Polytechnic University Capital Space Standards & Guidelines

Education, Culture and Employment
Government of the Northwest Territories

DECEMBER 2022

Government of
Northwest Territories

K’áhshó got’ɻne xədə k’é hederı ʔedɻhtl’é yerınıwę ní dé dúle.
Dene Kədə́

ʔerıhtł’ís Dëne Sųłıné yatı t’a huts’elkër xa beyáyatı theʔą ʔat’e, nuwe ts’ën yółtı.
Dëne Sųłıné

Edı gondı dehgáh got’ɻe zhatıé k’ę́é edatł’éh enahddhę nıde naxets’é edahłí.
Dene Zhatıé

Jii gwandak izhii ginjìk vat’atr’ijąhch’uu zhit yinohthan jì’, diits’àt ginohkhìi.
Dinjii Zhuh Ginjik

Uvanittuaq ilitchurisukupku Inuvialuktun, ququaqluta.
Inuvialuktun

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Inuktitut

Hapkua titiqqat pijumagupkit Inuinnaqtun, uvaptinnut hivajarlutit.
Inuinnaqtun

kīspin ki nitawihtīn ē nīhīyawihk ōma ācimōwin, tipwāsinān.
nēhiyawēwin

Tłɻchǫ yatı k’ę̀è. Dı wegodı newǫ dè, gots’o gonede.
Tłɻchǫ

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Une version française de ce document est disponible

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1. Introduction

1.1 Purpose

In 2018, Aurora College began a process of transformation into a polytechnic university. Change in the approach to facilities is a key feature of the transformation process. This document will help guide this aspect of the transformation and, following establishment of the new institution, guide ongoing engagement and expansion of polytechnic university facilities.

It should be note that that the needs of public post-secondary education institutions are distinct, in many ways, from other public sector facilities, including JK-12 schools. This document, including associated space formulas, are intended to guide the design and development post-secondary environments suitable for a polytechnic university. The overarching intent is to ensure education and research environments at least on par with similar institution elsewhere in Canada and that create an environment supportive of Norther students.

Under the *Aurora College Act,* responsibility for facilities lies with the Board of Governors and Aurora College only receives partial operating funding from the Department. As such, the capital standards and guidelines established by the Department do not bind the institution, but should inform decision making by the Board of Governors and align with the current and future polytechnic university facilities plan.

However, it should also be noted that the Department typically provides full or partial funding to building projects, including new construction, renovation and upgrading of facilities and equipment. As such, they will inform government decisions regarding funding for building projects.

1.2 Vision

The built environment of the polytechnic university will support a quality of education and student experience that meets or exceeds the standard of post-secondary institutions across Canada. Key objectives are to:

- Improve accessibility of post-secondary opportunities for Northern students, including interest in the student experience;
- Expand research capacity at the institution and enhance its competitiveness in attracting researchers;
- Ensure that a sense of belonging to the institution is achieved regardless of a student's geographical location in the territory;
- Be meaningfully informed by mutually beneficial relationships between the community learning centres and three campuses; and
- Create a unique, Northern-focused educational environment.

1.3 Space Allocation Formulas

This report includes three space allocation spreadsheets, which propose functional programming and estimated areas for the required new facilities at each campus. These space allocation formulas have been informed by a review of the following documents:

- NWT Aurora College Capital Standards and Criteria NWT College Facilities (March 2007)
- NWT Housing Standards (2007)
- Campus Alberta Quality Council Handbook: Quality Assessment and Quality Assurance document (revised June 2021)
- Stanford University Space and Furniture Planning Guidelines (updated April 2009)
- 2019-20 Inventory of Physical Facilities of Ontario Universities – Committee on Space Standards and Reporting – Council of Ontario Universities (December 2021)
- Carleton University Guidelines on Space Standards – Facilities Management and Planning (March 2018)
- British Columbia Universities Space Manual (February 27th, 2003)
- University of Maryland Baltimore County, Utilization Report, prepared by Education Consulting Services Corp. (January 2019)
- University of Calgary Design Standards (updated January 21, 2019)

These were selected to inform the NWT polytechnic space planning standards due to a combination of applicability, availability and thoroughness in approach. The Campus Alberta Quality Council Handbook should be considered an especially important source for this work, as it outlines the requirements and expectations for universities expecting to receive accreditation. Two key concepts were highlighted by the Campus Alberta Quality Council as being critical determinants in the quality of a post-secondary institution:

- Student support services
- Academic freedom of faculty and researchers

Following this approach to space standards, a great deal of importance is placed on the capacity of the polytechnic facilities to support these objectives.

2. Overview of Space Allocation Approach

2.1 Academic facilities and support spaces

In comparison to the existing Aurora College, a polytechnic university will require considerably more space for faculty and research facilities. The figure shown below is taken from the Ontario Council of Universities, and shows average space ratios for distribution of academic facilities. Notably, faculty offices and research labs constitute the largest use of space – at approximately 38%, whereas classrooms only make up 11.5%. Note also the considerable amount of space dedicated to student services.

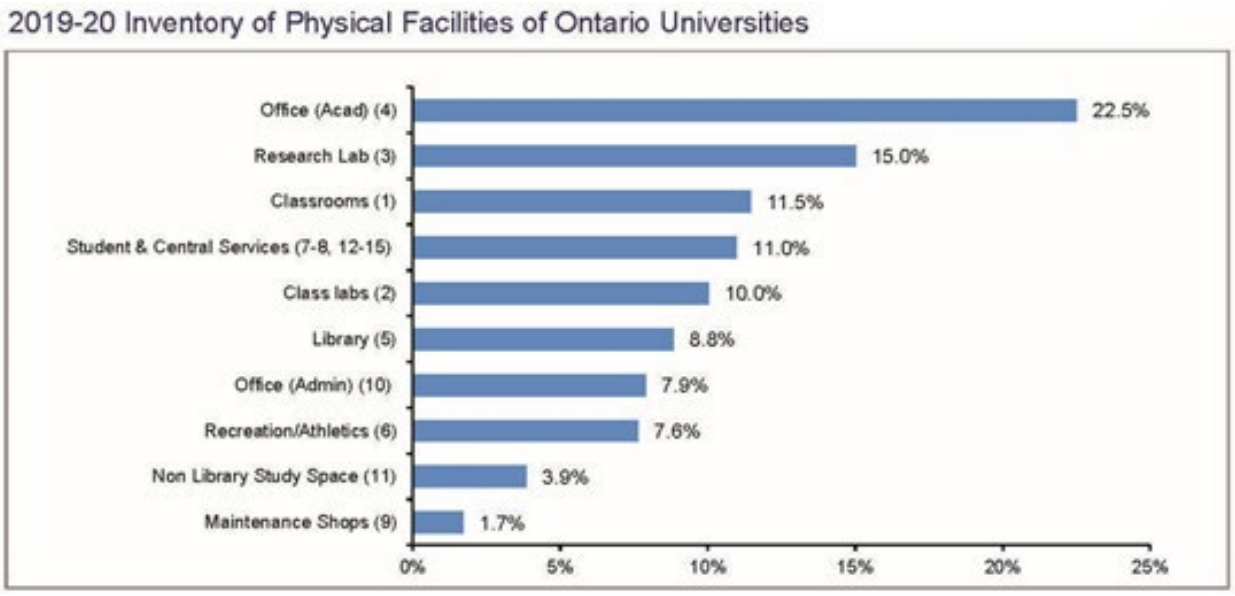

Figure 1: Distribution of actual space by major formula categories for Ontario universities, 2019-20

2.1.1 Student Services

The importance of student support is backed up by numerous comments recorded throughout the engagement process for the Facilities Master Plan (2022). A wide variety of stakeholders emphasised the need for the polytechnic university to provide supports to Northern students Such supports include:

- Counselling
- Health services (with an emphasis for these to be on-campus rather than part of the respective community health system)
- Daycare services – again separate from the respective community daycare
- Student social spaces, indoor gathering spaces
- On-the-land access, proximity to water

- Outdoor gathering spaces and outdoor activity areas

The proposed space standards therefore account for a multi-use student services facility, which can either be a standalone building or combined with the larger academic facility.

2.1.2 Faculty Support and Research independence

In planning for a polytechnic university, the NWT is committing to create an environment for academic research – research for its own sake – which is a separate component from teaching.

Researchers require their own office, labs, lab support space, access to quality libraries, and meeting rooms. Where the researchers are teaching, they also require teaching space. Research is typically undertaken towards a common aim within a department. The various departments of the new polytechnic university will therefore need to be equipped with the additional support (and associated spaces) to make this possible.

As the polytechnic university evolves, the institution may wish to retain affiliation with researchers as they retire; this will lead to the creation of "Emeritus Professor" positions.

Typically, Emeritus Professors will maintain an office (or even a lab) at the facility. Planning for this eventuality is important, as maintaining support and relations with the Emeritus Professors will increase the prestige of the institution – which, in turn, attracts more researchers as well as students.

2.1.3 Proposed approach to distribution of space

The following two charts provide a comparison between two theoretical campus buildings assuming 200 students. The first follows the existing NWT post-secondary space standards (used by Aurora College currently) while the second follows the 2019-20 Inventory of Physical Facilities of Ontario Universities. An assumption is made that the general instruction space would be the same for both theoretical buildings. The purpose of this comparison is to identify that a polytechnic university is a new building type for the Northwest Territories (NWT), and requires a stand-alone consideration rather than comparison to existing building types (for example, a high school).

NWT Aurora College Space Standard (assumes 200 students)

Area Type	Space Allocation	For 200 students	Space percentage
General Instruction	7m2/Student	1,400m²	39.7%
Special Areas - Academic	1m2/student	200m²	5.7%
Special Areas – Trades	120m2/30 students or custom allocation	800m²	22.7%
Resources Areas (Library)	1.25m2/student plus 100m2/campus only	350m²	9.9%
Faculty Areas	17m2/Full time Faculty	425m²	12.0%
Administration Areas	17m2/Full time staff	255m²	7.2%
Leisure and gathering areas	0.5m2/student	100m²	2.8%
Total Net building area		**3,350m²**	

Ontario University Average comparison against NWT AC Space Standard

Area Type	Increase or Decrease in Space	For 200 students	Space percentage
General Instruction	Neither	0m²	11.5%
Classroom Labs (Academic Special Areas)	Increase	1,017m²	10%
Labs (Comparison with Trades Special Areas)	Increase	1,026m²	15%
Resources Areas (Library)	Increase	134m²	12.7%
Faculty Areas	Increase	2,297m²	12.5.0%
Administration Areas	Increase	707m²	7.9%
Leisure and gathering areas	Increase	1,239m²	11%
Total Net building area		**9,950m²**	

By comparing the two approaches, it is clear that the space recommended by the existing NWT post-secondary standards is considerably lower than the average space allocation for Ontario Universities.

Though several additional factors play into the development of these numbers, the intent of this comparison is to identify that the ratio between classroom space and research/support spaces will need to be significantly modified in order to support the transformation of Aurora College into a polytechnic university.

2.2 Student housing

Student housing is a somewhat unique requirement for the NWT, for at least two reasons. One is that Aurora College supports a predominantly mature student population, many of whom have families and cannot attend college unless their families can be housed. Further, commercially available housing – particularly in Yellowknife – is expensive and often beyond the financial means of students. In every community, low vacancy rates make housing difficult to secure.

The current NWT College Facilities Capital Standards and Criteria (March 2007) allow for the following:

- Thebacha Campus – housing to be provided for 97% of full-time students
- Aurora Campus – housing to be provided for 97% of full-time students
- Yellowknife North Slave Campus – housing to be provided for 57% of full-time students

According to the NWT College Facilities Capital Standards and Criteria (March 2007) – pg. 9:

"*The total number of bedrooms can be combined to provide dormitories, single apartments, or multiple bedroom units. To make housing as flexible as possible, all multiple bedroom units should be designed so that they can be shared by more than one student or assigned to students with dependants.*"

Distribution of singles units vs family units:

The ratio of singles to family housing has been a difficult issue for Aurora College to resolve, and may continue to be an issue into the future for the polytechnic university. As noted above, housing is a necessary requirement for a large percentage of students. The provision of family housing (with an assumed average of 104 m2 per student) is approximately 2.6 times the cost of housing for single students (40m2 per student).

At present, the Aurora College space standards allow for a set percentage of housing per student, without creating additional space to be occupied by students' families. Students' families are expected to occupy housing which would otherwise be designated for single students; this effectively reduces the amount of student housing available overall. This is particularly the case for Yellowknife, where there is an assumption that the private market can make up the difference (it should be noted that the cost of private housing in Yellowknife is too high for most full-time students).

The chart below indicates a ratio for single vs family housing required at the three campuses, which can serve as a baseline assumption even if the figures are somewhat outdated.

	2008-09		2012-13	
	Single Units	Family Units	Single Units	Family Units
Aurora	43%	57%	47%	53%
Yellowknife North/Slave	25%	75%	25%	75%
Thebacha	45%	55%	45%	55%

Source: Aurora College Housing Stats 2008/09 – 2012/13

Figure 2: Percentage of student housing units by type

An example for student housing numbers based upon the current (March 2007) NWT Post-Secondary Capital Standards

Based on the existing formulas: Yellowknife, with 283 FTE students, would qualify to accommodate 161 students. However, assuming a family would require three bedrooms, and 75% of students have families (see above), only 40 single students, and 40 students with families could be accommodated in practice. This halves the amount of students actually being housed, and results in approximately 5,720m2 of residential space. If, instead, housing is provided for 161 students, with family housing provided for 121 students and singles housing for 40 students, the requirement for residential space would be 14,184m2.

3. Space Standards

3.1 Administration

3.1.1 Executive Leadership

For the purposes of parity, it is assumed that each campus will include executive-level space under the new polytechnic university. Executive leaders may include a President, Vice President, Associate Vice President or Dean. This space is to accommodate the following:

Room Type	Net Area	Circulation gross-up for room	Net area with gross-up space	Number of rooms	Total net area
Executive Leadership Office	25m²	5m²	30m²	1	30m²
Storage room	4m²	0.8m²	4.8m²	1	4.8m²
Meeting Room	30m²	6 m²	36m²	1	36m²
Reception	10m²	2m²	12m²	1	12m²
Waiting Area	30m²	6m²	36m²	1	36m²
Sub-Total space area					118.8m²

The size of the Dean's office is not impacted by the number of students. The potential exists to share the meeting room, reception and possibly the waiting space with other administrative areas.

3.1.2 General Administration

Campus Director and Administrative Team

The General Administration area is the home to the general campus staff. Staff would administer the school and all that is related to it, including student wellbeing, faculty management, campus finance, etc. The potential exists for the meeting room to be combined or shared with the Dean's office.

Room Type	Net Area	Circulation gross-up	Net area with gross-up space	Impacted by no. of students or staff?	Notes
Campus Director office	20m²	4m²	24m²	No	30m²
Finance Officer	14m²	2.8m²	16.8m²	No	4.8m²
Student Relations Office	14m²	2.8m²	16.8m²	No	36m²
Curriculum Office	14m²	2.8m²	16.8m²	No	12m²
Misc. Office	14m²	2.8m²	16.8m²	Yes	36m²
Storage Room	4m²	0.8m²	4.8m²	No	
Meeting Room	30m²	6m²	36m²	No	

Reception	14m²	2.8m²	16.8m²	No	
Waiting area	30m²	6m²	36m²	No	As a public space, the waiting area should have a ceiling height of at least 3.0m

3.2 Faculty

For universities in general, the number of faculty is not related to the number of students. It is understood, however, that in the early years of the NWT polytechnic university, these numbers may remain related.

For the purposes of this space standards program, it is assumed that the departments would (at least in the early years) serve approximately 85 students each. As such, the number of students has an impact upon number of departments and so number of department chairs.

Each faculty member would be provided with their own office, and have access to reception, meeting rooms, a work room (per department) and a faculty lounge.

Faculty spaces should be fitted out to accommodate increasingly sophisticated personal computers and other personal digital personal systems. Also, faculty work areas should include a whiteboard. Given that faculty will likely use personal portable computers, accommodation for sufficient power and wi-fi (or equal) is required to support individual systems.

It is assumed that faculty would use the teaching research laboratories rather than dedicated faculty labs. This can be further reviewed in the development of the project program at a later stage.

Lighting should be indirect. Natural light should be provided to all faculty work areas including office-type spaces.

Room Type	Net Area	Circulation gross-up	Net area with gross-up space	Impacted by no. of students or staff?	Comments
Department Chair	16m²	3.2m²	19.2m²	Yes	One per deparment
Faculty office	12m²	2.4m²	14.4m²	Yes	One per faculty member (less number of department chairs)
Reception	10m²	2m²	12m²	Yes	One per department
Storage	10m²	2m²	12m²	Yes	One per department
Meeting room (large)	26m²	5.2m²	31.2m²	Yes	One per department
Meeting room (small)	16m²	3.2m²	19.2m²	Yes	One per department
Lounge	40m²	8m²	48m²	Yes	One per facility but increases in size per number of faculty

Work room (photo copier etc)	16m^2	3.2m^2	19.2m^2	Yes	One per department

Office Design Standards	*Office design standards are derived from the following standards*
	• Standard University Space and Furniture Planning Guidelines (Updated April 2009) • 2019-20 Inventory of Physical Facilities of Ontario Universities - Committee on Space Standards and Reporting – Council of Ontario Universities (December 2021) • Carleton University Guidelines on Space Standards – Facilities Management and Planning (March 2018)

3.3 Academic Facilities

3.3.1 Lecture halls and classrooms

The learning environment for a polytechnic university is comprised of a series of important spaces that range from large lecture halls to the smallest study room. It is proposed that each campus facility would receive a large lecture hall that would accommodate at least half of the student population. From here, there would be a number of classrooms (of various sizes), computer rooms, conference and study rooms. The number of each would be determined by the number of departments rather than directly dependant upon the number of students. The ratio proposed here could be revisited or reviewed as the polytechnic university grows.

Classrooms should be fitted out to accommodate increasingly sophisticated audio and visual presentation material and systems. Basic technology should include a smart TV, possible projector, whiteboard, ethernet and video capacity. (This list should be reviewed and updated on at least a five-year basis). Given that students will likely use personal portable computers, accommodation should be made for adequate wi-fi to support individual systems.

Lighting should be indirect and power should be provided for charging of personal lap-tops – particularly in the smaller study and meeting rooms.

Natural light should be provided to all classroom types.

For safety purposes, smaller study and meeting rooms should be configured to ensure public viewing from circulation.

Classroom type	Specific classroom type	Net area	Circulation gross-up for room	Net area with gross-up space	Impacted by Number of students or staff?	Comments
Lecture Hall						
	Hall (200 students)	200 m^2	40 m^2	240 m^2	No	One per campus
Classroom						
	Large (60 students)	100 m^2	20 m^2	120 m^2	No	One per department
	Medium (30 students)	60 m^2	12 m^2	72 m^2	No	Two per department
	Small (16 students)	40 m^2	8 m^2	48 m^2	No	Four per department
Computer cluster rooms						
	Large (10 students)	40 m^2	8 m^2	48 m^2	No	One per two departments
	Medium (8 students)	35 m^2	7 m^2	42 m^2	No	One per department
	Small (2 students)	10 m^2	2 m^2	12 m^2	No	Two per department
Conference rooms						
	Conference room (large - 16-20)	60 m^2	12 m^2	72 m^2	No	One per two departments
	Conference medium (6-10)	40 m^2	8 m^2	48 m^2	No	One per department
Study rooms (students)						
	Group study room (4-6)	30 m^2	6 m^2	36 m^2	No	One per department
	Study room (2)	12 m^2	2.4 m^2	14.4 m^2	No	Two per department

Lecture Hall: The intent of the Lecture Hall is to provide a space where a large percentage of the student body can be assembled indoors to partake in special events or gatherings. This said, the Hall can also be utilized for general lessons, large departmental gatherings or even faculty gatherings. This said, due to its ability to be utilized for specialty events it may not be available on a daily basis and so should not be accounted for when determining amount of dedicated classroom space required.

Classroom and Computer cluster rooms: It should be noted that while the overall approach to the majority of facility space standards is governed by the Full Time Equivalent student numbers, in the case of classroom areas, the number of each type of learning space should also include consideration of the following issues:

- The polytechnic university is anticipated to continue with the current trend of hosting part-time students in addition to the full-time student numbers. At present, part-time students outnumber full-time students by an approximate factor of 2.25 : 1.0 (based on the 2020 Aurora College Annual report).
- Teaching space should accommodate changes in programming from year to year, while providing a variety of classroom spaces. The utilization rate of classrooms is assumed to be approximately 70%, according to general best practice. When utilization rates reach 80%, additional classroom space should be constructed. This said, it is typical for actual use rates of university classrooms to be closer to 50%.

Conference & Study Rooms: It should be noted that the conference rooms and study rooms should not be considered as part of the overall student usage for teaching space as they are intended instead as student self-learning spaces where students can gather to study and research independently and are therefore intended to be located around the facility where students have easiest and convenient access to them. From a student security perspective, it is advisable that these spaces should have at least one wall fully glazed and open to a prominent corridor.

Classroom Design Standards	*Office design standards are derived from the following standards*
	• Standford University Space and Furniture Planning Guidelines (updated April 2009) • 2019-20 Inventory of Physical Facilities of Ontario Universities – Committees on Space Standards and Reporting – Council of Ontario Universities (December 2021)

3.3.2 Laboratories and Research

Laboratories are typically the most expensive spaces within the university and should therefore be planned with care and diligence. Two types of facilities fall under this category: wet labs and dry labs.

Wet Laboratories include a laboratory, an equipment storage room, a cold room, a chemical storage room, a lab office, and a multipurpose space (which serves as second office, test room, guest room etc.). Wet laboratories support water-based experiments (chemicals, drugs, biological matter etc.).

Dry laboratories include the research lab space (typically smaller than a wet-lab due to the reduced potential for contamination and personal space). Typically, they are the environments where computational or applied mathematical analyses (or similar) are undertaken. They include,

in addition to the laboratory space, a procedural library, lab office space and a collection storage space.

Both wet and dry laboratories should be designed to be flexible, accommodate modular furniture and lab desk systems. Wet labs should be provided with Fume Hoods as well as Chemical Storage Cabinets and the related ventilation systems for these.

Power for the Laboratories should accommodate modular lab systems desk systems.

The space allocated to each department includes one wet lab and one dry lab. Note that the specific use of these spaces will need to be determined in more detail once the programming for the polytechnic has been established.

Room Type	Net area	Circulation gross-up for room	Net area with gross-up space	Impacted by number of students or staff?	Comments
Wet Laboratory	115 m^2	23 m^2	138 m^2	Yes	One per department
Equipment storage	17 m^2	3.4 m^2	20.4 m^2	No	One per lab
Cold rooms	17 m^2	3.4 m^2	20.4 m^2	No	One per lab
Chemical storage	17 m^2	3.4 m^2	20.4 m^2	No	One per lab
Other	17 m^2	3.4 m^2	20.4 m^2	No	One per lab
Office support/admin (+/-16% of lab space)	16 m^2	3.2 m^2	19.2 m^2	No	One per lab
Research Lab	55 m^2	11 m^2	66 m^2	Yes	One per department
Secure procedural library	5 m^2	1 m^2	6 m^2	No	One per lab
Private Office	16 m^2	3.2 m^2	19.2 m^2	No	One per lab
Collection storage	17 m^2	3.4 m^2	20.4 m^2	No	One per lab

Actual size of the laboratories should be reviewed with specific research teams. However, for general purposes, the areas identified above conform with the standards set by other institutions. (See, for reference, Stanford University Space and Furniture Planning Guidelines, updated April 2009, p. 40-47).

Laboratory Design Standards	*Office design standards are derived from the following standards*
	• Standford University Space and Furniture Planning Guidelines (updated April 2009)

3.3.3 Library

The function of libraries is changing with the increase of available research material online. However, archival material, maps, specialty books, magazines and space for independent research, and student study gatherings continue to require dedicated space. The library proposed here is based upon the student numbers at the Yellowknife North Slave Campus, which is (at present) the only campus in need of a new library.

The main library space should be provided with natural light that should be introduced in an indirect manner so as to not impact the books/material with UV light.

Study areas and meeting rooms should be fitted out to accommodate increasingly sophisticated audio and visual presentation material and systems. Basic technology should include a smart TV, projector, whiteboard, ethernet and video capacity. (This list should be reviewed and updated on at least a five-year basis). As in all academic spaces, adequate wi-fi should be provided.

Lighting should be indirect, and power should be provided for charging of personal laptops – particularly in the smaller study and meeting rooms.

Natural light should be provided to all room types with the exception of sensitive archival storage.

For safety, smaller study and meeting rooms should be configured to ensure public viewing from circulation.

Classroom type	Specific classroom type	Net area	Circulation gross-up for room	Net area with gross-up	Impacted by number of students or staff?	Comments
Main library						
	Stacks	160 m^2	32 m^2	192 m^2	No	
	Study Carrols	60 m^2	6.4 m^2	66.4 m^2	No	
	Computer research stations	30 m^2	6 m^2	36 m^2	No	
	Display area	100 m^2	20 m^2	120 m^2	No	
	Circulation	220 m^2	44 m^2	264 m^2	No	
	Reception/check-out	20 m^2	4 m^2	24 m^2	No	
Meeting rooms						
	Large meeting room	60 m^2	6 m^2	66 m^2	No	
	Medium meeting room	40 m^2	4 m^2	44 m^2	No	
Library administration						
	Head Librarian office	16 m^2	1.6 m^2	17.6 m^2	No	
	Support librarian office	14 m^2	1.4 m^2	15.4 m^2	No	
	Book repair room	20 m^2	2 m^2	22 m^2	No	
	Storage	20 m^2	2 m^2	22 m^2	No	

Library Design Standards	*Areas identified are drawn from conversations with current Yellowknife Aurora College Librarian team – held November 2021*

3.4 Student Services

Per the engagement sessions undertaken as part of the master-planning process, numerous community groups have identified that on-campus student support is necessary for the success of Northern students. This suggestion is backed up by other universities' space standards and by the Campus Alberta Quality Council.

Key issues cited by NWT informant stakeholders include:

- Daycare
- Counselling
- Health services
- Social centres

Space Type	Specific classroom type	Net area	Circulation gross-up for room	Net area with gross-up space	Impacted by number of students or staff?	Comments
Student commons						
	Large public lounge	218.4 m^2	21.84 m^2	240.24 m^2	Yes	Size of the public lounge dependant upon the number of students. Different for each campus.
	Meeting rooms	40 m^2	8 m^2	48 m^2	No	
	Games room	60 m^2	12 m^2	72 m^2	No	
	Storage room	30 m^2	6 m^2	36 m^2	No	
	Store	25 m^2	5 m^2	30 m^2	No	
	Canteen	218.4 m^2	43.68 m^2	262.08 m^2	Yes	Anticipated to be one quarter the size of the public lounge
	Loading area/dock	40 m^2	8 m^2	48 m^2	No	

	Exercise/Gym	151.2 m^2	100 m^2	251.2 m^2	Yes	Exercise gyms typically calculated at 1.5m per gym user. Assume approximately 1/3 of students will plan to use the facility. Also account for a space approximately 66% of the gym size for entrance, yoga or other open floor classes
	Lockers/change rooms	42.0 m^2	4.2 m^2	46.2 m^2	Yes	Change rooms sizes are a function of the planned user numbers.
	Storage etc. for gym	42.0 m^2	4.2 m^2	46.2 m^2	Yes	

The student commons is typically the environment where students can unwind and interact away from the formality of the classroom. It is recommended that student support services be connected to this environment rather connected to the administrative or academic spaces.

Under Section 10 of the Campus Alberta Quality Council – Quality Assessment and Quality Assurance Handbook, the first item is: "services provided (counselling, residence, athletics, recreation, student government, clubs and other extracurricular activities, food, health services, financial aid etc.)."

The following are proposed space standards for recommended student support services:

Student Support/Counseling

Space type	Specific space type	Net area	Circulation gross-up for room	Net area with gross-up	Impacted by # students	Comments
Student support						
	Counselor office	14 m^2	2.8 m^2	16.8 m^2	No	Number of counselor offices would be governed by student numbers. Recommended: one per 85 students.
	Reception	10 m^2	2 m^2	12 m^2	No	
	Enclosed waiting area	16 m^2	3.2 m^2	19.2 m^2	No	

	Storage	8 m²	1.6 m²	9.6 m²	No	

Student counselling has been identified as a specific need for both southern and Northern students to address numerous personal, academic or other issues/concerns students may have.

Counselling Design Standards	Standards and Guidelines for Counselling Services in the Colleges, Institutes and Universities of British Columbia, October 1995, amended 2018.

Daycare

Function	Specific space type	Net area	Circulation gross-up for room	Net area with gross-up space	Impacted by Number of students	Comments
Daycare	Number of kids: Recommended approach is based upon .75 daycare student per student with a family.					Number of children assumed between the age of 3-5. Younger children require increased staffing and nap space.
	Entrance vestibule	11.2 m²		11.2 m²	N	
	Kitchen	11.2 m²	1.1	12.3 m²	N	
	Coat closet	5.6 m²	0.6	6.2 m²	N	
	Washroom	7.84 m²	0.8	8.6 m²	Y	
	Staff washroom	4.48 m²	0.4	4.9 m²	N	Separate from daycare students WR
	Office	12 m²	1.2	13.2 m²	N	
	Meeting room	16.8 m²	1.7	18.5 m²	Y	
	Play area	89.6 m²	9.0	98.6 m²	Y	Assume 4m2 per student
	Nap space	14.9 m²	1.5	16.4 m²	Y	Assume 1/3 students nap at any given time. Each requires 2m2 plus internal circulation
	Main circulation	26.1 m²		26.1 m²	Y	
	Exit vestibule	7.84 m²	0.8 m²	8.6 m²	N	

A daycare was noted as a necessary function for each campus, to support students with families.

The estimated number of children in the daycare is, therefore, based on the number of students in family housing. According to engagement with Aurora College staff, many, but not all, of the students in family housing require daycare services. Some students have brought family members with them who provide live-in childcare. Some students in family housing are providing for elders or other family members, not only for children. On the other hand, some staff members will also require daycare services.

For the purpose of the space allocation formulas, the estimated number of children in daycare is 75% of the number of students in family housing. For the Yellowknife North Slave Campus, for example, this formula yields an estimated 115 children enrolled in daycare.

Daycare Design Standards	See GNWT's "A handbook for Early Childcare programs", 2013 (Chapter 7)

Note: Capital projects for daycare spaces must be assessed to determine if GNWT's Child Day Care Standards Regulations are applicable prior to using the standards listed above.

Health Centre

Function	Specific space type	Net area	Circulation gross-up for room	Net area with gross-up space	Impacted by Number of students	Comments
Student Health Centre						
	Waiting area (enclosed)	20	6	26	N	
	Reception desk	12	3.6	15.6	N	
	Exam room	14	4.2	18.2	N	Number of exam rooms depends upon student numbers
	Nurse and/or Doctors office	10	3	13	Y	Number of doctor/nurse offices depends upon student numbers
	weight & general checks room	14	4.2	18.2	N	
	Rest area/room	20	6	22.4	N	
	Storage	14	4.2	18.2	Y	

	File storage (can be part of reception)	6	1.8	7.8	Y	

As noted previously, the inclusion of a dedicated Health clinic on-campus has been recommended by several stakeholders. This space is especially important for the north, given both: A) the complexity of becoming registered with a community clinic; and B) students' desire to have to an element of privacy when addressing personal health issues, which may be perceived as compromised when attending a community clinic.

Health Centre Design Standards	Standards and Guidelines for Counselling Services in the Colleges, Institutes and Universities of British Columbia, October 1995, amended 2018

Note: Capital projects for healthcare spaces must be assessed to determine if CSA Z8000 standards are applicable prior to using the standards listed above.

3.5 Student Housing

The NWT Post-Secondary Facilities Capital Standards and Criteria (March 2007) allow for the following:

- Thebacha Campus – housing to be provided for 97% of full-time students
- Aurora Campus – housing to be provided for 97% of full-time students
- North Slave Campus – housing to be provided for 57% of full-time students

As noted, this document is ambiguous regarding the provision of housing for families. However, the Master Planning engagement process has clarified that family housing is necessary, given that students with families (a significant demographic) will otherwise be unable to access post-secondary education.

3.5.1 Student housing space allocation assumptions

Bedroom

It is assumed that student housing will provide for:

- A Twin XL bed (rationale is that a single bed may be too narrow for some students, while the XL means the bed is longer than a typical bed to accommodate for tall students). Also, the bed typically doubles as a couch.

- A desk (610mm x 914mm) and a chair for the desk.
- Drawers for clothes – typically two units that are 914w x 914d x 610h
- Hanging clothes (approximately 610mm length of clothes hanging rod)
- Space for a bar fridge
- Storage space for at least two suitcases

Bathroom

A bathroom can either be developed to be shared by a group of students, shared by two adjacent student rooms or provide one per student room. Bathroom for one or two students should include:

- Sink and counter with storage drawers, cupboards and mirror
- Toilet
- Shower
- Baths typically not provided due to accessibility and cleanliness as well as water consumption issues.

Kitchen

Typically, a communal kitchen will be provided, to be shared by students. Kitchen would accommodate the following:

- One sink,
- One dishwasher
- One oven with stove-top
- One microwave
- Storage cupboards (above and below counter)
- Vertical storage cupboard for cleaning equipment including brooms
- Space for garbage
- Sitting area for tables/chairs (number dependent on the number of students served)

Entrance, circulation and miscellaneous

Each housing unit will have to be designed with an entrance, circulation, stairs, miscellaneous space (garbage, cleaning, storage, etc.) as well as mechanical space. Actual space will have to be

coordinated depending upon the number of students per space. Overall space allocations for housing are suggested based on proposed housing typologies, below.

3.5.2 Housing Typologies

Single student housing – dormitory-style rooms

This type of accommodation provides a room in which a bed, desk space, and cupboard space is provided. Washrooms/bathrooms can be provided as communal or "jack and jill" (shared bathroom between two resident rooms). Typically, this type of residence has a common lounge, shared kitchen, laundry, etc. Typical rooms are approximately 11m2 with washroom, corridor and common space, bringing the per-student area to approximately 30m2 per student. While this is an economical approach to housing students, these types of rooms are typical only for short term stays or for first year students.

Single student housing – studio and multiple bedroom accommodation

This type provides more space for longer-term single students. This can be accommodated either through studio apartments (bed space, kitchenette, bathroom, storage area), or housing 3-4 students in a residence unit with multiple bedrooms, a shared bathroom, kitchen and living space. This type of residence is typically preferred for long durations (one year or more) and can provide a more social approach to accommodation. Typical space per student is approximately 58m2 – representing almost twice that of the dorm style housing above. Further, the 3-4 bedroom unit can be easily modified to accommodate a family if necessary or desirable.

Family Housing – Townhouse style

The townhouse style of accommodation is similar to the 3-4 bedroom unit for single students, except that only one person within the family is a student. Units can vary from 2 to 4 bedrooms. The town-house style takes an approach where each unit faces out to a street but can be located in a row of connected units – typically two storeys in height. These units, while providing a sense of street address, also require site work, increased building envelope et cetera and as such, are a relative expensive per-student approach to accommodation. This said, individual heating systems can be simple and limited vertical circulation is required per unit. As an average, these units utilize 104m2 per student.

Family Housing – apartment building (multi-unit buildings)

Multi-unit accommodation will provide approximately the same amount of space per student as the town-house style (described above). However, interior corridor circulation, larger mechanical systems, greater structural systems, could be more expensive than a town-house approach – this depends on the scale of the project. If only accommodating ten units, for example, the economy of scale is not met and so becomes expensive. For larger developments, this approach could be more economical than the townhouse approach. Typically, these units will result in an average area per student of 128m2.

3.6 Exterior space requirements for a new campus

During development of the Polytechnic University Facilities Master Plan (2022), numerous Indigenous and community governments expressed concerns that the current College in Yellowknife lacks meaningful outdoor space. Further they identified the need for the following:

- Ceremonial space.
- Park space surrounding and integral with the proposed new polytechnic university – exterior grounds that will maintain the proximity of the natural environment to the learning environment.
- A campus grounds that are integrated with the community in such a way that the local community feels comfortable visiting the campus grounds.
- A campus grounds where students from the local schools can visit and become acquainted with the polytechnic university in a way that will allow them to consider it as a viable option for their future.
- A campus grounds that provides the appearance of a "real campus.
- Bus drop-off area (assume road space and drop off paved area of 15mx3m)

Exterior/Campus Grounds Requirements

Function	Area	Circulation gross-up	Net area inc. gross-up	Impacted by no. of students	Notes
Ceremonial space (100 students x 2m2/student)	200	40	240	Y	
Daycare playground	75	25	100	Y	
Bus drop-off	45	0	45	N	
Parking (Academic/student support)	1984	620	2604	N	
Parking (student housing)	400	125	525	Y	
Service Space (Academic/Student support)	150	40	210	N	Includes garbage storage/pick-up
Service space (Student housing)	75	40	115	N	Includes garbage storage/pick-up

4. Development Guidelines

4.1 Facilities Planning Principles

The NWT polytechnic university facilities should be designed to achieve the following:

Cultural safety and inclusivity: Facilities should be comfortable, welcoming, accessible, and safe for students from all backgrounds.

Engaging and supportive student experience: The student experience should be enhanced by shared spaces that support community-building, and services tailored to the needs of the student population. Campus should include supports for social, physical and mental well-being.

Inspiring and innovative learning environment: A dynamic educational environment should be designed to inspire continuous learning and exploration, in diverse forms.

Synergies with the community context: Facilities should be designed to complement their community settings, responding to existing infrastructure, services, amenities, and contexts.

Flexible opportunities for long-term growth: The master planning approach should protect the institution's capacity for long-term growth, while remaining adaptable to evolutions in programming, technologies, contexts, and pedagogical approaches over time.

High-quality and sustainable development: Facilities should reflect design excellence and be built to endure the environmental conditions of the North, minimizing maintenance requirements and environmental impacts. Quality of the developments are to be on par with the standards set by post-secondary institutions across Canada.

Unique Northern-focused identity: A distinct and cohesive character for the institution should be reinforced by the facilities design, and be informed meaningfully by the diverse peoples and landscapes of the NWT. The campus should be planned with an on-the-land sensibility to help Northern students feel at home. The natural environment should be preeminent, and views from facilities should be toward the land.

It is important to consider that the built campus environment is also one of the principal means of attracting students and faculty.

4.2 General Planning Approach

A campus and its facilities are a representation of the post-secondary institution and its supporting community's aspirational intent. For the NWT polytechnic, the following guidelines should be taken into account:

- Buildings and site are developed to promote a safe, healthy and comfortable environment.

- Site and buildings are organized and planned to generate a positive and social learning environment where all of society can have access. Further, as a paragon of learning, the campus and its buildings should be developed to encourage imagination and enquiry.
- Site and buildings are built to develop a positive relationship with the land – particularly in the NWT where the relationship with the land for the population of the NWT is so very important.
- The campus and its buildings should be planned for a long life – 100 or more years. As such, they should be planned to accommodate the potential for adaptability and modified use, both in the short and long term.
- The campus and its buildings should be developed in such a manner that they are economical to operate over their anticipated life. Given the fact that the facilities are typically intended to last for generations, this does not necessarily mean inexpensive building as the operational costs of a building will be significantly more expensive than a building's capital cost. As such, care and consideration should be provided to the development long lasting and economical operation of building and campus systems.

The development, planning and design of the campus and its facilities should express the above, and embody a level of quality that inspires both confidence in the institution, and aspirations by the community.

4.3 Development Guidelines – Aurora Campus

4.3.1 Campus site Development

- The existing open space on campus should be reinforced as an inviting gathering space for outdoor learning and community activity. Development around the open space should offer access and ground floor fenestration for visual connections between inside and outside.
- A more formal pedestrian connection should be built between the recreation centre and the campus, including the existing student residence, in conjunction with other improvements to the campus and larger area or as a standalone initiative. The connection should consist of a paved, lighted multi-use path maintained year-round.
- Future academic buildings should be linked to existing buildings with landscaped open spaces designed for passive enjoyment, and future buildings south of the existing main academic building should help to frame a central common open space that extends the open space.

4.3.2 Buildings

- Buildings should have a generally consistent setback from roads and open spaces to help frame the public realm and contribute to a coherent campus identity.

- Buildings generally should be at least two storeys tall, with the exception of sheds and other service buildings.
- Buildings over 40 metres long should be articulated and/or incorporate material changes to reduce their perceived mass and create visual interest.
- Academic and apartment buildings should have prominent, clearly identifiable entrances oriented to the street or a campus open space. Entrances should have awnings or other weather protection.
- Academic buildings should have active uses on the ground floor, such as lounges or student services, and such spaces should have a high proportion of glazing on the ground floor for transparency between interior and exterior spaces.
- Sheds and other single-storey storage or service buildings should be located to the rear of academic and residential buildings, screened from public view as much as possible.

4.3.3 Parking, Drop-off and Servicing

- Future parking lots should be located at the side or rear of buildings wherever possible while maintaining proximity to building entrances.
- Parking lots serving academic and residential buildings should be paved, lighted and bordered by landscaping. Lighting should focus downward to reduce light pollution and maintain dark night skies.
- Servicing and loading areas should be located at the rear of buildings, consolidated as much as possible and screened where appropriate. Garbage and recycling collection bins should be located within buildings wherever possible.

4.4 Development Guidelines – Thebacha Campus

4.4.1 Key Places

Conibear Crescent

Conibear Crescent is the most significant structuring element in the campus plan. It defines a primary axis through the academic and community components of the campus, from McDougal Rd to York Crescent. The most prominent buildings in the plan will front this corridor, including the existing academic buildings and future buildings, whether for academic uses, housing, amenities and services, or a combination of these. The following guidelines apply to the streetscape of Conibear Crescent and future buildings and open spaces along the corridor. They should take precedence over the general guidelines below.

- Over time, Conibear Crescent should be improved to reflect complete street design principles, balancing the needs of pedestrians, cyclists and vehicles.

- The road should have continuous sidewalks on both sides to promote to support and encourage pedestrian activity and connectivity.
- Driveway accesses should be consolidated wherever possible to minimize curb cuts and reduce the potential for conflicts between drivers and pedestrians.
- The zone between the roadway and the front of buildings should have a unifying landscape treatment, related to existing courtyard of the academic campus, to create an inviting pedestrian environment and enhance the setting for development.
- Consistent lighting, potentially with a distinctive character, should be used to help define the corridor and enhance safety. Lighting should focus downward to reduce light pollution and maintain dark night skies.
- Common amenity spaces and student services within buildings should be highly visible from Conibear Crescent while enhancing visual and physical connections to outdoor gathering and learning spaces.
- Parking lots generally should be located at the rear of buildings, although parking at the side of buildings, buffered by landscaping, may be considered. Parking should not be located between buildings and the road.

Field to King Corridor

A new northwest-southeast corridor, perpendicular to Conibear Crescent, is planned through the "community campus" to help organize future development and improve connectivity from Field Street to King Street. This axis will provide additional frontage for development, particularly for planned housing north of Conibear Crescent. It may take on a mix of forms and functions—parts of it may be developed as a street for all modes of travel, while other parts may consist of a landscaped multi-use pathway.

- Development should not prevent the creation of complete street in the corridor over time. A minimum 16-metre wide right-of-way should be protected.
- At a minimum, the corridor should accommodate a continuous, lighted multi-use pathway from Field Street to Conibear Crescent. Lighting should focus downward to reduce light pollution and maintain dark night skies.
- New buildings should present a fenestrated façade along the corridor.
- Parking along the corridor should be minimized and buffered by landscaping.

Breynat Hall Site

The Breynat Hall site is identified as a future place of significance, with specific uses and features to be determined through broad community engagement. It is anticipated to have community-oriented spaces. Future development adjacent to the Breynat Hall site should respond to this

potential with attractive, well-fenestrated walls facing the site and direct pedestrian connections. Buildings, and service areas in particular, should not back onto the site.

4.4.2 Buildings

- Buildings should have a generally consistent setback from roads and open spaces to help frame the public realm and contribute to a coherent campus identity.
- Buildings should be at least two storeys tall, with the exception of sheds and other service buildings.
- Buildings over 40 metres long should be articulated and/or incorporate material changes to reduce their perceived mass and create visual interest.
- Academic, apartment and mixed-use buildings should have prominent, clearly identifiable entrances oriented to the street or a campus open space. Entrances should have awnings or other weather protection.
- Academic and mixed-use buildings should have active uses on the ground floor, such as lounges, student services or community/cultural space, and have as high proportion of glazing on the ground floor for transparency between interior and exterior public spaces.
- Sheds and other single-storey storage or service buildings should be located to the rear of academic and residential buildings, screened from public view as much as possible.

4.4.3 Parking, Drop-off and Servicing

- Parking lots should be located at the side or rear of buildings wherever possible while maintaining proximity to building entrances. Parking should not be built in the space between buildings and streets.
- Where there are townhouse clusters around the perimeter of a block, parking should be located within interior courtyards.
- Parking lots serving academic and residential buildings should be paved, lighted and bordered by landscaping. Lighting should focus downward to reduce light pollution and maintain dark night skies.
- Drop-off and pick-up should be accommodated in the road right-of-way wherever possible and should not occur off-street, in front of buildings, to maintain front yards for landscaping and pedestrian amenities. Drop-off areas at the side or rear of buildings may be appropriate.
- Servicing and loading areas should be located at the in the rear of buildings, consolidated as much as possible and screened where appropriate. Garbage and recycling collection bins should be located within buildings wherever possible.

4.5 Development Guidelines – Yellowknife North Slave Campus

4.5.1 Campus site development

Following from the planning principles for the new campus, and an assessment of the site conditions, character and opportunities presented, the following set of parameters are intended to guide the development of campus infrastructure on Tin Can Hill:

Respect the site topography

- Building sites follow the lines of the land rather than manufacturing a new development pattern
- Development of hard infrastructure is minimized: all facilities hinge off a single, simple vehicular circulation route – which builds on the existing road through the site.
- To minimize the blasting required, parking is distributed into several smaller lots at various elevations, as the site allows

Maintain a natural, treed horizon

- Where facing the waterfront, buildings are nestled into the low points in the landscape rather than dominating the skyline
- A wide buffer is maintained between the new residential developments and the existing neighbourhood on School Draw Avenue

Celebrate the experience of the land and water

- Green space is preserved between every development parcel to maintain sense of being on (or close to) the land
- Existing vegetation, where possible, is maintained
- Views over the waterfront are afforded to developments that face the site's eastern edge

Create vibrant outdoor spaces through a pedestrian -focused approach

- Parking is maintained at some distance from the main academic buildings, encouraging an approach to facilities on foot
- Landscaped grounds are established as a central defining element of the campus
- Existing walking trails through the site are maintained, and remain accessible to the public

Distinct experience between public, semi-public and private

- Academic developments are accessed primarily on foot and face the waterfront

- Residences are clustered into neighbourhoods and buffered (by forested space) from the academic area, and from city streets
- Residential and academic sites are afforded separate access points and parking

4.5.2 Guidelines for specific campus components

- Academic buildings should:
    - Maximize views to the lake and broader natural setting.
    - Have prominent, clearly identifiable entrances with awnings or other weather protection.
    - Have active uses at grade, such as lounges, student services or other gathering spaces, where they face streets and outdoor gathering/amenity space. Glazing at grade should provide a high degree of transparency between interior and exterior public spaces.
    - Be linked with landscaped open spaces for passive enjoyment. Where enclosed corridors are used to connect buildings, they should be heavily glazed and contain space for sitting.
- Campus open spaces should respect existing drainage patterns and incorporate stormwater management, where appropriate.
- Drop-off and pick-up should be accommodated on campus streets and should not occur off-street, between the street and buildings.
- Servicing and loading areas should be located away from the main entrances of buildings, consolidated as much as possible and screened where appropriate. Garbage and recycling collection bins should be located within buildings.
- Sheds and other single-storey storage or service buildings should be located away from main entrances of academic and residential buildings, screened from public view.
- Parking lots should be paved (preferably with permeable paving) and lighted.
- Campus streets should have sidewalks on both sides and be lighted.
- Lighting should focus downward to reduce light pollution and maintain dark night skies.
- Residential areas should include common outdoor amenity space for students and their families.
- Apartment buildings should contain amenities at grade, adjacent to outdoor amenity space.
- Residential areas should be linked to the academic buildings and downtown with lighted pathways that are as direct as possible.