Commercial and Industrial Land Study

Submitted by

Groundswell PLANNING

in partnership with

GREENWOOD ENGINEERING SOLUTIONS

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URBAN systems

INUKSHUK PLANNING & DEVELOPMENT LTD

to

City of Whitehorse Planning and Sustainability Services Department

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Executive Summary

A healthy local economy relies on the availability of a suitable mix of employment lands to support growth in key business sectors and related employment levels and local spending. Commercial and industrial lands that support economic activities and land uses not traditionally sited within downtown areas are a vital part of this mix.

The pending update of the 2010 Official Community Plan (OCP) by the City of Whitehorse ("the City") necessitated a review of the current status of and future needs for commercial and industrial lands outside of Downtown in Whitehorse. The City hired a consulting team led by Groundswell Planning to conduct a Commercial and Industrial Land Study, aimed at:

- Assessing and determining future demand for commercial and industrial land within the city (excluding Downtown) through to 2040;
- Identifying options and alternatives to meet future demand with supply (i.e. policy and/or land use prescriptions); and
- Making recommendations, including an implementation plan, for the City to consider in formulating relevant portions of the OCP.

This study was undertaken from Spring 2018 to Winter 2020, and included the following tasks:

- An inventory of current commercial and industrial land supply in Whitehorse, focusing specifically on areas designated in the 2010 OCP as Industrial (I), Natural Resource (NR), Mixed-Use – Industrial/Commercial (MU-I/C) and Future Planning (FP);
- A review and summary of economic trends and projections relating to commercial and industrial activity;
- A review of land use and regulatory considerations for the emerging and water-intensive food, beverage and cannabis production industries;
- Identification of underutilized commercial and industrial areas within Whitehorse and formulation of policy recommendations for optimizing use;
- An assessment of the development suitability of:
    - Undeveloped areas designated I and MU-I/C for industrial and commercial use;
    - Areas designated FP situated adjacent to existing areas designated I for industrial use;
    - Land parcels currently undergoing quarrying, and their potential to transition into new industrial lands; and
    - The Stevens Quarry area for industrial or commercial uses (versus the current NR and FP OCP designations).
- Formulation of recommendations for:
    - Improvements to planning, disposition, and monitoring processes relating to commercial, industrial, and quarry lands;
    - Future locations and land use mix for new commercial and industrial lands in urban and rural areas, including discussion on infrastructure, servicing and related considerations for cost-effective development;
    - Integrating food, beverage and cannabis production industries into existing or new commercial and industrial areas in Whitehorse; and
    - Changes to existing, and development of new, commercial and industrial areas.

The study team engaged with a range of stakeholders to better understand current and future requirements and market conditions for commercial and industrial lands. Engagement efforts included a business/property owner survey, focus group sessions with local business and industry representatives, and interviews with First Nation governments and development corporations, realtors, developers, industry associations, and the Government of Yukon (YG).

Approximately 973 and 462 hectares of land within municipal boundaries are designated I and MU-I/C, respectively. These designations and the four zones that fall under them – specifically IH - Heavy Industrial, IS - Service Industrial, CH - Highway Commercial, and CIM - Mixed-Use Commercial/Industrial – are primarily located outside of Downtown and residential areas. An additional 289 and 3895 hectares of land designated NR and FP[1], respectively, are potential candidates for accommodating future private sector growth. Settlement Lands of the Kwanlin Dün First Nation (KDFN) and Ta'an Kwäch'än Council (TKC) are also potential future contributors to the commercial and industrial land supply; the former designated First Nation Future Planning and the latter falling under other OCP designations.

Land Use Designations and Zones	Total Area (ha)	Total Area – Other Lands (ha)	Total Area – First Nation Land (ha)	# of Lots[2]
INDUSTRIAL (I)	**972.9**	**969.5**	**3.5**	-
IH – Heavy Industrial	66.2	66.2	-	3[3]
IS – Service Industrial	265.3	239.1	26.2	213
MIXED-USE – INDUSTRIAL/COMMERCIAL (MU-I/C)	**461.9**	**445.8**	**16.1**	**-**
CH – Highway Commercial	95.2	90.2	5	77
CIM – Mixed-Use Commercial/Industrial	140.8	123.1	17.7	254
NATURAL RESOURCE (NR)	**288.6**	**288.6**	-	**-**
IQ – Quarries	449.5	449.5	-	-
FUTURE PLANNING (FP)[4]	**3895.3**	**3866**	**29.3**	**-**
FP – Future Planning[5]	4133	4102.7	30.3	-
FIRST NATION FUTURE PLANNING[6] (FNFP)	**294**	**-**	**294**	**-**
FNFP – First Nation Future Planning[7]	1.8	0.8	1	-

Currently, I and MU-I/C designated lands are distributed in various nodes around Whitehorse, most of which are oriented directly on or in proximity to the Alaska Highway. Nodes of heavier industrial activity include the Kulan, Taylor, Mount Sima, and MacRae industrial areas, which are generally serviced with gravel roads and Internet/telephone, but are not connected to municipal water or sewer. MU-I/C designated lands are found along the Alaska Highway throughout much of Whitehorse, and are also concentrated in several nodes in Marwell, north of Downtown, along Range and Burns roads near the airport, and Metropolit Lane at the intersection of the highway and Robert Service Way/Hamilton Boulevard. With the exception of Marwell and a few other nodes situated off the Alaska Highway, most of these lands are not serviced with municipal water and sewer.

There are also about 450 hectares of land zoned IQ – Quarries within the municipality, the vast majority of which are Commissioner's lands leased to quarry operators by YG's Land Management Branch. Gravel quarry approval and management on Commissioner's lands is administered under the *Lands Act Quarry Regulations*. The City is consulted prior to the issuance of testing and quarry permits to ensure OCP and zoning conformance.

[1] Only FP designated lands located adjacent to MU-I/C and I designated areas were examined in this study.
[2] This includes unconsolidated land parcels that comprise larger properties as well as vacant lots.
[3] The majority of IH zoned land is comprised of lease areas, some with split zoning. Three lots (6.5 ha) are privately owned.
[4] This includes only those FP designated areas located adjacent to I and/or MU-I/C designated areas.
[5] This includes only FP zoned areas located within the FP designated areas adjacent to I and/or MU-I/C designations.
[6] This designation is specific to KDFN lands; TKC lands are incorporated into the FP designation. Only those FNFP areas located adjacent to I and/or MU-I/C designated areas are included in this total.
[7] This includes only FNFP zoned areas located within the FNFP designated areas adjacent to I and/or MU-I/C designations.

The past 20 years have seen only a handful of Whitehorse commercial lots released to market by YG[8]. Over 50 industrial lots were released in the two phases of the Mount Sima industrial subdivision in the early to late 2000s. A private development in the Marwell area released almost 50 CIM zoned lots between 2007 and 2017. In the past two decades of government-led lot sales, both commercial and industrial lot prices have trended moderately upwards, while the sales period sharply decreased around the peak of the commodities "supercycle" between 2010 and 2013 that saw elevated mineral prices and accompanying exploration and production activity.

The majority of the approximately 205 development applications received by the City during the 2009-2018 timeframe in the zones of study interest involved development permits for IS and CIM zoned parcels. About 80% of permits were triggered by new construction, with redevelopment (i.e., additions or renovations) comprising the remaining 20% or so. Caretaker residences comprised just over one quarter of IS permit applications.

Realtors, First Nation development corporations, and private developers told the project team heard that demand can be difficult to accurately pinpoint but is felt to have increased over the past several years. Demand is particularly high for the Titanium Way model of development (i.e., small lots, multi-unit buildings, ground-floor shops with second storey office space, etc.) and, to a lesser extent, larger land parcels suitable for larger format rental/retail businesses and equipment and materials storage. Interviewees described market supply as very limited and costs as steadily increasing, owing to a variety of factors that include a lack of raw land sales, the high costs of retrofitting existing outmoded properties for the specific needs of business, and older properties functioning as "junkyards" likely in avoidance of municipal landfill tipping fees.

Property owners and business operators shared similar insights, citing land availability and affordability as critical challenges to the private sector. About one third of the 39 respondents to the project's online survey indicated plans to relocate and/or expand onto another Whitehorse property in the next decade, with a similar proportion indicating plans to expand buildings or business activity on their current property. Almost all of the respondents who indicated they were currently seeking a new property described the supply of commercial and industrial lots as either "limited" or "non-existent". Property seekers expressed a preference for CIM zoning, a mix of lot sizes, and lots with municipal water and sewer. They also emphasized that land ownership was strongly preferred over leasing and/or rental arrangements.

The future demand for commercial and industrial lands will be dictated by both macro and micro-economic conditions impacting Whitehorse. The Yukon's economy is heavily dependent on public sector activity, and this sector has shown steady growth over the past fifteen years. Private sector performance is typically linked to the performance of the mining sector in particular; not surprisingly, there was a notable decline in most industries as mineral exploration and production in the territory sharply dropped post-2013. However, Gross Domestic Product (GDP) from most private sector-oriented industries has since steadily increased from 2014-2016 lows and, as of 2018, slightly surpassed those previous highs, despite the fact that mining-related GDP is still at pre-"boom" levels, suggesting that public sector spending, and possibly broader regional population growth, is as much a contributor.

Economic forecasting for the territory would suggest that another cycle of high mineral exploration and production can be expected over the 2020-2030 timeframe, buoyed by Victoria Gold's Eagle mine coming online and the reasonable likelihood of the Coffee Gold mine project following suit within the next few years. Meanwhile, population projections indicate that the greater Whitehorse area will be home to about 44,650 residents by 2040.

Using the overarching assumptions that future economic growth (or decline) in industry sectors requiring commercial and industrial lands will be fairly consistent with the 2008-2018 timeframe and that the public sector will continue to buffer the economic fluctuations induced by cyclical mining sector activity, an estimated 87 and 32 hectares of raw land will be required by 2040 with I and MU-I/C designations, respectively. These land need predictions factor in the team's best estimate of 2019 latent demand and incorporate a range of assumptions around the distribution of certain industries between Downtown, residential neighbourhoods, and I and MU-I/C designated areas.

[8] YG has primary responsibility for land development (surveying, infrastructure, and sales) in Yukon.

	2030 Land Demand (ha)		2040[9] Land Demand (ha)	
	MU-I/C	I	MU-I/C	I
Future Demand – All Relevant Industry Sectors	9.7	18	18.3	33.9
2019 Latent Demand	5.8	31.5	5.8	31.5
TOTAL – Land Demand (Net)	15.5	49.5	24.1	65.4
TOTAL – Land Demand (Gross)	20.6	66.0	32.1	87.2

There are multiple options for meeting that anticipated requirement for 120 gross hectares of MU-I/C and I designated lands over the next 20 years, including infill of already developed areas, redevelopment, and greenfield development.

Approximately 3784 hectares of undeveloped lands in Whitehorse are designated MU-I/C and I and/or are located adjacent to areas with these designations. Of these candidate lands, 58% have good, or good with some constraints, development potential. Approximately 8% and 18% of lands with good, or good with some constraints, development potential are already designated MU-I/C and I, respectively, and over 25% is First Nation Settlement Land[10].

First Nation Settlement Lands account for 11% of candidate lands for future commercial and industrial development. In many cases these parcels are located in highly strategic areas, making them critical pieces in the medium and long-term Whitehorse development puzzle. After YG, KDFN is the largest landowner in the municipality, and commercial and industrial land uses are envisioned for over 50% of its Type 2 parcels situated within Whitehorse. Relatively recent legislative efforts by both KDFN and YG now allow for the registration of leasehold interests on First Nation lands on the territory's land registry. KDFN's Chu Níikwän Development Corporation is actively seeking private sector tenants and lessees for some of its Settlement Lands; TKC, however, is not at this time.

Infill development of lands located within, and/or immediately adjacent to, already developed industrial and commercial nodes could potentially provide about 80 hectares of raw land, of which almost two-thirds is under Commissioner's and/or City ownership, and of that, a little over half are both appropriately designated and zoned already. These 80 hectares of infill potential could almost completely satisfy 2030 requirements and about three-quarters of 2040 requirements, with some exceptions. Site utilization across Whitehorse's developed industrial and commercial lots of interest is typically in the 80-100% range, indicating relatively little potential for substantive redevelopment and/or densification of existing nodes. The City's experiences to date with attempting to bring municipal servicing to currently unserviced areas suggests that property owners are very reluctant to incur the associated costs once they have already invested in on-site solutions, even with the prospect of higher site utilization. The unserviced Kulan and Taylor industrial areas are within reasonable proximity of City water and sewer infrastructure; however, the already very high utilization of lots in these areas suggests minimal potential for subdivision and the creation of new lots should they be connected to municipal services.

On the balance of numerous high-level suitability criteria, including estimated development costs, impacts on recreational and environmental values, and potential synergies with residential and/or Settlement Land development, the project team concluded that the most favourable development conditions currently exist for the "MacRae East" area for unserviced industrial land development and the "Taylor North" and "Hillcrest South" areas for serviced commercial development. The area at the intersection of Robert Service Way/Hamilton Boulevard with the Alaska Highway could also be a highly strategic greenfield area to develop if bedrock constraints can be overcome in a cost-effective manner.

Potential brownfield conversion of gravel quarries to commercial and industrial lands is theoretically possible but virtually impossible to properly plan for within the current YG administrative and permitting regime. Monitoring of quarry activity is limited to conformance with issued permits and lease conditions, *not* progress made towards the fulfillment of the initial quarry plan. Further, there is no continuous or intentional record keeping around annual extraction quantities. Practical experience with both the Ear Lake and McLean Lake quarries to date would suggest

[9] Inclusive of 2030 demand.

[10] The inclusion of First Nation lands in the development suitability analysis was triggered by adjacency to OCP designated areas versus specified development intent. This figure is a very rough guideline for discussion purposes.

that initial pit life estimates can be far exceeded. There is a need to revisit, and possibly redesign, the administrative regime for quarry management within Whitehorse to achieve better long-term land use planning, land use efficiency, and possibly achieve higher utilization through the facilitation of third party interim uses in pit areas that have been exhausted but are still under lease for quarrying.

The former Whitehorse Copper mine site and the Stevens Quarry area are two large undeveloped areas with potential suitability for future commercial and industrial activity but are subject to a host of complicating factors. Given the need for a substantial future gravel resource located close to City limits, the absence of suitable alternatives, and the fact that industrial lots could be provided with fewer land use conflicts (and presumably opposition) in other areas of Whitehorse, there is no sound rationale to re-designate the Stevens Quarry area for commercial and/or industrial purposes at this time. The Whitehorse Copper site has been privately leased since 2011. The original lessee intended to reprocess old tailings and reclaim the Old Pond area, currently zoned Heavy Industrial, to a potential industrial area. However, the reprocessing project fell through and closer examination of the caveats originally made around reclamation suggest that a more concerted government effort and possible creative private-public sector approaches should be considered if this area is ever to properly function as industrial land.

Areas of economic growth that future commercial and industrial lands will need to accommodate are the food, beverage and cannabis production sectors. Zoning approaches across North America have shifted to better integrate food and beverage production into urban areas, in many cases blurring the lines between industrial and agricultural activity. Some of these zoning approaches include the creation of specific definitions and even zones to accommodate production activities, often varying on the basis of whether production is indoor or outdoor and whether there are associated retail uses. Some Western Canadian municipalities now allow for the full spectrum of indoor food production activities in some Downtown, commercial, and industrial areas. Similarly, breweries and distilleries have expanded beyond their industrial area beginnings, with craft-level producers generally allowed within commercial zones and associated retail and lounge functions being permitted in industrial locations. Cannabis production is a relative newcomer and larger western Canadian municipalities are generally restricting such operations to industrial areas.

Local growers, industry associations, and government representatives involved with agriculture described a local food and beverage sector that is both growing and maturing due to healthy local interest and demand. They stressed the need for a supportive land use regime as well as the reduction of barriers throughout the production chain – including a shift to integrated management of waste streams. Land availability and affordability were cited as key determinants to where the sector locates, along with infrastructure such as three-phase power, Internet, and access to transit. Similar to other industry sectors, the ability to generate additional revenue and secure labour resources with caretaker residences was desired, as was stacked land-use allowances that allow for on-site production, retail, and tasting functions.

Currently, the City's *Zoning Bylaw* indirectly captures uses such as indoor agriculture, breweries, and food/beverage processing through generalized use definitions. The emergence of such water and wastewater intensive uses in rural, unserviced areas has created unique challenges for the City and other regulators and highlighted ambiguities and potential gaps in the regulatory framework. The City and partners should endeavour to better understand and define water-intensive land uses (which additionally include car washes and caretaker residences) and develop a regulatory framework that is both supportive of industry and protective of public health and the environment. The restriction of water-intensive industries to serviced areas is one potential strategy to consider. Intensity thresholds for unserviced areas could also be explored to develop precautionary zoning regulations.

While the team concludes that there is little risk of a gap between land supply and demand on a land quantum basis, it encourages both the City and YG to take a more strategic, investment-oriented view on how land should be developed moving forward. The respective roles and responsibilities of public and First Nation governments in meeting market demand will need to be delineated and coordinated in a manner that meets a balance of private sector needs and preferences, the spirit and intent of the final agreements involved, and sound land use policy. Commercial and industrial lands within the Urban Containment Boundary (UCB) established in the 2010 OCP should be prioritized for fully serviced, higher value and higher density development that is integrated with residential areas (where appropriate) and employment-supportive amenities. These areas will become the future home of businesses and industries that become gradually outmoded in Downtown and Marwell as they evolve in

the manner envisioned in the City's recent long-range plans for both. At the same time, industrial activities – particularly those of a "nuisance" nature – need to be adequately protected through zoning and appropriately sited.

Recovering the higher costs of serviced development supports the idea of pursuing Whitehorse's next major residential subdivision in the Southern UCB (SUCB) area located to the west of the Alaska Highway between Copper Ridge and McLean Lake, an option the City investigated in 2017. While the City has relatively little control over land prices, it can potentially push the affordability needle for business and property owners through land use controls that maximize income generation and/or cost savings – specifically greater flexibility around caretaker residences in areas where the priority test of compact, higher value (i.e., serviced) development can be met.

The project team offers the following recommendations for the City to consider:

Process and Partnerships

1. In cooperation with YG, institute a moratorium on spot land applications for commercial and/or industrial use within City limits to facilitate more comprehensive development that optimizes existing and future servicing and addresses a broader spectrum of market needs. The notable exception to this recommendation is the consideration of spot land applications for heavy industrial uses that can not be accommodated elsewhere due to noxious impacts;
2. Establish a process to formalize collaboration and coordination around land development between the City, YG, and KDFN and TKC, respectively. The process deliverables, ideally Memorandums of Understanding (MOUs), should provide guidance to the signing parties with respect to:
    a. Roles and responsibilities in regards to land development and supply for the private sector;
    b. Potential mechanisms for cost and/or capacity sharing that could be utilized to advance development of higher priority (and value) parcels located within the UCB; and
    c. Potential mechanisms and/or thresholds for ensuring a balance of land ownership and First Nation land leasing opportunities are available to the private sector (as appropriate to each First Nation).
3. Upon the anticipated 2020 renewal of the quarry leases for the former Whitehorse Copper Mine site, advocate for more detailed study and clarification of the technical issues enabling and/or precluding future conversion to fully productive industrial lands;
4. Work with YG to update the quarry administration system to better monitor quarry progress and inform land use planning, and explore potential mechanisms for accommodating interim uses in quarried areas;

Official Community Plan Update

5. Retain the MU-I/C and I designations for undeveloped areas outlined in the 2010 OCP;
6. Should the SUCB area be designated for residential development, consider a re-designation of the McLean Lake quarries to FP to reserve a broader range of future land use options;
7. Subject to the identification of more suitable (and/or extensive) granular sources, retain the NR designation for the Stevens Quarry area;
8. Consider the re-designation of a portion of the FP designated area located between "Taylor North" and Forestview on the east side of the Alaska Highway to I to accommodate heavy industrial activity over the long-term;

Zoning Bylaw Update (Post-OCP adoption)

9. Extend I and/or CIM zoning to areas currently zoned FP in Mount Sima and Range Road as a precursor to infill development;
10. Increase the number of caretaker residences permitted on serviced IS, CH, and CIM zoned lots while protecting primary employment uses;
11. Maintain current caretaker residence allowances for IS, CH, and CIM zoned lots in unserviced areas and consider instituting occupancy-oriented restrictions, subject to the findings of the research described in #30;
12. Subject to the findings of the research outlined in #30, consider increasing minimum lot size requirements in unserviced areas to reflect commercial/industrial uses combined with caretaker residence use;
13. Create new *Zoning Bylaw* definitions to address indoor agriculture (food and cannabis), beverage production and processing (breweries and distilleries). Consider instituting impact and intensity related thresholds contingent on location and servicing;
14. Consider creating new definitions for other water/wastewater-intensive commercial and industrial uses not listed above (i.e., car washes) and review their suitability for unserviced areas;
15. Consider mechanisms, such as thematic districts, to encourage the "clustering" of food and beverage production uses in targeted areas of Marwell and Downtown;
16. Consider extending the "studio" use to the CIM zone to better accommodate artisanal and small-scale manufacturing;
17. Reconsider zoning regulations that unnecessarily restrict the ability of entrepreneurs to base more than two businesses from one address, where no discernible change in impacts to adjacent property owners will result;
18. Review purposes, uses and associated definitions for the IS and IH zones for fairness, consistency and adequate protection and accommodation of "nuisance" industrial activities;
19. Ensure mapping data consistency between zones and their "parent" OCP designated areas;

Underutilized and Infill Lands (Shorter Term Land Development)

20. Consider a short-term incentive program (i.e., tipping fee relief) to encourage the clean-up and sale of industrial properties functioning as "junkyards" within Whitehorse;
21. Work with YG, First Nations, and private sector interests to initiate implementation of the heavy industry relocation aspects of the 2018 Marwell Plan and ensure the plan's objectives are factored into institutional capital planning efforts;
22. Work with private owners of large land parcels in Marwell to explore options for subdivision that would quickly bring new lots in this area to market;
23. Work with YG and First Nation landowners to expedite the planning, subdivision, surveying and disposition of infill lots in:
    a. MacRae
    b. Range Road
    c. Mount Sima
    d. Kulan (subject to the identification of an alternate snow dump location)

    Infill development should provide a mix of medium (~0.5 ha/~1 ha for serviced/unserviced) and large (~1 ha/2+ ha for serviced/unserviced) lot sizes, and lots accessible off of Mount Sima Road should be considered for CIM zoning (versus I). YG should be encouraged to test and adapt alternative tender

approaches to reduce development costs and avoid unnecessary escalation of lot pricing. The inclusion of IH zoned lots in industrial infill areas should be considered;

24. Explore the potential for lot expansions, reviewed at the neighbourhood-level to allow cohesive planning that considers surrounding recreational and wildlife values;

Greenfield Development (Medium to Longer Term Land Development)

25. To provide new serviced MU-I/C designated lots post-infill development, work with YG, KDFN, and TKC to:
    a. Select and/or prioritize development between the two options of "Hillcrest South" and (portions of) "Taylor North" for MU-I/C lands;
    b. Undertake initial development due diligence for the higher priority/preferred areas; and,
    c. Establish a charter or MOU to pursue co-development of priority MU-I/C-designated Commissioner's land and adjacent Settlement Lands, with the aim of bringing new lots to market in the late 2020s[11];
26. To provide new serviced I designated lots post-infill development, work with YG and KDFN to undertake initial development due diligence and potential co-development for the "Taylor North" area, with the aim of bringing new lots to market in the late 2020s to early 2030s;
27. To provide new unserviced I designated lots post-infill development, work with YG to:
    a. Undertake further planning and prioritization work to confirm the "MacRae East" and/or "Utah" area, including discussions with KDFN, TKC and White Pass and Yukon Route railway about their development interests;
    b. Undertake initial development due diligence for the "MacRae East" and/or "Utah" area;
    c. Pursue co-development, utilizing a charter or MOU approach with any additional parties, of the "MacRae East" and/or "Utah" area, with the aim of bringing new I lots to market in the mid-2030s[12];

Servicing and Services

28. Work with the YG to adopt interim "precautionary principle" based mechanisms to address industrial and commercial wastewater in unserviced areas;
29. Ensure that capital upgrades to the Alaska Highway corridor through central Whitehorse are supportive of current and future employment land integration with public transit and active transportation options;
30. In partnership with YG, undertake a risk-based assessment of allowing water/wastewater intensive and contaminant-generating uses in serviced and unserviced areas and identify precautionary policy and regulatory measures;
31. Encourage landowners sited along the lower elevations of Bennett and Laberge roads in Kulan to connect to municipal water service in support of industry diversification;

Permitting and Business Support

32. Consider aligning City business permit administration with the North American Industry Classification System to allow for finer-grained (and nationally comparable) industry monitoring, and instituting a new category; and

[11] Subject to full utilization of infill potential; should this not occur, timelines should theoretically advance.
[12] Subject to full utilization of infill potential; should this not occur, timelines should theoretically advance.

33. Expand upon previous work around water/wastewater intensive and contaminant-generating uses, including potential updates to the *Sewer and Storm Utility Bylaw* and the development of sector-oriented information and application packages.

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List of Frequently Used Abbreviations

CIM	Mixed Use Industrial/Commercial
CH	Highway Commercial
FNFP	First Nation Future Planning
FP	Future Planning
GDP	Gross Domestic Product
I	Industrial
IH	Heavy Industrial
IS	Service Industrial
IQ	Quarries
KDFN	Kwanlin Dün First Nation
MOU	Memorandum of Understanding
MU-I/C	Mixed Use - Industrial/Commercial
NR	Natural Resource
OCP	Official Community Plan
TKC	Ta'an Kwäch'än Council
UCB	Urban Containment Boundary
YG	Government of Yukon

1.0 INTRODUCTION

1.1 Purpose and Scope

A healthy local economy relies on the availability of lands that can accommodate the range of commercial and industrial activity and employment not traditionally sited in downtown areas. Such lands house primary, secondary, and tertiary economic sectors that extract and produce raw materials, manufacture and/or assemble goods, and provide services to both local and regional populations. In Whitehorse, commercial and industrial lands outside of the downtown core are home to a wide range of businesses that serve Whitehorse residents, the public sector, and local and regional private sector players such as the mining industry.

The provision of commercial and industrial lands is a priority for the City of Whitehorse ("the City") and is supported in numerous City documents including the 2010 Official Community Plan (OCP), 2015 Community Economic Development Strategy, and 2016 Whitehorse Sustainability Plan. The 2016 Downtown Retail and Entertainment Strategy and 2018 Downtown and Marwell plans filled in information gaps and set a 20-year vision for these vital retail/commercial and industrial employment areas. In preparing for the 2020 update of the OCP, the City again wished to examine the status of commercial and industrial lands outside of the downtown area.

The City hired a consulting team led by Groundswell Planning to undertake a Commercial and Industrial Land Study aimed at:

- Assessing and determining future demand for commercial and industrial land within the city (excluding Downtown) through to 2040;
- Identifying options and alternatives to meet future demand with supply (i.e. policy and/or land use prescriptions); and
- Making recommendations, including an implementation plan, for the City to consider in formulating relevant portions of the OCP.

Whitehorse is located in southern Yukon, within the traditional territories of the Kwanlin Dün First Nation and Ta'an Kwäch'än Council. The City, Government of Yukon (YG), and both local First Nations are governing bodies within the municipality, each having potential influence on the future supply and mix of commercial and industrial lands.

1.2 Study Methodology

This study was undertaken from Spring 2018 to Winter 2020, and included the following tasks:

- An inventory of current commercial and industrial land supply in Whitehorse, focusing specifically on areas designated in the 2010 OCP as Industrial (I), Natural Resource (NR), Mixed Use – Industrial/Commercial (MU-I/C) and Future Planning (FP);
- A review and summary of economic trends and projections relating to commercial and industrial activity;
- A review of land use and regulatory considerations and approaches around food, beverage, and cannabis production industries;
- Identification of underutilized commercial and industrial areas within Whitehorse and formulation of policy recommendations for optimizing use;
- An assessment of the development suitability of:
    - Undeveloped areas designated I and MU-I/C for industrial and commercial use;

- Areas designated FP situated adjacent to existing areas designated I for industrial use;
- Land parcels currently undergoing quarrying, and their potential to transition into new industrial lands; and
- The Stevens Quarry area for industrial or commercial uses (versus the current NR and FP OCP designations).

- Formulation of recommendations for:
  - Future locations and land use mix for new commercial and industrial lands in urban and rural areas, including discussion on infrastructure, servicing and related considerations for cost-effective development;
  - Integrating food, beverage and cannabis production industries into existing or new commercial and industrial areas in Whitehorse; and,
  - Prioritization of changes to existing, and development of new, commercial and industrial areas, including an implementation plan.

The project team utilized a combination of Geographic Information System and Google Earth-based analyses and groundtruthing to inventory and assess utilization of lands of study interest within Whitehorse. Internet-based research supplemented primary research with both the City and YG for an understanding of land sales and development trends from approximately 2000 onwards. Development suitability of candidate potential future commercial and industrial lands was based on a desktop review of pre-existing 1;20,000 terrain mapping conducted for the City.

1.2.1 Engagement Process

Engagement of external parties by the project team primarily consisted of outreach to the following groups:

- Property and/or business owner operating within the CH - Highway Commercial, CIM - Mixed-Use Commercial/Industrial, IS - Service Industrial, and IH - Heavy Industrial zones;
- Local First Nation governments and development corporations; and
- Realtors, developers, and industry associations.

Engagement commenced with an online survey for property owners and business operators. Invitations to participate were sent by mail to approximately 350 addresses in early November 2018 and were followed up by a reminder letter in mid-December. The survey was produced on the online application Survey Monkey, and was accessible from November 5th until January 15th through a link posted on the project website. Thirty-nine surveys were completed; results are included in Appendix A.

Two focus group sessions were held concurrent with the survey in late November 2018 to discuss current successes and challenges, emerging trends, land needs, and potential City strategies around IS, CIM and CH zoning. A third session was also held to discuss the emerging food, beverage and cannabis production sectors[13]. The focus group sessions were open to current and prospective property and business owners, along with representatives of governments and industry associations. Twenty people participated, with some participants attending more than one session.

The project team also conducted semi-structured interviews with representatives of KDFN, TKC, and YG, First Nation development corporations, industry associations, realtors and development companies to gain qualitative insights into future land needs and supply, industry trends, market conditions and potential strategies.

[13]A fourth session was scheduled for Heavy Industrial zoning but was cancelled due to lack of interest.

1.2.2 Land Needs Estimate

To arrive at an estimate of future industry needs for MU-I/C and I designated lands, the team employed two forecasting methods:

- *Shift Share Employment Forecast* – use of 2008-2018 employment sector data to forecast future employment and associated spatial needs based on typical employment density for various sectors, relying on Statistics Canada employment data linked to North American Industry Classification System industry categories combined with results from the Yukon Business Survey; and
- *Population-Based Forecast* – use of population forecasting through to 2040 to project incremental industry growth based on per capita support and spatial needs (for retail and food services, specifically), drawing on typical industry behaviour and Yukon Bureau of Statistics population projections.

In order to arrive at land estimates, the project team formulated many assumptions based on its knowledge of typical industry behaviour and observation of local conditions. These assumptions and detailed calculations are included in Appendix F.

1.2.3 Development Potential Analysis

The team undertook a terrain-based evaluation of broad development potential for candidate future commercial and industrial lands across Whitehorse, focusing in particular on:

- Undeveloped areas currently designated I and/or MU-I/C in the 2010 OCP; and,
- Undeveloped areas designated FP or First Nation Future Planning (FNFP) located adjacent to areas currently designated I and/or MU-I/C.

The evaluation was undertaken at a high-level (1:20,000 scale) using pre-existing 1;20,000 terrain mapping conducted for the City of Whitehorse by Mougeot GeoAnalysis (1996) and identified potential areas that warrant further consideration, based on terrain and landscape conditions alone, for land development. The detailed methodology is included in Appendix G and the results are shown on the maps in Appendix H.

1.2.4 Industrial Area Survey

The project team undertook a field survey of industrial areas in Spring 2019 to gauge both the quantity of privately owned undeveloped and/or vacant land and the extent of utilization of developed properties. Properties were visually assessed from the adjoining road and then subsequently checked in Google Earth review to determine approximate building coverage and other site utilization.

2.0 LAND INVENTORY

Understanding the current extent and composition of commercial and industrial lands in Whitehorse is a prerequisite to identifying potential gaps and forecasting incremental need for future commercial and industrial activities. The following section provides an overview.

> ***OCP vs. Zoning***
>
> The City's OCP provides high-level policy guidance by applying various land use designations across Whitehorse. The City's *Zoning Bylaw* provides more explicit direction through the application of specific zones, along with accompanying regulations for permitted uses, site coverage allowances, building setbacks, etc.

2.1 Designations and Zones

Five OCP designations and seven zones were scoped into this review as shown in Table 1 below. OCP designations included I, MU-I/C and NR. Areas designated FP located adjacent to currently designated I and MU-I/C areas were also included for consideration as potential future development areas.

Table 1. Inventory of Whitehorse Lands Included in the Study Area

Land Use Designations and Zones	Total Area (ha)	Total Area – Other Lands (ha)	Total Area – First Nation Land (ha)	# of Lots [14]
INDUSTRIAL (I)	**972.9**	**969.5**	**3.5**	-
IH – Heavy Industrial	66.2	66.2	-	3[15]
IS – Service Industrial	265.3	239.1	26.2	213
MIXED-USE – INDUSTRIAL/COMMERCIAL (MU-I/C)	**461.9**	**445.8**	**16.1**	-
CH – Highway Commercial	95.2	90.2	5	77
CIM – Mixed-Use Commercial/Industrial	140.8	123.1	17.7	254
NATURAL RESOURCE (NR)	**288.6**	**288.6**	-	-
IQ – Quarries	449.5	449.5	-	-
FUTURE PLANNING (FP)[16]	**3895.3**	**3866**	**29.3**	-
FP – Future Planning[17]	4133	4102.7	30.3	-
FIRST NATION FUTURE PLANNING[18] (FNFP)	**294**	-	**294**	-
FNFP – First Nation Future Planning[19]	1.8	0.8	1	-

Refer to Appendix A for a city-wide map indicating OCP designations, zoning and land tenure.

2.2 Land Uses and Restrictions

2.2.1 Commercial and Industrial Zones

Pursuant to the City's *Zoning Bylaw*, each zone under the I and MU-I/C designations is subject to a host of regulations pertaining to appropriate use, parcel size, and development pattern. The intention of each zone assessed is as follows:

[14] This includes unconsolidated land parcels that comprise larger properties as well as vacant lots. IH and IQ totals include lease areas on public lands.
[15] The majority of IH zoned land is comprised of lease areas, some with split zoning. Three lots (6.5 ha) are privately owned.
[16] This includes only those FP designated areas located adjacent to I and/or MU-I/C designated areas.
[17] This includes only FP zoned areas located within the FP designated areas adjacent to I and/or MU-I/C designations.
[18] This designation is specific to KDFN lands; TKC lands are incorporated into the FP designation. Only those FNFP areas located adjacent to I and/or MU-I/C designated areas are included in this total.
[19] This includes only FNFP zoned areas located within the FNFP designated areas adjacent to I and/or MU-I/C designations.

- **IH - Heavy Industrial** – to provide for large-scale industrial uses and other uses that may have large land requirements or nuisance effects on adjacent uses;
- **IS - Service Industrial** – to provide for a mix of commercial and industrial uses including manufacturing, processing, assembly, distribution, service or repair, which may carry out a portion of their operation outdoors or require outdoor storage;
- **CH - Highway Commercial** – to provide for high quality commercial development primarily along arterial roadways including those that serve as entrance and tourist routes into the City; and
- **CIM - Mixed-Use Commercial Industrial** – to provide a transition zone for the development of service commercial and clean industrial uses near the city centre.

Principal uses for the four zones are shown in Table 2 at right.

Land Use Allowances

The *Zoning Bylaw* prescribes land use allowances within each zone. Principal uses are automatically approved. Secondary uses are typically approved so long as they are accompanied or preceded by a principal use. Principal and secondary use approvals are under the authority of the City's Development Officers. Conditional uses require a City Council and public input process. These uses are approved based on careful consideration of various factors, including design and character, impact on neighbouring properties, demonstrated need, mitigation, and public input.

Principal Uses	CH	CIM	IS	IH
Aircraft sales/services		■		
Animal clinics	■	■	■	
Animal shelters	■	■	■	
Auctions/auction grounds		■	■	
Asphalt plants				■
Bulk fuel depots			■	■
Business support services		■	■	
Commercial schools		■		
Commercial storage	■	■	■	
Community recreation services	■	■		
Concrete plants				■
Crematoria	■			
Custom indoor manufacturing	■	■	■	
Eating and drinking establishments	■	■		
Emergency and protective services	■	■		
Equipment sales/rentals, heavy	■	■	■	
Fabrication shops		■	■	■
Fleet services	■	■	■	
Garden centres	■	■	■	
Gas bars	■	■		
General contractor services		■	■	
Health services		■		
Hostels	■			
Hotels	■			
Household repair services	■	■		
Indoor participant recreation services	■	■		
Industrial, salvage		■	■	■
Motels	■			
Kennels		■		
Manufacturing		■	■	■
Mobile catering food services		■	■	
Offices (above ground floor)		■		
Outdoor recreation equipment rentals/sales	■	■	■	
Outside storage			■	■
Parks	■			
Pet clinics		■		
Processing, heavy				■
Processing, light		■	■	■
Recreational vehicle parks	■			
Retail services, convenience	■	■		
Retail services, general less than 500 m^2	■			
Retail services, restricted		■		
Trucking terminals	■		■	■
Vehicle sales and service	■	■	■	
Warehouse sales	■	■	■	

Table 2. Principal Uses for Commercial and Industrial Zones Included in the Study Area

Secondary and Conditional uses for the four zones are shown in Table 3 below.

Table 3. Secondary and Conditional Uses for Commercial and Industrial Zones Included in the Study Area

Secondary Uses	CH	CIM	IS	IH
Accessory building/structure				
Caretaker residence				
Offices				
Offices, above ground floor				
Outdoor storage				
Retail services, general				
Retail services, general, less than 500 m^2				
Conditional Uses	**CH**	**CIM**	**IS**	**IH**
Bulk fuel depots				
Caretaker residence (121-297 m^2)				
Eating and drinking establishments				
Indoor participant recreation services				
Land treatment facilities				
Natural resource extraction				
Offices, ground floor				
Offices, on ground floor or more than 50% of gross floor area				
Scientific and cultural exhibits				

The *Zoning Bylaw*'s minimum lot size requirements for commercial lots are considerably smaller than for industrial lots within serviced areas, but are standardized for lots that are not connected to municipal water and sewer. Maximum site coverage allowances are either 50% or 75%, depending on zone. Refer to Table 4.

Table 4. Minimum Lot Sizes and Coverage Allowances for Commercial and Industrial Zones Included in Study

Zone	Minimum Lot Size (Serviced)	Minimum Lot Size (Unserviced)	Maximum Site Coverage[20]
CH - Highway Commercial	875 m^2 0.0875 ha	5,000 m^2 0.5 ha	50%
CIM - Mixed-Use Commercial/Industrial	650 m^2 0.065 ha	5,000 m^2 0.5 ha	75%
IS - Service Industrial	2,000 m^2 0.2 ha	5,000 m^2 0.5 ha	75%
IH - Heavy Industrial	5,000 m^2 0.5 ha	5,000 m^2 0.5 ha	50%

2.2.2 Quarries

The NR designation of the OCP "recognizes the potential for the extraction and management of mineral and gravel deposits and should be restored to a natural state following extraction activities". Quarrying is also permitted within the Industrial designation, with the expectation of a future land use that may eliminate the need for reclamation to a natural state.

Pursuant to the *Zoning Bylaw*, the intention of the IQ - Quarries zone is as follows:

- **IQ - Quarries** – to provide a site for the on-site removal, extraction, and primary processing of soil and aggregate materials found on or under the site.

[20] Maximum Site Coverage is defined in the Zoning Bylaw as "the percentage of horizontal area of a lot that may be built upon including accessory buildings or structures…."

Principal, Secondary and Conditional uses are outlined in Table 5 below.

Table 5. Principal, Secondary and Conditional Uses for the IQ - Quarries Zone

Principal Uses	Secondary Uses	Conditional Uses
Concrete plants	Accessory building/structure	Asphalt plants
Natural resource extraction	Caretaker residence	Land treatment facilities

The minimum lot size allowed in the zone is 2.5 hectares. Site restrictions are general OCP provisions around orderly quarry development and management (i.e., operation plans, signage, vehicle access, etc.) There is also a provision requiring redevelopment and reclamation of the site upon termination of extraction activities.

2.3 Commercial and Industrial Nodes

Commercial and industrial activity is distributed in areas across Whitehorse. Most are oriented directly on or in proximity to the Alaska Highway. The following section provides an overview of key nodes, described from north to south. Refer to Appendix A for maps of these and surrounding areas.

Kulan Industrial Area

The Kulan industrial area is accessed via the Alaska Highway immediately south of the Crestview residential area. Approximately 40 lots are located here, with lots generally ranging from 0.5 to 2.2 hectares. Kulan hosts a diverse mix of private sector companies, primarily in the Construction and Transportation & Warehousing sectors, along with numerous Utilities-related operations. There are a number of undeveloped First Nation parcels in the area as well. Zoning is predominantly IS.

Figure 1. Kulan Industrial Area

Kulan features three-phase power, Internet/telephone, and gravel roads. Water supply includes onsite wells and/or water delivery, with disposal into septic systems. The Porter Creek reservoir is located within Kulan; no lots are connected to a watermain that runs along Lindeman Road (before crossing the highway), but fire flows are believed to be below typical industrial fire flow requirements of 150 L/sec.

Taylor Industrial Area

48 lots are located in the Taylor Industrial Area immediately northwest of Porter Creek residential area, with lots generally ranging from 0.4 to 1.7 hectares. Taylor has a similar mix of business types as Kulan, with more mining-oriented technical services present. Again, zoning is predominantly IS.

Servicing in Taylor consists of single-phase power, Internet/telephone and gravel roads. Similar to Kulan, lots have onsite wells or water delivery and septic systems. Watermains and sewermains are located within close proximity of the subdivision and it would be feasible to install water services to all of the lots as well as pave the roads, a portion of which could be funded through a Local Improvement Charge.

Alaska Highway (between Kopper King and Airport)

A number of CH and CIM zoned properties are situated along the Alaska Highway between the Kopper King area and Erik Neilsen Whitehorse International Airport. Highway-situated commercial uses include gas stations, motels, restaurants and museums. A strip of CH zoned development along the southernmost extent of Range Road includes numerous car dealerships along with municipal operations facilities. A cluster of CIM zoned lots are situated across the Alaska Highway from the airport in the Burns Road area and are home primarily to transportation and storage businesses as well as public and private sector office uses.

Three-phase power and internet/telephone are available along the highway corridor. Municipal water and sewer are generally available as well, however there is limited water and sewer infrastructure between the Takhini and Kopper King neighbourhoods. The available fire flows along this corridor are very high (greater than 250 L/s). The Alaska Highway is currently being upgraded (i.e., twinned) south of Two Mile Hill, and Range Road is being extended further south. The highway in the Wasson Place/Burns Road area is also scheduled for upgrading, which will likely include twinning the highway and the installation of stop lights (versus current stop signs). Municipal water and sewer extends as far south as Lodestar Lane.

Figure 2. Alaska Highway Commercial Services Strip Near Airport

Marwell Industrial Area

The Marwell area is Whitehorse's original heavy industrial area, having been the site for the Canol refinery that operated for a short time during World War II. In the decades since, Marwell has evolved into an eclectic mix of specialty retail-commercial, service-commercial, light to heavier industry, office and organizational uses situated across a wide range of lot sizes (0.16 – 2.6 hectares) - operating on 232 lots with CIM zoning. The 2018 Marwell Plan established a vision for a higher density mixed-use and light industrial neighbourhood that acts as an industrious extension to the Downtown core, augmented by new and/or improved transportation connections, park and trail amenities, and the relocation and remediation of heavy industrial uses.

Figure 3. Titanium Way Development in Marwell

KDFN has a large, undeveloped Settlement Parcel situated along Tlingit Street in the northernmost portion of Marwell, typically referred to as Lot 226. Its development corporation, Chu Níikwän, is proceeding with the development of the Hammerstone business park, with over 30 lots available for lease envisioned (with nine coming online in Summer 2020).

The subdivision has piped water and sanitary sewers; however, there are portions of Marwell that are not currently connected to this infrastructure. Available fire flows are typical. Three-phase power and Internet/telephone is available. Roads are predominantly paved and stormwater managed with a combination of open ditches and storm sewers. Tlingit Road is the last remaining unpaved major arterial road but is scheduled for upgrades in the short-term.

Figure 4. Metropolit Lane at Intersection of Alaska Highway with Hamilton Boulevard and Robert Service Way

Robert Service Way/Hamilton Boulevard

The Alaska Highway corridor in the vicinity of the intersection with Robert Service Way/Hamilton Boulevard is home to several clusters of CH and CIM zoned properties housing an eclectic mix of businesses. The Metropolit Lane development has established over the past decade, resulting from the subdivision of the large Yukon Gardens parcel.

There is no municipal water or sewer infrastructure south of Lodestar Lane (in the vicinity of Whitehorse International Airport); as such, all lots in this area have on-site systems or water delivery. Changes made to the Zoning Bylaw in 2019 are intended to prohibit the future subdivision of unserviced lots to this size.

Mount Sima Industrial Area

Located about 10 kilometres south of the Robert Service Way/Alaska Highway intersection is the Mount Sima industrial area. Mount Sima was developed in two phases between the early and late 2000s and includes 65 lots with IS zoning ranging from 0.23 to 7.6 hectares in size (seven vacant KDFN parcels have First Nation (FN)-IS zoning). Mount Sima hosts a diverse mix of private sector companies, primarily in the Construction, Transportation & Warehousing, Mining and Utilities sectors. As well, it has two breweries and several artist studios. Sima currently has a larger supply of vacant and/or for lease/sale parcels than other industrial areas in Whitehorse. Three-phase power and Internet/telephone are available in Mount Sima. Lots have onsite wells or water delivery and dispose of wastewater into septic systems. The road network servicing the subdivision is paved.

Figure 5. Mount Sima Industrial Area

MacRae Industrial Area

MacRae was first established as a flagstop station for the White Pass and Yukon Route railway. It then functioned as a critical army checkpoint and relay station (complete with barracks, fire hall, and recreation centre) during the construction of the Alaska Highway, and later developed as an industrial area in the 1960s. 14 CH, 52 IS, and one CIM zoned lots are located here, with lots ranging from 0.19 to 2.6 hectares and averaging 0.55 hectares. The IS

zoned lots in MacRae host a similar mix of businesses to Mount Sima. The strip of CH zoned properties situated directly along the highway, predominantly to the west of the industrial lots, feature a mix of businesses including service stations and lumber suppliers. Three-phase power and Internet/telephone are available in MacRae, and lots have onsite wells or water delivery and dispose of wastewater into septic systems. Gravel roads provide access within the subdivision.

Figure 6. Highway Commercial Zoned Properties Fronting the Alaska Highway in MacRae

2.4 Quarries

Approximately 450 hectares of land within the municipal boundary is zoned IQ - Quarries. With the exception of two City-owned parcels that are leased and a few private parcels, virtually all Whitehorse quarries are Commissioner's lands administered by the Government of Yukon (YG)'s Land Management Branch. The government's list of active quarries and the City's add up to about 468 hectares of active quarries, a small discrepancy from the zoning. A list of active Whitehorse quarries is presented in Table 6.

Table 6. Quarries Located Within City Limits

Location	Lease Area (ha)	Land Tenure	Location	Lease Area (ha)	Land Tenure
Crestview	2.76	YG	McLean Lake	4.11	YG
Crestview	10	YG	McLean Lake	5.5	YG
Echo Valley	16	YG	McLean Lake	7	YG
Echo Valley	28.3	YG	McLean Lake	7.187	YG
Echo Valley	39.5	YG	McLean Lake	9.26	YG
Ear Lake	9.6	City	McLean Lake	9.5	YG
Ear Lake	7.8	City	McLean Lake	12	YG
Whitehorse Copper	9.94	YG	McLean Lake	0.89	City
Whitehorse Copper	12	YG	McLean Lake	3.3	YG
Whitehorse Copper	14	YG	McLean Lake	3.5	YG
Whitehorse Copper	224.15	YG	McLean Lake	3.91	YG

Sources: YG Lands Branch and City of Whitehorse

Gravel quarry approval and management on Commissioner's lands is the responsibility of YG's Department of Energy, Mines and Resources (EMR) under the *Lands Act Quarry Regulations*. The City is consulted at two distinct steps: first, prior to the issuance of a permit for testing; and second, prior to the actual development of a quarry. This two-step "check-in" allows for the City to ensure conformance with the OCP and applicable zoning. Applications are further subject to a screening under the *Yukon Environmental and Socioeconomic Assessment Act*. All subsequent inspections and administration are the responsibility of EMR.

3.0 HISTORICAL AND CURRENT MARKET DYNAMICS

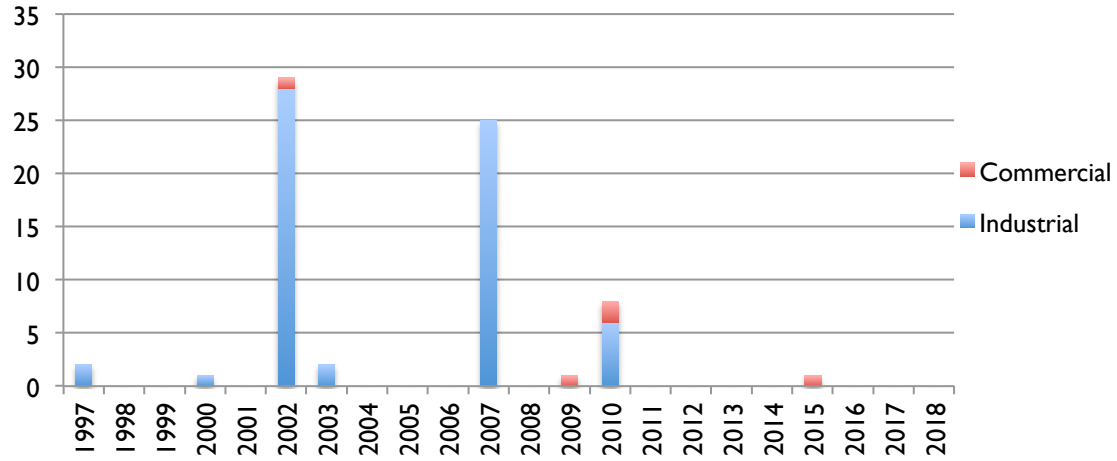
Predicting the potential growth and change in economic activity that will require a supporting land base relies on an understanding of local market conditions, drivers and indicators. The following section provides a closer look at what the current and historical state of employment lands supply and demand in Whitehorse, drawing from a range of quantitative data and insights gained from the team's engagement.

3.1 Previous Lot Sales

The survey and sale of commercial and industrial lots[21], along with installation of infrastructure, is the responsibility of YG's Land Development Branch. The Branch works in cooperation with the City to ensure local land needs are being met. Lots are sold either over the counter or via public tender.

The past 20 years saw only a handful of new commercial lots released to market, while over 50 industrial lots were released in the two phases of the Mount Sima industrial subdivision in the early to late 2000s. No lots came on the market between 2016 and 2018. Refer to Figure 7.

Figure 7. YG Commercial and Industrial Lot Sales in Whitehorse: 1997-2018



Source: YG Land Management Branch

Over the past 20 years, both commercial and industrial lot prices have trended moderately upwards, while the sales period has sharply decreased. For example, the market absorbed the first phase of Mount Sima over an 8-year period; the second phase, released in 2007, sold in less than half that time. Refer to Table 7.

Another noteworthy sale of lots involved the Titanium Way development in Marwell. Northern Vision Development initiated construction in 2006 and a total of 48 CIM zoned lots in the 0.2-hectare range were sold between 2007 and 2017.

3.2 Building Permits

The Yukon Bureau of Statistics (YBS) tracks the number and value of building permits on an annual basis. Looking at results for commercial and industrial building permits over the past 10 years, there is correlation with both land sales and broader territorial economic performance. The number and value of industrial property building

[21] Commercial and industrial classifications are YG's, versus indicative of City zoning.

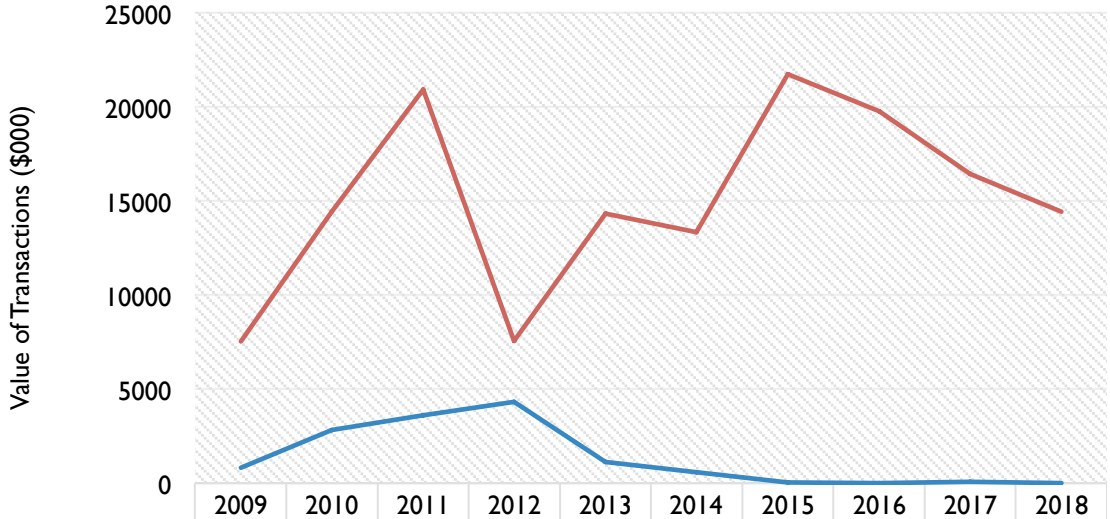
Table 7. YG Commercial and Industrial Land Sales, 1997-2016

Year(s)	Area	Land Use	# of Lots	Price/ft^2	Absorption Time	Other Notes
1997-00	Porter Creek	Industrial	3	n/a	n/a	
2002	Hillcrest	Commercial	1	$4.08	n/a	Sold via tender
2002	Mount Sima (Phase 1)	Industrial	28	$0.47	8 yrs	9 KDFN lots, 2 tender, 19 counter
2003	Taylor	Industrial	2		n/a	
2007	Mount Sima (Phase 2)	Industrial	25	$0.58	3 yrs	8 tender, 17 counter
2009	Copper Ridge	Commercial	1	$4.25	n/a	Sold via tender
2010	Hillcrest (Burns Road)	Industrial (6)/ Commercial (2)	8	$6.40	10 mos	2 tender, 6 counter
2015	Marwell	Commercial	1	$10.64	n/a	Sold via tender
2015	MacRae	Industrial	1	$0.94	n/a	Sold via tender
2016	Whistle Bend	Commercial	1	$6.81	n/a	Sold over counter

Source: YG Land Management Branch

permits peaked in 2012 – some three years after lots in Mount Sima Industrial Area had fully sold and at the height of a commodities "supercycle" of high mineral prices and corresponding production and exploration activity. After 2012, industrial building activity sharply dropped and has remained flat since. Commercial building activity showed a similar pattern, peaking in 2011 and then sharply declining; however, building activity rallied for a 2015 high that exceeded 2011. Refer to Figure 8.

Figure 8. Number and Value of Commercial and Industrial Building Permits in Whitehorse: 2009-2018



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
# of permits (I)	17	44	25	32	14	7	3	0	2	0
Value of permits (I)	$826	$2,842	$3,597	$4,319	$1,142	$577	$50	$-	$82	$-
# of permits (C)	66	96	91	100	114	129	142	123	137	204
Value of permits (C)	$7,531	$14,439	$20,936	$7,555	$14,322	$13,352	$21,735	$19,755	$16,438	$14,422

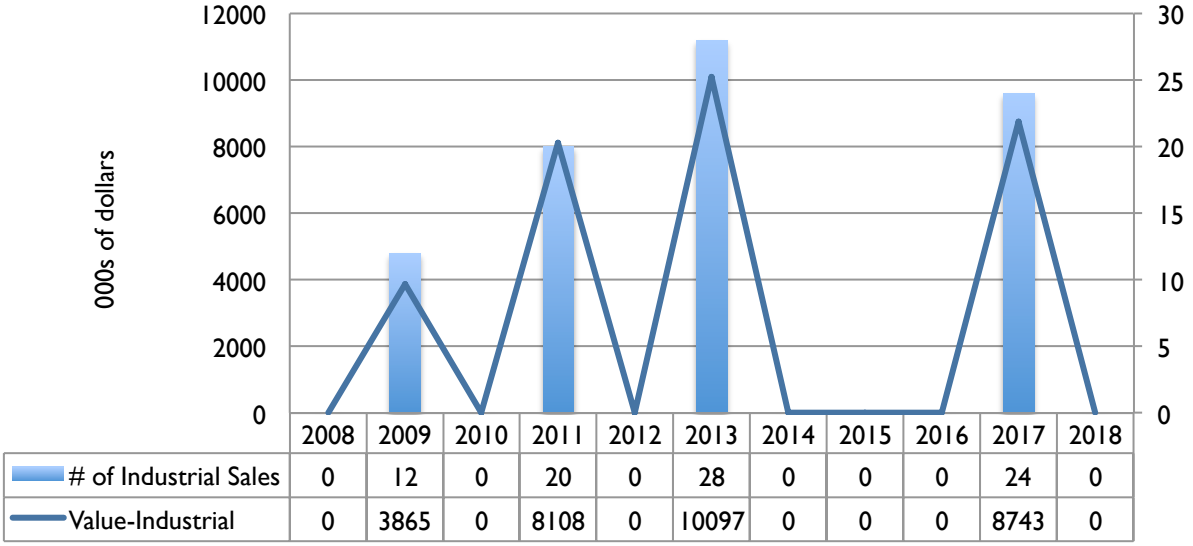
Source: YBS 2018 Annual Statistical Review

Note that the inclusion of all commercial properties throughout Whitehorse means this data set includes but is not exclusively attributable to the CH and CIM zones. The project team assumes that much of the permits and associated value pertains to construction in Core Commercial and Service Commercial zones in Downtown.

3.3 Property Transactions

Industrial property transactions in Whitehorse over the 2008-2018 period exhibited a pattern of sharp peaks and troughs. The 2013 peak saw the highest number of industrial property transactions (28), followed by a 2017 peak that saw 24 properties sold. For 7 of those 11 years, sales were statistically negligible. Refer to Figure 9.

Figure 9. Number and Value of Whitehorse Industrial Real Estate Transactions: 2008-2018



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
# of Industrial Sales	0	12	0	20	0	28	0	0	0	24	0
Value-Industrial	0	3865	0	8108	0	10097	0	0	0	8743	0

Source: YBS 2018 Annual Statistical Review[22]

Commercial property transactions in Whitehorse over the 2008-2018 period were more stable, ranging from 17-26 in number for the last 5 years. Prior to 2014, the volume and value of transactions was considerably smaller (in fact, statistically negligible for four of six years). Again, this data set pertains to all commercial properties, not specifically those zoned CH and CIM. Refer to Figure 10.

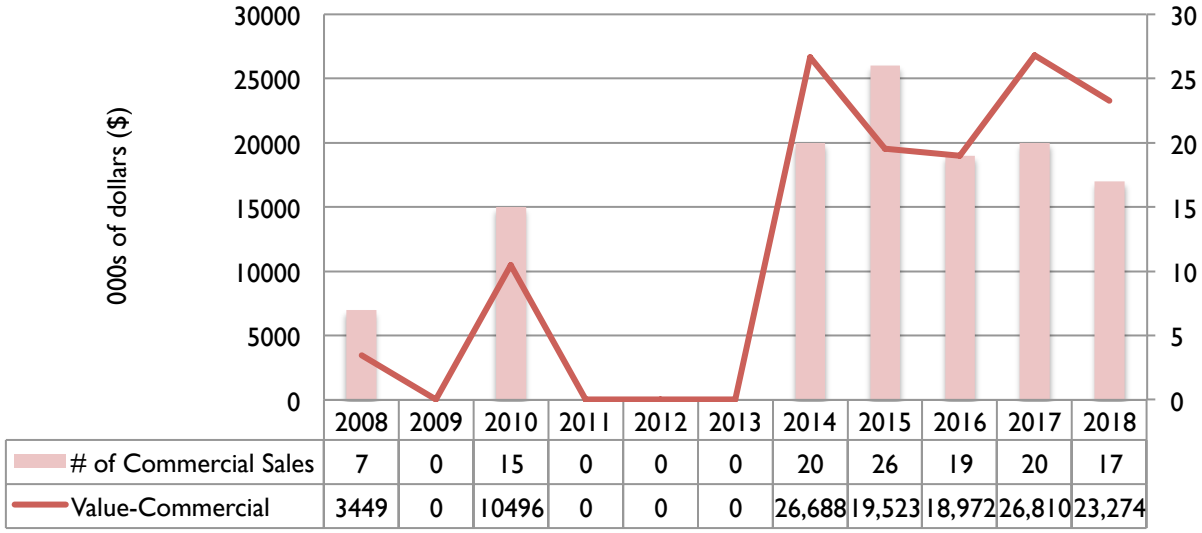
3.4 Development Approvals

Any significant changes to a commercial or industrial property in Whitehorse – be it a change in use, subdivision (including enlargements and consolidations), or construction of a new building – triggers a review and approval by the City's Land and Building Services Department.

A review of applications received by the City for the zones of interest during the 2009-2018 timeframe shows that the majority involved development permits on IS and CIM zoned parcels (84 and 74 respectively). Applications for industrial lot subdivisions and enlargements increased during the 2013 building boom and totalled 12 over the decade. Almost exclusively, applications for rezoning and OCP amendments related to CH zoned parcels. Refer to Table 8.

[22] The Yukon Bureau of Statistics suppresses data for reasons of confidentiality. This suppressed data is indicated as '0' on the chart.

Figure 10. Number and Value of Whitehorse Commercial Real Estate Transactions: 2008-2018



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
# of Commercial Sales	7	0	15	0	0	0	20	26	19	20	17
Value-Commercial	3449	0	10496	0	0	0	26,688	19,523	18,972	26,810	23,274

Source: YBS 2018 Annual Statistical Review[23]

Table 8. City of Whitehorse Development Approvals, By Type, 2009-2018

Year	Development Permits			Rezoning/OCP Amendment				Lot Subdivisions*			Lot Enlargements			Lot Consolidations		
	CIM	CH	IS	CIM	CH	IS	IQ	CIM	CH	IS	CIM	CH	IS	CIM	CH	IS
2009	2		2		1											
2010	4	2	9		1					1			1			1
2011	6		12		3						1		1			
2012	10		15		1	1	1		1	1			2			
2013	5	1	7					1		4			3			
2014	9		7							1						
2015	6		6					1		1			1	1		1
2016	11		9	1	1			1							1	
2017	8		9		1			2		2*						
2018	13	1	8		1			1*		2*						
TOTAL	**74**	**4**	**84**	**1**	**8**	**1**	**1**	**6**	**1**	**12**	**1**		**8**	**1**	**1**	**1**

**Includes Settlement Land*

Source: City of Whitehorse

A closer look at development permits for CIM and IS zoned parcels, which accounted for the vast majority of City development approvals of interest over the 2009-2018 timeframe, shows that they were triggered predominately by new construction. Applications for caretaker residences comprised just over 25% of IS zoned parcel permits, indicating a high level of interest in this secondary use. Redevelopment (i.e., additions and renovations) comprised 22% and 18% of CIM and IS applications, respectively. Changes to and/or temporary uses were proportionally higher on CIM zoned parcels than on IS zoned parcels. Refer to Table 9.

[23] YBS suppresses data for reasons of confidentiality. This suppressed data is indicated as '0' on the chart.

Table 9. City of Whitehorse Mixed-Use Commercial/Industrial and Service Industrial Zone Development Permits, By Type, 2009-2018

Year	CIM Zoned Parcels					IS Zoned Parcels				
	Total Permits	New Build	Addition/ Renovation	Caretaker Residence	Use	Total Permits	New Build	Addition/ Renovation	Caretaker Residence	Use
2009	2	2				2				
2010	4	4	1	2		9	4	4	1	
2011	6	4	1	1		12	11	1	4	
2012	10	6	3	1		15	11	3	5	
2013	5	3	1	1		7	6		2	1
2014	9	6		2	2	7	5	1	2	1
2015	6	3		1	3	6	5		1	
2016	11	6	2	1	3	9	6	2	1	3
2017	8	4	2	1	2	9	6	2	2	1
2018	13	2	6	1	3	8	5	2	4	1
TOTALS	**74**	**40**	**16**	**11**	**13**	**84**	**59**	**15**	**22**	**7**

Source: City of Whitehorse

3.5 Current Market Needs and Demand

3.5.1 What We Heard – Development Community

The project team spoke with with First Nation development corporations, realtors, and developers to gain qualitative insights into the current state of supply and demand for commercial and industrial properties in Whitehorse. The following section highlight key themes that emerged from these discussions; complete workshop summary notes are included in Appendix B.

Demand is difficult to accurately pinpoint

Realtors noted that it can be difficult to assess the actual demand for land in Whitehorse; some market activity may be fuelled by land speculation versus actual real-time market need attached to business start-up and/or growth and expansion. Land demand was described as being highly cyclical, even on an annual basis, with interest typically increasing in space to conduct business activities indoors over the cold winter months.

Demand is believed to be on the upswing, particularly for certain properties/sectors

Interviewees generally felt that demand is up, but not substantially so, compared to 8-10 years ago. A few noted a relatively recent "uptick" in interest. There is reportedly very strong interest in the trade centre model of development (e.g., Titanium Way) – specifically units with a garage door and some office and storage space. The team also heard that there is unmet demand for large parcels of land for storing supplies and equipment, particularly related to mining and construction, and rentals of storage space are becoming increasingly common. In addition, there is apparently some demand for land suitable for larger retail developments (auto parts and wholesale retail were specifically mentioned). The team heard that most of the demand is for raw land due to the expense and difficulty of retrofitting an existing property/building to meet the specific needs of another business.

Supply is very limited and costs are rising

Interviewees noted that the areas of demand noted above are largely unsatisfied at present.[24] Costs and limited options for operating a business Downtown are making Marwell an attractive option for small business, although there is very little supply available. Bare land prices in Mount Sima were said to have increased considerably to the \$4-\$5/ft^2 range. One realtor noted that there is a gap in building stock; there are numerous buildings and

[24] Both the Downtown and Marwell plans also highlight the gap for larger format retail.

warehouses built in the 1980s/90s with poor energy efficiency that do not meet the needs of today's prospective buyers. Further, areas such as MacRae have older properties, some with 2nd generation owners, that effectively function as "junkyards" because the costs of cleanup (i.e., tipping fees) far exceed annual taxes paid on them.

What's For Sale?

Market listings in Fall 2019 were limited to a handful of properties, including:

Zone	Description	Price	Location
CIM	Ground-floor commercial space in a multi-unit building	$430,000	Marwell
	Industrial shop and second-storey caretaker suite	$459,000	Marwell
IS	6000 ft² garage/workshop/office & residence on 1.8 acres	$1,100,000	Mount Sima

A rare listing for a medium-sized parcel of raw land in the popular Marwell area was priced at $9/ft² in Spring 2019. Around the same time, the team's field survey of industrial properties across Whitehorse in Spring 2019 found about 7 hectares of developed property available for rent/lease. There were no IH zoned property listings.

3.5.2 What We Heard – Property Owner and Business Operator Focus Group Sessions

Participants in the study's focus group sessions for CIM, CH, and IS lands shared a broad range of perspectives around current land supply and demand, many consistent with what the project team heard during interviews. Complete summary notes from the sessions are included in Appendix B. The team felt that the following themes emerged as the most prevalent:

Affordability is lacking

The affordability of shop rental space is a big issue for Whitehorse's business community. One focus group participant shared that his best option would require an outlay of $3,500/month and was difficult to find. It was suggested that many businesses struggle to cover their monthly rents, and that the high cost of purchasing land translates into high rents. It was mentioned that land costs have tripled since lots were released in Mount Sima, and that the days of $90,000 lots are over. Concern was also raised for how development permit applications can trigger current zoning regulations, and that this can have a big financial impact on businesses.

Underutilized lots are contributing to undersupply

Participants reported that the line between "salvage yard" and "junkyard" is blurred in industrial areas across the city. It was pointed out that City landfill tipping fees provide a disincentive to selling for owners who have either gone out of business or have inherited properties. Another contributing factor is the lack of a reuse economy in Whitehorse. Similarly, participants in the industrial focus group commented that some lots are purchased but remain undeveloped for years with little to no financial disincentive for owners due to low property taxes.

Land scarcity is forcing rezoning

It was noted that the shortage in land availability leads some property owners to rezone at their locations in order to carry out their desired business activities. There is nowhere to move to, so owners try to make do with what they have. Sometimes this does not result in a good outcome from a neighbourhood design perspective; but the lack of alternative sites makes this a persistent issue.

Land ownership is preferred over other options

Participants in both the commercial and industrial focus groups stressed that businesses need land ownership opportunities to build their assets and equity. Increasing rental opportunities was not viewed as a viable solution to addressing the land availability challenge, and it was questionable as to whether there is interest in the land

leasing/rental model. Businesses often have very specific needs that require custom-built facilities to accommodate their activities; it was viewed as uncommon for businesses to be able to rent what they need.

3.5.3 Property Owner and Business Operator Survey

Results of the online survey distributed to property owners and business operators on CH, CIM, IS, and IH zoned lands were largely aligned with what the project team heard during interviews and focus group sessions. The complete results are included in Appendix C.

The current supply for commercial lots was reported as being non-existent or limited by a majority of those looking, with only a few reporting a good supply. Refer to Figures 11 and 12.

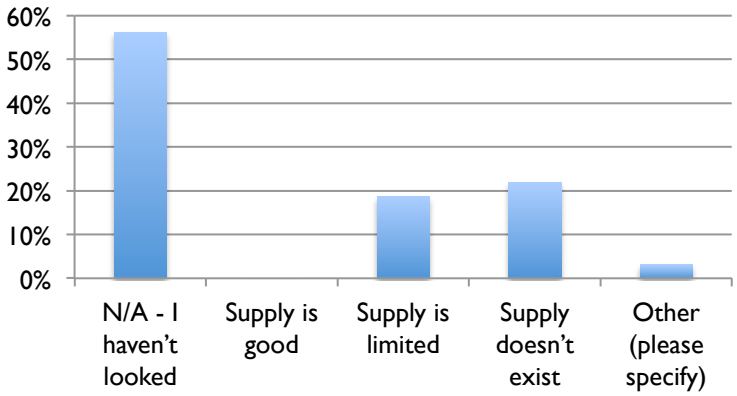
Who Participated in the Survey?

Invitations to complete an online survey were sent to 350 property owners and businesses in late 2018. 39 surveys were received. Here is a snapshot of survey respondents:

- Own and/or operate on:
  - CH lands (18%)
  - CIM lands (49%)
  - IS lands (28%)
  - IH lands (13%)
- Own and/or operate on:
  - One lot (41%)
  - Two lots (33%)
  - Three lots (5%)
  - Four or more lots (18%)
- Own and/or operate in:
  - Marwell (41%)
  - MacRae (33%)
  - Alaska Hwy corridor (12%)
  - Kopper King (10%)
  - Mount Sima (10%)
  - Kulan (10%)
- Respondents:
  - Owned property and operate business on it (59%)
  - Own property and rent/lease to others (26%)
  - Rent/lease property from others for business (18%)

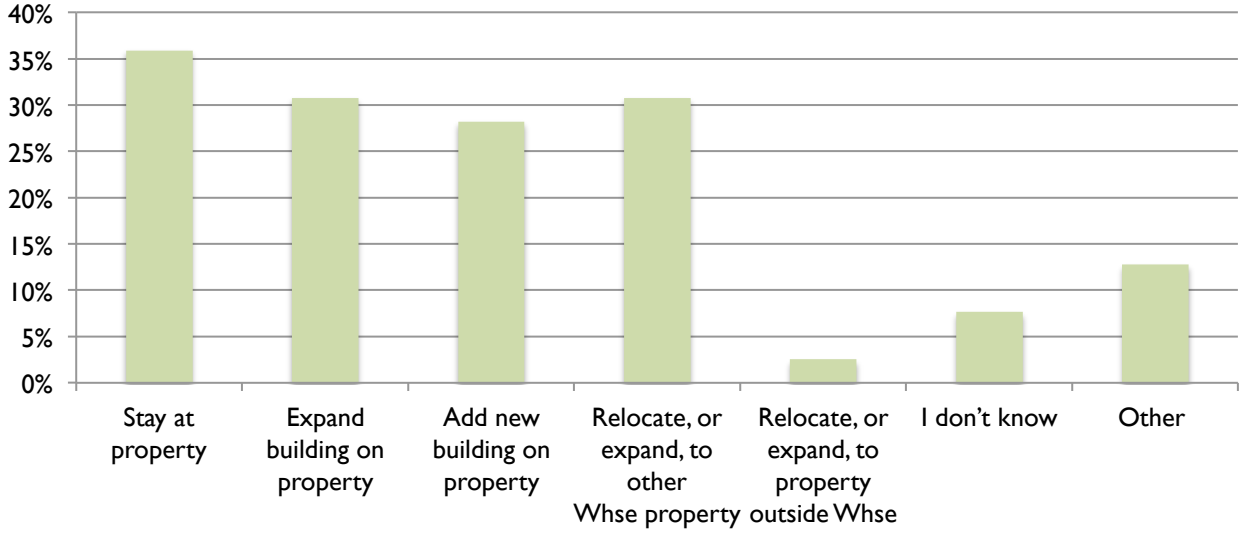
Figure 11. Current Supply of Commercial Lots According to Survey Respondents

Figure 12. Current Supply of Industrial Lots According to Survey Respondents



When queried about their future property-related business plans, 36% of survey respondents indicated that they intend to stay at their current property, while slightly fewer (31%) hope to relocate and/or expand to another Whitehorse property. 31% plan to expand an existing building and 28% plan to construct a new building, indicating that many property owners who intend to stay at their current site plan to meet their needs through redevelopment. Only 3% of respondents indicated a plan to relocate outside of Whitehorse; survey comments

Figure 13. Property/Business Plans of Survey Respondents



would suggest that taxes may be a primary motivator. Refer to Figure 13.

CIM zoning was the preference of a majority of respondents (36%) who indicated a future move or expansion to a new property, followed by IS (15%). There was very little interest indicated in CH and/or IH zoned lots. Refer to Figure 14.

Respondents who indicated a future move showed roughly equal interest (18-21%) in small, medium, and large lots. About half of these respondents desired municipal water and sewer connection. Refer to Figure 15.

Figure 14. Preferred Zoning for Lots in Demand from Survey Respondents

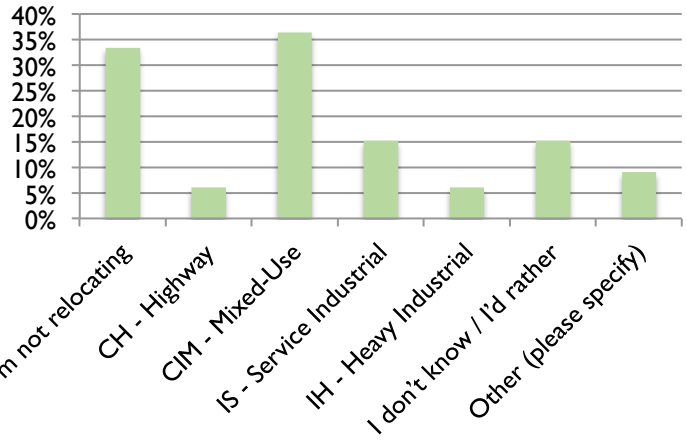
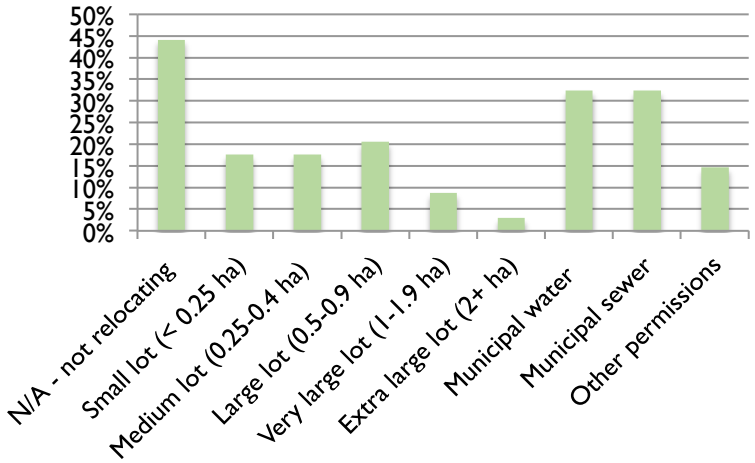


Figure 15. Lot Features in Demand by Survey Respondents



Survey comments provided additional context to the multiple choice question results. Several respondents spoke to the difficulty of attracting employees due to the lack of affordable housing and their inability to provide it with current zoning restrictions. Another respondent commented that commercial properties they have had for sale for years have not attracted much interest. Other comments spoke to the lack of both suitable and affordable land purchase and/or lease/rental opportunities.

3.6 Emerging Market Needs and Demand – Food, Beverage and Cannabis Production

The "produce/buy local" movement has changed the face of industrial and commercial areas across North America over the past decade. The following section considers the current state and needs of the food and beverage production sector, as well as the newly emerged cannabis production sector, both within Whitehorse and outside of it.

3.6.1 What We Heard

Participants in the study's focus group session for the food, beverage and cannabis production sector provided valuable insight into the current state of the sector and its needs. Complete minutes from the session are included in Appendix D. The team felt that the following themes emerged as the most prevalent:

Who Participated in the Focus Group?

The Food, Beverage and Cannabis Production Sector focus group included representation from:

- Agriculture and Agri-Food Canada
- Government of Yukon Agriculture Branch
- Fireweed Community Market Society
- Growers of Organic Food Yukon
- Yukon Agricultural Association
- Yukon Chamber of Commerce's Food and Beverage Committee
- Alaska Highway Business Association
- Farm owners
- Restaurant owners
- Highway Commercial property owner
- Service Industrial property owner

The local food, beverage and cannabis production sector is growing and maturing

Participants cited a healthy market of consumers interested in buying local products, and a corresponding growing community of entrepreneurs that want to supply them. The territory's poultry, egg, pork and cattle industries were cited as "maturing". At the local resident level, there is growing interest in do-it-yourself production as well as non-commercial production opportunities near residential areas (i.e., community gardens, etc.)

Participants shared several emerging trends that could soon have an impact locally, including growing interest in entomophagy (insect farming) both for human consumption and livestock feed, as well as cannabis production (although no production license applications have been completed yet in the territory).

Industry support needs to be system-wide, not just through zoning and land availability

Participants shared the need for the City to create a supportive and attractive climate for the sector not through land use planning, but reducing barriers throughout the production chain - from the initial step of getting a business license to dealing with production waste. The City's current limit of two business licenses per address (viewed as a hindrance to start-ups that experiment with multiple business ventures) was cited as a specific administrative hurdle. Waste management restrictions at the City landfill were also raised as a barrier to the food, beverage and cannabis sectors, given that certain kinds of production waste - notably slaughter waste - are not currently accepted. It was pointed out that if these sectors are unable to manage their waste, they will not be able to establish in Whitehorse.

An integrated resource management mindset is required

It was expressed that some "wastes" from production sectors are "resources" when the right processes and infrastructure are in place to capture their potential (e.g., organics turned into compost). Again, slaughter waste was raised as an example, which is an organic material that could be used as feed or contribute to the compost production process. It was stated that three phase electric power is also needed to support production, and that some producers are interested not only in using power, but in generating power than can be fed back into the grid.

Regulations can hinder both business start-up and long-term success

Some participants mentioned that Federal regulations (and to a lesser degree, corporate policies within the distribution chain) can make it difficult for small scale, local producers to get their products onto grocery store

shelves. The narrow profit margins in the food and beverage sectors can make compliance difficult for smaller producers. Some felt that the City and YG operate within regulatory "boxes", sometimes outdated, that can be difficult for businesses to navigate. Modernization of municipal and territorial regulations is needed to respond to the emergence of new sectors; otherwise they will not be able to develop.

Sectors locate where economic and operational needs are best met

Land availability and affordability, as well as suitable infrastructure, are key determinants to where the sectors choose to locate, according to participants. Some encouraged the City should to look at examples from elsewhere (e.g., Granville Island) to see what factors have allowed for successful sector hubs to develop.

Having affordable land was not viewed as the only determining factor for where a business will choose to locate. Some specific infrastructure requirements were also identified by participants. Indoor production methods often use cameras and systems requiring Internet to monitor and regulate growing conditions, such as watering, heating, cooling, and feeding; as such, access to fast and reliable 4G internet and three-phase power is a key consideration in a producer's decision as to where to locate their facility.

It was further suggested that access to public transportation is needed in employment areas located outside of the city core, and will become increasingly important for industries that have on-site employment. Low cost transportation options can help offset other living costs and make employees easier to attract and retain.

Minimizing costs and additional revenue streams can help

Some participants suggested that high municipal tax rates are a disincentive to locating production facilities within city limits. It was also suggested that a tax incentive specific to food production could help to encourage businesses to get into the industry. The question was posed as to whether the agricultural tax rate (which is applied to the YG agriculture zone) could be tied to land-use, rather than zoning (i.e., apply the rate to food producers in commercial and industrial zones).

Caretaker residences are highly desired by this sector

Participants indicated that the housing scarcity and high cost of accommodation in Whitehorse can make it difficult to attract and retain employees. Some businesses have trouble paying sufficient wages and caretaker residences can provide a viable option for businesses to attract workers by offering subsidized board in exchange for labour. This was viewed as being particularly advantageous for seasonal/short-term employees. Other benefits (i.e., on-site security, eliminating reliance on transit) were also mentioned.

Onsite enjoyment of FB&C products is preferred, and some locations are ideal for it

Support was indicated for stacked land-use allowances at production sites (e.g., tasting rooms or pubs wherever a brewery use is allowed). It was felt that enjoyment of a product on-site is an opportunity to enhance the educational experience and is in line with the "agro-tourism" model, which is gaining in popularity. Consumers are interested to meet the "makers" and learn about the production process. YG has explored this concept through a new "Agriculture^{X}" zoning, whereby some farms also have land-use rights to establish restaurants on-site.

Some participants were enthusiastic about the Downtown and Marwell waterfront evolving into a thriving brewer destination and the possibility of having tasting experiences at the waterfront in general was strongly supported.

Communal processing and retail spaces encourages small business by reducing financial risk and increasing efficiencies

Participants expressed support for more off-site communal retail spaces, such as the Fireweed Community Market and the Carcross Commons, to be developed. These spaces function as incubators by helping to lower financial risks and overhead costs for businesses as they get established. Similarly, the idea of a makerspace with a commercial kitchen, or a "food hub", was raised as a potential idea that could support both small-scale commercial and DIY producers. A central storage facility for food could be another idea to explore.

The future of locally grown cannabis is uncertain

It was suggested that meeting Federal regulations for the "standard" level of production (i.e., facility construction) and higher costs to import ingredients and export product would be major deterrents to local cannabis production. The small customer market in Yukon is a limiting factor that may inhibit larger production facilities from establishing, but the "micro" license avenue might make better economic sense. It was suggested that despite the short growing season of Yukon, there is potential for outdoor production to occur if plants are started indoors and then transplanted. No production licenses have been confirmed yet in Yukon, although some have started the process. It is expected that producers will likely also want processing licenses.

3.6.2 Cross-Jurisdictional Review

In order to understand municipal responses to the emerging food, beverage and cannabis production sectors in Whitehorse, the team undertook a review of cities across western Canada, namely Vancouver, Victoria, Kelowna, Nelson, Sooke, Calgary and Edmonton. Refer to Appendix E for the detailed results.

The team found that municipalities in western Canada are employing a variety of zoning approaches to meet the needs of local food and beverage producers. The key differences relate to how permissive and expansive the approach is, whether production is indoor or outdoor, and whether retail is involved.

Most of the municipalities reviewed have created specific definitions to accommodate indoor food and smaller scale outdoor food production. With respect to food production, Calgary has perhaps the simplest, most permissive and flexible approach of all jurisdictions reviewed, allowing for broadly defined (indoor) "Food Production" in many downtown residential, commercial, mixed-use, and industrial districts.

The team found an even more permissive zoning approach applying to breweries, which have evolved from being standalone operations housed in industrial areas to horizontally integrated operations encompassing brewing, tasting, food service, and retail located within industrial-commercial transition zones and even the heart of traditional commercial areas. This evolution is generally supported by the municipalities reviewed, with most allowing the full range of brewery-related operations within both commercial and industrial areas (albeit limiting smaller-scale, "craft" breweries in commercial areas). Victoria appears to be the most accommodating in regards to breweries, allowing them in core downtown zones – even without a food or beverage service or retail function – and creating several Brew Pub districts throughout the city.

Indoor Food Production 101

Indoor food production is a rapidly evolving sector. Here is an overview of some of the main types:

Aeroponics – a plant cultivation technique utilizing air or mist environment in lieu of soil or an aggregate medium

Aquaculture – farming of aquatic organisms

Aquaponics – a system of aquaculture in which the waste produced by farmed aquatic animals supplies nutrients for hydroponically grown plants

Hydroponics – process of growing plants in sand, gravel or liquid, with added nutrients but without soil

Vertical Farming – growing crops in vertically stacked layers, often incorporating techniques such as hydroponics, aquaponics and aeroponics

Cannabis production is the relative newcomer to industrial areas with the legalization of marijuana having occurred in November 2018 with the *Cannabis Act*. All three levels of government have defined roles to play in regards to cannabis production. Municipalities exercise the most significant control over where cannabis production can and cannot occur via zoning and other controls such as buffers. Of the seven municipalities reviewed, cannabis production is incorporated into defined uses in five and cannabis production operations are restricted to Industrial zones and/or districts. Sooke has two separate definitions distinguishing "micro" and "standard" production; micro is permitted in all Industrial zones whereas standard is disallowed in the Light Industrial zone and limited to the General and Heavy Industrial zones.

3.6.3 Whitehorse Zoning

Currently uses such as breweries, indoor agriculture, and food/beverage processing are captured under the City's *Zoning Bylaw* under the generalized categories of "light processing", "heavy processing", and "manufacturing". Only one brewery operates in the downtown core (ancillary to the primary lounge use and occupying less than 50% of the floor area). Another brewery that operates in an industrial zone received a Conditional Use approval for an "eating and drinking establishment". It appears that CIM zoning is serving a brewery located in the Marwell area, as well as two indoor food/beverage producers, adequately.

3.6.4 Water and Wastewater

The growth of local food and beverage production in Whitehorse creates unique challenges for the City and other regulators in regards to water use and wastewater disposal.

Food and beverage production can be both water and wastewater intensive in nature. There are estimates that it takes an average of seven gallons of water to produce a single gallon of beer, factoring in all steps of the brewing process (American Brewers Association, N.D.). Cannabis plants require an estimated 4 to 5 gallons of water per day each (BC Craft Supply Co., 2019). Indoor growing systems for both food and cannabis production commonly incorporate hydroponic technologies and can range in design from drain-to-waste to closed loop systems. Regardless of type, all systems eventually need to drain for routine maintenance, and the use of nutrient solutions and pesticides in indoor agriculture generates the potential to introduce contaminants into groundwater.

Businesses in unserviced areas typically rely on on-site well and septic systems to meet their water and much of their uncontaminated liquid waste disposal needs. Some businesses have water delivery and pump out services in lieu of on-site servicing, or use these services in combination with on-site servicing. Food, beverage and cannabis production activities use more water than activities that have historically operated in Whitehorse's unserviced industrial areas (such as equipment storage).

Regulatory Context for Water and Wastewater Management

In Whitehorse's serviced areas, the City's *Sewer and Storm Utility Bylaw* governs which substances may or may not enter into the municipal sewer system. The bylaw includes a list of prohibited substances.

In unserviced areas, wastewater disposal is regulated by YG's Environmental Health Services Branch and the Yukon Water Board, depending on the nature (i.e., composition) and scale (i.e., volume) of disposal activity. Applicable territorial legislation includes:

- *Environment Act*
- *Public Health and Safety Act (including the Sewage Disposal Systems Regulation)*
- *Waters Act (including the Waters Regulation)*
- *Yukon Environmental and Socio-economic Assessment Act*

Regulations for septic systems restrict their use to the disposal of domestic waste, or 'sewage'. Commercial/industrial wastewater must generally be handled through alternative disposal methods. In some cases, on-site gravel pits can be authorized to dispose of uncontaminated wastewater.

Water licenses are typically triggered by the volume of water drawn and/or discharged. "Industrial undertakings" and "agricultural undertakings' are authorized to utilize less than 100 m^3 and 300 m^3 per day without a license, respectively. Activity that "has no potential for significant adverse environmental effects" and "would not interfere with existing rights of other water users or waste depositors" is exempt from requiring a water license for wastewater disposal.

The *Zoning Bylaw* currently makes no distinctions for the suitability of such uses in serviced versus unserviced areas. Furthermore, no consideration is given during the development approval process as to whether or not a proposed water and/or wastewater-intensive business use is combined with a caretaker residence, which can be similarly intensive. The territorial approval processes do consider these aspects, but on a site-specific basis, and there are administrative challenges in assessing projects.

First, there is ambiguity around what constitutes a domestic versus commercial/industrial wastewater deposit in YG's septic system authorization process. Second, the *Yukon Waters Act* is ambiguous as to whether or not food and cannabis production in industrial areas qualifies for "agricultural" thresholds for water withdrawal. Third, a clear determination of whether or not the requirement for a water license for wastewater deposit is triggered is difficult to make on the basis of the complexities of discharge content and hydrological and/or geotechnical site-

specific factors at play. Lastly, there is little to no consideration of cumulative impacts of combined activities in the legislation or administration of it.

Water and wastewater activities of potential concern are by no means limited to food and beverage production. Currently, caretaker residences are permitted according to gross floor area versus the number of bedrooms or occupants. The City has heard of some residences housing five or more employees, and given the 80-100 gallon average daily water use of an individual (USGS, N.D.), there is potential for impacts on the local water table. Car washes are another business type that is associated with high water consumption and wastewater generation. Basically, any type of business with high water, wastewater, and contaminant-producing activities merits a closer look, whether located in serviced or unserviced areas.

The City and partners should endeavour to better understand these land uses and develop a regulatory framework that is both supportive of industry and protective of public health and the environment. A more fulsome examination of these issues falls outside of the project team's scope; however, some initial guidance is provided here. As a starting point, the City should seek clarity on legislative triggers for water use by indoor agriculture and wastewater contamination under the *Yukon Waters Act*. With guidance on these points, the City and YG should audit their respective application and review processes to ensure industrial and commercial wastewater is handled appropriately. The City could examine a range of in-house zoning options, including restricting water-intensive industries to serviced areas, increasing minimum lot sizes for water-intensive uses, and adding specific use requirements to car washes, breweries and indoor food and cannabis producers. A review of the City's *Sewer and Storm Utility Bylaw* and creation of information packages and applications geared to sectors of concern could also be helpful.

3.6.5 Other Considerations

The potential negative impacts of food and beverage production are not limited to water and wastewater. Some production activities have the potential to generate odours and waste byproducts that pose a nuisance, and even potential safety hazard (i.e., bear attractants), to adjacent landowners and/or users. Examples include abattoirs and larger-scale cannabis facilities. The former may be better suited to agricultural parcels located further away from urban areas altogether. If the City allows for such uses within the municipality, heavy industrial lands may be the most appropriate home for them.

4.0 LAND NEEDS FORECAST

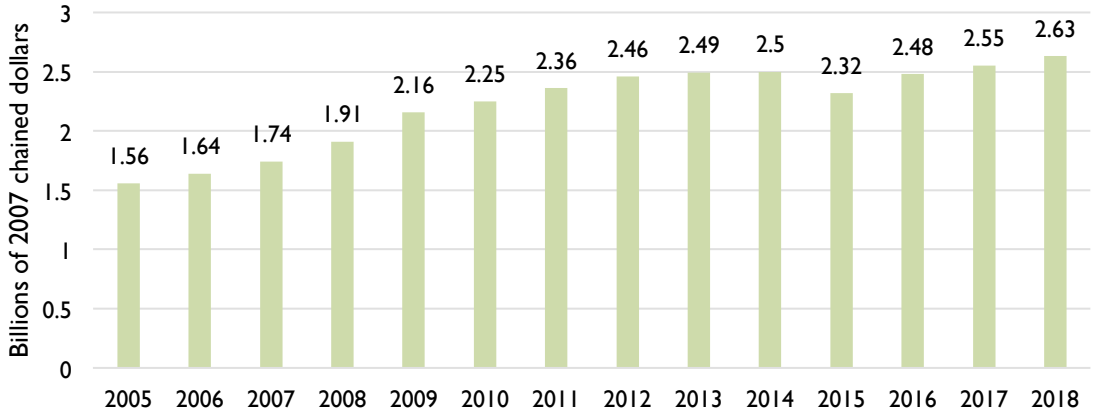
A healthy private sector economy will depend on the availability of suitable employment-oriented lands to meet the current and future needs of a range of business types. The following section examines key economic drivers and demand indicators, and concludes with a forecast of commercial and industrial land needs, by type, through to 2030 and 2040.

4.1 Macro-Economic Trends

4.1.1 Gross Domestic Product

The Yukon's Gross Domestic Product (GDP) is a key indicator of macro-economic performance. GDP of all industries increased almost 70% between 2005 and 2018. The steady increase and moderate decrease in the 2005 to 2014 corresponds with the commodities "supercycle" that saw an explosion in mineral exploration and production. While the cycle effectively ended around 2013, the residual economic decrease did not fully register until 2015, as shown in the chart below. Even with mineral exploration and production down in the 2016-2018 period, GDP continued to rebound, reaching a new high of 2.63 billion dollars in 2018. Please refer to Figure 16.

Figure 16. Yukon GDP Total, All Industries: 2009-2018

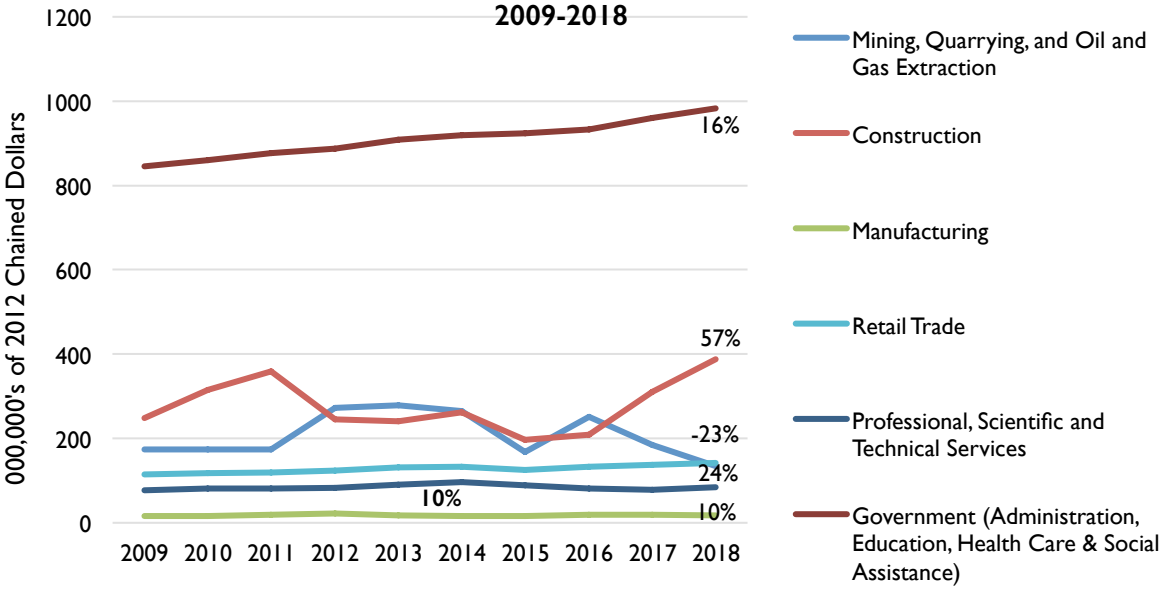


Source: YBS 2018 Annual Statistical Review

A closer look at the economic and industry sectors contributing to overall GDP reveals that the public sector far outstrips any other in terms of economic output, and further – that its growth has steadily increased over the past decade. This contrasts with other private sector-oriented industries such as Wholesale Trade, Manufacturing, and Professional, Scientific and Technical Services, all of which declined in tandem with the mining sector around 2015. Notably, construction output dropped well in advance of the mining industry "bust" due to a virtual halt in residential construction in Whitehorse.

Interestingly, GDP from most private sector-oriented industries has steadily increased from 2014-2016 lows and - as of 2018 - slightly surpasses those previous highs, despite the fact that Mining, Quarrying, and Oil/Gas Extraction GDP is still at pre-boom levels. This opposing trend suggests that private sector growth is underpinned by public sector spending, and possibly broader regional population growth. Refer to Figure 17 for a sample of GDP performance for a range of key economic sectors.

Figure 17. Yukon GDP, Selected Industries, and % Increase: 2009-2018

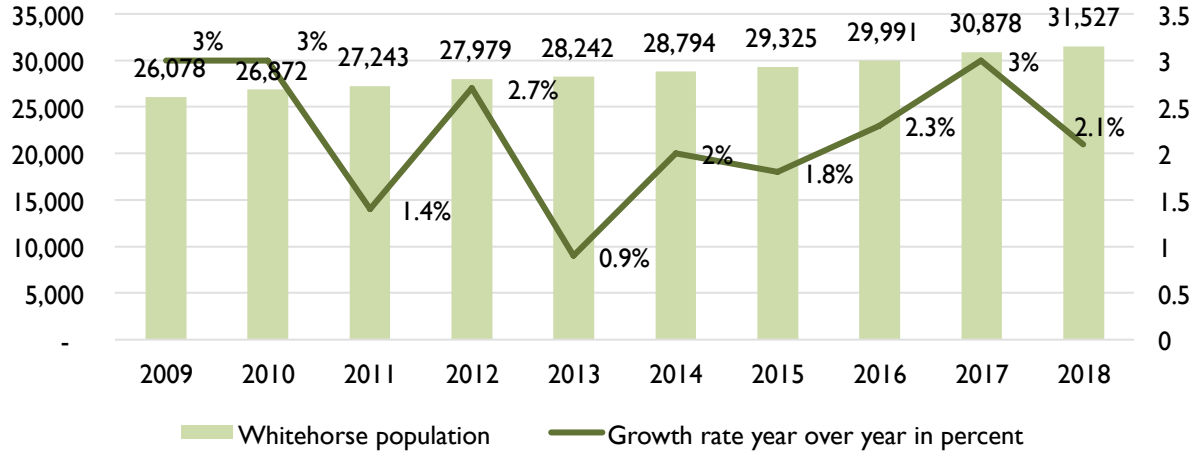


Source: YBS 2018 Annual Statistical Review

4.1.2 Population Growth

Whitehorse's population increased about 21% over the 2009 to 2018 period, from just over 26,000 residents to 31,527. An annual growth rate of 3% (considered "High" in the 2010 OCP) occurred 3 years out of 10, and no negative growth occurred. Refer to Figure 18. The post-2015 growth trend is in stark contrast to previous eras of depopulation following significant downturns in the Yukon mining sector (Jane of all Trades, 2015), suggesting that steady public sector growth has provided a stable foundation for continued population growth in Whitehorse. As of 2019, YBS' "preferred" 2030 and 2040 population projections for Whitehorse (and surrounding area) were almost 38,850 and 44,650, respectively.

Figure 18. Whitehorse Population and Population Growth Rate: 2009 - 2018



Source: YBS 2018 Annual Statistical Review

4.1.3 Economic Forecasts

The Conference Board of Canada (CBC) provides intermittent economic forecasting, upon which the Government of Yukon formulates its own projections. CBC's Fall 2018 Economic Outlook predicted the following:

- Healthy economic growth over the 2018-2030 period attributed to Victoria Gold's Eagle and Goldcorp's Coffee gold mines and the Casino mega-project;
- High economic growth (4-6%) in the 2018-2020 timeframe, with slower growth (3.4%) in the 2021-2025 period, rebounding to the 6% range for 2026-2030; and,
- High potential for labour shortages due to an older population and already high labour participation rates, necessitating domestic migration and/or immigration.

As recently as July 2019, CBC was already revising its forecast to factor in slower-than-anticipated mining sector growth, while remaining optimistic for 2020.

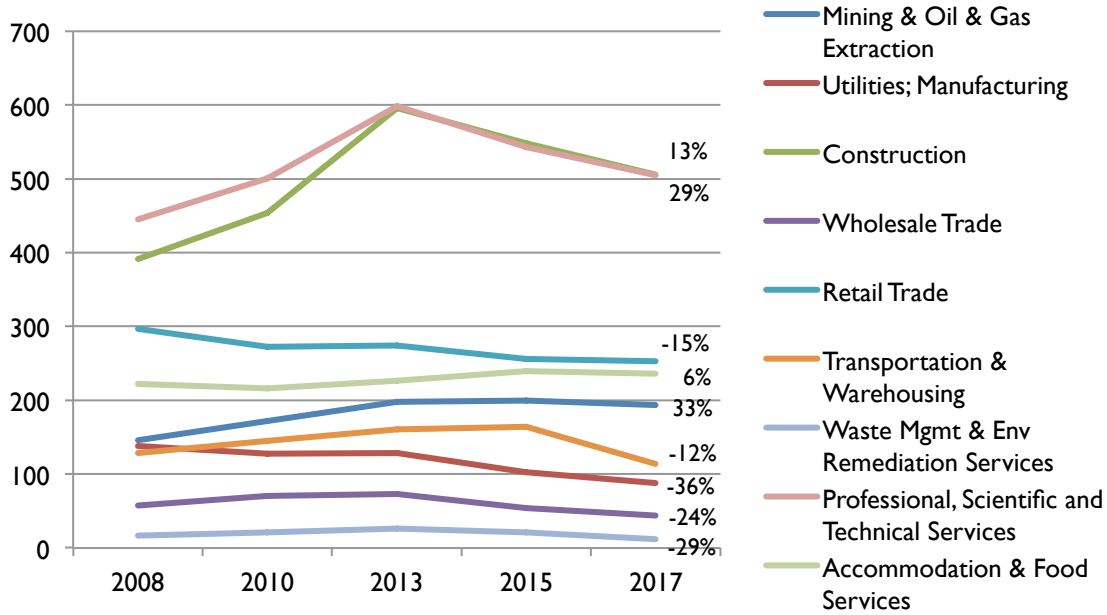
The trajectory of regulatory and environmental assessment processes, investor confidence, mineral prices, and other factors will ultimately dictate how accurate these predictions are. The continued surge in gold prices, buoyed in part by growing uncertainty in global stock markets, certainly lends credence to CBC's forecast in the short-term.

4.2 Industry Trends

4.2.1 Local Industry Growth

Looking at the growth and/or decline in number of Yukon businesses in sectors requiring I, MU-I/C and NR designated lands is a logical starting point to understanding past industry behaviour. Please refer to Figure 19.

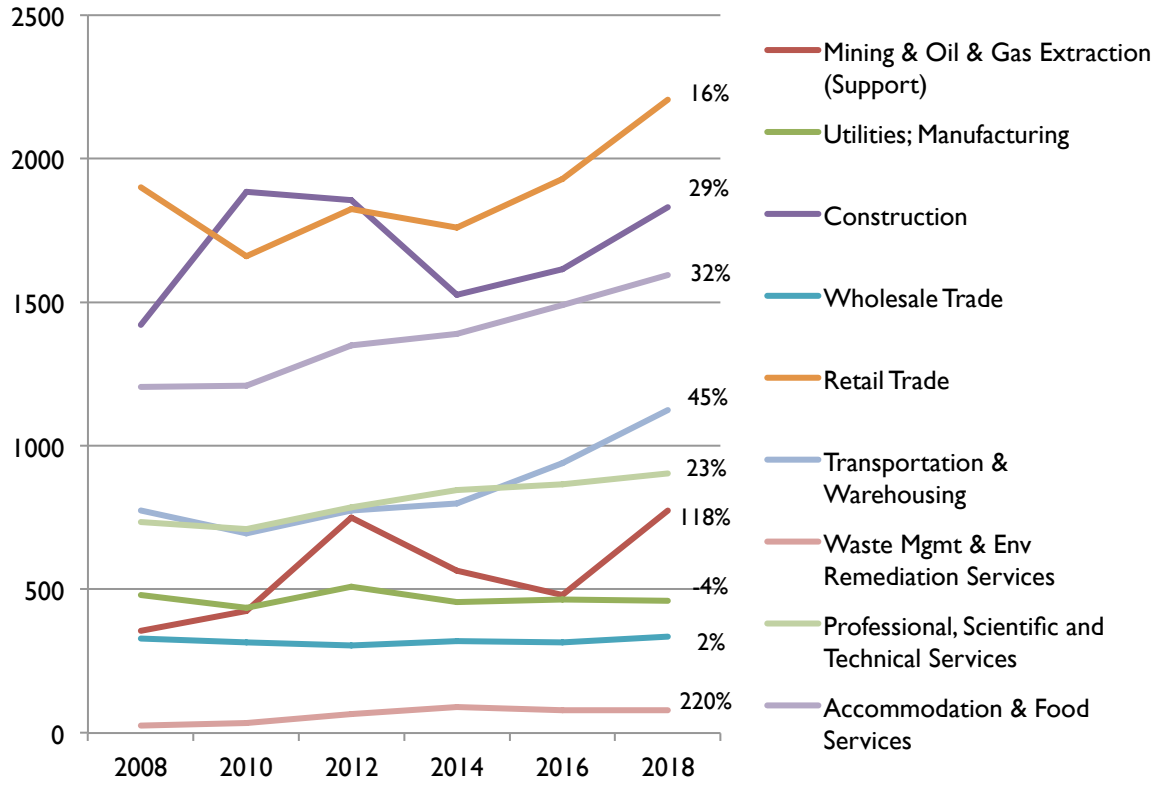
Figure 19. Number of Yukon Businesses by Industry Sector and % Increase: 2008-2017



Source: YBS 2017 Yukon Business Survey

The number of businesses in sectors such as Retail Trade, Transportation & Warehousing, Utilities & Manufacturing, Wholesale Trade, and Waste Management & Environmental Remediation trended strongly downward over the 2008-2017 timeframe. The number of Yukon businesses in Construction and Professional, Scientific & Technical Services sectors peaked in 2013 and subsequently declined, but has since increased beyond 2008 levels. Despite the commodities downturn, the number of Mining & Oil & Gas Extraction businesses increased about 33% over the decade. The Accommodation & Food Services sector maintained a consistent number of businesses over the timeframe[25].

Figure 20. Number of Yukon Employees by Industry Sector and % Increase, 2008-2018



Source: Statistics Canada via YBS, requested information

Sector-specific employment statistics show that, while the number of Yukon businesses in numerous industry sectors is down and/or stable over the past decade, the number of employees is generally increasing. The gains were most substantial in the Mining and Oil and Gas Extraction and Waste Management & Environmental Remediation sectors, while the Retail Trade, Construction, Transportation & Warehousing, Professional, Scientific & Technical Services sectors showed more modest increases. Employment in Utilities & Manufacturing declined slightly, whereas Wholesale Trade numbers held steady. Refer to Figure 20.

4.2.2 National Trends

Trends underway outside of the Yukon may influence the demand for commercial (highway/mixed use) and/or industrial lands within Whitehorse and include the following:

[25] This sector predominantly requires land within downtown areas but is included here for gross analysis.

- Continued growth of Internet-based commerce stoking demand for large-scale warehouse and distribution space, as well as "last-mile" delivery and storage supporting local distribution of goods purchased online;
- In urban markets with industrial land supply challenges, intensification of light industrial and warehousing buildings in select locations; and
- Rise in "buy/produce local" movement, stoking demand for artisanal, small-scale secondary production of goods.

4.2.3 What We Heard – Development Community

Interviewees from the real estate, First Nation development, and private development sectors weighed in on the future of Yukon's economy during discussions with the project team. Some felt that the private sector has become more diversified than it was previously, noting more entrepreneurs as one specific example, and predicted that this will help fuel some future demand. While there was a general feeling that the long-term economic outlook is positive, particularly during periods of low oil prices when access to the Yukon as a place to do business is optimized, future demand for employment lands was predicted to be more or less consistent with what has been observed in the past 10-20 years.

Figure 21. Marwell Industrial Area with Early Titanium Way Development in Foreground (Credit: Alistair Maitland Photography)

4.3 Projected Land Needs by Industry Sector

Based on the Yukon's economic performance over the previous decade, short and longer-term economic forecasting, and broader industry trends, the project team made the following broad assumptions for the 2019-2040 period:

- GDP and industry sector growth patterns are likely to exhibit a similar pattern (and annual average increase/decrease) to the 2009-2018 cycle due to projected short-to-medium term growth in the mining sector, with a peak and subsequent decline being realistic;
- The economy is likely to continue to be stabilized by public sector activity and GDP growth, providing a buffer in the event that mining sector activity drops significantly, and ensuring that population growth and demand for goods and services in Whitehorse remains on a steady (if modest) upward trajectory;
- The central Yukon location of mining exploration and production activities is likely to fuel future growth similar to the activities which spurred the 2006-2013 "supercycle", meaning that the distribution of employment and benefits to the Whitehorse economy should remain similar to the 2008-2018 average;
- The percentage of home-based versus non-home based employees in industry sectors requiring industrial and commercial lands will likely remain similar to 2017 levels;
- Average annual growth rates of employees in key sectors requiring industrial and commercial lands through to 2030 and 2040 will likely mimic 2008-2018 growth; and
- Negative 2008-2018 growth in the utilities/manufacturing sector may see a reversal due to anticipated growth in local food and beverage production activities, but this growth is very difficult to quantify and future land needs are better considered in a qualitative, versus quantitative, manner at this juncture.

In addition to those broad assumptions, the project team made further assumptions about how the current supply situation and industry sector growth could interact with the available land base through to 2030 and 2040:

- The latent demand for I and CIM zoned lots is based on historical sales for Mount Sima Phase II and Titanium Way, respectively, factoring in the non-linear relationship between land supply and demand over time. CH lot demand is based on anecdotal information, whereas IH lot demand is considered negligible;
- Some industrial-oriented sectors can (and will likely) be accommodated on both MU-I/C and I designated lands (detailed breakdowns shown below in Table 10);
- Demand for new visitor accommodations through to 2040 is assumed to be satisfied through new supply currently in the planning and/or construction phases in the vicinity of the downtown waterfront and/or redevelopment elsewhere in the downtown;
- Demand for new food services in 2030 and 2040 will likely be tied to incremental population growth and per capita spending that remains consistent with 2018/9 levels, with 15% of new food services tied to projected population growth locating outside of the downtown core and, of this portion, one-third to Commercial Service (CS) zoned areas within or adjacent to residential subdivisions;
- Retail trade-related land demand will likely be tied to population growth, per capita spending, and higher-ratio industry-standard retail support, with 15% of regional-serving and 85% of local-serving businesses locating outside of the Downtown core in MU-I/C designated areas. Of these portions, one-third and two-thirds respectively, locating in CS zoned areas within or adjacent to residential subdivisions; and
- New lots will be developed in areas with good development potential, resulting in a gross land to lot yield of 75%.

Factoring in all of these assumptions, the project team projects that approximately 32 and 87 hectares of gross (or undeveloped) MU-I/C and I designated lands, respectively, will be required to address current latent demand and accommodate private sector growth through to 2040. Refer to Table 10.

Table 10. Projected Industry Needs for MU-I/C and I Designated Lands, 2030 and 2040

Industry Sector – Industrial/ MU-I/C	Total Land Demand (ha)		Land Allocation		2030 Land Demand		2040[26] Land Demand	
	2030	2040[27]	MU-I/C	I	MU-I/C	I	MU-I/C	I
Mining & Oil & Gas Extraction (Support Services)	10.8	20.1	10%	90%	3.8	7.0	7.0	13.1
Utilities; Manufacturing	0.0	0.0	35%	65%	0.0	0.0	0.0	0.0
Construction	5.5	10.5	35%	65%	1.9	3.6	3.7	6.8
Wholesale Trade	0.0	0.0	50%	50%	0.0	-	0.0	-
Transportation & Warehousing	9.2	17.5	20%	80%	1.8	7.4	3.5	14.0
Waste Management & Environmental Remediation	0.76	1.90	-	100%	-	1.3	-	2.5
Industry Sector - MU-I/C Only	**Total Land Demand (ha)**		**Land Allocation**		**2030 Land Demand**		**2040[28] Land Demand**	
	2030	2040[29]	Downtown & Comm Service	MU-I/C	MU-I/C	I	MU-I/C	I
Professional, Scientific & Technical Services	0.9	1.7	50%	50%	0.4	-	0.8	-
Accommodation & Food Services	0.7	1.2	90%	10%	0.07	-	0.1	-
Retail Trade - Regional	6.3	11.7	85%	15%	0.6	-	1.2	-
Retail Trade – Local Serving	3.9	7.2	57.5%	42.5%	1.1	-	2.0	-
SUB-TOTAL – Future Demand	**38.1**	**71.8**	**-**	**-**	**9.7**	**18**	**18.3**	**33.9**
SUB-TOTAL – 2019 Latent Demand	**37.3**	**37.3**	**-**	**-**	**5.8**	**31.5**	**5.8**	**31.5**
TOTAL – Land Demand (Net)	**75.4**	**109.1**	**-**	**-**	**15.5**	**49.5**	**24.1**	**65.4**
TOTAL – Land Demand (Gross)	**100.5**	**145.5**	**-**	**-**	**20.6**	**66.0**	**32.1**	**87.2**

Detailed background calculations and associated assumptions are included in Appendix F.

[26] Inclusive of 2030 demand.
[27] Inclusive of 2030 demand.
[28] Inclusive of 2030 demand.
[29] Inclusive of 2030 demand.

5.0 FUTURE LAND SUPPLY OPTIONS

An estimated 120 hectares will be required to address anticipated future and current latent demand for MU-I/C and I designated lands over the next 20 years. The following sections examine some of the options for meeting this need, including:

- Maximizing existing development through infill, redevelopment and/or intensification, and enhanced servicing;
- Greenfield development; and
- Brownfield development.

5.1 Maximizing Existing Developed Areas

In the interests of minimizing Whitehorse's development footprint and potentially costs, the maximization of existing developed areas warrants consideration. Three specific strategies – infill, higher utilization (or redevelopment) of developed properties, and intensification via servicing – are briefly reviewed here.

5.1.1 Infill

The team drew from information provided by City staff and previous desktop investigations conducted by the City to identify potential opportunities for infill in already developed industrial and/or commercial areas outside of the downtown core. This was not intended to be an exhaustive inventory but rather a "snapshot".

The team's review found that there are at least 80 hectares of lands potentially available for infill development, of which almost two-thirds is under Commissioner's and/or City ownership. A little over half of Commissioner's and/or City infill lands are both designated and zoned for commercial and/or industrial uses. Some KDFN parcels have the appropriate zoning but are designated FNFP under the 2010 OCP. Refer to Table 11.

Table 11. Select Infill Opportunities for Commercial and Industrial Land Supply

Area	Designation	Zoning	Estimated Area (ha)	Public Land (ha)	First Nation Land (ha)	Description
Kulan	I	IS	12.7	9.5	3.2	City lot (snow dump), 2 TKC parcels
	I	FP	10.4	10.4	-	YG parcel south of City lot
	FNFP	IS	13.9	-	13.9	KDFN parcels
Marwell	FNFP	CIM	8	-	8	KDFN Lot 226
MacRae	IND	IS	5.6	5.6	-	YG land, including 2 surveyed lots
Range Road	MU-I/C	CIM	1.5	1.5	-	Vacant parcel south of new Municipal Operations Building
	PS	PS	1	1	-	Area north of new Municipal Operations building
Mount Sima	I	IS	8	8	-	Greenspace on Collins Drive
	I	FP	11	11	-	Greenspace on Mt. Sima Road
	FNFP	IS	10.3	-	10.3	KDFN parcels
TOTAL – MU-I/C LANDS			**10.5**	**2.5**	**8**	
TOTAL – IND LANDS			**71.9**	**44.5**	**27.4**	

These infill areas could completely satisfy the forecasted 2030 needs for I designated land and almost half of forecasted 2030 needs for MU-I/C designated land. It should be noted that CH zoned land needs may be underserved due to the limited potential remaining in the sole infill area suitable for that designation: Range Road.

5.1.2 Redevelopment

The team's Spring 2019 field survey found approximately 12 hectares of vacant IS properties, over half of which were located in the Mount Sima subdivision. The Google Earth desktop review concluded that site usage (which includes buildings, outdoor storage, parking, etc.) was typically in the 80-100% range in virtually all areas but generally higher for the smaller lots in Taylor and Burns Road areas and generally lower in Mount Sima, where the lots are largest.

The field survey also noted that some redevelopment is occurring in the MacRae area, a positive trend given the subdivision's age and higher likelihood of having less desirable (i.e., efficient, in good repair, etc.) building stock. The team also attempted to verify anecdotal reports of unproductive "junkyards" with no current business activity occupying land. A few candidate properties were identified in MacRae and Kulan; otherwise, the team concluded that this does not appear to be a widespread problem.

The team notes that almost one-third of online survey respondents indicated plans to expand an existing building over the next decade and over one quarter indicated plans to add a new building to their property. It would appear that redevelopment will likely be a key strategy by which property and business owners meet their needs in the coming years.

5.1.3 Enhanced Servicing

Servicing of currently developed but unserviced areas could theoretically free up lot area dedicated to on-site septic and water systems, allowing for higher lot utilization and potentially subdivision. More serviced areas could also accommodate industries that use or produce high volumes of water and/or wastewater during the production process. As such, the team investigated opportunities to extend water and sewer servicing to two unserviced areas in relatively close proximity to municipal infrastructure: Kulan and Taylor industrial subdivisions.

As discussed in Section 2, the installation of municipal water service in Taylor would be possible by connecting to the adjoining system in Porter Creek. Connecting to Porter Creek water lines will provide very good fire flows and will likely contribute to increased fire flows in the Crestview subdivision; there is a possibility that a water circulation pump station may be required. It is also possible to install sanitary sewer within the subdivision with a connection to the existing sanitary sewer system in Porter Creek near the Porter Creek Flush Tank on Larch Street (although a review of the existing manhole invert elevations is required to confirm whether it can be achieved with a gravity collection system or it requires a lift station). Alternatively, there is likely sufficient capacity at the active Crestview lagoons to accommodate the Taylor subdivision. For now, the City is paving roads within the subdivision.

The Porter Creek reservoir is located within the Kulan subdivision. The City installed a new water main along Laberge and Bennett roads in Summer 2019 as part of the servicing plan for the new Brookside development immediately south of Crestview. Lots located along the Bennett/Laberge corridor could connect to this water main, but the water pressure at the higher elevations will be marginal, and water pressure boosting pumps will be required by lot owners.

A gravity sanitary sewer could be installed within the Kulan subdivision and connected to the sewer system at Centennial Street and the Alaska Highway; there is an existing highway sewermain crossing at this location that connects to the gravity sewer system in Porter Creek. A review of the capacity of the sewermains that the Kulan subdivision would tie into should be completed prior to proceeding with a connection to the sewer system. Alternatively, if there are capacity issues with the Porter Creek sanitary sewer system, the Kulan subdivision could tie into the Crestview Lagoon.

Estimated costs for extending full municipal servicing to the Taylor and Kulan subdivisions range from $4 to $7.6 million dollars each. Refer to Table 13 (and Appendix I for detailed calculations).

	Taylor Subdivision	Kulan Subdivision
Water Service	$2 - $2.6 million	$3.6 - $4.8 million
Wastewater Service	$2 - $2.5 million	$2.2 - $2.9 million
Total	**$4 - $5.1 million**	**$5.8 - $7.6 million**

Table 12. Estimated Servicing Costs for Taylor and Kulan Subdivisions

The very high (~90%+) typical lot utilization in both areas suggests that the potential for subdivision and new lot creation, even assuming property owner support, is minimal: the area freed up by a decommissioned septic field is considerably smaller than a typical lot. However, lower elevation lots in Kulan should be encouraged to connect to municipal water to increase their relative productivity and ability to accommodate water intensive uses.

5.2 Greenfield Development

5.2.1 Inventory of Candidate Lands

The team undertook a terrain-based evaluation of broad development potential for candidate future commercial and industrial lands across Whitehorse, focusing in particular on:

- Undeveloped areas currently designated I and/or MU-I/C in the 2010 OCP; and,
- Undeveloped areas designated FP or FNFP located adjacent to areas currently designated I and/or MU-I/C.

The analysis showed that about 58% of candidate lands have either good, or good with some constraints, development potential. 13% of candidate lands were deemed to have moderate potential, 26% were deemed to have poor potential, and the remainder (the former Whitehorse Copper site) were considered moderate potential with special considerations. Of the candidate lands with good potential, 9% and 11% are already designated MU-I/C and I, respectively. 24% of candidate lands with good development potential is First Nation Settlement Land[30]. Refer to Table 13 and Appendix H for the accompanying maps.

Development Potential Classifications

The four classifications used are:

- **Good** - few to little physical limitations to development
- **Good with Some Constraints** - relatively good development potential, with possible areas of sporadic or intermittent steep slopes or bedrock near surface or other processes that may create localized challenges
- **Moderate** - some development potential, but likely terrain challenges associated with steep topography and near-surface bedrock that may limit development or make development difficult and/or more costly
- **Poor** - multiple terrain challenges thatwould make development difficult and costly

Detailed methodology is in Appendix G.

Table 13. Overview of Potential Candidate Lands for Future Commercial and Industrial Activity

Development Potential Land Classification	Total Area		Public Land		First Nation Land		MU-I/C Designation		I Designation	
	ha	%	ha	%	ha	%	ha	%	ha	%
Good	959	25	733	76	227	24	89	9	109	11
Good with Some Constraints	1254	33	1189	95	65	5	84	7	281	22
Moderate Potential	474	13	460	97	14.6	3	10	2	34	7
Moderate with Special Considerations	101	3	101	100	-	-	-	-	57	57
Poor	996	26	881	88	115	12	5	.5	84	8
Total Analyzed	**3784**	**100**	**3363**	**89**	**421**	**11**	**187**	**5**	**566**	**15**

The team's analysis is high-level in nature; as such, further site-specific due diligence, including more detailed geotechnical analysis, would be required prior to final confirmation of suitability and/or a decision for development to proceed.

5.2.2 First Nation Settlement Lands

The land inventory conducted by the team identified that approximately 11% of undeveloped lands located adjacent to and/or within designated Industrial and/or MU-I/C areas are First Nation Settlement Land. Many of

[30] The inclusion of First Nation lands in the development suitability analysis was triggered by adjacency to OCP designated areas and broader interest in examining the potential land base as a whole, versus specified development intent.

these Settlement Land parcels are located in central and strategic areas; as such, they should be considered critical pieces in the medium and long-term development puzzle in Whitehorse.

The 2010 OCP dealt with TKC and KDFN lands quite differently. TKC lands were largely designated the same as adjacent public lands. KDFN lands, by contrast, were designated FNFP with no specified future land use[31]. In the *Zoning Bylaw*, TKC lands are zoned FP and most KDFN parcels are zoned FNFP. However, numerous KDFN parcels are also zoned CIM and IS – notably in Marwell and Mount Sima Industrial Area.

After YG, KDFN is the largest landowner within municipal boundaries. KDFN's *Self Government Agreement* establishes the intended land uses for its 59 Type 2 land parcels, all of which must be planned and zoned in a manner consistent with the City's OCP. Commercial and industrial land uses are envisioned for over 50% of KDFN's Type 2 parcels. Refer to Figure 20.

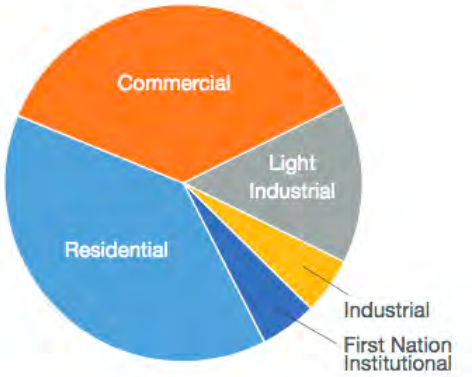


Figure 22. Breakdown of KDFN Type 2 Parcels by Intended Land Use
Source: Kwanlin Dün First Nation

While Settlement Lands can not be sold or given away, both KDFN and YG have taken important strides in recent years to ensure that the economic potential of Settlement Lands within the city can be maximized and municipal property taxes offset. The *Land Titles Act* and KDFN's *Self Government Agreement* were amended to allow for the registration of First Nation lands on the territory's land registry without affecting Aboriginal rights and title. There are tested examples of residential and commercial leases registered in the territory's Land Titles Office for up to 125 years. CNDC's Hammerstone business park in Marwell will consist of more than 30 such commercial leases at full build-out.

TKC is not actively pursuing development of its Settlement Lands for third party use at the present time. Instead, the government is hoping to undertake a planning process with citizens to determine the desired use of TKC parcels both within and outside of the municipality. For the foreseeable future, its Da Daghay Development Corporation is focusing most of its land development activities on fee simple parcels.

5.2.3 Potential New Serviced Areas

The team investigated opportunities and costs to develop and provide full municipal services to numerous greenfield areas deemed to have good (or good with some constraints) development potential, including:

- "Taylor North";
- "Kulan West";
- Kopper King Area;
- "Hillcrest South"; and
- Robert Service Way/Hamilton Boulevard.

The following section examines potential new commercial and/or industrial areas in more detail and highlights potential development costs and considerations. Preliminary conceptual servicing maps are included in Appendix I.

[31] The expectation at the time was that KDFN would be applying its own zoning regime to these parcels.

- "Taylor North"

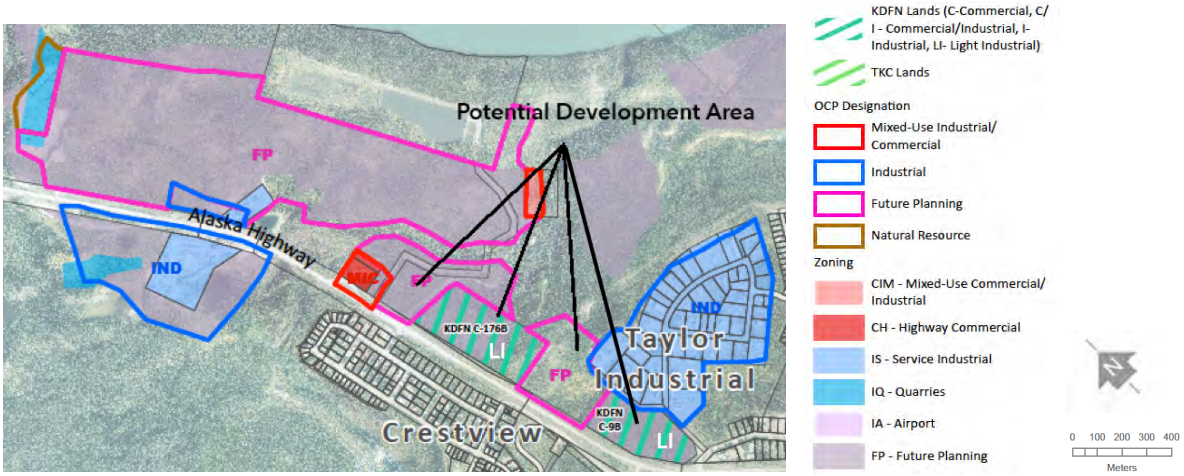


Figure 23. Map of Potential Development Area for "Taylor North"

Figure 24. Potential Development Area for "Taylor North" with Crestview in Foreground (Credit: Alistair Maitland Photography)

Description: The "Taylor North" area is located immediately north of Taylor Industrial Area, between the Alaska Highway and Yukon River. The area is predominantly Commissioner's land designated FP, but KDFN parcels C-9B and C-176B are located within it. Refer to Figures 23 and 24.

Servicing: There is three-phase power along the Alaska Highway corridor north of Porter Creek; however, ATCO reports that a new development could potentially trigger an upgrade to the Laberge substation located in the Kulan subdivision, which would require additional land.

Gross Developable Area	42 ha
Net Developable Area	34 ha
Estimated Development Costs	$8,100,000
Cost per Developed Hectare	$238,235/ha

Table 14. Estimated Development Costs for "Taylor North"

There are existing watermains between the Taylor subdivision and highway that could service this development area. The available fire flows are low for an industrial area (75-100 L/s) and the possibility of increasing them should be considered as part of the future servicing plan. Since this is the north end of the water system, a pump station may be required for freeze protection. A sanitary sewer system that services this area could tie into the Crestview lagoon trunkmain north of the site. There is likely sufficient capacity to accommodate the flows from this subdivision with a gravity collection system, subject to confirmation via a review of the capacity of the Crestview lagoon and trunkmain. Should there not be sufficient capacity, a lift station would be required to pump the wastewater flows to the existing sewermain at Centennial Street and the Alaska Highway; however, this will be more costly both on capital and operating fronts. The estimated cost for "Taylor North" per developed hectare is $238,235. Refer to Table 14.

Other: There is merit in considering the potential for MU-I/C designation and CIM zoning for directly highway accessible portions of "Taylor North". The terrain may provide natural "breaks" and buffers between uses. KDFN has an interest in potential development of C-9B and has completed some preliminary investigations to this end; C-176B is further on the development horizon.

- "Kulan West"

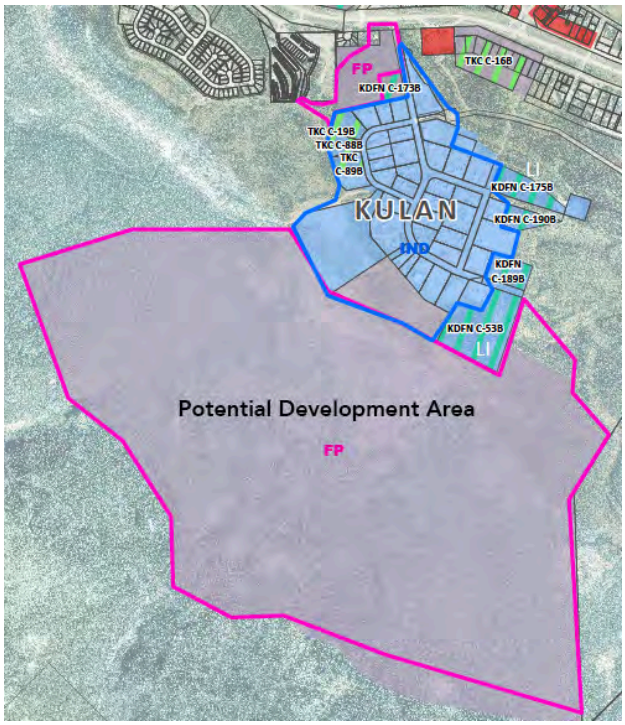
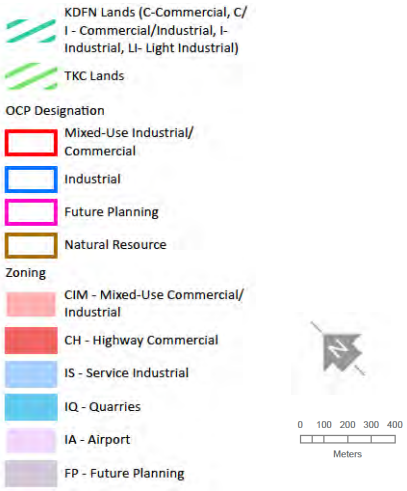


Figure 25. Map of Potential "Kulan West" Development Area

Figure 26. Potential "Kulan West" Development Area
(Credit: Alistair Maitland Photography)

Gross Developable Area	197 ha
Net Developable Area	NA
Estimated Development Costs	NA
Cost per Developed Hectare	NA

Table 15. Estimated Development Costs for "Kulan West"



Description: The "Kulan West" area is located immediately west of Kulan Industrial Area on a predominantly east-facing slope. The majority of the area is deemed to have good (with some constraints) development potential; however, a large portion at lower elevations and adjacent to Kulan has poor potential due to permafrost, steep slopes, and poor drainage. The area is currently designated FP. Refer to Figures 25 and 26.

Servicing: ATCO predicts that installing any power poles in this area would be very costly due to the rocky terrain and distance from existing infrastructure. Similar to "Taylor North", servicing this area would most likely trigger upgrades to the Laberge Substation.

Preliminary power servicing costs are in the $2-3 million range, not including upgrades to the substation ($500,000+). From a water and sewer servicing perspective, similar challenges would be encountered working with rock to install the watermains and sewermain. A new water reservoir and booster station would also be required to service this area.

Given these challenges and associated variables, it is very difficult to estimate the development costs without a more extensive review. The team predicts that the costs to develop and service this area would be much higher than the other potential greenfield areas.

- Kopper King Area

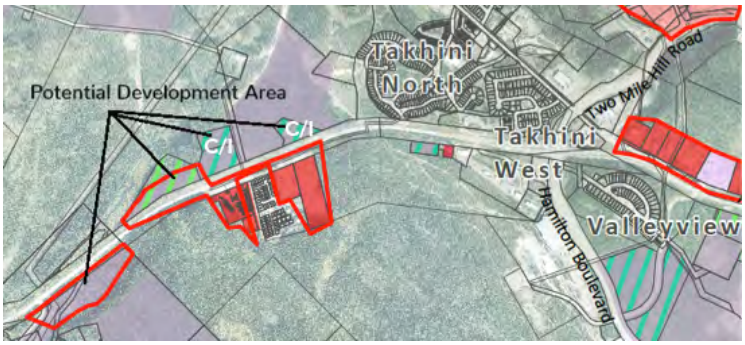


Figure 27. Map of Potential Kopper King Development Area

Figure 28. Potential Kopper King Development Area, with Kopper King Neighbourhood in Foreground (Credit: Alistair Maitland Photography)

Gross Developable Area	14 ha
Net Developable Area	11 ha
Estimated Development Costs	$10,300,000
Cost per Developed Hectare	$936,364/ha

Table 16. Estimated Development Costs for Kopper King Area

Description: The Kopper King development area is comprised of First Nation Settlement Land parcels and unoccupied Commissioner's lands located across the Alaska Highway to the north, and west along the highway about 500 metres. Refer to Figures 27 and 28.

Servicing: There are three-phase powerlines that run along the highway that could be used to service this development area. The terrain is fairly low lying with poor drainage and ATCO has had issues with its power poles falling over and needing replacement. Any development of this area would benefit from building up the wet marshy areas with appropriate fill.

A watermain from the McIntyre Booster Station supplies water to three fire hydrants along Kopper King (with good fire flow at 150-250 L/s) and a sewermain that services Kopper King connects to the sanitary sewer system in Takhini. This area could connect to the existing water and sewer infrastructure that services Kopper King; however, a water circulation pump station may be required for freeze protection. The estimated cost per developed hectare of the Kopper King area is $936,364. Refer to Table 16.

Other: The idea of a more direct connection between the Alaska Highway and Yukon College area via the Kopper King area has been raised in various plans over the past 20 or so years, but the continued build-out and increasing population of Whistle Bend has the City now more closely considering it. The development of employment lands in this area would benefit from the construction of this connector road, should it proceed. Should it not, a new highway intersection would be required, along with a frontage road to meet modern highway safety standards.

- "Hillcrest South"

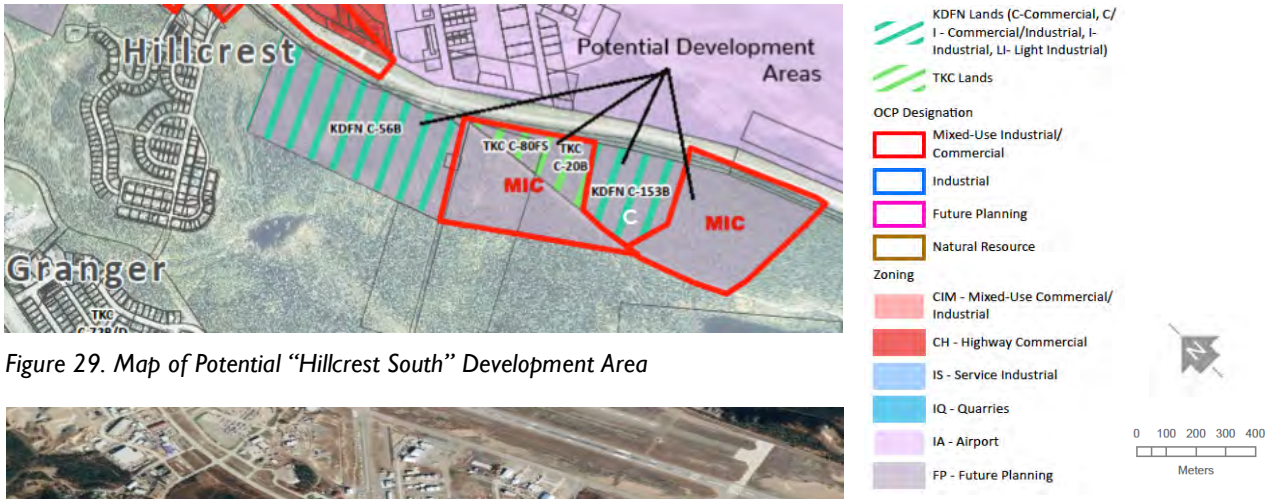


Figure 29. Map of Potential "Hillcrest South" Development Area

Figure 30. Potential "Hillcrest South" Development Area
(Source: Google Earth 2019)

Gross Developable Area	60 ha
Net Developable Area	48 ha
Estimated Development Costs	$17,500,000
Cost per Developed Hectare	$364,583/ha

Table 17. Estimated Development Costs for "Hillcrest South"

Description: The "Hillcrest South" development area is located south of Hillcrest on the west side of the Alaska Highway. It is comprised of both KDFN and TKC Settlement Land parcels and unoccupied Commissioner's lands. Refer to Figures 29 and 30.

Servicing: There is three-phase power along the highway and the area could be serviced from this existing power. ATCO has encountered challenges installing overhead power in these areas due to airport restrictions; for example, the power along Hamilton Boulevard is underground (which was much more costly to install) and was likely due to airspace restrictions during the design phase. NAV CANADA and Transport Canada would need to be carefully consulted as part of future development plans.

KDFN parcel C-56B is designated for Commercial/Residential use in the Self-Government Agreement, while C-153B is designated Commercial. KDFN undertook a market opportunities analysis for a mixed-use development on C-56B several years ago.

"Hillcrest South" could be serviced from the existing water and sewer infrastructure in Hillcrest as well as the water and sewermain stubs that cross the Alaska Highway at Lodestar Lane. The area would require a new highway intersection and service roads (assuming multiple adjacent properties) in order to meet the vision set by YG for the Alaska Highway corridor. The "Hillcrest South" area is swampy and would likely need to be built up to construct an appropriate road. Steeper slopes in the southern-most portion of "Hillcrest South" may pose further constraints. The Ice Lake Road would need to be factored into detailed subdivision design as well.

The estimated cost per developed hectare for "Hillcrest South" is $364,583. Refer to Table 17.

- Robert Service Way/Hamilton Boulevard

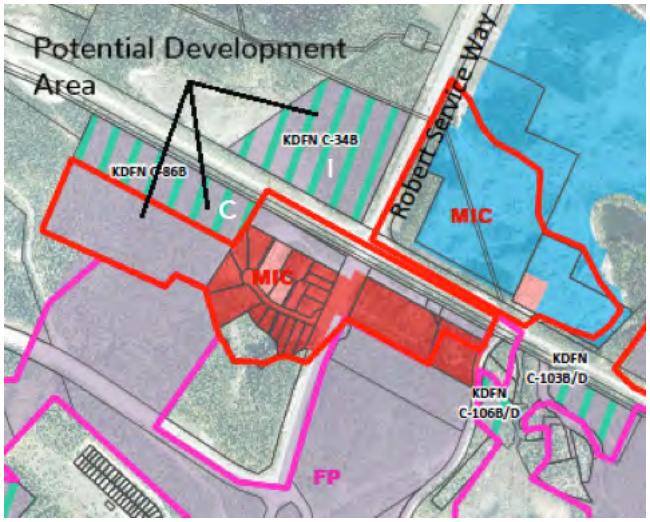


Figure 31. Map of Potential Robert Service Way/Hamilton Boulevard Development Area

Figure 32. Potential Robert Service Way/Hamilton Boulevard Development Area, With Metropolit Lane in Foreground (Credit: Alistair Maitland Photography)

Gross Developable Area	23 ha
Net Developable Area	18 ha
Estimated Development Costs	$11,900,000
Cost per Developed Hectare	$661,111/ha

Table 18. Estimated Development Costs for Robert Service Way

Description: This development area is located at the intersection of Hamilton Boulevard and Robert Service Way with the Alaska Highway, approximately half a kilometre south of "Hillcrest South". The area is comprised primarily of KDFN Settlement Land, with some adjacent Commissioner's lands. It is immediately north and east of the Metropolit Lane development, which does not have municipal water or sewer. Refer to Figures 31 and 32.

Servicing: The three-phase power running along the highway could be used to service this area, subject to the same airspace and limitations discussed previously for "Hillcrest South". The watermain that terminates at Lodestar Lane immediately south of the airport would need to be extended and a lift station installed at the Robert Service Way intersection to pump the wastewater to the existing sewermain on Lodestar Lane.

Road development considerations would be similar to those for "Hillcrest South"; however, standing water is not an issue in this area. The estimated cost per developed hectare for Robert Service Way is $661,111. Refer to Table 18. Note that only those portions of the area deemed to have good (or good with some constraints) development potential were included in the scope; the total land yield would increase (and per hectare costs possibly decrease) if moderate potential lands (i.e., FP designated areas with known near surface bedrock issues) were incorporated as well.

Other: The "Hillcrest South" and Robert Service Way areas could be simultaneously or sequentially serviced as part of a larger Alaska Highway development.

5.2.4 Potential New Unserviced Areas

The team investigated opportunities and potential costs associated with developing several greenfield areas south of Downtown, "MacRae East" and "Utah", with only partial servicing – specifically roads, power, and communication infrastructure.

- "MacRae East"

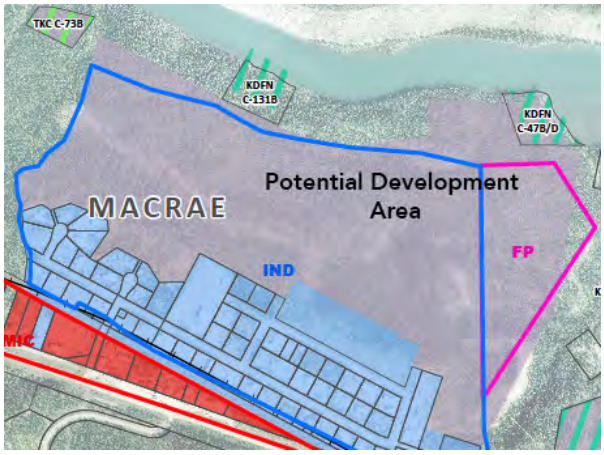
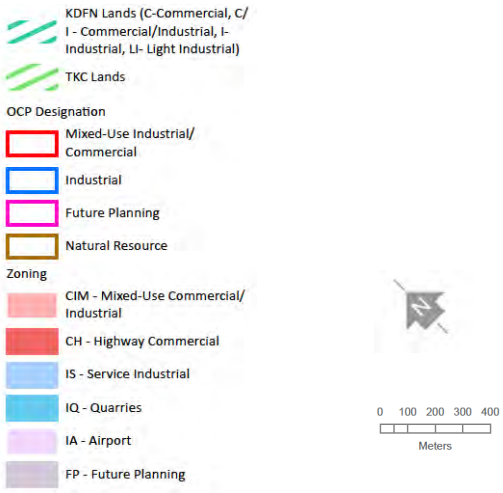


Figure 33. Map of Potential Development Area for "MacRae East"

Figure 34. Potential Development Area for "MacRae East", with MacRae in Background (Credit: Alistair Maitland Photography)

Gross Developable Area	84 ha
Net Developable Area	67 ha
Estimated Development Costs	$10,500,000
Cost per Developed Hectare	$156,716/ha

Table 19. Estimated Development Costs for "MacRae East"

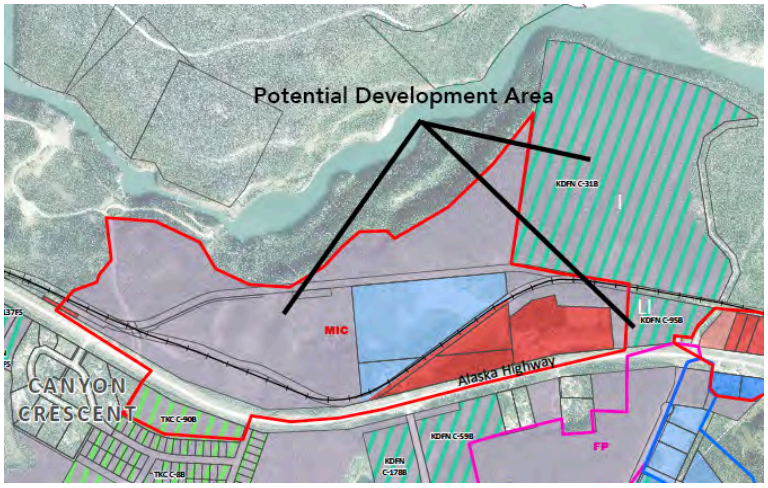


Description: "MacRae East" is situated directly east of the MacRae Industrial Area, about five kilometres south of the Robert Service Way/Hamilton Boulevard intersection with the Alaska Highway. The development area is bordered by the Yukon River to the east. The vast majority of the area was designated Industrial in the 2010 OCP; a small Future Planning area is adjoined. The entire area is vacant Commissioner's land. Several small TKC and KDFN parcels are located adjacent to the east and north, two directly on the river. Refer to Figures 33 and 34.

Servicing: There is currently three-phase power in MacRae but the anticipated load on the system could be tripled with development of this area (based on its size); as such, it is very likely that the MacRae substation would need to be upgraded. There is a continuous steep slope separating MacRae from "MacRae East"; access and development would presumably be confined to the gentler grades to the east, where terrain conditions are good for road/lot development and installation of new power infrastructure. KDFN's and TKC's residential interests for their nearby parcels is also likely to influence potential development yield, and a suitable buffer would need to be identified. The estimated cost per developed hectare for "MacRae East" is $156,716. Refer to Table 19.

Other: This area sees nominal land-based recreational use. However, there is considerable boat traffic on this stretch of the Yukon River; additionally, the Yukon River Trail runs along the opposite high bank of the river and is well utilized. As such, preserving aesthetics from the Yukon River corridor would be a key consideration in planning the development.

- "Utah"



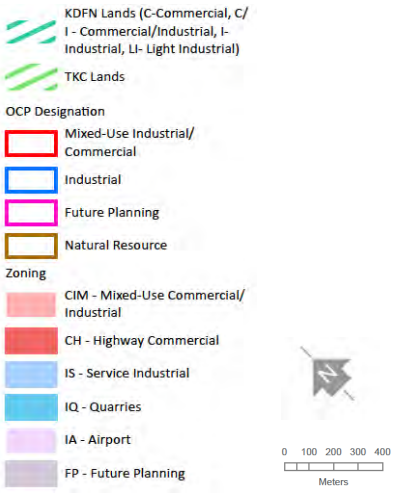


Figure 35. Map of Potential Development Area for "Utah"

Figure 36. Potential Development Area for "Utah" (Source: Google Earth)

Gross Developable Area	172 ha
Net Developable Area	NA
Estimated Development Costs	NA
Cost per Developed Hectare	NA

Table 20. Estimated Development Costs for "Utah"

Description: The "Utah" area is situated north of "MacRae East" and bordered by the Alaska Highway to the west and Yukon River to the east. The area is comprised of vacant Commissioner's lands and KDFN parcel C-31B.

White Pass and Yukon Route (WPYR) railway's Utah Siding yard, zoned IS, is located immediately adjacent to the area. The railway and a former pipeline traverse the area and both rights-of-way are owned by WPYR.

A preliminary conceptual planning study was undertaken for the area in 2016 by Inukshuk Planning and Development in response to a private interest in developing a sand and gravel quarry.

Servicing: The study noted a number of development challenges, most notably an estimated 1,200,000 m^3 net fill requirement to develop a sizeable portion of the area, and access and land tenure issues by private property and rights-of-way. The study concludes "it will be difficult to pursue the efficient development of this area without the cooperation and support of White Pass". Given these challenges, the team did not develop a preliminary cost estimate. However, the very similar (and favourable) ground conditions and similar power upgrade requirements to "MacRae East" lead the team to assume that per hectare development costs would be in a similar range for Utah. Perhaps the most significant variable, and a likely source of higher costs, would be the resolution of the access and land tenure issues during the planning stages.

Other: Another noteworthy constraint to development of this area is local recreational, heritage, and aesthetic values. The aforementioned quarry project raised significant public concerns due to its proximity to and views of from Miles Canyon, one of Whitehorse's most historic, scenic, and well-visited landmarks. The historic Hepburn Tramway line runs through the development area as well.

5.2.5 Overall Development Suitability

Incorporating the results of the development potential analysis and preliminary servicing cost estimates, the team created a matrix of broad potential development criteria for the greenfield areas described above. This largely qualitative tool facilitated a high-level understanding of how well each area performs against a suite of planning considerations, including compatibility with adjacent land uses, protection of environmental and recreational values, and strategic coordination with other prospective development, including First Nation Settlement Lands and future residential areas. Refer to Table 21.

The matrix suggests that the "Taylor North" and "Hillcrest South" areas currently have the most favourable development conditions for serviced employment lands. The Robert Service Way area may be as favourable (if not more so) than the "Hillcrest South" area if moderate development potential lands are incorporated and per hectare costs are reduced. The ability to manage near surface bedrock, and recover the associated higher costs of servicing, would be a deciding factor in whether or not to develop the entire Robert Service Way area (versus a portion). The costs to fully service Kopper King are significantly higher than the other areas, and at this early stage, the team posits that Kulan would be even more expensive. The potential for arterial road development could improve the Kopper King area's economics, whereas there is no foreseeable co-development scenario for Kulan.

First Nation Settlement Lands, particularly those of KDFN, constitute a sizeable portion of all three areas; as such, the orderly and efficient development of them will be contingent upon some form of co-development between territorial and First Nation governments. KDFN's priorities may help to determine which area should be developed first. The question of "which first" may also be answered in part by the pending OCP's determination of where future residential development will occur. Should the Lobird-McLean Lake area (or Southern Urban Containment Boundary) be the priority over the next 10-20 years, the economics of Hillcrest South and Robert Service Way could improve significantly. Alternately, "Taylor North" is located near the growing residential neighbourhood of Whistle Bend, which will be Whitehorse's largest population node when fully built out.

In terms of unserviced employment lands, "MacRae East" appears to offer the most favourable development conditions at the present time. "Utah" is almost twice the size as "MacRae East" and holds significant development potential. However, the development complexity it poses, in addition to the higher relative recreational and aesthetic values it is believed to have (in comparison to "MacRae East") may render it a less suitable option if the goal is to minimize development costs and provide affordable unserviced lots on a cost recovery basis. The anticipated significant cost to service "Kulan West" is sound rationale for considering this area as an unserviced development. Even with a reduced development standard, the team predicts the per hectare costs of "Kulan West" will be considerably higher than for either "MacRae East" or "Utah".

5.3 Brownfield Development

5.3.1 Gravel Quarries

A 2015 study conducted for the McLean Lake quarries predicted that annual city-wide demand for granular resources would increase from the 200,000 m^3 range to 250,000 m^3 by 2025 (Inukshuk Planning and Development, 2015). Demand approximately quadrupled between 1985 and 2008, and surpassed 350,000 m^3 during the construction of Whistle Bend Phases 1 and 2 (Ibid). Given the potential of these quarried areas to function as future employment lands, they are considered briefly here.

Gravel quarry approval and management is the responsibility of YG's Department of Energy, Mines and Resources under the *Lands Act Quarry Regulations*. The City is consulted at two distinct steps: first, prior to the issuance of a permit for testing; and second, prior to the actual development of a quarry. This two-step "check-in" allows for the City to ensure conformance with the OCP and applicable zoning. Applications are further subject to a screening under the *Yukon Environmental and Socioeconomic Assessment Act* (YESAA).

Under the regulations (and to satisfy the information requirements of a YESAA screening), an Operation and Rehabilitation Plan is required prior to the issuance of a lease and subsequent quarry development. An extraction

Table 21. Broader Development Suitability of Candidate Greenfield Areas

Greenfield Area	Extent of Net Developable Land	Estimated Development Costs	Recreational Values	Environmental Values	UCB Location	First Nation Co-Development Potential	Other Co-Development Potential
SERVICED							
Taylor North	Medium	Medium	Moderate	Low	Yes	High	Low
Kulan West	High	High[1]	Low	Low	Yes	Low	Low
Kopper King	Low	High	Low	Moderate	Yes	High	Moderate
Hillcrest South	Medium	Medium	Moderate	Moderate	Yes	High	High
Robert Service Way[2]	Low	High	Low	Low	Yes	High	High
UNSERVICED							
Kulan West	High	High	Low	Low	Low	Low	Low
Utah[3]	High	Low-Moderate	Moderate	Moderate	No	Moderate	Low
MacRae	High	Low	Low	Low	No	Low	Low

Condition for Development	
Favourable	
Somewhat favourable	
Unfavourable	

Explanatory Notes

Extent of Net Developable Land: High (> 60 hectares); Medium (30-60 hectares); Low (< 30 ha)

Estimated Development Costs (per Developed Hectare): High ($500,000 -$1,000,00); Medium ($200,000-$499,999); Low (< $200,000)

Recreational Values: Qualitative assessment made on basis of conflict with Recreation Areas identified in 2010 OCP

Environmental Values: Qualitative assessment made on basis of conflict with Environmentally Sensitive Areas identified in 2010 OCP

UCB Location: Location within the Urban Containment Boundary identified in the 2010 OCP

First Nation Co-Development Potential: Qualitative assessment made on basis of proximity of First Nation settlement parcels (vs. known intention to develop)

Other Co-Development Potential: Qualitative assessment made on basis of co-located potential residential and/or transportation infrastructure development

[1] Costing was not undertaken for "Kulan West" but is assumed to be high on the basis of serious development constraints

[2] Only those portions of the Robert Service Way area deemed to have good (or good with some constraints) development potential were incorporated into the costing and net developable land analysis. The inclusion of moderate potential lands would modify both the net developable land and per hectare development costs, possibly in a more favourable direction.

[3] Costing and servicing assessment was not undertaken for the Utah area but team predicts them to be marginally higher than for "MacRae East" due to special access and private land ownership issues.

quantity and pit life estimate would typically be included in the plan. Leases are normally issued for a five-year term.

The challenge lies with what happens *after* the quarry is first approved and developed. Monitoring of quarry activity is limited to conformance with issued permits and lease conditions, *not* progress made towards the fulfillment of the initial quarry plan. Internal Government of Yukon records indicate annual extraction quantities, not comparisons against original estimates. Some of this information may be provided as part of subsequent lease renewal approvals, but there is no continuous or intentional record-keeping in this regard.

Figure 37. Ear Lake Quarry Area

There are a few indications of the timeframe for potential conversion of quarrying areas to future commercial and/or industrial uses, however. Almost half of the 468 hectares of leased quarry lands within the city are attributed to the Whitehorse Copper site, for which there is no clear development horizon or pathway (see following section). The McLean Lake quarries comprise about 40% of the remainder and the recommended planning horizon established in 2015 is 30-35 years (Inukshuk Planning and Development, 2015). The Ear Lake quarries (about 15 combined hectares) are anticipated to be active for another 10-20 years (Jane of all Trades, 2018). The status of the remaining quarries is unknown.

Practical experience with both the Ear Lake and McLean Lake aggregate areas to date would suggest that initial pit life estimates are far exceeded. Whether this is due to market conditions, the operating capacity of lessees, flexibility of regulators, or other factors is unknown. Applying significant timing pressure to quarry operations could result in the incomplete extraction of (and subsequent irreversible development over top of) valuable aggregate sources. Alternately, a laissez-faire approach fails to incent efficient extraction and ultimately alienates land within the city from other productive or valued uses for many decades. Neither approach is desirable.

A compromise approach could involve the staging of quarry operations to allow for the use of exhausted pit areas by new or sub-lessees in the timeframe between pit establishment and final reclamation. There may be numerous practical limitations to co-locating industrial activity with active quarrying. The noise, dust and haul traffic inherent to quarrying may be incompatible with many activities. One potential compatible use is that of heavy equipment storage and laydown yards, demand for which is associated with mining industry activity. Perhaps quarried areas have a niche role to play in meeting demand for space intensive, low-density employment land uses – particularly those associated with mining "booms".

Regardless of whether this avenue is pursued, there is a need to revisit, and possibly redesign, the administrative processes underpinning quarry management within Whitehorse. The lease application, record keeping, lease inspection and royalty reporting processes should all be re-oriented towards better monitoring of utilization of quarried areas and their progress towards final reclamation to facilitate better long-range land use planning and efficient land use. The team concurs with the relevant recommendations for governments to consider in this regard contained in the McLean Lake Quarry Assessment (Inukshuk Planning and Development, 2015).

5.3.2 Stevens Quarry Area

The Stevens area has been slated for quarry development since the mid-1990s, when an initial development plan was created. According to the most recent development plan (Inukshuk Planning and Development, 2012), the estimated quarry area is 119.5 hectares and probable aggregate yield is 2,350,000 m^3. The plan notes that this is a significant reduction from original estimates and the anticipated quarry life and ability to accommodate demand would be similarly decreased, to a minimum of 10-12 years.

The 2012 plan included four lots – two for use by City, YG, and KDFN[35]; and the other two for lease by private operators. A fifth possible pit could be developed pending an OCP boundary adjustment and relaxation of the 300 metre setback mandated in the 2010 OCP. KDFN's *Self Government Agreement* identifies adjacent parcel C100-B for Industrial use, and C-144B and C-145B for Residential/Commercial use. TKC's adjacent parcel C-51B is intended for residential use (Inukshuk, 2012).

The proposed plan was submitted to the Yukon Environmental and Socio-economic Assessment Board (YESAB) in 2012, with a subsequent recommendation for the project to proceed, subject to 49 recommendations addressing concerns about wildlife, neighbourhood impacts, etc. (Kerr, 2013). The Government of Yukon issued a decision document rejecting YESAB's recommendations and halting the project on the basis of the proposed mitigation being "undeniably onerous" and an acceptance of "the potential for substantial effects" (Waddell, 2013). This decision effectively put the City's plans on hold[36].

The question of the end use of the Stevens Quarry area hinges on need, timing, and suitable alternatives. Resident opposition to the Stevens Quarry was partially based in scepticism as to the actual need, particularly when the McLean Lake quarries continue to be mined. While gravel supply and demand is outside of the scope of the team's work, it did hear from several interviewees that there is a current shortage of supply and that the City needs to be planning "a decade out" to meet its projected needs.

Assuming the need can be demonstrated and there are no suitable alternatives, the question of timing is best answered in partnership with First Nation landowners in the area. One thing is certain; any justification of proceeding with Stevens Quarry on the basis of opening up new commercial and industrial lands is tenuous when the reality is that the area would undergo quarrying for decades and there is ample, better located land to develop closer to the city core. Furthermore, a large commercial and/or industrial area adjacent to First Nation parcels already identified for the same use could inadvertently create competition.

On the basis of the team's assessment of land needs and accompanying supply over the lifetime of the next OCP, there is no compelling need to re-designate the Steven's Quarry area for commercial and/or industrial purposes. Partially serviced industrial lots could be provided with fewer land use conflicts (and presumably opposition) in other areas of Whitehorse. The designation of the Steven's area must be made with a full accounting of the relative long-term risks of foregoing an extensive aggregate resource in close proximity to the city versus the risks (financial, political, and other) of pursuing a controversial development.

5.3.3 Whitehorse Copper Site

The Whitehorse Copper mine closed in the early 1980s and came under the ownership of YG in the *Devolution Transfer Agreement*. The site's decommissioning in 1998 involved removal of structures, blocking of mine shaft openings, flattening of tailings, and water control structures. The mill and other buildings were removed, and the foundations were covered with up to one metre of crushed rock. The site contains approximately 10 million tonnes of tailings, of which approximately 18-20% is recoverable magnetite.

The Contaminated Sites Registry file for the site reports that water sampling at the site shows exceedance of Canadian Council for Ministers of the Environment's freshwater aquatic life guidelines in some tailings ponds on

[35] Kwanlin Dün First Nation's (KDFN) Final Agreement includes a commitment to provide access to 1.18 million m^3 of granular material within City limits, without specifying the source. The Stevens Quarry allotment would fulfill an estimated 70% of this commitment.
[36] The City's Planning & Sustainability Services Department was the primary driver behind the project and undertook the preliminary planning work, even though the Government of Yukon submitted the application to YESAB.

the site. The Little Chief open pit has numerous nearby subsidences caused by the collapse of underground workings that constitute a public safety hazard. The tailings remain uncovered at the site, resulting in some dust dispersal to nearby residential areas and preventing revegetation of the site. Although the Old Pond area of the site is currently zoned IH by the City, the "tailings do not provide a hospitable or structurally supportive surface for industrial development" (Eagle Industrial Minerals, 2011).

In 2011, Eagle Industrial Minerals entered into a 10-year lease with YG for exclusive use and rights to enter the land for the purposes of working the tailings and waste rock in order to extract minerals. Eagle also purchased 19 quartz mineral claims that overlap the site. The primary objective of the "Whitehorse Copper Tailings Reprocessing and Reclamation Project" was to reduce the environmental impact of the tailings deposits and convert the main tailings storage area to a potential industrial area by covering it with a gravel layer. The project proposed to process the tailings to remove magnetite and sell as iron ore, with an expected life of 6-7 years.

On closer examination, there are significant caveats issued in regards to the industrial end use of the reclaimed tailings in Eagle's proposal. The project submission explains that the unconsolidated nature of the tailings, even with the gravel layer, "may preclude erection of buildings, storing heavy equipment or other industrial activities which require more solid ground." Several options for optimizing end use were explored and roughly costed out. Compacting the tailings, contingent on reducing their moisture content, was estimated to cost $4.2 million dollars. Adding rock to produce an engineered fill was estimated at $2.3 million dollars. It was suggested that one or more government entities could fund this advanced level of reclamation to realize broader long-term benefits.

Eagle's interest in the site was transferred to Groundtrax Environmental Services Ltd. in 2015. The lease expires in 2020. As of 2018, Groundtrax's plan was to utilize a 10,000 ft^2 building on site for year-round crushing operations and sale of resulting fill (Waddell, 2018). The team is unaware of the status of Groundtrax's current activities and/or future plans. It would appear that the Whitehorse Copper site may require a more concerted government effort, long-term planning, and possibly a creative private-public sector approach if it is to be reclaimed to the point of full and proper functioning as heavy industrial land.

5.4 Supply-Demand Comparison

Of all the supply options considered in the previous section, the team concludes that only infill and greenfield development have the potential to successfully address Whitehorse's future employment land demand. Enhanced servicing and redevelopment will help to improve the quality (i.e., variety and functionality) of existing developed areas; however, neither will bridge the quantity gap. Quarry areas and the Whitehorse Copper site may be long-term future development options but depend on management regime change.

The infill and higher suitability greenfield development areas are more than sufficient to meet the forecasted 2040 demand for MU-I/C and I designated lands. Infill areas alone could meet 30% and 82% of MU-I/C and I needs, respectively. A "Taylor North" development could meet 131% and 48% of MU-I/C and I land needs (both could be potentially suitable), "Hillcrest South" 187% of MU-I/C land needs, and "MacRae East" 96% of I land needs. Strategic and cost-effective land development, versus outright supply, will be the challenge in the future.

Table 22. 2040 Supply-Demand Comparison

Option	Potential Supply (ha)	2040 MU-I/C Land Needs (ha)	2040 I Land Needs (ha)	% of 2040 MU-I/C Land Needs	% of 2040 I Land Needs
Infill Development		32.1	87.2		
MU-I/C Areas	9.5			30	-
I Areas	71.9			-	82
Greenfield Development					
Taylor North	42			131	48
Hillcrest South	60			187	-
MacRae East	84			-	96

6.0 KEY ISSUES AND CONSIDERATIONS

Matching land demand with adequate supply is the central goal of planning for future commercial and industrial land needs. As established in Section 5.0, land supply is not a serious limiting constraint. However, supply-demand intersect with a much broader array of policy and strategic issues and considerations that the City and its partners must consider moving forward in the interests of market responsiveness, private sector growth, and strategic land development. The team elaborates on some of the key ones in the following section.

6.1 Private Sector Preferences

6.1.1 What We Heard – Focus Group Sessions

Affordable land development is a priority and may require new approaches

Focus group participants suggested that providing affordable land should be a top priority and identified a number of strategies by which the City and government partners could achieve it. Keeping servicing to a minimum was one such strategy, although municipal water was identified as higher priority if some level of servicing is applied. Some felt the that the "bundling" of development projects (i.e., deep, shallow, and surface works) by government is creating construction monopolies and driving up the price of land development, the logical remedy to which is separating phases into smaller contracts and creating a more competitive bidding process. It was also suggested that the City should consider following the lead of other municipalities where public and private partnerships are moving development along at a faster pace than what is felt to be achievable under the current government-led land development regime.

Industrial properties should not be subject to certain requirements

Focus group members raised several examples of where the development requirements for industrial properties are felt to be needlessly onerous and adding to capital costs. Landscaping requirements for industrial areas was cited as having little value to the neighbourhood. It was pointed out that building code requirements could use review to be more practical in their application for industrial settings. An example was offered whereby insulation requirements in walls are set to a high R-value, yet large garage doors on a shop are a low value, so net heat loss occurs. It was also mentioned that some industrial shop spaces do not need to be heated, depending on the operation, yet are required to meet high R values. These requirements increase development costs for businesses, and might not be achieving the desired outcomes.

When it comes to lot development, there is no "one size fits all"

Participants told the Team and City that an ideal lot size does not exist because businesses vary widely in their operational needs. However, some stressed that lots need to be sized and designed to meet basic servicing needs. It was indicated that lot size constraints can force businesses to utilize their entire lot for storing materials and/or driving heavy vehicles, potentially compromising the proper functioning of septic fields.

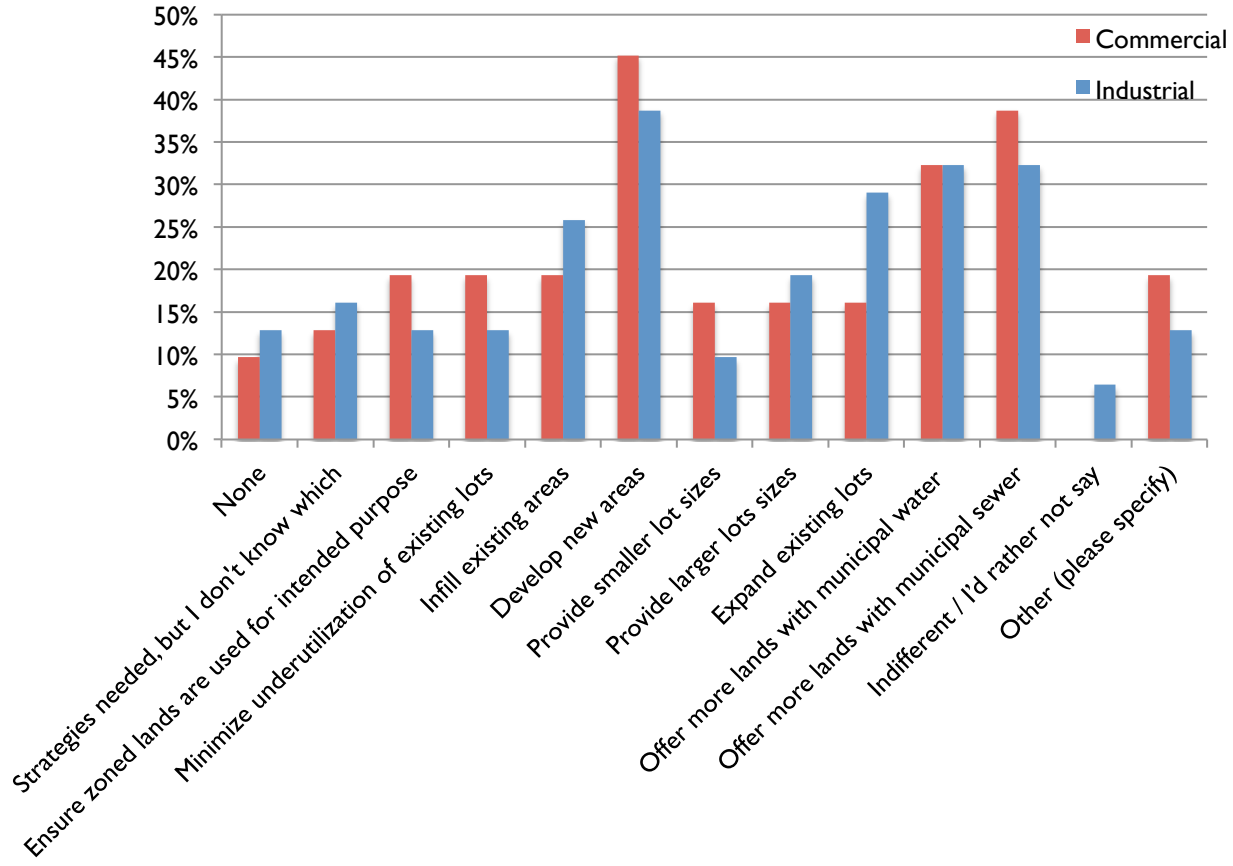
Work-live situations are desired but some caution is required

Participants commented that having the opportunity for live/work situations on industrial properties is desirable and can help with affordability. It was noted, however, that residential functions and resident expectations should not detract from the intended purposes of industrial lands. For example, noise within an industrial area should be expected, and nuisance complaints should not be enforced the same way that they are in residential areas. Indeed, caution was advised around the mixing of industrial and residential activity. The example of heavy industrial trucks driving through the residential portions of Mount Sima was one example provided of incompatible uses, and it was recommended that similar situations be avoided in the future through better separation of industrial and residential development.

6.1.2 What We Heard – Property Owner/Business Operator Survey

Business and property owners on both commercial and industrial lands indicated a strong preference for new land development as a strategy for the City to pursue to ensure the present and future land needs of Whitehorse's private sector can be met. Interestingly, the second and third most commonly recommended strategy from owners/operators on both types of lands was to offer lots with municipal water and sewer – a result that contrasts with what the team and City heard during focus group sessions. 28% of Industrial property owners/operators recommended lot expansions as compared to only 16% for Commercial property owners. Other strategies, such as enforcing intended land uses and addressing underutilization received less support (8-20% range). Refer to Figure 38.

Figure 38. Land Supply Strategies Preferred by Survey Respondents



Again, survey comments provided additional context to the multiple choice results. Some respondents advised the City on broader strategy, urging the development of the Alaska Highway corridor near Hamilton Boulevard, prioritizing mixed commercial/residential uses in the urban core and restricting industrial uses to rural areas, and developing First Nation land. Another respondent suggested that the "huge glut" of commercial space in the City suggests that government does not understand market demand and that private developers would better accommodate it. Several others urged the City to prioritize infrastructure investment, one specifically requesting major upgrades to Taylor subdivision for improved functionality. Lastly, numerous respondents requested greater flexibility and opportunity to utilize caretaker residences to accommodate employees and generate additional revenue.

6.2 Strategic Land Development

6.2.1 Coordination with First Nations

The pending update to Whitehorse's OCP will mark the first such effort to occur amidst a local First Nation actively engaging in development of its Settlement Land. This First Nation role is a relatively new one but merits careful consideration and the formulation of a coherent policy-based approach that ensures all governments involved in land development are exercising their duties in a coordinated and mutually supportive manner.

Participants in the focus group and survey conducted for this study communicated a clear preference for land ownership, and some even expressed skepticism as to land leasing. The experience of jurisdictions such as West Kelowna, where the private sector has successfully developed on First Nation-owned lands, suggests that, given the right combination of factors, leasehold arrangements on First Nation lands in Whitehorse could become "normalized" as a viable option for Whitehorse's private sector in the future. The issue of private sector uptake of First Nation lands strikes at the very heart of public government's role with respect to land development. Is it the responsibility of government to ensure that the market's first choice is satisfied, or simply that there is land supply to facilitate private sector activity and employment, period?

In answering that question, Chapter 22, Economic Development Measures, of the *Umbrella Final Agreement* should be kept top of mind. Two of the chapter's three overarching objectives speak to the development of economic self-reliance and the creation of economic benefits flowing directly from the Settlement Agreements. Neither KDFN's nor TKC's final agreements specifically reference land development but Schedule A, Chapter 22 of both refer to a Traditional Territory Economic Development Plan involving YG, City, and commercial and industrial interests. To date no such planning exercise has been initiated; nonetheless, it can be expected that the matter of land development would be central to it.

Ultimately, the question posed above will need to be answered by all governments involved and articulated in a market-facing manner through policy or other mechanisms. New boundaries of cooperation and coordination will need to be charted. This will take time and negotiations. The outcome of such deliberations will need to address the spectrum of interests at play – market needs and choice, First Nation economic opportunities, fiscal frameworks, and coherent and strategic land policy – simultaneously.

In the absence of such clarity during the interim, the Team suggests that as a starting point, government should endeavour to not dispose of land in a manner that directly or indirectly undermines KDFN's ability to compete in the marketplace. This recommendation applies doubly to dispositions involving greenfield development within the UCB and/or within areas where First Nation land leasing opportunities are present.

6.2.2 Compact and Higher Value Development

The introduction of the UCB in the 2010 OCP signalled a commitment by the City to curb sprawl and concentrate future urban development to a more central geographic area. The upcoming OCP update is an opportunity to further solidify the UCB concept through continued and expanded policy measures, including those involving commercial and industrial lands.

If the City is to truly fulfill its vision of a future, dense geographic core of residential and employment-oriented activity, lands contained within the UCB must be guarded against both lower density and lower value development. The City's experience with Taylor industrial area illustrates the difficulty of introducing municipal services after-the-fact, when property owners have already invested in on-site servicing. Given this challenge, there is solid rationale for ensuring that future commercial and industrial land development within the UCB be fully serviced, and accordingly, higher density in nature. New lower value, unserviced lots could continue to be brought to market outside of the UCB to ensure choice and affordability for prospective owners. In unserviced areas, health and safety considerations must take precedence over density in determining minimum lot sizes.

Prioritizing serviced development within the UCB provides additional impetus for public and First Nation governments to collectively approach land development, as most of the sizeable undeveloped areas contained within the UCB are comprised of both First Nation and Commissioner's lands.

The explicit or implicit view of land as a "cheap" resource undermines sound decision-making. Moving forward, it is critical that the lens of "liability" through which land development exercises are sometimes viewed is replaced with one of "investment". Only through this lens will more sustainable and strategic land development approaches emerge.

6.2.3 Preserving Choice

Engagement with property and business owners and development stakeholders revealed that there is no one "ideal" industrial and/or commercial property; rather, providing variety and choice in the marketplace is key. Survey respondents expressed roughly equivalent interest in small (< 0.25 ha), medium (0.25-0.4 ha), and large (0.5-0.9 ha) lots; very large lots (1 or more hectares) received the least interest[37]. There was clearer direction to provide larger lots for industrial properties in the survey results, however. While some property owners commented on space constraints on their current lots, more commented on the need to provide affordable lots for businesses at all stages of growth.

Increasing minimum lot sizes could pose an additional affordability challenge. The team believes that the need for medium and larger lots is generally best addressed in the subdivision planning stage versus zoning updates. The noteworthy exception is minimum lot sizes in unserviced areas; depending on the outcome of further precautionary principle based discussions with YG. As one example, the municipality of Sooke, B.C. has set industrial subdivision limits to ensure parcels are no less than one hectare in size.

6.2.4 Achieving Affordability

Affordability was a recurring theme of the team and City's discussions with property and/or business owners over the course of this study. This is one of the most challenging issues for the City to address. Lot pricing is the purview of YG and informed by actual development costs and prevailing market values at the time of lottery or sale. Pricing comparisons of lots sold in the 2007-2010 and 2015-2018 timeframes indicate that commercial and industrial raw land prices increased in the range of 60-70%, a trend consistent with residential raw land and housing prices. The fact is that real estate in Whitehorse has simply become more expensive, and the macroeconomic conditions that helped fuel that price increase are likely to persist for some time. The territorial government should consider potential mechanisms to curb continued cost increases in its approach to land development, as focus group participants suggested. However, aside from tax relief and advocating for price stabilization, the City itself has few mechanisms at its disposal to make an impact on lot prices.

Where the City does have the ability to push the affordability needle is in zoning and land use controls that impact a business and/or property owner's ability to maximize income generation and/or cost savings. Demand for caretaker residences is evidenced both by the steady stream of permit applications received by the City over the past decade; judging by the feedback received during focus group sessions, they are a highly valued asset on both practical (i.e., security, staff housing, etc.) and strategic (i.e., property value) levels. Caretaker residences, however, should take a secondary priority to compact, value-oriented urban development and the protection of industrial activity from incompatible adjacent land uses. Where both conditions can be satisfied, there is sufficient rationale for the City to provide property owners with more flexibility and autonomy to meet the affordability challenge.

6.2.5 Downtown and Marwell Evolution

While the study focused specifically on lands located outside of the downtown core, the relationship between Downtown lands and land use dynamics elsewhere in the city must be factored in. The 2018 Downtown Plan envisions an increasingly dense urban core with a larger resident population and vibrant mix of residential,

[37] These results should be considered in tandem with the fact that approximately twice as many survey respondents indicated an interest in CIM/CH zoning as IS/IH zoning.

institutional and commercial land uses, public spaces, active transportation, and arts and culture. The experience of other jurisdictions and Whitehorse's own over the past 15 years would suggest that land values can be expected to remain highest in the downtown area relative to other areas in Whitehorse.

Over the past decade, the Marwell industrial area has been the primary development beneficiary of rising land values in the downtown core. The relocation of traditionally city centre-oriented office and other uses to new Marwell development such as Titanium Way is evidence of this trend. The 2018 Marwell Plan envisions a continued, gradual transition of land intensive industrial and institutional uses to higher density mixed uses, including residential along the highly valued waterfront. The anticipated development of Kwanlin Dün First Nation's Lot 226 as a business park will further solidify this vision. While much of the Marwell vision hinges on the achievement of physical planning initiatives – including active transportation, Quartz Road and Tlingit Street improvements, parks and green spaces, etc. – the "crux" of the plan resides in the brownfield revitalization and relocation of land intensive uses. The latter issue is directly pertinent to this study.

The successful relocation of land intensive uses from Marwell over time will be contingent on the availability of larger parcels in close proximity to the downtown core. The Alaska Highway corridor between Robert Service Way and Two Mile Hill could provide a suitable landing spot for some of these uses, particularly institutional ones (i.e., new grader station, vehicle fleet storage, etc.) The City's construction of a new Municipal Services Building along the southern extent of Range Road is a move that could be replicated for other government operations. At a minimum, making these necessary moves requires the City to clearly signal intention to YG and establish inroads into its capital planning processes.

Ideally, commercial and industrial lands outside of the Downtown and Marwell areas should function as a repository for land uses that no longer have a logical home in either area as Whitehorse continues to evolve along a densification-oriented pathway. The creation of a hub of vehicle rental, lease and sales businesses along southern Range Road over the past 10-15 years is evidence of the market leading that evolution itself.

The City's decision to curb "big box" and fast-food development along the highway through zoning restrictions has been effective at maintaining the vibrancy of Downtown and should be upheld. Now is not the time to "open the flood gates" to land uses such as destination retail along the Alaska Highway within the heart of Whitehorse. With current Highway Commercial and CIM zoning maintained, this area will likely continue to evolve as various concentrated nodes of purposeful, niche business types (i.e., equipment and vehicle operations, etc.) that become increasingly outmoded in the downtown core in the coming decades. The key is to ensure that they can fully function as employment areas, integrated with nearby residential areas, municipal transit services, and active transportation.

In addition to brownfield development and relocation of land intensive uses in Marwell, there is potentially an opportunity for subdivision of several large parcels that are underutilized. The City could work with the property owners to review options to unlock new development potential via subdivision as part of a broader commercial/industrial land infill initiative.

6.2.6 Relationship to Residential Land Development

With the final phases of Whistle Bend largely underway now, the City will need to identify the next area for long-range residential development in the upcoming OCP. The "low hanging fruit" is effectively exhausted with respect to large tracts of raw land within the UCB; accordingly, a more nuanced, nimble and diverse strategy will be required from hereon in. The feasibility of developing two larger-scale candidate areas was explored on behalf of the City in 2016/17 and it was concluded that both the Northern Urban Containment Boundary (NUCB) and Southern Urban Containment Boundary (SUCB) could theoretically be suitable for development, subject to the mitigation of various anticipated impacts.

The study team (Inukshuk Planning and Development, 2017) recommended that the SUCB area - effectively the area located west of the Alaska Highway between Copper Ridge and McLean Lake - be considered in the broader context of off-site opportunities, specifically the possibility that the McLean Lake quarry area could eventually convert to a residential versus industrial area, whereby maximizing the investments made to extend municipal services from the airport and Copper Ridge over the long-term. Commercial and industrial land development

along the Alaska Highway corridor between Hillcrest and Robert Service Way should be viewed as a similar opportunity to be leveraged should the SUCB be pursued. The costs of off-site infrastructure upgrades can be spread across both residential and commercial/industrial land development and benefits more broadly distributed. This should factor in as an advantage of the SUCB over the NUCB.

6.2.7 Climate Change Mitigation and Adaptation

Climate change mitigation and adaptation will undoubtedly have an impact on how Whitehorse evolves as a city in the coming decades. How significant those impacts will be, and the exact form they make take, is not well understood yet. The evolution of three key sectors that are already undergoing rapid transformation – transportation, food production, and energy – may provide some indication, however.

Transportation is expected to become increasingly electrified and non-vehicle based in society's effort to shift away from the greenhouse gas emissions associated with fossil fuel based transportation. Having employment nodes located close to higher density residential areas facilitates alternative modes of transport, including public transit and cycling. With the Whistle Bend neighbourhood due to be Whitehorse's most populous (at approximately 8000 people) at full build-out, there is strong rationale to consider developing new (serviced) employment lands in proximity to it.

There are some predictions that global food production will become significantly more localized and indoor-based over the coming decade (CBC, 2019). At the very least, climate change mitigation will likely necessitate that jurisdictions which are heavily reliant on imports, such as Whitehorse, produce more local food. This "produce/grow/buy local" trend is well established not just for food but a wide array of products. The trend will likely persist, if not expand further, as Yukon works to become more self-sufficient and climate change resilient.

Lastly, a continual shift away from fossil fuel-based energy sources for electricity and heating may prompt the emergence of newer development or subdivision-scale solutions such as district heating systems and solar farms. There could even be future synergies between industry as generators of waste heat and residential areas as consumers – a synergy best enabled by close proximity.

6.2.8 Protection and Accommodation of Industrial Activity

The accommodation of "nuisance" (i.e., fumes, noise, etc.) industrial activities in proximity to population centres and transportation corridors is important to a community's economic well-being. Ensuring that such activities have an appropriate home is the function of zoning and successful development siting.

The City currently accommodates a diverse range of uses in its IS and IH zones. The IH zone is geared towards activities with large land requirements or nuisance effects on adjacent uses, whereas the IS zone specifically prohibits activities that create a nuisance or hazard extending beyond the site. Interpretation of activities allowed in the IS zone is a challenge due to inconsistent wording between land use definitions, the stated purpose of the zone, and its regulations. Some principal uses, such as business support services, may not fully correspond with the typical purpose of industrial zones, let alone higher nuisance nature of activities often encountered in them. This more permissive approach to uses extends to the IH zone, where numerous principal uses duplicate those of the IS zone. This overlapping of uses creates additional challenges for fair and consistent administration of zoning; further, it may fail to adequately safeguard the more limited supply of IH zoned lands for high nuisance activities.

The widespread distribution of country residential areas, greenspaces valued for recreation, and First Nation Settlement Lands poses serious constraints to the siting of future IH zones within City limits. While the team did not identify significant latent or current demand, new IH zoned lots will be needed moving forward. These could potentially be developed alongside IS zoned lots, subject to appropriate siting and setbacks. The southerly winds that prevail in the Yukon River valley at Whitehorse are key consideration in siting. There may be potential to zone for IH at the outer, northern limits of predominantly focused IS-zoned development (i.e., Kulan in the short term or "MacRae East" in the medium term). Over the long term, the former Whitehorse Copper mine site and area located between Forestview and "Taylor North" on the east side of the Alaska Highway could be the best candidates for stand-alone IH zoned development.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Industrial and mixed commercial/industrial lands are required to support a prosperous and growing regional economy and workforce in the Yukon's capital city. Whereas other jurisdictions are moving to protect employment lands from conversion to residential or "lower nuisance" uses (in the case of industrial lands), Whitehorse is in the enviable position of having both available land and time to pre-empt future problems through sound, rational policy.

Currently, lands designated MU-I/C and I house a wide range of employment uses located outside of the Downtown core and residential areas. There are 973 hectares of I lands designated in the 2010 OCP, of which 265 and 66 hectares is zoned IS and IH, respectively. MU-I/C-designated lands account for 462 hectares and include 95 hectares of CH and 141 hectares of CIM zoned lands. Within both designations, there are undeveloped lands currently zoned FP. Approximately 468 hectares of quarries are considered active within municipal boundaries, almost without exception on Commissioner's Lands.

Employment areas designated MU-I/C and I are situated within key nodes distributed across Whitehorse's land base. Most of Whitehorse's industrial areas are unserviced, some located near or adjacent to country residential subdivisions. Full municipal servicing is only available in the Marwell area north of Downtown, as well as the Range and Burns roads areas adjacent to the Alaska Highway. The 2018 Marwell Plan adopted by the City envisions the gradual transition of this historic industrial area into a more mixed use, higher density, industrious extension of a denser, increasingly residential future Downtown core. This evolution of both the Downtown and Marwell will place additional pressure on other areas to accommodate outmoded land uses.

Land demand in Whitehorse is influenced by a variety of local and regional economic influences. On review of lot sales and availability over the past decade, real estate activity, and the input received from business and property owners via an online survey and series of focus group sessions, the team concludes that there is a current undersupply of both MU-I/C and I designated lands for local industry. A prevailing view of property ownership as an integral business strategy, high prices, specificity of operational needs, and aging building stock on developed properties are understood to be contributing factors.

The macroeconomic conditions driving the local Whitehorse and broader Yukon economy have changed over the past 20 years and provide a glimpse into what the future may hold. The Yukon's public sector has steadily grown over the past 10 years, both in terms of employment and GDP share, while the growth of the private sector has been comparatively flat. Declines in private sector employment followed in the wake of the 2007-2013 commodities "supercycle" that helped to fuel economic growth and corresponding residential and employment land demand in Whitehorse. However, numbers have largely recovered or are now surpassing those previous numbers in key sectors that tend to reside outside of the downtown core. With Victoria Gold now in production and several other large mines in development, a similar peak and decline could be anticipated over the next decade. The key distinction now, as compared to the late 1990s, is that public sector activity now acts as a buffer against the fluctuations of commodities prices and mining activity in the territory.

The team concludes that the City will need approximately 32 and 87 hectares of MU-I/C and I designated lands by 2040 to address both 2019 latent demand and the future growth of relevant industry sectors. With utilization of existing lots already quite high, intensification potential will be largely limited to building expansions and/or additions undertaken by individual property owners. Connecting the already developed Kulan and Taylor subdivisions to full water and sewer service is unlikely to be supported (or co-funded) by property owners or result in substantial lot subdivision. The idea of converting currently quarried areas – which comprise about 468 hectares currently – to employment lands is theoretically sound but currently inhibited by a quarry management regime that provides little impetus to operators to fulfill their operating plans and fails to monitor their progress in a manner that supports land use planning.

The forecasted 2040 land demand is best accommodated through a combination of infill and greenfield development. Currently developed industrial and commercial nodes hold an estimated infill potential of 46 and 34 hectares of public and First Nation lands, respectively, enough to address about one-third of 2040 MU-I/C land needs and over three-quarters of 2040 I land demand. The options for supplying MU-I/C-designated lands are

more limited than for I-designated lands; meeting this demand through infill will require the increased integration of associated land uses with adjacent industrial ones and/or the expediting of KDFN's anticipated business park in the Marwell area.

On the balance of various suitability criteria, the team identified "MacRae East" as the most suitable greenfield area for future, unserviced industrial land development, with about 84 hectares of raw land with good development potential. Nearby "Utah" is twice the size and holds excellent potential but appears to pose a more complex set of planning challenges. For serviced industrial development, the "Taylor North" area north of Porter Creek appears to have the more favourable development conditions; consideration should be given for some level of MU-I/C development here as well. The Alaska Highway corridor between Hillcrest and Robert Service Way/Hamilton Boulevard is the logical candidate for future serviced MU-I/C development with an estimated 83 hectares of raw land with good (or good with some constraints) development potential. Combined with infill development, both of these areas will satisfy demand for the lifetime of the next OCP, and likely well beyond.

Food and beverage production are relatively new uses to Whitehorse's commercial and industrial areas, and one that the City can better accommodate and support through more use-specific definitions and accompanying permissions in the *Zoning Bylaw* than is currently afforded by capturing these activities under generic manufacturing and processing uses. Numerous jurisdictions in western Canada have adapted their zoning to better integrate the full spectrum of food and beverage production into suitable commercial and residential neighbourhoods. Cannabis production is a relative newcomer and municipal policy is less advanced in this regard; however, the trend thus far is to accommodate the use in industrial and agricultural areas.

The water and wastewater intensive nature of some food and beverage production, coupled with the potential for high nutrient loading in waste streams, raises numerous challenges for both the City and territorial authorities who oversee applicable development approvals. These issues are compounded where such uses locate in unserviced industrial areas, a trend in recent years. Other uses such as car washes and caretaker residences pose similar concerns. Numerous administrative gaps and regulatory ambiguities require further attention and clarification for the sake of environmental and public health protection. A coordinated, precautionary principle-based approach that supports and provides certainty to local industry is warranted.

While the team concludes that there is little risk of a gap between land supply and demand on a land quantum basis, it cautions both the City and YG to take a more strategic, investment-oriented view to how land is developed moving forward. The respective roles and responsibilities of public and First Nation governments in meeting market demand will need to be delineated and coordinated in a manner that meets a balance of private sector needs and preferences, the spirit and intent of the Final Agreements involved, and sound land policy.

Commercial and industrial lands within the UCB established in the 2010 OCP should be prioritized for fully serviced, higher value and higher density development that is integrated with residential areas and employment-supportive amenities. These areas will become the future home of businesses and industries that become gradually outmoded in the Downtown and Marwell areas as they evolve in the manner envisioned in the City's recent long-range plans for both. Recovering the higher costs of serviced development lends additional support to the idea of pursuing Whitehorse's next major residential subdivision in the SUCB area located to the west of the Alaska Highway between Copper Ridge and McLean Lake. Alongside new development, the City needs to ensure that "nuisance" industrial activities are properly accommodated in zoning regulations, and appropriately sited.

The project team offers the following recommendations for the City to consider:

Process and Partnerships

1. In cooperation with YG, institute a moratorium on spot land applications for commercial and/or industrial use within City limits to facilitate more comprehensive development that optimizes existing and future servicing and addresses a broader spectrum of market needs. The notable exception to this recommendation is the consideration of spot land applications for heavy industrial uses that can not be accommodated elsewhere due to noxious impacts;

2. Establish a process to formalize collaboration and coordination around land development between the City, YG, and KDFN and TKC, respectively. The process deliverables, ideally Memorandums of Understanding (MOUs), should provide guidance to the signing parties with respect to:
    a. Roles and responsibilities in regards to land development and supply for the private sector;
    b. Potential mechanisms for cost and/or capacity sharing that could be utilized to advance development of higher priority (and value) parcels located within the UCB; and
    c. Potential mechanisms and/or thresholds for ensuring a balance of land ownership and First Nation land leasing opportunities are available to the private sector (as appropriate to each First Nation).
3. Upon the anticipated 2020 renewal of the quarry leases for the former Whitehorse Copper Mine site, advocate for more detailed study and clarification of the technical issues enabling and/or precluding future conversion to fully productive industrial lands;
4. Work with YG to update the quarry administration system to better monitor quarry progress and inform land use planning, and explore potential mechanisms for accommodating interim uses in quarried areas;

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5. Retain the MU-I/C and I designations for undeveloped areas outlined in the 2010 OCP;
6. Should the SUCB area be designated for residential development, consider a re-designation of the McLean Lake quarries to FP to reserve a broader range of future land use options;
7. Subject to the identification of more suitable (and/or extensive) granular sources, retain the NR designation for the Stevens Quarry area;
8. Consider the re-designation of a portion of the FP designated area located between "Taylor North" and Forestview on the east side of the Alaska Highway to I to accommodate heavy industrial activity over the long-term;

Zoning Bylaw Update (Post-OCP adoption)

9. Extend I and/or CIM zoning to areas currently zoned FP in Mount Sima and Range Road as a precursor to infill development;
10. Increase the number of caretaker residences permitted on serviced IS, CH, and CIM zoned lots while protecting primary employment uses;
11. Maintain current caretaker residence allowances for IS, CH, and CIM zoned lots in unserviced areas and consider instituting occupancy-oriented restrictions, subject to the findings of the research described in #30;
12. Subject to the findings of the research outlined in #30, consider increasing minimum lot size requirements in unserviced areas to reflect commercial/industrial uses combined with caretaker residence use;
13. Create new *Zoning Bylaw* definitions to address indoor agriculture (food and cannabis), beverage production and processing (breweries and distilleries). Consider instituting impact and intensity related thresholds contingent on location and servicing;
14. Consider creating new definitions for other water/wastewater-intensive commercial and industrial uses not listed above (i.e., car washes) and review their suitability for unserviced areas;
15. Consider mechanisms, such as thematic districts, to encourage the "clustering" of food and beverage production uses in targeted areas of Marwell and Downtown;
16. Consider extending the "studio" use to the CIM zone to better accommodate artisanal and small-scale manufacturing;

17. Reconsider zoning regulations that unnecessarily restrict the ability of entrepreneurs to base more than two businesses from one address, where no discernible change in impacts to adjacent property owners will result;
18. Review purposes, uses and associated definitions for the IS and IH zones for fairness, consistency and adequate protection and accommodation of "nuisance" industrial activities;
19. Ensure mapping data consistency between zones and their "parent" OCP designated areas;

Underutilized and Infill Lands (Shorter Term Land Development)

20. Consider a short-term incentive program (i.e., tipping fee relief) to encourage the clean-up and sale of industrial properties functioning as "junkyards" within Whitehorse;
21. Work with YG, First Nations, and private sector interests to initiate implementation of the heavy industry relocation aspects of the 2018 Marwell Plan and ensure the plan's objectives are factored into institutional capital planning efforts;
22. Work with private owners of large land parcels in Marwell to explore options for subdivision that would quickly bring new lots in this area to market;
23. Work with YG and First Nation landowners to expedite the planning, subdivision, surveying and disposition of infill lots in:
    a. MacRae
    b. Range Road
    c. Mount Sima
    d. Kulan (subject to the identification of an alternate snow dump location)

    Infill development should provide a mix of medium (~0.5 ha/~1 ha for serviced/unserviced) and large (~1 ha/2+ ha for serviced/unserviced) lot sizes, and lots accessible off of Mount Sima Road should be considered for CIM zoning (versus I). YG should be encouraged to test and adapt alternative tender approaches to reduce development costs and avoid unnecessary escalation of lot pricing. The inclusion of IH zoned lots in industrial infill areas should be considered;
24. Explore the potential for lot expansions, reviewed at the neighbourhood-level to allow cohesive planning that considers surrounding recreational and wildlife values;

Greenfield Development (Medium to Longer Term Land Development)

25. To provide new serviced MU-I/C designated lots post-infill development, work with YG, KDFN, and TKC to:
    a. Select and/or prioritize development between the two options of "Hillcrest South" and (portions of) "Taylor North" for MU-I/C lands;
    b. Undertake initial development due diligence for the higher priority/preferred areas; and,
    c. Establish a charter or MOU to pursue co-development of priority MU-I/C-designated Commissioner's land and adjacent Settlement Lands, with the aim of bringing new lots to market in the late 2020s[38];
26. To provide new serviced I designated lots post-infill development, work with YG and KDFN to undertake initial development due diligence and potential co-development for the "Taylor North" area, with the aim of bringing new lots to market in the late 2020s to early 2030s;

[38] Subject to full utilization of infill potential; should this not occur, timelines should theoretically advance.

27. To provide new unserviced I designated lots post-infill development, work with YG to:
    a. Undertake further planning and prioritization work to confirm the "MacRae East" and/or "Utah" area, including discussions with KDFN, TKC and White Pass and Yukon Route railway about their development interests;
    b. Undertake initial development due diligence for the "MacRae East" and/or "Utah" area;
    c. Pursue co-development, utilizing a charter or MOU approach with any additional parties, of the "MacRae East" and/or "Utah" area, with the aim of bringing new I lots to market in the mid-2030s[39];

Servicing and Services

28. Work with the YG to adopt interim "precautionary principle" based mechanisms to address industrial and commercial wastewater in unserviced areas;
29. Ensure that capital upgrades to the Alaska Highway corridor through central Whitehorse are supportive of current and future employment land integration with public transit and active transportation options;
30. In partnership with YG, undertake a risk-based assessment of allowing water/wastewater intensive and contaminant-generating uses in serviced and unserviced areas and identify precautionary policy and regulatory measures;
31. Encourage landowners sited along the lower elevations of Bennett and Laberge roads in Kulan to connect to municipal water service in support of industry diversification;

Permitting and Business Support

32. Consider aligning City business permit administration with the North American Industry Classification System to allow for finer-grained (and nationally comparable) industry monitoring, and instituting a new category; and
33. Expand upon previous work around water/wastewater intensive and contaminant-generating uses, including potential updates to the *Sewer and Storm Utility Bylaw* and the development of sector-oriented information and application packages.

[39] Subject to full utilization of infill potential; should this not occur, timelines should theoretically advance.

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