all rivers, streams, lakes, and wetlands, year-round or seasonal. The Riparian Setback will be measured from the ordinary high-water mark of the river, stream, lake, or wetland to the property line as illustrated on Figure 6 Illustration of Riparian Setback. Government of Canada and Government of Yukon environmental guidelines, and applicable City bylaws, must be followed in all cases.

**Note that the planning area boundary setbacks were determined to be more than 30m from riparian areas.**

#### TRANSPORTATION AND MOBILITY

- 11.30 The City will coordinate with other Governments to ensure land uses adjacent to the Erik Nielsen Whitehorse International Airport are compatible with the airport’s ongoing operations.

#### POLICIES ON LAND MANAGEMENT

- 13.10 *To acknowledge the impression conveyed by the overall appearance of the Alaska Highway corridor:*
- i. The City will encourage clean-up along the highway on both private and public lands.*
  - ii. New development visible from the Alaska Highway may be required to incorporate aesthetic enhancements such as:*

- *Site design, landscaping, or fencing requirements that visually screen parking and storage from the Alaska Highway; and*
- *Signage requirements subject to approvals from either the City or the Government of Yukon.*

13.11 Visual mitigation measures (e.g., fencing, landscaping, berms) will be required to be incorporated into the design for outdoor manufacturing activities that are visible from the Alaska Highway or from nearby non-industrial uses.

#### **DEVELOPMENT REQUIREMENTS: MASTER PLANS**

13.22 A Master Plan will be required for all development of sites over 1.5 hectares in size, prior to zoning amendment and/or subdivision. These sites may include one or more properties and have one or more owners.

i. The requirement for the preparation of a Master Plan may be waived through a development review process for developments that have minimal implications to municipal infrastructure, drainage concerns, surrounding properties, or other considerations.

13.23 Master Plans will be required to conform with the OCP and consider community feedback. Where a proposed Master Plan does not conform with the OCP, the owner of the subject development site will be required to apply to amend the OCP.

13.24 Master Plans may be required to include, but not limited to:

i. The history and background of the development site with a map showing property ownership and easements;

ii. The planning context of the site (i.e., what has been planned for the area in the OCP and any other relevant plans or studies);

iii. Existing planning area conditions (e.g., environmentally sensitive areas, topography, existing structures);

iv. An overview of surrounding uses;

v. A summary of the opportunities and constraints for the site;

vi. An overall vision for what is being proposed for the area, with a focus on how the proposed development is in alignment with the OCP;

vii. A description of proposed land uses including parks, playgrounds, natural spaces, and community amenities, with associated maps;

viii. Proposed land use calculations with anticipated dwelling units, densities, and population projections;

ix. A transportation plan showing major internal roadways and connectivity to the City's surrounding transportation and mobility network; and

x. An engineering feasibility report addressing servicing capacity, costs, and connections.

### **COSTS OF DEVELOPMENT**

- 13.26 The City may consider the use of cost-sharing agreements among landowners to cover the costs associated with major infrastructure, studies, assessments, or plans that may be required because of, or to prepare for, land development. These agreements may include environmental assessments, restoration plans, and the provision of community facilities including parks and shared infrastructure. Such agreements will be initiated by landowners or the City and provide for the fair sharing of costs among benefiting parties.
- 13.27 The City may consider alternative tools to cover the costs associated with land development.
- 13.28 Developers may be required to cover the costs of associated off-site infrastructure improvements for redevelopment and intensification development in existing neighbourhoods. This could be done through the Development Permit process or using a different mechanism.

### **FIRST NATION DEVELOPMENT LANDS**

- 15.3.1 The City will work with Ta'an Kwäch'än Council and Kwanlin Dün First Nation to ensure the compatibility of adjacent uses and sensible and efficient planning of lands and infrastructure in the community.
- 15.3.2 Master plans will be required for development on lots greater than 1.5 ha, as stated in Section 13 Land Management, and subject to a review by the City. The master planning process will be used to confirm the land use, prior to zoning.
- 15.3.3 Once a land use is selected through the master planning process, the applicable land use policies for a similar City land use designation shall apply as well as any other applicable OCP policy.

Note the OCP designates most KDFN parcels in the City of Whitehorse as First Nation Development Lands.

## INDUSTRIAL/COMMERCIAL

- 15.7.1 Uses that may be suitable for inclusion in this designation include but are not limited to light manufacturing, processing, indoor agriculture, and warehousing.
- 15.7.2 Ancillary commercial uses such as retail may be considered.
- 15.7.4 Where the Industrial/Commercial designation is in proximity to a residential neighbourhood, the proposed development may be required to include a vegetated buffer of approximately 200 metres. This does not include where this designation is adjacent to a Live/Work area.
- 15.7.5 Appropriate infrastructure will be provided for safe access for drivers, cyclists, and pedestrians to and from arterial or collector roads.

### 3.1.2 ZONING BYLAW

The majority of the northern half of the planning area is zoned Greenbelt (PG), encompassing the undeveloped unsurveyed YG land. Public Service (PS) zoning applies to the active Weigh Station (also referred to as 'Weigh Scales') along the Alaska Highway Right-Of-Way. To the south, zoning is split between Future Planning (FP) (undeveloped YG lands), and First Nation Future Planning (FN-FP) (KDFN C-86B).

The purpose of the Future Planning (FP) Zone is to provide a zone to protect land with no determined use in a generally undeveloped and natural state until such time as planning has occurred to determine appropriate zoning. The purpose of the First Nation Future Planning (FN-FP) Zone is to identify those lands owned or selected by the Kwanlin Dün First Nation, which will be planned and designated in accordance with the Kwanlin Dün Self-Government and Final Agreements.

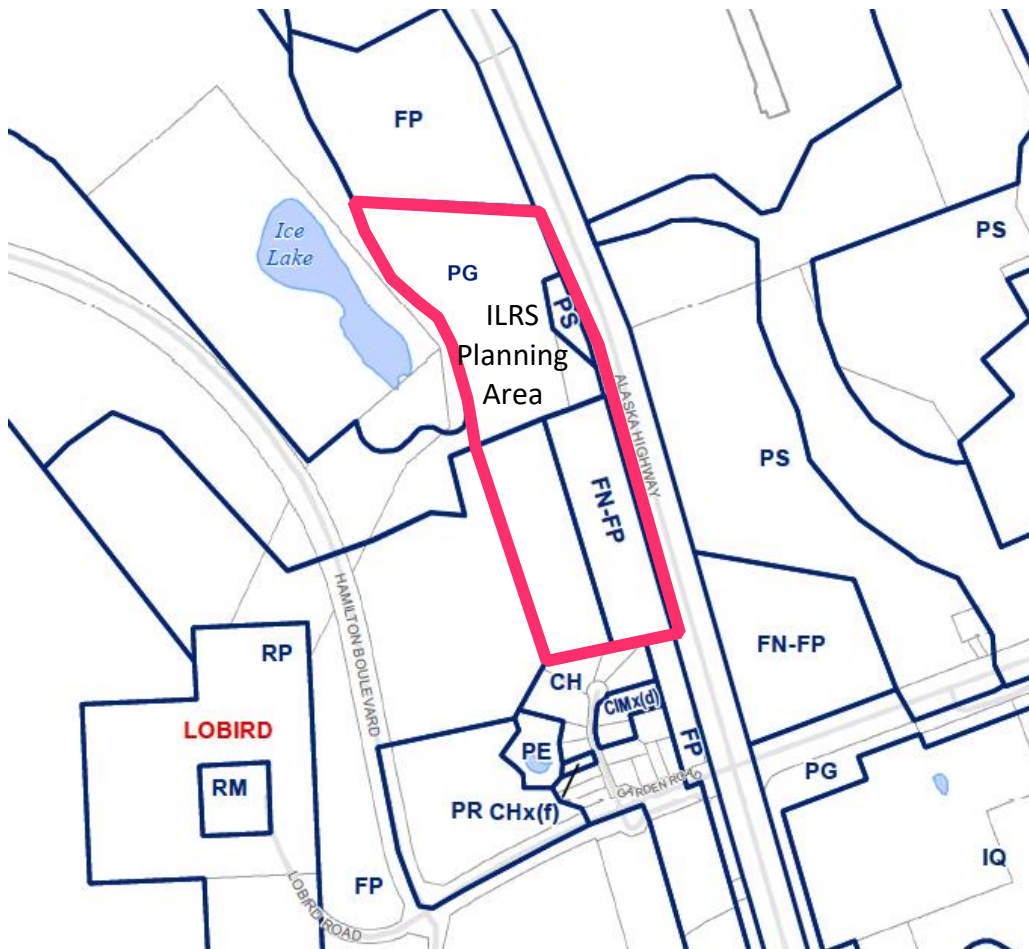
The purpose of the Public Service (PS) Zone is to *provide for public and privately owned facilities of an institutional or community service nature, such as the weigh scale facility.*

Finally, the purpose of the Greenbelt Zone (PG) is to *provide areas of public land that are typically left in a natural state and may be used primarily for buffers, walkways, trails and for unorganized or passive recreation.*

#### Note:

- The Zoning Bylaw currently being updated, and when completed it will more closely reflect land use designations in the recently updated OCP. Therefore, the portions of the planning area zoned PG are, for the time being, inconsistent with the land use designation in the OCP.
- The zoning bylaw can be supplanted by KDFN if the First Nation Government exercises its rights to enact planning and zoning regulations under the KDFN Lands Act on Type 1 and 2 Settlement Land.

FIGURE 5: ZONING BYLAW MAP (2012-20, CONSOLIDATED TO BYLAW 2023-10)



### **3.1.2.1 LANDSCAPING AND SCREENING REQUIREMENTS**

Section 5.5 of the Zoning Bylaw includes general and Commercial zoning (i.e., CIM, CH) specific site design policies for all developments, including for pathways, screening, and landscaping treatments. Relevant commercial-specific policies include:

#### **COMMERCIAL ZONES**

##### **Fences and Walls**

a) Fences and walls are not required in any commercial zone, but where constructed in any commercial zone the following requirements apply. Fences and walls constructed in the front yard in any commercial zone shall not exceed 1.2 m in height, with the exception of CH zones where fences and walls in the front yard shall not exceed 2.0 m in height. Fences and walls in the side or rear yard of any commercial zone shall not exceed 2.0 m in height, with the exception of commercial zones which abut a residential zone, where fences and walls in the side or rear yard shall not exceed 2.5 m in height. See section 5.5.2.4 for method of determining height of fences and walls.

##### **Landscaping Adjacent to Highways**

b) In the CH zone, the landscaping requirements specified in this section must be planted in the front yard. Additional landscaping elsewhere on the site is encouraged.

##### **Landscape Plantings**

c) On-site landscape plantings are required for new developments in all commercial zones. The required landscape planting area in square metres is calculated based on 3.0 m x total public road frontage of the property in metres. Requirements in all commercial zones except CC and CPG are a minimum 2.0 m wide landscape planting area with one tree planted per 25 m<sup>2</sup> landscape planting area or one shrub planted per 15 m<sup>2</sup> landscape planting area, or any combination thereof to meet the standard.

##### **Screening of Storage Areas**

d) Screening of storage areas is required in all commercial zones and shall be located to the rear or side of the principal building and shall be screened from view from any street and from adjacent sites in a residential zone.

##### **Vegetative Buffers**

e) Vegetative buffers are required in CIM, CN, CNC, CNC2, CS and CH zones where the development is adjacent to a residential zone. The required minimum width of vegetative buffers in a commercial zone adjacent to a residential zone is 3.0 m. Minimum density of existing or planted vegetation in a vegetative buffer is one tree or two shrubs per 20 m<sup>2</sup> of required buffer area, or any combination thereof to meet the standard.

## Walkways

f) Walkways are required in all commercial zones and shall provide for onsite pedestrian circulation with adequate connections with parking areas, public sidewalks, active transportation routes, etc. Primary walkways in all commercial zones shall be hard-surfaced and a minimum 1.5 m in width.

Note that CIM Zoning does not require Vegetative Buffers or Walkways, while all the above requirements apply to CH zoning.

### **3.1.3 KDFN SELF-GOVERNMENT AGREEMENT (2005) LANDS ACT (2020) & COMMUNITY LANDS PLAN (2020)**

The KDFN Self-Government Agreement (SGA) specifies that the land use and development designation for C-86B is Commercial. If this designation is to be varied, KDFN, Government of Yukon, and the City of Whitehorse must follow a process outlined in the SGA. The KDFN Lands Act, enacted in 2020, governs land management and administration within the KDFN Traditional Territory. It outlines rules and procedures for land use, leasing, and development of Settlement and other KDFN-owned lands.

The KDFN Community Lands Plan (2020) ('KDFN Lands Plan') guides the planning and development of KDFN Settlement Land within Whitehorse.

The KDFN Lands Plan identifies goals for each KDFN land parcel in the city. These goals reflect the original designations for the parcels within the KDFN SGA and the input from beneficiaries and citizens. KDFN Lands Plan identified specific lands within the City of Whitehorse that hold promise for commercial or industrial development (i.e., revenue generation). The KDFN-C-86B parcel within the ILRS planning area is identified for revenue generation.

KDFN's planning department participated in all stages of the ILRS planning process. The draft ILRS Master Plan was submitted to KDFN for review.

## **3.2 PLANNING AREA CONTEXT**

Ice Lake Road South is a undeveloped forested greenfield located in the City of Whitehorse. The ILRS planning area is owned by YG (Unsurveyed Commissioner Land) and KDFN Settlement Land (Settlement land C-86B). The Weigh Station occupies a narrow strip of YG surveyed highway frontage (LOT 1143).

The planning area is approximately 3.5km from Downtown Whitehorse and 1.2 km southwest of the Erik Nielsen International Airport.

### **3.2.1 THE SURROUNDINGS**

The Planning Area is bounded by the Alaska Highway (re-developed and twinned in 2023) to the east which is a key corridor for goods and services travelling north and south. The southern border of the

planning area is located approximately 315 metres north of the South Access – the main entrance to the city for locals, visitors and businesses travelling from the south.

**SOUTH:** Properties located on Metropolit Lane define the southern edge of the study area. This subdivision includes light industrial, commercial, as well as highway commercial uses.

**PHOTO 1: METROPOLIT LANE CUL-DE-SAC (SOUTH OF PLANNING AREA, VIEW TO THE SOUTH)**



**EAST:** The eastern edge of the site is defined by the Alaska Highway and accompanying paved active transportation trail (east side of highway).

**PHOTO 2: HIGHWAY FRONTAGE AND NEWLY TWINNED SECTION OF THE ALASKA HIGHWAY (ADJACENT TO PLANNING AREA TO THE EAST, VIEW TO SOUTH)**



**NORTH:** The northern edge of the study area is undeveloped land known as Ice Lake Road North.

**PHOTO 3: ICE LAKE ROAD NORTH AREA (VIEW TO THE SOUTH FROM ALASKA HIGHWAY / LODESTAR LANE / ICE LAKE ROAD INTERSECTION)**



**WEST:** The western edge of the study area is defined by Ice Lake Road and forested greenspace comprising part of the Paddy’s Pond / Ice Lake Regional Park.

**PHOTO 4: HAMILTON BOULEVARD AND ICE LAKE ROAD (WEST OF PLANNING AREA, NORTH, AND NORTHEAST VIEW)**



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### 3.2.2 THE PLANNING AREA TODAY

The planning area is mostly undeveloped and forested, with a mix of spruce and trembling aspen and small pockets of lodgepole pine. Terrain and vegetation are similar to other upland boreal areas around Whitehorse that were clearcut for fuel wood in the early-20<sup>th</sup> century and have since naturally afforested. There are no watercourses, ponds, or wetlands in the planning area. An overhead powerline transects the centre of the planning area from east to west (see Photo 5). The two other main developed features include the Weigh Station (Photo 6) and the ‘weigh scale connector trail’ which is a closed gravel road that is now used as a recreational trail (Photo 7).

**PHOTO 5: CLEARED POWERLINE AND HILLSLOPE (VIEW TO THE WEST FROM THE ALASKA HIGHWAY)**



**PHOTO 6: WEIGH STATION AND THE ALASKA HIGHWAY RIGHT OF WAY LOOKING NORTH**



**PHOTO 7: WEIGH STATION CONNECTOR TRAIL**



**PHOTO 8: FLAT FORESTED AREA IN KDFN C-86B**

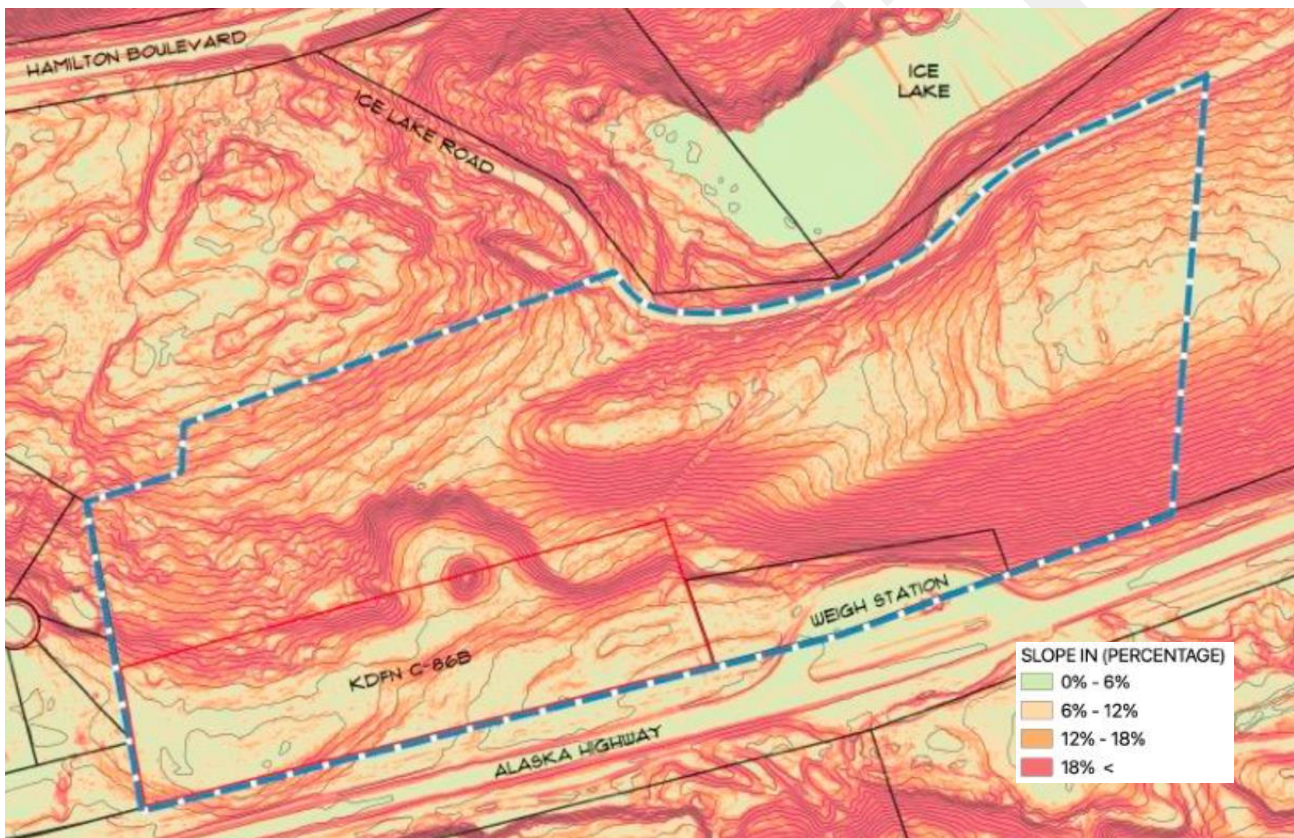


### 3.2.3 TOPOGRAPHY

The site's topography consists of moderately steep (12%-18%) to steep (>18%) slopes, with elevation differences on the order of 25 meters from the bottom of the slope to the highest points in the Planning Area. Gentle slope areas are concentrated on the KDFN parcel (Photo 8) and at the top of the small glaciofluvial ridge in the northwest portion of the planning area.

The steeper portions (20% or more) of the planning area will need to be reviewed by a geotechnical engineer and could be subject to geotechnical assessment and slope setback provisions outlined in the OCP 2040 (Section 7 – Environmental Stewardship).

FIGURE 6: PLANNING AREA SLOPE MAP



The desktop Geotechnical Assessment completed by Ausenco (2022) suggested that shallow bedrock may be present in the planning area and recommended further intrusive work be completed prior to development. Site walks confirmed that shallow and exposed bedrock are prevalent, with visible surface bedrock outcrops concentrated in the south (see Photo 9).

A Ground Penetrating Radar investigation completed by Aurora Geoscience (2023) indicated that shallow bedrock areas exist throughout much of the planning area. No intrusive geotechnical work was completed to confirm and expand on these findings in the development of the Master Plan.

The Rock Gardens Trail is a city-built and maintained single-track trail that traverses the southwest quadrant of the planning area. It connects the Rock Gardens parking area (off Hamilton Boulevard) to the Ice Lake Perimeter Trail (Photo 10).

**PHOTO 9: SURFACE BEDROCK OUTCROP AND HILLY TERRAIN IN THE SOUTH END OF THE PLANNING AREA (WEST OF C-86B)**



**PHOTO 10: SOUTH ENTRANCE TO THE ROCK GARDENS TRAIL**



### **3.2.4 HERITAGE RESOURCES**

Ecofor (2022; 2023) completed a heritage resource overview (final report) and impact assessments (interim report). During the assessments, no heritage values (e.g., archaeological sites, historic sites, or Culturally Modified Trees related to traditional use) were identified, and no further heritage investigations are recommended at this time. The HRIA includes standard mitigations for construction and applicable legislation/regulations governing heritage resources for land development type projects.

### 3.2.5 TRAILS

As shown in Figure 7, the Planning Area has numerous official trails and trails that are mapped by users on Trailforks. The Ice Lake Road forms the northwest boundary of the study area. The road is gated to car traffic and used as a multi-use recreational trail. The recently built Ice Lake Trail encircles Ice Lake to the west of the planning area. This is a popular non-motorized recreation trail.

Approximately 1,787 metres of trails are within the planning area (Table 1: Trails). The single-track non-motorized Rock Gardens Trail transects the planning area roughly from north to south. The City of Whitehorse built this trail, and it is part of the City’s maintained network. The Weigh Station Access trail runs east-west and connects to Ice Lake Road. This trail is mapped on Trailforks and is not an official city-maintained trail.

A powerline clearing maintenance trail follows the KDFN C-86B surveyed cutline and powerline (‘Powerline trail’). This trail is not maintained by the City but is visible and well established by the clearing of the powerline easement.

TABLE 1: TRAILS

TRAILS	OVERLAP WITH STUDY AREA (M)
Rock Gardens Trail (single track type 3/4)	975
Weigh Station Access Trail (unofficial)	453
Powerline Trail (unofficial)	359
<b>Total</b>	<b>1,787</b>

### 3.2.6 ENVIRONMENTAL CONTAMINATION STUDIES

Phase I and follow-up Phase II Environmental Site Assessments were completed, and no contamination was found. No follow-up work is recommended at this time (Aperture Consulting, 2022; 2023).

### 3.2.7 SERVICING & INFRASTRUCTURE

**Power & Telecommunications:** There is currently an overhead power line that crosses the Study Area and provides power, data, and communications to the Whitehorse Weigh Station and to the Lobird residential subdivision. 3-phase power is not provided on this overhead line. 3-phase power is available on the overhead lines on the Alaska Highway adjacent to the study area. Overhead power service runs on the west side of the Alaska Highway. Industrial land use typically requires 3-phase power.

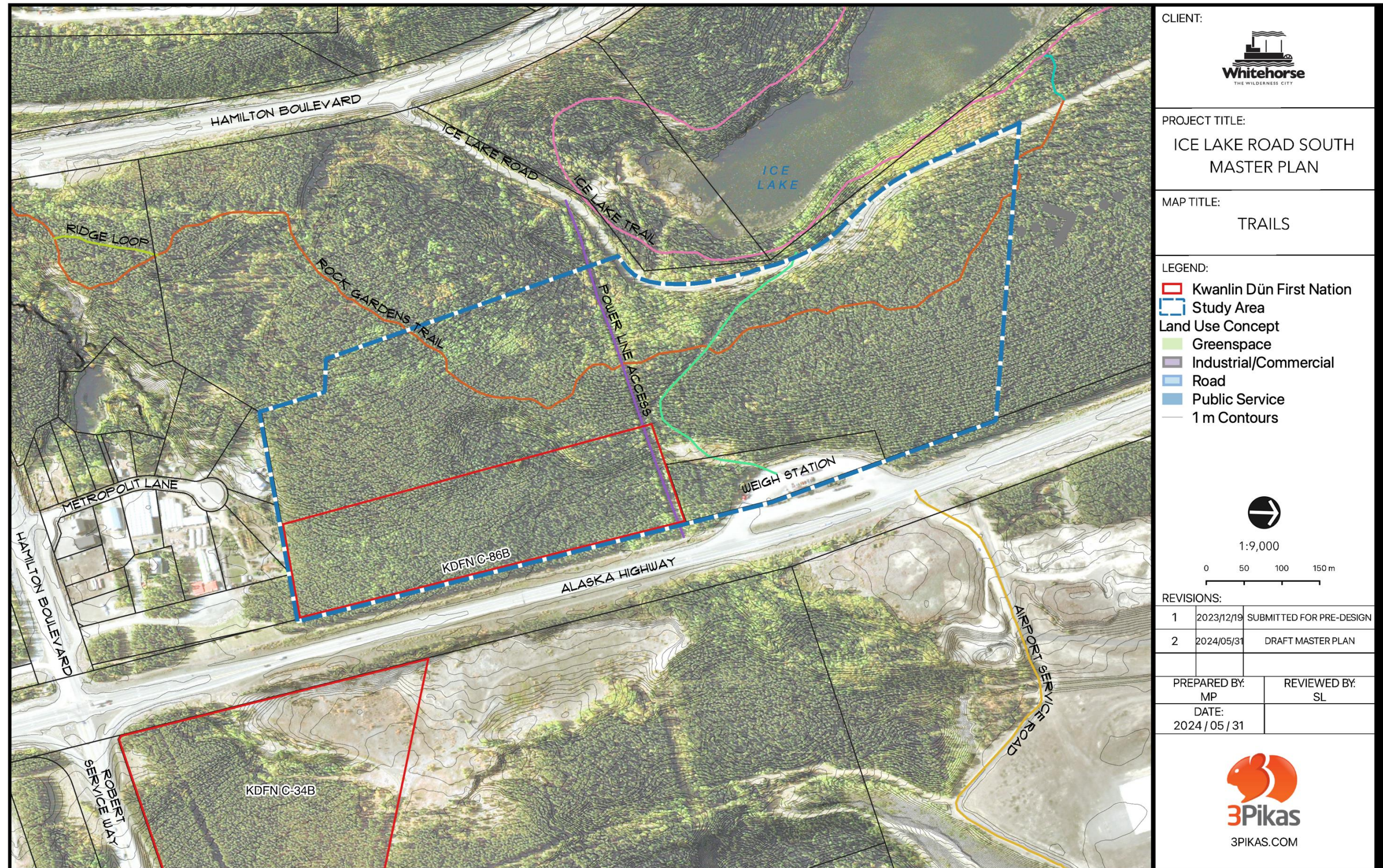
**Municipal Water and Sewer:** The planning area is outside the municipal piped servicing catchment. Piped servicing is extended to the Alaska Highway / Condor Road intersection about 1,300 meters north of the planning area boundary. At this time the City of Whitehorse has no detailed plans to bring piped infrastructure to the planning area.

**Roads:** There are no roads within the planning area. The Alaska Highway is adjacent to the east of the planning area. The Ice Lake Road is immediately to the west. The Ice Lake Road is unmaintained and closed to vehicle traffic.

**Drainage:** No drainage infrastructure exists on the planning area. Stormwater and runoff are managed along the Alaska Highway using overland ditches, culverts, and swales.

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FIGURE 7: TRAILS



## 3.3 OPPORTUNITIES AND CONSTRAINTS

Based on key aspects of the site, the following key opportunities and constraints were identified. These were carried forward to the conceptual design, which attempts to maximize the opportunities, and where possible mitigate and minimize constraints, or turn them into strengths.

### 3.3.1 OPPORTUNITIES

- **Central location, close to downtown, major neighbourhoods, and major corridors:** Ice Lake Road South's central location would provide commercial and industrial lands close to employees, customers, and service areas in the City and beyond.
- **Proximity to Transportation Corridors:** Ice Lake Road South is well serviced by the surrounding road and active transportation network. It abuts the Alaska Highway, which is Whitehorse's main north south corridor, and is close to the Hamilton Boulevard / Robert Service Way / Alaska Highway intersection that is a key commuter and transport traffic node. A paved separated bike path conveys active transportation users along the Highway.
- **Highway Frontage for Commercial Development:** Owing to the proximity to the Alaska Highway, Ice Lake Road South is well disposed for highway commercial development requiring convenient vehicle access and high visibility to traffic.
- **Compatibility with existing development:** the neighbouring development on Metropolit Lane is compatible with industrial and commercial development. The existing airport and Weigh Station uses are also generally compatible land uses.
- **Conducive relatively flat terrain conditions on C-86 portion of the planning area:** the majority of C-86B is flat to gentle hillslope in character. As such, it will likely require minimal pre-grading / fill to achieve desired grades for commercial and industrial use (i.e., %0 - %5), and install road access.
- **Potential for future connection to Ice Lake Road North area (in pre-planning stage).**

### 3.3.2 CONSTRAINTS

- **Topography and hillslopes:** The presence of a steep hillslope on much of the planning area poses a challenge to access, lot development, and drainage. Some of the area is too steep for consideration for Industrial/Commercial land use (i.e., greater than 3 to 1 slopes). These areas are concentrated in the YG portions of the planning area, with some overlap in the northwest corner of C-86B.
- **Shallow and exposed bedrock:** The road and lot layout must consider the higher elevation areas in the southern portion of the planning area that have extensive exposed / shallow bedrock, as well as steep hillslopes. Further, there is an elevated potential for shallow bedrock

throughout the planning area. Bedrock can be removed during road and utility construction. Individual lot owners can remove or infill bedrock during lot pre-grading and installation of buildings and services. However, it is generally more challenging and expensive.

- **Adjacent recreation and environmentally sensitive spaces:** The design must consider adjacent recreation and environmentally sensitive areas from the Paddy's Pond Environmentally Sensitive area / The Paddy's Pond / Ice Lake Park conceptual boundary (to be confirmed through future park planning). This area is a popular for recreation and contains areas of elevated ecological value.
- **Weigh Station:** The existing Weigh Station location presents road safety and transportation servicing and design challenges that will impact the final location, configuration, cost, design, and timing of the highway access intersection.

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## 4 THE MASTER PLAN

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### 4.1 VISION

*"Ice Lake Road South is an employment hub connected to the Alaska Highway Corridor and integrated into the evolving long-term commercial and industrial development and greenspace fabric of the area. The City of Whitehorse's vision is a forward-thinking industrial and commercial subdivision in the Ice Lake Area, strategically positioned along the Alaska Highway corridor. Following the direction set in the City of Whitehorse's Official Community Plan (2023), the plan embraces the unique opportunities that this location offers, to create a greenfield development that capitalizes on highway-oriented commercial potential and is a conducive environment for diverse industrial enterprises.*

*The Ice Lake Road South seeks to harmonize economic growth with environmental responsibility, ensuring an ongoing supply of employment lands for a thriving and growing Whitehorse. Through YG, KDFN, and City of Whitehorse collaboration, the Ice Lake Road South is designed to connect to anticipated future growth areas to the north, and overcomes site constraints to maximize industrial and commercial opportunities while retaining greenspaces and trail connections."*

### 4.2 INDUSTRIAL/COMMERCIAL AND PUBLIC SERVICE LAND USE PLAN

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*The Ice Lake Road South concept supports a diversity of industrial and commercial land uses in line with current and future anticipated employment land needs. The existing Public Service land use (Weigh Station) will continue to serve this function until it is relocated.*

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The land use concept (Figure 10) illustrates the overall land uses, road, and proposed industrial/commercial development fabric. The land use concept is intended to create capacity for approximately 21 lots (13.6 Hectares) for industrial and commercial use. It articulates a structured transformation of the Ice Lake Road South area into a mix of employment, greenspace, and public service land uses.

The recommended land uses are summarized in Table 3. Access is provided from the Alaska Highway (abutting the Weigh Station to the south). A mix of industrial/commercial uses are focussed in two locations along the primary internal road network: in **the Alaska Highway frontage (KDFN C-86B)** and **upper industrial/commercial area (YG land)**.

At full build out it is envisioned that approximately 42% of the area will be designated Industrial/Commercial use, 41% will be allocated to greenspace, 5% for Public Service, and 12% for roads (see Table 2).

**TABLE 2: SUMMARY OF PROPOSED LAND USE MIX<sup>1</sup>**

LAND USE	YG AREA (HA)	YG AREA (%)	KDFN AREA (HA)	KDFN AREA (%)	TOTAL AREA (HA)	TOTAL AREA (%)
COMMERCIAL / INDUSTRIAL	8.7	33.9%	5.0	72%	13.6	42%
GREENSPACE	12.7	49.4%	0.67	10%	13.3	41%
PUBLIC SERVICE (WEIGH STATION)	1.5	5.7%	0	0%	1.5	5%
ROAD	2.8	10.9%	1.3	18%	4.0	12%
<b>TOTAL</b>	<b>25.6</b>	<b>100.0%</b>	<b>6.9</b>	<b>100%</b>	<b>32.5</b>	<b>100%</b>

**Note that the road alignment, road right-of-way, and land use configurations that are presented are conceptual and subject to further studies and detailed engineering design.**

#### **4.2.1 ALASKA HIGHWAY FRONTAGE AREA**

The **Alaska Highway Frontage Area** connects commercial and light industrial uses within the KDFN Parcel to the Alaska Highway corridor. Land uses include high quality car-oriented commercial development opportunities adjacent, and visible from, the main north south arterial roadway in Whitehorse.

Anticipated primary land uses in this area are in line with those outlined in the Highway Commercial zoning, such as: community recreation services, light manufacturing, restaurants, public service buildings, garden centres, small hotels, convenience / gas bars, and retail.

The flat topography in this area is conducive to developments in line with other Highway Commercial areas in the City, such as semi-truck movements, up to 50% site coverage, parking areas, and larger structures. The alignment of the access through the centre line of the parcel maximizes the utility of the available space by double-loading lots along the roadway.

Greenspaces are included for greenway connections and in an area on at the northwest corner of the KDFN Parcel with unsuitable topography for development. These areas would accommodate trails and are intended to be left undeveloped and accessible for public use.

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<sup>1</sup> For simplicity the Weigh Scale property is not included in the breakdown.

**Suitable zoning:**

- Highway Commercial (CH).
  - **Minimum lot size:** 0.5 Hectares (no piped municipal water and sewer connections)

**4.2.2 UPPER DEVELOPMENT AREA**

The **Upper Development Area** is set back from the highway and provides opportunities for light industrial and commercial uses.

The hillslope character and probability of shallow bedrock pose a risk that it will not be economically feasible to pre-grade large areas during subdivision construction or later by lot owners. As a result, land use within the northern portion will likely remain incongruous with more intensive commercial and industrial uses. The northern portion provides opportunities for light commercial and industrial uses that do not need frequent large truck access / movement, large laydown areas, or extensive lot coverage. The area is set back from the highway and will be less disposed to highway commercial (i.e., retail, restaurant, convenience store etc.) orientation.

Suitable uses in the upper industrial/commercial area include light manufacturing, small workshops / equipment yards, landscaping businesses, equipment sales / service, and secondary residential use.

**Suitable zoning:**

- Mixed-Use Commercial Industrial (CIM).
  - **Minimum lot size:** 0.5 Hectares (no piped municipal water and sewer connections)

**4.2.3 PUBLIC SERVICE AREA (WEIGH STATION)**

The plan articulates no changes to the existing land use on the Weigh Station property. If the Weigh Station were moved to another location, land use changes to align with the Highway Commercial concept articulated in this plan is recommended (see policies below)

**Suitable zoning:**

- Public Service (PS)

**FIGURE 8: EXAMPLE OF RURAL INDUSTRIAL ROAD AT THE ENTRANCE TO MOUNT SIMA SUBDIVISION (YUKON NEWS, 2020)**



**FIGURE 9: EXAMPLE OF HIGHWAY COMMERCIAL DEVELOPMENT (METROPOLIT LANE) (GOOGLE, 2022)**

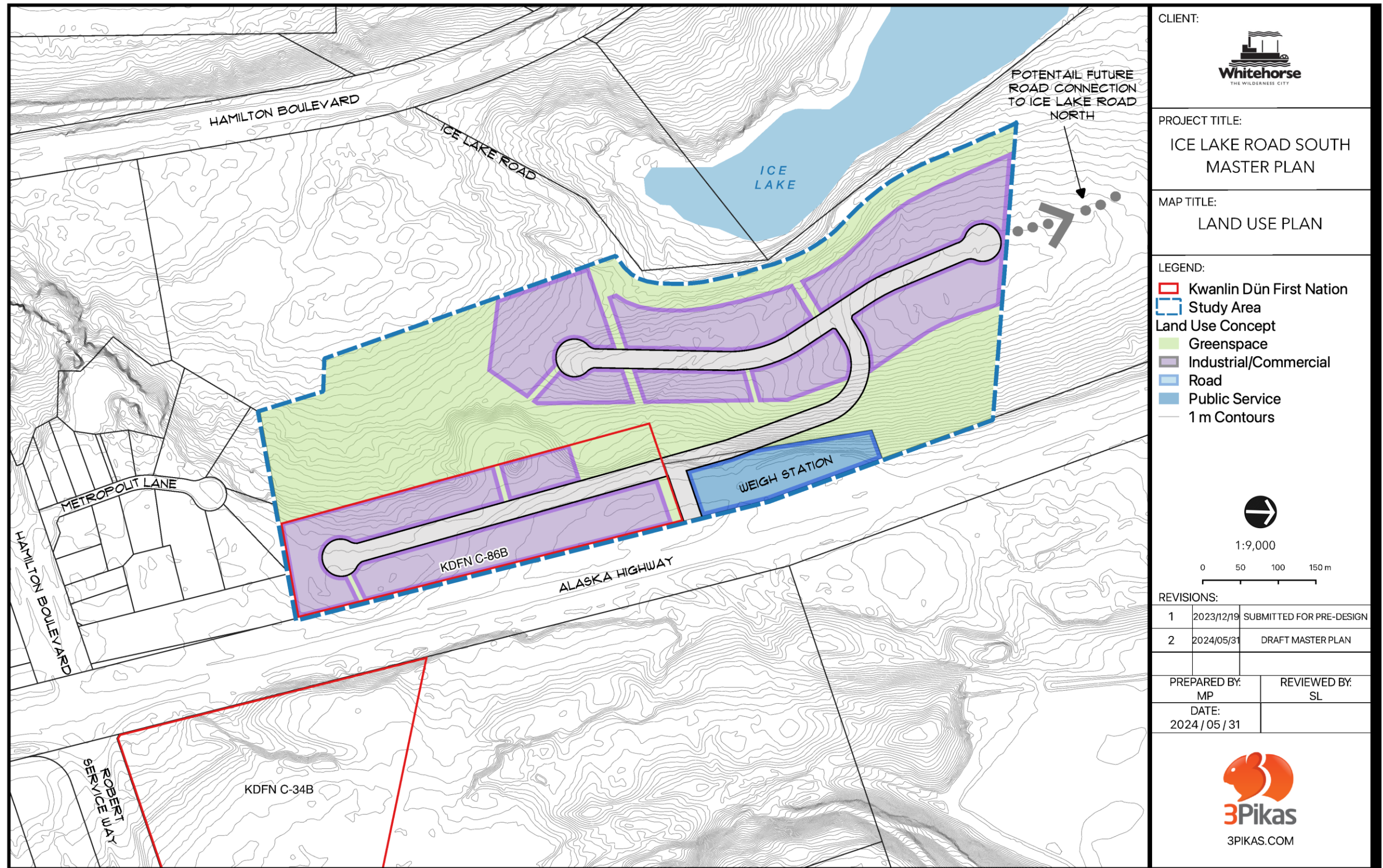


#### **4.2.4 INDUSTRIAL/COMMERCIAL AND PUBLIC SERVICE LAND USE POLICIES**

Industrial/Commercial policies provide the necessary direction to actualize the Master Plan vision.

1. Visual screening and landscaping of commercial and industrial activities will be required per Section 5.5. (Site Design) of the City of Whitehorse Zoning Bylaw (2023).
2. Due to the onsite servicing requirement, and shallow bedrock conditions, a hydrogeological study should be completed prior to allowing land uses that require large quantities of water and wastewater storage / pump out or ground discharge (e.g., car washes, laundromats, larger hotels, etc.)
3. Should the Weigh Station be moved to another location, highway-oriented commercial and light industrial land uses should be considered a priority to maintain complementary land uses along the Alaska Highway frontage. This will trigger an OCP amendment and potentially a new Master Plan process as well.
4. Alaska Highway Frontage Area: Highway Commercial Design guidelines should be developed and implemented to provide continuity in the building, signage, and landscaping features of the Alaska Highway Frontage Area.
  - Specifically, these guidelines should address aesthetic and landscaping objectives and design options for the Alaska Highway Right of Way / C-86B Parcel development boundary area. Guidelines will ensure more harmonious aesthetic and continuity with the Zoning Bylaw.

FIGURE 10: LAND USE PLAN



CLIENT:




PROJECT TITLE:  
ICE LAKE ROAD SOUTH MASTER PLAN

MAP TITLE:  
LAND USE PLAN


LEGEND:

- Kwanlin Dün First Nation
- Study Area
- Land Use Concept
- Greenspace
- Industrial/Commercial
- Road
- Public Service
- 1 m Contours

  
 1:9,000  
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REVISIONS:		
1	2023/12/19	SUBMITTED FOR PRE-DESIGN
2	2024/05/31	DRAFT MASTER PLAN

PREPARED BY: MP	REVIEWED BY: SL
DATE: 2024 / 05 / 31	

  
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## 4.3 GREENSPACE & TRAILS PLAN

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*Greenspaces are configured to encompass the more challenging terrain and bedrock areas that bookend commercial and industrial uses, providing buffering from Ice Lake, as well as recreational, passive drainage, and ecological functions. Greenspaces and trails support a variety of uses like walking, mountain biking, and foraging, as well as support ecological functions and connectivity through the development.*

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Greenspaces are included for ecological and habitat functions, slope stability, drainage, trail connections. These areas will remain accessible to the public.

**Suitable zoning:** Greenbelt (PG)

The Greenspace and Trails Plan feature the following key components:

- Approximately 13.3 Ha of greenspace.
- A 30 m linear greenspace spans the entire western edge of the site providing a natural treed buffer between Ice Lake Road / Ice Lake Regional Park.
- Greenspaces protect the integrity of slope areas and avoid the areas identified in previous studies as having extensive shallow bedrock.
- Greenspace in the Alaska Highway Frontage Area is included on the northwest corner of C-86B where there is a significant grade change and steeper (20%) slopes, and for the existing powerline easement / powerline trail.
- Trails are strategically located between blocks to manage stormwater runoff and to connect to existing recreation trails and the proposed Ice Lake Park area. An example of expected trail treatment is shown in Figure 11.
- Greenspace is allocated for the existing powerline easement, accommodating the existing powerline trail through the east-west axis of the development.
- The Rock Gardens Trail is rerouted (Figure 12) and traverses the southwest quadrant Greenspace, connecting to the existing Ice Lake Perimeter trail. In total, the trail diversion impacts approximately 1 kilometre of the existing trail. The diversion concept replaces approximately 400 meters, covering similar rolling forested terrain and route direction and, where possible, following a historical logging trail visible in the satellite imagery.

### 4.3.1 GREENSPACE & TRAILS POLICIES

1. All onsite and offsite trail improvement will achieve a Type 3 level of service (i.e., single track trail between 1.1 and 1.3 m in width, with 30-70cm tread width) per the City of Whitehorse Trail Plan (2020) and any other City requirements / standards.
2. Assessment, designation of trails (i.e., non-motorized and motorized use) will be completed, per the City's requirements and objectives.
3. Trails improvements / changes are incorporated into updated City trails maps, as needed.

FIGURE 11: TYPICAL SINGLE TRACK TRAIL TREATMENT

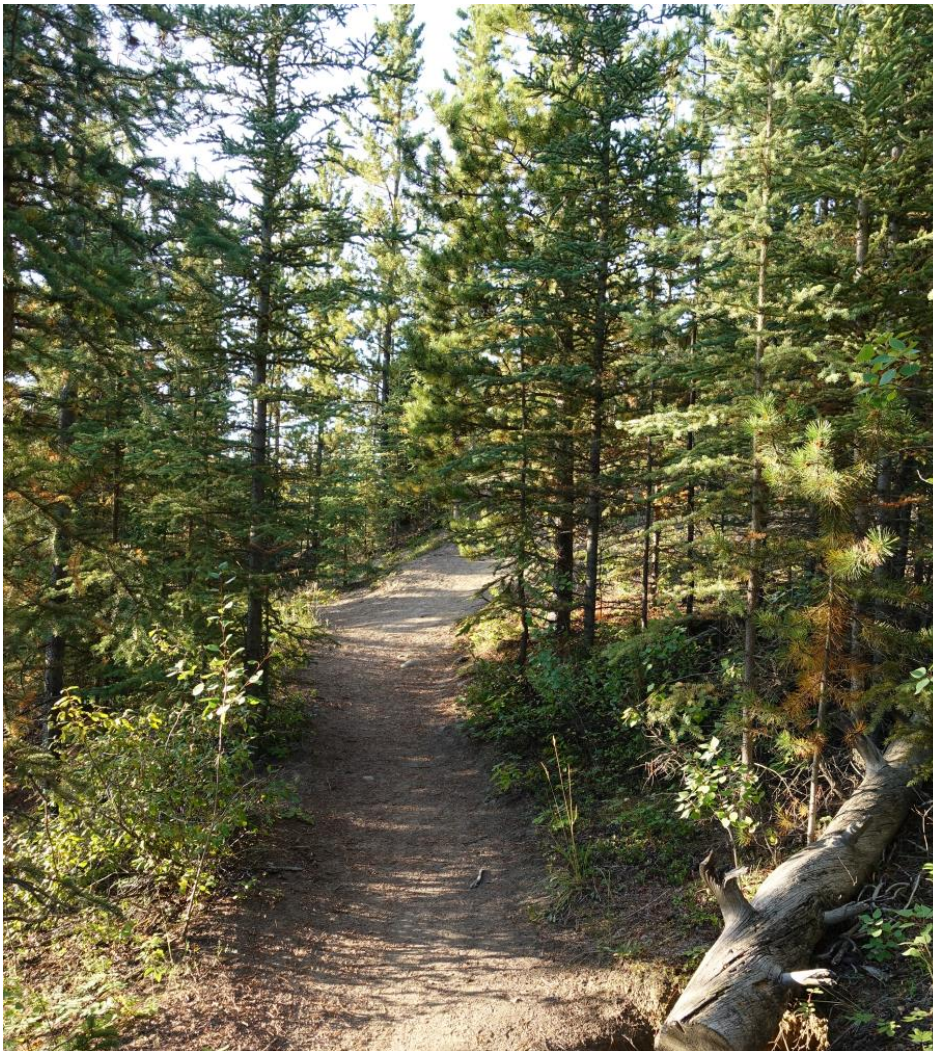
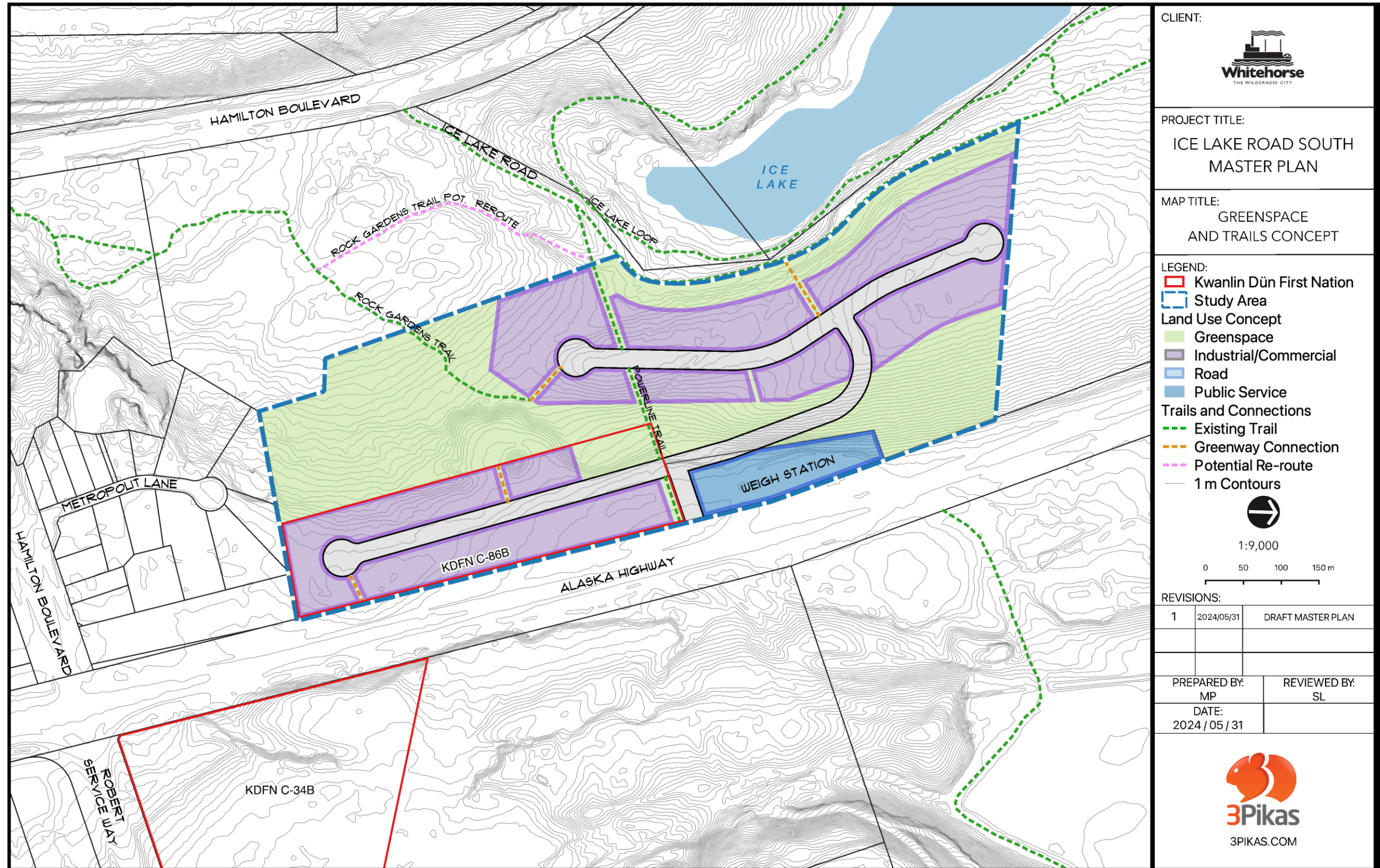



FIGURE 12: GREENSPACE AND TRAILS PLAN



CLIENT:




PROJECT TITLE:  
ICE LAKE ROAD SOUTH  
MASTER PLAN

MAP TITLE:  
GREENSPACE  
AND TRAILS CONCEPT


LEGEND:

- Kwanlin Dün First Nation
- Study Area
- Land Use Concept
- Greenspace
- Industrial/Commercial
- Road
- Public Service
- Trails and Connections
- Existing Trail
- Greenway Connection
- Potential Re-route
- 1 m Contours

  
 1:9,000  
 0 50 100 150 m

REVISIONS:		
1	2024/05/31	DRAFT MASTER PLAN

PREPARED BY: MP DATE: 2024 / 05 / 31	REVIEWED BY: SL
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## 5 SERVICING PLAN

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The servicing concept envisions a typical rural level of service, including onsite or trucked water and wastewater servicing, and overhead power. Stormwater will be collected and conveyed through overland drainage. The preliminary design report prepared by Greenwood Engineering Solutions is attached in Appendix A.

The servicing concept considers potential tie-ins to piped water and sewer when municipal services are extended to the South Growth Area. Power and telecommunications will be provided by ATCO Electric and local telecommunications companies.

**Note that the conceptual lot configuration presented in Figure 14, Figure 15, and Figure 16 are for illustrative purposes only.**

### 5.1 TRANSPORTATION CONCEPT

The transportation concept articulates an internal road network stemming from a 4-way signalized intersection or roundabout on the Alaska Highway south of the existing Weigh Station.

The Alaska Highway signalized intersection / roundabout location is based on the following input regarding potential benefits discussed during the design workshop and from the public survey:

- Increases potential for highway-oriented commercial development as vehicles travelling along the highway will be able to see businesses / signage, and then conveniently access them from the Alaska Highway.
- Potential for synergies with planned grader station development and access across the highway (YG – \_Highway and Public Works is considering the project, but no direction could be given at this time regarding timelines / approvals).
- Respondents to the public survey indicated that the Alaska Highway intersection was preferred (versus access off Hamilton Boulevard that was also contemplated).

The internal road network provides access to the **Alaska Highway Frontage Area** and **Upper Development Area**.

Both areas are serviced by a common 123 m roadway ('Common Access') that connects the entire development to the Alaska Highway corridor (see Table 3, and Figure 15 and Figure 16).<sup>2</sup>

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<sup>2</sup> An alternative access from a Highway Frontage Road along Hamilton Boulevard was contemplated in the planning process and, although technically feasible, this was not the preferred option that was advanced.

The **Alaska Highway Frontage Area** (C-86B parcel) is serviced by an estimated 450 m long road and cul-de-sac. For traffic safety, the roadway's T-intersection is set back from the main entrance/intersection.

The **Upper Development Area** (YG Land) is serviced from the main access, which extends uphill to the north to a T-intersection with the upper roadway. The total road length to service the Upper Development Area is 526 m.

**A cul-de-sac at the north end of the road network (Upper Development Area) allows for a future connection to the anticipated development of the Ice Lake Road North area.** This connection would provide connectivity between the developments and potential for an alternative Alaska Highway access point, should the access articulated in this plan prove to not be technically or economically feasible.

**TABLE 3: ESTIMATED ROAD LENGTH**

Development Area	Common Access YG / KDFN (m)	YG (m)	KDFN (m)	Total (m)
<b>Alaska Highway Frontage Area</b>	123	-	450	573
<b>Upper Development Area</b>	-	526	-	526
<b>Total</b>	<b>123</b>	<b>526</b>	<b>450</b>	<b>1,099</b>

### **5.1.1 ROAD DESIGN**

Access to the proposed subdivision will be provided through a 9m wide, 2-lane rural industrial road with a 25m right of way connecting to the Alaska Highway. A conceptual cross section of the roadway is shown in Figure 13.<sup>3</sup>

The road structure is anticipated to be Bitumen Surface Treatment (BST) along the drive lanes and asphalt at the intersections. All intersections provide a 0-2% vertical alignment to improve driving conditions for vehicles approaching a stop. A 20-meter clearance has been provided between the intersection and the start of the vertical curve, as required in TAC.

Asphalt surface treatment will be provided for the cul-de-sacs. Each one has an 18-meter radius to accommodate larger vehicles and future bus traffic.

A minimum 3.5m wide gravel access road will provide driveways to all lots using excess fill from the road construction. All roadways and driveways will have a 3% crossfall. Culverts will be required at all

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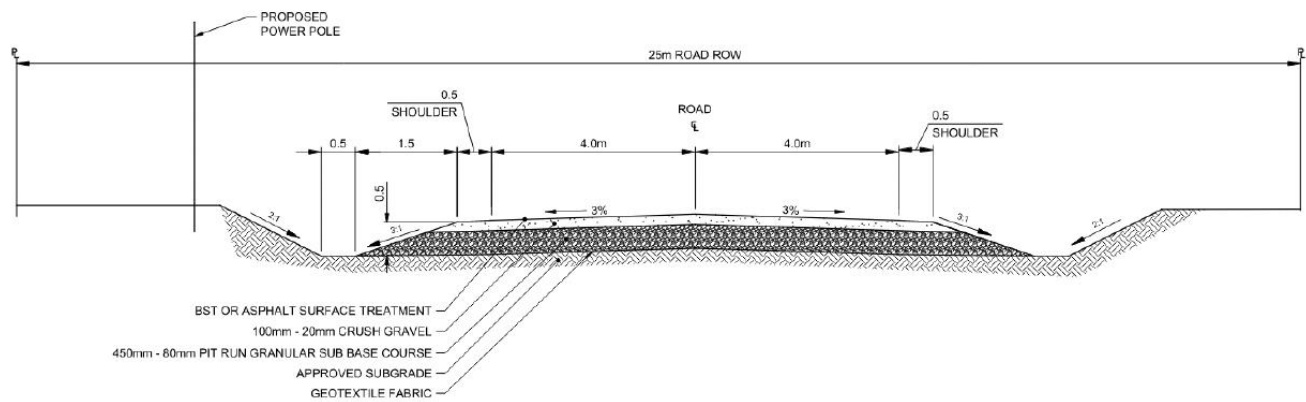
<sup>3</sup> Road width will be confirmed in detailed design based on requirements and results of planning / additional requirement for the Ice Lake Road North area.

driveway accesses to ensure proper drainage of the roadways. The landowner will develop and construct these driveways and culverts.

The preliminary design articulates how the roadway could overcome the steep grades and shallow bedrock conditions that must be traversed to access the upper industrial / commercial areas (Greenwood Engineering Solutions, 2024). Figure 14 shows the preliminary cut / fill balance for construction of the road network in colour banding from red (more cut) to blue (more fill).

Based on available bedrock depth information, Greenwood Engineering Solutions, suggests that the more significant cut (indicated in red to access the upper industrial / commercial area) will require removal of bedrock (see also 6.2 Development Phasing).

**FIGURE 13: 9-METER RURAL INDUSTRIAL LOCAL STREET CROSS SECTION (25 M RIGHT OF WAY)**



### **5.1.2 TRANSPORTATION IMPACT ASSESSMENT**

ISL Engineering completed a transportation impact assessment (TIA) based on the preferred land use scenario (see Appendix B). The TIA analyzes the traffic impacts of a proposed industrial/ commercial development on the surrounding transportation network. The analysis includes evaluating traffic conditions at two intersections: Alaska Highway / Robert Service Way (RSW) and Alaska Highway / the recommended development access at the south end of the Weigh Scale ('Development Access').

The RSW and Alaska Highway intersection is signalized. YG-HPW is contemplating an upgrade for this intersection (Signalized or Roundabout); however, no decision on the approach or advancement of the design and construction timeline has been made to date. The Development Access is currently an unsignalized (stop sign) entrance/exit from the south end of the YG-HPW-operated Weigh Station. Per

direction from YG-Highways and Public works, we assume that a signalized intersection or roundabout is required at the Alaska Highway access to meet safety requirements and service objectives.<sup>4</sup>

The TIA considers two background and two development scenarios. The results of the analysis concluded the following:

- For the 2026 Background scenario (no development), the operations at both intersections are deemed acceptable with the existing lane and intersection configurations.
- For the 2026 Background + Development scenario, a new signalized intersection will be required at the Alaska Highway / Weigh Scale Access intersection, and two eastbound egress lanes are recommended at the Development Access. It is noted that the intersection design of the development access along with the integration of Weigh Scale access is outside the scope of work of the TIA and Master Plan.
- For the 2046 Background scenario (no development), an upgrade to the Alaska Highway / RSW intersection is required to maintain acceptable levels of service. As noted, improvements to this intersection are already in the planning phase (YG-HPW, *email correspondence*, September 2023).
- For the 2046 Background + Development scenario, no additional upgrades are required.

The TIA also includes an analysis of active modes of transportation, such as pedestrians, bicyclists, and transit. Future work will involve developing an internal sidewalk / pathway plan and connections to the existing pathway network (i.e., a paved path on the east side of the Alaska Highway). Also, the extension of transit into the development should be explored.

**ISL emphasizes that the design / feasibility of the signalized Development Access at the Alaska Highway is outside the scope of this project. It is assumed that determining an intersection configuration that can accommodate the existing activities at the Weigh Station will be explored in future planning and design work.**

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<sup>4</sup> Citation: Adam Luciano, Manager, Planning and Programming, YG Highways and Public Works – Transportation Engineering Branch, *email correspondence*, June 2023

### **5.1.3 TRANSPORTATION POLICIES**

1. Pedestrian and cycling travel in the roadway should be considered during detailed design.
2. The posted speed limit and traffic calming measures should consider more vulnerable road users such as pedestrian and cyclists and crossing locations.
3. Configuration and selection of streetlights will consider measures to limit light pollution.
4. If the signalized intersection access off the Alaska Highway is deemed to be not feasible during detailed design stages, access from Hamilton Boulevard / Highway Frontage Road, or from the Ice Lake North development area should be contemplated as alternatives.

## **5.2 WATER**

Water servicing will be provided using either water delivery by trucks or through well systems, with the final responsibility falling on the property owner in accordance with zoning and development regulations, well construction guidelines and requirements, and Design Specifications for Sewage Disposal Systems (i.e., for setbacks etc.) (YG, Environmental Health Services).

However, due to the steep slopes and shallow bedrock, it could be cost-prohibitive to develop wells. Additional analysis, including a geological investigation, should be undertaken to determine the feasibility of developing wells within the proposed development area.

## **5.3 SANITARY SERVICING**

On-site holding septic tank will be required for trucked sewage servicing. The tank sizing and setbacks will need to align with Design Specifications for Sewage Disposal Systems (YG, Environmental Health Services). The tank sizing and setbacks will be dependent on the use of each lot and need to align with the Yukon government regulations and design standards.

The feasibility of onsite septic disposal systems will be determined in subsequent design stages (i.e., hydrogeological and geotechnical investigations) and / or permitting processes with Environmental Health (by the landowner / lease holder).

## **5.4 STORMWATER MANAGEMENT**

As shown in Figure 15 and Figure 16, ditches and culverts will be utilized to collect and direct water to greenspace areas. A subdivision drainage plan should be developed during detailed design to ensure run-off from developments flows to designated greenspace and ditch / culvert conveyances.

## **5.5 POWER & COMMUNICATION**

This proposed development is within the main power grid connecting the southern portion of the Yukon. All electricity in the Whitehorse area and southern region is provided by Yukon Energy

Corporation (YEC) and distributed by ATCO Yukon. There is currently an overhead power line that crosses the Study Area and provides power, data, and communications to the Whitehorse Weigh Station and the Lobird residential subdivision. 3-phase power is not provided on this overhead line. However, 3-phase power is available on the overhead lines on the Alaska Highway in adjacent to the study area.

## 5.6 LOT GRADING

Lot grading will be the responsibility of the lot owner. Existing grades in development areas vary and grading requirements will be contingent on lot conditions and the desired uses of land owners.

### 5.6.1 SERVICING POLICIES

1. Undertake a hydrogeological investigation to determine the feasibility of developing wells within the proposed development area.
2. An overall subdivision drainage plan should be developed during detailed design to ensure run-off from developments will flow to designated greenspaces, ditch / culvert network.
3. In steep areas, alterations to the natural topography should be minimized.

FIGURE 14: CUT FILL BALANCE

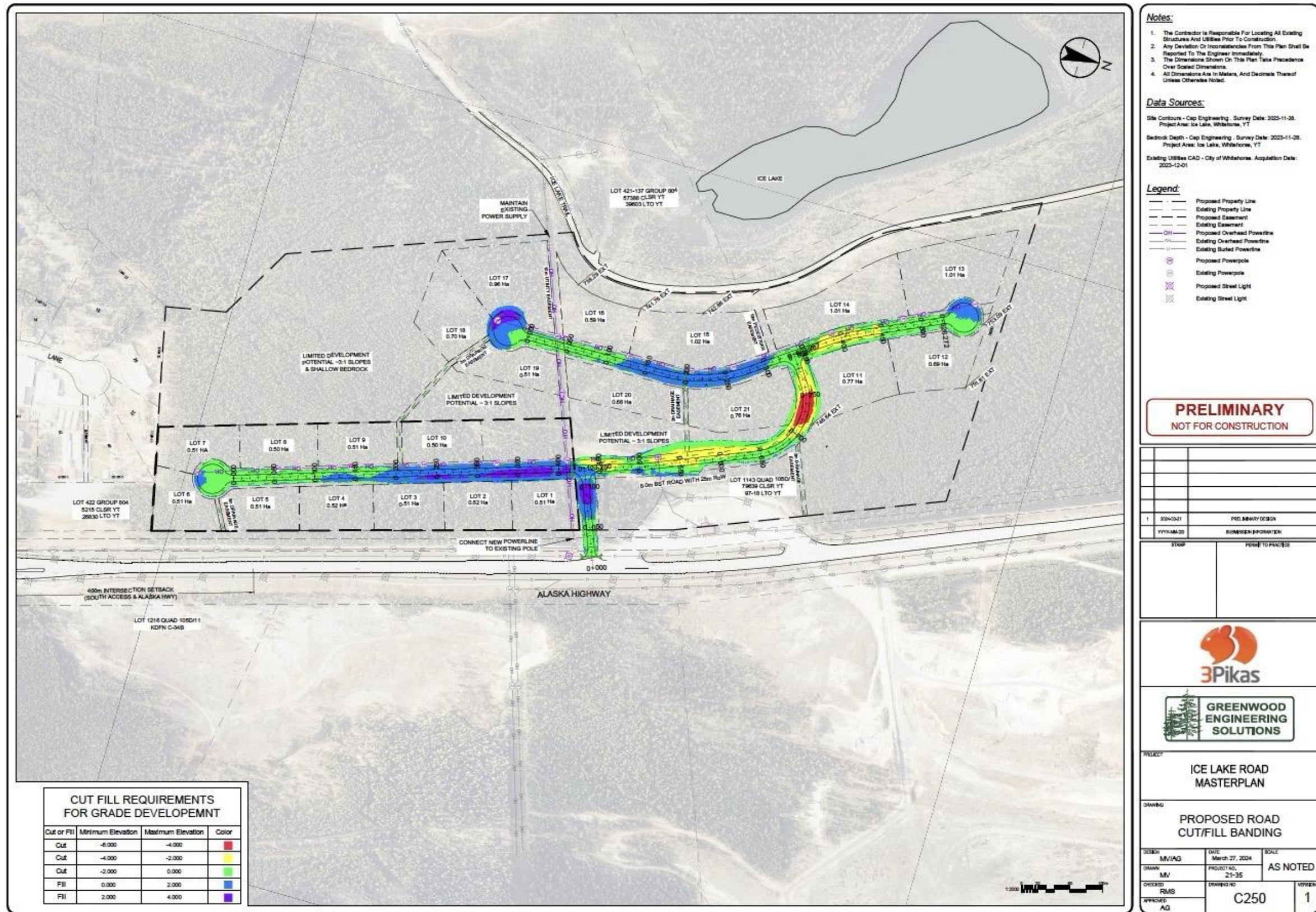
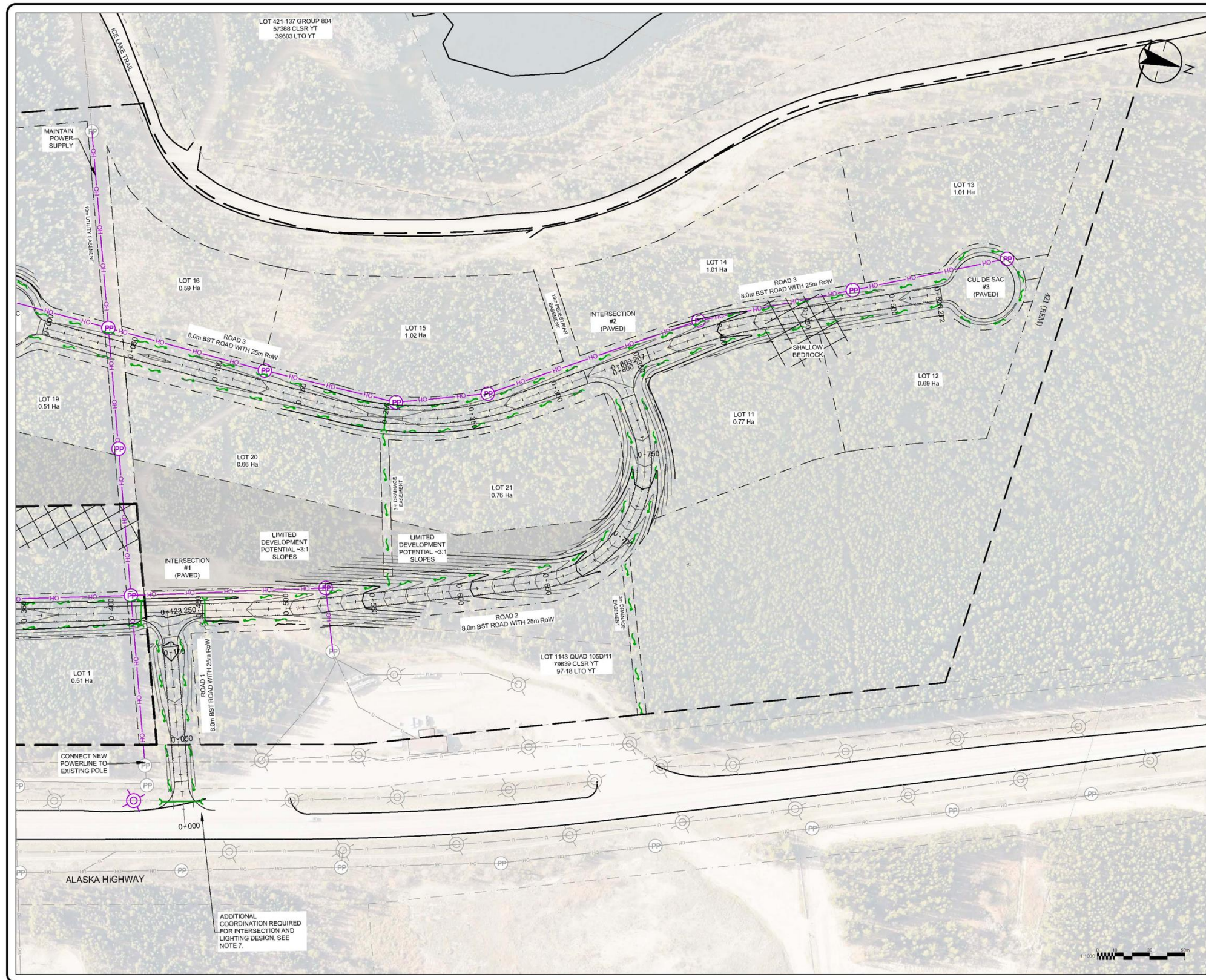


FIGURE 15: PRELIMINARY SITE LAYOUT AND DRAINAGE PLAN (NORTH)



- Notes:**
- The Contractor is Responsible For Locating All Existing Structures And Utilities Prior To Construction.
  - Any Deviation Or Inconsistencies From This Plan Shall Be Reported To The Engineer Immediately.
  - The Dimensions Shown On This Plan Take Precedence Over Scaled Dimensions.
  - All Dimensions Are In Meters, And Decimals Thereof Unless Otherwise Noted.
  - All Contours are Displayed in 1.0m Minor and 5.0m Major Intervals.
  - Power Pole Locations and Alignments are Preliminary Input from ATCO Electric Yukon is Forthcoming and Will be Reflected on the Next Iteration of the Drawings.
  - Intersection Design and Conflicts with Weigh Scale Require Additional Analysis. YG Highways and Public Works Should be Involved in Subsequent Design Related to Intersection for Access to their Development on the East Side of the Highway as well as Future Plans Related to the Weigh Scale.

**Data Sources:**

Site Contours - Cap Engineering - Survey Date: 2023-11-28.  
Project Area: Ice Lake, Whitehorse, YT

Bedrock Depth - Cap Engineering - Survey Date: 2023-11-28.  
Project Area: Ice Lake, Whitehorse, YT

Existing Utilities CAD - City of Whitehorse, Acquisition Date: 2023-12-01

- Legend:**
- Proposed Property Line
  - Existing Property Line
  - Proposed Easement
  - Existing Easement
  - Proposed Overhead Powerline
  - Existing Overhead Powerline
  - Existing Buried Powerline
  - Proposed Powerpole
  - Existing Powerpole
  - Proposed Street Light
  - Existing Street Light

**DRAFT**

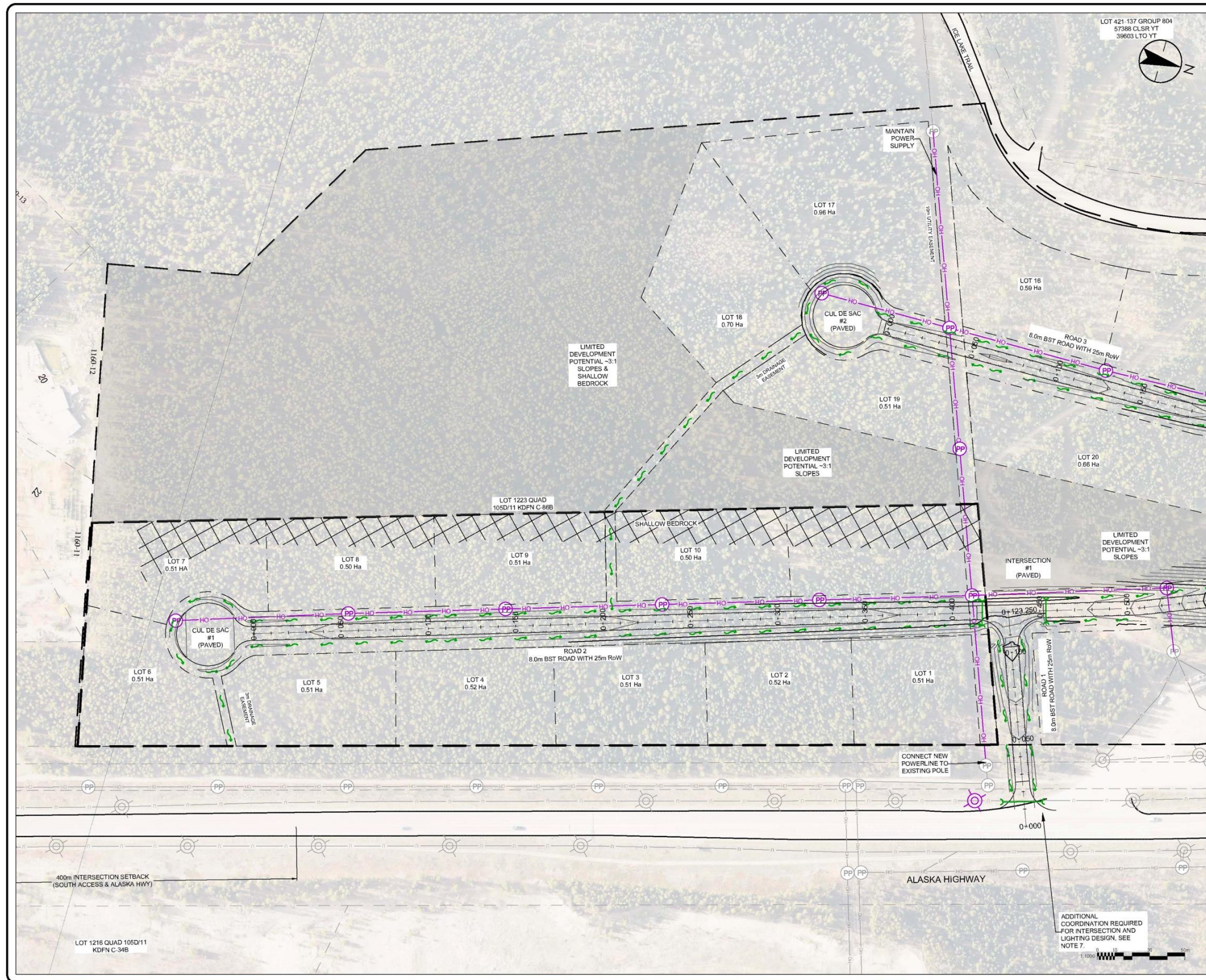
1	2024-03-27	PRELIMINARY DESIGN
	YYYY-MM-DD	SUBMISSION INFORMATION

STAMP	PERMIT TO PRACTICE
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PROJECT		ICE LAKE ROAD MASTERPLAN	
DRAWING		PROPOSED SITE LAYOUT- NORTH	
DESIGN	MV/AG	DATE	March 27, 2024
DRAWN	MV	PROJECT NO.	21-35
CHECKED	RMS	DRAWING NO.	C210
APPROVED	AG	VERSION	1
		SCALE: AS NOTED	

FIGURE 16: PRELIMINARY SITE LAYOUT DRAINAGE PLAN (SOUTH)



- Notes:**
1. The Contractor Is Responsible For Locating All Existing Structures And Utilities Prior To Construction.
  2. Any Deviation Or Inconsistencies From This Plan Shall Be Reported To The Engineer Immediately.
  3. The Dimensions Shown On This Plan Take Precedence Over Scaled Dimensions.
  4. All Dimensions Are In Meters, And Decimals Thereof Unless Otherwise Noted.
  5. All Contours are Displayed in 1.0m Minor and 5.0m Major Intervals.
  6. Power Pole Locations and Alignments are Preliminary Input from ATCO Electric Yukon is Forthcoming and Will be Reflected on the Next Iteration of the Drawings.
  7. Intersection Design and Conflicts with Weigh Scale Require Additional Analysis. YG Highways and Public Works Should be Involved in Subsequent Design Related to Intersection for Access to their Development on the East Side of the Highway as well as Future Plans Related to the Weigh Scale.

**Data Sources:**

Site Contours - Cap Engineering Survey Date: 2023-11-28.  
 Project Area: Ice Lake, Whitehorse, YT

Bedrock Depth - Aurora Geosciences Ltd Survey Date: 2023-11-28. Project Area: Ice Lake, Whitehorse, YT

Existing Utilities CAD - City of Whitehorse. Acquisition Date: 2023-12-01

- Legend:**
- Proposed Property Line
  - Existing Property Line
  - Proposed Easement
  - Existing Easement
  - Proposed Overhead Powerline
  - Existing Overhead Powerline
  - Proposed Buried Powerline
  - Existing Buried Powerline
  - Proposed Powerpole
  - Existing Powerpole
  - Proposed Street Light
  - Existing Street Light

**DRAFT**

1	2024-03-27	PRELIMINARY DESIGN
	YYYY-MM-DD	SUBMISSION INFORMATION

STAMP	PERMIT TO PRACTICE
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**3Pikas**



**GREENWOOD  
ENGINEERING  
SOLUTIONS**

PROJECT		ICE LAKE ROAD MASTERPLAN	
DRAWING		PROPOSED SITE LAYOUT - SOUTH	
DESIGN	MV/AG	DATE	March 27, 2024
DRAWN	MV	PROJECT NO.	21-35
CHECKED	RMS	DRAWING NO.	C200
APPROVED	AG	VERSION	1
		SCALE: AS NOTED	

## 6 IMPLEMENTATION & PHASING

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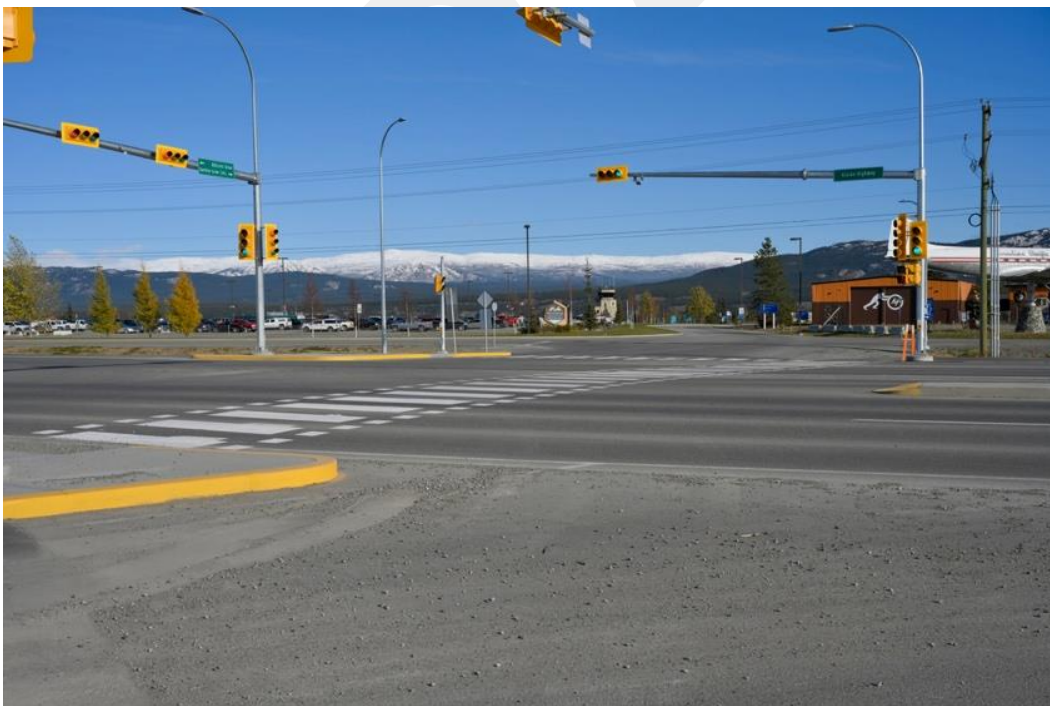
When considering how to implement the vision articulated in the Master Plan, the implementation and phasing will need to reflect the contextual issues such as working within the Alaska Highway access environment.

### 6.1 SIGNALIZED INTERSECTION OR ROUNDABOUT AT THE ALASKA HIGHWAY

The Alaska Highway intersection access was selected to meet the vision of creating highway access-oriented commercial and industrial opportunities. However, achieving this will require an upgrade to the intersection on the Alaska Highway, which will involve coordination and funding.

To meet YG Highways requirements, the intersection will require to be upgraded to a modern signalized intersection standard or roundabout (see recent example in **Error! Reference source not found.**). The Weigh Station pose a design challenge for this intersection that will need to be considered in detailed design and will likely increase complexity and cost. Without project partners (e.g., YG–HPW), the cost of the intersection would likely be prohibitive to development on a cost recovery basis, based on the development opportunity presented.

**PHOTO 11: ALASKA HIGHWAY HILLCREST DRIVE BARKLEY-GROW CRES. SIGNALIZED INTERSECTION COMPLETED IN 2022**



## 6.2 DEVELOPMENT PHASING

Construction of the Ice Lake Subdivision will be challenging due to large cut and fill volumes, bedrock, steep grades and additional items as noted in Section 2 of the attached pre-design report (Greenwood Engineering Solutions, 2024).

Development of the entire site will require the cooperation and financial coordination from both YG and KDFN landowners to develop the new road network and shared infrastructure. Construction can be completed all at once or separately between landowners.

It is important to note that phasing is not required so long as both landowners can coordinate their construction timelines. Construction of the entire development all at once will conserve the most amount of common excavation on site, and will ultimately lower the overall costs for the construction of the roadways compared to building separately.

### **6.2.1 FULL SUBDIVISION DEVELOPMENT**

Developing all roads in the KDFN and YG parcels (Upper Development Area and Alaska Highway Frontage) simultaneously is the best option to reduce the overall road costs for the subdivision. This is because all suitable common excavation material can be reused in both the KDFN and YG areas, which will reduce the total amount of import material needed for road development resulting in reduced project costs.

### **6.2.2 UPPER DEVELOPMENT AREA FIRST (YG)**

Developing the Upper Development Area first would include the development of all roadways within the YG parcel, and all roadways between the Alaska Highway intersection up to Intersection #2. The development of the Upper Development Area requires substantially more cut compared to the Alaska Highway Frontage Area. This is primarily due to the large hill and shallow bedrock present between Lot 21, Lot 11 and Lot 14, as well as the large cut requirement for the other areas of Phase 1.

Given the general suitability of the cut material for road construction, it can be stockpiled and re-used for the fills that are required for the KDFN area (roadway and lots). Alternatively, if the construction of the KDFN area is estimated to be delayed for a long period of time, all cut material could be used to pre-grade portions of the YG lots which could reduce the costs / complexity to potential landowners to develop their lots. If the YG lots are pre-graded the KDFN area will not receive any reuse material which will increase the road construction costs for the KDFN area (i.e., more imported fill needed).

### **6.2.3 ALASKA HIGHWAY FRONTAGE AREA FIRST (KDFN)**

The Alaska Highway Frontage development area would include the roadway within the KDFN C-86B parcel located between Intersection #1 to Cul De Sac #1. This road is estimated to be a net fill area due to the existing low areas within the along the proposed road alignment.

Developing this area alone would require that large amounts of reuse material be brought in from offsite locations to fill these low areas. To reduce the amount of import material, all suitable common excavation from the YG area should be used for the KDFN road construction (if available). Developing the KDFN area first will result in increased overall development road construction costs because fill material from the YG area could not be collected and shared between areas.

## **6.3 ADDITIONAL STUDIES**

Based on the pre-design report, the following studies are recommended to be completed prior to or in tandem with YESAB, Re-Zoning, and detailed design to better characterize the site and development opportunity / feasibility. This is a high-level overview for charting the way forward and is not intended to be comprehensive.

- Hydrogeological Study
- Ice Lake North Development Feasibility Study.
- Detailed (intrusive) geotechnical study (including septic field and well feasibility).

## 7 WORKS CITED

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- Aperture Consulting Inc. (2022). Phase 1 Environment Site Assessment, Study Areas 4 and 5. Digital. Government of Yukon.
- Aperture Consulting Inc. (2023). Phase II Environmental Site Assessment in the Hillcrest South Area, Whitehorse, Yukon. Digital. Government of Yukon.
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- Groundswell Planning. (2020). Commercial and Industrial Land Study. City of Whitehorse. Digital.
- Inukshuk Planning. (2002). Landscape Guidelines for Industrial Development. City of Whitehorse. Digital.
- ISL Engineering (April 2024). Draft Transportation Impact Assessment Report. City of Whitehorse.
- Welder Engineering. (2022). Industrial/Commercial Infill Site Servicing and Access Assessment, Areas 4 and 5. Government of Yukon.

# 8 APPENDICES

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**8.1 APPENDIX A: PRELIMINARY DESIGN REPORT – ICE LAKE ROAD SOUTH MASTER PLAN (GREENWOOD ENGINEERING SOLUTIONS, 2024).**

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**8.2 APPENDIX B: TRANSPORTAION IMPACT ASSESSMENT  
(ISL, 2024)**

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**8.3 APPENDIX C: WHAT WE HEARD REPORTS (CITY OF WHITEHORSE, 2023; 2024)**

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