Inclusive Physical Space Framework

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Territorial Acknowledgement

The University of Waterloo acknowledges that much of our work takes place on the traditional territory of the Neutral, Anishinaabeg and Haudenosaunee peoples. Our main campus is situated on the Haldimand Tract, the land granted to the Six Nations that includes six miles on each side of the Grand River. Our active work toward reconciliation takes place across our campuses through research, learning, teaching, and community building, and is coordinated within the Office of Indigenous Relations.

About this Document

The Inclusive Physical Space Framework follows best practice in accessible print design as set out by the Council of Ontario Universities' Clear Print Guidelines. This includes text that is a minimum of 12 points in size, line-spacing of at least 1.25, high contrast, and the use of simple, sans-serif typefaces. Alt text is provided for all photos and supporting graphics. Text contrast meets the requirements of WCAG 2.1 Level AA. The document is laid out in Microsoft Word using standard typefaces (Arial and Calibri) to enable easy updates and adaptation by others.

An EnAbling Change Project
with the Government of Ontario

Introduction

1. Background

The Inclusive Physical Space Framework (hereafter the "Framework") is an open resource document developed by the University of Waterloo and Human Space (selected through a public competition) with support from the Government of Ontario's EnAbling Change Program. It is intended to guide and empower post-secondary institutions to plan, build, operate, and maintain physical spaces on and off campus which uphold strategies for accessibility, well-being, and sustainability (note that terms defined in Terms and Definitions will be underlined the first time they appear).

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The Framework focuses on criteria where at least two of the three strategies have synergies and present the opportunity to raise the quality and experience of the <u>built environment</u>. The Framework does not list every consideration related to accessibility, well-being, sustainability. Project teams are expected to comply with applicable standards required by governmental authorities having jurisdiction and the post-secondary institution.
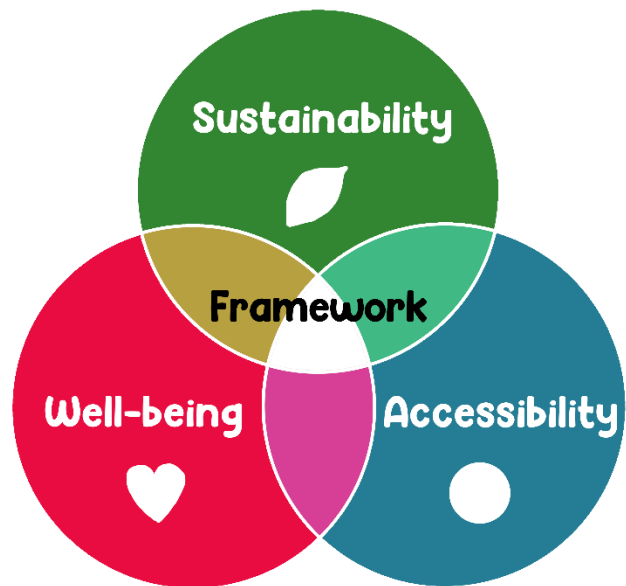

Figure 1. The Framework focuses on points of overlap between strategies for accessibility, well-being, and sustainability.

Development of the Framework included a literature review of existing standards, legal requirements, and better practices for accessibility, well-being, and sustainability. To further structure and develop the Framework, the Project Team engaged with the University of Waterloo student community, a Project Advisory Committee, and Community and Disability Partners:

- A survey of the University of Waterloo community was conducted between April 3rd and April 28th, 2023, to record experiences related to the strategies discussed in the Framework. The survey was also designed to understand what students, staff, and faculty value about existing physical spaces and how these spaces provide comfort and/or enable productivity.

- Both the Project Advisory Committee and Community and Disability Partners reviewed drafts and provided feedback at early, interim, and final stages of development.

The authors would like to thank the following (in alphabetical order) for their contributions in developing the Framework:

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- Dave Dame, Director of Product Accessibility, Microsoft

- Howard Gerry, Associate Professor, OCAD University

- Sarah Manteuffel, Community Planner, Urban Systems Ltd.

2. Toronto Pan Am Sports Centre

2. Purpose

The purpose of the Framework is to enable better design processes and the building, operation, and maintenance of better physical spaces in a post-secondary education environment. By highlighting synergies between the areas of accessibility, well-being, and sustainability, we can capture opportunities for better design not considered in other design standards and guidelines.

The Framework considers a university's duty of care and responsibility to create an inclusive, sustainable, high-quality environment that promotes health and well-being

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among members of the university community. Furthermore, the Framework recognizes the various budget models for construction of post-secondary infrastructure and encourages the reframing of cost to be more holistic, recognizing that the total cost of a project goes beyond initial capital construction cost.

a) Consider the Total Cost of the Project

The concept of project cost should consider life-cycle costs including the social and economic benefits of <u>inclusion</u> and well-being (or the societal costs of exclusion), the savings that may be realized by planning for future advancements, and any <u>opportunity costs</u>. Life-cycle costing encourages examination beyond initial capital and construction costs and considers the costs associated with maintenance, operations (including training for new technologies), and residual value at the end of a project's <u>life cycle</u>.

The social and economic benefits of inclusion flow from <u>universal design</u> as the basis of good design. If an environment is accessible, usable, convenient, and a pleasure to use, everyone benefits. By considering diverse needs and abilities throughout the design process, universal design creates products, services, and environments that meet peoples' needs. Within an education context, compared with others, persons with <u>disabilities</u> are less likely to receive an education as children, be employed as adults, start their own families, participate in community events, and, as a result, are more likely to live in poverty. Through the creation of <u>accessible</u> and barrier-free post-secondary environments, we can contribute toward closing the education gap and further enable persons with disabilities' full participation in society. From this perspective, the cost of exclusion is too high. Building and upgrading educational facilities that are child-, disability-, and gender-sensitive contributes to providing safe, non-violent, inclusive, and effective learning environments for all.

Well-being in the built environment continues to be demonstrated through existing, evidence-based guidelines. Metrics established for air and water quality, thermal and auditory comfort, and social and mental well-being uphold both mental and physical health. Costs related to poor health are most often seen by organizations through absences and diminished productivity. The cost of operating a building is often less than the cost of the salaries of those who work in the building. Ensuring the health and well-being of people through good building design also greatly contributes to innovation within post-secondary environments. In short, when people are healthy, they are more productive and better able to achieve their goals or engage in <u>campus life</u>.

In terms of sustainability, the emphasis is often reversed, with the energy used to operate a building being considered over emissions in other stages. Life-cycle cost in this context means accounting for emissions associated with site development and manufacturing, transporting, and installing materials and systems (the underlined embodied carbon of a project). It also means planning for disposal or reconditioning of a building or space at the end of its useful life.

With any project, there is the concept of underlined opportunity cost and spaces that could be shared or transferred for other faculty use. Opportunities for efficient space use, without sacrificing usability or accessibility, are also important to explore.

The Framework strategically lists criteria for design teams and project sponsors to reflect on at all stages of planning, designing, building, operating, and maintaining physical spaces.

4. Dumfries and Galloway College

3. Related Policies, Standards, and Guidelines

The following are publications consulted or referenced as part of the development of the Framework. Some represent minimum legal standards while others are examples of current best practice in the areas of accessibility, well-being, or sustainability. This section should be updated as new regulations are adopted or standards are developed.

* Indicates that the resource is part of framework that includes metrics to compare and track progress.

a) Accessibility

- [Accessibility for Ontarians with Disabilities Act (AODA)](#) 2005, O. Reg. 191/11 Integrated Accessibility Standards (IASR), PART IV.1, 413/12, s. 6., Design of Public Spaces Standards (DOPS)

- [B651-23 Accessible Design for the Built Environment](#), Canadian Standards Association

- Building Code Act, 1992, S.O. 1992, c. 23, [O. Reg. 332/12: Building Code](#), O. Reg. 88/19, s. 97, Ontario Building Code (OBC), Section 3.8 Barrier-Free Design, with 2022 amendments

- [Combatting the Costs of Exclusion](#), UNICEF

- [Guide to Conducting Accessible Meetings](#), Ontario Municipal Social Services Association

- [Guidelines for Hosting Accessible Virtual Meetings](#), University of Waterloo Centre for Extended Learning

- [Ontario Human Rights Code, R.S.O. 1990, c. H.19](#). Last amendment 2021, c. 4, Sched. 11, s. 16

- [Rick Hansen Foundation Accessibility Certification](#), Rick Hansen Foundation*

b) Well-being

- [ANSI/ASHRAE Standard 55, Thermal Environmental Conditions for Human Occupancy](#)

- [Core Recommendations for Safe Indoor Air](#), Ontario Society of Professional Engineers

- [Indoor Air Quality Guide](#), American Society of Heating, Refrigerating and Air-Conditioning Engineers

- [Nine Dimensions of Wellness](#), University of Waterloo Engineering

- [Okanagan Charter Commitments](#), University of Waterloo Mental Health and Wellness

- PAS 6463:2022 Design for the Mind – Neurodiversity and the built environment, British Standards Institution (BSI)

- The Cost of Employees' Poor Health, Johns Hopkins HealthCare Solutions

- WELL Building Standard v2, International WELL Building Institute*

c) Sustainability

- Criteria for the Passive House, EnerPHit and PHI Low Energy Building Standard, Passive House Institute

- Drinking Water Source Protection, Conservation Ontario

- Leadership in Energy and Environmental Design (LEED) v4, Canadian Green Building Council*

- Life Cycle Costing Guideline, University of Waterloo Secretariat

- Living Building Challenge, International Living Future Institute

- RELi Resilience Action List & Credit Catalogue, Institute for Market Transformation to Sustainability*

- Shift: Neutral: The University of Waterloo's Roadmap to Carbon Neutrality

- Source Water Protection, Region of Waterloo

- Toronto Green Standard v4, City of Toronto

- Zero Carbon Building Standard, Canada Green Building Council

4. Scope

The Framework applies to all campus physical space projects representing any level of change. This document should be reviewed prior to the commencement of any scale of project, including building maintenance, renovation, new construction, and the procurement of furnishings, fixtures, equipment and building materials or site elements. It applies to the planning, design, build, construction, operation, and maintenance phases of any physical spaces in a post-secondary environment.

8. Quadrangle Studio

5. Accountability

This section describes the accountabilities associated with the Framework for each office or party involved in project execution.

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a) Plant Operations/Facilities Management Offices

- Oversee implementation of the Framework with project clients and monitor implementation of criteria on all projects.

- Integrate requirements into bid documents and other relevant documentation.

- Review and update the Framework on a periodic basis or as required by regulatory changes, and at minimum on five-year intervals, liaising with relevant interested parties or community partners. Review should consider evolving terminology and better practices in all focus areas.

- During procurement phase of projects, ensure Request for Proposals (RFP) include evaluation criteria that require proponents to indicate their commitment to and process for achieving accessibility, well-being, and sustainability in the built environment.

b) Relevant Centres of Expertise/Experience

- Represent priority areas including accessibility, <u>equity</u>, diversity, and inclusion (EDI), Indigenous relations, well-being, <u>safety</u>, or sustainability.

- Advocate for the use of the Framework on projects.

- Recommend interested parties, including community partners, to be involved in consultation phases.

- Support review of the Framework as necessary.

c) Project Clients

- Review the Framework and indicate intent to review and apply criteria to the project during the RFP process.

- Integrate criteria of the Framework into project planning.

d) Design Consultant and Construction Manager

- Understand and implement criteria in the Framework as specified in bid and contract documentation.

10. University of Roehampton

6. Design Principles

All projects should integrate the following design principles throughout the life cycle of the project, including through planning, design development, construction, and operation of the building and/or site:

a) Accessibility

The principle of accessibility recognizes the adoption of inclusive processes and outcomes, and accessible design strategies. Inclusive processes and outcomes should strive to bring "everyone to the table" so that <u>lived experience</u> is reflected in design decisions. The design of the project should be inclusive to persons with disabilities and consider the range of disabilities experienced including mobility, vision, hearing, dexterity, strength and stamina, size, stature, cognitive, and hidden disabilities.

b) Well-being

The principle of well-being recognizes that the built environment impacts how students, staff, and faculty engage with their surroundings and can positively or negatively affect their well-being. The Framework emphasizes well-being as a priority and recognizes that the built environment should promote a sense of community and belonging.

c) Sustainability

The principle of sustainability recognizes the climate emergency and the role that the built environment plays in addressing climate change. In the context of a post-secondary environment, the Framework stresses making choices that create better outcomes for our planet, such as reaching <u>net-zero</u> or being net-zero ready. Performance standards and targets for energy use, water conservation, and greenhouse gas emissions should be implemented to measure progress towards sustainability goals. This principle urges decision-makers to balance the <u>first cost</u> with <u>life cycle cost</u> and <u>opportunity costs</u> when thinking about the cost of the project. Furthermore, as the climate and planet have changed, the Framework also considers how our built environment needs to respond and adapt to climate risks by increasing <u>resilience</u>.

12. Mattamy National Cycling Centre

7. Terms and Definitions

Defined terms in the Framework are <u>underlined</u> the first time they are used.

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Accessibility/Accessible

The qualities that make a place or experience open to all, or the degree of ease that a device, service, physical environment, or information can be accessed, used, and enjoyed by persons with disabilities. An accessible space can be used or experienced by the full range of human diversity with respect to ability, language, culture, gender, age, and other forms of human difference in such a way that achieves independence and interdependence, dignity, integration, inclusion, and equality of opportunity. The terms imply conscious planning, design, and/or effort to ensure something is barrier-free to persons with disabilities. Accessibility benefits the general population by making things more equitable and usable for all, including older people, children, and caregivers.

Acoustic Zone (Zoning)

Acoustic environments can be controlled to minimize background noise, echo, and reverberation. The level of acoustic control should vary according to the level of user focus required within the zone. Activities of higher focus should be designed to provide a higher level of acoustic control and be part of reduced stimulus rooms. Provisions should also be made for different levels of acoustic control, so users can move from one level of acoustic control to the next, slowly moving towards a typical or less-controlled environment to avoid a static universal sensory whiteout.

Biophilic Design/Biophilia

The practice of designing for connection between people and the natural environment. Biophilic design includes a range of practices, from providing direct, physical access to nature to making architectural reference to organic forms.

Built Environment

Includes the human-made space in which people live, work, and recreate on a routine basis. This includes the indoor and outdoor facets of sites/grounds, buildings, facilities, and paths of travel. The built environment also relates to the layout and design of their elements, including lighting, acoustics, temperature, and other environmental components, furniture, equipment, built-in counters, storage, and shelving, operable parts such as doorknobs and light switches, and greenery and plants.

Cane-Detectable

An object is cane-detectable when it can be identified by a person using a long white cane for wayfinding. This can be achieved by having an object's bottom edge mounted at or below 680 mm above the finished floor (AFF). Tactile walking surface indicators (TWSI) are also considered cane-detectable.

Campus Life

The full post-secondary education experience, encompassing all academic and non-academic aspects.

Carbon-Sequestering (Materials)

Products or materials that capture and store atmospheric carbon dioxide. Specifying carbon-sequestering materials can help reduce the amount of carbon dioxide in the atmosphere with the goal of mitigating climate change.

Circadian Rhythms

The internally driven cycles that rise and fall during the 24-hour day. They help individuals fall asleep at night and wake up in the morning. The internal circadian clock synchronizes and controls sleep/wake cycles, hormonal activity, body temperature, rhythm, hunger, and digestion.

Circular Economy

A model of production and consumption that seeks to address climate change and other challenges (e.g. affordability) by decoupling economic activity from emissions, pollution, and other environmental harms. Core concepts include waste-reduction, repair, and the reuse of products, materials, or spaces at their highest possible value. The circular economy contrasts with the linear economy, in which products, materials, and spaces are disposed of at the end of their useful lives and recycling typically degrades their value (e.g. clothes being recycled as rags). In a circular economy, principles of circularity are applied at the design stage to ensure products or spaces can be easily decommissioned, deconstructed, and recirculated.

Co-design

Participatory design processes centered around groups of people, particularly ones with lived experience related to a particular topic, who collectively contribute to the formulation of a solution to a problem. Co-design is a process which includes idea generation, designing solutions, approvals, implementation, and evaluation.

Desire Path

Unplanned paths created by people choosing a route of least resistance between two points, generally representing a shortcut, over a deliberately planned path. Over time desire paths become well-defined through use, encouraging even more use. Desire paths are often inaccessible until formalized.

Disability

Can be visible, hidden, temporary, intermittent, or permanent. Can be defined from the lens of a medical model or a social model. In the medical model of disability, it is a condition that encompasses any degree of physical conditions and include persons who use mobility devices, persons who are blind or have low vision, persons who are deaf or hard of hearing, persons with limited strength, stamina, and dexterity, persons of all sizes, and persons with cognitive and learning disabilities.

In the social-ecological model of disability, it is about the mismatch between a person and their environment or a product. From this perspective, disability is a result of the organization of society rather than individual ability. Those responsible for planning, designing, building, operating, and/or maintaining the built environment or products therefore have the capacity to impact the extent of a person's disability.

Electrochromic Glass

A type of glass that can change its level of transparency, from transparent to opaque, when an electrical charge is applied. Electrochromic glass can provide privacy while reducing glare. Also referred to as "smart glass."

E-waste

Electronic waste describes discarded electrical or electronic devices or products that are unwanted, not working, broken, and nearing or at the end of their useful life. Common e-waste items include home appliances, home entertainment devices, communications and information technology devices, electronic utilities, and office and medical equipment.

Embodied Carbon

Refers to the greenhouse gas emissions arising from the manufacturing, transportation, and installation of building materials. Embodied carbon represents a significant percentage of global emissions, and mitigating climate change requires strategies to both reduce embodied carbon in new construction and preserve the embodied carbon of existing structures.

End-User Controls

Controls for the operation of building services or safety devices, including, but not limited to, controls for the operation of building services or safety devices (i.e., fire manual pull stations, fire extinguishers, etc.), including electrical switches, thermostats, and intercom switches, intended to be operated by the occupant and located in an accessible path of travel; electrical outlets, and data ports; information technology, audio/video, communications, and automation systems; coat hooks and rods, shelves, and millwork; eye wash stations; controls for the operation of windows and window shades; and lockers and locker locks.

Equity/Equitable

Recognizes that each person has different circumstances and allocates the resources and opportunities necessary to achieve a fair and just outcome or access. In contrast to equality, which means that each individual or group of people is given the same resources or opportunities.

Fit-for-Use

A concept evaluating if and how the existing space can be used for the intended programming or activities desired for the space.

First Cost

A term used in the Framework to indicate the cost at construction. First cost is often the only cost considered when developing a built environment project or selecting a product. Solely focusing on first cost fails to recognize life cycle costs which can lead to decision-making that does not enable sustainable building practices.

Flicker

Refers to the flicker produced by electric lighting, especially fluorescent lighting fixtures, which may be obvious or barely perceptible. The flicker of lighting has the potential to tire, distract, disorient, and cause discomfort for users, increase energy consumption, and create a risk of seizure for those with photosensitive epilepsy.

Green Streets

Roads that include green infrastructure, natural and human-made, that allow for rainwater management while directing the water to plants and trees. The plants act as a natural filter that cleans the water before it makes it way into local waterways. This strategy can enhance the tree canopy along streets, parking lots and pedestrian

walkways, mitigating urban heat island effect while managing stormwater runoff, and providing opportunities to enhance biodiversity.

Hoteling

Desk hoteling is a space-sharing strategy for workspaces in which people may reserve their workstations ahead of time.

Hybrid Environments/Teams

A hybrid team is a flexible work structure in which some team members work remotely, and others work from a central location or office. Hybrid environments enable hybrid work by anticipating changing levels of use and incorporating infrastructure to run effective hybrid meetings.

HVAC

Refers to heating, ventilation, and air conditioning.

Inclusion

The act or practice of including and considering people who have socially, politically, and/or historically been excluded because of their disability, age, sexual orientation, sex, gender expression, race, gender, sexuality, etc.

Indigenous Species (Plants)

Plants that are native to a geographic area and climate zone. Native species help reduce invasiveness, require less maintenance, improve tolerance to climate conditions, and can have a higher resilience to local wildlife. Native spaces also provide important habitat for local pollinators.

Landmark (Landmarking)

A prominent object, feature, design element that serves as a guide to help identify a location in a space or site.

Life Cycle Cost/Life Cycle Assessment (LCC/LCA)

Refers to the process of identifying costs and environmental impacts over the full life of a physical product or piece of infrastructure, from harvesting raw materials through manufacturing, use, and disposal. Life cycle cost herein references the total cost of ownership to the post-secondary institution over a defined timeframe, and life cycle assessment focuses primarily on greenhouse gas emissions. Life cycle cost is an approach that assesses the total cost of an asset over its life, including initial capital

costs, maintenance costs, operating costs, and the asset's residual value at the end of its life.

Lived Experience

Knowledge or understanding gained through direct involvement rather than observation, study, or learning through a story that was shared. Lived experience may be shared among members of a demographic group or informed by complex intersectionalities (the cumulative effect of multiple identities including gender, race, or ability).

Luminaire

A complete lighting unit or fixture comprising lamps or bulbs, sockets, shades, reflectors, and lenses, as applicable, that provides illumination.

Passive House Principles

The five passive house principles include continuous insulation and thermal bridge free, airtight barrier layers, high performance windows and doors, controlled ventilation, and solar gain and loss through design. Using passive house principles, buildings can be designed to be more sustainable.

Path of Travel

A continuous, unobstructed route providing exterior and interior access to elements and spaces. Interior accessible paths of travel include aisles, corridors, hallways, unobstructed passing areas, ramps, elevators and platform lifts. Exterior accessible paths of travel include sidewalks, trails, pathways, boardwalks, beach access routes, pedestrian overpasses and underpasses, exterior paths of travel to entrances and exits, ramps, pedestrian crossings, traffic islands, curb ramps, depressed curbs and access aisles. An accessible path of travel should be safe, unobstructed and the most direct route.

Net-Zero

A target of carbon neutrality or completely negating the amount of greenhouse gases produced by human activity by reducing emissions, removing carbon from the atmosphere, and/or purchasing third-party offsets. Carbon neutrality refers to a balance between the carbon put into the atmosphere and that taken out. In buildings, net-zero means: embodied carbon + operational emissions - offsets = 0.

Opportunity Costs

A decision-making process that can be applied to the design and build industry. An opportunity cost represents the potential benefits that can be achieved or lost when choosing one alternative over another. Opportunity costs can be easily overlooked and require a holistic understanding of the range of benefits that go beyond the dollar value assigned to a decision.

Pearl Effect/Halo Effect

A pearl or halo effect is a visual phenomenon whereby lights appear surrounded by a glowing ring or ball and can affect one's ability to navigate a space by overwhelming the visual field. All people can experience the pearl/halo effect depending on ambient light conditions, but it is more prevalent among people with some disabilities or diseases.

Recreational Trails

Public pedestrian paths of travel used for physical activity and leisure purposes. These paths of travel are often found in naturalized areas such as parks, forests, ravines, or green spaces.

Reduced-Stimuli Spaces

Also referred to as escape spaces, reduced-stimuli spaces provide respite for users from stimuli found in their environment to prevent over-stimulation. These spaces may include a small, partitioned area or crawl space in a quiet section of a room, or throughout a building. They should provide a neutral sensory environment with minimal stimulation that can be customized by the user to provide the necessary sensory input. Lighting effects, colour, sounds, music, scents, textures, etc. may be considered in the design to deliver stimuli to various senses.

Resilience

In the context of climate change, resilience recognizes that the climate has changed and will continue to change. As a result, the built environment should be designed to allow the capacity or ability to anticipate and cope with shocks, and to recover from their impacts in a timely and efficient manner. This is different from adaptation. Refer to adaptation, sustainability, and mitigation strategies.

Safety

The concept of safety in the built environment refers to: physical safety, or the design of spaces with appropriate safeguards to avoid risk of injury to users; public safety, or the design and servicing of spaces to discourage conflict and violence; and psychological or

emotional safety, or the design of spaces to promote comfort, independence, trust, and teamwork.

Sensory Garden

A garden designed to allow users to enjoy a wide variety of sensory experiences. It may be designed to stimulate or engage users' sense of sight, smell, touch, taste, or sound. It should consider who the garden is intended for and what plants, materials, or features will best achieve the desired atmosphere. Sensory gardens may be located indoors and outdoors.

Sensory Maps

Representations of a space or environment which identify environmental characteristics that may benefit or adversely affect people with sensory sensitivities. Environmental characteristics may include light levels or the presence of flickering or flashing lights, acoustic levels, scents, and levels of privacy or activity.

Sensory Sensitivities

Users can experience both hypersensitivity (over-responsiveness) and hyposensitivity (under-responsiveness) to a wide range of stimuli including sights, sounds, smells, tastes, touch, balance, awareness of body position and movement, and awareness of internal body cues and sensations. Sensory overload or shutdown occurs when an intense sensory stimulus overwhelms a user's ability to participate. Understanding and designing potential sensory sensitivities can help to ease discomfort and increase opportunities for user participation.

Service Animals

An animal that accompanies a person to aid them in engaging with the built environment. There are various types of service animals besides guide dogs that enable people with various types of disabilities, such as persons with low to no vision, persons who are deaf or hard of hearing, persons with Epilepsy, persons with autism, persons with physical or mental health-related disabilities. This includes service animals for emotional support.

Smudging

Used widely to refer to the smudging ceremonies of Indigenous peoples, in which sacred herbs and medicines are burned as part of a ritual, or for cleansing or health purposes. Indigenous peoples have their own terms and phrases for smudging.

Source Water Protection

A process or plan to protect municipal wells and surface water intakes from specific activities that may pose a threat to drinking water.

Stack Effect

The movement of air into and out of buildings through unsealed openings, chimneys, flue-gas stacks, or other areas such as building entrances resulting from air-buoyancy. In locations such as building entrances the use of larger vestibules or revolving doors help to create seals to reduce the impact of the stack effect.

Sustainability

In the context of climate change, sustainable design is about making design choices today that create less harm, do no harm (net-zero), or even regenerate the environment. For the purposes of the Framework sustainability will include resiliency.

Tactile Maps

Are designed to be read by touch by users with low to no vision to help reach their destination. They should be located at key points to make an environment intuitive, help users understand where they are, know where their desired location is, and know how to get to that destination from their present location. Tactile maps should help to reduce overall stress and frustration, increase efficiency and functionality of a space, and contribute to an environment that is easy to exit in case of emergency evacuation.

Tactile Walking Surface Indicators (TWSI)

Textured ground treatments, detectable underfoot, used to indicate the presence of a hazard, such as the transition from a sidewalk to a roadway, or to aid in navigation in open spaces. Truncated domes or bumps are typically used to indicate hazards and elongated bars or lines for direction.

Universal Design

Universal design is the design and composition of an environment so that it can be accessed, understood, and used to the greatest extent possible by all people regardless of their age, size, ability, or disability. An environment (or any building, product, or service in that environment) should be designed to meet the needs of all people who wish to use it. This is not a special requirement, for the benefit of only a minority of the population. It is a fundamental condition of good design.

Urban Heat Island Effect

Happens when the closely packed buildings and paved surfaces that make up a city amplifies and traps heat far more effectively than natural ecosystems and rural areas,

which are often shaded by trees and vegetation and cooled by evaporating moisture. Cities also generate their own heat, which is released from sources such as furnaces, air conditioners, and vehicles. On a sunny day, paved surfaces can be between 27 to 50 degrees Celsius hotter than the air. The difference is especially noticeable at night when the heat captured by pavement and buildings during the day continues to warm the city after the sun goes down. Large cities can be as much as 12 degrees Celsius warmer than their surroundings in the evening.

Water Feature

In landscape and architecture, a water feature is one or more items from a range of fountains, pools, ponds, cascades, waterfalls, and streams.

Well-Being

The sum of factors that make up one's general health and happiness. Wellness and health both contribute to an overall sense of well-being. Standards such as WELL V2 are tools for buildings and organizations to consider evidence-based strategies to enhance human health and well-being.

Wellness

The holistic integration of many interconnected dimensions including physical, intellectual, cultural, environmental, financial, relational, vocational, and spiritual wellness. Wellness fuels the body, engages the mind, and nurtures the spirit.

Window-to-Wall Ratio

The fraction of the above-grade wall area that is covered by fenestration (the arrangement of windows and doors on the elevations of a building), calculated as the ratio of the wall fenestration area to the gross above grade wall area.

14. Alliance Manchester Business School

8. Using the Framework

The Framework builds upon existing better practices and the lived experience of people with disabilities. It serves as a baseline from which any post-secondary institution can adapt to meet their institution's specific needs and values. All people involved in the planning, design, construction, maintenance, and operation of the site, building, or specific feature should review the Framework. It should be reviewed at the outset of a project and consulted at decision-making points throughout.

The Framework is divided into three sections – Engagement Process, Overarching Considerations, and Space-Specific Considerations – however not all sections will apply to all projects. In general, every project will require an Engagement Process, several Overarching Considerations, and one or more Space-Specific Considerations. However, due to the wide variety of possible projects, users should familiarize themselves with the headings and applications of all sections to recognize potential.

Criteria with implications for each focus area are indicated using symbols: 🔵 for accessibility, ❤️ for well-being, and 🍃 for sustainability.

Engagement Process

9. Engagement

Requirements for engagement will evolve over the course of the project and should be informed by the institution's internal design group policy and procedure manual.

In general, groups to be consulted should include:

- Facilities management (Plant Operation, Design & Construction at the University of Waterloo) and other relevant offices (e.g. maintenance and operations, grounds, infrastructure, mechanical, electrical);

Inclusive Physical Space Framework

- Relevant centres of expertise/experience including offices for accessibility, equity, diversity, and inclusion (EDI), Indigenous relations, safety, and sustainability;

- Project clients; and

- Design consultants and construction managers.

Where appropriate, project clients should meaningfully involve interested and affected communities and people with lived experience in the early stages of project design through a process of <u>co-design</u>.

a) Process

The engagement process should be informed first by any internal policies or procedures of the facilities managers or clients, such as the University of Waterloo's Plant Operations' Internal Design Group Policy and Procedure Manual. In general, engagement in each project phase should resemble the following.

Project Conception

At project conception a team familiar with the Framework should be assembled comprising representatives of the above offices. If not represented on the team, a committee including users or community members with lived experience should also be formed to guide engagement and provide ongoing input/review. Size and makeup will depend on the scale of the project. At this stage, the parties responsible for broader engagement, as well as engagement audiences and targets, should be identified.

Pre-design

In the pre-design phase, the client determines program requirements, identifies constraints including spatial and budgetary, and defines goals. In terms of the Framework, engagement should focus on defining goals for accessibility, well-being, and sustainability which may inform the need for new priorities, spaces, or adjacencies. Engagement in this phase should be both internal and external.

Schematic Design

In the schematic design phase, the architect or designer begins to translate program requirements into a design that articulates mass, site relationships, and broad strategies. Engagement pertaining to the Framework should focus on aspects such as access points to the space/building, impacts on adjacent spaces or paths of

travel, and experiential qualities of the space/building. Engagement in this phase should be both internal and external and include relevant staff for perspective on capacity for ongoing maintenance of design features.

Design Development

In the design development phase, engagement should ensure that project goals articulated previously are reflected in the design and that proposed materials, lighting, and acoustic strategies reflect the considerations of the Framework. Engagement in this phase should be internal, in the form of design review, and reflect the results of previous external engagement.

Construction Documents

In the construction document phase, engagement should be internal with a focus on drawing review to ensure elements such as materials, the placement of windows and doors, and operating controls reflect the Framework. For larger projects this detailed review may be delegated to consultants.

Completion

Upon completion of projects and during the commissioning stage, project teams and committees should be de-briefed, and feedback recorded with the goal of improving the process. Representatives from the staff, student, and faculty communities should be surveyed to understand their experience with the new project and specific engagement should be undertaken with people with disabilities.

Post-Occupancy

In the post-occupancy phase, users of a space should be engaged on a regular, multi-year schedule both to ensure the performance of the space over time and to capture new requirements or expectations. More intentional engagement may be required before maintenance projects which will impact the space either permanently or temporarily.

Overarching Considerations

10. Circular Economy

Application

This section includes considerations for reducing waste associated with the built environment, with a focus on fostering a <u>circular economy</u> within the post-secondary institution.

Key: 🔵 Accessibility ❤️ Well-being 🌱 Sustainability

Inclusive Physical Space Framework

a) The University as a Closed-Loop System

The principles of the circular economy with respect to the built environment include building: less, efficiently, for long-term use, and with appropriate materials. Due to their size and capacity, post-secondary institutions are better able to implement internal systems than most other organizations. In addition to contributing to a larger circular economy, project proponents are encouraged to explore the extent to which spaces and materials can be recirculated within the post-secondary institution itself.

Adaptively reusing existing facilities avoids the emissions of new construction, makes use of existing adjacencies, and resists expansion of the institution's footprint. With careful planning, spaces can be redeveloped to efficiently meet the programmatic requirements of the organization. Existing buildings have an added benefit of contributing to one's sense of belonging and identity. It is critical when undertaking a reuse project that existing barriers to access be addressed. In this way, reuse and rehabilitation projects can improve whole-campus accessibility over time.

Building efficiently means minimizing the use of carbon-intensive materials like concrete and steel by optimizing structural design or avoiding architectural elements requiring excessive material use. Building for long-term use means using durable materials while ensuring spaces and structural systems are adaptable for future use. Appropriate materials include those with potential for reuse, those that sequester carbon (see carbon-sequestering materials), and those that do not pose health hazards in their manufacturing or use. Layered and mechanically fastened materials, which can easily be separated and broken down, are preferable to composite or chemically fastened materials, which may be inseparable or require additional processing.

Re-using spaces and materials on campus can avoid emissions associated with transportation while reducing costs for both the university and members of its community. A campus-wide compost program, for instance, could provide organic material for landscaping while generating heat for space heating. A material or furniture bank could recycle building elements back into the system, reducing waste while avoiding purchase costs.

Evaluation Criteria

1. 🔵 ❤️ 🌿 Have existing spaces and building stock been reviewed for suitability before considering new construction? Can existing space be rehabilitated to serve the project's needs? Can rehabilitation improve access to the existing space? Has the <u>embodied carbon</u> of the existing space been considered and balanced against its accessibility and <u>fit-for-use</u>?

2. 🔵 ❤️ 🌿 Does the design of the space, including its structural and mechanical systems and finishes, enable:

   a. Adaptation as expectations for accessibility evolve or as accessible technologies develop?

   b. Reconfiguration as program requirements change?

   c. Easy repair or replacement of finish components?

   d. Ready access to mechanical systems and building services for repair and upgrade including water, air, and steam lines, ventilation ducts, and cabling?

   e. Deconstruction and reuse at the end of its life?

3. ❤️ 🌿 To what extent can:

   a. Waste heat from compost and other heat-generating activities (e.g. computing) be reused?

   b. Materials and furnishings from deconstructed or reconfigured spaces be reused?

4. ❤️ 🌿 Are layered materials and mechanical fasteners specified over composite materials and chemical fixings?

Resources

Circular Buildings Toolkit (2022), Arup

Circular Economy – Principles for Building Design (2020), European Commission

Waste and the Circular Economy – Toronto Green Standard v4 (2022), City of Toronto

The Do's and Don'ts for Deconstructability (2022), UK Green Building Council

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

Related Sections

Refer to:

- 14 Product and Material Selection for more on selecting construction materials.

11. Site, Orientation, and Massing

Application

This section focuses on criteria to consider when planning and designing new buildings and spaces, or additions to existing buildings. References to buildings below can be taken to include additions, exterior spaces, and other structures as appropriate.

a) General

Buildings should be located to optimize relationships with site characteristics including vegetation and natural heritage, topography, local climates, other buildings, and amenities. A building on a sloped site, for instance, can be designed to enable level exterior access to multiple floors while providing accessible means of navigating the slope. If located near existing buildings, a new building can minimize paths of travel and exposure to the elements. New construction should minimize site disturbance and maximize opportunities for biophilia.

Simplifying a building's form can reduce its surface area and the number of junctions requiring careful insulation and air sealing, thereby reducing heat-loss and increasing interior comfort. The use of shade structures or trees can likewise improve comfort.

To further increase comfort, instill a sense of safety, and facilitate wayfinding, a building or addition should be oriented to take advantage of passive heating and cooling opportunities, provide views to outdoor spaces, and create protected exterior spaces and paths.

Evaluation Criteria

1. 🔵 ❤️ 🍃 Is the building oriented and located to:

    a. Minimize heat gain in the summer and maximize solar heating in the winter (generally oriented east-west with long axis facing south)?

    b. Provide shelter, including from wind, sun, and environmental noise to adjacent outdoor spaces or other buildings?

    c. Reduce impact on the environment by preserving existing trees and maintaining soil permeability?

    d. Be served by accessible paths of travel and facilities?

2. 🔵 ❤️ 🍃 Does the building make use of grade changes to enable level access at multiple points? Can the building provide accessible vertical circulation to navigate existing grade changes?

3. ♥ 🌿 Does the design of the building:

   a. Minimize junctions, including overhangs, except where beneficial for well-being or usability?

   b. Use balconies, screens, or other devices to block high, summer sun and admit low, winter sun? Are the benefits of elements like inset balconies balanced with associated increases in surface area?

4. 🔵 ♥ 🌿 Does landscaping include coniferous trees to protect from winter wind and deciduous trees to protect from summer sun? Are shelter trees coordinated with accessible entrances, rest areas, and waiting areas? Have operations and maintenance plans been considered for landscaping?

5. 🔵 ♥ 🌿 Are new buildings located on transit routes or connected to routes by accessible paths? Is parking minimized and are required parking facilities designed to be adaptable to new future uses? Where parking is provided:

   a. On grade, does it take away from land use that could be used for other key uses?

   b. Above grade, could more sustainable materials and practices such as wood construction be considered?

   c. Below grade, have the costs, associated emissions, and other impacts been considered?

Resources

[Circular Buildings Toolkit (2022), Arup](#)

[BC Energy Step Code Design Guide (2019), BC Housing:](#)
[Section 3: Key Strategies](#)

[Biophilic Design Toolkit (2022), International Living Future Institute](#)

Related Sections

Refer to:
- 10 Circular Economy for additional considerations related to reusing existing buildings and materials.

- 20 Operations and Maintenance for criteria related creating Standardized Operational Plans (SoP).

Key: 🔵 Accessibility ♥ Well-being 🌿 Sustainability

b) Building Entrances

Building entrances should be designed to welcome everyone while serving as a thermal and air barrier between the exterior and interior environments. Larger vestibules provide space for people using mobility devices to turn, wait, or dress for the elements, while preventing exterior elements like cold or warm air, precipitation, and outdoor pollutants from entering the building.

Evaluation Criteria

1. 🔵 ❤️ 🍃 Are entrance vestibules used over revolving doors to minimize the impact of the <u>stack effect</u> and maintain indoor air quality?

2. 🔵 ❤️ 🍃 Are building entrance vestibules designed large enough to support energy conservation, reduce stack effect in the building, and provide space necessary for people using larger mobility devices?

3. 🔵 ❤️ 🍃 Are designated smoking areas located away from building entrances and served by accessible paths of travel?

4. 🔵 ❤️ Are accessibility and safety features, including door openers, clear floor spaces for operating doors and controls, and muster stations, marked and kept free of obstructions?

Resources

Facility Accessibility Design Standards (FADS) (2017), OCAD University

> 4.1.5 Entrances

WELL Building Standard v2 (2022), International WELL Building Institute

> Feature A02 Smoke Free Environments

Related Sections

Refer to:
- Reserved.

Key: 🔵 Accessibility ❤️ Well-being 🍃 Sustainability

c) Windows

Windows tend to have less insulative value than wall assemblies but serve other critical functions. They provide natural light, can provide passive ventilation, enable healthy circadian rhythms (particularly important in intense-use areas like laboratories, studios, and study areas), and facilitate landmarking by enabling awareness of one's surroundings.

Providing operable windows is a favoured wellness strategy as it can provide access to outdoor air and enable passive ventilation. However, in larger buildings, where open windows can impact the effectiveness of HVAC systems, operable windows may not be suitable.

Finding the right window-to-wall ratio is important for achieving these benefits while balancing the thermal performance of the building and reducing bird collisions into glass. Specifying more visible, bird-friendly glass can also help reduce bird collisions.

Where windows are located along paths of travel such as stairs, the movement of the sun throughout the day can result in shadows on stair treads which can distort a user's perception of steps. In these cases, diffuse, indirect light is preferable to direct sunlight.

Evaluation Criteria

1. 🔵 ❤️ 🌿 Are windows located:
    a. At heights that enable people of all statures to see out of and operate them (if operable)?
    b. To provide views to transit stops, pick-up and drop-off areas (PUDO), outdoor gathering spaces, and exterior paths of travel?

2. 🔵 ❤️ 🌿 Where windows are provided are they operable or non-operable? If operable, have maintenance and operational plans been considered? Have end users, including students, staff, and faculty, received training on operating windows and the impacts of leaving windows open?

3. 🔵 ❤️ 🌿 Are window mullions minimized to reduce thermal bridging and located out of the sightlines of people of shorter stature or seated in a mobility device?

4. ❤️ 🌿 Have window-to-wall ratios been established that provide exterior views and access to natural light while balancing thermal loss or gain and reducing bird collision? Are windows carefully located to provide critical views or light critical spaces?

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

Inclusive Physical Space Framework

5. 🔵 ❤️ 🌿 Are fully glazed walls minimized? Where they are specified, are continuous, opaque strips (vision strips) applied to the glazing? Where glazed walls are opaque, can the vision strip be transparent? Can frit, film, or acid-etched patterns be integrated with the vision strip to enhance the visibility of the glass for birds? Have doors been identified within the span of fixed glass?

6. 🔵 ❤️ 🌿 Do windows provide views to the outside to enable healthy circadian rhythms, encourage break-taking, and promote a sense of place?

7. 🔵 ❤️ Do interior windows provide views into and out of spaces to enable navigation, promote landmarking and connection to others, and increase visibiltiy to help one feel safe within a space?

8. 🔵 ❤️ 🌿 Where windows are located next to stairs, has a window film or diffuse light been considered to reduce the impact of thermal gain and the intensity of light and shadow on the steps?

Resources

[BC Energy Step Code Design Guide (2019), BC Housing](#)

> [Sections 03.41-03.5 Key Strategies](#)

[OCAD Facility Accessibility Design Standards (2017), OCAD University:](#)

> [4.1.8 Windows](#)

[Bird-Friendly Best Practices Glass (2016), City of Toronto](#)

Related Sections

Refer to:

- 12 Paths of Travel for further criteria related to paths around and through buildings.

- 17 Lighting and Visual Comfort for further criteria related to window design/placement.

22. Alliance Manchester Business School

12. Paths of Travel

Application

This section focuses on criteria to consider when planning and designing paths of travel, including access points to campus and paths between buildings, to and from outdoor spaces, and within buildings.

Key: 🔵 Accessibility 💗 Well-being 🌱 Sustainability

Inclusive Physical Space Framework

a) Arrival to Site

Considerations for arriving at a campus or building should include all the ways students, staff, and faculty travel, including public transit, active transportation, and personal vehicles. However, a full response to the climate emergency should include action to reduce reliance on personal vehicles and enable low-emissions transportation and mobility. Strategically locating PUDO can help improve access to the site. PUDO should be sized for the anticipated amount of traffic and a range of vehicle sizes.

These considerations should be balanced with creating a network of safe and easy-to-find accessible paths of travel between and within buildings. In the 2020 updates to National Building Code the maximum distance between passing areas along the accessible path of travel was reduced to 24 m, providing greater accessibility. This standard is adopted by the Framework as a better practice.

To promote public and active transportation, infrastructure should be accessible, conveniently located, distributed across a larger site, and paired with facilities like change rooms or showers that are designed to be accessible.

Evaluation Criteria

1. 🔵 ❤️ 🌿 Where reduced vehicle traffic is planned, are easy-to-access PUDO for public transit or personal vehicles provided? Are these drop-off points located at accessible entrances and connected to accessible paths of travel? Where PUDO cannot be provided to buildings within the campus, is there an alternative vehicle service that brings people from the easy-to-access PUDO to accessible entrances?

2. 🔵 ❤️ Are emergency vehicle routes, such as designated fire lanes, signed to remain unobstructed and available for emergency use at all times? Are these routes provided in addition to PUDO?

3. 🔵 ❤️ 🌿 Are accessible public transit stops located near (within 24 m of) an accessible entrance and connected to an accessible path of travel?

4. 🔵 ❤️ 🌿 Do public transit stops provide accessible shelters and rest areas suitable for long waits? Are they designed to accommodate people using mobility devices or people with service animals?

5. 🔵 ❤️ 🌿 Do electric vehicle parking spaces include spaces meeting accessible parking standards? Are they served by an access aisle that connects to an accessible path of travel and that does not require crossing vehicular traffic? Can the electric charging station and parking space be designed so that any cords and

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

cables are highly visible and do not create a tripping hazards? Are they located intuitively near all accessible entrances?

6. 🔵 ❤️ 🌿 Does cycling infrastructure include:

    a. Long-term bicycle parking in secure, controlled-access bicycle parking facilities or purpose-built bicycle lockers?

    b. Short-term bicycle parking in public, highly visible locations within 24 m of accessible entrances?

7. 🔵 ❤️ 🌿 Is cycling infrastructure connected to an accessible path of travel?

8. 🔵 ❤️ 🌿 Are electrical outlets for charging e-bikes or e-scooters provided adjacent to bicycle parking? Are outlets mounted at an accessible height?

9. 🔵 ❤️ 🌿 Are accessible showers and change facilities provided to allow people to freshen up before they engage in campus life? Are they distributed throughout campus, including near bicycle parking?

Resources

Air Quality Cycling and Pedestrian Infrastructure (2023), City of Toronto

Facility Accessibility Design Standards (FADS) (2017), OCAD University:

       4.1.4 Accessible Routes, Paths, & Corridors,

       4.1.12 Accessible Parking,

       4.2 Washroom Facilities,

       4.3.4 Dressing/Change Rooms,

       4.3.13 Passenger-Loading Zones.

Ontario Fire Department Fire Protection Standard: Fire Apparatus Access Roads (Fire Lanes)

National Building Code Section 3.8 Barrier-Free Requirements

Related Sections

Refer to:

- 19 Wayfinding for criteria related to wayfinding and signage on site.

- 20 Operations and Maintenance for criteria related to snow removal.

- 23 Living Spaces for further criteria related to hygiene and self-care spaces.

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

b) Shared Routes on Site

Post-secondary campuses are like little cities, offering a wide range of spaces and environments for learning, socializing, and working. Site connectivity allows students, staff, and faculty to travel between various site features and buildings on campus, supporting engagement in campus life.

Where there are shared spaces between cyclists, pedestrians, and/or vehicles, clear, delineated, and separate paths of travel should be provided. This scenario may be found along roadways but also in parking lots that act as the main connection between buildings. For people who are blind or have low vision, electric vehicles are quieter and can be difficult to detect. Where these paths may intersect, the use of accessibility strategies such as tactile walking surface indicators (TWSI) or colour contrast should be employed to communicate hazards. Where safety strategies have been planned it is important to ensure that the strategy is inclusive of people with disabilities.

Evaluation Criteria

1. 🔵 ❤️ 🍃 Do accessible paths of travel connect vehicular parking, bicycle parking, transit, and/or PUDO to accessible building entrances?

2. 🔵 ❤️ 🍃 Are paths of travel for vehicles, bicycles, and pedestrians clearly demarcated and physically separated where possible? Where paths are shared, are they designed to minimize conflict?

3. 🔵 ❤️ 🍃 Do intersections prioritize active transportation over personal vehicle movement by providing raised cross walks, curb-extensions (or bump-outs), advance signals, and/or by prohibiting right turns at red lights?

4. 🔵 ❤️ 🍃 Do accessible exit points from buildings and egress routes lead to exterior accessible paths of travel that extend to muster points where people can safely wait?

Resources

OCAD Facility Accessibility Design Standards (FADS) (2017), OCAD University
> 4.1.4 Accessible Routes, Paths, & Corridors

Air Quality Cycling and Pedestrian Infrastructure (2023), City of Toronto

WELL Building Standard v2 (2022), International WELL Building Institute
> Features X01-03, X05-08

Key: 🔵 Accessibility ❤️ Well-being 🍃 Sustainability

Related Sections

Refer to:

- Reserved.

c) Exterior Paths of Travel

Pathways should be considered as connective networks throughout the campus and allow for a continuous journey sequence. Pathways should be balanced between direct routes and meandering routes. Direct routes recognize that people will most often take the shortest route or "path of least resistance" between two points (see desire paths). They help reduce people's exposure to extreme weather conditions such as cold, wind or heat, while meandering routes can enable opportunities for enjoyment, engagement with nature, and physical activity. Pathways should also be intuitive and allow for easy navigation of the post-secondary environment.

Given the climate in southern Ontario, products and materials should be durable to sustain the harsh winter conditions while maintaining the firm, stable, and level surface required for accessibility.

Evaluation Criteria

1. 🔵 ❤️ 🌿 Are exterior paths of travel:

    a. Accessible and integrated throughout the site?

    b. The primary route used by people on campus and aligned with the natural flow of people?

    c. Designed so that direct routes to accessible entrances and site features are provided while balancing the provision of green space?

    d. Designed so that pathways also allow for the enjoyment of the broader site?

    e. Designed to reduce the impact of wind tunnels between buildings?

    f. Firm, even, slip-resistant, colour-contrasted with adjacent surfaces, and durable (e.g. resistant to erosion, settlement, or heave)?

    g. Designed to minimize the ecological impact on the local environment while providing accessible paths of travel, particularly in recreational trails in forests or ravines?

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

> h. Located to provide protection from wind and sun using built and other features (e.g. trees)?

Resources

OCAD Facility Accessibility Design Standards (FADS) (2017), OCAD University

      4.1.4 Accessible Routes, Paths, & Corridor

Air Quality Cycling and Pedestrian Infrastructure (2023), City of Toronto

Design Needs, Clearing our Path (2016), CNIB

Green Streets (2023), City of Toronto

Related Sections

Refer to:
- 13 Access to Nature for considerations related to exterior paths and signage in naturalized areas.

- 17 Lighting and Visual Comfort for further considerations related to lighting exterior paths.

- 19 Wayfinding for other considerations related to signage on exterior paths.

d) Changes in Elevation

Promoting stair use to encourage physical activity has been a key strategy in designing the built environment for wellness. However, to ensure equitable access to all levels, stairs, elevators, and ramps should be co-located and easy to identify from the same starting point along the journey sequence. Placing elevators in less-obvious locations to encourage stair use, at the expense of the person who must use the elevator to navigate the elevation change, should not occur.

Where existing spaces are being retrofitted, signage should clearly indicate the nearest accessible path where access is not possible. In general, passive strategies like ramps or reorienting entrances should be prioritized over seemingly easy solutions like lifts or elevators which require maintenance and are prone to breaking down.

Evaluation Criteria

1. 🔵 ❤️ 🍃 Are change-in-elevation access points or vertical circulation modes easy to identify?

2. 🔵 ❤️ Are stairs, ramps, and/or elevators co-located and positioned so that both can be viewed and accessed from a similar starting point?

3. 🔵 ❤️ Is signage and wayfinding provided to direct people to the accessible path of travel if the path is not obvious? During a renovation, does signage indicate anticipated duration of the detour and the potential amount of time required to navigate through the detour?

4. 🔵 ❤️ 🍃 Are exterior changes in elevation, including stairs and ramps, designed with sufficient clearance and space to allow for snow removal and storage?

5. 🔵 🍃 Particularly in renovation scenarios where barrier-free access is being provided to primary entrances, are passive strategies (e.g. ramps or grade changes) prioritized over mechanical strategies (e.g. lifts)?

Resources

OCAD Facility Accessibility Design Standards (2017), OCAD University

       4.1.9 Ramps

       4.1.14 Elevators

Related Sections

Refer to:
- 19 Wayfinding for considerations related to identifying and navigating changes in elevation.

Key: 🔵 Accessibility ❤️ Well-being 🍃 Sustainability

e) Rest Areas

Rest areas could be designed as reduced-stimuli spaces to enable people to rest physically and mentally. They can be designed to provide temporary relief from the hustle and bustle on campus. Along interior paths of travel, rest areas can serve as impromptu areas to read, study, or collaborate, however seats should be designated accessible or provided in additional locations to ensure availability for those with reduced mobility.

Evaluation Criteria

1. 🔵 ❤️ Are rest areas:

    a. Provided at regular intervals (at least every 24 m recommended) both inside a building and across a site?

    b. Designed to allow multiple people to convene so that no one is forced to rest alone?

    c. Designed to provide shelter from sun, rain, and snow?

    d. Cleared of snow in the winter months, including areas adjacent to benches for people with mobility devices or service animals?

    e. Served by an accessible path of travel?

    f. Maintained throughout the year?

    g. Designed to provide reprieve from sensory overstimulation and to act as a temporary restorative space while maintaining personal safety?

    h. Is the rest area positioned with sightlines and visibility to other spaces to reduce the risk of vandalism or other unsafe or unsanctioned activities?

2. 🔵 ❤️ Can rest areas along interior paths of travel provide furniture to enable both rest and impromptu reading, studying, or collaboration? Do associated materials and lighting provide a comfortable acoustic and visual environment?

Resources

Facility Accessibility Design Standards (FADS) (2017), OCAD University

> 4.1.4 Accessible Routes, Paths, & Corridors

> 4.3.1.5 Benches

National Building Code Section 3.8 Barrier-Free Requirements

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

Related Sections

Refer to:

- 17 Lighting and Visual Comfort and 18 Sound and Acoustic Comfort for considerations related to designing rest areas..

24. University of Waterloo

13. Access to Nature

Application

This section applies to all spaces covered by the Framework, including both interior and exterior spaces. This section applies when developing or renovating exterior grounds, landscaped areas, and naturalized areas including trail systems. This section also applies to interior areas where biophilic design is considered.

a) Green Streets and Spaces

Access to nature and opportunities for personal restoration that enable mental health and well-being should be provided. Access to nature can also be strategically considered through landscaping strategies that create green streets, where roadways integrate green infrastructure to capture rainwater, expand the tree canopy, and enhance biodiversity along a hardscaped environment. Where green streets are implemented, protecting waterways from pollutants such as salt use during the winter months should be considered. Alternatives to road salt should be integrated into procurement and operational plans to protect waterways and drinking water protection areas next to campus. Regional and site-specific source water protection requirements should be reviewed. Where green street strategies are implemented next to paths of travel, these paths of travel should be designed to be accessible.

To further enhance access to nature and to implement biophilic design, green roofs, indoor or outdoor planters, green walls, and water features have grown in popularity in the design of buildings and spaces. Landscaping features and plantings should also be selected to enable an inclusive experience and contribute to wayfinding. Planting can create a defined edge or provide olfactory or auditory cues for a person moving through the site or space. With the introduction of such elements, ongoing care and maintenance is required and should be planned to uphold the intent of the design element. In consideration of these maintenance needs, alternative solutions for achieving the same design intent should be considered. For example, green roofs and white-coloured roofs may both mitigate solar heat gain, however the former requires more maintenance. Such a cost may be justified if the green roof also serves as an accessible amenity space.

Evaluation Criteria

1. 🔵 ❤️ 🌿 Have green street strategies been employed along roadways and hardscaped sites? Where such conditions exist, are source water protection and the management of pollutants including salt considered? Can the green street be adjacent to an accessible path of travel?

2. 🔵 ❤️ 🌿 Has the biodiversity of plants and animals been considered in landscape plans? Are pollinator gardens located away from seating and rest areas to reduce unwanted interactions with wild bees and other pollinating insects? Have plantings been selected to contribute to wayfinding on the site?

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

3. ♥ 🌿 Are <u>indigenous species</u> and drought-resistant plants used? Are plantings on the organization's Indigenous Species Planting List or equivalent?

4. 🔵 ♥ 🌿 Is landscaping paired with rest areas with accessible seating to encourage break-taking and delight in the environment?

5. 🔵 ♥ 🌿 Do plantings offer a variety of textures within an accessible reach range to enable multi-sensory enjoyment?

6. 🔵 ♥ 🌿 Where natural elements such as green roofs and walls, planters, or water features have been provided:

    a. Have operations and maintenance plans been considered? Has a budget been established for ongoing maintenance and the training required to uphold the design intent?

    b. Have unintended consequences been considered (e.g. attracting wildlife, like mosquitos or geese to water features, that may inhibit use of the space)?

7. 🔵 ♥ 🌿 Where green roofs are provided and intended to be usable by people, are they designed to be accessible to people with disabilities?

8. ♥ 🌿 Where elements like green roofs are being considered, have other design strategies been considered that could meet the same intent while requiring less operational or maintenance planning?

Resources

Green Streets (2023), City of Toronto

Biophilic Design Toolkit (2022), International Living Future Institute

Sustainability: Native Species (2023), University of Waterloo

Related Sections

Refer to:
- 20 Operations and Maintenance for criteria related to additional factors to consider when implementing a design strategy.

b) Naturalized Areas

In naturalized areas or where recreational trails are provided, the accessible path of travel should connect to and include parts that are firm, stable, and level. Ground surface materials should be selected that are firm, stable, and water-permeable. Where accessible paths of travel lead to particular site features, those features should be designed to account for the increase in traffic that can come with easier access. An accessible lookout area, for instance, should be large enough that those who require its accessibility features are not crowded out. In areas where there are changes in topography, signage should be provided to help people understand if they have the ability and capacity to use the path of travel.

Evaluation Criteria

1. 🔵 ❤️ Are opportunities to access nature, including water features (indoor or outdoor), green spaces, or activity spaces served by accessible paths of travel?

2. 🔵 ❤️ Are water features located away from traffic and other environmental noises to enable auditory enjoyment? Are there opportunities for tactile engagement or sensory play with water?

3. 🔵 ❤️ Do accessible paths of travel in naturalized areas, including accessible recreational trails, provide a range of views, experiences, and landscapes? Where accessible paths of travel lead to such site features, are viewing areas, experiences, or landscapes sized to account for an increase in use?

4. 🔵 ❤️ Does signage communicate:

    a. Topography/slope conditions, surface quality, and distance or location of accessible site features?

    b. Potential hazards, including spaces where interaction with wildlife is likely (e.g. bees or geese)?

Resources

OCAD Facility Accessibility Design Standards (2017), OCAD University

   4.1.4 Accessible Routes, Paths, & Corridors

Key: 🔵 Accessibility ❤️ Well-being 🍃 Sustainability

Inclusive Physical Space Framework

Related Sections

Refer to:
- 21 Collaboration Spaces for further criteria related to designing for outdoor collaboration.

c) Accessibility Features in Nature

When planning the site and access to nature, elements such as service animal relief areas, drinking water, and <u>sensory gardens</u> are key accessibility features that should be provided. For persons travelling with service animals, easy access to designated service animal relief areas with drinking water and waste disposal is critical while away from home. Sensory gardens provide the opportunity to engage with nature through sound, scent, and touch rather than just sight.

Evaluation Criteria

1. 🔵 ❤️ 🍃 Are service animal relief areas provided? Are environmentally and animal-friendly materials used? Are such areas identified as designated service animal relief areas?

2. 🔵 ❤️ 🍃 Are accessible waste receptacles and biodegradable bags available at service animal relief areas? Can waste receptacles be connected to a natural composting system?

3. 🔵 ❤️ Is drinking water for people and service animals provided in both indoors and outdoors?

4. 🔵 ❤️ 🍃 Have sensory gardens been considered in site planning? Have operations and maintenance plans been considered?

Resources

Air Quality Cycling and Pedestrian Infrastructure (2023), City of Toronto

Green Streets (2023), City of Toronto

OCAD Facility Accessibility Design Standards (2017), OCAD University

      4.3.14 Landscaping Materials and Plantings

      4.3.19 Dog Relief Areas.

Sensory Gardens Design Guide, Sensory Trust

Related Sections

Refer to:

- 20 Operations and Maintenance for further discussion of planning for ongoing maintenance of accessibility features.

26. University of Birmingham

14. Product and Material Selection

Application

This section applies to the procurement of all materials, finishes, or furniture, fixtures, and equipment (FF&E). It considers how students, staff, and faculty interact within the environment as well as the impact of such elements on our health and well-being.

a) Building Materials

Choice of products and materials in building design has a significant effect on embodied carbon as well as implications for operational energy use. Renewable resources, like timber, can sequester carbon while others, like concrete or steel, have associated emissions at the mining as well as processing and transporting phases. The former should therefore be prioritized while the latter should be minimized through optimized structural design or avoided. Use of concrete, for example, can be avoided by limiting underground construction, particularly for parking.

Renewable and locally sourced materials can also enhance well-being. Wood can bring warmth and visual interest to a space, and its softness can be used for tactile and acoustic effect. Using local materials as finishes can also contribute to a sense of place while avoiding transportation emissions.

Many products are created with hazardous materials. Specifying products and materials that restrict hazardous materials or volatile organic compounds (VOC) are critical to creating a more inclusive environment for persons with environmental or scent sensitivities. Identifying them in the procurement process helps to reduce our exposure to such contaminants, enable green building practices, and improve indoor air quality.

Operational and maintenance considerations should also be factored into the selection of materials. The lower upfront cost of some materials may be negated by long-term maintenance requirements, whereas more durable options may cost more upfront but require less maintenance or replacement. The concept of cost when selecting building materials should consider the whole life cycle cost.

Evaluation Criteria

1. 💗 🌿 Does the building design use renewable, carbon-sequestering materials like timber or make efficient use of carbon-intensive materials like steel and concrete?

2. 💗 🌿 Are locally sourced materials incorporated in both structural and finish applications?

3. 🔵 💗 🌿 When selecting products and materials, do they:

    a. Restrict known hazardous materials, such as asbestos, lead and mercury found in building materials, furniture, millwork, and fixtures?

    b. Limit VOC?

Key: 🔵 Accessibility 💗 Well-being 🌿 Sustainability

4. 🔵 ❤️ 🌿 Have ingredients been disclosed by the manufacturer and reported through a certified third-party disclosure organization such as Health Product Declaration, Cradle-to-Cradle Certified™ product, or Declare label?

5. 🔵 ❤️ 🌿 When selecting materials, have operations and maintenance plans been considered? Has the life cycle of the material been considered?

Resources

WELL Building Standard v2 (2022), International WELL Building Institute
 Features X01-03, X05-08

Living Building Challenge Red List (2022), International Living Future Institute

Related Sections

Refer to:

- **Error! Reference source not found. Error! Reference source not found.** for more on specifying materials for deconstruction and circularity.

- 20 Operations and Maintenance for further criteria on anticipating and planning for maintenance of building elements.

b) Visibility and Recognition

Furnishings, finishes, and materials should consider the wide range of disability experienced by people. Considerations for physical disabilities and neurodivergence enable a more holistic view of disability and range of choices to evaluate. For persons with low vision, colour contrast is a critical wayfinding tool used to understand the built environment and identify hazards. Some persons who are neurodivergent may experience hypersensitivity to colour and sensory overload. Careful selection of materials to reduce glare helps to improve the visual field, reduce anxiety, and aid coping with the surrounding environment.

Evaluation Criteria

1. 🔵 ❤️ Are elements selected or designed:

   a. With colour contrast between the operable portion and its surrounding background?

   b. To be <u>cane-detectable</u> and not create a tripping hazard or obstruction?

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

      c. To be equitable and accessible?

      d. With <u>end-user controls</u> that are operable using a closed fist without tight grasping, pinching, or twisting of the wrist?

2. 🔵 ❤️ Are neutral colours selected? Do these colours provide contrast between key surfaces and elements? Have heavy patterns been reviewed to ensure that they do not create visual or cognitive confusion?

3. 🔵 ❤️ Are matte surfaces selected to reduce the impact of glare?

4. 🔵 ❤️ Does installed art and imagery consider the use of colour and contrast both to increase perceptibility and prevent adverse impacts?

Resources

OCAD Facility Accessibility Design Standards (2017), OCAD University:

      4.4.15 Texture and Colour

Design for the Mind: Neurodiversity in the Built Environment (2022), BSI

      Chapter 12: Surface finishes

Related Sections

Refer to:
- Reserved.

c) Flexible and Fixed Options

Provide adjustable furniture pieces that can adapt to a range of body sizes and shapes to enable ergonomic and accessible design. Persons using mobility devices will have specific requirements for knee clearance at desks and service counters and may require the option to remove arm rests to allow for side transfer onto a seat. People who experience an unstable gait or limited strength will require an arm rest and back support. For persons of shorter stature, height-adjustable chairs allow for ease of access and comfortable seating. Providing task chairs without wheels can ensure that chairs are secure and do not move when people are trying to sit. Providing flexible furniture pieces can reduce the total amount of different pieces required and can also reduce the amount of space required to allow the range of programmatic requirements.

Key: 🔵 Accessibility ❤️ Well-being 🍃 Sustainability

Evaluation Criteria

1. 🔵 ❤️ 🌿 Are millwork, furnishings, fixtures, and equipment (FF&E) selected or designed to have:

   a. Adjustable or flexible surface heights?

   b. Knee clearance where fixed accessible height surfaces are provided?

   c. Work surfaces in a range of sizes with accessible outlets for charging?

2. 🔵 ❤️ 🌿 Is a range of seating and chair options provided which includes:

   a. Seating and chairs with and without arm and back support?

   b. Chairs that are adjustable and not adjustable?

   c. Task chairs with and without wheels?

3. 🔵 ❤️ 🌿 Is FF&E provided in appropriate quantities and configurations for the space to prevent overcrowding and intrusions on accessible paths? Where furniture is moveable, is placement occasionally "reset" to ensure usability?

4. 🔵 ❤️ 🌿 Can FF&E be selected or designed to have various functions or be easily tucked away when not in use to reduce the required area or space (e.g. Murphy beds or tables that can function as a coffee table, dining table, and a desk)? Can accessible features, such as colour contrast and accessible end-user controls, be integrated into the design?

Resources

OCAD Facility Accessibility Design Standards (2017), OCAD University

> 4.1.1 Space and Reach Requirements

Related Sections

Refer to:
- Reserved.

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

28. York University (UK)

15. Indoor Air Quality

Application

This section applies to all indoor spaces described by the Framework. Reviewing this section is critical when evaluating <u>HVAC</u> systems and associated operational procedures.

Key: 🔵 Accessibility ❤️ Well-being 🌱 Sustainability

a) General

Monitoring and managing indoor air quality (IAQ) is important for all building users. Low IAQ, including inadequate ventilation, is associated with decreased performance in students, staff, and faculty and can contribute to absenteeism due to illness. For those with lung diseases, scent sensitivities, and other conditions, negative effects are more pronounced. At the same time, ventilation comes with financial and energy costs which must be balanced against its benefits. Balance can be achieved using passive and efficient mechanical systems as well as filtration or other air-cleaning measures which reduce the need to pre-heat or pre-cool outdoor air.

The COVID-19 pandemic highlighted the need not just to manage IAQ but to assure students, staff, and faculty of the safety of their environments. For this reason, air quality measures, targets, and readings should be publicly displayed. Users of indoor spaces should also be trained in the use of systems, including passive ventilation like windows, both to ensure their effective use and the conservation of energy.

Evaluation Criteria

1. 🔵 ❤️ 🌿 Are air quality measures, readings, and targets displayed in logical locations, such as entry or exit points, on an accessible path of travel? Are alternative formats provided?

2. 🔵 ❤️ 🌿 Is outdoor air provided using high-efficiency heat or energy recovery ventilation systems (HRV/ERV)?

3. 🔵 ❤️ 🌿 Are operable windows and ventilation, with accessible end-user controls, provided in accessible locations? Have operations and maintenance plans been considered?

4. 🔵 ❤️ Are ventilation systems designed to reduce the auditory impact on indoor spaces?

5. 🔵 ❤️ 🌿 Are scents and other pollutants controlled using ventilation or filtration rather than chemical masking or other additive air-cleaning methods?

6. 🔵 ❤️ 🌿 Are ventilation or filtration systems programmed to flush spaces between occupancies while deactivating if there are six or more hours between occupancies (e.g., overnight)?

7. ❤️ 🌿 Is external air intake located in car-free, low-particulate areas?

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

8. ♥ 🍃 Is training provided for occupants in the use of ventilation systems, including passive ventilation?

Resources

Accessible Science Labs for Students with Disabilities (2014)

ANSI/ASHRAE Standard 62.1-2022, Ventilation and Acceptable Indoor Air Quality

Design Guidance for Education Facilities: Prioritization for Advanced Indoor Air Quality (2023), ASHRAE

Classification of Laboratory Ventilation Design Levels (2018), ASHRAE

Design for the Mind: Neurodiversity in the Built Environment (2022), BSI
    Section 9.1 Air Quality

Safer Indoor Air (2022), Ontario Society of Professional Engineers

WELL Building Standard v2 (2022), International WELL Building Institute
    Features A01 Air Quality, A03 Ventilation Design, A08 Air Quality Monitoring and Awareness

Related Sections

Refer to:
- 11 Site, Orientation, and Massing for further considerations related to window design and use.

- 14 Product and Material Selection for criteria related to the IAQ implications of products and materials.

- 18 Sound and Acoustic Comfort for criteria related HVAC and the sensory environment.

Key: 🔵 Accessibility ♥ Well-being 🍃 Sustainability

Inclusive Physical Space Framework

16. Thermal Comfort

Application

This section applies to all spaces covered by the Framework, including both interior and exterior spaces. Reviewing this section is critical when evaluating HVAC systems and procurement of insulation materials.

Key: 🔵 Accessibility 💗 Well-being 🌿 Sustainability

a) Indoor Spaces

Temperature and humidity have significant impacts on one's comfort in a space and, as a result, one's ability to concentrate. Excess heat and humidity can contribute to a need to distance oneself from others, resulting in distraction particularly in a learning environment. In addition to causing general discomfort, cold can exacerbate pain felt by people with some disabilities.

Because thermal comfort is not universal, focus should be placed on enabling occupants to control their own comfort, either through end-user control or by moving to an appropriate temperature zone. User control is particularly important in living spaces like bedrooms where heating or cooling needs are highly personal and changing spaces is not possible.

Unpredictable noise from HVAC systems can be repetitive or consistent throughout the day. For people who are neurodivergent or have sensory processing differences, noise created from the operation from the HVAC systems can be distracting. Consideration for low-noise fans, in-duct attenuators, and acoustically insulated ductwork can help to reduce noise transfer.

Evaluation Criteria

1. 🔵 ❤️ 🌿 Does the project place a strong emphasis on robust building envelopes to reduce the requirements on the mechanical systems and improve occupant comfort? Does the building have established design parameters, such as maximum window-to-wall ratios, effective building insulation values (R-values), and requirements to account for thermal bridging when doing energy modelling?

2. 🔵 ❤️ 🌿 Has the project set airtightness requirements and is performance verified through a blower-door test?

3. ❤️ 🌿 Have <u>passive house principles</u> been incorporated in the project?

4. 🔵 ❤️ 🌿 Are window coverings provided with accessible end-user controls?

5. 🔵 ❤️ Are heating and cooling controls intended to be operable by the end-user, provided in accessible locations, clearly labeled, and simple to use?

6. 🔵 ❤️ 🌿 Do smart controls reset to default values based on occupancy or time delays?

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

Inclusive Physical Space Framework

7. 🔵 ❤️ Where heating and cooling controls are not intended to be operable by the end-user, are a range of temperature zones provided to allow occupants to select their preferred environment? Where zones are provided, have they been included on a <u>sensory map</u> of the space? Have zones also been indicated within the space?

Resources

[OCAD Facility Accessibility Design Standards (2017), OCAD University](#)
> [4.1.1 Space and Reach Requirements](#)

[WELL Building Standard v2 (2022), International WELL Building Institute](#)
> [Features T01-09](#)

[Design for the Mind: Neurodiversity in the Built Environment (2022), BSI](#)
> [Section 9.3 Temperature control](#)

Related Sections

Refer to:
- 11 Site, Orientation, and Massing for further criteria related to the impacts of building location and design on thermal comfort.

- 14 Product and Material Selection for further criteria related to the procurement process of building insulation materials.

- 17 Lighting and Visual Comfort for further criteria related to window coverings to aid in reducing interior heat gain.

b) Outdoor Spaces

The built environment can affect thermal comfort in outdoor spaces on multiple scales. On a small scale, shading devices including trees, structures, and buildings themselves can reduce sun exposure. On a larger scale, implementing green infrastructure and minimizing paving can enable natural cooling and prevent overheating caused by the <u>urban heat island effect</u>. Evaluation Criteria

1. 🔵 ❤️ 🌿 Is shade provided in outdoor spaces, including at transit stops, rest areas, and gathering places by trees or adjacent structures? Have opportunities for shade been equitably distributed across the site? Does the distribution account for the anticipated number of end users?

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

2. 🔵 ❤️ 🌿 Are buildings, sites, and infrastructure designed to limit the urban heat island effect by including vegetation and limiting paving and other impermeable site cover while providing accessible paths of travel?

Resources

Urban heat island tools and resources (2022), Health Canada

Reducing the Urban Heat Island Effect – Parking Lot Design Guide (2013), Bureau de normalisation du Québec

A Practical Guide to Cool Roofs and Cool Pavements (2012), Global Cool Cities Alliance

Related Sections

Refer to:
- 11 Site, Orientation, and Massing for further criteria related to the impacts of building location and design on thermal comfort.
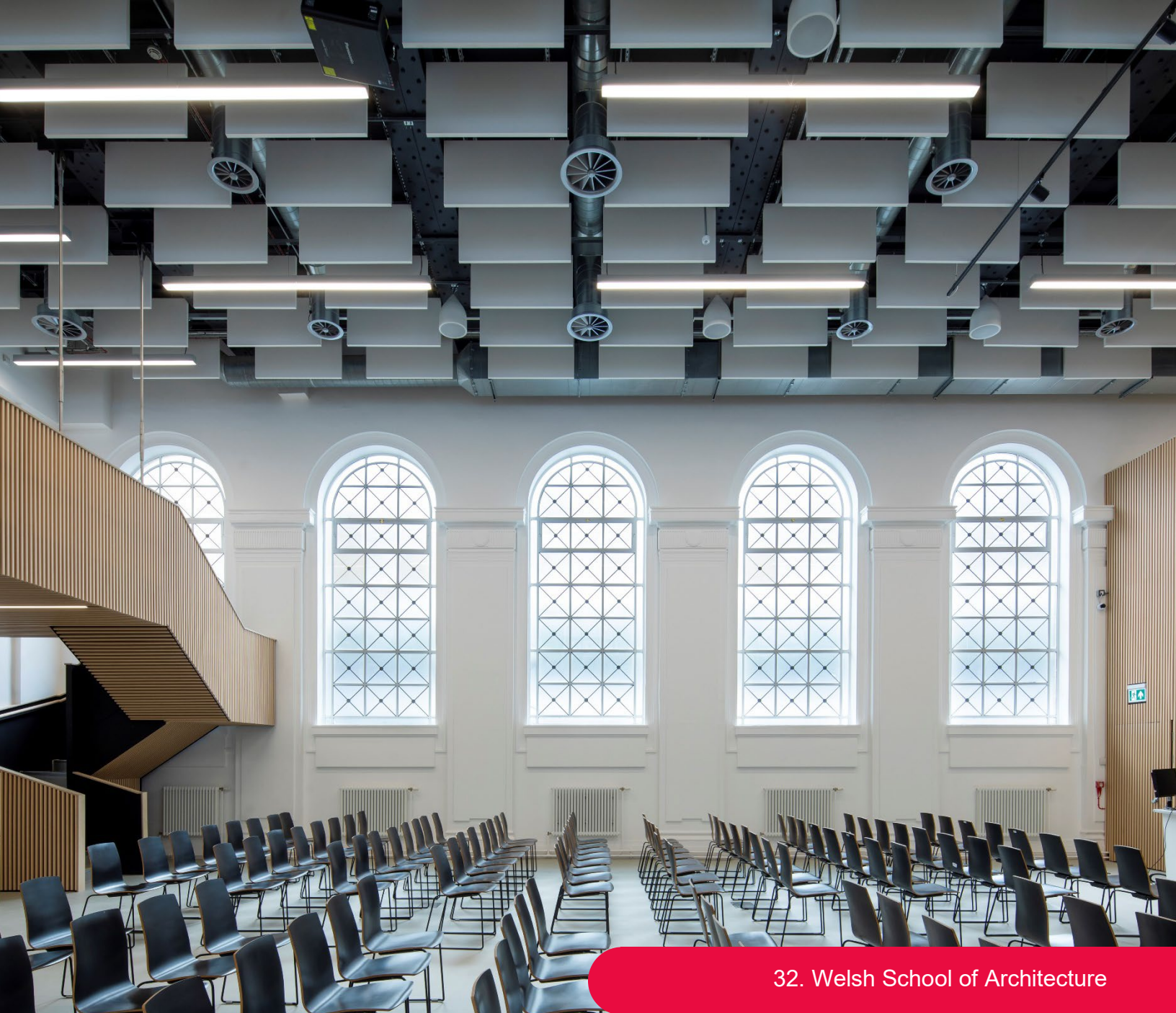
17. Lighting and Visual Comfort

Application

This section applies to all indoor and outdoor spaces covered by the Framework. Reviewing this section is critical when engaging in lighting design, placing windows and coverings, and selecting finish materials.

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

a) Indoor Spaces

In general, all indoor spaces in which students, staff, and faculty are expected to study or work should have access to both natural and artificial light sources. Natural light sources save energy while supporting healthy circadian rhythms. Artificial light sources enable extended and safe use of indoor spaces.

Energy-efficient LED lights are highly customizable in terms of both light levels and colour temperature. Cooler colour temperatures and higher lux levels can help create invigorating environments, while warmer colour temperatures and dimmer lux levels can help create a calmer environment.

Where possible, and particularly in small spaces, both natural and artificial light should be adjustable to suit individual needs and specific tasks. Selected luminaires should shield the light source to minimize the impact of glare which can further reduce the visual field. People with sensory sensitivities, migraines, or epilepsy are sensitive to lighting flicker. Flicker is often not consciously perceived but is known to cause visual discomfort leading to eye strain, headaches, or migraines. For people with balance disorders, flicker can also be disorienting, further exacerbating the inability to balance oneself when moving. Flickering and humming noises are often the result of incompatibility between luminaires, dimmers, and drivers.

Interior lighting in most spaces should be motion-activated and scheduled to conserve energy and reduce the amount of light emitted through windows after dark. Signage should be provided to indicate where lighting is sensor-controlled or on a timer to avoid startling or confusing people about how the lighting system operates.

Shade and shadows on interior surfaces from daylight shining through patterns in sheer window coverings and slats between blinds can be distracting especially for people who are neurodivergent, have experienced a concussion, or are susceptible to migraines.

Evaluation Criteria

1. 🔵 ❤️ 🍃 Are indoor spaces designed to have access to both natural and artificial light?

2. 🔵 ❤️ 🍃 Particularly in small spaces, are lighting systems, including light levels and colour temperature, adjustable by end users? In larger spaces, are they programmed to respond to natural light conditions (i.e., brighter, cooler light during the day, and dimmer, warmer light at night)?

Key: 🔵 Accessibility ❤️ Well-being 🍃 Sustainability

Inclusive Physical Space Framework

3. 🔵 ❤️ Are minimum light levels maintained during use in common areas and paths of travel?

4. 🔵 ❤️ 🍃 Are spaces evenly lit using energy efficient luminaires with colour temperature lamps?

5. 🔵 ❤️ 🍃 Is lighting motion-activated, paired with occupancy sensors, or scheduled to turn off in buildings that are not in use overnight?

6. 🔵 ❤️ Do luminaires shield the light source or cast indirect light to mitigate the impact of glare?

7. 🔵 ❤️ Has compatibility between luminaires, operating controls, and drivers been reviewed to prevent flickering or humming?

8. 🔵 ❤️ 🍃 Is signage provided to indicate when lighting systems are automated or sensor-activated?

9. 🔵 ❤️ 🍃 Are roller, opaque shades specified rather than blinds or translucent, patterned window coverings? Are associated end-user controls accessible?

Resources

Design for the Mind: Neurodiversity in the Built Environment (2022), BSI
> Section 9: Light, lighting and reflection

Designing and Specifying Daylighting for Buildings (2020), Illuminating Engineering
> Society

Lighting Educational Facilities (2020), Illuminating Engineering Society

Designing Quality Lighting for People and Buildings (2020), Illuminating Engineering
> Society

Lighting and the Visual Environment for Older Adults and the Visually Impaired (2020),
> Illuminating Engineering Society

WELL Building Standard v2 (2022), International WELL Building Institute
> Features L01-05, **L07**, L09

Key: 🔵 Accessibility ❤️ Well-being 🍃 Sustainability

Related Sections

Refer to:
- 11 Site, Orientation, and Massing for further criteria related to window placement for natural lighting and impacts of solar gain for further criteria related to window placement for natural lighting and impacts of solar gain.

b) Outdoor Spaces

In outdoor spaces, insufficient lighting levels can make navigation difficult and reduce one's sense of safety, while excess light can cause glare, interrupt natural cycles in both humans and animals, and reduce one's ability to enjoy the night sky. Ambient lighting may be required throughout the site to create a safe space and to mitigate the risk of persons hiding or lurking in dark areas. Focus should be on managing light levels using appropriate luminaires. Generally, luminaires should emit warm, amber light and have "full cut-off" or "sharp cut-off" shielding. Where possible, light should be scheduled or motion-activated to reduce light pollution and conserve energy.

On paths of travel, lighting should be limited to the path surface. Light-coloured surfaces and lights mounted near the surface can reduce the amount of illumination and energy required.

Evaluation Criteria

1. 🔵 ❤️ 🌿 When in use, are outdoor spaces and paths of travel evenly lit by down-cast, shielded luminaires? Do they avoid the <u>pearl effect</u>?

2. 🔵 ❤️ 🌿 Are bollard or rail-mounted lights, which limit light to the width of a path, balanced with overhead lighting? Has the safety of the site been considered when designing the lighting plan?

3. 🔵 ❤️ Are ground-level, up-cast light fixtures avoided, especially adjacent to paths of travel?

4. 🔵 ❤️ 🌿 Does pedestrian-scale lighting serve pathways that connect the campus and lead to key features such as building entrances, transit infrastructure, PUDO, bicycle parking, and accessible parking?

5. 🔵 ❤️ 🌿 Are buildings intended to be used at night served by accessible paths of travel illuminated by amber, shielded luminaires?

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

Inclusive Physical Space Framework

6. 🔵 ❤️ 🌿 Is lighting for auxiliary paths of travel or spaces motion-activated or scheduled to turn off at a set time after sunset?

7. 🔵 ❤️ 🌿 Are light-coloured surfaces used which reduce required illumination and typically increase contrast?

Resources

[Canadian Guidelines for Outdoor Lighting (2020), Royal Astronomical Society of Canada](#)

[Designing Quality Lighting for People in Outdoor Environments (2020), Illuminating Engineering Society](#)

Related Sections

Refer to:
- Reserved.

18. Sound and Acoustic Comfort

Application

This section applies to all indoor and outdoor spaces covered by the Framework. Reviewing this section is critical when planning spaces and adjacencies.

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

Inclusive Physical Space Framework

a) General

For people with sensory sensitivities, the acoustic environment can be challenging to process and can lead to increased levels in stress, anxiety, and sensory overload. Types of noise sensitivity includes sensitivity to continuous noise, intermittent noise, unexpected noise, high-volume noise, and specific frequencies. Quieter noise, such as a continuous hum, ticking, or dripping, are also sounds to consider when evaluating the built environment and any background noise.

Working with an acoustic specialist can help determine how acoustic comfort can be achieved depending on the level of anticipated activity. Determining the placement of spaces and adjacencies, finishes and product selection, and equipment can impact the acoustic properties of the space and overall comfort. Where high levels of activity are anticipated, higher degrees of acoustical management may be required.

Establishing acoustic zones can help people, especially persons who are neurodivergent, make a gradual transition from the quietest to the noisiest space within a building. Acoustic zones can be communicated on a sensory map to better help people understand the anticipated sensory environment. Furthermore, specific surface finishings have acoustic properties that can aid persons who are blind, or those with low vision, navigate the built environment.

Providing people with the opportunity to control their exposure to noise in the post-secondary environment can benefit everyone's well-being but is especially important for people with sensory sensitivities or for people who are neurodivergent. Providing reduced-stimuli spaces creates space for people to take temporary reprieve from the hustle and bustle of post-secondary campus environment, while having the ability to control elements such as HVAC systems and operable windows allows people to further manage their immediate environment. From an operational perspective, large-group gatherings such as conferences or seminars should be booked in closed rooms that can isolate noise from the greater facility.

Evaluation Criteria

1. 🔵 ❤️ Would the project benefit from an acoustic specialist? Has an acoustic specialist been engaged?

2. 🔵 ❤️ Has the anticipated level of activity (including variation in activity level) and space adjacencies been considered in designing for acoustic comfort? Have acoustic zones been established?

Key: 🔵 Accessibility ❤️ Well-being 🌱 Sustainability

3. 🔵 ❤️ Are spaces, including building details and materials, designed to reduce noise, including echoes and reverberations, particularly in large spaces and/or those with primarily hard surfaces?

4. 🔵 ❤️ Does a sensory map identify acoustic zones? Can acoustic zones be designed to aid in wayfinding?

5. 🔵 ❤️ 🌿 Does the project provide a person the opportunity to control their exposure to sound (i.e., by providing a reduced-stimuli room or operable controls for windows and HVAC systems)?

6. 🔵 ❤️ Are closed rooms provided that allow noise to be isolated from the greater facility?

Resources

OCAD Facility Accessibility Design Standards (2017), OCAD University
> 4.1.16 Acoustics

Acoustic Comfort (2022), Whole Building Design Guide

Acoustic Performance – LEED v4.1 (2022), US Green Building Council

Acoustics of Schools Design Guide (2020), Institute of Acoustics

Design for the Mind: Neurodiversity in the Built Environment (2022), BSI
> Section 10: Acoustics and noise management

WELL Building Standard v2 (2022), International WELL Building Institute
> Features S01-09 Sound

Related Sections

Refer to:
- 14 Product and Material Selection for further criteria related to material selection related to sound absorption.

- 16 Thermal Comfort for further criteria related to acoustic considerations related to HVAC systems.

- 17 Lighting and Visual Comfort for further criteria related to acoustic considerations related to incompatible lighting elements.

36. Barnsley BSF

19. Wayfinding

Application

This section applies to wayfinding at all scales, from campus-level strategies to room-specific elements.

a) General

Post-secondary environments are typically large and complex, with multiple interacting departments and generations of infrastructure. Navigating large, complex sites can be anxiety-inducing and adds another layer of complexity to the post-secondary experience. While campus-wide approaches to wayfinding should be strived-for, spaces and buildings are often updated individuall, and different strategies should be made to work together. Where possible, wayfinding strategies should be consistent, intuitive, and available in multiple formats.

For many, wayfinding begins before arriving at the post-secondary environment with the review of online information. Accessibility information should describe arrival to the site, navigating the campus, and accessible paths of travel to and through individual buildings.

While simplicity is encouraged, it is also important that enough information be provided on-site to enable students, staff, and faculty to select appropriate routes. Signage in every space should indicate present location, including building and room names and/or numbers, preferably both outside and inside the space. Signage at decision-making points along paths of travel should indicate accessible routes, nearby or important destinations and distances to them, and accessible features such as washrooms and elevators. Tactile maps using colour and pattern contrast should provide high-level overviews of routes and indicate approximate distance and/or travel times. Tactile maps indicating sensory zones should also be provided. This information should be updated during construction and after projects are completed.

Evaluation Criteria

1. 🔵 ❤️ Does the project integrate with existing wayfinding systems so that routes to other spaces, between, and/or within building are intuitive and easy to follow?

2. 🔵 ❤️ Can signage and wayfinding cues include Indigenous languages and icons?

3. 🔵 ❤️ Is pre-visit information, including a campus map and building-specific conditions, provided in accessible formats and in intuitive locations (e.g. an easy-to-find website)?

4. 🔵 ❤️ 🌿 Do wayfinding elements indicate:

   a. Accessible paths of travel, including routes to elevators, bridges/overpasses, and other accessible facilities such as accessible washrooms?

   b. Routes that are "dead ends" or include locked doors/restricted access areas?

   c. The linear lengths of routes, changes in elevation, and estimated travel times between locations?

   d. The locations of recycling facilities, electric vehicle charging stations, bicycle parking, and public transit infrastructure?

5. 🔵 ❤️ Are room names and/or numbers identified in accessible formats both inside and outside the space?

6. 🔵 ❤️ Are tactile maps of the site, building, or space provided at decision-making points including entrances or circulation hubs?

Resources

OCAD Facility Accessibility Design Standards (2017), OCAD University

   4.4.7 Signage

   4.1.16 Acoustics

Acoustic Comfort (2022), Whole Building Design Guide

Related Sections

Refer to:
- Reserved

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

20. Operations and Maintenance

Application

This section applies to all the spaces in the Framework and includes considerations for projects at any stage.

Key: 🔵 Accessibility 💗 Well-being 🌿 Sustainability
Inclusive Physical Space Framework

a) Planning and Design

As early as the planning and design phases of a project, decisions should consider the ongoing operations and maintenance of the space. For example, from an accessibility lens, clear spaces designed to allow for transferring or maneuverability are often not maintained or left clear. Likewise, elements that can be sensor-operated, such as lighting, faucets, heating and cooling systems, or window controls, can break down and require ongoing maintenance. Many "smart technologies" designed to reduce energy consumption and enable sustainable building usage can only be effective if the elements are maintained and if end users are aware of their presence and use. The project team should consider required budgets, knowledge bases, protocols, and staffing to ensure that the design and intended usage are maintained.

Many up-front design choices "lock in" certain accessibility, well-being, and sustainability performance opportunities for decades or make future retrofits and redesigns considerably more expensive.

Most higher-education institutions have some level of greenhouse-gas (GHG) reduction targets, with many pushing for ambitious reductions over aggressive timelines. Meeting these targets will generally require that new buildings create far fewer GHGs than a typical building now emits throughout its lifecycle.

A growing range of technologies are emerging that enable decarbonization in construction and through renovations, and while each building will face its own unique challenges and opportunities, there are many common approaches that can make significant efficiency and GHG improvements. Setting clear outcomes is an important step in keeping efforts focused throughout the design process.

Evaluation Criteria

1. 🔵 ❤️ 🌿 Is there a standard operating procedure (SoP) for the element that requires ongoing maintenance? At a minimum, does the SoP outline:

    a. Who is responsible for maintenance of the various components of the design?

    b. At what frequency the maintenance should occur?

    c. What budget and resources are needed to maintain the element?

    d. What kind of training might be required for operations?

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  e. Information that end-users would need to be aware of to ensure the item or element remains operable?

  f. The accessibility design strategies and how they can be maintained?

  g. Any existing SoP to be adopted (e.g. BOMA Best)?

2. 🔵 ❤️ 🌿 During the close-out and commissioning phase of a project:

  a. Has training for operational and maintenance requirements been transferred into a SoP?

  b. Do operations and maintenance staff who did not receive training know where to find relevant information to uphold the operational and maintenance requirements of the element?

3. 🔵 ❤️ 🌿 Has the cost of renovation to meet a higher level of accessibility, well-being, or performance standard for sustainability in the future been considered?

4. ❤️ 🌿 Does the construction or renovation project significantly reduce or remove fossil fuels used in building operations, for example by electrifying the space- and water-heating systems using heat pumps?

5. ❤️ 🌿 Has the project integrated GHG performance targets, typically expressed in $kg/CO^2\text{-}e/m^2$ per year, with a plan to eventually reach zero or use renewable energy credits or offsets?

Resources

[Operational Emissions and Energy Requirements for Mid-High Rise Residential & Non-Residential buildings – Toronto Green Standard v4 (2022), City of Toronto](#)

[A Developer's Guide to Passive House Buildings (2023),](#)[Passive House Canada](#)

[Energy Step Code and the Zero Carbon Step Code (2021), Government of British Columbia](#)

Related Sections

Refer to:

- 14 Product and Material Selection for further criteria related to procuring and specifying appropriate maintenance products or materials.

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b) Post-Occupancy

Inclement weather or seasonal changes can impact the integrity of accessible paths of travel and the usability of furnishings and equipment. Operational plans should therefore include both regular and responsive inspections. Maintenance in response to barriers or hazards such as snow, ice, and leaves should be addressed using low-impact products and methods. The use of loud, gas-powered equipment, for instance, should be limited for both environmental and sensory reasons, and the use of salt and other ice-melters should consider their impact on vegetation, wildlife, and ground water.

Ongoing maintenance plans that address waste management and cleaning products and protocols have the capacity to reduce people's exposure to hazardous materials and improve air quality. Issuing a post-occupancy survey can help determine any ongoing opportunities for improving the experience for students, staff, and faculty which may require changes to established operational and maintenance procedures. Using a pre-validated post-occupancy survey should be considered to help collect usable information from the survey.

Waste and recycling receptacles should be provided in a variety of convenient locations served by accessible paths of travel and any provided dispensers should be kept stocked. Loud and other potentially disruptive maintenance operations should be completed outside regular study hours where possible.

Operations should also contemplate the maintenance of accessible paths of travel over time. Minor changes to access protocols, such as restricting use of a corridor or locking an accessible exterior door, can significantly impact routes, travel times, or base-level access to a building. Implementing an instant notification system and a well-managed work-order system for any required maintenance can help to ensure repairs are completed in a timely manner.

Evaluation Criteria

1. 🔵 ❤️ 🌿 Do operational plans include seasonal and post-weather event inspections to ensure accessible paths of travel, furnishings, and equipment remain in good, usable condition?

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2. 🔵 ❤️ 🌿 Are exterior paths and spaces:

   a. Cleared of snow and ice using environmentally and animal-friendly, non-toxic, and/or biodegradable methods?

   b. Cleared of natural obstructions including tree branches and seasonal debris like leaves using environmentally friendly methods?

   c. Maintained to be level, firm and stable after seasonal ground heaving or after heavy use leading to degradation?

3. 🔵 ❤️ 🌿 Has a post-occupancy survey been planned for and issued? Has a pre-validated tool been selected?

4. 🔵 ❤️ 🌿 Has a budget been established to enable the implementation of new technology that may also require training of operations and maintenance staff? When new technology has been implemented, have end users such as students, staff, and faculty been informed of any required action or behaviour changes on their part (e.g. do not keep windows open as they are sensor-controlled)?

5. 🔵 🌿 Are accessible drop-off points for recyclables, <u>e-waste</u>, and organics provided?

6. 🔵 ❤️ 🌿 Does the waste management plan include disposal processes for hazardous materials including batteries, fluorescent lamp tubes, and pesticides and for bio-hazards such a medical-use needles, diapers, or catheters?

7. ❤️ 🌿 Do operations include an accredited Integrated Pest Management (IPM) program or are IPM principles operationalized?

8. ❤️ 🌿 Do cleaning protocols align with Green Seal® or GBAC STAR Service Accreditation programs?

9. 🔵 ❤️ Are provided dispensers (e.g. hand sanitizer, wipes, or masks) checked and filled on a regular schedule?

10. 🔵 ❤️ Are loud or other potentially disruptive maintenance operations scheduled outside regular study hours? Where conflict cannot be avoided, is it clearly communicated, in advance, to users of the space?

11. 🔵 ❤️ Are accessible paths of travel consistently maintained by ensuring that:

   a. Doors are unlocked during regular hours/posted times?

   b. Elevators remain in operation for after-hours users?

   c. Doors without openers in accessible corridors remain in their open positions (fire doors may require closers)?

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12. 🔵 ❤️ 🌿 Is there a well-managed work-order system for any required maintenance? Has a notification system been developed to communicate to those responsible for operations and maintenance that the system requires attention or an element requires repair? Is there an easy-to-use system or "crowd-source" app for students, staff, and faculty to report and learn of any operational or maintenance issues?

Resources

WELL Building Standard v2 (2022), International WELL Building Institute

Features X09-11

Features C04-C05

Related Sections

Refer to:
- 14 Product and Material Selection for further criteria related to procuring and specifying appropriate maintenance products or materials.

Space-Specific Considerations

21. Collaboration Spaces

Application

This section focuses on criteria to consider when designing spaces that enable engagement in collaborative work or study activities that may be in-person, virtual, or hybrid in nature. Examples include meeting rooms, lounges, food courts, dining halls, and outdoor seating areas.

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a) Welcoming Environments

Collaboration spaces can include a range of environments, from study areas and workspaces to spiritual and wellness spaces. A significant part of one's well-being is understanding that one belongs and is welcome in a space. Key features of a welcoming and inclusive environment include accessible and culturally responsive spaces.

Evaluation Criteria

1. 🔵 ❤️ Are collaboration spaces designed to welcome everyone? Do they include equitable and accessible paths of travel to all amenities within the space or environment?

2. 🔵 ❤️ Are there spaces that enable spiritual wellness and cultural ceremonies, such as multi-faith spaces or <u>smudging</u> rooms, that are accessible to people with disabilities?

3. 🔵 ❤️ Are there all-gender spaces where binary-gendered spaces have been provided?

Resources

[WELL Building Standard v2 (2022), International WELL Building Institute](#)
    [Feature M02 Nature and Place](#)

Related Sections

Refer to:
- 23 Living Spaces for additional criteria related to inclusive washrooms, including ablution fixtures, and self-care spaces.

- 25 Refreshing Spaces for additional criteria related to creating inclusive, spiritual, and wellness spaces.

b) Large Spaces

In large collaboration spaces and environments, the gathering of many people engaging in numerous activities can create a high-energy environment that is loud and busy. For some people, large spaces are invigorating and enhance one's ability to collaborate. For others, large spaces with lots of people can be distracting and hinder one's ability to

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collaborate. Still others benefit from the visual cues of being in a large and busy environment while being isolated from the loud auditory environment. Providing spaces where the visual, auditory, and thermal environment can be controlled within the larger environment is important to consider.

Evaluation Criteria

1. 🔵 ❤️ Are there designated quiet spaces with reduced sensory stimuli in large collaboration spaces such as meeting rooms, lounges, food courts, dining halls, and outdoor seating areas?

2. 🔵 ❤️ Are spaces designed to enable hybrid collaboration?

Resources

Autism ASPECTSS Design Index (2013)

Design for the Mind: Neurodiversity in the Built Environment (2022), BSI
      Section 14: Recovery and Quiet Spaces

Related Sections

Refer to:
- 21 Hybrid Collaboration Spaces in this section for further criteria related to hybrid environments.

- 23 Living Spaces for further criteria related to Hygiene and Self-Care spaces.

c) Small Spaces (Quiet Spaces)

In collaborative environments, a small space can be designed to support safety, enable reprieve and recovery from sensory stimulation, and relieve associated discomfort such as anxiety. To aid in creating a recovery space, spaces should be private, allow for movement, and have the flexibility to support people who are hypersensitive or hyposensitive to the sensory environment. Where smaller spaces are designed to be quiet spaces or sensory-reduced zones, considerations for IAQ as well as thermal, lighting, and acoustic comfort should be carefully evaluated.

Evaluation Criteria

1. 🔵 ❤️ Are smaller spaces adjacent to larger, open spaces?

2. 🔵 ❤️ Are small, reduced-stimuli rooms designed to be accessible to persons using larger mobility devices? Do they provide the space to pace or have a private call or conversation?

3. 🔵 ❤️ 🌿 Is the space designed to be flexible for people who require low-stimulus and high-stimulus spaces? Can the furniture be moved to adjust to people's needs? Are comfortable furnishings offered? Can temperature be controlled to allow for personalized thermal comfort? Are lighting levels adjustable? Has the acoustical environment been considered?

4. 🔵 ❤️ 🌿 Where end-user controls are mounted at an accessible height and provided to adjust thermal or lighting levels, are they connected to occupancy sensors? Has a maintenance and operational plan been considered for the occupancy sensors?

5. 🔵 ❤️ Does the space provide sightlines to busy areas such as entry points and central gathering areas, or to exterior public spaces to enable a sense of connectivity and safety? Can these sightlines also be blocked temporarily when desired using elements such as roller shades or electrochromic glass?

6. 🔵 ❤️ Have additional safety considerations been considered in the space, such as the provision of:

    a. Two-way communication systems to call for help?

    b. Signage to indicate emergency phone numbers on campus?

    c. Multiple exit points from the room or space?

    d. Furnishings laid out so that access to doors or exits is unobstructed from any point in the room?

Resources

Autism ASPECTSS Design Index (2013)

Design for the Mind: Neurodiversity in the Built Environment (2022), BSI
    Section 14: Recovery and Quiet Spaces

WELL Building Standard v2 (2022), International WELL Building Institute
    Feature M07 Restorative Spaces

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Related Sections

Refer to:

- 22 Learning Spaces for further criteria related to classrooms, study areas, laboratories.

- 25 Refreshing Spaces for further criteria related to Spiritual and Wellness spaces.

d) Hybrid Collaboration Spaces

Today's collaboration environments exist as in-person, virtual, and hybrid opportunities. To best enable engagement and collaboration in a hybrid environment, provide space and technology to improve the experience and the effectiveness of the collaboration opportunity. Physical properties of the space, including the acoustical and visual environment, can further enhance the hybrid experience.

Evaluation Criteria

1. 🔵 ❤️ Are a range of room sizes designed to enable hybrid collaboration?

2. 🔵 ❤️ Where open spaces are used for hybrid collaboration, have the acoustic properties of the space been designed to allow for numerous conversations to occur simultaneously and still allow for an acoustically comfortable environment?

3. 🔵 ❤️ 🍃 Are a screen and camera provided in larger spaces to allow for group hybrid collaboration? Can selected equipment be programmed to automatically turn off when not in use?

4. 🔵 ❤️ Can multiple cameras be provided such that one can be isolated to the current reader to enable lip-reading?

5. 🔵 ❤️ Are speakers and microphones distributed throughout larger spaces?

6. 🔵 ❤️ Where a camera is positioned, is the frame or view against a neutral background with limited prints or patterns? If windows are in the space, are window coverings provided to control the level of natural light?

7. 🔵 ❤️ Are electrical outlets provided in accessible locations and at accessible heights?

8. 🔵 ❤️ Are outlets provided to allow people to connect to the internet by hard-wire rather than Wi-Fi alone?

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9. 🔵 ❤️ Is software and hardware consistent with other facilities on campus and supported by trained staff?

Resources

[OCAD Facility Accessibility Design Standards (2017), OCAD University](#)

> [4.1.1. Space and Reach Requirements](#)
>
> [4.3.5 Offices, Work Areas & Meeting Rooms](#)

Related Sections

Refer to:

- 22 Learning Spaces for further criteria related to classrooms, study areas, and laboratories.

e) Outdoor Collaboration Spaces

Outdoor spaces in a post-secondary environment are typically found in central locations around the campus. They can act as gathering, collaboration, or restorative spaces for people to enjoy the outdoors. Where features are provided in outdoor spaces, they should be equitably usable by all people. Amenities such as benches, shade, and lighting are key considerations for make the space welcoming.

Defining pockets of space through seating, water features, or <u>landmarks</u> helps to create destinations within the larger space that can provide temporary reprieve from the hustle and bustle of campus. Outdoor spaces can also be designed to provide a gradient of exposure suitable for a range of people and weather conditions, from sheltered outdoor booths or "rooms" to more exposed arrangements. Balancing sightlines and lighting levels after dark help to improve wayfinding and safety in the outdoor space.

Larger open spaces provide opportunities for organized sports, classes, or informal gatherings. Where these spaces include green lawns, areas should also be provided that are firm, level, and stable to allow for accessible outdoor open spaces.

Evaluation Criteria

1. 🔵 ❤️ Are outdoor spaces designed with areas that can be equitably accessed by people with disabilities?

2. 🔵 ❤️ 🍃 Have outdoor features and amenities, such as indigenous landscaping features, seating, tables, water features, or dog relief areas, been considered in the space?

3. 🔵 ❤️ 🍃 Do outdoor spaces offer different levels of exposure or shelter from the elements, encouraging extended use?

4. 🔵 ❤️ Are there opportunities for people to have a moment of quiet without compromising their safety?

5. 🔵 ❤️ Are outdoor assistance intercoms provided in regular locations, served by accessible paths of travel, and designed with accessible end-user controls?

Resources

OCAD Facility Accessibility Design Standards (2017), OCAD University

> 4.3.14 Landscaping Materials and Plantings
>
> 4.3.15 Benches
>
> 4.3.16 Public Use Eating Areas
>
> 4.3.18 Dog Relief Areas

Related Sections

Refer to:
- 12 Paths of Travel for further criteria related to designing outdoor spaces.

- 25 Refreshing Spaces for further criteria related to different uses of outdoor spaces.

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22. Learning Spaces

Application

This section focuses on criteria to consider when designing spaces for instruction, studying, and focused learning including classrooms and lecture halls, seminar rooms, study spaces, labs, and studio spaces.

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a) Classrooms, Lecture Halls, and Seminar Rooms

Active instruction is a critical part of post-secondary learning. To enable knowledge transmission and retention, spaces for learning should: enable clear communication between students, staff, and faculty; facilitate access to course materials; enable full participation in all aspects of a course; and provide a comfortable environment conducive to learning.

Enabling communication means eliminating visual or acoustic barriers between students, staff, and faculty, providing a choice of vantage points from which to take in information, controlling external noise and light to reduce distractions and increase legibility, and implementing or enabling the use of assistive technologies.

To ensure equitable learning opportunities, access to course materials can be facilitated by the university through both design and policy. Course materials and notes should be provided in formats that are accessible and that reflect a variety of learning styles, and the use of technology to take and share notes should be supported.

Enabling full participation means ensuring there is space in every learning space, both physically and socially, for students to engage with course content and one another. This includes provided seating options in traditional lecture halls for persons with sensory, mobility, and cognitive disabilities, as well as non-hierarchical, level-access rooms and seating (e.g. "horseshoe") arrangements. Round room configurations can also enable Indigenous practices and ways of learning.

Providing a comfortable environment means balancing the need for fresh air, which can prevent the spread of airborne pollutants and increase alertness, with the need to warm or cool air depending on the season. Lighting should be flexible so that users are able to adjust it according to their needs.

Evaluation Criteria

1. 🔵 ❤️ Are spaces designed to enable group work and interactive learning where all spaces and elements can be equitably accessed by everyone?

2. 🔵 ❤️ Do instructional spaces facilitate access to course content? Have elements such as vantage points, lighting, and acoustics been considered?

3. 🔵 ❤️ 🌿 Does "smart" technology enable paperless access to notes?

4. 🔵 ❤️ Are outlets and internet access provided to facilitate the use of assistive technologies? Are outlets or ports located in accessible locations and at accessible heights?

5. 🔵 ❤️ Does signage indicate:

    a. That seats near instructors or displays should be reserved for people with disabilities?

    b. Which assistive technologies are supported by the space?

6. 🔵 ❤️ Is a choice of seating provided for people with disabilities, including clear floor spaces for persons using mobility devices that are located in the front, middle, and rear of the learning space? Is furniture spaced such that mobility devices can pass comfortably between them?

7. 🔵 ❤️ Do learning spaces include level, non-hierarchical rooms and seating arrangements? Is there a mix of fixed and flexible seats and tables in the space?

8. 🔵 ❤️ Is adjustable lighting available in locations suitable for illuminating sign language interpreters?

9. 🔵 ❤️ Are height-adjustable lecterns provided?

Resources

[OCAD Facility Accessibility Design Standards (2017), OCAD University](#)

      [4.5.8 Teaching Spaces](#)

Related Sections

Refer to:
- 21 Collaboration Spaces for further criteria related to hybrid learning.

b) Study Areas

Study areas include spaces used by students to review course materials or complete coursework. Like classrooms, they should provide a comfortable environment in terms of air circulation, temperature, light, and sound, but with longer periods of use in mind. Adjustable furniture and lighting levels create more flexible spaces that can adapt to student's needs and preferences. Emphasis should be placed on supplying ergonomic furniture and fittings and ensuring study spaces are near facilities for hygiene, eating,

and refreshing. Providing access to nature via views and vistas, and considering the integration of biophilic design, can help to improve well-being in study areas.

To suit a range of needs, study areas should be available in a variety of sizes and designed for multiple learning styles. Small spaces may suit single-occupancy use or those who prefer closed-in environments while larger spaces can enable groups or students with attendants. Users should feel secure in all study areas, especially in more private spaces and those that are open after other facilities close.

Desk-booking systems or <u>hoteling</u> systems are typically used in workplace and office design, however they should be considered in study areas for those who would benefit from having a more predictable environment or specific furniture and fixtures (e.g. height adjustable or accessible desk surfaces).

Evaluation Criteria

1. 🔵 ❤️ Are a variety of seating options and table heights provided, including ergonomic chairs, tables with knee clearance, and standing desks?

2. 🔵 ❤️ 🌿 Can lighting levels be adjusted? Is task lighting provided? Are low-light areas provided?

3. 🔵 ❤️ Are study areas located near, with signage leading to:

   a. Accessible, and/or universal washrooms?

   b. Water fountains and food service areas?

   c. Outdoor areas and indoor refreshing spaces?

4. 🔵 ❤️ Are interior and exterior windows provided to allow views into and out of study areas?

5. 🔵 ❤️ 🌿 Have biophilic elements been considered in the space and located along accessible paths of travel?

6. 🔵 ❤️ Have desk-booking systems or hoteling been considered in the study area?

7. 🔵 ❤️ 🌿 In study areas that are open "after hours:"

   a. Are minimum light levels maintained while in use? Can occupancy sensors be used to reduce energy consumption when not in use?

   b. Are accessible two-way communications systems installed and emergency numbers posted?

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

Resources

OCAD University Facility Accessibility Design Standards (2017), OCAD University
      4.5.7 Libraries

WELL Building Standard v2 (2022), International WELL Building Institute
      Feature M02 Nature and Place
      Feature V02 Ergonomic Workstation Design

Related Sections

Refer to:
- 21 Collaboration Spaces for further criteria related to designing small spaces and hybrid collaboration.

- 24 Employee Spaces for further criteria related to desk-booking systems or hoteling.

c) Lab and Studio Spaces

Lab spaces include facilities for hands-on learning in fields including chemistry, engineering, and computer science. Studio spaces are typically used by students in fields including fine art, architecture, and planning. In this section, lab and studio spaces will include spaces provided for "pinning up" work for evaluation. Labs can be high energy-use spaces with requirements for specialized equipment, such as freezer farms. Co-locating such spaces can help with efficient space planning, sharing resources, and can also encourage collaboration amongst other lab groups.

Lab and studio spaces tend to be busy, high-stimulus working areas with a variety of outputs that can result in clutter, waste, and risk of hazards. Studios are often associated with poor "work-life balance." The design of these spaces should enable students to engage safely in work, by controlling potential hazards, and easily detach both physically and mentally, by providing external cues and nearby refreshing spaces.

Evaluation Criteria

1. 🔵 ❤️ 🌿 Have lab spaces been co-located to allow the sharing of high-energy resources or equipment?

2. 🔵 ❤️ Are accessible paths of travel marked and kept clear of equipment, materials, cables, and debris?

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3. 🔵 ❤️ Are tools and equipment returned to designated locations on a regular schedule and mounted within an accessible reach range?

4. 🔵 ❤️ Do flexible pin-up areas enable students to display work for evaluation according to their needs (i.e., within an accessible reach range)?

5. 🔵 ❤️ Is safety equipment, including fire extinguishers and eye-wash stations, located on an accessible path of travel, mounted at an accessible height, and clearly indicated by signage in multiple formats?

6. 🔵 ❤️ Are lounge spaces physically separated from lab/studio spaces with their own fresh air supply and washing facilities? Are these spaces accessible?

7. 🔵 ❤️ Are demonstration stations located on an accessible path of travel and at an accessible height?

8. 🔵 ❤️ Are windows to outdoor spaces provided in all possible lab and studio spaces?

9. 🔵 ❤️ Are lab benches and drafting tables provided at accessible heights with knee and toe clearance and controls within an accessible reach range?

10. ❤️ 🌿 Can post-consumer materials be diverted from waste streams and provided for use (i.e., for fine art or model-making)?

Resources

[Accessible Science Labs for Students with Disabilities (2014)](#)

[OCAD Facility Accessibility Design Standards (2017), OCAD University](#)
      [4.5.9 Laboratories](#)

Related Sections

Refer to:
- 21 Collaboration Spaces for further criteria related to welcoming environments, large and small space design, and hybrid collaboration.

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

23. Living Spaces

Application

This section focuses on criteria to consider when designing spaces for private activities like sleeping, eating, dining, and engaging in hygiene or self-care. They include a variety of on-campus and institution-owned off-campus housing facilities including dormitory rooms, apartments, and their amenities, as well as spaces for eating, grooming, and socializing.

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a) Housing

Institution-owned housing should meet the range of needs of prospective student-residents by providing a variety of units within a building or area. The housing offering should enable households of different types and sizes, from individual students to groups of peers or families. It should also consider the cultural makeup of the university community, with the layout or design of kitchens, washrooms, and associated public spaces reflecting this diversity.

Individual units, including apartments and rooms, should be accessible and private. Passive ventilation and natural light should be provided where possible, end-user controls for both passive and active systems should be easily operable, and residents should feel in control of, and safe in, their living spaces.

Evaluation Criteria

1. 🔵 ❤️ Are accessible housing units provided that reflect a diversity of household types, sizes, incomes, and cultures?

2. 🔵 ❤️ 🌿 Are the non-accessible designated housing units designed to be visitable by people with disabilities?

3. 🔵 ❤️ 🌿 Are residences co-located with or near facilities for active and public transportation, exercise, cultural expression, and family support (i.e., childcare)?

4. 🔵 ❤️ 🌿 Do residential buildings facilitate sustainable behavior by providing convenient, accessible recycling and compost facilities and programmable thermostats?

5. 🔵 ❤️ Do shades and locks enable residents to control the privacy and security of their personal space? Are controls intuitive and located within an accessible reach range?

6. 🔵 ❤️ Are bedrooms located or detailed to reduce noise infiltration from the exterior, common areas, and building services?

7. 🔵 ❤️ Are common areas provided with enough clear space to comfortably move around, practice rituals like prayer or meditation, and perform light exercise?

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

Resources

[Plan of Action: Campus Housing Equity, Diversity, Inclusion and Anti-Racism response (2023), University of Waterloo](#)

[OCAD Facility Accessibility Design Standards (2017), OCAD University](#)
[4.5.10 Residences](#)

[Visitable Home (2018), Canadian Mortgage and Housing Corporation (CMHC)](#)

Related Sections

Refer to:

- 22 Learning Spaces for further criteria related to study areas in residential buildings or units.

b) Eating and Dining

Considerations for eating and dining include in-unit facilities, shared kitchen(ettes), and public eating areas like cafeterias or meal halls.

Electric (e.g. induction) cooktops should be provided rather than gas or propane appliances which have negative implications for IAQ. Ventilation, which can be adjusted by accessible controls, should be expelled to the exterior to remove smoke and other irritants from the space. In larger kitchens, or in units intended for specific demographics, separate stations should be provided for the preparation of diets such as halal, kosher, or vegan.

Kitchen(ettes) should be spatially separated from unrelated nearby spaces to inhibit the spread of smell and sound. They should, however, be located as close as practicable to studying, working, and collaboration spaces to facilitate nutrition breaks and meals.

In public dining halls, queuing systems should be planned for ease of navigation while providing personal space. A range of seating options should be offered, including individual and group tables, more or less private areas, and areas with reduced stimuli.

To enable the use of fresh, plant-based, and local or "farm-to-table" produce, garden space should be available to food service providers for the cultivation of ingredients.

Evaluation Criteria

1. 🔵 ❤️ 🌿 Are accessible electric cooktops provided rather than gas or propane?

2. 🔵 ❤️ Does kitchen ventilation expel to the exterior? Are ventilation controls provided within an accessible reach range?

3. 🔵 ❤️ 🌿 In larger kitchens or specialized units, are accessible stations provided for the preparation of halal, kosher, vegan meals, and food allergies or sensitivities?

4. 🔵 ❤️ Are kitchen(ettes) provided near, but spatially separated from, studying, working, and collaboration spaces?

5. 🔵 ❤️ In public dining areas, are queuing systems accessible, intuitive (i.e. simple to understand), and organized to prevent crowding?

6. 🔵 ❤️ Are a range of seating arrangements provided, offering accessible group and individual seating options?

7. 🔵 ❤️ In larger dining areas, is seating zoned in terms of privacy, sound, and smell?

8. 🔵 ❤️ 🌿 Are garden spaces with accessible beds available to residents or food service providers to enable the cultivation of herbs, vegetables, and fruit?

Resources

[OCAD Facility Accessibility Design Standards (2017), OCAD University](#)

> [4.3.20 Kitchen and Kitchenettes](#)
>
> [4.5.10 Residences](#)

Related Sections

Refer to:
- Reserved.

c) Hygiene and Self-Care

Hygiene and self-care can take place in a variety of contexts including residential washrooms, public washrooms, and change rooms associated with recreational facilities. Spaces for hygiene and self-care that are usable by people of all abilities, genders, cultures, and family types, should be available and identifiable in all areas of campus.

Many needs can be addressed simply by providing accessible, inclusive, common-use facilities, while others may require fixtures that are non-standard in a North American context. Providing a hand-held bidet, for example, can make a washroom welcoming for those who come from cultures where they are common or who use water as part of ablution rituals. The locations of such fixtures should be clearly identified on campus maps as well as on-site. Where innovations related to accessibility, well-being, and sustainability have been implemented, education and awareness campaigns can help to bring an understanding of the various design interventions and enable use, acceptance, and maintenance of the spaces.

Evaluation Criteria

1. 🔵 ❤️ Do accessible washroom facilities include single-occupancy spaces for families and all gender identities?

2. 🔵 ❤️ Where gendered, multi-stall washrooms are converted to all-gender washrooms, are partitions extended to the floor and ceiling and urinals replaced with stalls or used to expand existing stalls?

3. 🔵 ❤️ 🌿 Are accessible washrooms with water-efficient water closets and lavatories provided? Can grey water systems be considered for toilet flushing?

4. 🔵 ❤️ 🌿 Are accessible washrooms with water efficient hand-held bidets provided? Have accessible end-user controls been selected for the hand-held bidet?

5. 🔵 ❤️ Are accessible, all-gender lactation rooms provided?

6. 🔵 ❤️ Are accessible, private facilities provided which are common-use and available to users of different family status and cultural background, such as accessible ablution stations?

7. 🔵 ❤️ Is it easy to access emergency assistance in the space in the case of an accident or conflict? Is a two-way communications system installed? Are emergency numbers and locating information (e.g., building name, floor, room name or number) clearly displayed in all hygiene facilities?

8. 🔵 ❤️ Are light switches located outside the space or lights motion-activated so that no one is required to enter a dark space?

9. 🔵 ❤️ 🌿 Where automatic or power-operated fixtures are provided, are there operational and maintenance plans in place to ensure that items remain in working order?

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

Inclusive Physical Space Framework

10. 🔵 ❤️ 🍃 Where innovations related to accessibility, well-being and sustainability have been implemented (e.g. grey water systems or hand-held bidets), has an education or awareness campaign been planned to help communicate the enhanced design features?

Resources

All-gender washroom list (updated 2023), University of Waterloo

Culturally inclusive washrooms (2019), Imprint

OCAD Facility Accessibility Design Standards (2017), OCAD University
> 4.2 Washroom Facilities

Related Sections

Refer to:
- 21 Collaboration Spaces and Welcoming Environments for further criteria for welcoming environments and inclusive spaces.

- 25 Refreshing Spaces for further criteria for spaces intended for spiritual wellness.

46. BDP Quadrangle Studio

24. Employee Spaces

Application

This section focuses on criteria to consider when designing spaces that allow for activities that are required for staff and faculty on campus such as offices, staff rooms, kitchenettes, and meeting rooms.

Key: 🔵 Accessibility 💗 Well-being 🌿 Sustainability

Inclusive Physical Space Framework

a) Staff and Faculty Rooms

Key spaces such as breakrooms, lounges, kitchenettes, and locker and change facilities support staff and faculty while on campus. These spaces encourage a healthy work-life balance, enable healthier meal planning, and enable exercise and active transportation. They should be included in program plans and serve all those working on campus.

Many organizations have adopted flexible working arrangements which benefit from hybrid work environments including desk-booking systems or hoteling. As people no longer need the use of a desk or space for 100% of the work week, sharing desks allows workspaces to be planned with smaller square footage. Saved space is then reallocated to shared spaces and required amenities to enable hybrid working. Considering the visual and acoustic comfort of a space and ensuring access to technology, including a stable internet connection, can enhance the experience of hybrid collaboration. For those on-campus, shared spaces can encourage informal, interdisciplinary collaboration.

Evaluation Criteria

1. 🔵 ❤️ Are staff and faculty offices designed to have the space for a person using a mobility device? People with disabilities?

2. 🔵 ❤️ 🍃 Are ancillary spaces, including kitchenettes, lunch/break/lounge rooms, lockers, and change facilities, designed to be accessible? Are they provided in the project space or within a reasonable distance along an accessible path of travel?

3. 🔵 ❤️ 🍃 Are spaces set up for hybrid collaboration?

4. 🔵 ❤️ Are accessible public-use or interdepartmental spaces provided? Where space is bookable, is it readily available to staff and members of other departments?

5. 🔵 ❤️ 🍃 Where desk-booking systems or hoteling are used:

   a. Is the technology user-friendly and usable by people with disabilities including persons with low vision or blindness?

   b. Is information provided up front (e.g. using text, plans, and/or photos) regarding the accessibility of the building, space, furniture, fixtures, equipment, and nearby amenities?

   c. Is booking or occupancy information provided at or near the room using accessible signs, indicators, or kiosks?

   d. Is temporary signage or day-use lockers provided?

Key: 🔵 Accessibility ❤️ Well-being 🍃 Sustainability

Resources

[OCAD Facility Accessibility Design Standards (2017), OCAD University](#)

       [4.3.4 Dressing/Change Rooms](#)

       [4.3.5 Offices, Work Areas & Meeting Rooms](#)

Related Sections

Refer to:

- 21 Collaboration Spaces for further criteria related to hybrid working spaces.

- 23 Living Spaces for further criteria related to eating, dining, hygiene, and self-care spaces.

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

25. Refreshing Spaces

Application

This section focuses on criteria to consider when designing spaces that enable mental health and well-being. These spaces allow for personal restoration through the provision of quiet or active campus environments.

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

a) Activated Spaces

Activated spaces, such as athletic venues, open spaces, and outdoor areas, provide opportunities where people can engage in movement and enjoyment. When designing to enable movement and enjoyment it is important to consider the range of physical abilities people have and the need for inclusive opportunities. A range of facilities can enable a variety of use-types and users. An open studio space, for instance, could enable a group class while smaller, semi-private rooms would be more welcoming for small groups or individuals uncomfortable exercising next to others.

Evaluation Criteria

1. 🔵 ♥️ Are active spaces served by equitable paths of travel?
2. 🔵 ♥️ Do equipment and furnishings within the space enable a diverse range of body sizes and abilities?
3. 🔵 ♥️ Are spaces provided in a range of sizes and configurations to suit the variety of users on campus?
4. 🔵 ♥️ Do spaces consider opportunities for play and include features such as public-use chessboards, ping pong tables, games area, or playful furniture?

Resources

OCAD Facility Accessibility Design Standards (2017), OCAD University

      4.5.1 Arenas, Halls, and Other Indoor Recreational Facilities

      4.5.2 Outdoor Athletic and Recreational Facilities

Related Sections

Refer to:
- 21 Collaboration Spaces for further criteria related to outdoor collaboration spaces.

b) Spritual Wellness

Spiritual wellness encompasses elements of being self-aware and developing a better understanding of oneself, one's personal beliefs, and one's values. A big part of spiritual wellness is feeling grounded and connected as both an individual and as part of the larger world. Spiritual wellness can be rooted in a particular religious faith, but can also

derive from a range of other sources that guide an individual's morals and ethics. In a post-secondary environment, where students, staff, and faculty may spend many hours of the day, providing spaces for religious practices and self-reflection, such as multi-faith rooms, can enable an individual's ongoing efforts to actively practice spiritual wellness.

Evaluation Criteria

1. 🔵 ❤️ 🌿 Are multi-faith rooms provided and are they:

    a. A range of sizes to accommodate individual and large-group use?

    b. Easy to access for students, staff, and faculty?

    c. Equitably accessed and usable by people with disabilities?

    d. Designed with safety features such as two-way communication systems?

    e. Designed with ventilation and plumbing suitable for cultural practices such as smudging? Can increased ventilation rates be limited to a time of use when needed, such as when smudging occurs?

    f. Designed to flexibly enable a range of uses including smudging ceremonies, prayer, and medication?

2. 🔵 ❤️ 🌿 Are elements such as pulpits, altars, daises, and ablution areas designed to be equitably used by people with disabilities?

Resources

Section 10.1 Special Ventilation: Smudging (2019), Public Services and Procurement Canada

Smudging Procedure and Request, Conrad Grebel University College

OCAD Facility Accessibility Design Standards (2017), OCAD University
4.5.5 Churches, Chapels and Other Places of Worship

Related Sections

Refer to:
- 21 Collaboration Spaces for criteria related to designing large, small, hybrid collaboration spaces.

Key: 🔵 Accessibility ❤️ Well-being 🌿 Sustainability

Appendices

26. Photo list

Photos in the Framework have been supplied by BDP/BDP Quadrangle, Human Space, and the University of Waterloo.

Cover photo: University of Waterloo

27. Next Steps

Engagement with experts and individuals with lived experience was central to the development of the Framework. Many recommendations are reflected in the present version, however others could not be realized. Several are described here in hope that they may be explored in the future:

- We acknowledge that there are many abilities and ways of learning and that no one format will work for all audiences. To broaden the accessibility and reach of the Framework, adaptation to other formats is encouraged, including:

    o A plain-language or jargon-free version;

    o An online/interactive version; and

    o Versions with additional visuals (i.e., diagrams).

- An evaluation system usable for weighing trade-offs and recording decisions made during project planning.

- A prioritization or scoring system for emphasizing higher-impact or lower-cost criteria.

28. Survey Results

University of Waterloo Inclusive Physical Space Framework: Survey Analysis

Table of Contents

Executive Summary

A survey was conducted in April 2023 to assess the University of Waterloo (UWaterloo) community's perceptions and priorities with respect to the three thematic areas of the Inclusive Physical Space Framework: accessibility, well-being, and sustainability. A total of 742 valid responses were recorded. Due to a high proportion of staff and women respondents, the results were unfortunately not generalizable to the overall community.

Respondents' perceptions of UWaterloo's current performance in terms of accessibility, well-being, and sustainability were largely split. Perspectives on accessibility were most polarized and negative while more respondents reported knowing less about UWaterloo's performance in terms of sustainability. Most respondents, including those with disabilities, reported difficulty moving between buildings on campus but relatively little trouble using spaces upon arrival. Issues most frequently related to a lack of connectivity between spaces and specific barriers.

Overall, respondents were more satisfied with the provision of collaboration and working spaces than living or refreshing spaces. While not polled specifically for learning spaces, students expressed a mild preference for studying on campus. Respondents tended to prefer enclosed collaboration spaces and generally felt they could find and use spaces that support both in-person and virtual work/meetings, apart from students who reported less access to spaces supporting virtual collaboration. Students expressed preference for focused learning spaces over collaborative or outdoor spaces, though open-ended responses supported the use of outdoor spaces when weather and facilities permit. All respondents typically referenced a need for more learning spaces with variety and flexibility among them. Most staff and faculty reported being able to find and use working spaces, however open-ended responses revealed desires for additional types of spaces including a mix of both private and public spaces with emphasis on environmental comfort.

Most respondents expressed comfort in gender-inclusive spaces except for all-gender, multi-stall washrooms as realized in some parts of campus. A mix of gender-specific, multi-stall, and all-gender, single-occupancy washrooms was preferred. Perspectives on the use of living spaces in general were less certain than for other spaces. Open-ended comments suggested staff and faculty members did not use living spaces either due to lack of time, comfort in them, or knowledge of their existence.

In general, feedback received through the survey supported the focus areas of the Framework and the need for design that supports multiple priorities using scarce

resources. Some specific considerations were incorporated into the final version while others may inform future development.

Engagement Process

Background

A survey was developed by the project team in 2022 to support the development of the University of Waterloo's (UWaterloo) Inclusive Physical Space Framework (the "Framework"). Respondents were asked about their experience and preferences with respect to the Framework's three themes – accessibility, well-being, and sustainability – as well as the types of spaces discussed therein. UWaterloo's Survey Research Centre (SRC) provided consultation and data collection services including survey design, programming, testing, hosting, monitoring, data validation, and reporting. Thank you to the SRC for their expert administration of the Inclusive Physical Space Framework Survey.

The survey was conducted online, on paper, and by phone, however all respondents opted for online participation. Eligible respondents included students, staff, faculty, and visitors of UWaterloo. Participants were eligible to enter a draw for one of six $50 WatCards.

The survey was open from April 3rd to April 28th, 2023. It was 53 questions in length (excluding eligibility, screening, or prize draw fields) and is provided in Appendix A: Survey. A total of 1,144 responses were recorded with a median completion time of 15 minutes. Surveys completed in less than 1/3rd median time (5 minutes), which exhibited suspicious response patterns or text responses, or which failed randomized bot-checking questions, were removed. After data-cleaning, 742 unique responses were retained for analysis.

Approach to Analysis

All respondents were asked the same questions, however some questions were more or less applicable to different types of respondents. Students, for example, typically have the most recent, relevant experience using learning spaces, while staff have stronger perspectives on employee spaces. In these cases, feedback from most impacted user types is broken out and noted. For other topics, all respondents are considered together. In the text below, *n* will denote the number of responses for each question (e.g. n=742).

To analyze qualitative data from open-ended response questions, inductive analysis was used to develop codes for each question reflecting common themes found among

the responses. A comment could receive up to three codes, therefore counts may total more than the number of respondents. Only the top five most frequent codes for each question are included in this report. To best relate results to the Framework, codes were chosen from headings found in the Framework where possible. Explanations of the type(s) of responses attributed to each are included.

Demographics

The survey received a significant response from UWaterloo staff (67%) as opposed to students (13%), faculty (15%), or other respondents (Figure 2). A correspondingly high number of respondents identified affiliation with academic support units (38%) as opposed to faculties (Figure 3).

Respondents self-reported ages ranging from 18 to 100. The distribution of respondents somewhat resembles the overall population (Figure 4), however it not typical of a post-secondary community in which a higher proportion in the range of the typical undergraduate student is expected.

Most (67%) of respondents self-identified as women. While women now outnumber men in overall university enrollment, the trend has been less pronounced at UWaterloo[1] and does not translate to faculty appointments.[2] This discrepancy may be a result of self-selection based on the subject matter or channels through which the survey was shared.

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[1] Approx. 54% of UWaterloo students identify as female in comparison to 65% nationally or 61% at comparable institutions. University of Waterloo Executive Report (2019), rpt_cusc_2019_first-year_survey_executive_report_waterloo.pdf (uwaterloo.ca)

[2] Female-identifying faculty made up 31.3% of UWaterloo's full-time, regular faculty in 2019. University of Waterloo Insitutional Planning & Analysis, https://uwaterloo.ca/institutional-analysis-planning/university-data-and-statistics/faculty-data/faculty-gender

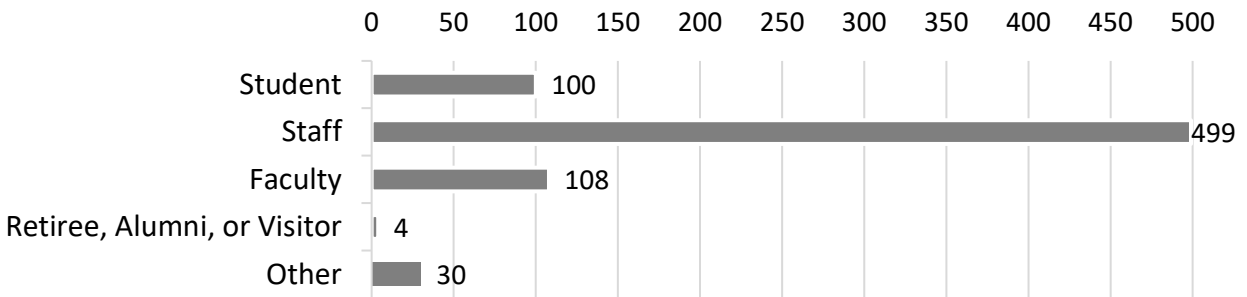## What is your current affiliation with the University of Waterloo? (n=741)

Affiliation	Value
Student	100
Staff	499
Faculty	108
Retiree, Alumni, or Visitor	4
Other	30

Figure 4 Affiliation of respondents with UWaterloo.

Which faculty do you primarily work, study at, or visit? (n=733)

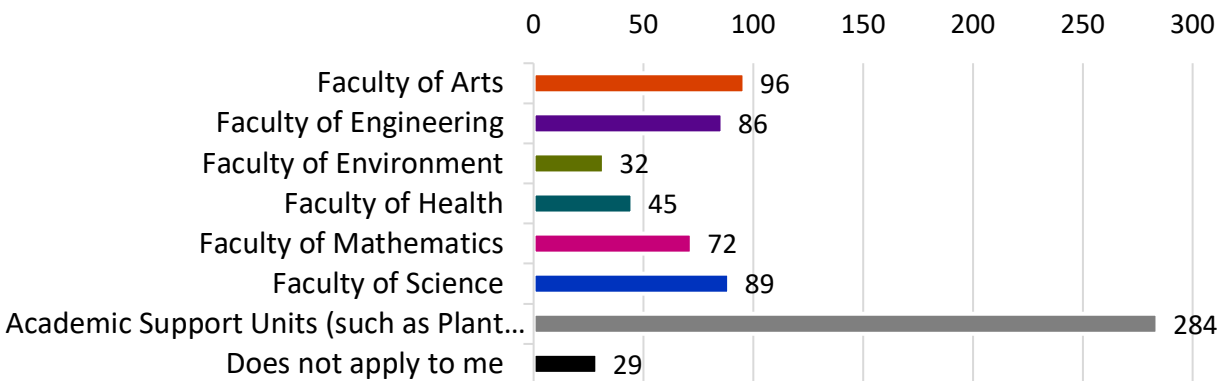| Faculty	Value
Faculty of Arts	96
Faculty of Engineering	86
Faculty of Environment	32
Faculty of Health	45
Faculty of Mathematics	72
Faculty of Science	89
Academic Support Units (such as Plant…	284
Does not apply to me	29

Figure 5 Affiliation of respondents with faculties or units.

Age distribution (n=742)
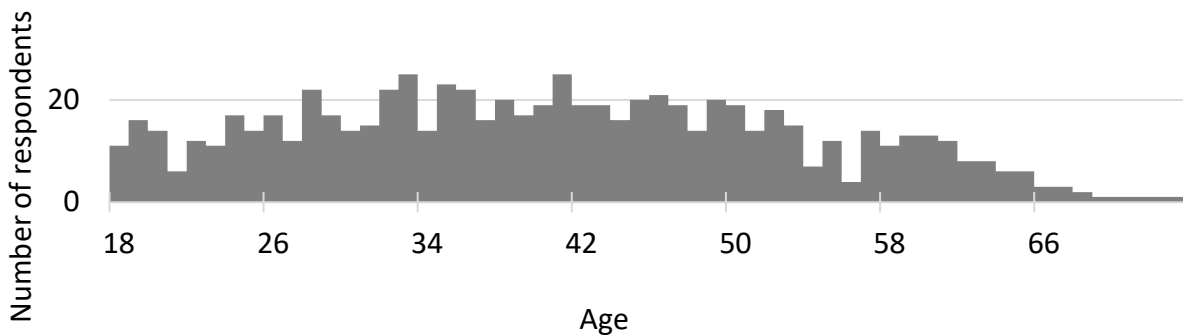
Figure 6 Age distribution of respondents.
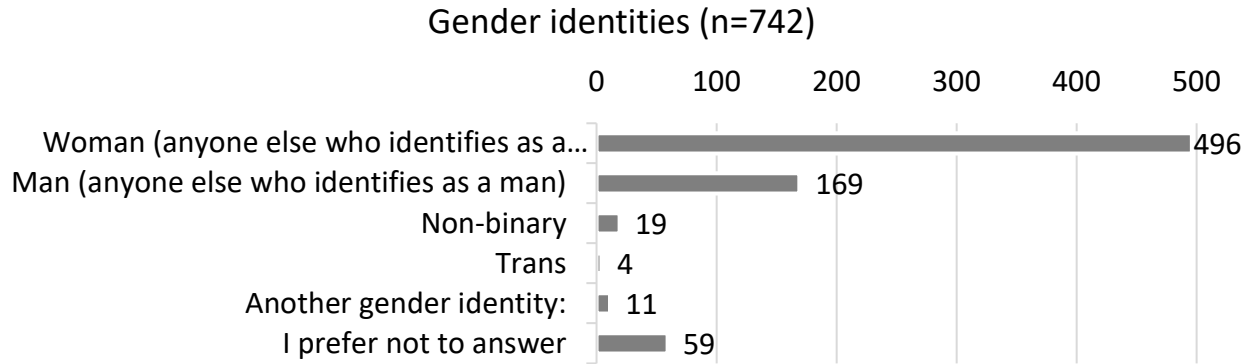
Gender identities (n=742)

Figure 7 Gender identities of respondents.

Limitations

While the survey enjoyed a high valid response rate, applicability of the results is limited by factors described above. In particular, the high proportion of staff to students and faculty, the resulting age distribution, and the high proportion of women respondents limit the generalizability of the data. The comparatively low student response rate may partly have been a result of the timing of the survey, which opened and closed during the spring exam period.

This Report

This report presents the quantitative results of the survey as well as preliminary analysis of the substantial qualitative feedback received. It follows the order of the Framework itself with three sections covering:

1. Engagement Process, including background and demographics;

2. Overarching Considerations, including university-wide perspectives; and

3. Space-Specific Considerations, including results related to space types identified in the Framework.

The report concludes with a discussion of key messages and the implications of results for the Framework and its future development.

Overarching Considerations

Current Perceptions

Respondents were largely split between agreeing or disagreeing that UWaterloo is designed for accessibility/inclusion, health/well-being, or sustainability. Accessibility was most polarizing, with roughly half as many respondents reporting a neutral perspective (neither agree nor disagree) compared to other themes. It was also viewed least favourably with 13% more respondents disagreeing that UWaterloo is successful in terms of accessibility (44%) than either well-being (31%) or sustainability (31%). More respondents reported not knowing of UWaterloo's performance in terms of sustainability (9%) than accessibility (3%) or well-being (2%), suggesting better communication in this area may be required.
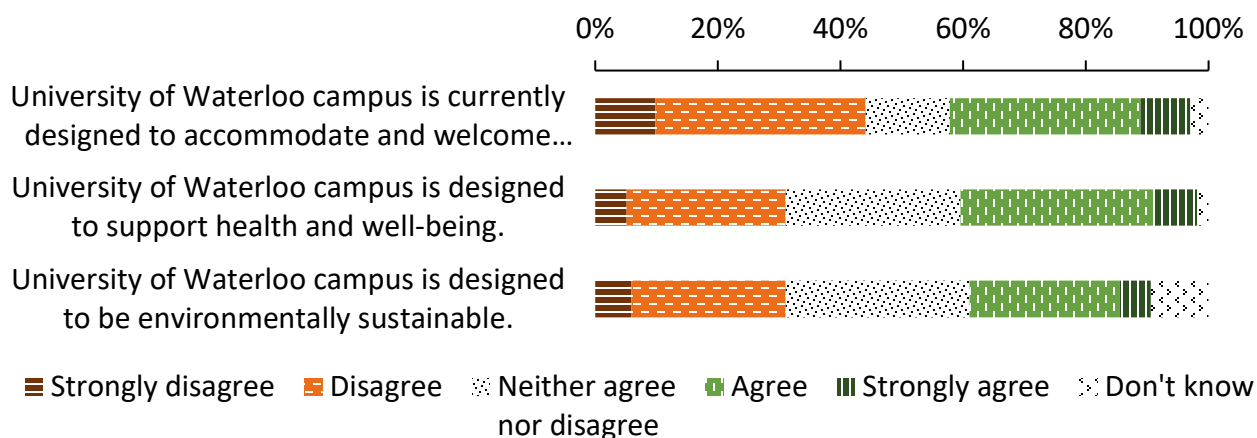

Figure 8. Overall perceptions of accessibility, well-being, and sustainability.

Priority Spaces

The spaces respondents identified as most important varied significantly by affiliation (Figure 7). Unsurprisingly, most staff and faculty prioritized "working spaces" with 86% including it in their top three (compared to 53% of students) and 57% ranking it most important.

Students identified "learning spaces" as their highest priority with 62% including it in their top three, however students' most important spaces were more varied. Approx. 23% of students considered working spaces to be most important and 18% said the same of travelling spaces, compared to 25% for learning spaces.
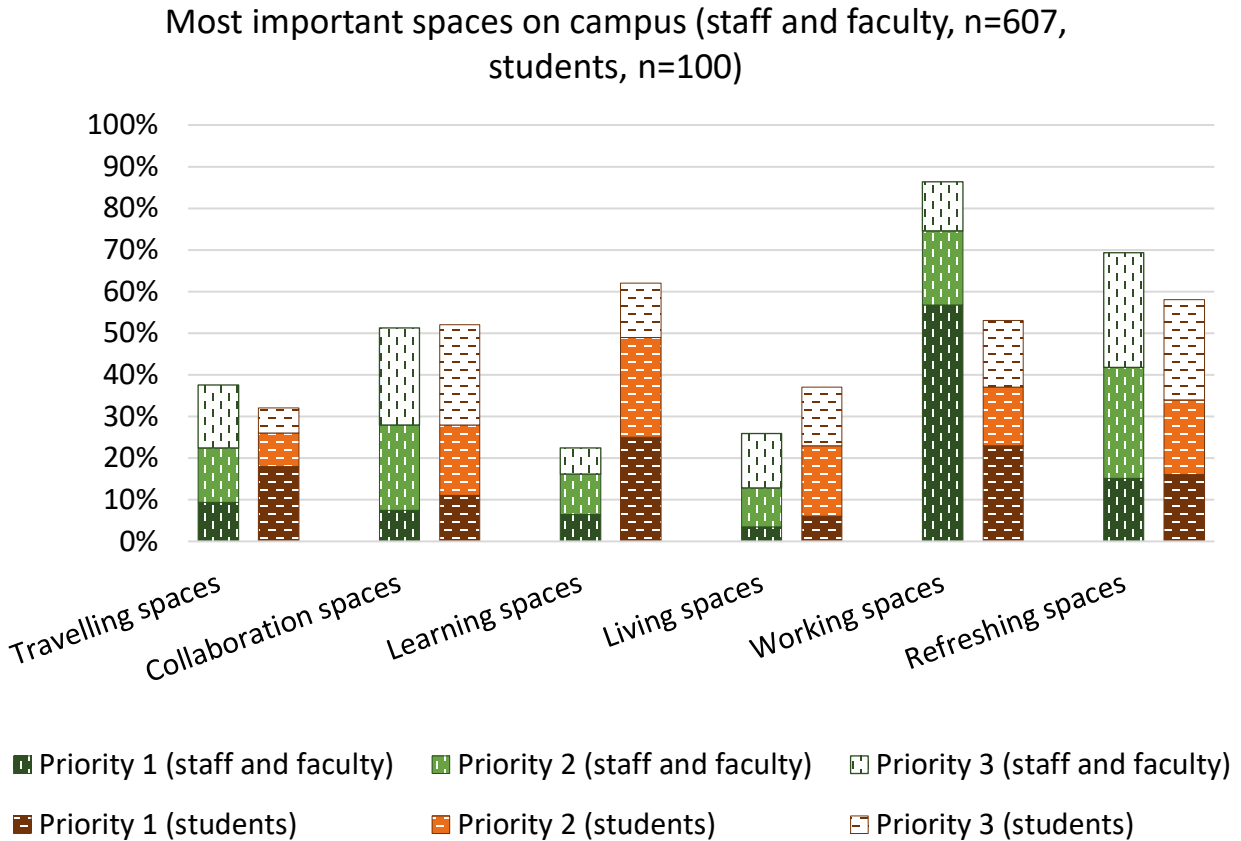
Most important spaces on campus (staff and faculty, n=607, students, n=100)

Figure 9 Most important spaces. Numbers represent the importance attributed to each type of space with 1 being most important.

Travelling on Campus

Respondents were asked to rate their ability move around campus and use existing buildings/spaces on a Likert scale. Results from people with disabilities, as those most likely to be impacted by route characteristics, were broken out for analysis (Figure 8). Though the following trends aligned with the broader audience, people with disabilities registered additional disagreement with each of the statements.

Generally, campus buildings and amenities were viewed as not easily accessible (58%) with respondents with disabilities disagreeing most with the statement that routes between buildings were accessible (69%). Upon arriving at a space, respondents with disabilities typically felt they could use the same entry point (73%) and navigate or use the space (66%).

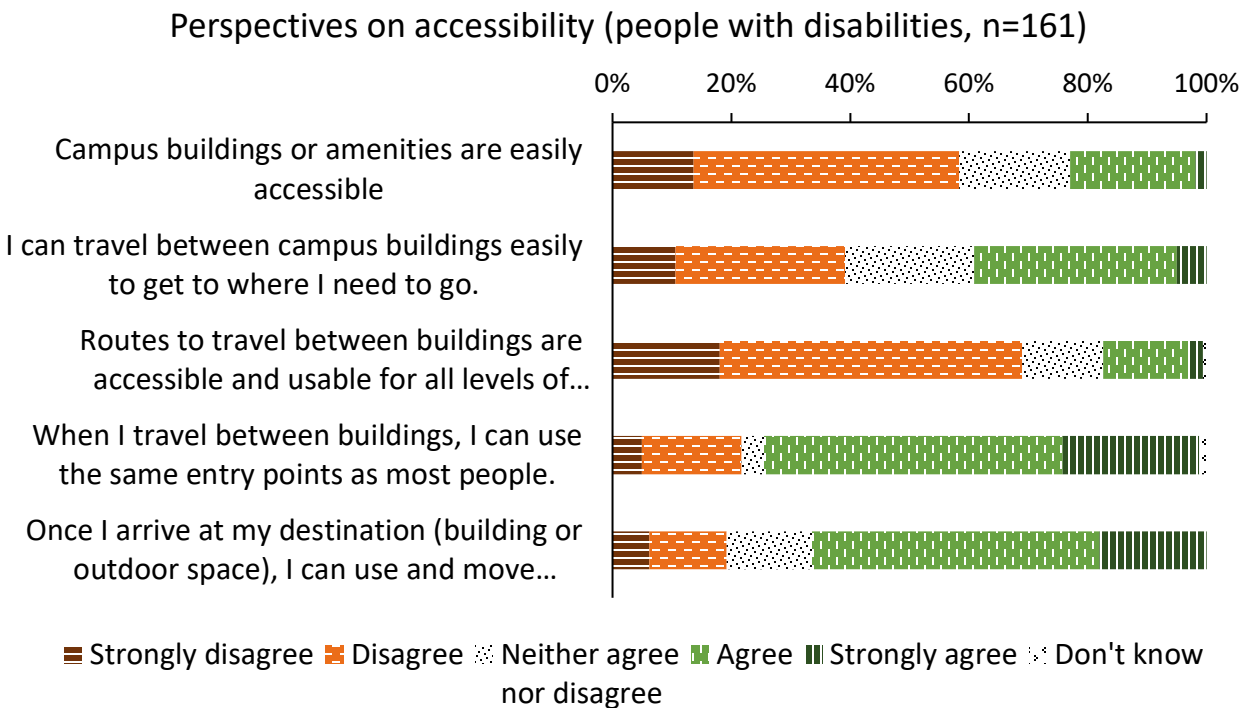## Perspectives on accessibility (people with disabilities, n=161)

Figure 10 Perspectives on accessibility from respondents with disabilities.

Respondents were also asked an open-ended question about negative experiences travelling on campus. Comments most frequently referenced improvements to paths of travel, followed by wayfinding, operations and maintenance, access features, arrival to site, and health and safety (Figure 9).

Within "paths of travel," comments commonly referred to a lack of connectivity between and within buildings due to long distances or unintuitive paths caused by a variety of barriers, from locked doors to the absence of safe pedestrian paths. Comments on "wayfinding" were characterized by a need for better awareness of direct, accessible, or sheltered routes. "Operations and maintenance" considerations included seasonal maintenance of routes and maintenance of elements such as automatic door openers.

Comments related to "access features" included specific need for ramps, elevators, door openers, etc. "Arrival to site" included the need for protection from vehicular traffic, active or public transportation infrastructure, and parking (often in reference to the provision of accessible parking). Lastly, "health and safety" concerns included reference to specific hazards related to allergens, wildlife, or crime.

Q10. If you have had a poor experience with journeys on campus, what could make your travelling experience on campus better?
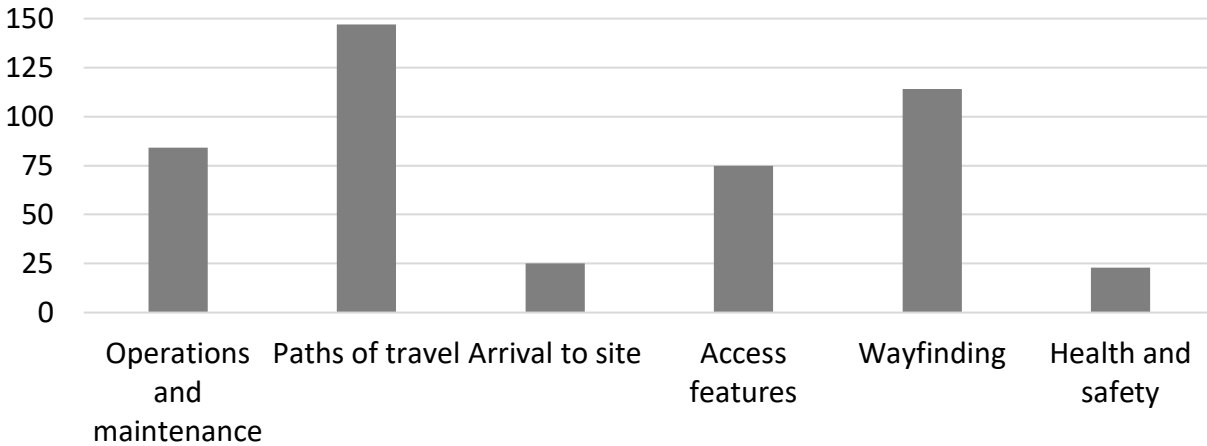

Figure 11 Frequency of comments referencing themes related to journeys on campus.

Other Considerations

When asked about considerations not covered by other questions, most comments referenced additional accessibility considerations, followed by well-being and sustainability (Figure 10). Comments related to "supporting spaces" and "wayfinding," for example, did not fit neatly into these categories but exhibited overlap between multiple themes.

In terms of accessibility, common sentiments included the need to make existing buildings accessible, to include accessibility as a core requirement for new infrastructure, and to consider mental health and other "invisible" disabilities. Several comments recommended auditing spaces from the perspective of people with disabilities. Others referenced the need for indoor air quality measures and/or masking as a prerequisite for campus accessibility.

In terms of well-being, common themes included the need for access to nature both inside (e.g. plants, views to the exterior) and out, environmental comfort particularly with respect to lighting, and indoor air quality. Comments on lighting revealed preference for natural light and adjustable, non-fluorescent artificial light. Ventilation and filtration were referenced both in relation to COVID-19 and general mental health/performance.

In terms of sustainability, comments frequently referenced waste (in terms of recycling, composting, and energy/water use), the need to retrofit existing (particularly old)

buildings for better performance, and the use of alternative energy sources like solar, wind, or geo-thermal.

Other comments straddled two or more headings. Comments under "supporting spaces" referenced spaces such as eating and dining, self-care and relaxation, and hygiene spaces which support the university community and goals for both accessibility and well-being. "Wayfinding" comments typically spoke to the need for an intuitive, accessible system to likewise support both accessibility and well-being.

Q41 Is there anything else that we should consider when thinking about accessibility, wellness, and environmental sustainability on campus?
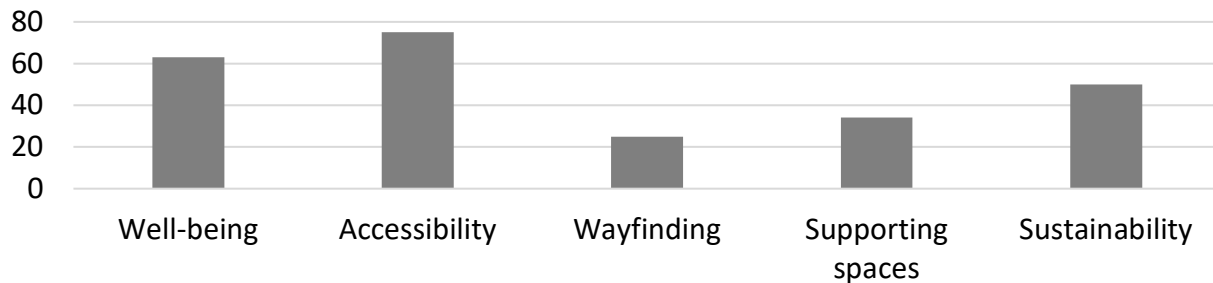
Figure 12 Other considerations related to the themes of the Framework.

Space-Specific Considerations

Collaboration Spaces

Collaboration spaces include meeting rooms, multi-purpose rooms, and spaces designed for hybrid work. Collaboration spaces are used for students, staff, and faculty for group or hybrid work.

Most respondents, when asked to choose (Figure 10), expressed preference for "enclosed" collaboration spaces, represented in the survey by an image of a small group room with conference-style table and glass walls. Outdoor spaces, represented by partially sheltered table

I prefer to collaborate in... (n=737)

Figure 13 Preferred types of collaboration spaces.

seating, also received significant support, followed by smaller spaces and open and large spaces.

When asked about their ability to find space to support hybrid collaboration (Figure 12), 61% of staff and faculty reported being able to easily find space for in-person collaboration and 56% for virtual collaboration. Between 22% and 26%, respectively, disagreed that it was easy to find such space. Students, on the other hand, reported greater difficulty with 27% disagreeing that in-person collaboration space was easy to find and 44% virtual. The latter suggests a lack of hybrid-enabled options for student use on campus.
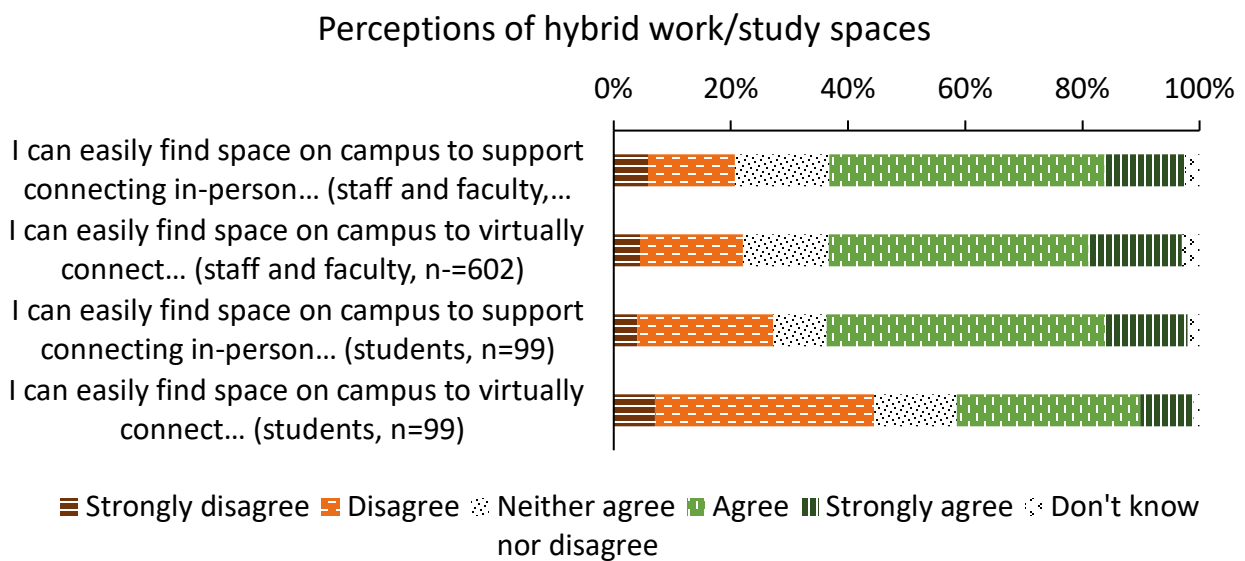
Perceptions of hybrid work/study spaces

Figure 14 Perceptions of hybrid work/study spaces. Respondents were asked to rate the ease with which they were able to connect "with [their] colleagues and peers in a hybrid work and study environment."

In open-ended responses, the most common sentiment was a need for more collaboration space or a greater variety of collaboration space, followed, relatedly, by awareness of available space and the ability to find and book appropriate spaces (Figure 13), including between academic units.

The need for appropriate environmental conditions, including lighting, sound, temperature/humidity, and air quality, was a common theme across most space-related questions in the survey, including collaboration spaces. Next were themes related to the fit-out of spaces, including comfortable, ergonomic, and adaptable furnishings, as well as technology including power, internet, and videoconferencing setups.
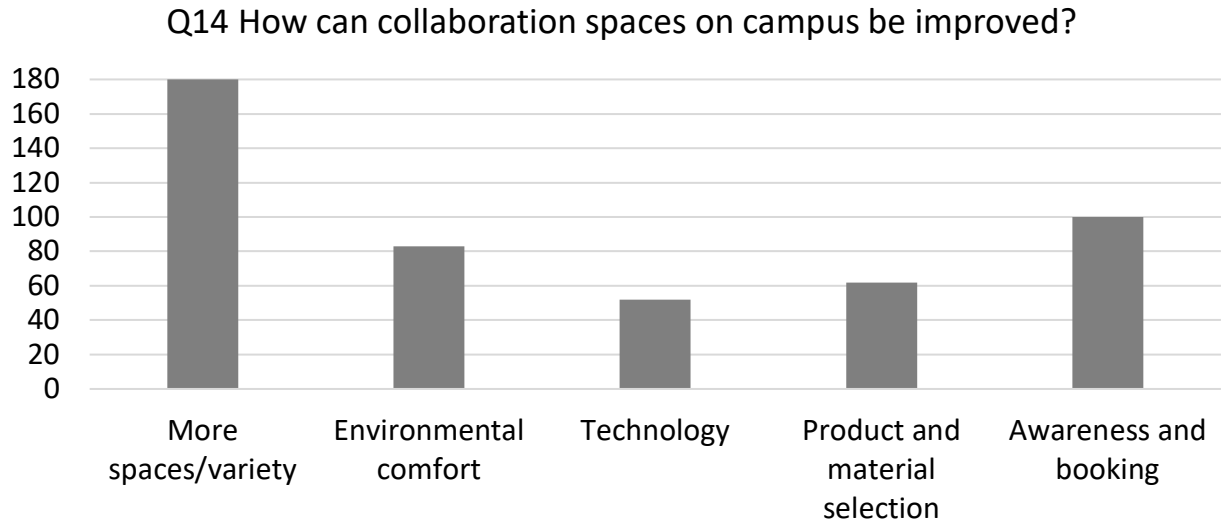
Q14 How can collaboration spaces on campus be improved?

Figure 15 Frequency of comments referencing themes related to improving collaboration spaces.

Priorities for hybrid spaces (n=742)

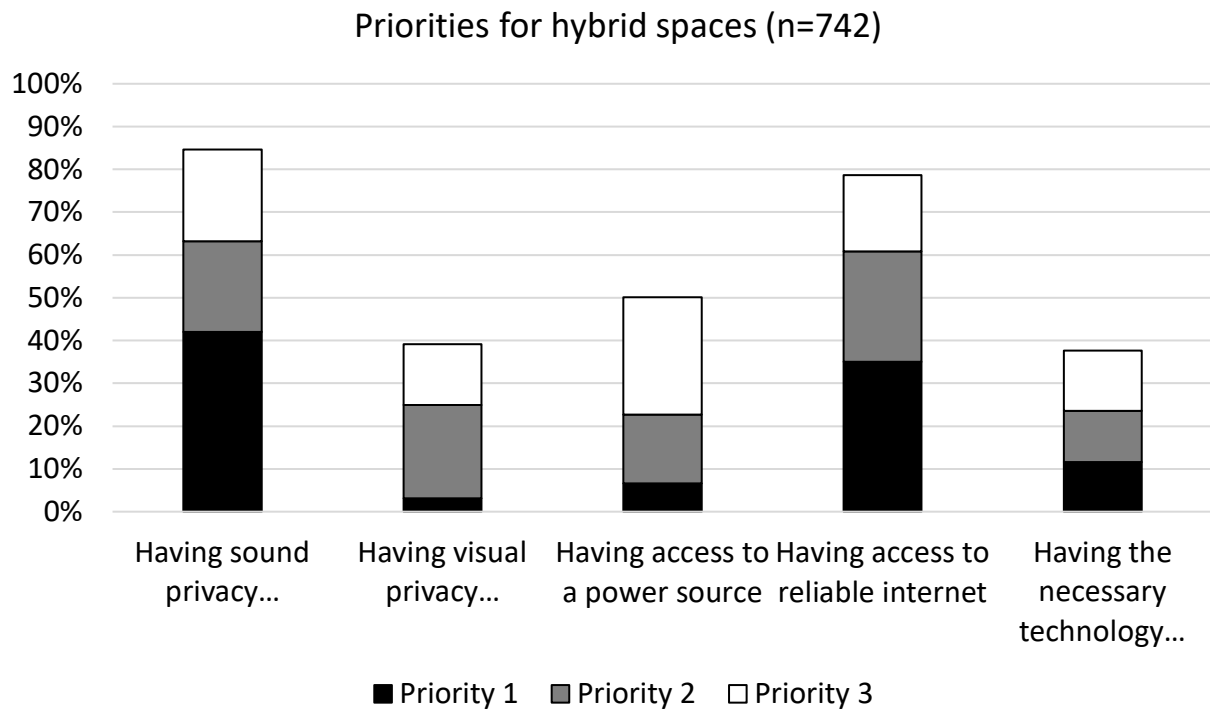■ Priority 1 ■ Priority 2 □ Priority 3

Figure 16 Priorities for hybrid collaboration spaces. Numbers represent the importance attributed to each type of space with 1 being most important.

In terms of hybrid collaboration spaces in particular, respondents rated sound privacy as their most important priority followed by reliable internet access (Figure 14). Access to a

power source, visual privacy, and access to necessary technology were viewed as lower priorities. The former and latter may be the result of the proliferation of laptops and tablets which have batteries and typically incorporate all required technologies. Open-ended comments referenced the need to have private conversations with concerns typically related to acoustic rather than visual privacy.

Learning Spaces

Learning spaces include classrooms, lecture halls, seminar rooms, labs, and studios. While students are generally the "learners" in such spaces, many staff and faculty use and have their own perspectives on them. Questions related to learning and studying are therefore analyzed from students' perspectives while open-ended responses are considered from all survey participants.
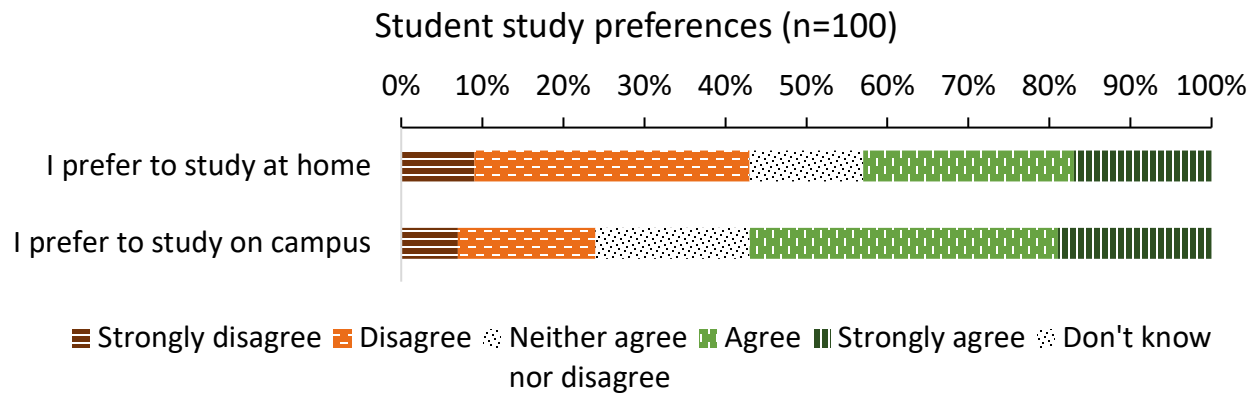

Figure 17 Student study preferences.

Approximately 57% of students indicated preference for studying on campus as opposed to 43% at home (Figure 15). Most students, when asked to choose, expressed preference for "focused learning spaces" (Figure 15), represented in the survey by individual study corrals in an open indoor environment. Open-ended responses, however, indicated support for a variety of options with preferences that change according to the type of work being completed and other factors.
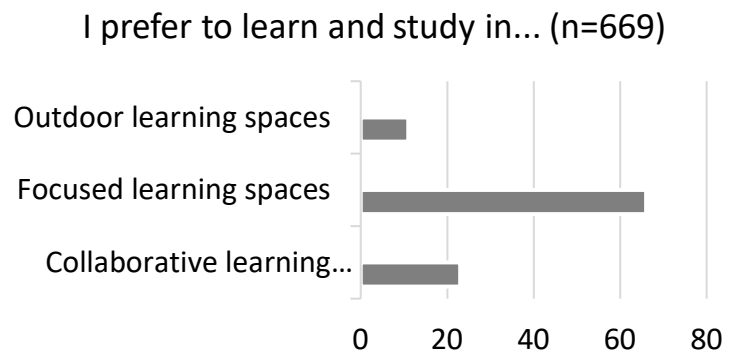

Figure 18 Student preference for types of learning and studying space.

When asked how learning spaces on campus could be improved (Figure 17), open-ended comments predominantly indicated need for more space or more types of spaces. Comments on "availability/flexibility" referred to the amount and variety of spaces provided, as well as the ability to adapt a space to suit one's (or a group's) needs. Relatedly, many respondents expressed a "spatial preference" for one or more types of learning space. A lack of consensus again pointed to a need for variety.

As with collaboration spaces, "environmental comfort" was a high priority for learning spaces, largely in terms of lighting and sound. Comments classified as "product and material selection" referred to the types of furnishing and finishes provided. Many respondents expressed desire for flexible furnishings which could be rearranged or reconfigured (e.g. height-adjustable desks). Lastly, comments characterized by "access to nature" included desire for exterior views, indoor greenery, or outdoor learning spaces.

Q19 How can learning spaces on campus be improved?
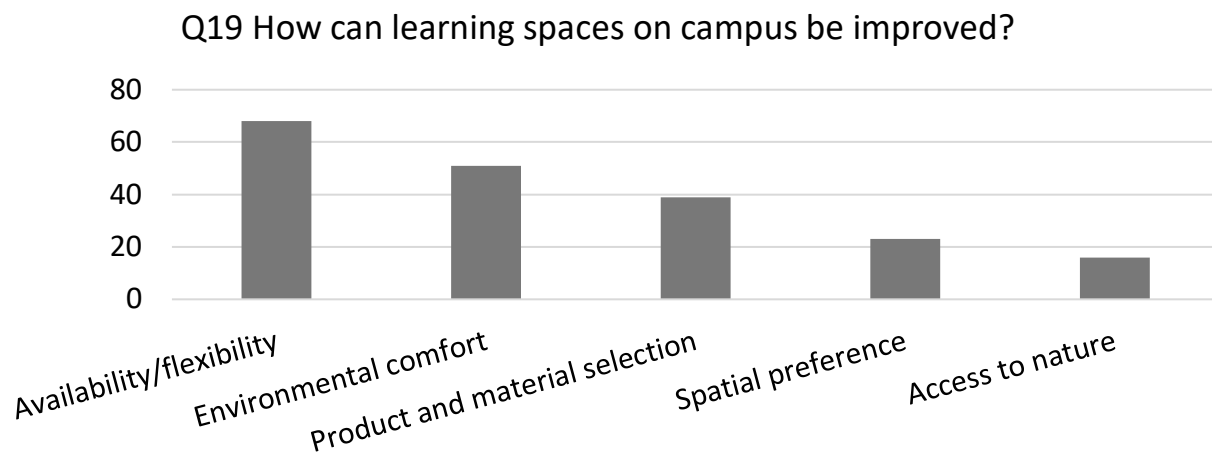
Figure 19 Frequency of comments referencing themes related to improving learning spaces.

Living Spaces
Living spaces include spaces for eating, dining, hygiene, and self-care, as well as housing options typically specific to students. Due to the broad applicability of most living spaces, responses are analyzed in the aggregate. Perspectives related to housing may therefore be under-represented.

Overall, nearly half of respondents (48%) felt they could easily access and use living spaces and the same number felt comfortable doing so (Figure 18). Only 26% felt there was an adequate number of living spaces. At 13-17%, more respondents responded

"don't know" to this question than any other, suggesting some uncertainty over the definition of living spaces or a perception that living spaces were not "for" them.

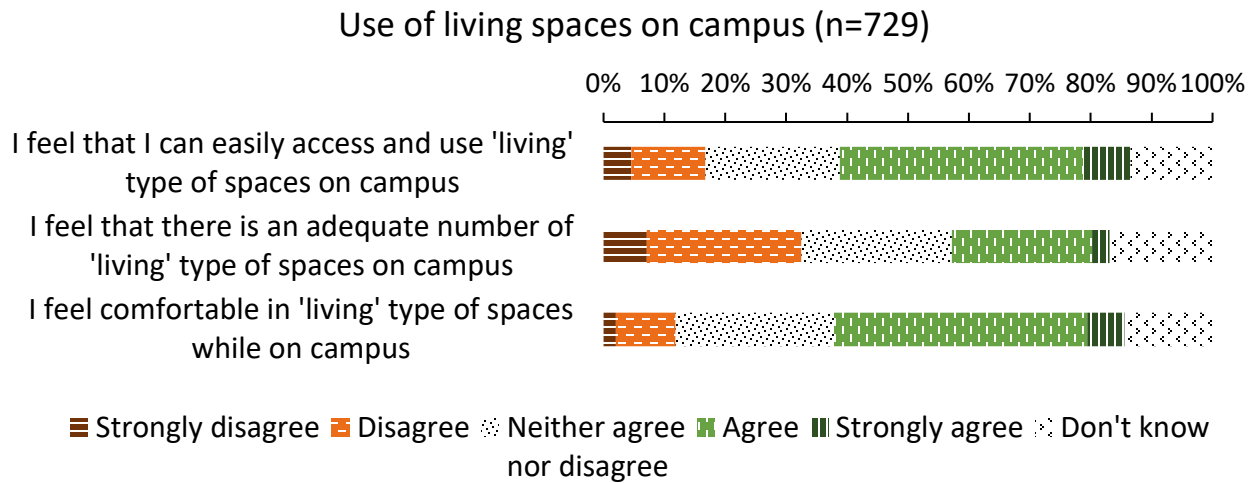### Use of living spaces on campus (n=729)

Figure 20 Experience accessing and using living spaces on campus.

The survey posed specific questions about comfort in gender-inclusive and gender-exclusive spaces. Respondents were generally comfortable in gender-inclusive spaces and there was no significant difference between comfort among students, staff, or faculty respondents (Figure 19).

Comfort in gender inclusive spaces

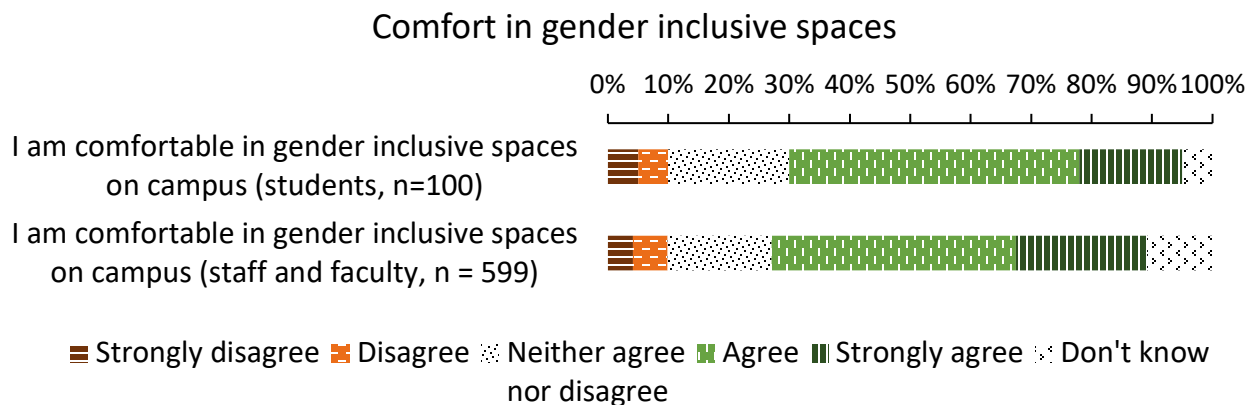Figure 21 Student vs. staff and faculty comfort in gender-inclusive spaces.

Of those who expressed a preference (Figure 20) the vast majority preferred either all-gender, single-occupancy (30%) or gender-specific, multi-stall washrooms (32%). A minority expressed preference for all-gender, multi-stall washrooms (4%) and a third of respondents expressed no preference. In open-ended responses, respondents cited

concerns with current iterations of all-gender, multi-stall washrooms including gaps in stall doors and the presence of urinals.
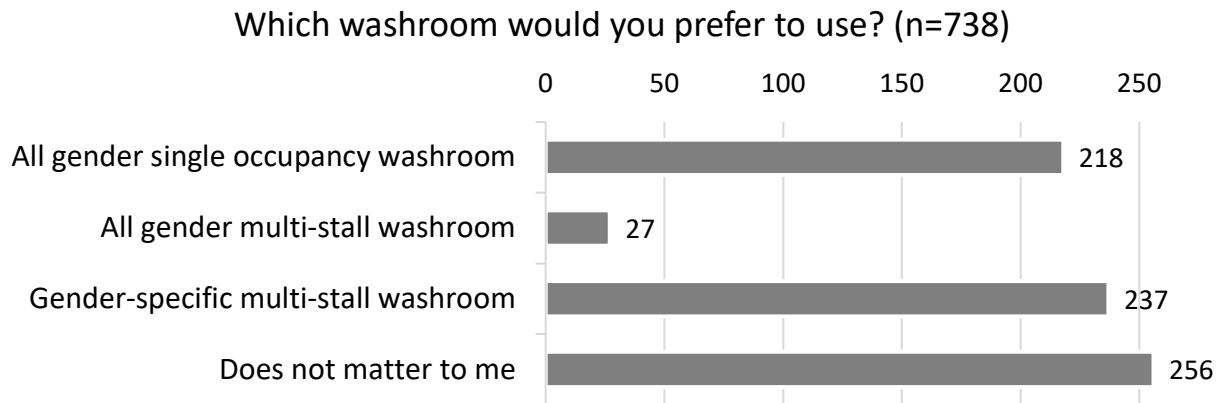
Which washroom would you prefer to use? (n=738)

Washroom type	Value
All gender single occupancy washroom	218
All gender multi-stall washroom	27
Gender-specific multi-stall washroom	237
Does not matter to me	256

Figure 22 Washroom configuration preferences.

The most desired types of living space in open-ended responses (Figure 21) were "hygiene and self-care spaces," including (particular types of) washrooms, accessible facilities in particular, change rooms, showers, and lactation rooms. This was followed by "eating and dining" spaces which included both casual lunchrooms/kitchen(ettes) and commercial food service offerings (particularly with extended hours).

Comments under "social spaces" expressed need for unprogrammed social spaces (e.g. lounges), social dining/drinking spaces (e.g. pubs), and gathering/event spaces. Classified under "access to nature" is desire for outdoor areas or living spaces with natural features. Lastly, "refreshing spaces" includes quiet spaces, prayer/meditation rooms, recreational facilities, and rest areas.
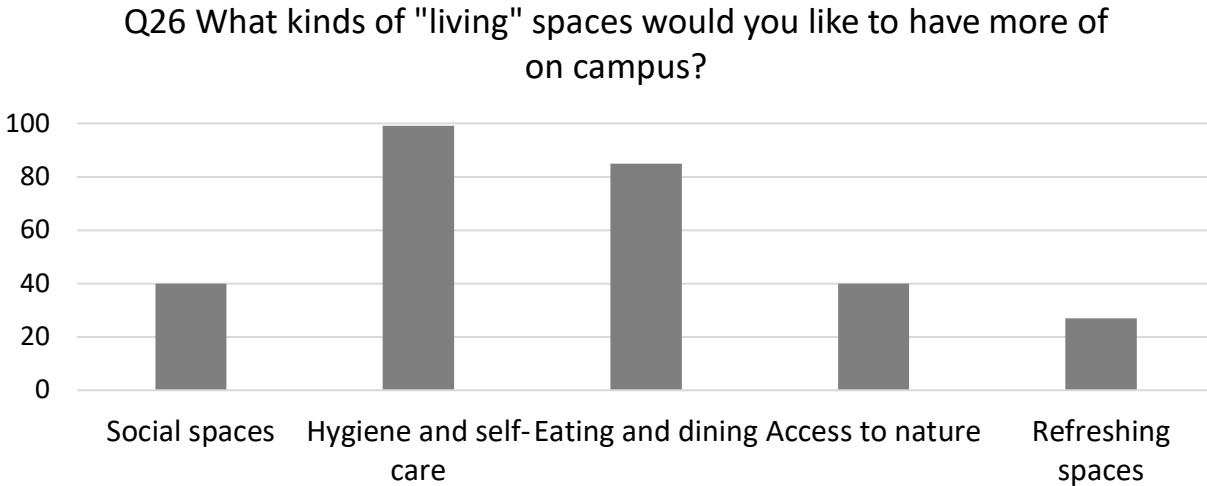
Q26 What kinds of "living" spaces would you like to have more of on campus?

Figure 23 Frequency of comments referencing themes related to living spaces.

Employee Spaces

Perspectives with respect to employee spaces, referred to as "working spaces" in the survey, are analyzed from the perspective of staff and faculty. Overall, staff and faculty each reported satisfaction (Figure 22) with their ability to access and use working spaces (77%) and felt existing spaces allow them to do their best work (68%).

Staff and faculty perceptions of working spaces

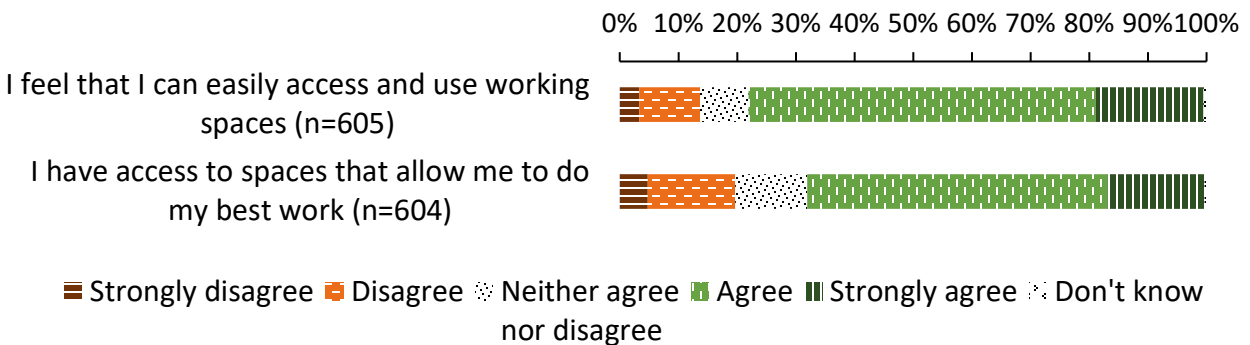Figure 24 Staff and faculty perceptions of working spaces.

In open-ended responses there was strong preference for environmentally comfortable spaces (including sound, lighting, indoor air quality, and temperature/humidity) with good lighting and acoustic qualities being most frequently cited (Figure 23). Desire was split between shared spaces and private spaces with some respondents desiring more of both.

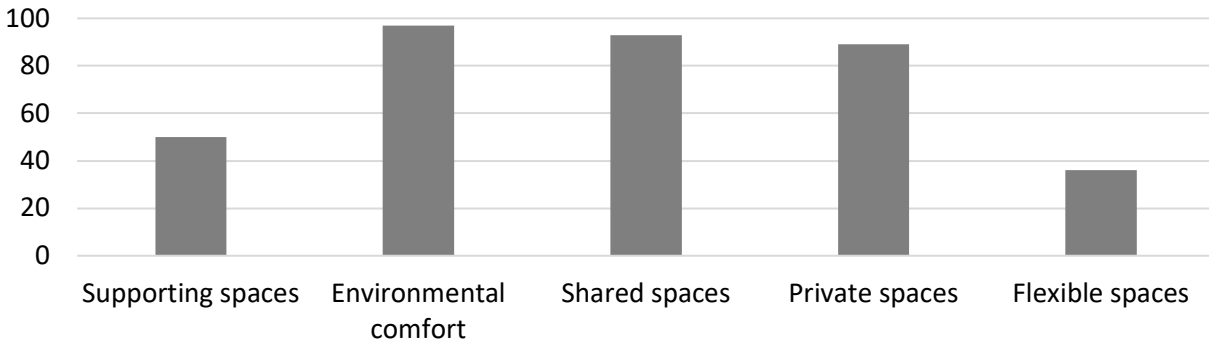## Q30 What kinds of working spaces would you like to have more of on campus?

A bar chart showing frequency of comments: Supporting spaces ~50, Environmental comfort ~97, Shared spaces ~93, Private spaces ~89, Flexible spaces ~36.

Figure 25 Frequency of comments referencing themes related to working spaces.

Refreshing Spaces

Refreshing spaces include those that support mental health and well-being, including spaces that enable one to "escape" from work/study or pursue mental or spiritual restoration.

Overall, respondents felt they could access and use existing refreshing spaces on campus (47%) but felt the number of refreshing spaces provided was inadequate (46%) for the university population (Figure 24).

Perceptions of refreshing spaces (n=739)

A stacked bar chart with scale 0% to 100%, showing two items:
- I feel that I can easily access and use refreshing spaces
- I feel that there is an adequate number of refreshing spaces

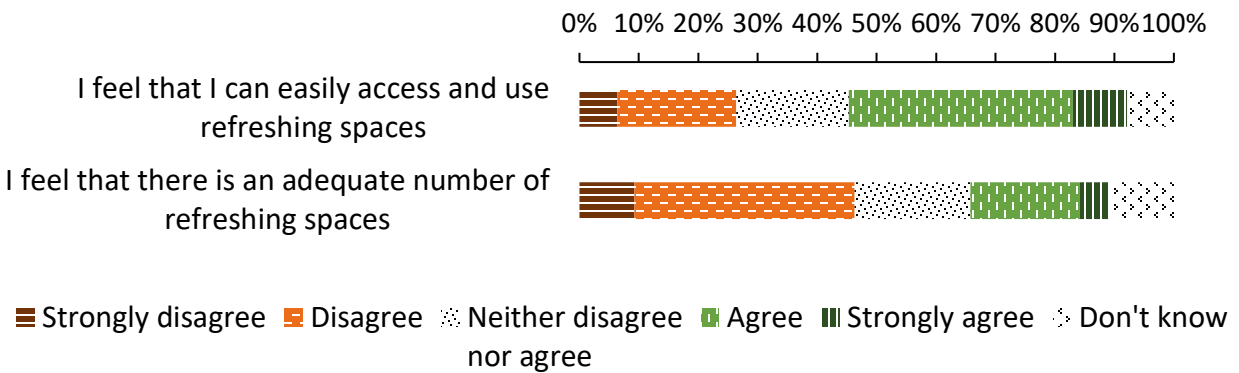Legend: Strongly disagree, Disagree, Neither disagree nor agree, Agree, Strongly agree, Don't know

Figure 26 Perceptions of refreshing spaces.

Respondents reported feeling most refreshed (Figure 24) after using active spaces (65%), represented in the survey by an image of an outdoor walking/jogging path, followed by quiet spaces (22%), social play and leisure spaces (11%), and multifaith and gathering places (2%). Th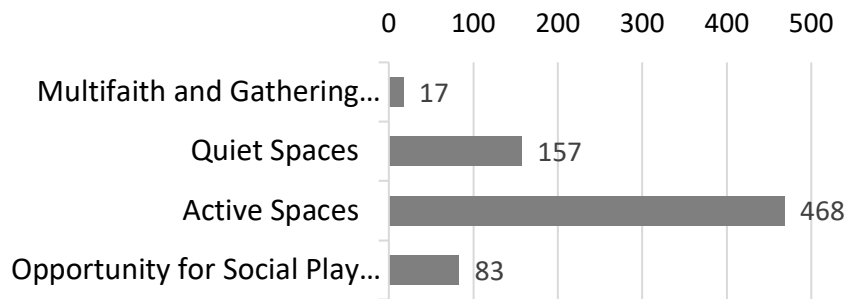is aligns with open-ended responses which indicated significant desire for outdoor green space and active spaces like walking or bike paths.

I feel most refreshed and restored after spending some time in... (n=725)

Space	Count
Multifaith and Gathering…	17
Quiet Spaces	157
Active Spaces	468
Opportunity for Social Play…	83

Figure 27 Most refreshing spaces on campus.

When asked which kinds of refreshing spaces they would like to have more of on campus (Figure 26), respondents most commonly referenced "outdoor/green spaces" including natural areas, trails, forests/treed spaces, gardens, and rest areas in such spaces. "Active spaces" were second most common, with preference again for outdoor recreational areas like walking paths/trails. "Play/leisure spaces" included more programmed indoor and outdoor spaces including facilities for games like ping pong or basketball, and for socializing in a relaxed environment. "Quiet/rest spaces" included need for places to escape from work/study with frequent reference to comfortable

furniture and environmental conditions. "Spiritual/reflective spaces" included need for multi-faith rooms, quiet space for reflection, and spaces to support indigenous practices.
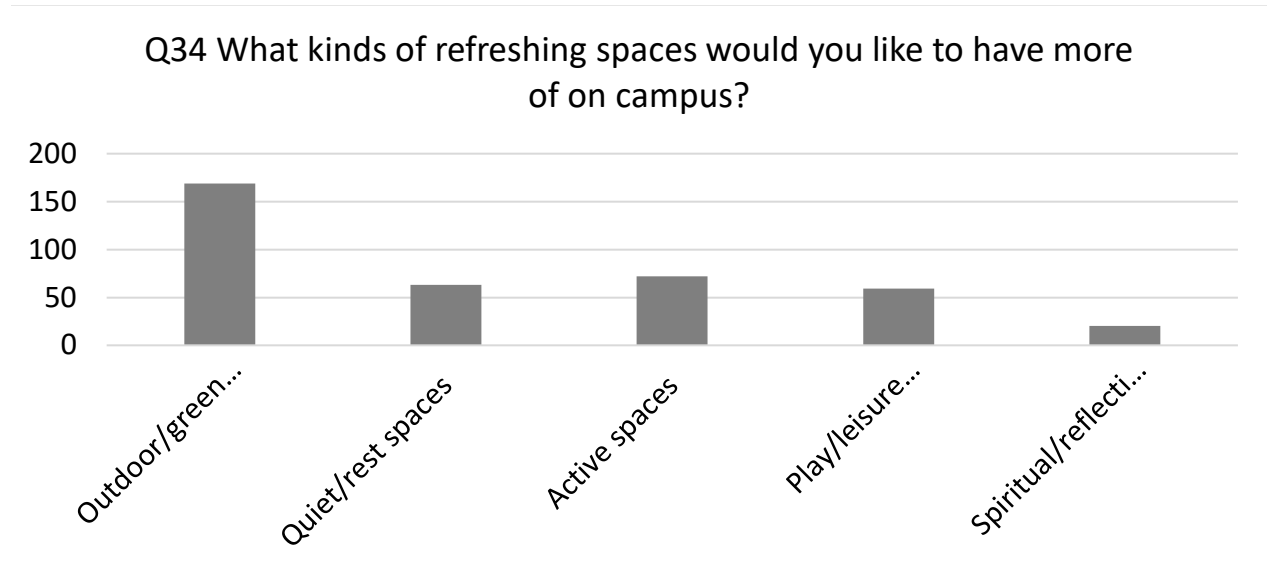
Q34 What kinds of refreshing spaces would you like to have more of on campus?

Figure 28 Frequency of comments referencing themes related to refreshing spaces.

Key Messages and Implications

Key messages from the survey:

- Survey responses confirm the priority areas of the Framework and its intersectional approach to developing space on campus.

    o Accessibility recurred as a theme in all open-ended questions, though below the level of inclusion in graphs above, and was a central theme in terms of travelling on campus.

    o Well-being manifested in strong support for developing refreshing and outdoor or natural spaces, as well as more comfortable interior environments.

    o Sustainability was identified as a priority and often referenced via green building elements or interiors, though it seems to enjoy the least awareness.

- Desire for *more* space of almost all kinds was common. This supports the approach of the Framework which seeks to make the most of each design decision. Open-ended responses suggested opportunities for more efficient use of existing space, including capitalizing on work-from-home and facilitating cooperation between departments.

- While the survey showed high comfort in gender-inclusive spaces, it also revealed preference against all-gender, multi-stall washrooms as developed in some areas of campus. Open-ended responses suggested several specific design changes which may improve acceptance. Many respondents preferred gender-specific, multi-stall washrooms or all-gender, single-occupancy washrooms while roughly one third had no preference.

- Despite UWaterloo's challenging climate, additional outdoor spaces were widely desired by a variety of users and for a variety of uses. Open-ended results suggest the importance of shelter and shading as discussed in the Framework.

Staff and faculty feedback supports the need for enclosed/small-group meeting or collaboration rooms as well as the ability to have private meetings or calls, particularly in terms of acoustic privacy.

Due to the lack of generalizability of the data, it is not possible to make definitive recommendations. Responses do, however, support the ideas developed in the Framework and suggest avenues for future exploration:

- Space-specific considerations related to social/gathering spaces which may not be captured under other headings. These include larger event spaces, multi-purpose spaces, and lounges.

- While the present version focuses on physical space, additional operational considerations could be explored. This includes frequent reference in open-ended responses to logistics (e.g. the location of meeting or classes to reduce travel distance/time) and inter-departmental cooperation to make more efficient use of existing space.

During development of future versions of the Framework, a new survey would help to improve the applicability of the results and further develop themes.

Table of Figures

Inclusive Physical Space Framework

Appendix A: Survey

Inclusive Physical Space Framework Survey

Introduction

This survey is being conducted by the University of Waterloo. To help you make an informed decision regarding your participation, this information letter will explain what the study is about, the possible risks and benefits, and your rights as a participant. If you require any clarification, please contact the investigator of this study.

What is the study about?

We are conducting a survey among the University of Waterloo community to better understand how accessibility, sustainability, and wellness are managed within the campus environment. In this survey, you will be asked about your experience with the campus grounds, buildings, spaces, and infrastructure.

What does participation in the study involve?

You are invited to participate in a short survey that will take about 15-20 minutes to complete and includes general questions about your views on how you experience the University of Waterloo campus and how we might improve its physical accessibility, how it can be designed to contribute to health and well-being, and how sustainable development continues on campus. This survey will be collecting responses between April 3, 2023 to April 21, 2023.

Who may participate in this study?

Eligible respondents are students, faculty, staff and visitors who have engaged with any of the University of Waterloo physical campuses within the past 7 years.

Is participation in the study voluntary?

Participation is voluntary and responses will be kept confidential. If you chose to participate, you can decline to respond to any question by leaving it blank and can decide to end your participation in the survey at any time. Public reports will include only summarized results, ensuring that no individual can be identified.

Will I receive anything for participating in the study?

As a thank you for participating in the survey, we would like to offer you the opportunity to be included in a draw for $50.00 on a WatCard. Please note that your name and email will remain confidential and will not be linked with any of your survey answers. The contact information collected from you to participate in the draw will be stored separately from your survey responses, and will be destroyed once the draw is

complete. Your odds of winning are based on the number of individuals that participate in the survey. The results of this survey will be stored in a secure, password-protected location with only authorized University of Waterloo staff members will have access to the raw data.

What are the possible risks associated with the study?
There are no known or anticipated risks associated with participation in this study. If a question makes you uncomfortable, you can choose not to answer.

How will the results from this survey be used?
There are no direct benefits to you for participating in this study. The findings from this survey will help inform the development of a framework that addresses how accessibility, sustainability, and wellness are address on University campuses. This framework is funded by the Province of Ontario, through the EnAbling Change Grant and will be a publicly available document.

Will my information be kept confidential?
The security of your personal information is critical. Your identity will be considered confidential and survey responses will be de-identified. All of the data will be summarized, and no individual will be able to be identified from the summarized results. The Survey Research Centre (SRC) temporarily collects your internet protocol (IP) address to avoid duplicate responses in the dataset.

This survey is being conducted using Qualtrics, an online survey software. Qualtrics has implemented technical, administrative, and physical safeguards to protect the information provided via the Services from loss, misuse, and unauthorized access, disclosure, alteration, or destruction. However, no Internet transmission is ever fully secure or error free. The data collected from this study will be securely stored in a locked office and/or on a password protected computer for a minimum of seven years.

Please note that if you want to enter the draw after you submit your responses, your personal information and email address will be stored separately from the survey responses and deleted once the draw is complete.

The Inclusive Physical Space Framework Team at the University of Waterloo is committed to respecting the privacy of survey respondents to our surveys. All personal information created, held, or collected by the Inclusive Physical Space Framework Team is protected by Canada's Freedom of Information and Protection of Privacy Act and consistent with Waterloo's information and privacy policy (https://uwaterloo.ca/privacy/).

Who is sponsoring/funding this study?

The study is funded by the Province of Ontario through the EnAbling Change Grant. However, the funder has no role in data collection, analysis, or interpretation of the results for this study.

Who should I contact if I have questions regarding my participation in the study?

Should you have any questions about the study or would like any additional information to assist you in reaching a decision about participation, please contact the Inclusive Physical Space Framework Team (inclusive.space@uwaterloo.ca).

Consent Section

Please select one of the options below.

    I consent to participate in this survey:
- ○ Yes
- ○ No

    To confirm, do you consent to participate in this survey?
- ○ No, I do not consent to participate
- ○ Yes, I do consent to participate

Thank you for your time. Only those who consented to participate in the survey may proceed.

Help Section

If you require technical help with the survey, please contact the Survey Research Centre at srcccinb@uwaterloo.ca.

For any questions about the study itself, please contact the Inclusive Physical Space Framework Team at inclusive.space@uwaterloo.ca.

Screening Questions

S1. When did you last visit a University of Waterloo campus?

_____ (year, month)

S2. What is your year of birth?

_____ (year)

Section 1: Opinions

The following questions ask your thoughts and opinions of the physical space on campus and if it is currently designed to accommodate people with disabilities, support health and well-being, and enhance environmental sustainability. These key factors can contribute to an inclusive sense of belonging to the University. Please think about the campus location that you visit most often when answering the following questions.

Please indicate your level of agreement or disagreement with each of the following statements:

Q1. University of Waterloo campus is currently designed to accommodate and welcome all people, including people with disabilities.

    a. Strongly disagree
    b. Disagree
    c. Neither disagree nor agree
    d. Agree
    e. Strongly agree
    f. Don't know

Q2. University of Waterloo campus is designed to support health and well-being.

    a. Strongly disagree
    b. Disagree
    c. Neither disagree nor agree
    d. Agree
    e. Strongly agree
    f. Don't know

Q3. University of Waterloo campus is designed to be environmentally sustainable.

    a. Strongly disagree
    b. Disagree
    c. Neither disagree nor agree
    d. Agree
    e. Strongly agree
    f. Don't know

Q4. To ensure we are capturing your answers correctly, please select all the fruits from the following list: (**select all that apply**)

    a. Strawberry
    b. Horse
    c. Apple

    d. Squirrel
    e. Banana

Section 2: Human Experience – Journeys on Campus

Travelling spaces: Travel refers to getting to campus, moving onsite between buildings and outdoor spaces, and movement inside of buildings.

Please indicate your level of agreement or disagreement with each of the following statements:

Q5. Campus buildings or amenities are easily accessible.

    a. Strongly disagree
    b. Disagree
    c. Neither disagree nor agree
    d. Agree
    e. Strongly agree
    f. Don't know

Q6. I can travel between campus buildings easily to get to where I need to go.

    a. Strongly disagree
    b. Disagree
    c. Neither disagree nor agree
    d. Agree
    e. Strongly agree
    f. Don't know

Q7. Routes to travel between buildings are accessible and usable for all levels of abilities.

    a. Strongly disagree
    b. Disagree
    c. Neither disagree nor agree
    d. Agree
    e. Strongly agree
    f. Don't know

Q8. When I travel between buildings, I **can** use the same entry points as most people.

    a. Strongly disagree
    b. Disagree
    c. Neither disagree nor agree
    d. Agree

     e. Strongly agree

     f. Don't know

Q9. Once I arrive at my destination (building or outdoor space), I can use and move throughout the space with little difficulty.

     a. Strongly disagree
     b. Disagree
     c. Neither disagree nor agree
     d. Agree
     e. Strongly agree
     f. Don't know

Q10. If you have had a poor experience with journeys on campus, what could make your travelling experience on campus better?

_____

_____

_____

Collaboration spaces: These spaces refer to areas that allow you to engage in activity around working and studying with others on campus. Examples include meeting rooms, lounges, food courts, dining halls, and outdoor seating areas.

Q11. Please indicate your level of agreement or disagreement with this statement: I feel that I can easily access and use collaboration spaces on campus.

     a. Strongly disagree
     b. Disagree
     c. Neither disagree nor agree
     d. Agree
     e. Strongly agree
     f. Don't know

Q12. I prefer to collaborate in: (select your top choice).

     a. Open and large spaces

Source: BDP

Large open space in a central atrium area of multiple floors. Various seating arrangements are offered including lounge furniture, bench table and stools, and round tables and chairs.

b. Enclosed spaces

Source: BDP, BDP

Enclosed meeting rooms with glass walls, a tv screen and meeting table with chairs.

c. Smaller spaces

Source: Stantec

Bar height round table with high chairs along windows in a wide corridor outside a lab area.

> d. Outdoor spaces

Source: World Landscape Architect

Outdoor seating in a public space with a portion covered by a glass overhead structure. Lots of people are travelling through the space as well as seated at tables.

Q13. Thinking about Waterloo's on campus collaboration spaces, what do you think works well (e.g., what makes the space effective for you to collaborate in)?

_____

_____

_____

Q14. How can collaboration spaces on campus be improved?

_____

_____

_____

Learning spaces: These spaces refer to areas that allow for studying and focused learning.

Please indicate your level of agreement or disagreement with each of the following statements:

Q15. I prefer to study at home.

    a. Strongly disagree
    b. Disagree
    c. Neither disagree nor agree
    d. Agree
    e. Strongly agree
    f. Don't know

Q16. I prefer to study on campus.

    a. Strongly disagree
    b. Disagree
    c. Neither disagree nor agree
    d. Agree
    e. Strongly agree
    f. Don't know

Q17. I prefer to learn and study in: (select your top choice)

    a. Collaborative learning spaces

Source: Steelcase

Gathering space with various seating options including lounge furniture with mobile power stands, tables and chairs, both at regular seated height and barstool height.

Image with three students collaborating on lounge furniture with laptops.

b. Focused learning spaces

Source: National University of Singapore

Large open area with multiple individualized study spaces or cubicles.

c. Outdoor learning spaces

Source: Lumos Solar

Outdoor area with various seating arrangement including outdoor lounge seating and coffee table and picnic table and benches. Overhead is a shading structure with smooth outdoor patio slab and 4 foot high concrete planters around the gathering area.

Q18. Thinking about Waterloo's on campus learning spaces, what do you think works well (e.g., what makes the space effective for you to learn / study)?

_____

_____

_____

Q19. How can learning spaces on campus be improved?

_____

_____

_____

Living spaces: These spaces refer to areas that allow for eating, dining, physical activity, socializing, engaging in hygiene and self-care such as washrooms, breast feeding, change rooms, social gathering spaces or any on-campus housing.

Please indicate your level of agreement or disagreement with each of the following statements:

Q20. I feel that I can easily access and use "living" type of spaces on campus.

    a. Strongly disagree
    b. Disagree
    c. Neither disagree nor agree
    d. Agree
    e. Strongly agree
    f. Don't know

Q21. I feel that there is an adequate number of "living" type of spaces on campus.

    a. Strongly disagree
    b. Disagree
    c. Neither disagree nor agree
    d. Agree
    e. Strongly agree
    f. Don't know

Q22. I feel comfortable in "living" type of spaces while on campus.

    a. Strongly disagree
    b. Disagree
    c. Neither disagree nor agree
    d. Agree
    e. Strongly agree
    f. Don't know

Q23. I am comfortable in gender inclusive spaces on campus.

    a. Strongly disagree
    b. Disagree
    c. Neither disagree nor agree
    d. Agree
    e. Strongly agree
    f. Don't know

Q24. I am comfortable in gender designated spaces on campus.

    a. Strongly disagree
    b. Disagree
    c. Neither disagree nor agree
    d. Agree
    e. Strongly agree
    f. Don't know

Q25. Which washroom would you prefer to use?

    a. All gender single occupancy washroom
    b. All gender multi-stall washroom
    c. Gender-specific multi-stall washroom
    d. Does not matter to me

Q26. What kinds of "living" spaces would you like to have more of on campus?

_____

_____

_____

Q27. To ensure we are capturing your answers correctly, please select all the animals from the following list: (**select all that apply**)

    a. Dog
    b. Blue
    c. Tiger
    d. Monkey
    e. Orange

Working spaces: These spaces refer to areas that allow for activities that are required for staff, faculty, and grad students on campus such as offices, collaboration spaces, classrooms, staff rooms, kitchenettes, and meeting rooms.

Please indicate your level of agreement or disagreement with each of the following statements:

Q28. I feel that I can easily access and use working spaces.

    a. Strongly disagree
    b. Disagree
    c. Neither disagree nor agree
    d. Agree
    e. Strongly agree
    f. Don't know

Q29. I have access to spaces that allow me to do my best work.

    a. Strongly disagree

b. Disagree
c. Neither disagree nor agree
d. Agree
e. Strongly agree
f. Don't know

Q30. What kinds of working spaces would you like to have more of on campus?

_____

_____

_____

Refreshing spaces: These spaces refer to areas that support mental health and wellbeing such as walking/jogging trails, multifaith and gathering spaces. These spaces allow for personal restoration either through the provision of quiet or active types of activities while being on campus.

Q31. I feel that I can easily access and use refreshing spaces.

   a. Strongly disagree
   b. Disagree
   c. Neither disagree nor agree
   d. Agree
   e. Strongly agree
   f. Don't know

Q32. I feel that there is an adequate number of refreshing spaces.

   a. Strongly disagree
   b. Disagree
   c. Neither disagree nor agree
   d. Agree
   e. Strongly agree
   f. Don't know

Q33. I feel most refreshed and restored after spending some time in: (select your top choice)

   a. Multifaith and Gathering Spaces

Source: Source: Multi-Faith Spaces Vancouver Island University

Two images are depicted. One of a rectilinear space with translucent coloured walls and mats on a wood floor with an "alter-like" focus at the front of the room. The second image depicts a square room with a circular arrangement of wooden stools around a contemporary, pyramid shaped fire feature. The walls are wood with openable panels where trees and landscaped area are visible beyond.

b. Quiet Spaces
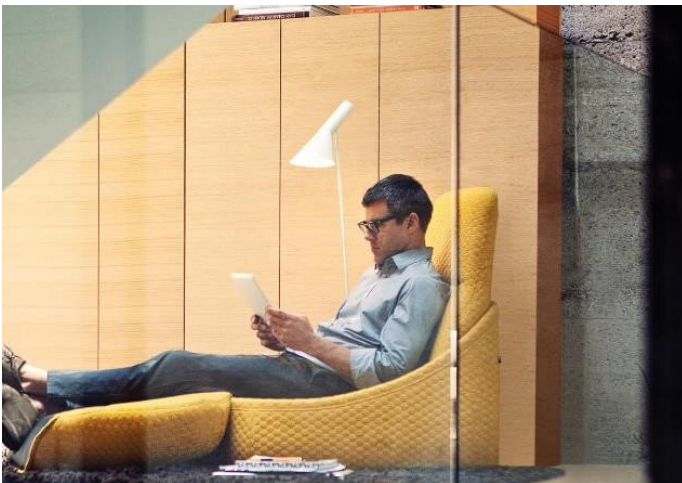
Source: NBS & Steelcase

Lounge furniture showing a man behind a glass wall with his feet up on an ottoman reading something on his tablet.

c. Active Spaces

Source: Terry Hershey Park – SWA Group

Two people walking/jogging through a grassy area with a winding concrete path. One side of the path has a forest. The other side has an open meadow with some young trees.

      d. Opportunity for Social Play and Leisure

Source: SWA Group

Outdoor gathering area with two people playing ping pong and cabana type structure in the background providing shading to additional seating areas.

Q34. What kinds of refreshing spaces would you like to have more of on campus?

_____

_____

_____

Q35. What are the top three most important spaces for you on campus? Please select and rank up to 3 from the following list: (1 = highest priority)

    a. Travelling spaces
    b. Collaboration spaces
    c. Learning spaces
    d. Living spaces
    e. Working spaces
    f. Refreshing spaces

Hybrid Work and Study Environments
Given the rise in need / opportunities for remote work and studying, think about the spaces you use on campus for this purpose.

Q36. I can easily find space on campus to support connecting in-person with my colleagues and peers in a hybrid work and study environment.

    a. Strongly disagree
    b. Disagree
    c. Neither disagree nor agree
    d. Agree
    e. Strongly agree
    f. Don't know

Q37. I can easily find space on campus to virtually connect with my colleagues and peers in a hybrid work and study environment.

    a. Strongly disagree
    b. Disagree
    c. Neither disagree nor agree
    d. Agree
    e. Strongly agree
    f. Don't know

Q38. What would be your top three priorities for space in hybrid work and study environment: Please select and rank up to 3 from the following list: (1 = highest priority)

    a. Having sound privacy while on a virtual call

   b. Having visual privacy while on a virtual call
   c. Having access to a power source
   d. Having access to reliable internet
   e. Having the necessary technology provided (ie. Camera, microphone, computer, etc.)

Q39. Is there a type of space that is missing on campus?

_____

_____

_____

Q40. What kinds of spaces would you like to see more of on campus?

_____

_____

_____

Q41. Is there anything else that we should consider when thinking about accessibility, wellness, and environmental sustainability on campus?

_____

_____

_____

Section 3: Demographic Information

This demographic information section asks questions about who you are. Your participation is voluntary, confidential, and will be used to describe the group who responded to the survey. The answers to these questions are used for broad analysis purposes only. When analyzed, all of the data will be summarized and anonymized so that no individual can be identified from these summarized results.

Q42. What is your current affiliation with the University of Waterloo? Are you a(n):

   a. Student
   b. Faculty
   c. Staff
   d. Retiree
   e. Alumni

    f. Visitor

    g. Other, please specify: _____

Q43. Are you an international student?

    a. Yes
    b. No

Q44. Are you a(n):

    a. Undergraduate student
    b. Graduate student
    c. Continuing education student
    d. Does not apply to me

Q45. If you are a student, where do you live while you are on a study term at University of Waterloo? (If you are currently on a co-op term, please answer where you lived during your most recent study term.)

    a. Waterloo Campus Housing
    b. Conrad Grebel, Renison, United College (Formerly St. Paul's) or St. Jerome's College
    c. Off-campus within the Waterloo Region
    d. Off-campus outside of the Waterloo Region
    e. Does not apply to me

Q46. Which faculty do you primarily work, study at, or visit?

    a. Faculty of Arts
    b. Faculty of Engineering
    c. Faculty of Environment
    d. Faculty of Health
    e. Faculty of Mathematics
    f. Faculty of Science
    g. Academic Support Units (such as Plant Operations, Food Services, Athletics, Finance, Human Resources, etc.)
    h. Does not apply to me

Q47. Which campus do you primarily work, study at, or visit?

    a. Waterloo Campus
    b. Cambridge Campus
    c. Kitchener Campus
    d. Stratford Campus

Q48. Are you a person with one or more disabilities?

For the purposes of this survey, disability is a physical, mental, intellectual, cognitive, learning, communication, or sensory impairment — or a functional limitation or difference. This disability could be permanent, temporary, or episodic in nature. It could be readily evident or invisible. The disability may result in a person experiencing disadvantage or encountering barriers to full participation in University life.

We understand that physical space has specific impacts to persons with disabilities and can create unintentional barriers to access and sense of belonging. This strategy strives to address common design challenges encountered by persons with disabilities, that are not generally captured through building codes or technical requirements.

a. Yes
b. No
c. I prefer not to answer

Q49. Please select the gender identity option(s) with which you identify (**select all that apply**):

a. Woman (Includes cis women, trans women, and anyone else who identifies as a woman)
b. Man (Includes cis men, trans men, and anyone else who identifies as a man)
   c. Non-binary
d. Trans
e. Another gender identity: _____
f. I prefer not to answer

Q50. Please select the sexual identity option(s) with which you identify (**select all that apply**):

a. Asexual
b. Bisexual
c. Gay
d. Lesbian
e. Pansexual
f. Heterosexual/straight
g. Queer
h. Questioning
i. Another sexual identity: _____

j. I prefer not to answer

Q51. Do you identify as an Indigenous person?

01 Yes, an Indigenous person from Canada (e.g., First Nations, Métis, or Inuit/Inuk)
02 Yes, an Indigenous person from outside Canada (e.g., Saami, Maori, Ainu, Aymara, etc.)
03 No
04 I prefer not to answer

Q52. Our society often describes people based on their race or racial background (e.g.,

"White" or "Black"), though these categories are complex, often overlapping, and not necessarily aligned with region or nationality.

Please select the following racial category or categories with which you primarily identify (**select all that apply**):

a. Black (e.g., African, Caribbean, Black Canadian, Afro-Latine, African American or other African descent)
b. East Asian (e.g., Chinese, Korean, Japanese, or other East Asian descent)
c. Latine (e.g., Latin American, Hispanic descent)
d. Middle Eastern (e.g., Afghan, Egyptian, Iranian, Lebanese, Turkish, Kurdish, or other Arab or Persian descent)
e. South Asian (e.g., East Indian, Pakistani, Bangladeshi, Sri Lankan, Indo-Caribbean, or other South Asian descent)
f. Southeast Asian (e.g., Filipino, Vietnamese, Cambodian, Thai, Indonesian, or other Southeast Asian descent)
g. White (e.g., British, German, Ukrainian, or other European descent)
h. Another race category: _____
i. I prefer not to answer

Q53. Please indicate your religion and/or spiritual affiliation (**select all that apply**):

a. No religious affiliation
b. Bahá'í Faith
c. Buddhism
d. Christianity
e. Hinduism
f. Indigenous spirituality
g. Islam
h. Jainism
i. Judaism

j.   Sikhism
k.   Another religion or spiritual affiliation: _____
l.   I prefer not to answer

Closing

Thank You! You have reached the end of the survey. We would like to thank you very much for your time!

For more information about the Inclusive Physical Space Framework project or to obtain a summary report of the survey, please contact us at inclusive.spaces@uwaterloo.ca

29. Case Studies

<<Add alt text to image and remove this note.>>

a) Case Study 1 (Template)

Institution: University of Waterloo

Year completed: ####

Type of space: E.g. Collaboration Space

Case study text.