



Carleton University

Campus Master Plan Update Draft

January 9, 2023



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Part 2

6.0 Campus Design Guidelines



We would like to acknowledge that Carleton University is situated within the traditional and unceded territory of the Algonquin Anishinabeg Nation. These territories, comprising the Kichi Sibi (Ottawa River) watershed, and including all of Canada's national capital region, were never surrendered or ceded by the Algonquin Anishinabeg Nation.

Today, this gathering place is home to many Indigenous peoples from across Turtle Island. We recognize, honour and respect Algonquin people as the traditional stewards of the land and water on which Carleton University is situated. We recognize the enduring presence of Indigenous peoples on this land and are grateful for their care for, and teachings about our earth and our relations.

The Campus Master Plan committee acknowledges and honours the people that have lived on these land for thousands of years.



1.0 Executive Summary & Overview

- 1.1 The Carleton Opportunity
- 1.2 The Planning Context
- 1.3 Consultation Summary

1.1 The Carleton Opportunity

Carleton’s Strategic Integrated Plan 2020-2025 will help realize the university’s core ambition to “Shape the Future”. The Campus Master Plan Update (CMPU) builds on this important document and its aspirations which reflect the university’s natural and cultural location bound by the Rideau River and Canal, and its surrounding community.

The Carleton University Strategic Integrated Plan, Shape the Future



1 Share Knowledge/Shape the Future: Capitalize on the compact and connected campus.



2 Serve Ottawa, Serve the World: Create Indigenous Placemaking so that Indigenous Students, Faculty and Staff see themselves reflected on Campus. Express the voice of the entire university in the Plan Update.



3 Strive for Wellness, Strive for Sustainability: Maximize the sustainability Impact of existing and new buildings and infrastructures. Provide greater guidance towards the creation of well-scaled built Form that integrates with Carleton’s exceptional open space setting on the Canal and River.

Carleton offers its students an exceptional educational experience within a memorable, compact and walkable 150-acre (62 ha) campus centrally located in Ottawa and the region. Carleton has evolved significantly since the adoption of the *2010 Campus Master Plan*, the *2016 Campus Master Plan Update* and the *2020 Outdoor Space Master Plan* to include a number of new and planned buildings and additions to serve the campus community.

Carleton is committed to creating a contemporary and inclusive 21st century learning environment. The Campus Master Plan Update will provide a campus sustainability road map for existing and future infrastructure to achieve the highest impact. As new buildings and expansions fill out the West Campus Precinct, greater pressure and consideration for building sites in the less developed East Campus Precinct emerge. The Update also provides direction for longer term growth of the North Campus Precinct, which can accommodate more diverse uses that both support Carleton’s academic mission as well as community uses for the surrounding neighbourhood and City. The CMP Update promotes an integrated building and open space approach, embedded in the cultural narrative of Carleton, located on traditional, unceded Algonquin Anishinabeg territory.

The CMP Update reinforces the Outdoor Space Master Plan to create an expanded, memorable greenspace setting including a campus wide *Green Ribbon recreational network* that reflects Carleton’s commitment to promoting campus community health through environmental innovation, adaptive planning, Indigenous placemaking, and new technologies.

Carleton University has also developed plans for a *Geological Time Trail*. PFS Studio has been working in collaboration with Carleton University to establish a 4.6 kilometres route that meanders through the campus and the riverfront to provide spaces to learn and understand the geological timescale of 4.6 billion years. The Time Trail utilizes existing pathways on the campus to integrate campus landscape features and showcase geoheritage, Indigenous, and other significant narratives. The trail will create an opportunity to showcase the geological history of Carleton University and will allow students, visitors, and staff to connect on deeper level with nature.

A Long Term Vision Update: The CMP Update establishes a long-term vision for buildings and open spaces, and helps the university identify and prioritize future projects on Campus over a 5 to 25 year time horizon. The Update will advance Carleton’s reputation for design excellence and sustainability, and apply best low carbon, low waste infrastructure practices. Building performance standards are intended to be progressive and flexible enough to promote design excellence, while strengthening the existing fabric of buildings and open spaces. The CMP Update promotes individual and community health by improving access to recreation and wellness through the proposed future Wellness Hub facility, and expansive recreational facilities.

A Future Transit Hub at the east side of the existing O-Train platform can provide an integrated new facility for campus arrival by train and bus. The Transit Hub can also serve as a facility for student services, social and study spaces which serve both the campus community and people visiting Carleton from the wider city and region.

Universal Accessibility challenges exist within an approximately 20 metre grade difference within the West Campus Precinct. Topographic variation in this part of campus occasionally subdivides outdoor space and limits clear connections in buildings and on outdoor pathways. Open surface parking lots similarly challenge accessibility and orientation across campus. Some of these surface lots are recommended as locations for future redevelopment, while potential parking facilities, either structured or surface lots, are recommended to generally maintain existing parking numbers, in combination with improved transit, and multi-modal travel options.

The CMP Update includes **Performance Standards** for buildings and site design that are intended to guide a consistent level of design excellence throughout the campus. The Performance Standards recognize the inherently mid-rise scale of the existing campus. Opportunities for existing building renovations and expansions are identified to maintain the compact campus and promote the best use of land and resources, while ensuring future buildings which may be similar or larger in scale, are well designed, promote sunlight access between and within buildings and create a comfortable pedestrian outdoor experience.

Performance Standards include overall campus plan objectives, including detailed illustrations to assist the university with communicating desired, high-quality implementation to buildings, site planning and outdoor spaces, with the potential for alternative design approaches, where it can be demonstrated that objectives of design quality, energy efficiency and durability are met.

1.2 The Planning Context

Carleton University's Campus Master Plan Update is part of a large network of integrated strategies that support the university's operations, maintenance, long-term planning objectives, and City of Ottawa municipal policies. The Planning Context sets the stage and positions the Campus Master Plan Update within a larger context of systems, studies and plans as an informed and comprehensive guiding document for the future of Carleton University.

Plans and strategies produced by the university should be coordinated with municipal policies, including Ottawa's Official Plan and Zoning By-law. Collaboration with the City ensures that growth and development on campus is supported and anticipated by municipal policies.

The Ottawa Official Plan

Ottawa's 2003 Official Plan outlines planning objectives and the vision for future growth. This document guides the physical development of Ottawa to the year 2036 in which the population of Ottawa is estimated to reach 1.1 million.


A new Official Plan has recently been approved and is set to be released towards the end of 2022. The new Official Plan outlines a comprehensive land use policy framework to guide growth and development within the city to the year 2046, and includes:

- Policies and schedules that address housing and growth management long-term planning for enjoyment and infrastructure;
- Protect water resources, natural heritage and agricultural areas;
- Manage non-renewable resources;
- Plan for climate change; and
- Safeguard public health and safety.

The Carleton Campus Master Plan Update adheres to the intent of Ottawa's Official Plan by:

- Creating a long-term plan for the efficient and environmentally sensitive use of land and resources;
- Encouraging sustainable and active transportation, mixed-use developments, and livable communities;
- Establishing a holistic sustainable approach to the natural and built environment;
- Promoting a mixed-use campus that is flexible to the diverse needs of the community it serves; and
- Building complete communities where people can live, work, study and play in a well-connected network of open spaces, amenities, buildings and transportation options.

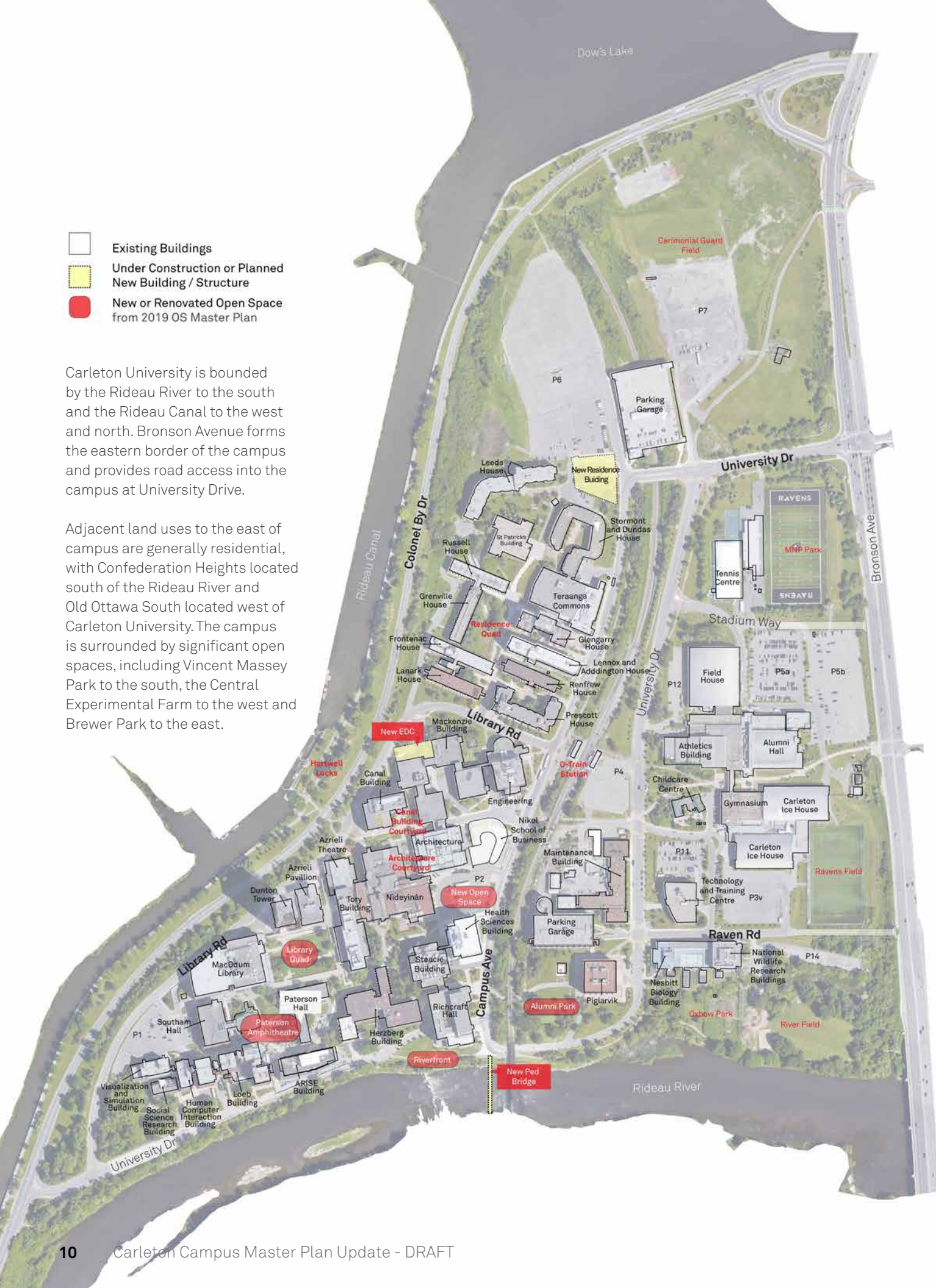
Carleton University has undertaken a number of studies, plans and frameworks to help guide its future growth including:

Strategic Integrated Plan (2020)	Campus Master Plan (2016)	Carleton Mental Health Framework (2017)
Energy Master Plan (2018-2021)	Equity, Diversity, and Inclusion Action Plan (2019)	Transportation Master Plan (2019)
Outdoor Space Master Plan (2020)	Kināmagawin (2020)	Sustainability Plan (2020-2025)
Carleton Coordinated Accessibility (2021)	Campus Space Utilization Study (2021)	

- Existing Buildings
- Under Construction or Planned New Building / Structure
- New or Renovated Open Space from 2019 OS Master Plan

Carleton University is bounded by the Rideau River to the south and the Rideau Canal to the west and north. Bronson Avenue forms the eastern border of the campus and provides road access into the campus at University Drive.

Adjacent land uses to the east of campus are generally residential, with Confederation Heights located south of the Rideau River and Old Ottawa South located west of Carleton University. The campus is surrounded by significant open spaces, including Vincent Massey Park to the south, the Central Experimental Farm to the west and Brewer Park to the east.

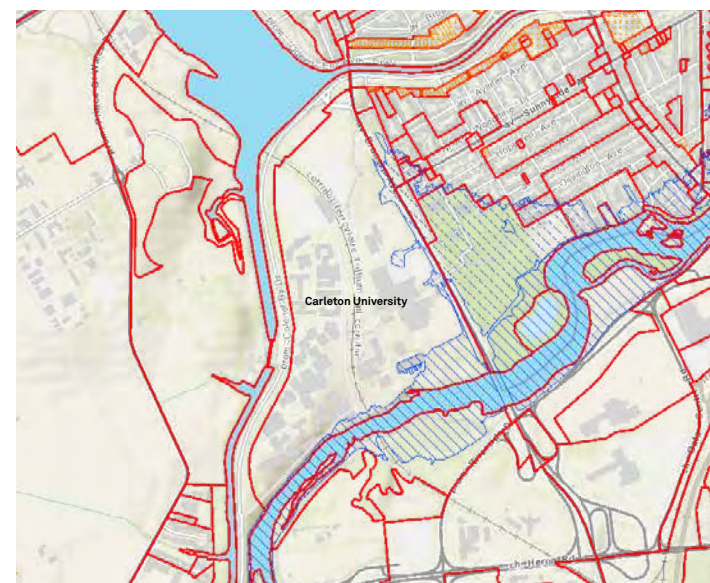


Carleton University should consider population growth estimates outlined in the Ottawa Official Plan in future servicing and programming directions. As the population in Ottawa continues to increase, the university will endure additional demands to meet the needs of student population growth.

City of Ottawa Zoning By-Law

Zoning by-laws are a tool to implement the policies contained within the Official Plan. Carleton University is subject to Ottawa's Zoning by-law 2008-250, which regulates the use of land, buildings, structures, and implements Ottawa's Official Plan. All of Carleton University is zoned I2 Major Institutional Zone. The purpose of the I2 Zone is to:

- Ensure that major institutional uses such as hospitals, colleges and universities are located at appropriate locations within areas designated as General Urban Area, Central Area and Mixed-Use Centre in the Official Plan;
- Ensure that large scale, high traffic generating institutions are located solely on large parcels of land, with direct access to an arterial road and near rapid transit stations;
- Impose regulations which ensure that the size and intensity of these uses are compatible with adjacent uses; and
- Permit minor institutional uses and provide for a range of ancillary service uses.



Progress Since the 2016 Campus Master Plan

The 2016 Campus Master Plan for Carleton University prepared by Brook McIlroy provided direction in four key areas;

- The design, programming and maintenance of campus-wide landscaped spaces;
- The height and massing of new buildings relative to their location on campus and proximity to streets, open spaces and existing buildings;
- The hierarchy and character of pedestrian and cyclist routes on campus including streetscape design for Campus Avenue and Library Road; and,
- A visionary new design for the North Campus Precinct with a strong focus on integrated circulation, new open space and a mix of building types, heights and sizes.

- ▨ Flood Plain (Section 58)
- ▭ Zoning By-law Boundaries

Portions of Carleton University pictured here fall within a floodplain. Development in the floodplain area is permitted, provided it complies with Section 58 of Ottawa's Zoning By-law.

Potential future development on and/or adjacent to Raven Road must include preventative measures that mitigate flood risk. (Zoning Map © geoOttawa)

2016 Carleton University Campus Master Plan



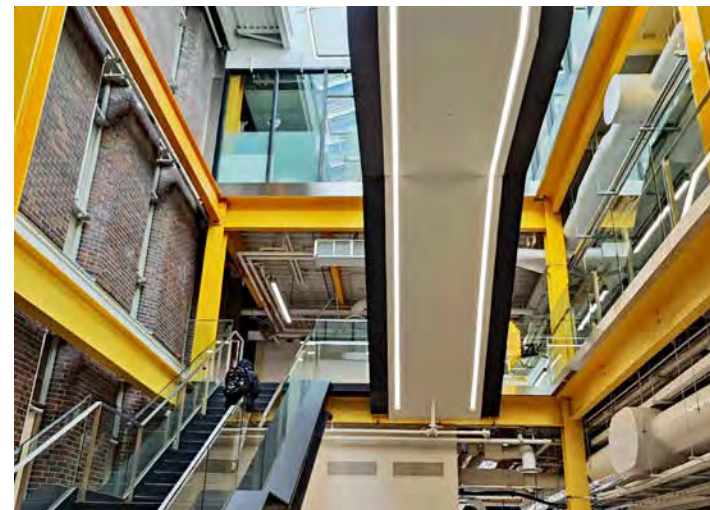
(© Brook McIlroy)

Buildings Completed After 2016



Health Sciences Building

Completed in 2017, the Health Sciences Building is a 120,000 sq. ft structure that accommodates the Health Science and Neuroscience program. The building was designed by Montgomery Sisam Architects and the design and layout of labs, offices, and workspaces encourages collaboration between faculty and students.



Engineering Design Centre

Opened in the Fall 2022 as an experiential learning facility for the Faculty of Engineering and Design. The 25,000 square foot expansion displays Carleton's continued commitment to accessibility and sustainability and is equipped with spaces for collaboration and connection.



Nicol Building

The award winning Nicol Building designed by Hariri Pontarini Architects, opened in September 2021. The building features 115,000 sq. ft of flexible classrooms, collaborative spaces, sustainable building features, and innovative technology.



ARISE Building

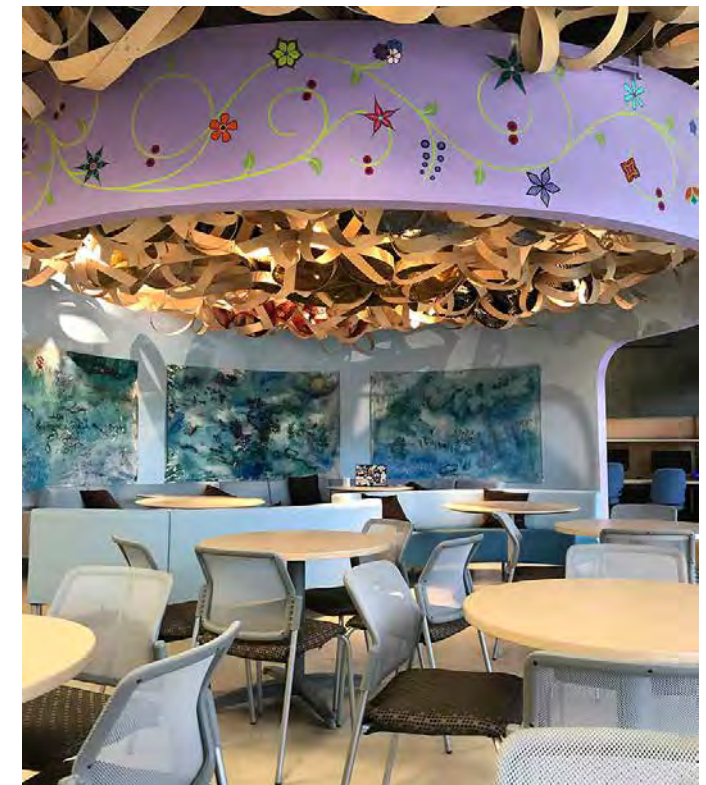
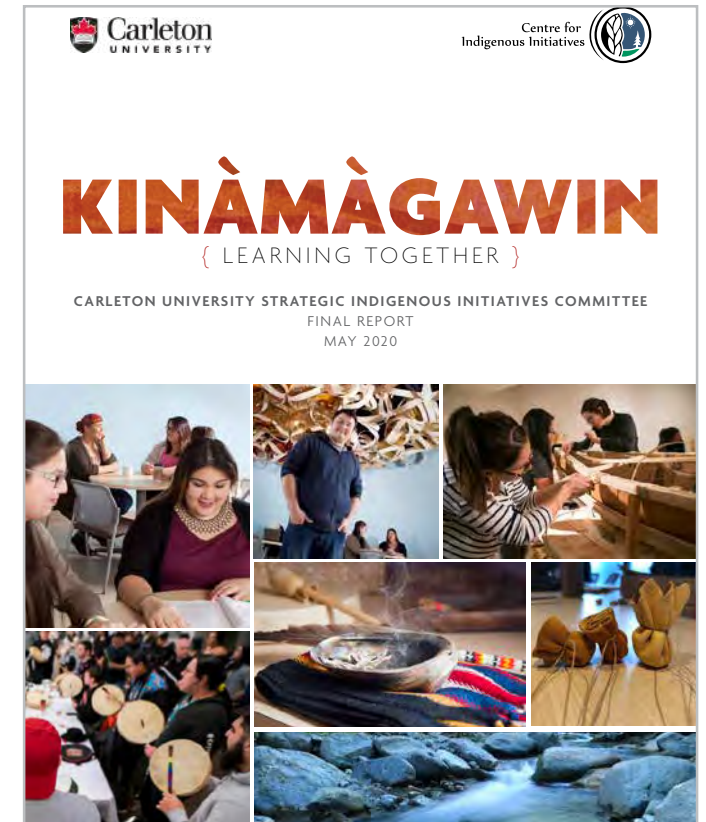
The Advanced Research and Innovation in Smart Environments (ARISE) redevelopment project was completed in 2019. The 74,000 square feet expansion is a living laboratory, bringing together staff and students from the faculties of Science, Engineering and Design, Sprott School of Business, Public Affairs and Arts and Social Sciences to collaborate on research and training.

Kinàmàgawin (2020)

In May of 2020, Carleton University's Strategic Indigenous Initiatives Committee produced a report called Kinàmàgawin ("Learning Together"). The purpose of Kinàmàgawin is to design a strategy to make Carleton a safer space for current and future Indigenous students and faculty. The report contains 41 Calls to Action based on an extensive and comprehensive consultation process. The Calls to Action focus on:

- Community engagement
- Indigenous student support
- The student experience
- Ways of teaching and learning
- Culture, systems and structures
- Research and innovation; and
- Qualitative and quantitative metrics by which to measure the implementation of Indigenous initiatives around campus.

Important tenets of the Campus Master Plan Update that have been highlighted in the Kinàmàgawin report include increasing Indigenous student support on campus, increasing Indigenous spaces and Indigenous visibility, and ensuring Indigenous teaching methods and ways of knowing are incorporated into development projects on campus. Refer to Section 6.2 of this Master Plan for specific design direction pertaining to Indigenous placemaking.



The Ojigkwanong Indigenous Student Centre is a place where First Nation, Métis and Inuit students can study, socialize, and participate in academic and cultural programming. (Douglas Cardinal © Carleton University)

Outdoor Space Master Plan (2020)

The Outdoor Space Master Plan (2020) focused on strengthening outdoor spaces by reflecting the natural and cultural history of Carleton, enhancing outdoor learning environments, and creating beautiful, useful and comfortable year-round outdoor spaces.

The Campus Master Plan Update builds on the design directions from the 2020 Outdoor Space Master Plan with a tailored focus on: enhancing outdoor spaces, improving connections to the natural environment, incorporating Indigenous placemaking, establishing a four-season campus and enhancing pedestrian and cyclist navigation on campus.

Key projects identified in the 2020 Outdoor Space Master Plan include:

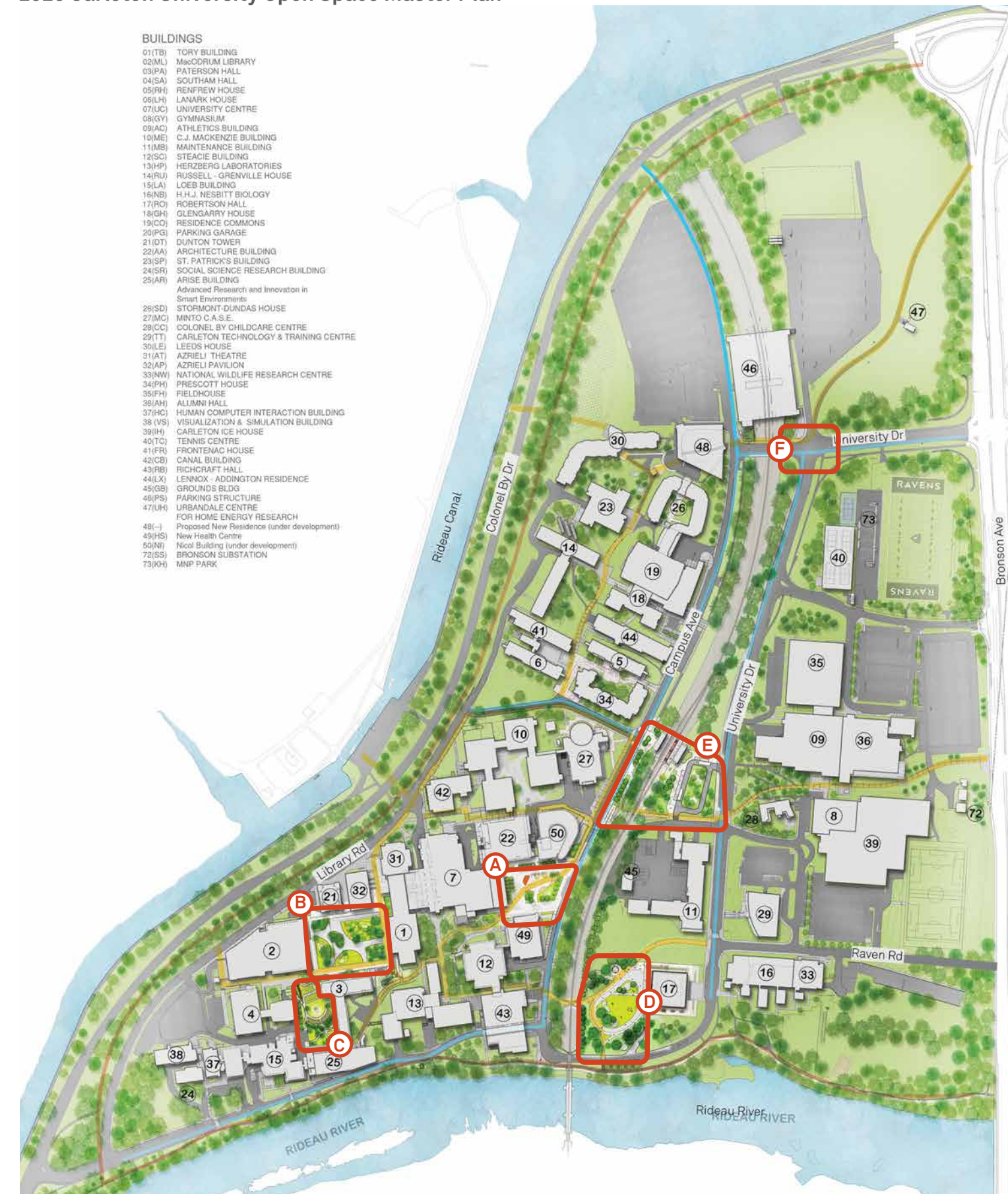
- A** Campus Avenue Quad
- B** Main Quad Improvements
- C** Indigenous Learning Place
- D** Alumni Park Improvements
- E** O-Train Station Area
- F** University Drive Gateway

The Campus Master Plan Update contains sections dedicated to Natural Systems (3.2) and Open Space (3.5) and provides Design Guidelines that outlines specific directions pertaining to landscape design, open spaces and natural systems (6.11).



Renderings from the 2020 Carleton University Open Space Master Plan showing proposed enhancements to the Main Quad. (© Brook McIlroy)

2020 Carleton University Open Space Master Plan



(© Brook McIlroy)

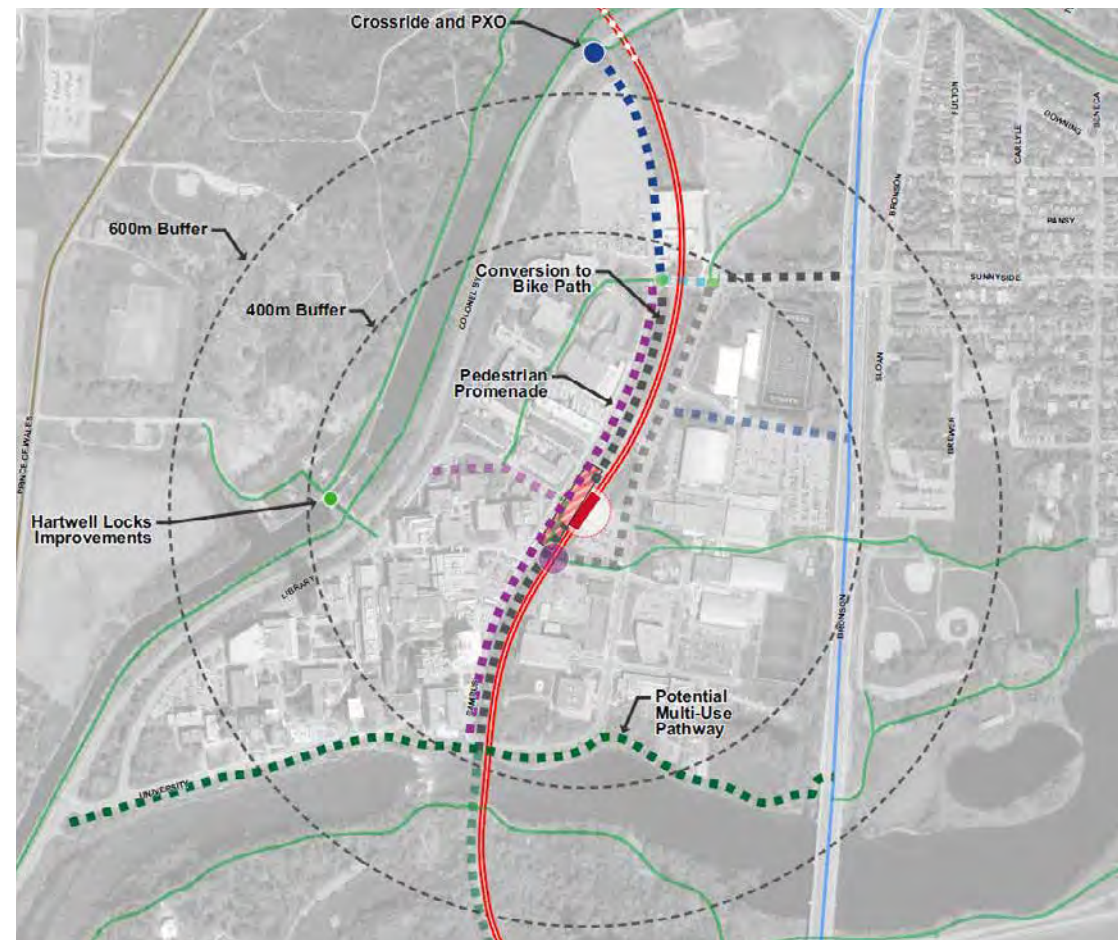
Transportation Master Plan (2019)

The Transportation Master Plan responds to the transportation challenges and opportunities expected to impact the university to the year 2024. Primary directions and recommendations included:

- Provide enhancements to walking, biking and transit modes of mobility
- Increase safety for each transport mode; and
- Optimize existing infrastructure to accommodate all modes of transport.

The Campus Master Plan Update integrates the following key directions from the Transportation Master Plan into the report, which works to increase connections and linkages throughout the campus and enhance connections into surrounding communities:

- Conversion of Library Road and Campus Avenue into flexible pedestrian boulevards
- Development of a transit hub to support the O-Train, Para Transpo and OC Transpo buses
- Dedicated bi-directional bicycle paths along Campus Avenue
- Enhanced bicycle infrastructure across campus
- Defining new campus primary and secondary gateways
- Reconfiguration of bus, service, and emergency vehicle routes; and
- Strategic placement of new potential parking garages and facilities.



Recommended long-term pedestrian and cycling plan (Carleton University 2019 Transportation Master Plan © Parsons)

- LRT Route
- LRT Station
- - - Proposed Pedestrian/Cycling Facility
- - - Proposed Multi-use Pathway
- - - Proposed Complete Street
- - - Bi-directional Bike Path
- - - Uni-directional Bike Lanes
- Existing Multi-use Pathway
- Existing Cycling Lanes
- Existing Paved Shoulders

Carleton University Energy Master Plan (2021-2026) and Comprehensive Sustainability Plan (2020-2025)

Carleton University's 2021-2026 Energy Master Plan details energy and carbon reduction initiatives guiding the university to become a carbon neutral campus by 2050. The Energy Master Plan encompasses the following objectives and goals:

- Reduce Carleton University's environmental footprint,
- Reduce utility operational costs, and
- Increase reliability and safety.

The Campus Master Plan Update responds to the Energy Master Plan by focusing on:

- Enhancing the natural environment
- Providing better connections to Carleton's natural ecology
- Enhancing sustainable transportation initiatives on campus
- Incorporating sustainable building design into future development projects; and
- Collaborating and providing better connections to nearby communities.

Carleton University's Comprehensive Sustainability Plan 2020-25 ensures that Carleton University continues to embed environmental and sustainable improvements on campus. The plan contributes to Carleton University's wider goal of integrating sustainability into academic programs, research and engagement initiatives and ensures a collaborative approach across the campus beyond its formal boundaries.

Equity, Diversity and Inclusion Action Plan (EDI, 2021)

Carleton University's Equity and Inclusive Communities (EIC) Advisory Group developed the EDI Action Plan which proposes an operational framework of high priority actions in the core activities and academic priorities of the university. The Campus Master Plan Update aligns with the goals outlined in the EDI Action Plan by ensuring spaces on campus are welcoming and inviting, and accurately reflect the diverse cultures of the campus community. Many of the guiding principles highlight key directions that support EDI and work towards fostering an inclusive and supportive campus environment.

Coordinated Accessibility Strategy (2020)

The Coordinated Accessibility Strategy (CAS) was released in 2020. Values that guided the strategy included: inclusivity, innovation, collaboration, commitment, and community. The CAS defines accessibility with the following components:

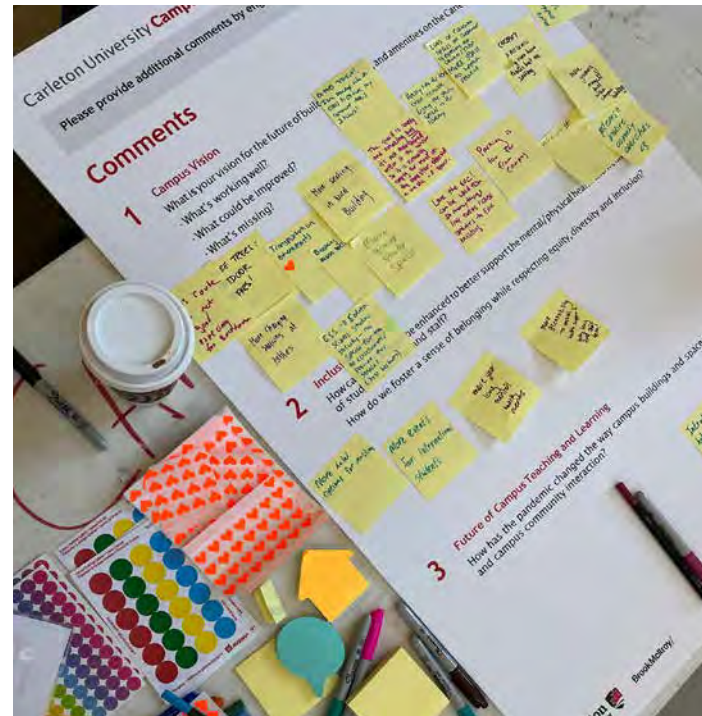
- Flexibility for the fullest participation of each individual in activities and society;
- Any place, space, item of service, whether physical or virtual;
- Attitudinal and systemic barriers to inclusion; and
- Visible and non-visible disabilities, including cognitive, developmental, intellectual, medical, mental, physical and sensory disabilities.

The CMP Update emphasizes the importance of universal design and accessibility and provides guidance to ensure Carleton University continues to progress forward on their accessibility commitments. Ensuring design is inclusive of people of all abilities will enable Carleton University to continue to evolve as an efficient, safe, and enjoyable campus for all users.

1.3 Consultation Summary



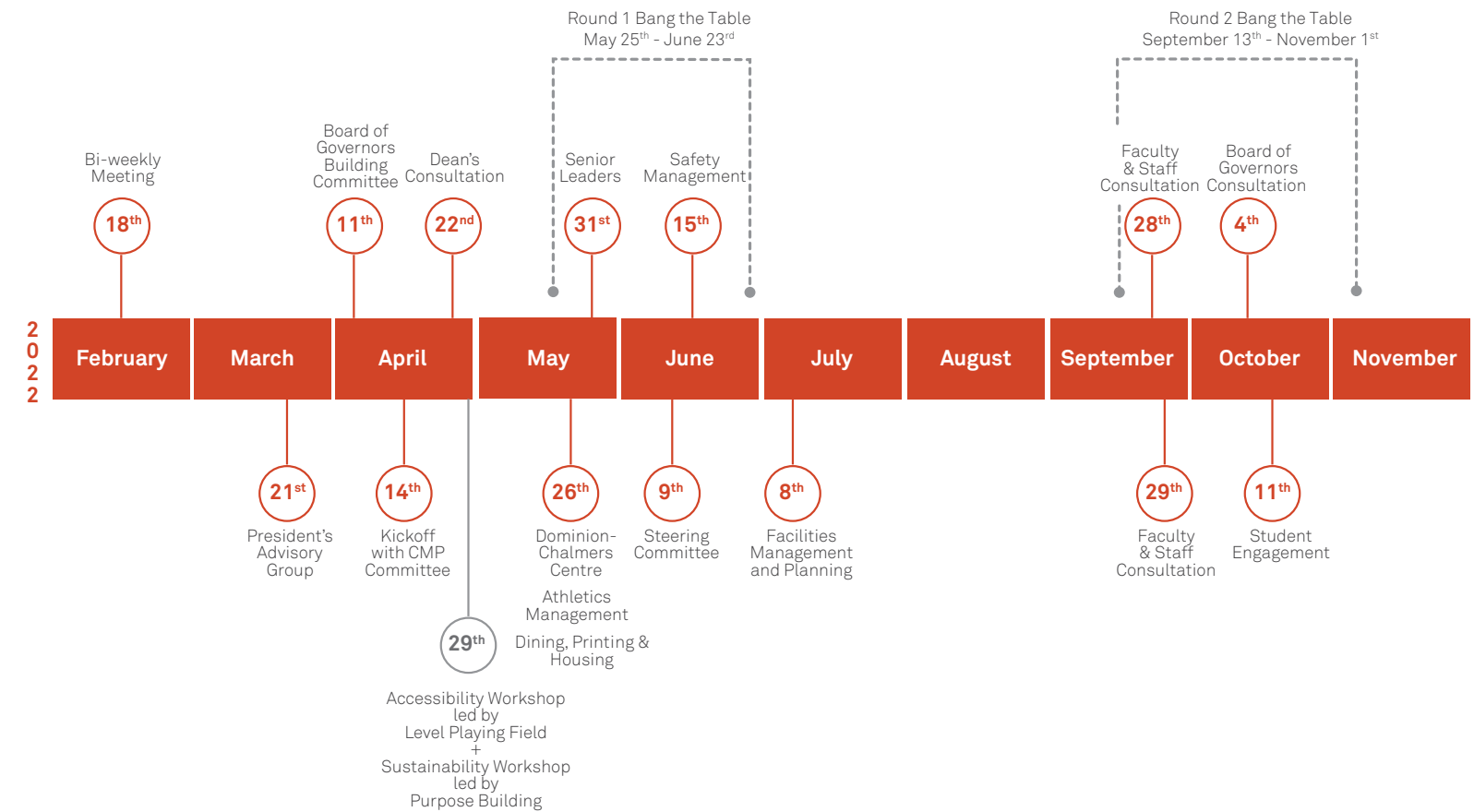
Student engagement sessions at Carleton University (© Brook McLroy)



This Campus Master Plan Update is the product of meaningful consultations with students, faculty, staff and the overall campus community. The engagement sessions sought to identify existing conditions and constraints at the university. The outcomes of these sessions informed the opportunities and design interventions for Carleton University's campus. Through the engagement sessions, themes such as health and wellness, buildings, open spaces, transportation, sustainability, accessibility, and the future of campus learning, and teaching began to emerge.

The consultation program included the following engagement methods used during both in-person and virtual sessions:

- Presentations to the university advisory committees including, the Steering Committee, the Board of Governors Building Committee, the President's Advisory Group and Senior Leaders;
- On campus consultation with students and the Board of Governors;
- An online engagement platform (Bang the Table);
- Presentations to faculty and staff; and
- Social media engagement (Carleton Instagram posts);



Input from the consultations on Kinàmàgawin and the Outdoor Space Master Plan were integrated into the development of the Campus Master Plan.



386 Bang the Table contributions

***969 total site visits**



133 Student Engagement



243 Carleton Community Internal Visioning Sessions



290 Social Media Responses

***5,888 total story views**

1,052 Total Voices to date

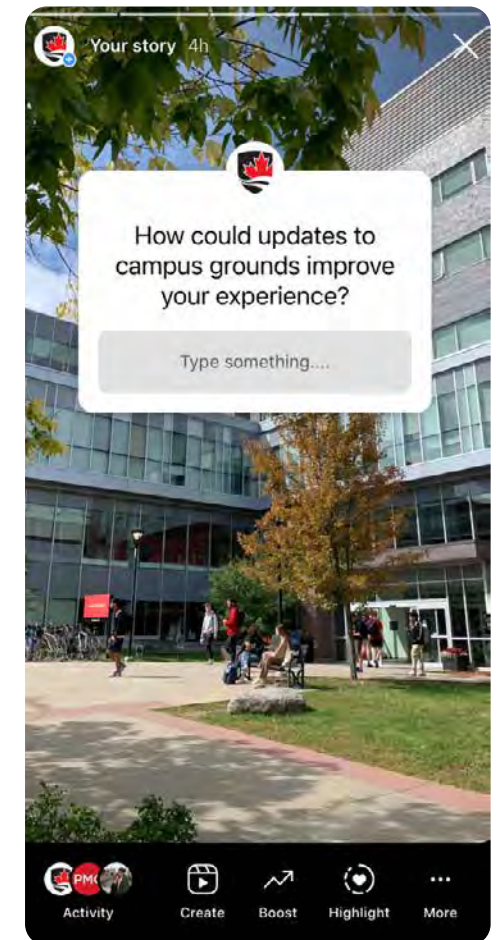
***Excluding Social Media views and Bang the Table site visits**

Summary and Outcomes

The consultation program included several internal visioning sessions with the Carleton campus community. Approximately 243 individuals from Carleton University attended these sessions in which the majority were held virtually.

Bang the Table, an online engagement platform, provided the campus community with an alternative way to contribute comments on the Campus Master Plan Update. The planning process included two rounds of Bang the Table in which a total of 386 contributions were made. The site contained an 'idea tool', which allowed participants to comment on a series of questions, and a 'mapping tool', which allowed participants to place stickers on areas of campus that they liked and/or disliked.

The consultation program also included some in-person engagement with students and the Board of Governors. These sessions provided participants an opportunity to engage in a visionary activity that included both a series of questions and a mapping exercise. Coinciding with the in-person student engagement session on October 11th, 2022, Carleton's Communication team shared a series of questions regarding the Campus Master Plan Update via Instagram, providing an additional platform for input.



A series of questions were posted on Carleton's Instagram account to engage with viewers. (Carleton Department of University Communications, 2022)

The following major themes emerged through the consultation process:

Health and Wellness

- Participants identified the need to increase awareness and support related to physical and mental health and wellness.
- Conversations included an idea of a future 'central hub' for easy access to student services and amenities.
- Faculty, staff and students discussed the need for enhanced food amenities, services, and retail options throughout the campus.

Indigenous Cultural Representations and Diverse Cultural Inclusions

- Faculty, staff and students voiced a desire to create spaces that respond to the diverse cultural needs of the campus community and increasing international student population.
- The need to ensure that the Indigenous campus community sees themselves reflected on campus.
- The importance of displaying diverse forms of art throughout Carleton's interior and exterior spaces.

Flexible Learning and Working Spaces

- Students, faculty and staff voiced the need for more multi-purpose spaces for collaborative and quiet studying, informal social areas, and creative hoteling spaces on campus.
- Better outdoor amenities such as study-friendly spaces, comfortable seating, and outdoor educational spaces with electrical outlets.
- The need for enhanced classroom technology and equipment to support flexible learning.

Leveraging Proximity to the Natural Environment

- Students, faculty and staff voiced the need to elevate, promote, and protect Carleton's natural environment. Emphasis was placed on making better use of the open spaces, courtyards, and pathways.
- A desire to provide better accessibility, use, and connection to the Rideau River, Rideau Canal and surrounding natural environment.
- Students, faculty and staff mentioned considering opportunities to better integrate buildings with outdoor green space.

Multi-modal Campus

- Participants noted the need for a balanced approach to campus circulation.
- Faculty, staff and students identified the need for tunnel system enhancements and expansions.
- The importance of appropriately phasing construction on campus to reduce congestion and traffic impediments for students, staff and faculty.

Safe, Accessible, and Legible Campus

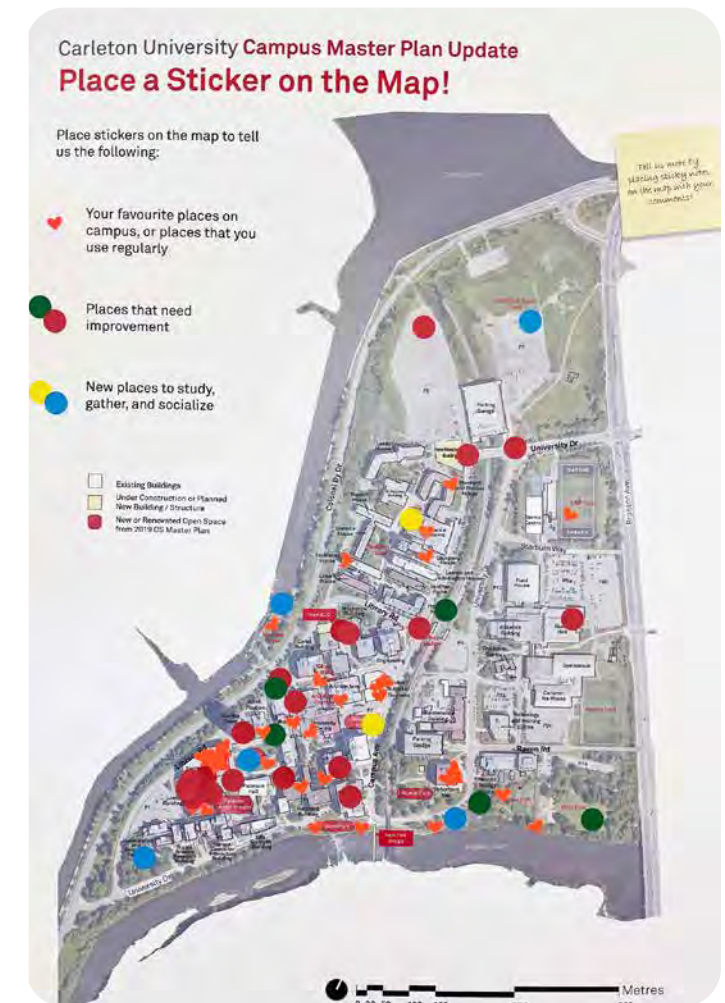
- The need for consistent signage and wayfinding within and across Carleton University.
- The need for a more cohesive, walkable and transit-oriented accessible campus.
- Rethink campus safety for pedestrians, cyclists and vehicles, priority should be placed at intersections, roundabouts and crossings.

Built Form and Development

- Participants indicated the need for enhanced connections between the interior and exterior of buildings.
- Faculty, staff and students noted the need to better integrate Carleton University with the surrounding community.
- Future development should consider best practices for inclusive, accessible, and sustainable design.

Four-Season Campus

- Participants identified the need to explore opportunities for year-round outdoor winter programming on campus and connections along the canal and riverfront.
- Students indicated the need for improved air circulation and temperature regulation in the tunnel system.
- The need for outdoor spaces that promote year-round enjoyment with improved access to wi-fi, and weather protected destinations.



Mapping exercise at a student engagement session at Carleton University. Students placed stickers indicating their favourite places on campus, identified areas that needed improvement, and marked potential new places to study, gather, and socialize. (© Brook McIlroy)

*Note: There is no organizational hierarchy between themes, with the exception of Health and Wellness and Indigenous Cultural Representations and Diverse Cultural Inclusion. These themes have been placed first as they have been identified through various consultation sessions as priority elements for this Campus Master Plan Update



2.0 Campus Vision

2.1 Guiding Principles

2.1 Guiding Principles

Nine guiding principles have been provided to shape the future development of Carleton University in keeping with the vision and concerns of students, faculty, staff, and community members. The guiding principles represent core themes that were derived from the consultation program.

The guiding principles provide a reference that will inform decision making throughout the campus design and planning process. The principles are embedded in each design framework, concept and guideline within the Campus Master Plan Update and contribute to the overall direction of Carleton University as envisioned by stakeholders and the Carleton Strategic Integrated Plan. Input from the consultations on Kinàmàgawin and the Outdoor Space Master Plan (2020) inform all aspects of development of this Campus Master Plan Update.

1

Strengthening the Natural Campus

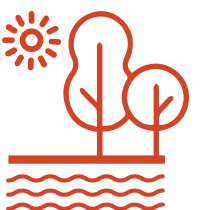
- Promote and protect Carleton's riverfront, canal and natural setting and reintroduce the landscape back into campus open spaces, courtyards, and pathways.
- Strengthen existing green space and outdoor learning opportunities and identify opportunities in existing courtyards.
- Build on existing systems and create additional formal and integrated opportunities for learning, socializing and connecting with the campus edges.
- Provide sheltered spaces and access to wi-fi to provide weather protected destinations.
- Create open spaces that provide a more flexible setting for Indigenous and cultural placemaking and outdoor teaching.
- Incorporate naturalized infrastructure such as bioswales, permeable surfaces, and stormwater reuse for new developments.



View of Richcraft Hall at Carleton University from the Rideau River. (©Moriyama & Teshima Architects)



Example of weaving Indigenous placemaking, stormwater management and landscape into the campus at the University of British Columbia. (© University of British Columbia)



2

Mixed-Use Complete Campus

- Promote the year-round/all season campus experience through a greater diversity of campus indoor and outdoor programs and spaces.
- Maintain a tight knit fabric of buildings that showcase and frame green spaces.
- Encourage a mixed-use, pedestrian and transit-oriented campus community.
- Provide new, creative, and flexible learning, working, and support spaces with appropriate technology and equipment to complement hybrid learning.
- Create adaptable spaces that suit the changing needs of students, faculty and staff (both collaborative and quiet spaces).
- Consider hoteling spaces to promote efficient, collaborative and creative areas with storage space.



The use of green roofs can promote sustainability initiatives throughout campus (Lawson Centre for Sustainability, University of Toronto Trinity College; Toronto, Canada; © RDHA)



Providing amenities in outdoor spaces can create vibrant, multi-use environments. Ensure outdoor spaces are equipped with furnishing and design measures that support a four-season climate. (Monash University, Melbourne, Australia, TCL © Ben-Wrigley)



3

Indigenous Cultural Representations and Diverse Cultural Inclusions

- Ensure Indigenous languages (Algonquin Anishinabeg Nation, in particular), artwork, spirituality and philosophical traditions are reflected in buildings, outdoor spaces, landscape design and the naming of spaces.
- Respond to diverse cultural needs through welcoming spaces including program spaces, social spaces, reflection spaces, ceremonial spaces, and food offerings.
- Create spaces on campus for staff, students and faculty, who are Indigenous, Black, Racialized, international, or from other equity deserving groups.
- Display art throughout Carleton's interior and exterior spaces that is reflective of the diverse campus community.



An example of incorporating Indigenous placemaking elements. (© Brook McIlroy)



Main entrance showcasing parametric wall installation illustrating the motion of water (Waakebiness-Bryce Institute for Indigenous Health; Toronto, Canada © Brook McIlroy)



4

Legible Campus

- Reimagine campus streets, paths, signage, wayfinding, and trails as a vital, integrated and human-scaled campus network to improve safety and mobility.
- Enhance wayfinding to and through campus with distinct and legible spaces: entrances, building design, sustainable practices, and balanced parking solutions.
- Improve universal access with respect to the AODA standards and guidelines.
- Enhance pedestrian and cyclist safety at major intersections and priority road crossings (ie. Bronson Avenue and Colonel By Drive).



An example of a vibrant pedestrian precinct with sustainable water management infrastructure embedded in the landscape. (University of Sydney, Jeppe Aagaard Andersen and Turf Design Studio ©Simon Wood)



Window markings can incorporate Indigenous design and aid in wayfinding. (© Brook McIlroy)



5

Collaborative & Outward-Facing Campus

- Strengthen community and Ottawa connections through walking and bicycle paths and shared programs and facilities.
- Plan and protect for future building and open space opportunities that promote positive campus growth towards its edges.
- Collaborate with the City of Ottawa, NCC and other relevant stakeholder groups.
- Establish the campus as a community destination.



Enhance connections to existing transit networks to allow for ease of flow to and from campus. (© Brook McIlroy)



Promote active forms of transportation through infrastructure (Flora Footbridge, Ottawa, Canada © DTAH)



5

Sustainability

- Embed sustainability best practices into the decision-making process when evaluating changes to open spaces, transportation networks, and buildings.
- Align projects with the Energy Master Plan to support Carleton’s carbon neutrality goal and prioritize resilience to future weather patterns driven by climate change.
- Evaluate the impact of decisions on waste generation, and prioritize strategies to reduce waste through construction, operations, and end of life.
- Enhance biodiversity and ecosystem health of natural areas within and surrounding the Campus.
- Improve accessibility and sustainability throughout the Campus, focusing on pedestrian pathways and the tunnel system.



A photovoltaic canopy provides cover and contributes to sustainability efforts. (Miller Hull and Lord Aeck © Jonathan Hilyer)



Enhance the campus’ ecological function by constructing green roofs. (© CHUTTERSNAPE, Unsplash)



6

Balanced Access

- Identify a comprehensive and balanced approach to campus circulation, which provides safe, efficient, and comfortable connections for pedestrians, cyclists, transit users, and parking opportunities.
- Create multi-modal campus streets and access, with a focus on pedestrian connections. Campus Avenue and Library Road will become flexible, pedestrian priority streets.
- Improve the campus image and experience through safe sustainable mobility options for people of all abilities.
- Continue to improve and promote the tunnel system as a beloved circulation network.
- Build on the transportation master plan by encouraging transit and alternative mobility options, including scooters, bike rentals and a Transit Hub.



A transit hub will be a key node within the campus and surrounding community. (Neumann Monson Architects © Assassi Architects)



Campus streets should ensure direct, safe and comfortable access for pedestrians, cyclists and motorists. (Brighton, UK© Gehl Architects)



8

Health and Wellness

- Ensure that new development on the Campus fits within its environment and creates safe and animated spaces for year-round use.
- Provide adequate food choices, retail options, green spaces and buildings that promote health and wellness.
- Showcase the water and natural setting, to promote physical and mental health and wellness needs of students and the entire campus community.
- Consider opportunities to better integrate buildings with outdoor green space.
- Promote health and wellness on Campus through a holistic approach to buildings, open space and streetscape design.



Dining commons at Simon Fraser University provides a variety of healthy food options. (© Simon Fraser University)



Streetscape improvements to promote outdoor activity. (Monash University © Ben Wrigley)

9

Buildings and Architecture

- Identify potential development opportunities that consider ongoing capital projects; efficiencies in space utilization in existing and new buildings; use of current space; and opportunities for renovation, renewal and expansion.
- Develop guidance for new buildings and structures on campus and create directions for phased development over the short-, mid- and long-term.
- Consider the future of the north campus as a mixed-use land opportunity with city and other stakeholder partnerships.
- Ensure high quality architecture at a balanced scale.
- Enhance connections from the interior of buildings to the exterior.
- Ensure future development considers best practices for inclusive, accessible and sustainable design.



Utilizing daylight to illuminate spaces. (Tulane Commons at Tulane University, New Orleans, USA © Tulane University)



An example of mass timber construction with a glue-laminated timber frame and CLT panels. (Portland, USA; LEVER ©Jeremy Bitterman)





The Design Framework establishes campus-wide structuring elements for Carleton University and informs the concept plans and design guidelines for this Master Plan Update. Each framework identifies key ideas and recommendations to enhance the campus as it continues to expand and develop to meet evolving needs.

3.0 Design Framework

- 3.1** Campus Framework for Sustainability
- 3.2** Natural Systems
- 3.3** Universal Design and Accessibility
- 3.4** Transportation Framework
- 3.5** Open Space Framework
- 3.6** Urban Design Framework

Design Framework & 'Big Moves'

Section 3.0 of this Campus Master Plan Update sets the stage for the 'Big Moves' of this Master Plan, providing design directions and objectives of the overall Plan concept.

The Master Plan Update is guided by the following design frameworks: sustainability, natural systems, universal design and accessibility, transportation, open spaces and urban design.

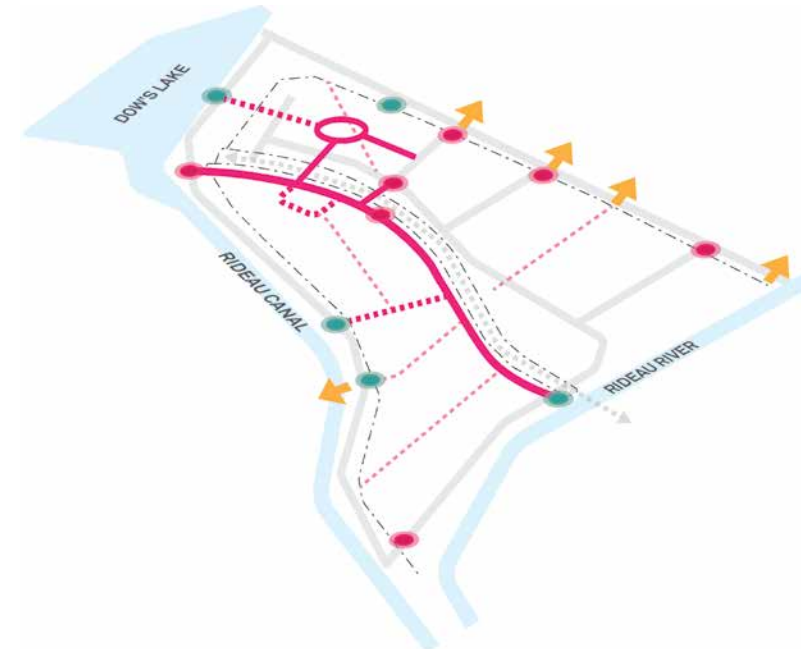
The 'Big Moves' that are informed by the design frameworks include:

- The Green Ribbon & Geological Time Trail
- Flexible Campus Streets, Campus Gateways & Pedestrian Networks
- Tunnel Improvements & Expansions
- Restoration of Riparian Habitats & Stormwater Management
- Potential Building Enhancements, Expansions & Developments

It is important to note that principles of sustainability and universal design are woven into each design direction identified above.



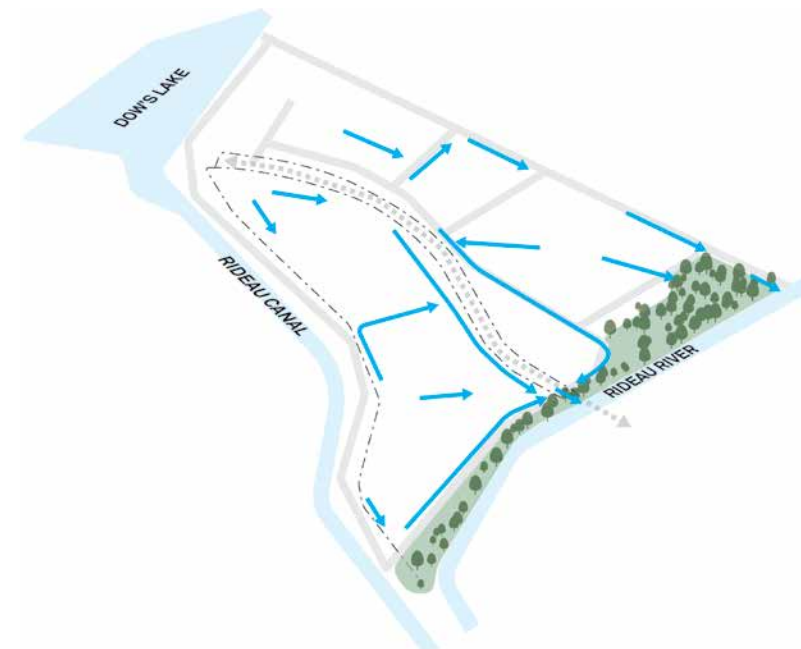
Green Ribbon & Geological Time Trail



Flexible Campus Streets, Campus Gateways & Pedestrian Network



Tunnel Improvements & Expansions



Restoration of Riparian Habitats & Stormwater Management



Potential Building Enhancements, Expansions & Developments

3.1 Campus Framework for Sustainability



The Chatham University Eden Hall Campus generates more energy than it uses, produces food, recycles nutrients, and supports habitat and healthy soils. (Pennsylvania, Mithun © Bruce Damonte)

Through its holistic and inclusive approach to sustainability, Carleton has established a commitment to exemplify practices that will achieve a better world for future generations. University staff have emphasized the important role the Campus Master Plan Update can play in demonstrating a visible and measurable commitment to sustainability that engages students, staff, and the local community.

As part of the CMP Update, four Core Sustainability Pillars have been developed to provide guidance for Carleton University. The pillars were informed by a thorough review of existing Carleton policies, plans,

“Carleton strives to be a leading Canadian university that shapes and strengthens sustainability in society and contributes to the well-being of the community in which it operates... Carleton defines sustainability in an inclusive style, encompassing human and ecological health, social justice, secure livelihoods, and a better world for all generations.”

- Carleton Sustainability Plan 2020-2025

and reports, as well as site visits, a sustainability workshop, and cross-departmental meetings with Carleton staff members. Opportunities and constraints have been identified for each pillar and will inform the campus design guidelines in Section 6.0 of this Plan.

The core sustainability pillars are:

- Energy & Carbon;
- Circularity;
- Health & Wellness; and
- Natural Systems Integration.



Dynamic solar shading systems mounted on the façade can adjust to the specific climate conditions, user patterns and provide optimal daylight. (SDU Campus, Henning Larsen © Martin Schubert)

Pillar #1: Energy & Carbon

Energy and Carbon play an important role in Carleton’s overarching sustainability vision. As stated in the 2021 Energy Master Plan: *“Carleton University’s carbon neutrality goal is an ambitious step forward that is in alignment with federal and local government policies and strategies toward climate change and its threat to our environment, health, economy and collective future. It demonstrates Carleton’s leadership and commitment to our collective effort to mitigate and reduce the impact of climate change.”*

Opportunities and constraints applicable to the Energy & Carbon Pillar include:



Example of a parking garage with passenger shelters with a solar panel array on the roof to produce a net-zero electricity use for the building. (The University of Northern Iowa’s Multimodal Transportation Center, United States, Substance Architecture © Paul Crosby Architectural Photography)

A. Low-Carbon Utility Strategy: Fossil Fuel Switch

Carleton’s 2021 Energy Master Plan indicates ongoing campus electrification through the addition of three new nodal heating plants that house electric boilers to generate low-temperature hot water for distribution around campus. There is an opportunity to allocate space for any additional distribution infrastructure required in areas of Campus that are not yet developed and within building renewal guidance. Constraints may appear if competing interests for future land-use and infrastructure installation timing are identified.

B. Renewable Energy

Onsite renewable energy generation is a part of the campus carbon-neutral strategy outlined in the 2021 Energy Master Plan. There is an opportunity to plan for solar access on new and existing buildings, and align with roof renewal plans where possible. Constraints to consider include: roof capacity, shading, electrical equipment, and structural load analysis. In addition, some areas for photovoltaics (PV) may compete with air source heat pump (ASHP) installations, therefore availability of roof space may be constrained.

C. Efficient Buildings

Future development can support Carleton's zero-carbon future by incorporating efficient building design and retrofit strategies. Opportunities include carefully considering efficient massing and orientation for new developments, optimizing window-wall ratios, and designing aesthetically attractive façades that are attainable with high performance cladding systems.

D. New Buildings Performance Standards

There is an opportunity for Carleton to set clear and consistent performance standards for all future buildings. Consideration should be given to the range of certification pathways available, streamlining the decision-making process and aligning with other campus goals where feasible. Constraints in this area include the rapidly changing landscape where references to standards and versions can quickly become out-of-date.

E. Building Retrofits

Reducing energy demand in existing buildings will help reduce overall campus emissions and operational costs, future utility infrastructure loads, and the associated capital cost. The Carleton Energy Master Plan currently sets an indicative minimum of 19% improvement for annual heating, cooling, and electricity consumption for existing building performance improvement by 2050. There is an opportunity to create a process to determine whether a building should be "sustained" (top performing buildings), "renovated" (buildings with potential that need improvement), or "renewed or replaced" (for those that require major intervention).

F. Embodied Carbon Reduction

Carleton's existing Plans do not currently address embodied carbon emissions, but they recognize the importance and value of understanding and including them in future updates. Tracking and managing embodied carbon emissions at an early stage can help guide a project's design, specifically for structural and envelope considerations. The opportunity to conduct space-use planning with considerations for increasing density and/or renovating existing buildings before deciding to build new can be considered to reduce embodied carbon.

G. Resilience

There is an opportunity to consider resilience on campus to mitigate climate-related and other potential disruptions. This includes enhancing the ability of buildings and systems on campus to withstand and respond to extreme weather events, maintaining occupant comfort as temperatures increase, and improving the university's ability to adapt to the changing regulatory landscape.

Smart technology such as self-shading and angled exterior louvers can help reduce solar heating and reduce an overall reliance on energy-intensive climate control systems. (Queensland University of Technology Australia; Henning Larsen & Wilson Architects © Christopher Frederick Jones)





Hampshire College's R.W. Kern Center is a multi-purpose facility that is self-sustaining— generating its own energy, capturing its own water, and processing its own waste. (Amherst, Massachusetts, Bruner/Cott & Associates © Robert Bensen)

Pillar #2: Circularity

Circularity addresses Carleton's desire to reduce physical waste— through construction, operations, and end-of-life— of various materials on campus. Opportunities and constraints applicable to the Circularity Pillar include:

A. Zero-Waste Operations

The university has a set target to achieve a diversion rate of over 90% in its operations. Space requirements should consider reusable materials instead of disposable, priority placement of recycling and compost collection, effective waste collection and sorting, and visual displays to increase proper diversion practices from campus community members and visitors. Constraints may include existing contracts and receiving facility capabilities.



Building materials can safely incorporate habitats for bees, birds, and bats. The pictured Bee Brick replace a brick in the wall and provides a nesting place for solitary bees within the irregular pattern of holes. (© Green & Blue)

B. Zero-Waste Construction

Opportunities to support low-waste materials selection and construction practices should be considered, along with synergies under the Energy & Carbon theme of Embodied Carbon. Constraints include complexities in developing policies, implementing practices campus-wide, and updating procurement processes.

C. Local Food

There is an opportunity to consider allocating space to grow food on campus. Constraints to consider include maintenance responsibility, accessibility, water and sunlight access, security, and protection from animals and pests without harmful pesticides.

D. Materials

There is an opportunity to encourage use of materials that are reusable, recyclable, and/or compostable at the end of the service life. Providing guidance to support low-embodied carbon materials and those with a longer lifespan should also be considered.



Karen Blixens Plads is an undulating plaza that mimics the surrounding landscape and provides sheltered parking for over 2,000 bicycles for the university's students and staff. (Karen Blixens Plads, Copenhagen, COBE & COAST © Rasmus Hjorthøj)

E. Water Efficiency

The existing Sustainability Master Plan includes the goal to minimize water consumption through conservation and efficiency measures, water reuse and recycling. There is an opportunity to address water efficiency both indoors, and outdoors. This includes a process for evaluating water fixture retrofits during building renewal conversations, space use planning and assessments for collecting and re-using rainwater and/or greywater, and planning naturalized spaces to support species that do not require permanent irrigation.

Pillar #3: Health & Wellness

The Health and Wellness Pillar encompasses three core themes: connectivity, comfort, and community. Each core theme includes a number of opportunities for creating a campus that fosters mental and physical health and wellness for members of the campus community, as well as for the natural environment.

Opportunities and constraints applicable to the Health & Wellness Pillar include:

A. Connectivity

The campus can be designed to support reduced reliance on single-occupancy vehicles, while making alternative travel modes more attractive options for staff, students, and visitors. Themes include: bicycle infrastructure, walkability, transit stops, and electric vehicles.

B. Comfort

Creating a comfortable year-round experience for the campus community— indoors and outside— was an important theme heard in the Sustainability Workshop.

- **Thermal Comfort:** Increasingly frequent extreme weather events should be considered. There is an opportunity to conduct outdoor thermal comfort analysis that can help inform both building massing strategies and outdoor space designs.
- **Visual Comfort:** There is an opportunity to support an enhanced public realm by incorporating visual comfort features such as art installations, and enhanced lighting and wayfinding.
- **Indoor Air Quality:** Opportunities to improve indoor air quality through strategic locations for building openings and air intakes in relation to pollution sources.
- **Safety and Security:** Considerations should be made in how vulnerable populations will experience the Campus throughout the year to foster a sense of inclusivity.

C. Community

- **Community Outreach:** Showcase the ambitious sustainability goals the university has set and empower students and faculty to actively participate in ongoing sustainability efforts.
- **Healthy food:** Better inform the campus community on healthy food accessibility, on-site gardens, and ongoing campus policies.
- **Accessibility:** Site infrastructure and building design should consider physical abilities, vision and hearing, age-related needs, etc. (Refer to Section 3.3)



The Green Ribbon and Geological Time Trail provides opportunities to implement Sustainable Urban Drainage Systems. (Fidelity Heart Zone, BID landscape architects © Jack-Hobhouse)



Example of weaving Indigenous placemaking, stormwater management and vegetation into the campus at the University of British Columbia, Vancouver, Canada. (PFS © University of British Columbia)

Pillar #4: Natural Systems Integration

The Natural Systems Integration Pillar acknowledges the important connection the Campus has with its natural surroundings, and the desire to enhance its role in protecting the local environment.

Opportunities and constraints applicable to the Natural Systems Integration Pillar include:

A. Stormwater Management

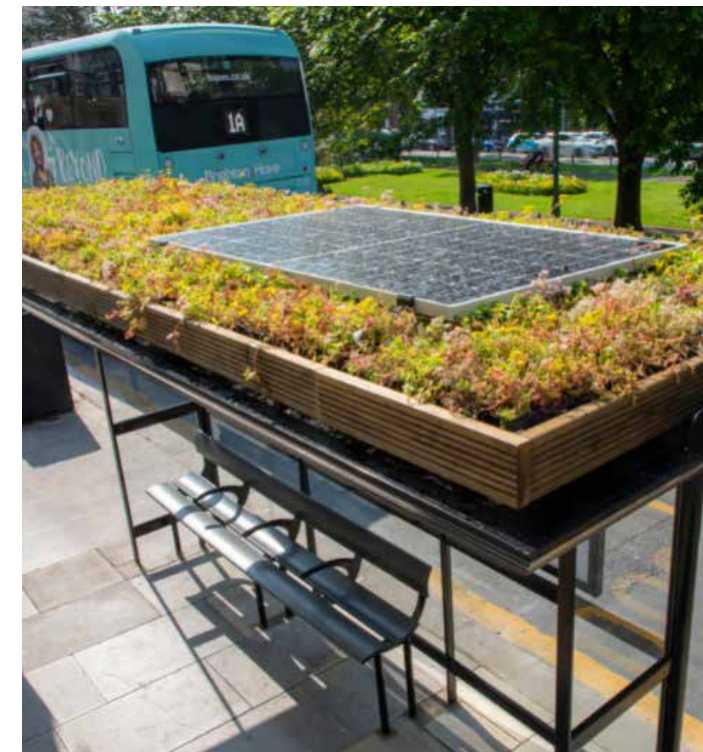
There is an opportunity to manage and reuse stormwater in the campus through bioretention facilities that will improve stormwater runoff quality and reduce total stormwater runoff. Constraints include limited room for revising existing developed areas and reconciling winter snow clearing with alternative pavement strategies.

B. Vegetated Spaces and Carbon Sequestration

There is an opportunity to align with the OSMP, which suggests elements to contribute to climate-positive design, such as an enhanced tree canopy and converting unused lawn to other plantings to increase biodiversity and offer improved carbon storage in plants and soil. Constraints may be found with competing interests between campus densification and open space.

C. Wildlife Connection

There is an opportunity to implement a wildlife strategy that highlights and interacts with the native flora and fauna while establishing parameters on how the university can support wildlife around campus through building design (such as bird-friendly glazing requirements) and site planning (protecting nesting areas, for example).



Solar-powered shelters with a living roof planted with a mix of wildflowers helps support biodiversity, provides a resting stop for pollinators, absorbs rainwater and is powered by solar energy. The bus stop is also designed with principles of circular economy. (Bee Bus Stop, ©Brighton & Hove City Council)



Rooftop gardens and greenroofs can be used for outdoor meetings, lectures, and events. Green roofs not only retain water but can act as natural filters for water runoff and can decrease stress on sewer systems at peak flow periods. (Chemnitz, Germany, Meyer-Grohbrügge © Johannes Richter)

3.2 Natural Systems



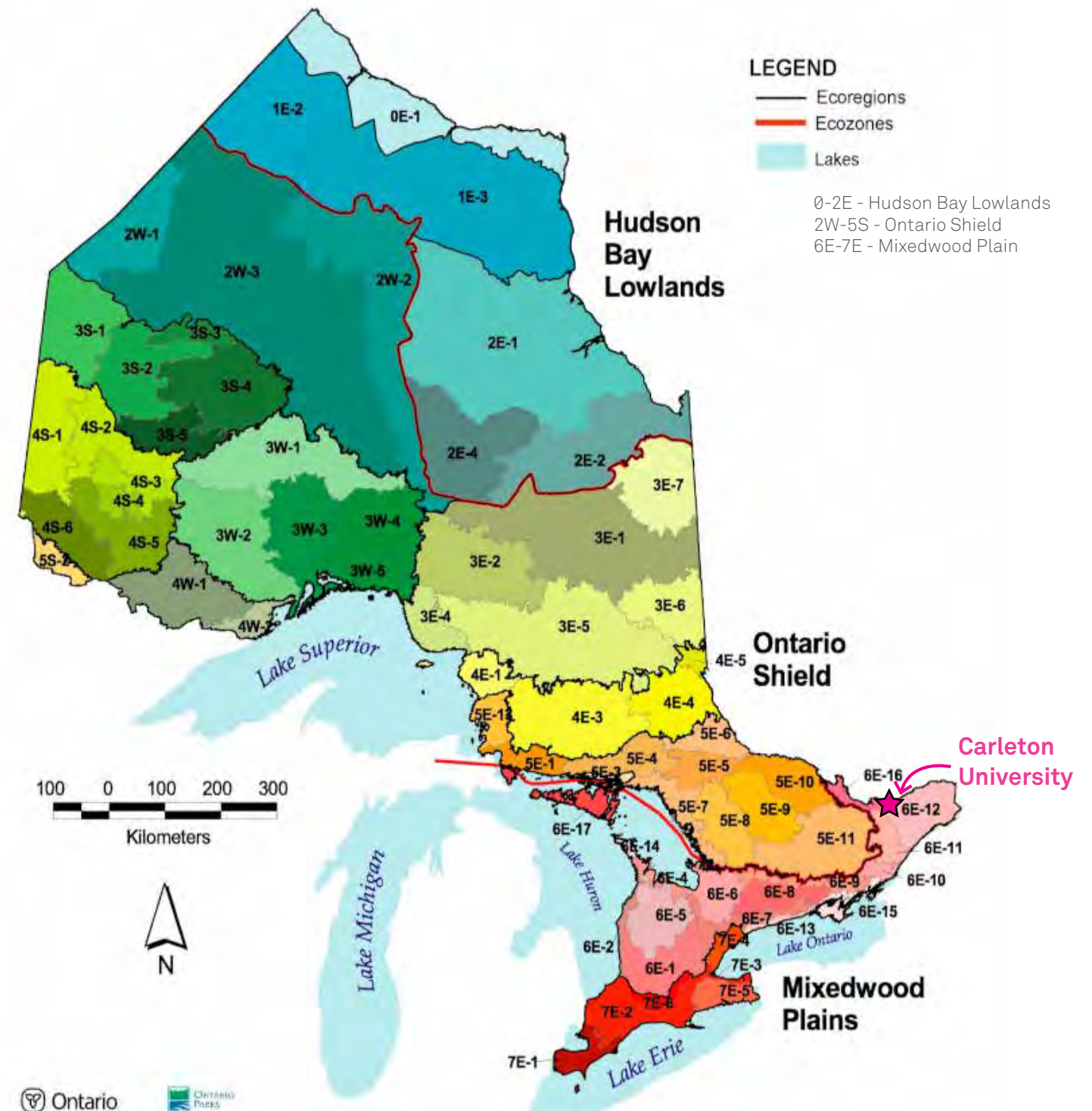
Rideau River Rapids © Brook McIlroy

Carleton University is nestled between two water features; one man-made and the other natural. Dow's Lake and the Rideau Canal flank the north and western edges of the campus, while the Rideau River borders the southern edge. Looking at Carleton's physical location in these terms primes the campus as a pioneer for integrated approaches between man-made and natural water-based systems.

Enhancing the natural setting and developing new areas with enhanced connections to water and the local ecology is a unique way to situate Carleton University within its regional context. Opportunities for enhancing planting areas should consider

“So . . .
 Catch!” calls the Once-ler.
 He lets something fall.
 “It’s a Truffula Seed.
 It’s the last one of all!
 You’re in charge of the last Truffula Seeds.
 And Truffula Trees are what everyone needs.
 Plant a new Truffula. Treat it with care.
 Give it clean water. And feed it fresh air.
 Grow a forest. Protect it from axes that hack.
 Then the Lorax
 and all of his friends
 may come back.”
 - Dr Suess, *The Lorax*

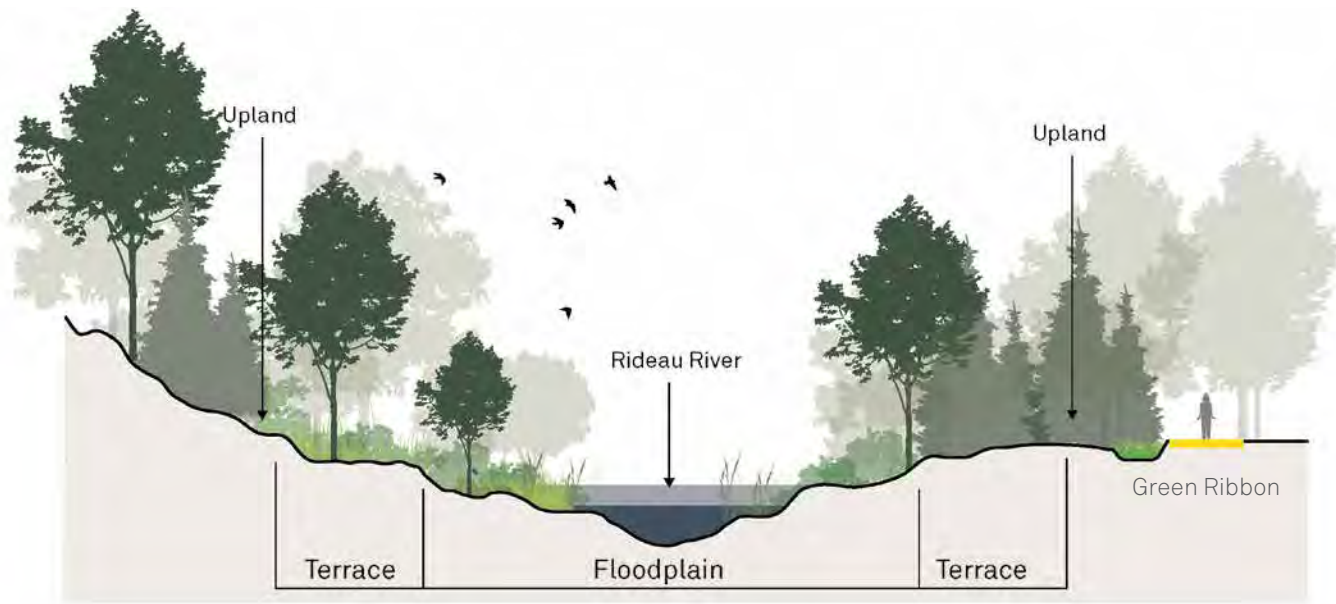
species that are significant to local ecotypes, such as the greater Ottawa Valley, the Ottawa Escarpment, and Ecoregion 6E Lake Simcoe-Rideau, as shown on the map to the right. Ottawa lies at the transition between the northern boreal forests (Taiga) and the eastern deciduous forests (Mixedwood Plains), providing the region with an abundance of species from both ecozones. This larger link is physically connected to the campus not only via its location but also through the surrounding water ways which are used by flora and fauna alike to travel great distances.



LEGEND
 — Ecoregions
 — Ecozones
 — Lakes

0-2E - Hudson Bay Lowlands
 2W-5S - Ontario Shield
 6E-7E - Mixedwood Plain

▲ Located at the northern edge of the Lake-Simcoe-Rideau Ecozone (6E) and close to the Georgian Bay Ecozone (5E), the Carleton Campus ecosystem is influenced by both of these natural communities of flora, fauna and weather. (©Ontario Parks)



Riparian Ecosystem Cross Section
Steep to Gentle Terrain

Healthy streams and waterways should contain a Riparian corridor. Riparian zones border waterways, filtering stormwater run-off, and creating lush wildlife corridors that connect different habitats. (Riparian Ecosystem Cross Section, USDA Forest Service ©Brook McIlroy)

Riparian Zone

Riparian corridors are the interface between land and waterways, these corridors are made up of a series of transition plant communities which are important in ecology and environmental resource management due to their role in soil conservation, their habitat biodiversity and the influence they have on fauna and aquatic ecosystems. Riparian zones are often punctuated with wildlife and rare or uncommon species of plants, insects, and birds.

Often characterized by a full and dense canopy of large deciduous trees and a rich understory, riparian areas vary widely. Riparian forests are bursting with activity, due to the proximity to water, vast amount of food, nesting opportunities and abundance of cover.

The Campus Master Plan Update aims to leverage and foster the riparian corridor by integrating the Green Ribbon and Geological Time Trail through the riparian zone, preserving existing natural elements

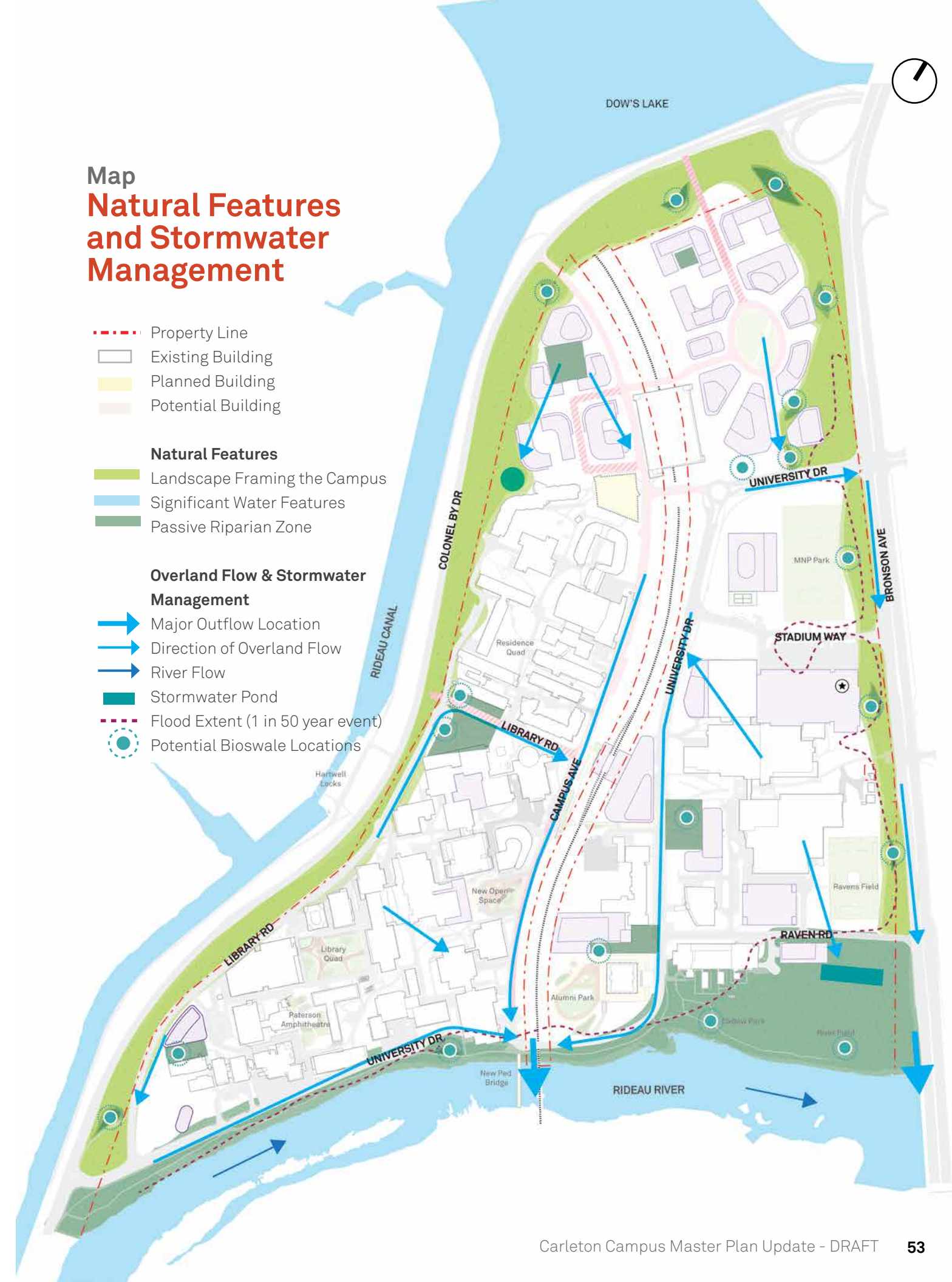
and adding placemaking features, native plantings and furnishings. The CMP Update also aims to increase connections from the campus core down to the river, working to increase linkages between the built form and the natural environment.



By adding formalized pathways through the Riparian Corridor and into the forested areas to the North of Rideau River will give students and visitors the opportunity for forest bathing, or a calming walk through a lush forest.

Map Natural Features and Stormwater Management

- - - Property Line
 - Existing Building
 - Planned Building
 - Potential Building
- Natural Features**
- Landscape Framing the Campus
 - Significant Water Features
 - Passive Riparian Zone
- Overland Flow & Stormwater Management**
- ➔ Major Outflow Location
 - ➔ Direction of Overland Flow
 - ➔ River Flow
 - Stormwater Pond
 - Flood Extent (1 in 50 year event)
 - Potential Bioswale Locations



Stormwater Management

Nurturing our waterways and minimizing runoff, slowing it and filtering it, are the most immediate ways to have a large impact at a site-specific scale. Stormwater management is often addressed through large retention ponds, bioswales and green roofs. The Campus Master Plan Update suggests incorporating a feasible method of stormwater management that is suitable to Carleton and its surrounding context.

Approximately half of the Carleton University's surface runoff drains directly into the Rideau River, with a large outflow going into the river near Campus Avenue. The remainder drains toward Bronson Avenue, likely flowing into the city sewer network. Although this is a common way to address stormwater, there are opportunities to integrate ecologically sensitive methods.

Specific strategies that align with those proposed by the OSMP include:

- Reduce impervious surfaces
- Permeable paving
- Snow storage and impervious surfaces to drain towards permeable and semi-permeable surfaces
- Low Impact Development strategies
- Aquatic buffers along the Rideau River to manage sediment and nutrient runoff.

Bioswales create robust stormwater infrastructure that can slow peak overland flows and allow more of it to infiltrate the soil, recharging local aquifers. These landscape areas would be at their most resilient when predominantly filled with native, salt, drought, flood, and pollution tolerant plants. Carleton University is surrounded by a beautiful landscape that offers plenty of opportunity to

enhance local placemaking through native gardens and small celebrations of local ecology. These interventions are simple, low-cost and effective in creating a unique sense of place on campus that can also benefit local and regional ecological habitats and ecoregions/zones. These elements are educational, aesthetic, and help build resilience to climate change.

The CMP Update suggests several interventions that will aid in enhancing linkages to the Rideau River and Canal through pedestrian connections and gateways, as well as through the future Green Ribbon and Geological Time Trail (Section 3.5), a multi-use pathway woven along built and natural areas in the core and periphery of the campus.



Bioswales can be designed to look like gardens. By flanking walkways with these gardenesque elements, a calming and natural scenic atmosphere can be created.



Rain gardens collect stormwater runoff and are often planted with native species that do not require permanent irrigation. (Somerville, Massachusetts, OJB © Kyle Cadwell)



In the winter, rain gardens and bioswales can create seasonal interest and become designated areas that require less maintenance. (Somerville, Massachusetts, OJB © Andrew Cridlin)



Gardens and public spaces can be utilized as water buffers. (Mecanoo © Delfland Water Board)

3.3 Universal Design & Accessibility



Accessible pathways should be well-integrated into the site design. (Baggage Building Arts Centre, Thunder Bay, Brook McIlroy ©David Whittaker)

Universal design goes beyond physical accessibility and considers visual, hearing, neurological and physical impairments when designing and developing spaces. It is an intersectional approach to how we develop and interact with our environments to create user-centric, cost-effective, and sustainable accessibility for a diverse range of people and user groups. The principles of Universal Design encourage flexibility, adaptability, safety, and efficiency in our built environment.

The application of Universal Design results in environments that anticipate the needs of users and work systematically to remove labels that stigmatize based on the access provided. Future development should utilize the following directions to the greatest extent possible, to ensure that Carleton University is a universally accessible campus. The following Seven Principles of Universal Design, coined by Ronald Mace will guide the design and development of spaces, products and communications, and offer opportunities for Carleton University to be more universally accessible.



Hard-packed, stable surface materials, and adequate clear height will improve accessibility to recreational trails for all users. (©Mirek Kijewski)

Seven Principles of Universal Design

1. Equitable Use

The design of spaces should be marketable to and useable by people with diverse abilities.

- Provide same means of use for all users.
- Avoid segregating, stigmatizing, or isolating specific user groups.
- Design should be appealing to all users.



Audio Frequency Induction Loop Systems (A.F.I.L.S.) are used by hearing aid wearers to assist them to hear clearly in difficult acoustic environments. (Induction Loop Systems © Sound induction Systems Ltd)

2. Flexibility in Use

The design of spaces should accommodate a wide range of individual preferences and abilities.

- Provide choice in methods of use.
- Accommodate right-handed or left-handed access and use.
- Facilitate user's accuracy and precision.
- Provide adaptability to the user space.

3. Simple and Intuitive Use

Spaces should be easy to understand and use, regardless of the user's experience, knowledge, language skills, or current concentration level.

- Eliminate unnecessary complexity.
- Design spaces consistent with user expectation and language skills.
- Accommodate a wide range of literacy and language skills.
- Arrange information consistent with its importance.
- Provide effective prompting and feedback during and after task completion.

4. Perceptible Information

The design of spaces should effectively communicate necessary information to the user, regardless of ambient conditions or the user's sensory abilities. The design should seek to eliminate sources of distraction.

- Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
- Provide high colour/tonal contrast between essential information and its surroundings.
- Maximize legibility of essential information.
- Differentiate elements in ways that can be described.
- Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

5. Tolerance for Error

The design of spaces should minimize hazards and adverse consequences of accidental or unintended actions.

- Arrange elements to minimize hazards and errors; hazardous elements should be eliminated, isolated, or shielded. Do not place the burden on individuals to utilize person protective measures.
- Provide warnings of hazards and errors in a variety of sensory modes.
- Provide fail-safe features.
- Discourage unconscious action in tasks that require vigilance.

6. Low Physical Effort

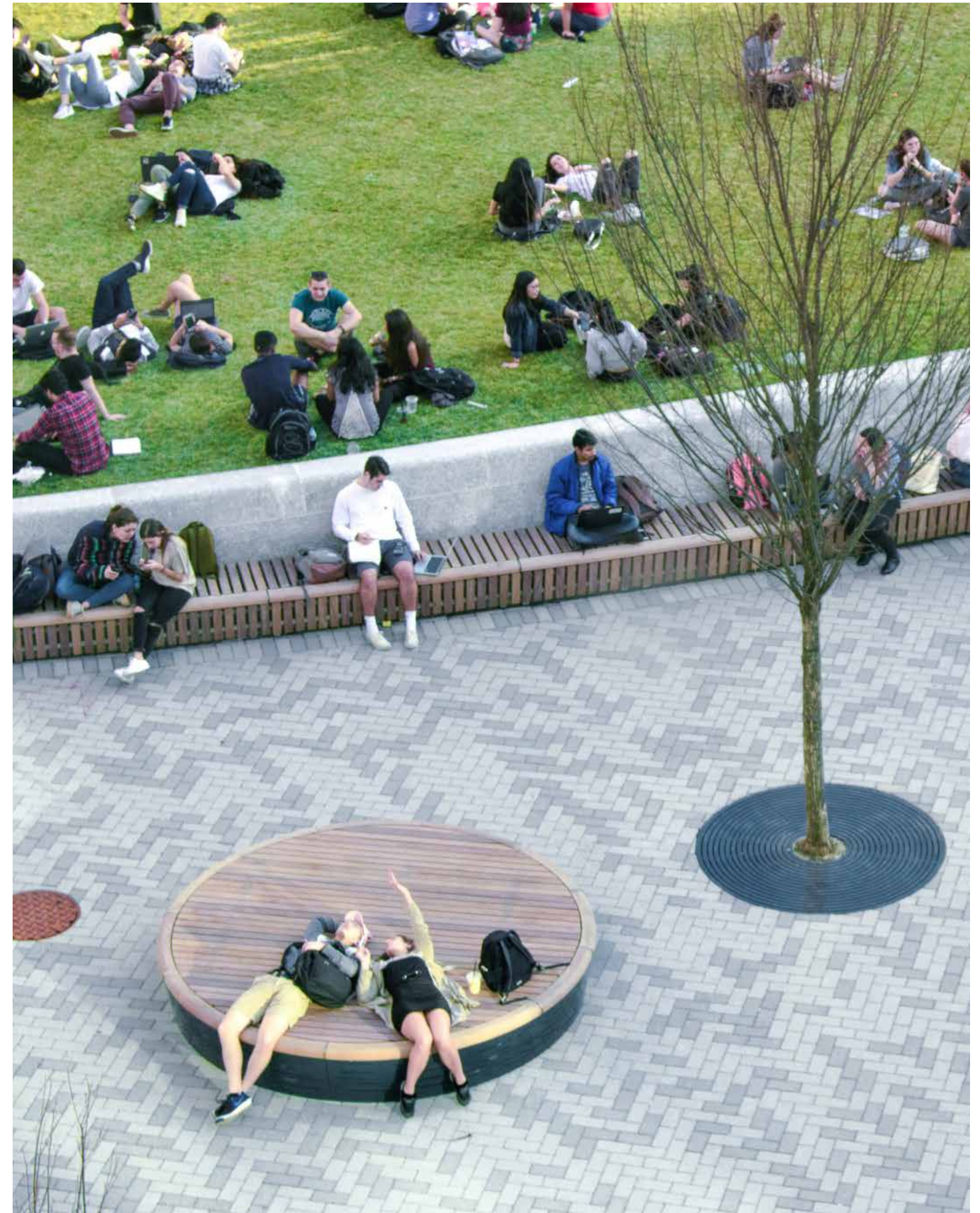
Spaces should be designed to be used efficiently and comfortably, with minimum fatigue.

- Allow users to maintain a neutral body position.
- Use reasonable operating forces.
- Minimize the need for repetitive actions.
- Minimize sustained physical effort.

7. Size and Space for Approach and Use

Spaces should be appropriately sized for reach, manipulation, and use, regardless of user's body size, posture, or mobility.

- Provide clear sight lines to important elements for any seated or standing user.
- Ensure reach to all components is comfortable for any seated or standing user.
- Accommodate variations in hand size and grip size.
- Provide adequate space for the use of assistive devices or personal assistance.



This outdoor space at Drexel University in Philadelphia is highly legible and uses high colour and tonal contrast to help users of all abilities navigate and understand the space. (Korman Center Quad © StreetLife)

3.4 Transportation Framework



The O-Train crossing the Rideau River. (© Carleton University)

The Campus

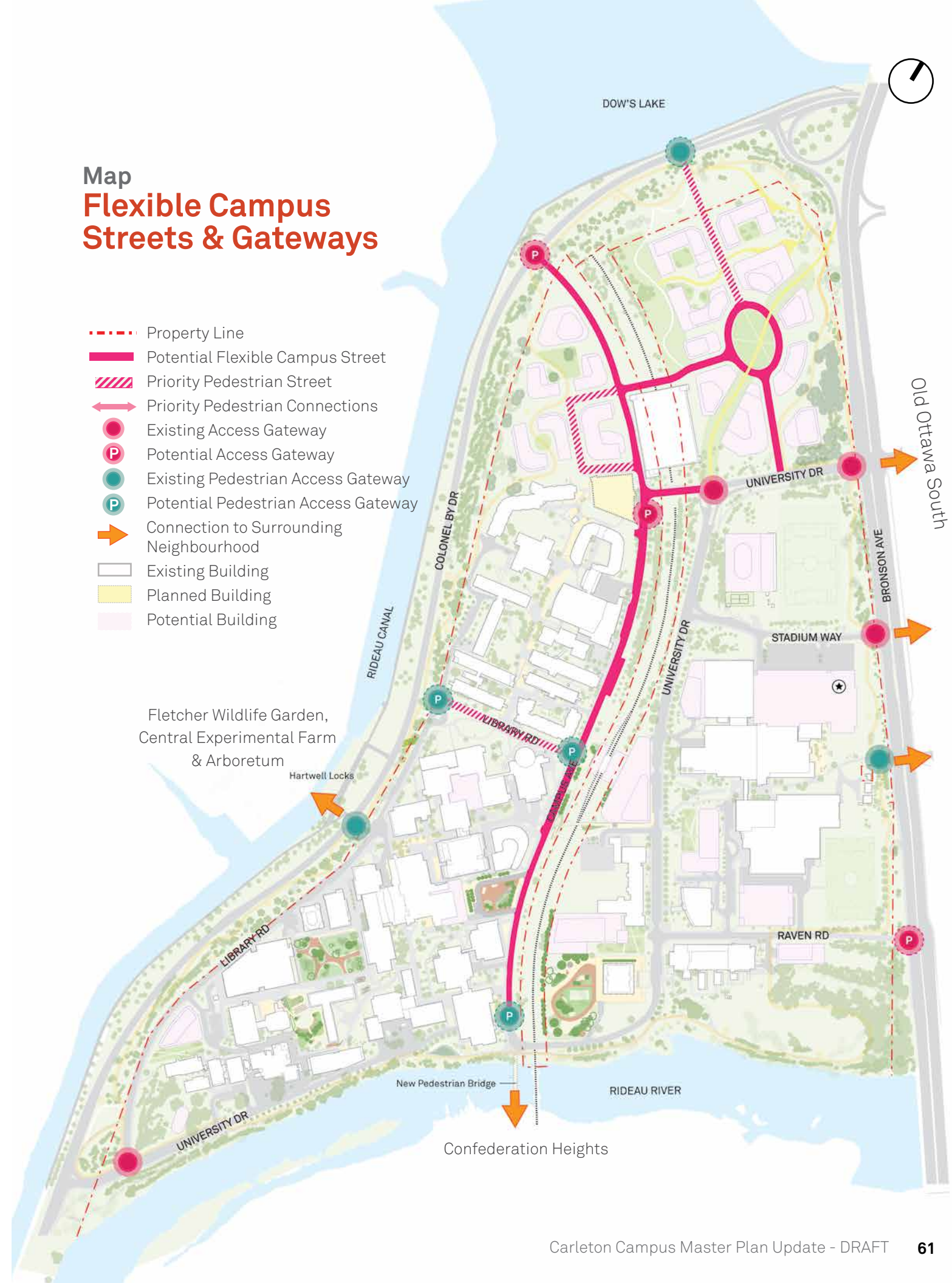
The campus street network is defined by a ring road system that accommodates all vehicle traffic circulation, including OC Transpo bus service. All campus roads generally contain two-lane profiles, with the exception of the segments approaching Bronson Ave and Colonel By Dr, where they widen to three and/or four lanes.

Carleton University contains a well-established transit network, which has been and will soon again be a defining feature of the campus. The O-Train Line 2 service (Trillium Line LRT), will act as the transportation system's pillar. It runs north-south through the campus with a station located at the campus core, which is supported by conventional bus and Para-Transpo service on the campus ring road.

In recent years, Carleton University has emphasized a more contemporary way of thinking about transportation. As noted in the 2016 Campus Master Plan, "when prioritizing modes of movement on campus, pedestrians have first priority, followed by bicycles, transit, high-occupancy vehicles and single occupant or service vehicles." This multi-modal approach to transportation planning reverses conventional thinking about priority of movement, and will create a more walkable and enjoyable campus environment.

Map Flexible Campus Streets & Gateways

- Property Line
- Potential Flexible Campus Street
- Priority Pedestrian Street
- Priority Pedestrian Connections
- Existing Access Gateway
- Potential Access Gateway
- Existing Pedestrian Access Gateway
- Potential Pedestrian Access Gateway
- Connection to Surrounding Neighbourhood
- Existing Building
- Planned Building
- Potential Building



Carleton University should strive for a balanced approach in addressing localized congestion and road network inefficiencies. Investments should be made in infrastructure and policies that support walking, cycling, transit, and mobility services (e.g. ride sharing and carpooling) that will improve system performance by reallocating demand from personal vehicles to more sustainable modes.

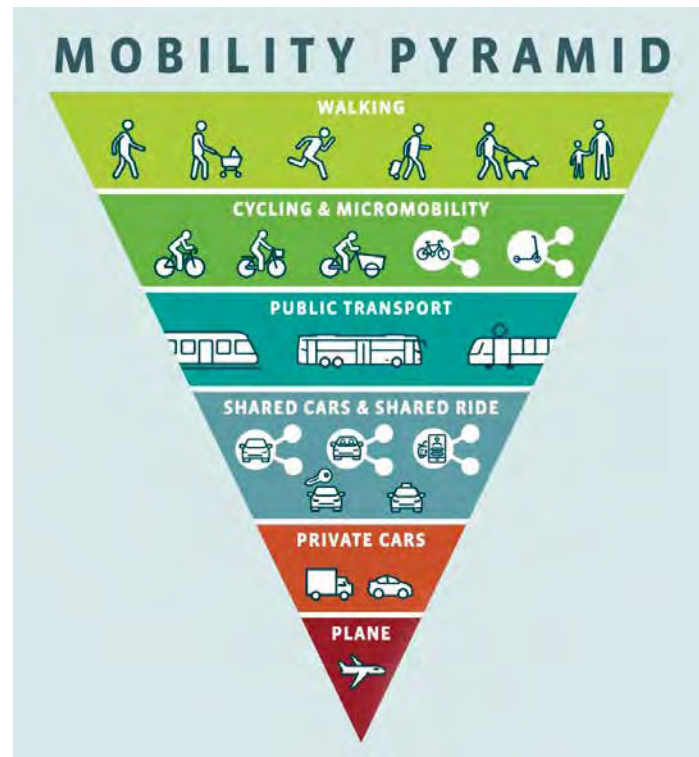
Removing or reducing barriers for active users to reach their destinations by adding or enhancing connections to buildings, transit areas and common areas, as well as providing safer crossings at intersections would enable active users to navigate campus more safely, efficiently and further enhance the campus' multi-modal character.

Strengthening of the active transportation network should be afforded the highest level of priority to increase the efficiency of movement of pedestrians and cyclists throughout the campus. Enhancing the quality and capacity of active transportation facilities on existing streets, filling in gaps within the network, and ensuring proper maintenance to enable year-round use should be paramount.

The 'Big Moves' to support campus transportation are:

Campus Avenue

- Campus Avenue shall be converted into a **shared street** that will enable shared use of the street by all users.
- Will be a low-speed environment with enhanced crossings that will prioritize safety and limit friction between users.
- Bi-directional segregated cycle tracks will also be provided, linking the new pedestrian bridge across the Rideau River and the Rideau Canal Eastern Pathway across Colonel By Drive at the north end of campus.
- Designed to accommodate trucks, including single unit moving trucks.



The Campus Master Plan Update aims to support more active transportation and limit the use of private vehicle (Mobility Pyramid @share-north.eu)

- General vehicle traffic and regular OC Transpo bus service will be restricted between University Drive to the north and University Drive by Richcraft Hall, which removes a significant barrier for pedestrians and cyclists that cross Campus Ave and the Trillium Line LRT station as well as Trillium Line crossing points.
- Limited vehicle use will be permitted, including emergency vehicles, paratranspo, service vehicles, and priority/preferred pickup/drop-off vehicles such as carpool/vanpool vehicles.
- Additional traffic calming measures may be considered in the **shared street** design. However, the intervention must give appropriate consideration for larger vehicles, such as emergency vehicles.
- Gateway features shall be placed at transition zones to provide visual and physical cues to vehicles and active users that they are entering/exiting the **shared street**.
- Appropriate pedestrian and cycling crossing treatments according to OTM Books 15 and 18 should be considered including the LRT Station and Trillium Line LRT crossing points.

Library Road

- Library Road shall be converted into a **shared street** that will enable shared use of the street by all users, enhancing the pedestrian and cycling realm.
- The **shared street** will be a low-speed environment with enhanced crossings that will prioritize safety and reduce friction between users.
- The **shared street** will be designed to accommodate trucks, such as single unit moving trucks. Limited vehicle use will be permitted, including emergency vehicles, paratranspo, service vehicles, and priority/preferred pickup/drop-off vehicles such as carpool/vanpool vehicles.
- Additional traffic calming measures may be considered in the **shared street** design, however, the intervention must give appropriate consideration for larger vehicles and emergency vehicles.
- Gateway features shall be strategically placed at transition zones to provide visual and physical cues to vehicles and active users that they are entering/exiting the shared street.

Colonel By Drive Connections

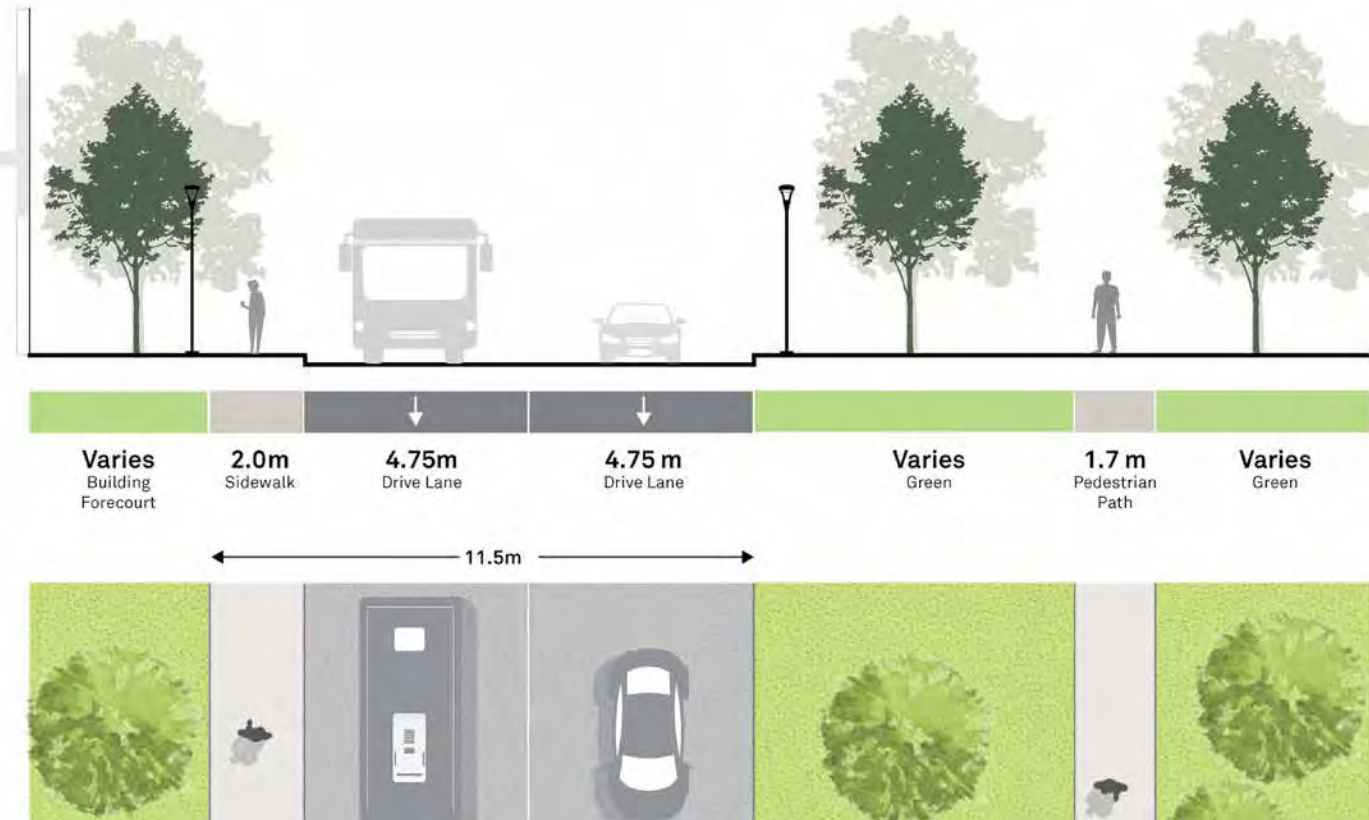
- Opportunities exist for Carleton University to explore new connections and enhance existing connections to Colonel By Drive and the Rideau Canal Eastern Pathway.
- A new signalized intersection at Campus Avenue and Colonel By Drive provides an additional vehicle access point into the North Campus Precinct and will relieve stress on the Bronson Avenue /Sunnyside Avenue/ University Drive intersection.
- The proposed Campus Avenue/Colonel By Drive intersection shall be designed as a fully protected intersection that will prioritize pedestrian and cyclist movement coming to/from the Rideau Canal Eastern Pathway, as well as meet contemporary accessibility design standards.

- Existing Colonel By Drive pedestrian and cycling crossing points at the Hartwell Locks and 150 metres west of Bronson Avenue should be designed to contemporary standards, following OTM Books 15 and 18.
- The City of Ottawa and NCC will be developing a feasibility study for the Hartwell Locks Bridge crossing, which presents an opportunity to explore new connection options, such as aligning a new Colonel By Drive pedestrian and cycling crossing with the Library Road "shared street," providing a more direct connection to the campus Trillium Line LRT station.
- Gateway features shall be strategically placed at transition zones to provide visual and physical cues to vehicles and active users that they are entering/exiting the "shared street".

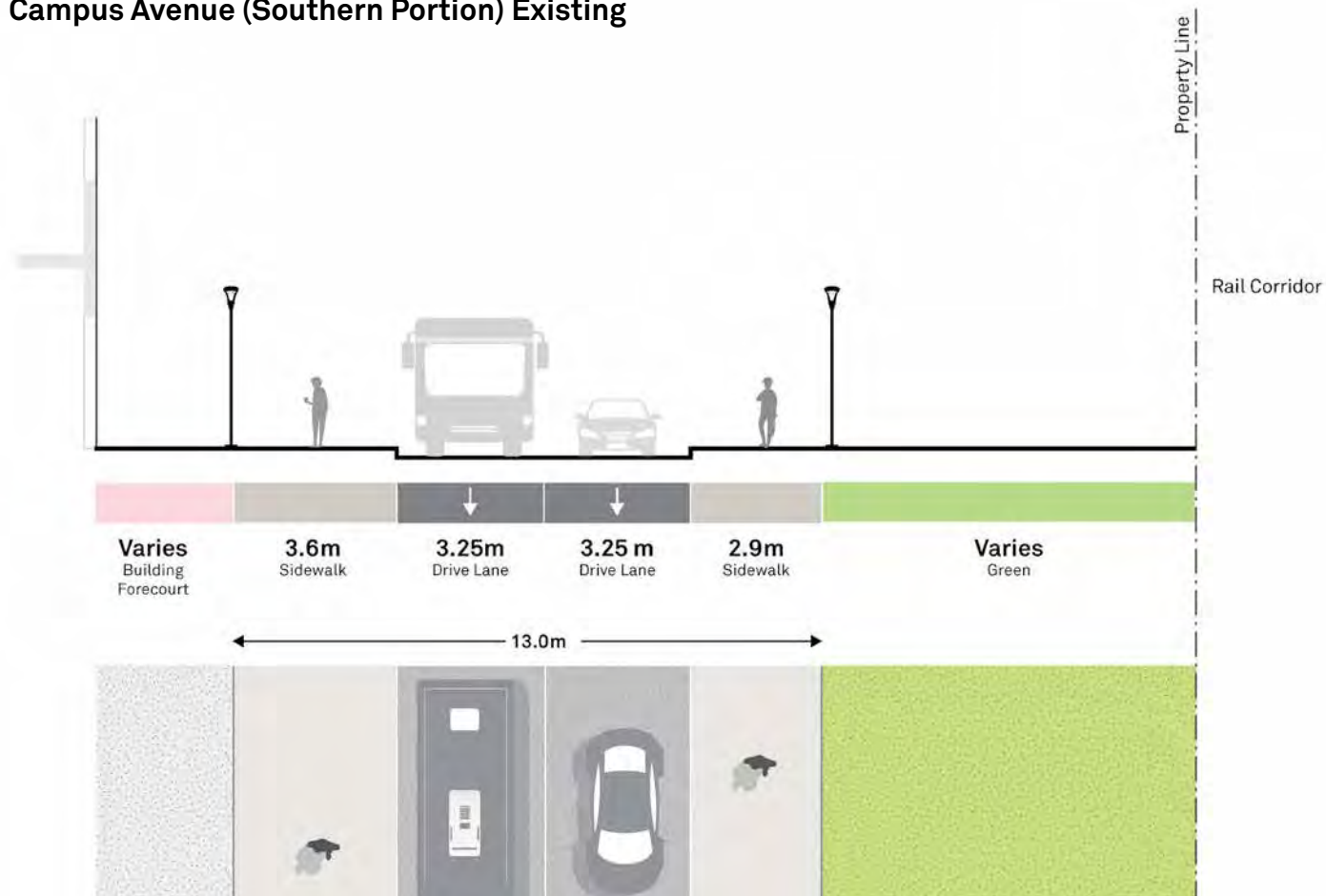


Example of a shared street design with cyclists, pedestrians and cars. (Netherlands @duoduo)

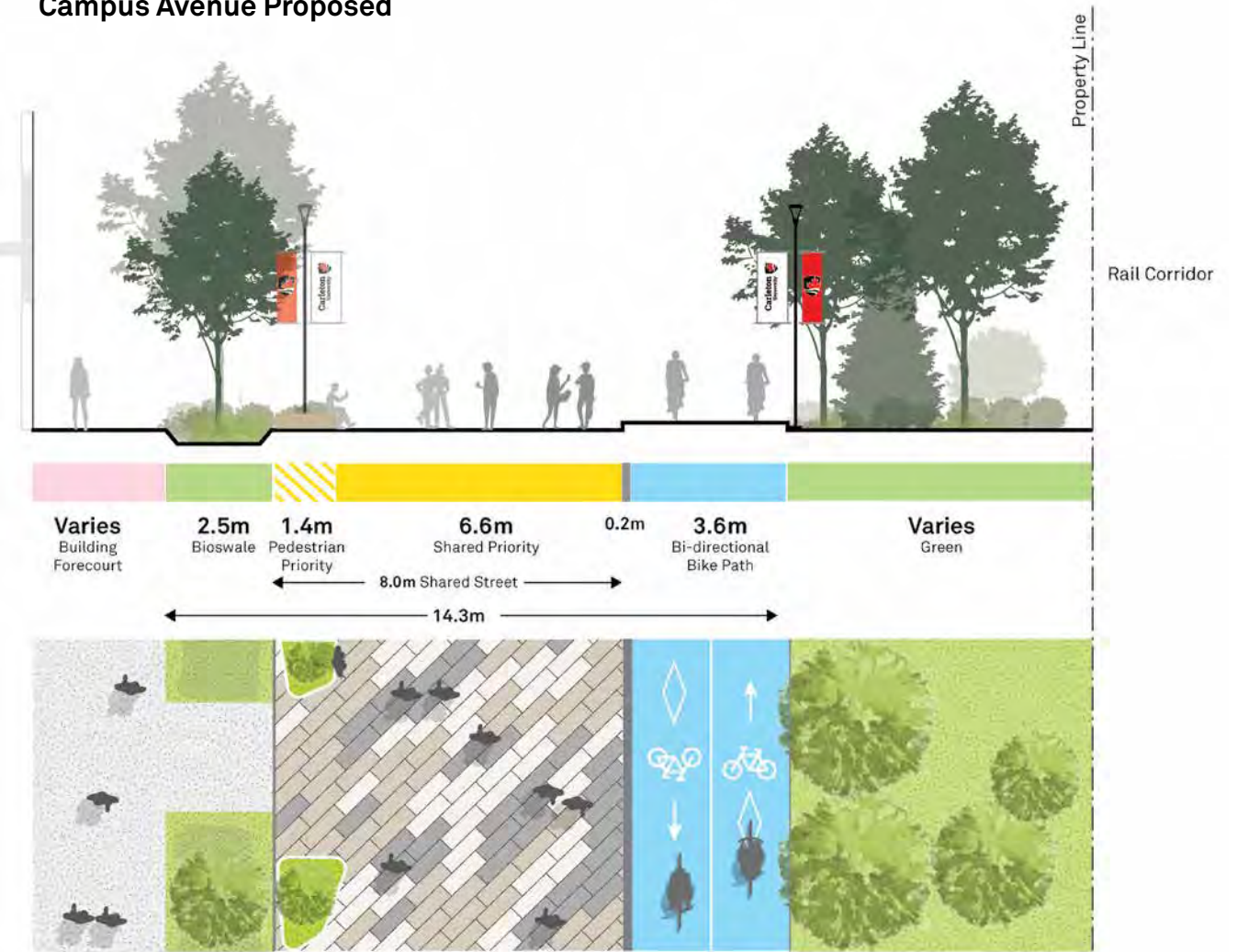
Campus Avenue (Northern Portion) Existing



Campus Avenue (Southern Portion) Existing



Campus Avenue Proposed

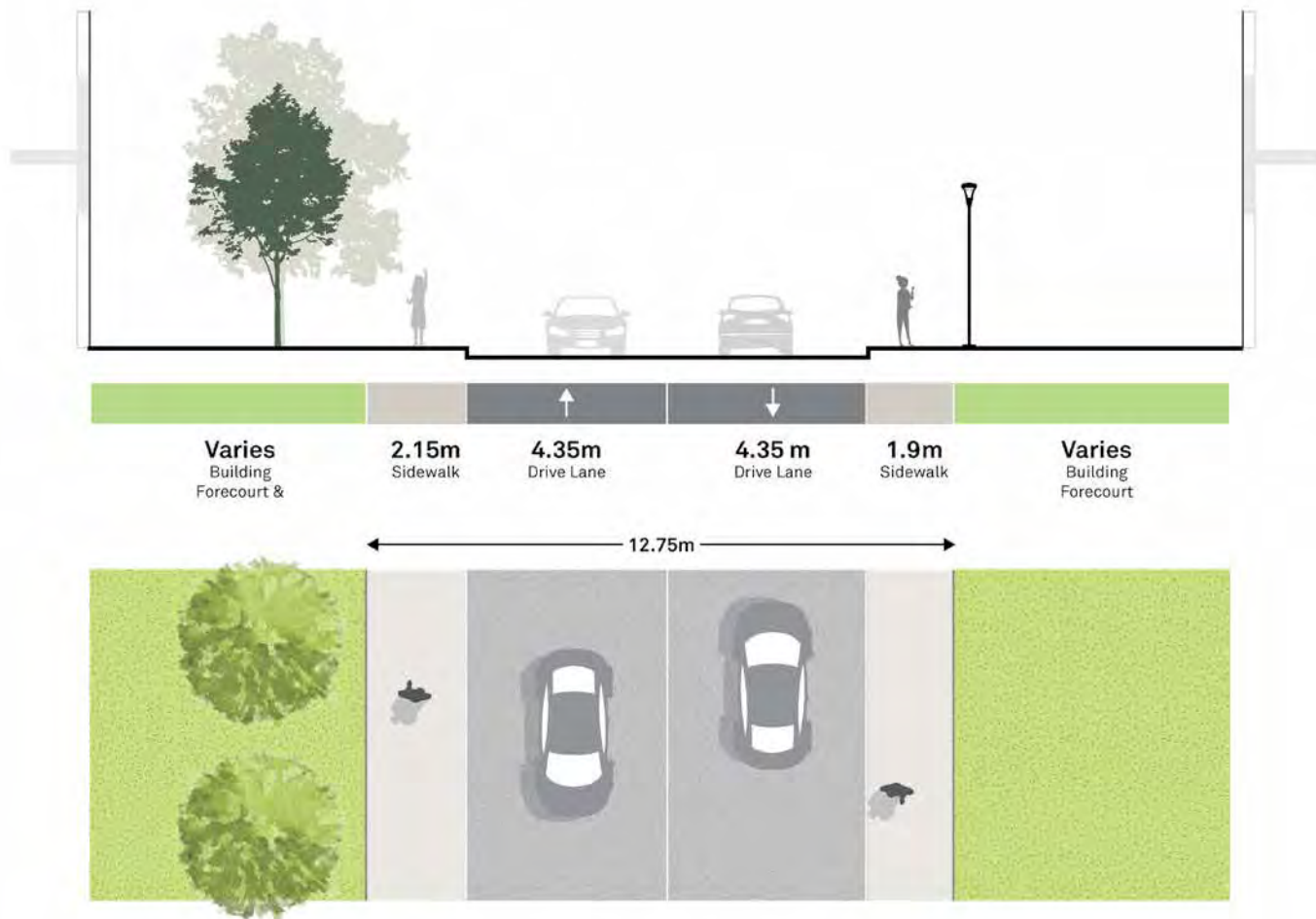


Campus Avenue proposed street section. Ensure that the 'shared priority zone' will have a 6.6m clearance; free of obstructions to accommodate emergency and service vehicles. The remaining 1.4m is designated as the 'pedestrian priority' zone which may contain benches, street furnishings and planters.

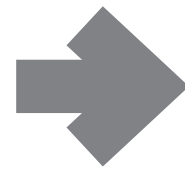


Library Road (North) Existing

Library Road (North) Proposed



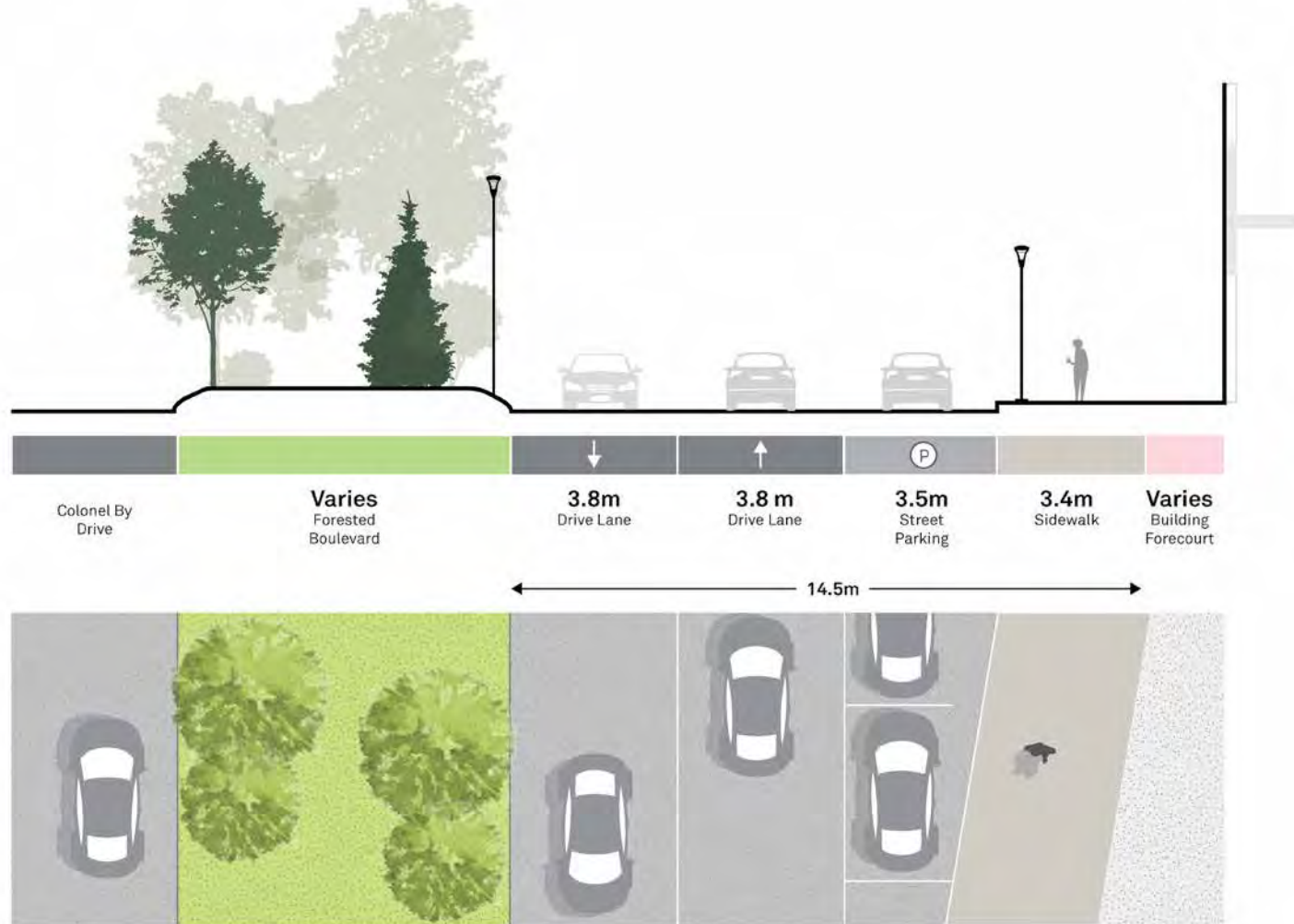
Library Road (north) existing street section.



Library Road (north) proposed street section.

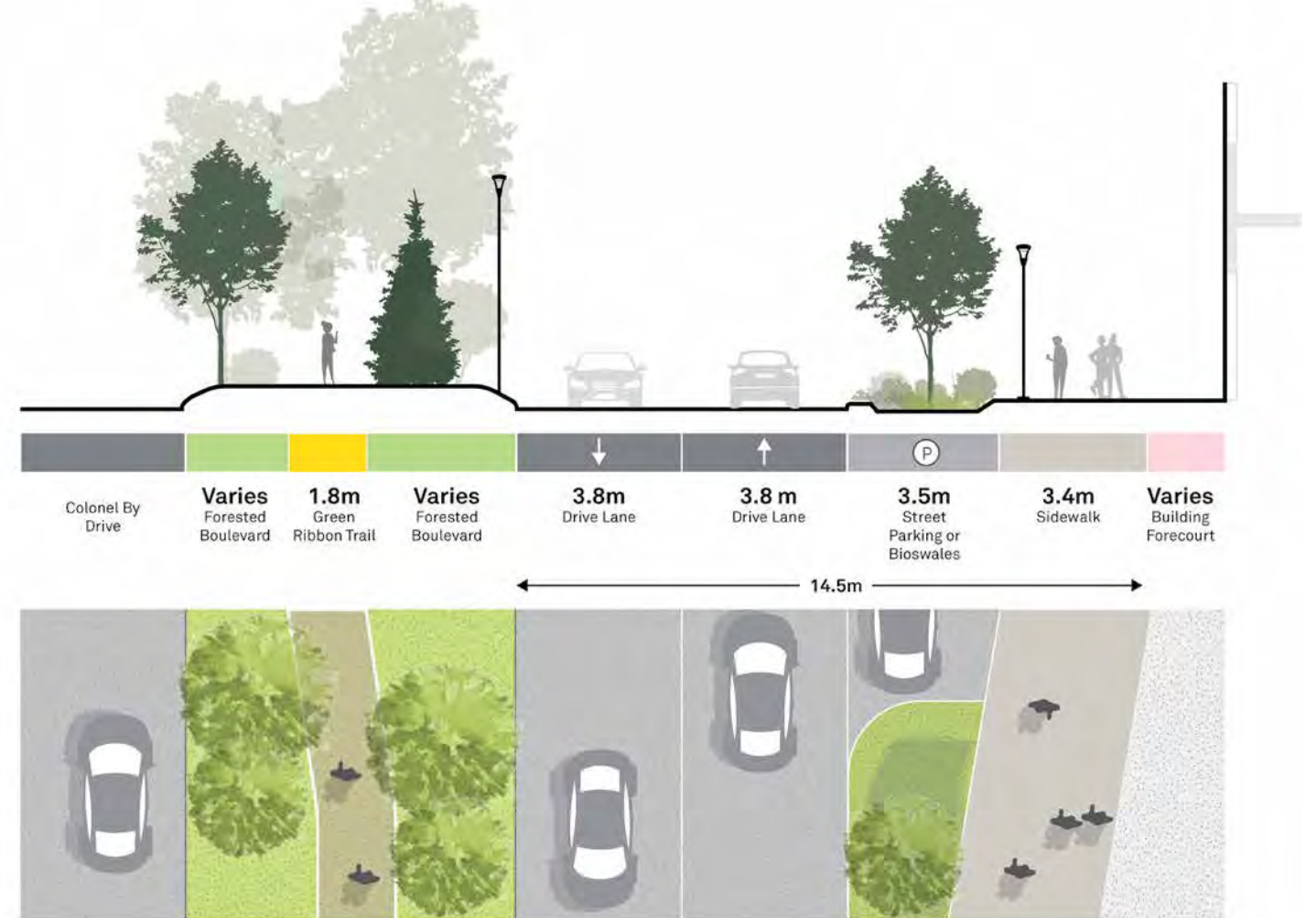


Library Road (West) Existing



Library Road (west) existing street section.

Library Road (West) Proposed



Library Road (west) proposed street section. Additional tree and site surveys will be required to determine the placement of the Green Ribbon Trail on the existing green berm between Colonel By Drive and Library Road. This portion of the Green Ribbon trail parallel to Library Road is intended for pedestrian and recreational use only. Cyclists would be encouraged to use the Rideau Canal pathway as this segment would meander through existing trees and foliage.

Raven Road Access

- Providing additional vehicle access points along Bronson Avenue will be an important consideration for the future of Carleton University. The Bronson Avenue/Sunnyside Avenue /University Drive intersection is an existing vehicle bottleneck, despite the campus having a strong transit presence (2019 Transportation Strategy).
- Carleton University should engage the City of Ottawa on the opportunity to redesign the existing Bronson Avenue /Raven Road intersection (currently transit only and permits limited movements) to an all-movement intersection that permits general traffic and enhances pedestrian and cycling priority. This would provide long-term capacity to ensure safe and efficient movement of traffic to/from the campus.

Stage 2 LRT Plans

- As part of the Stage 2 LRT project, Line 2 (Trillium Line) will be upgraded and extended. Once completed in 2023, Line 2 will extend from its current terminus at Bayview Station in the north, where it connects with existing Line 1 (Confederation Line) to the Riverside South community at Limebank Road. The extension also includes a branch to Ottawa's Macdonald-Cartier International Airport (Line 4).
- As part of the Line 2 project, station platforms are being enlarged to accommodate longer trains, which will result in an approximate doubling of passenger capacity. Trains are anticipated to remain at 12-minute headways during most service periods.
- In the far future, eventual double-tracking and electrification of Line 2 will further increase service and capacity of the line serving Carleton University.

- As part of the rebuilt station, the existing active transportation connection under the rail alignment (south of the station) has been widened to accommodate increased active pedestrian and cycling volumes, while provision for a future pedestrian tunnel has also been made in the station area.
- A new Trillium Line above-grade LRT crossing is proposed within the North Campus Precinct, which further strengthens east-west pedestrian and cycling connectivity on campus.

Future Bus Circulation

- With the conversion of Campus Avenue into a **shared street**, bus routing on campus will need to be adjusted. University Drive will become the primary road supporting transit services in both directions, versus northbound-only as it currently stands.
- Retention of the Raven Road access to Bronson Avenue constructed as part of the city's Stage 2 LRT project would assist in maintaining efficient bus circulation, by allowing bus egress onto Bronson Avenue without the need for a turnaround facility on campus.

Transit Hub

- A location for a future Transit Hub has been identified on the east side of the existing Carleton O-Train Station (P4 parking lot). This hub will accommodate buses serving the campus with the closure of Campus Avenue to bus and general traffic. The Transit Hub offers the opportunity to integrate local buses and LRT as well as redevelopment of the existing parking lot.

Potential Parking Garages

- Personal vehicle use is expected to continue in the future, and the accommodation for vehicle parking is an important long-term consideration, as it dictates driver behaviour and decisions on which access points and streets to use when arriving on campus.
- Carleton University should strive to reduce general vehicle travel in areas with high pedestrian and cycling activity (e.g. the campus core, across pedestrian/cycling desire lines, near transit facilities/hubs etc.), which means strategically placing future parking supply away from these areas, and closer to access points that limits cross-campus vehicle travel.
- Strategically targeting underutilized access locations, such as Stadium Way, the north end of Campus Avenue (if the future Colonel By Drive intersection is constructed), and/or Raven Road (if the existing intersection at Bronson Ave is reconfigured and open to general traffic) will help balance vehicle demand across multiple access points, which will reduce congestion, improve efficiency of movement for buses, and help reduce conflicting vehicle volumes across pedestrian/cycling desire lines.
- Moving potential parking garages to the periphery of the campus will increase travel distance to the campus core for vehicle users.

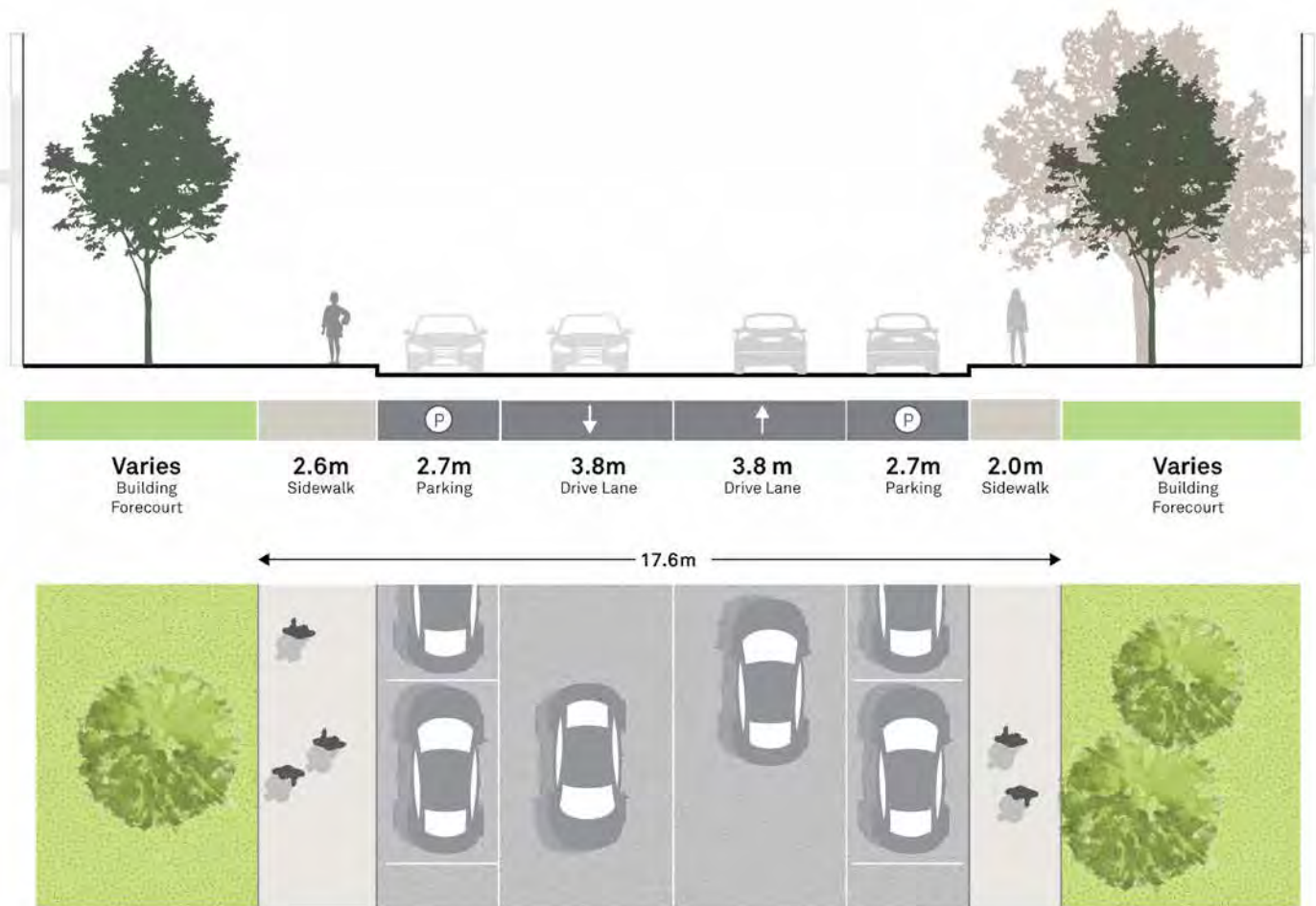
Accessibility

- Ensure an adequate number of accessible parking spaces are provided at locations throughout the campus to allow those using accessible permits to park adjacent or near to their intended destination.
- Ensure paratransit vehicles and those with accessible parking permits are able to use the campus' full network of shared and complete streets to park, pick up, and drop off as near as possible to their destinations.
- All internal streets and **shared streets** will accommodate service and emergency vehicles, with primary access/egress via the Bronson Avenue /Sunnyside Avenue /University Drive intersection (2019 Transportation Strategy).



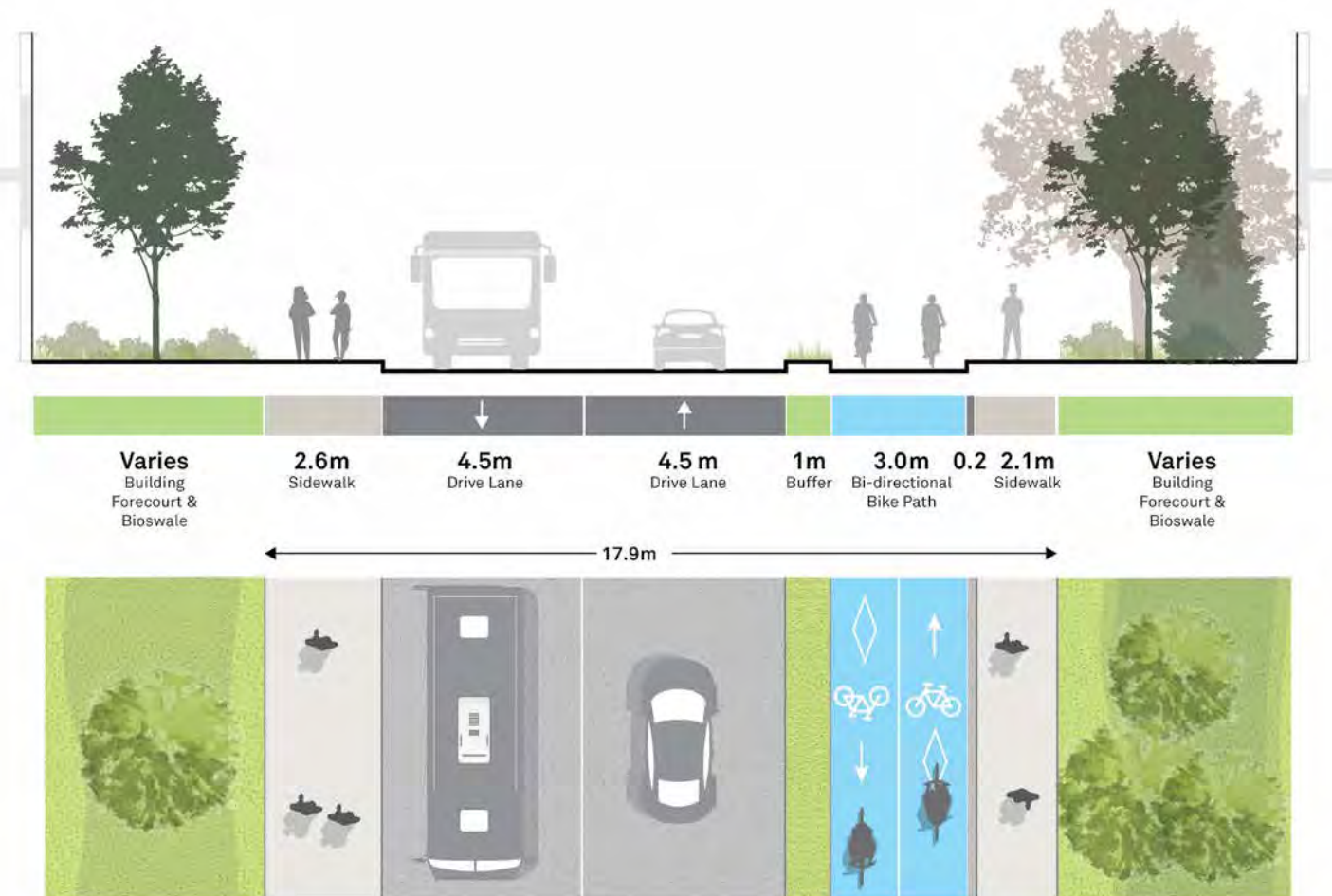


University Drive Existing



University Drive existing street section

University Drive Proposed



University Drive proposed street section. Note that the street section adjacent to the proposed Transit Hub will vary.

Tunnel Improvements and Expansions

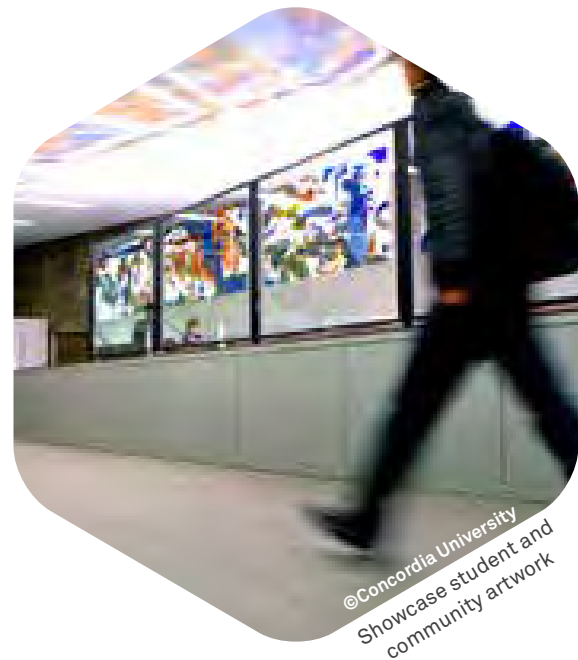
Carleton University's underground tunnel network is a valued amenity for mobility on campus, particularly in winter months. The tunnels present various challenges as identified through consultation with the broader campus community who use the system as pedestrians and staff who rely on the network for movement of goods, materials, and access to infrastructure. The series of underground passages were originally designed as maintenance paths for university staff, allowing fast movement between facilities in a climate-controlled environment. Today, in addition to serving their original purpose, the tunnels provide the campus community with a highly accessible alternative form of travel through the campus.

The Campus Master Plan Update aims to address a number of existing challenges with the tunnel system and looks to future connections to make the network more robust and useful within the East and North Campus Precincts.

Noted shortcomings of the tunnel system as identified through engagement with the campus community include:

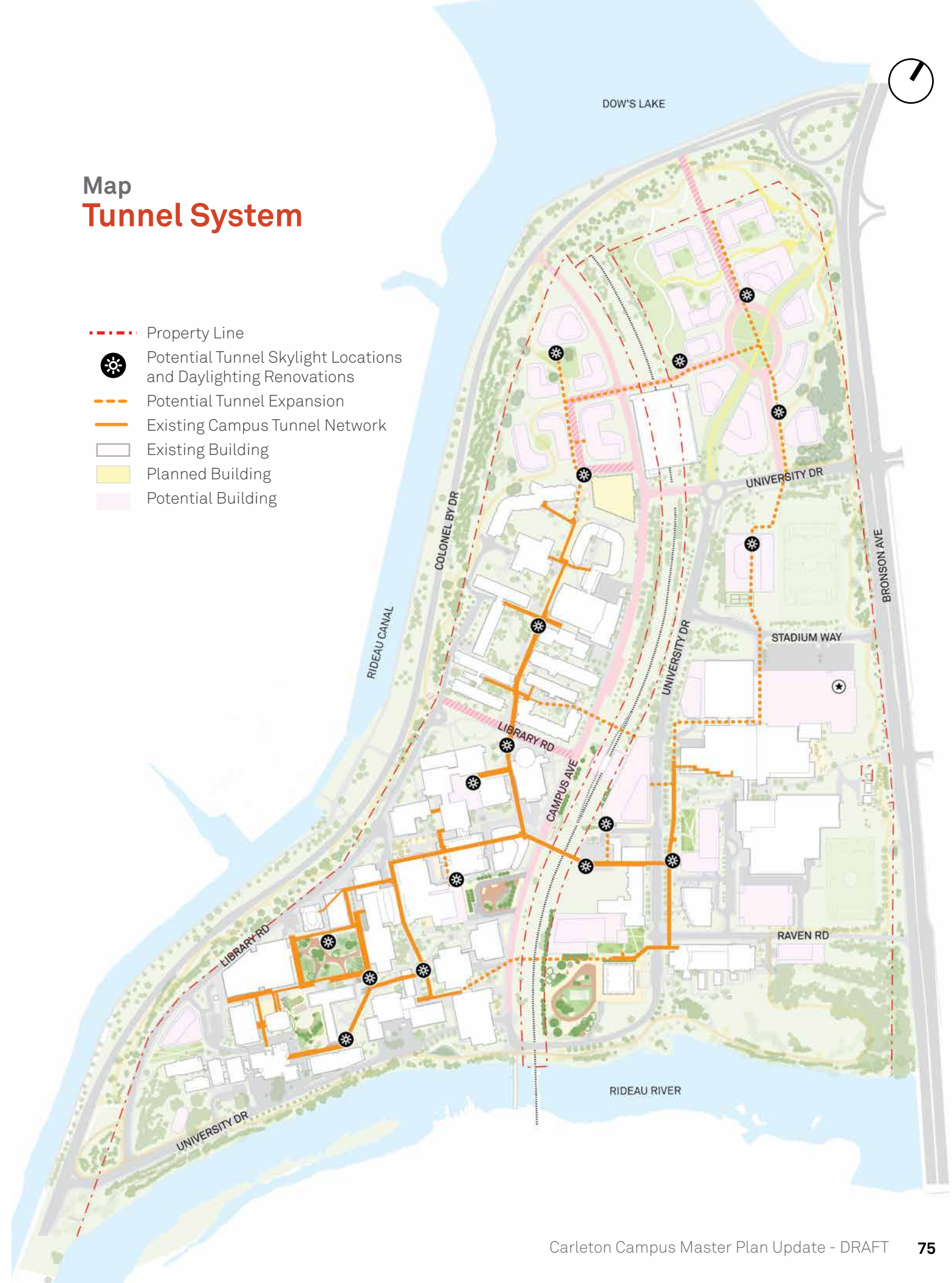
- Challenges in wayfinding for those unfamiliar with the system;
- A utilitarian aesthetic in materials and lighting;
- Lack of natural light; and
- Congestion in busy locations.

Opportunities exist for humanization of the tunnel system through a series of approaches. These include materials and lighting, daylighting, and connections and places.



Map Tunnel System

- Property Line
- ☼ Potential Tunnel Skylight Locations and Daylighting Renovations
- - - Potential Tunnel Expansion
- Existing Campus Tunnel Network
- ▭ Existing Building
- ▭ Planned Building
- ▭ Potential Building



Materials and Lighting

Material finishes can be upgraded in the most well-used areas of the tunnel system to improve the overall look and feel. Most interior tunnel surfaces are concrete and are both aesthetically unpleasing and contribute to noise amplification. Floor, wall, and ceiling finishes can be applied to the base structure to create an experience similar to a hallway within a building above grade. Incorporating a coloured and patterned resilient or tile floor surface, natural wall and ceiling materials such as wood, reflective materials such as glass and acrylic panels, and occasional bursts of colour will improve the aesthetic and acoustic qualities of the space and make them more pleasant to use while remaining robust and low maintenance.

Lighting fixtures within the tunnel system primarily consist of high-colour-temperature fluorescent fixtures which provide low colour-rendering and an institutional aesthetic quality. By retrofitting LED panel light fixtures within the tunnel network, lighting temperature, colour, and overall aesthetic qualities of the spaces can be significantly improved. Modern LED panel light fixtures are lightweight, dimmable, offer multiple colour temperatures, and can be surface-mounted or cable-hung. With high quality lenses, these light panels provide the appearance of a skylight and provide even lighting over large areas.

It is recommended that a pilot project include the addition of new surface finishes and LED panel light fixtures within a short section of the tunnel system. Response from users can be sought and recorded to develop strategies for future improvements of the larger system over time.



Skylights integrated into public spaces. (Amos Rex, a below-grade art museum, Helsinki, JKMM © Mika Huisman)



Westbrook LRT Station, Calgary. (© GEC Architecture)

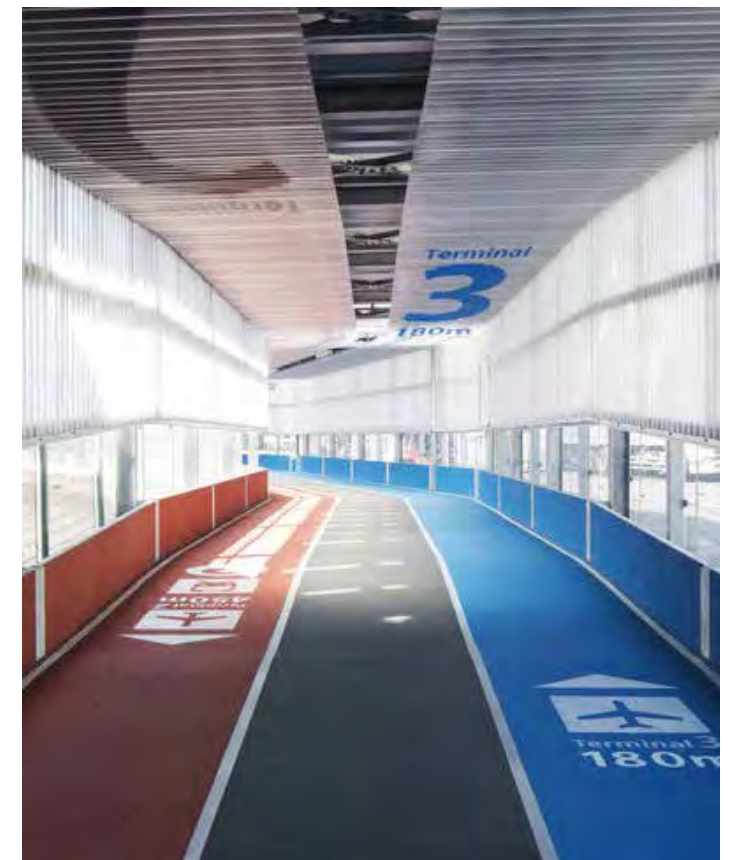
Daylighting

The introduction of natural light into the tunnel system at key locations will improve mental and physical health by creating visual connections and sunlight penetration into below-grade tunnels, and will improve wayfinding by establishing associations between above-grade landscape elements and nodes within the tunnels. This allows travelers to create a mental mind map that ties together what is happening above grade with the tunnel system, which is key to improving orientation, particularly for those less familiar with the tunnels. At prime locations, openings at the surface can be created with large aperture skylights, filtering sunlight into the tunnel below. Above the surface, the skylight can become a landscape element with integrated seating and planting. As a distinct landscape element in the fabric of the campus, associations can be created from above and below, tying the tunnel network into the overall campus wayfinding system.

Connections and Places

Creating nodes and additional large open skylit access points within the tunnel network will help animate and humanize the system, improve wayfinding, and encourage movement up into the vibrant ground floor areas of buildings on campus. The approach is best exemplified by the bright, open connection point at the northeast corner of the Nicol Building where natural light and ground floor activity spills into the widened, open tunnel from above. Additional locations for tunnel access points within building expansions, new buildings, and as glazed expansions to building edges will provide better intuitive connections between the tunnels and grade-related activities, introduce natural daylight at key points, and better integrate the below-grade circulation system with campus buildings and outdoor spaces.

Locations for potential daylighting and access points are indicated on the Tunnel System Map. It is recommended that these opportunities are explored as part of larger capital projects involving renovations, construction of new buildings and expansions, and improvements to outdoor spaces on campus. High congestion areas of the tunnel system, including portions between the Nideyinàn and the southwest corner of campus (VSIM, SR, HC, and Loeb) should be prioritized for new access points, daylighting, and aesthetic improvements. Where possible, heavily-used pinch points should be widened or additional redundant routes should be created to alleviate pressures and pedestrian traffic volumes.



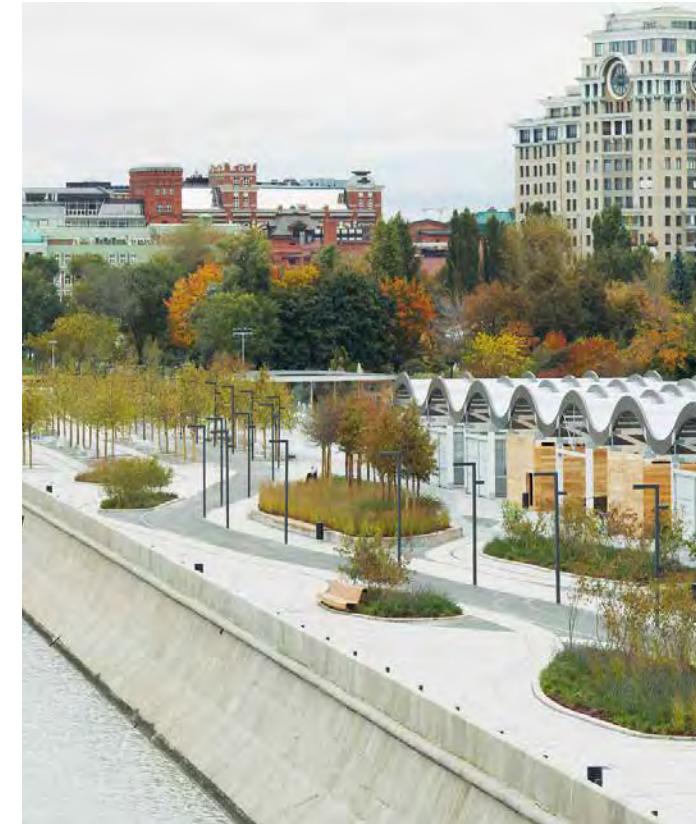
The Narita Airport hosts an exciting and playful wayfinding experience that integrates running tracks used for track and field and added signage for user-friendly guidance. (© Narita International Airport Terminal 3, Nikken Sekkei + Ryohin Keikaku + PARTY)

3.5 Open Space Framework

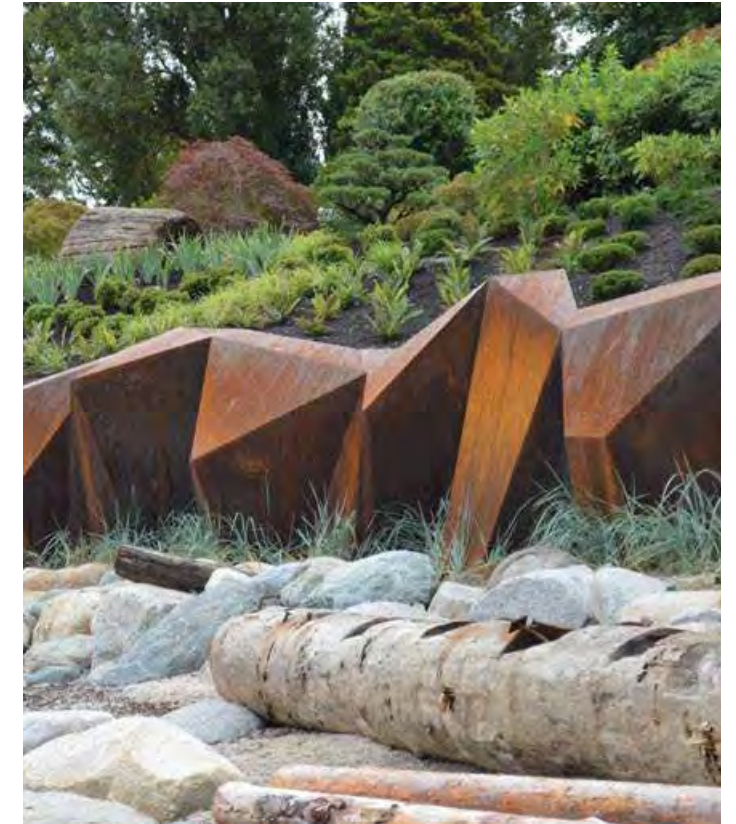


Variety in paving patterns, dense vegetation and large trees give a pedestrian walkway a luscious feeling. Beautiful pathways promote active movement, and can improve the sustainability of the campus by creating more pollinator gardens and bioswales. The immediacy of these elements in the pedestrian realm will reinforce these core values for anyone who visits the Carleton University Campus. (Buffalo Niagara Medical Capus Streetscape © Scape Studio)

As outlined in the Open Space Master Plan, open spaces are intended to promote the university's extraordinary landscape setting as a catalyst for learning and sustainability. This Campus Master Plan Update supports the goals and principles of the OSMP to reinforce the network of quads and outdoor spaces and improve connections to the natural environment, while offering additional design interventions that will enhance and promote open spaces on campus.



Channelized waterways provide opportunities for urban plazas, weaving trails with gardens, buildings, and look out locations. (Channelized waterfront walk way and park, Krymskaya embankment © Wowhaus Architecture Bureau)



This sculptural intervention mitigates shoreline erosion along the Pacific Ocean. A similar approach could be used at Carleton University. (© Paul Sangha Landscape Architecture)



Bioswale Garden at Cornell University, Ithaca, USA (© Chris Kitchen Photography)

Campus Green Ribbon & Geological Time Trail

The Campus Master Plan Update identifies the opportunity for a 4-kilometre Green Ribbon loop and 4.6-kilometre Geological Time Trail that will form an integral open space network weaving along built and natural areas in the core and periphery of the campus. The potential multi-use trail system will enhance the existing natural landscape of the campus and strengthen the connections between the Rideau Canal, Rideau River, Carleton University, and the surrounding community.

The proposed trail system responds to the campus community's desire for landscape integration, immersive engaging experiences, improvements to pedestrian mobility, recreational opportunities, and links between social spaces. The Green Ribbon and the Geological Time Trail will incorporate themes of Indigenous placemaking, health and wellness, local geological history, and climate adaptation. Furthermore, the trail will provide opportunities for robust landscaping best practices, rain gardens, bioswales, indigenous vegetation and year-round activities.



Map Green Ribbon & Geological Time Trail

- Property Line
- Green Ribbon Trail
- Geological Time Trail
- Potential Bioswale
- Potential Indigenous Cultural Marker or Artwork
- Existing Building
- Planned Building
- Potential Building

The Green Ribbon trail system will reinforce and rejuvenate the existing green frame around the Campus while also increasing opportunities for recreational activities, added connections to the regional ecological patch matrix and provide enhancements to the riparian corridor.



The City of Ottawa, in collaboration with Parks Canada will be undertaking a feasibility study to explore potential modifications to the Rideau Canal crossing at the Hartwell Locks. As part of the dialogue, there is an opportunity to enhance the existing pedestrian and cyclist connection from the Hartwell Locks into the campus through Colonel By Drive. Improving the existing bridge infrastructure and pedestrian crossing from the Rideau Canal into Library Road would increase safety and comfort, further encouraging people to flow from one space into the next, bringing people from the campus core down to the canal. The Campus Master Plan Update also suggests exploring the potential of implementing an additional pedestrian connection farther north, near Lanark House to connect with Library Road which leads to Campus Avenue. In addition, the CMPU proposes new pedestrian crossing enhancements as seen on the adjacent map to address the safety concerns noted by the staff and students during the consultation process.

While understanding the level of physical complexity of the Hartwell Locks, as well as the land ownership on the west side of Carleton, we strongly recommend that Carleton University continue to work collaboratively with the NCC to establish appropriate interventions along the canal to foster mutual benefits to the campus as well as the Rideau Canal.



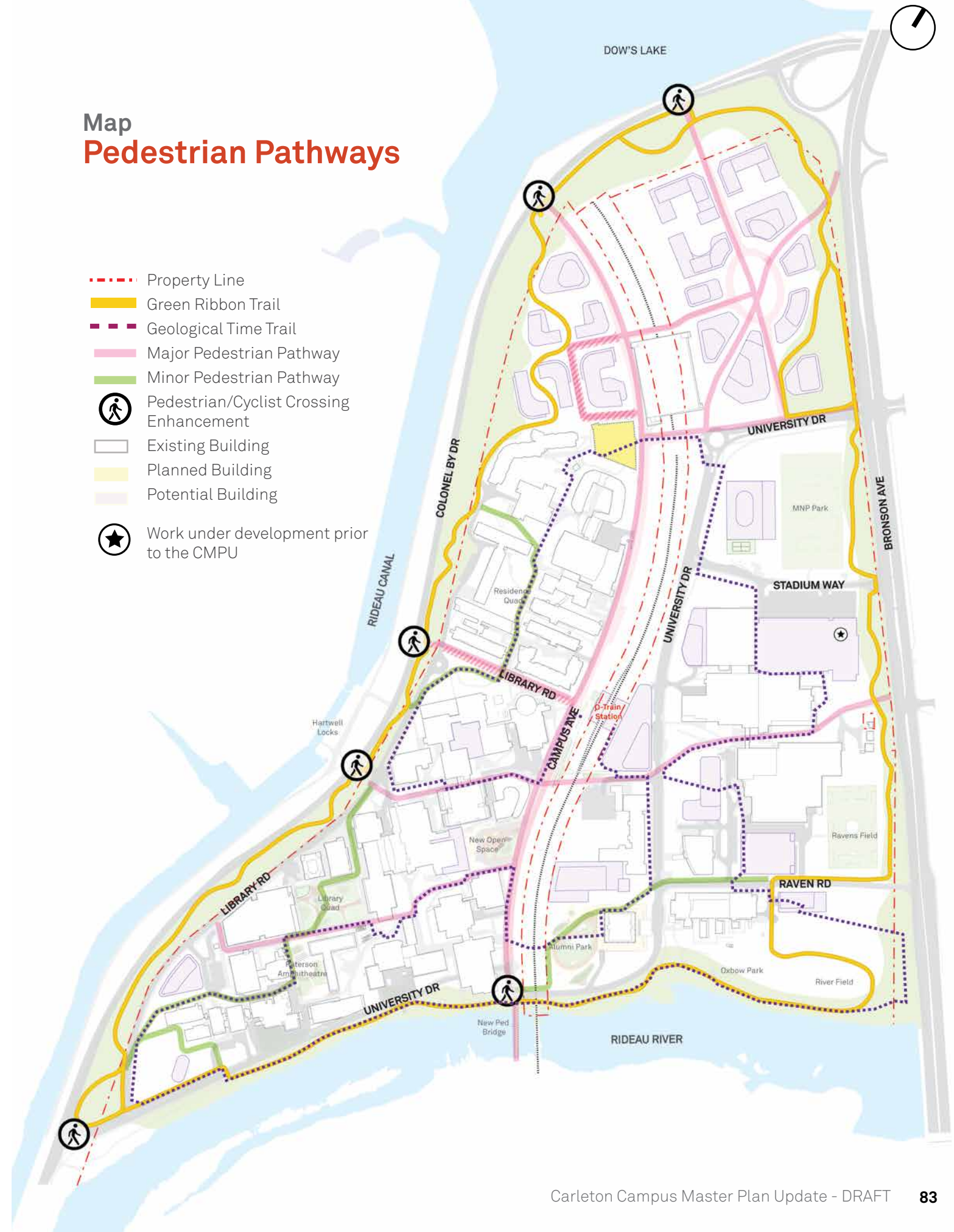
Aerial view of the Hartwell Locks. (© Google)



Existing view of one of the pedestrian/cyclist crossings at Hartwell Locks. (© Brook McIlroy)

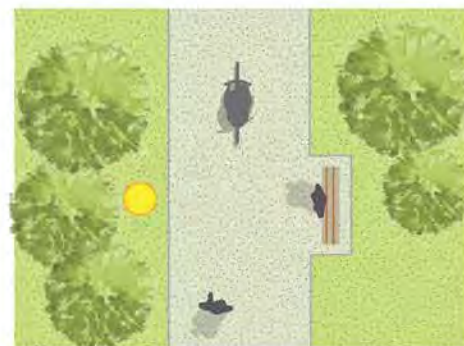
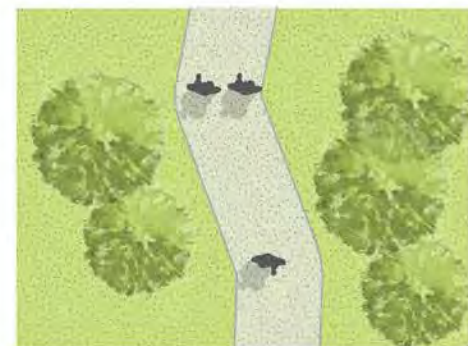
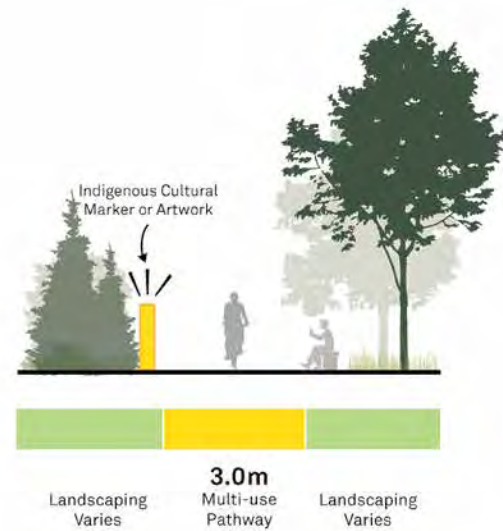
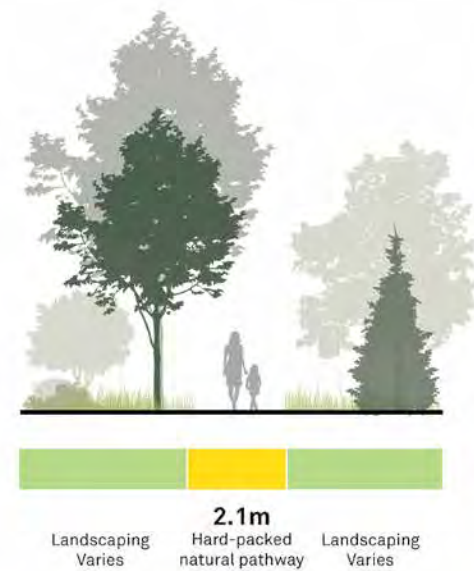
Map Pedestrian Pathways

- - - Property Line
- Green Ribbon Trail
- - - Geological Time Trail
- Major Pedestrian Pathway
- Minor Pedestrian Pathway
- Pedestrian/Cyclist Crossing Enhancement
- Existing Building
- Planned Building
- Potential Building
- Work under development prior to the CMPU



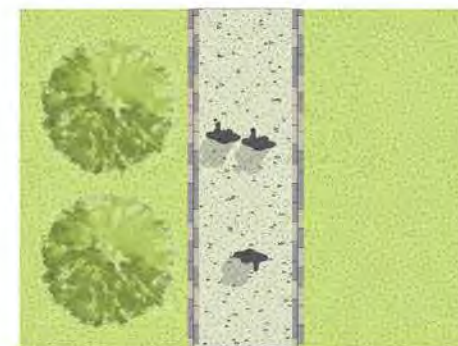


Green Ribbon Typologies



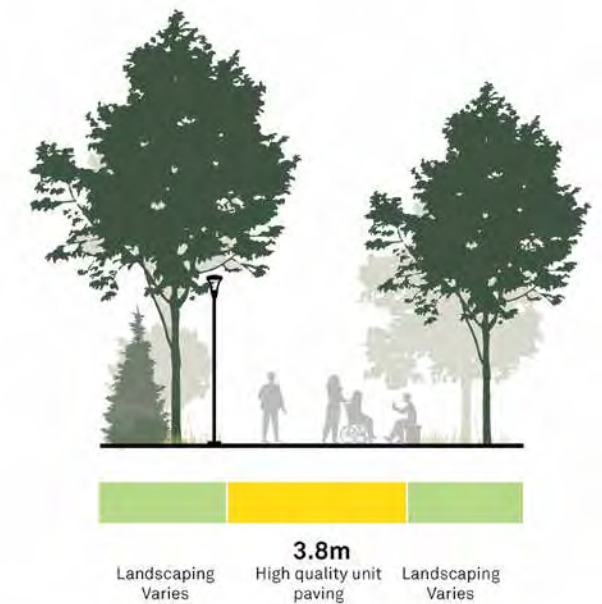
The Green Ribbon Trail will have varying widths ranging from 2.1m to 3m. The trails will provide opportunities for robust landscaping, bioswales, indigenous vegetation and year-round use and activity. Cultural Markers will be interwoven throughout Green Ribbon trail and will be used to communicate Indigenous, cultural and/or historic narrative of the land on which Carleton University resides. In the winter months, the Green Ribbon Trail network can be used for cross-country skiing, snowshoeing and winter trekking. Additional tree and site surveys will be required to determine the exact placement of the Green Ribbon Trail. Refer to key map for proposed widths.

Minor Pathway



Minor pathways have lower foot traffic than major pathways. These may include access and egress from secondary exits and entrances.

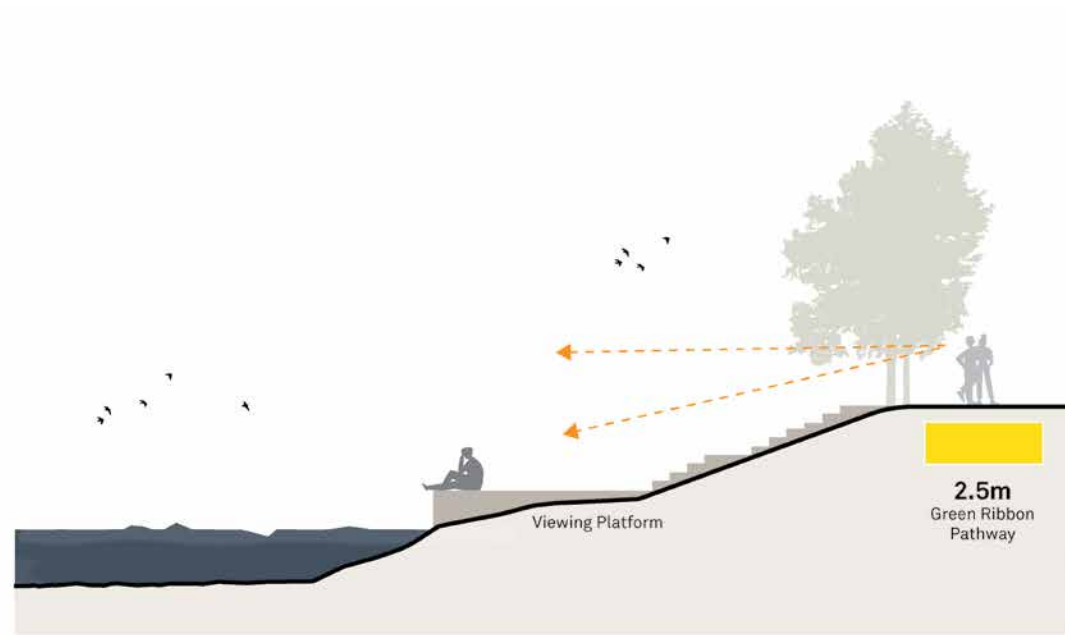
Major Pathway



Major pathways should be created with the highest quality design standards. Where possible, major pathways should be flanked by a row of trees on each side and have uniform lighting with frequent seating.



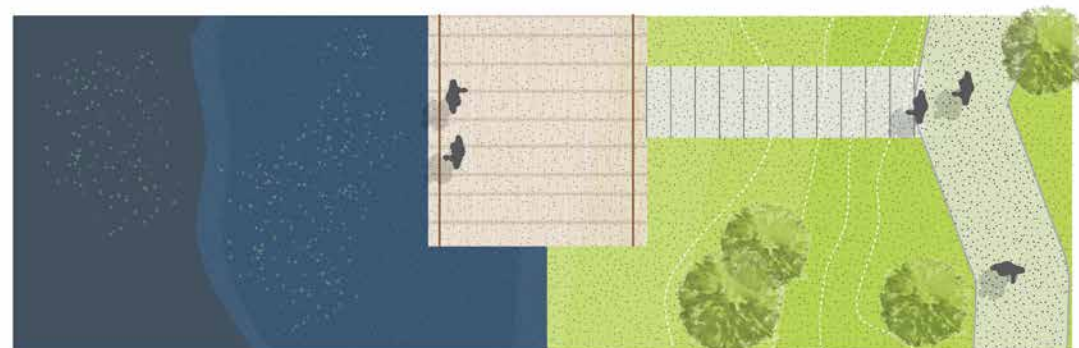
Rideau River Strategic Views & Platforms



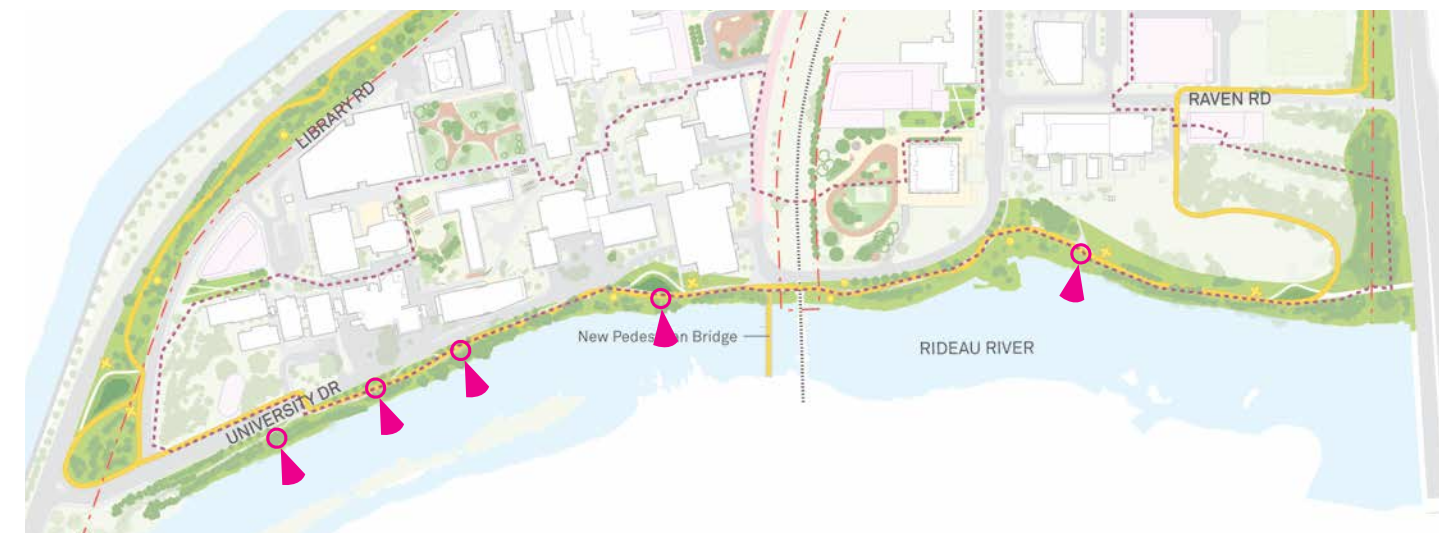
Example of a viewing platform at Låsby Søpark, Denmark.
(© Skanderborg)



Rideau River rapids looking towards Carleton University.
(© Brook McIlroy)



The image above is a proposed section of the Rideau River edge.



The image above is a diagram designating potential areas for rest and relaxation with strategic clearing for views. Note any vegetation removed from these viewing points should be replanted.

3.6 Urban Design Framework



Learning environments should support project-based learning, varied forms of collaboration and individual study spaces. Indoor and outdoor spaces should be designed to work together. Environmental sensitivity and sustainability should be prioritized in existing and new developments. Circulation around the campus should promote healthy activity, safety, and student engagement. Shaded decks provide space to collaborate and socialize. (TIDE Academy, United States, LPA © Jason O'Rear Photography)

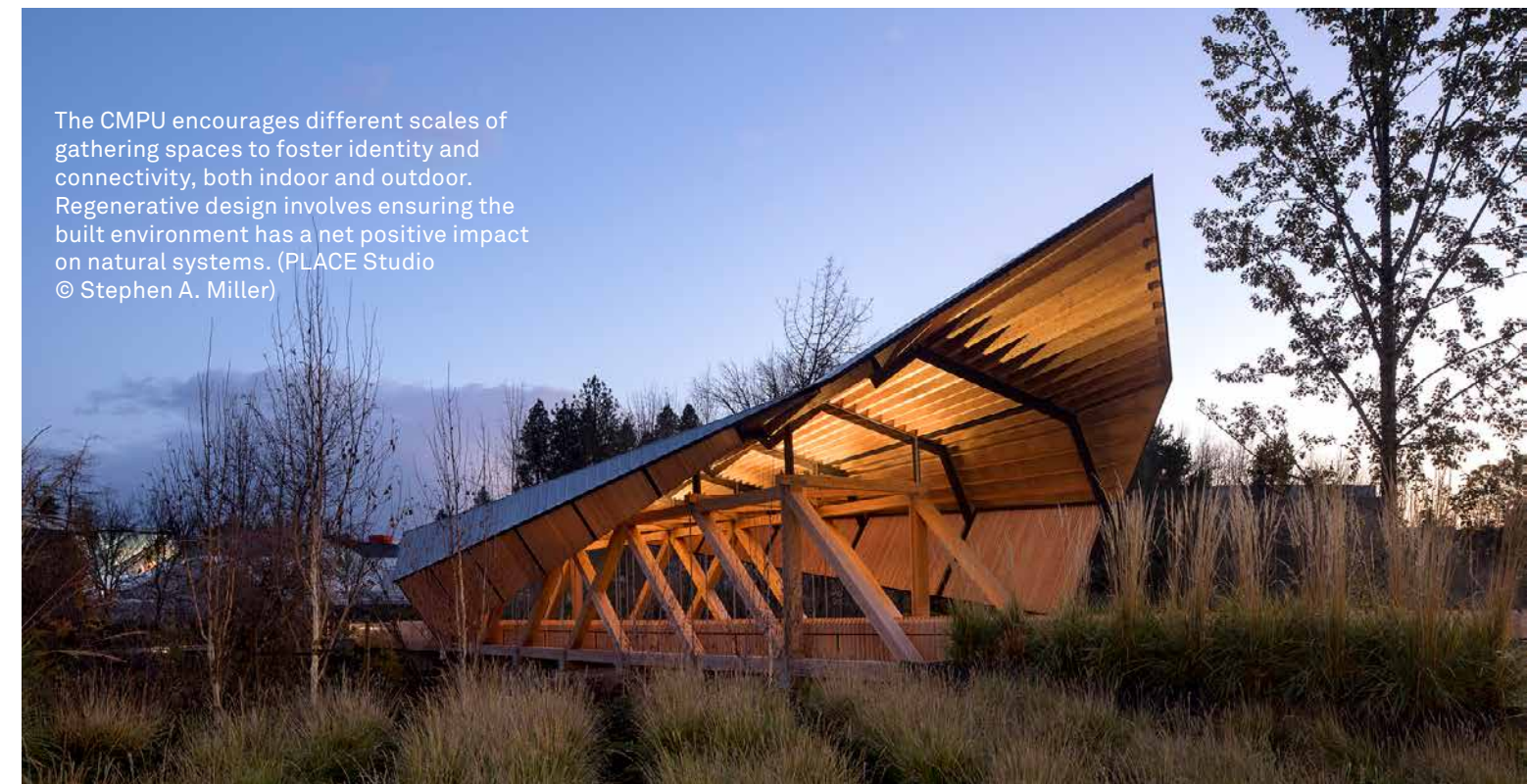
The approach to urban design at Carleton University weaves together each element of the overall Design Framework, including sustainability, natural systems integration, universal design and accessibility, transportation, and open spaces. Interventions that expand and improve existing buildings as well as the identification of sites for future construction to accommodate growth are included in the urban design framework. As teaching pedagogies and daily life on campus continue to evolve, so do the needs for spaces that embrace new ways of learning and interacting.

Relationship-building between diverse members of the Carleton community is a key component of the overall campus experience, and contributes to improved mental wellbeing, particularly for students. The urban design framework in this Campus Master Plan Update recognizes the short-term need for bright, vibrant social and collaboration spaces at the core of campus as well as long-term needs for buildings and infrastructure that can accommodate growth in academic, research, residence, support, and mixed-use programming.



Different space typologies should be designed to accommodate different types of learning: collaboration, contemplation, and concentration. (TIDE Academy, United States, LPA © Jason O'Rear Photography)

The CMPU encourages different scales of gathering spaces to foster identity and connectivity, both indoor and outdoor. Regenerative design involves ensuring the built environment has a net positive impact on natural systems. (PLACE Studio © Stephen A. Miller)



Potential Building Enhancements, Expansions, and Development Sites

The Carleton Campus contains a number of locations identified as having excellent potential for enhancements and expansions to existing buildings, construction of buildings with varied programs, as well as landscape and open space enhancements that capitalize on the spectacular natural setting of the campus.

The Campus Master Plan Update identifies development opportunities for renovation, renewal and expansion. New buildings will be strategically

located, well-scaled to fit within the existing context, and will provide opportunities for new and improved open spaces and pathways. The university currently has a number of development projects completed, underway, or planned for completion. These initiatives are considered within the overall long-term strategic development plan. Each major project illustrated in the adjacent plan will be described in more detail in the next chapter.



Map Potential Development Sites

- Property Line
- Existing Building
- Planned Building
- Potential Development Site
- ★ Work under development prior to the CMPU





4.0 Campus Master Plan Concept

- 4.1 Overview
- 4.2 West Academic Campus Precinct Plan
- 4.3 East Academic Campus Precinct Plan
- 4.4 North Campus Precinct Plan
- 4.5 The Multi-Campus Strategy

4.1 Overview

The Multi-Campus Strategy

Carleton University continues to evolve and grow not only at its main campus but also through the establishment of new satellite campus facilities. Carleton's Kanata North Campus and the Carleton Dominion-Chalmers Centre have expanded the geographical reach and presence of the university within the Ottawa region, while also expanding academic and research opportunities as well as connections with the larger Ottawa community. As part of this Campus Master Plan Update, it is important to highlight the presence of all three Carleton campuses in an effort to raise awareness, establish consistency in branding, and create unity between staff, students and faculty at all three locations as integral parts of the larger Carleton community.

The Main Campus

This Campus Master Plan Update establishes three main precincts: the West Campus, including the academic core and residences, the East Campus, comprising mixed academic, research, recreation, and support buildings, and the future mixed-use North Campus. The precincts have been analyzed through a series of 2- and 3-dimensional plans and models. Each precinct varies in use, size and character, and is analyzed based on its distinct attributes and opportunities. The following plans were shaped by the Campus Vision, Guiding Principles and the Design Framework which have all been informed by a rigorous consultation program with Carleton University.

The identified opportunities for this Campus Master Plan Update are outlined through key focus areas located within in each precinct. The 2- and 3- dimensional illustrations convey the proposed recommendations, are conceptual in nature, and

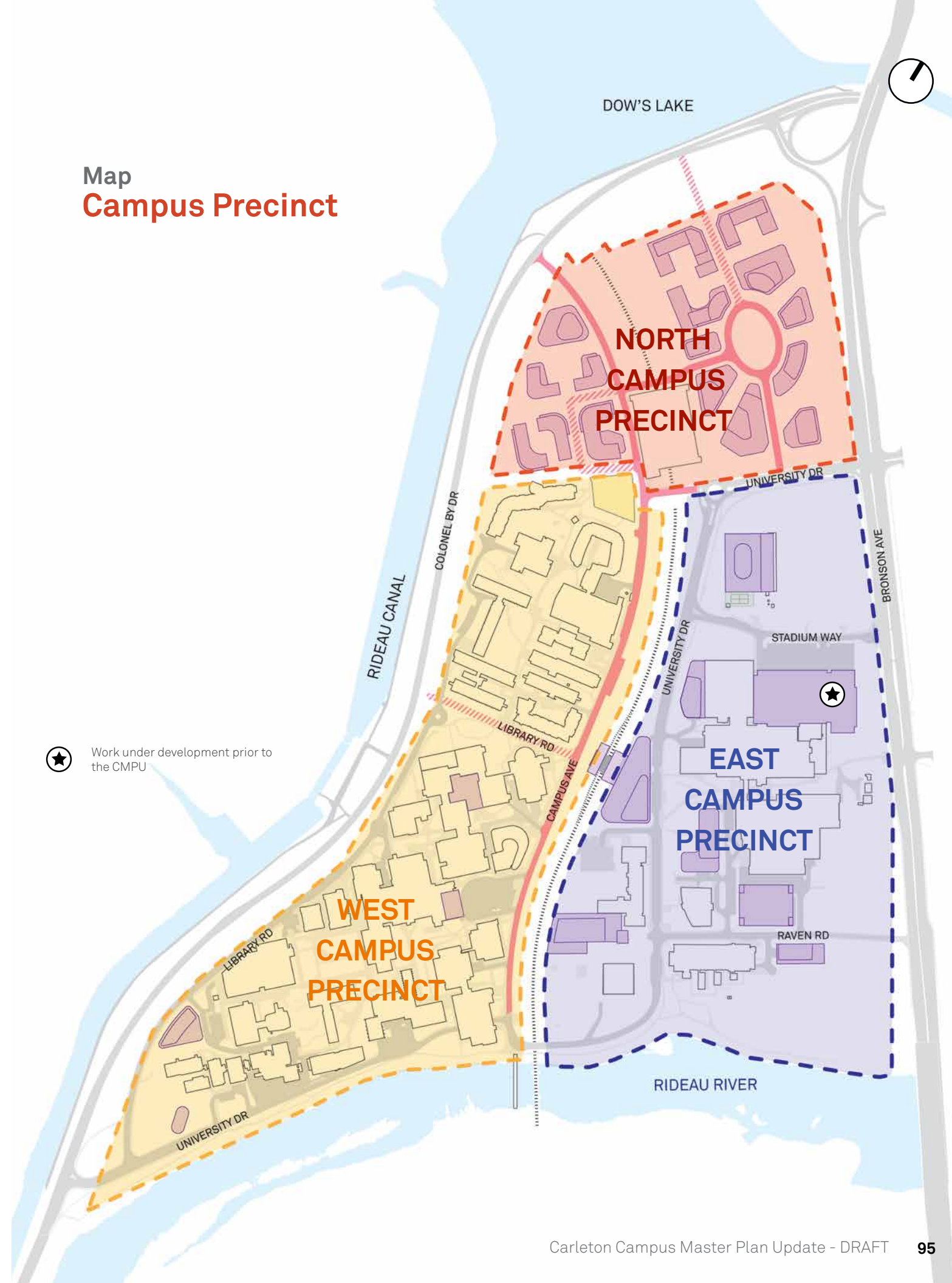
demonstrate what is possible at each site based on the feasibility of the built form and aspirations for the future of the Carleton campus.

Precincts for Carleton University include:

- **West Campus (WC)** bound by Leeds House Residence to the north, the LRT corridor to the East, Rideau River to the south and NCC Lands and Rideau Canal to the west.
- **East Campus (EC)** bound by University Drive to the north, Bronson Avenue to the East, the Rideau River to the south and the LRT corridor to the west.
- **North Campus (NC)** bound by Colonel By Drive to the north, Bronson Avenue to the east, University Drive and Leeds House Residence to the south and Colonel By Drive to the west.

This section presents enhancement and development opportunities on campus for the short, mid and long term. The design and development directions for this Campus Master Plan Update are intended to promote high-quality urban design and provide flexibility for future growth on campus. Development is anticipated to occur incrementally to limit congestion imposed by construction and to reflect the evolving space, facility and service needs. Carleton may explore development opportunities beyond the ones that have been identified, however, this will be dependent on funding and evolving campus priorities.

Map Campus Precinct



The identified locations for new buildings, building expansions, public space interventions, campus connections and gateways displayed in this document have been selected based on feedback obtained through the consultation process, as well as through specific investigation of site potential and opportunities. Development on campus will work to form a walkable, connected, and human-scaled system of unified and complementary campus spaces that serve users of all ages and abilities at all times of the day and year. This includes landscaped and natural open spaces that encourage gathering and individual creativity, framed by beautiful, thoughtfully-designed buildings.

Key Campus Master Plan Update moves include:

1. Enhancements to courtyards and outdoor spaces.
2. Reinforcement of pedestrian connections and linkages through campus green spaces and courtyards.
3. Improvements to pedestrian and vehicle gateways at key entry points to campus, strengthening sense of arrival, wayfinding, and orientation.
4. Transition of Campus Avenue and Library Road into shared pedestrian-oriented streets with enhanced public realm features.
5. Incorporation of cycling infrastructure along Campus Avenue and Library Road to improve active modes of transportation on campus.
6. Identification of potential building interventions, expansions, and new building sites to create more flexible collaboration and social space, optimize site uses, define campus edges, improve street animation, and provide opportunities for future growth.
7. Addition of a Mixed-Use Transit Hub at the existing P4 parking lot, providing an opportunity to create a consolidated welcoming entry and waiting point at the core of the campus for transit users.
8. Creation of a Green Ribbon and Geological Time Trail as a system of pathways woven along built and natural areas in the core and periphery of the campus, establishing additional linkages to the Rideau River and Canal. The path will support sustainable design for climate, biodiversity and stormwater management and provides additional outdoor learning opportunities.
9. Improvements for humanization of the tunnel system, including lighting, connections, and material enhancements.
10. Implementation of a potential parking garage on the east campus to consolidate and accommodate the removal of surface parking and decommissioning of the P9 parkade in 2024.

01(TB)	TORY BUILDING
02(ML)	MACODRUM LIBRARY
03(PA)	PATERSON HALL
04(SA)	SOUTHAM HALL
05(RH)	RENFREW HOUSE
06(LH)	LANARK HOUSE
07	NIDEYINAN
08(GY)	GYMNASIUM
09(AC)	ATHLETICS BUILDING
10(ME)	C.J. MACKENZIE BUILDING
11(MB)	MAINTENANCE BUILDING
12(SC)	STEACIE BUILDING
13(HP)	HERZBERG LABORATORIES
14(RU)	RUSSELL - GRENVILLE HOUSE
15(LA)	LOEB BUILDING
16(NB)	H.H.J. NESBITT BIOLOGY
17	PIGIARVIK
18(GH)	GLENGARRY HOUSE
19	TERAANGA COMMONS
21(DT)	DUNTON TOWER
22(AA)	ARCHITECTURE BUILDING
23(SP)	ST. PATRICK'S BUILDING
24(SR)	SOCIAL SCIENCE RESEARCH BUILDING
25(AR)	ARISE BUILDING Advanced Research and Innovation in Smart Environments
26(SD)	STORMONT-DUNDAS HOUSE
27(MC)	MINTO C.A.S.E.
29(TT)	CARLETON TECHNOLOGY & TRAINING CENTRE
30(LE)	LEEDS HOUSE
31(AT)	AZRIELI THEATRE
32(AP)	AZRIELI PAVILION
33(NW)	NATIONAL WILDLIFE RESEARCH CENTRE
34(PH)	PRESCOTT HOUSE
35(FH)	FIELDHOUSE
36(AH)	ALUMNI HALL
37(HC)	HUMAN COMPUTER INTERACTION BUILDING
38(VS)	VISUALIZATION & SIMULATION BUILDING
39(IH)	CARLETON ICE HOUSE
41(FR)	FRONTENAC HOUSE
42(CB)	CANAL BUILDING
43(RB)	RICHCRAFT HALL
44(LX)	LENNOX - ADDINGTON RESIDENCE
46(PS)	PARKING STRUCTURE
47(UH)	URBAN DALE CENTRE
48(--)	FOR HOME ENERGY RESEARCH
49(HS)	NEW RESIDENCE BUILDING
50(NI)	HEALTH SCIENCES BUILDING
72(SS)	NICOL BUILDING
73(KH)	BRONSON SUBSTATION
74(--)	MNP PARK ENGINEERING DESIGN CENTRE WELLNESS HUB

- - - Property Line
- Existing Building
- Planned Building
- Potential Building
- Potential Campus Courtyards
- Green Ribbon Trail
- Work under development prior to the CMPU



4.2 West Campus Precinct Plan

Future Development of the West Campus

The West Campus Precinct, comprised of approximately 52 acres (21 ha) of land, has served as the academic and research core of Carleton University since its inception and continues to be the heart of campus life for many students, staff, and faculty members. The west campus contains a number of program and faculty-specific buildings, as well as shared common spaces that benefit all members of the campus community, regardless of their area of work or study.

Through extensive engagement with hundreds of members of the campus community, the most consistent desire expressed was for increased informal collaborative spaces in the core of the west campus. The need for more flexible, open, bright, and lively spaces that encourage social interaction and collaboration is common on campuses across North America, particularly as technology allows

for greater flexibility for work purposes, gathering and studying. The ability to undertake a number of independent and/or collaborative activities surrounded by the vibrancy of daily campus life is what makes spaces like the new Nicol atrium incredibly successful and a defining feature of the Carleton experience.

The Campus Master Plan Update's approach to development in the west campus focuses on the creation of new spaces and buildings that add to the success of the Nicol atrium and other precedent spaces by both capitalizing on existing buildings and infrastructure, as well as future opportunity sites. The goal of the west campus is to create spectacular spaces that will draw people to the campus throughout the day and year, and encourage them to stay and experience the best of campus life.



Map
West Campus Precinct

- W# Potential Building
- - - Precinct Boundary
- Existing Building
- Planned Building
- Green Ribbon Trail
- ★ Work under development prior to the CPMU

4.2.1 Mackenzie Atrium W1



The inspiration for the Mackenzie Atrium stems from the success of large-volume brightly-lit spaces that tie together adjacent, but separate work and study spaces. Originally referred to as a 'Fort' due to its narrow windows and austere appearance, the building's first two blocks, now the northwest and northeast blocks, together with a central connector, were opened in 1964. The southwest and southeast blocks were constructed several years later and created the Mackenzie courtyard, serving as a principal access point and unifying outdoor space, framed on all sides by the building.

Inspired by the success of the Nicol Building atrium as a cross-disciplinary collaboration and social space catering to all members of the campus community, the courtyard of the Mackenzie building presents an opportunity to create a new, large indoor atrium space that takes advantage of the existing structures and walls of the building, minimizing required construction materials. The vision for the Mackenzie Atrium involves enclosing the space with a glass skylight roof supported by tree-like mass timber columns. A new glass south wall creates a main entrance to the complex and allows the Atrium to function as both main lobby and central social space.











Mackenzie Building northwest and northeast blocks (centre), 1965 © City of Ottawa

Development & Public Space Opportunities



Site W1 opportunities and existing condition. View looking northwest.

- | | | | |
|---|---|--|---|
|  Bioswale |  Gateway |  Potential Development Site |  Potential Flexible Campus Street |
|  Pedestrian Connection |  Daylighting Renovations |  Proposed Open Space & Enhanced Landscape |  New Roundabout |



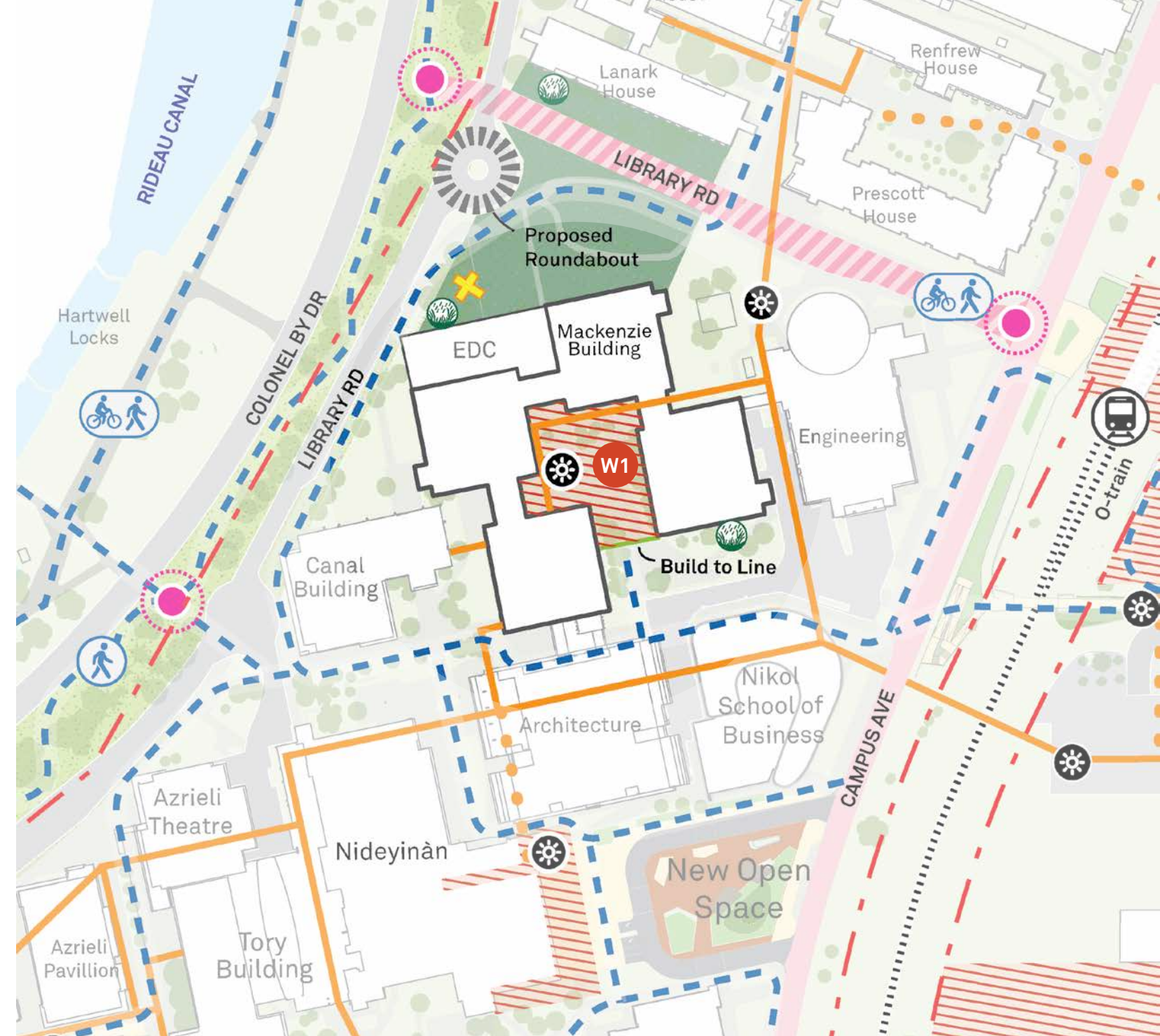
Site W1 potential courtyard addition. View looking northwest.



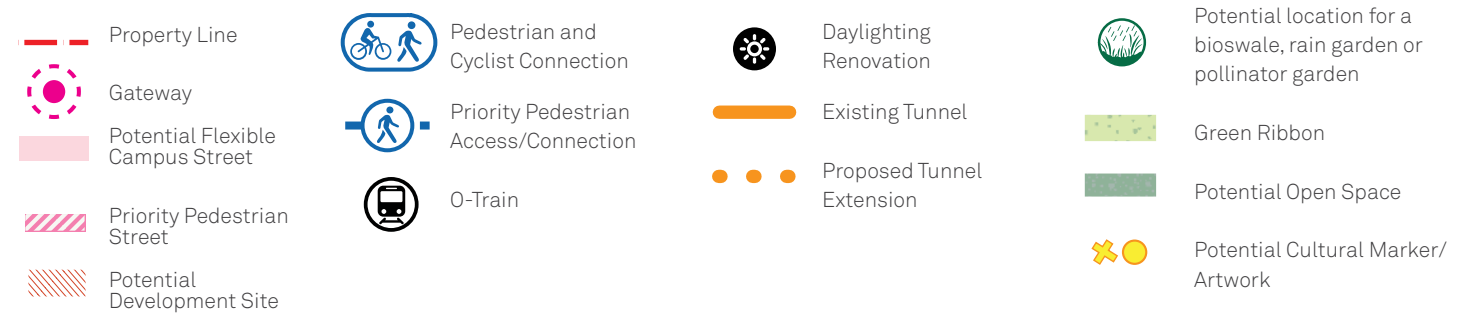
Example of enclosed atrium providing seating for socializing and rest as well as indoor greenery. (Lazardis Hall, Wilfrid Laurier University, Waterloo; Diamond Schmitt Architects & David Thompson Architect © Doublespace Photography and Tom Arban)

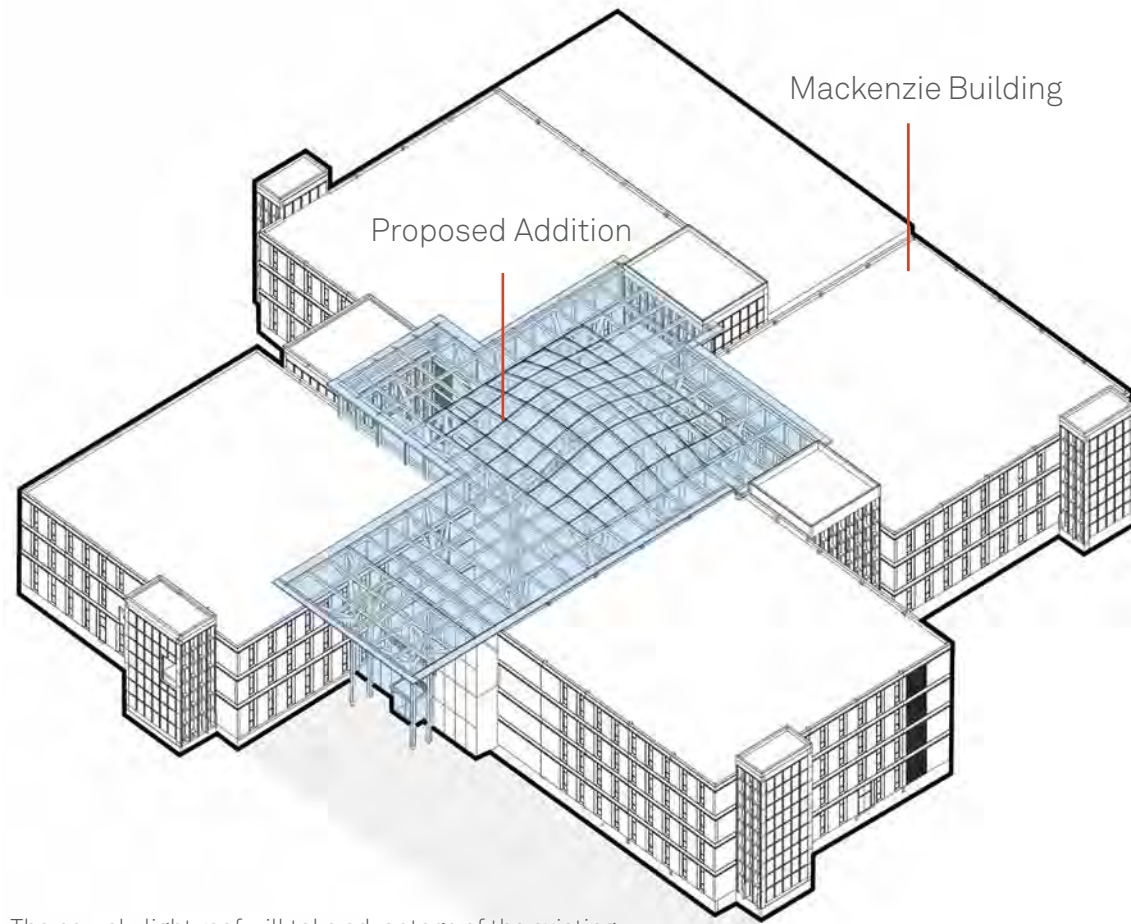


Example of enclosed atrium designed with tree-like columns and natural material cladding to evoke a sense of the outdoors. (Nine Bridges Country Club, Shiguru Ban Architects © Hiroyuki Hiarai)



The above illustration shows Mackenzie Atrium's potential buildable area, adjacent pedestrian connections, potential open spaces, and context.



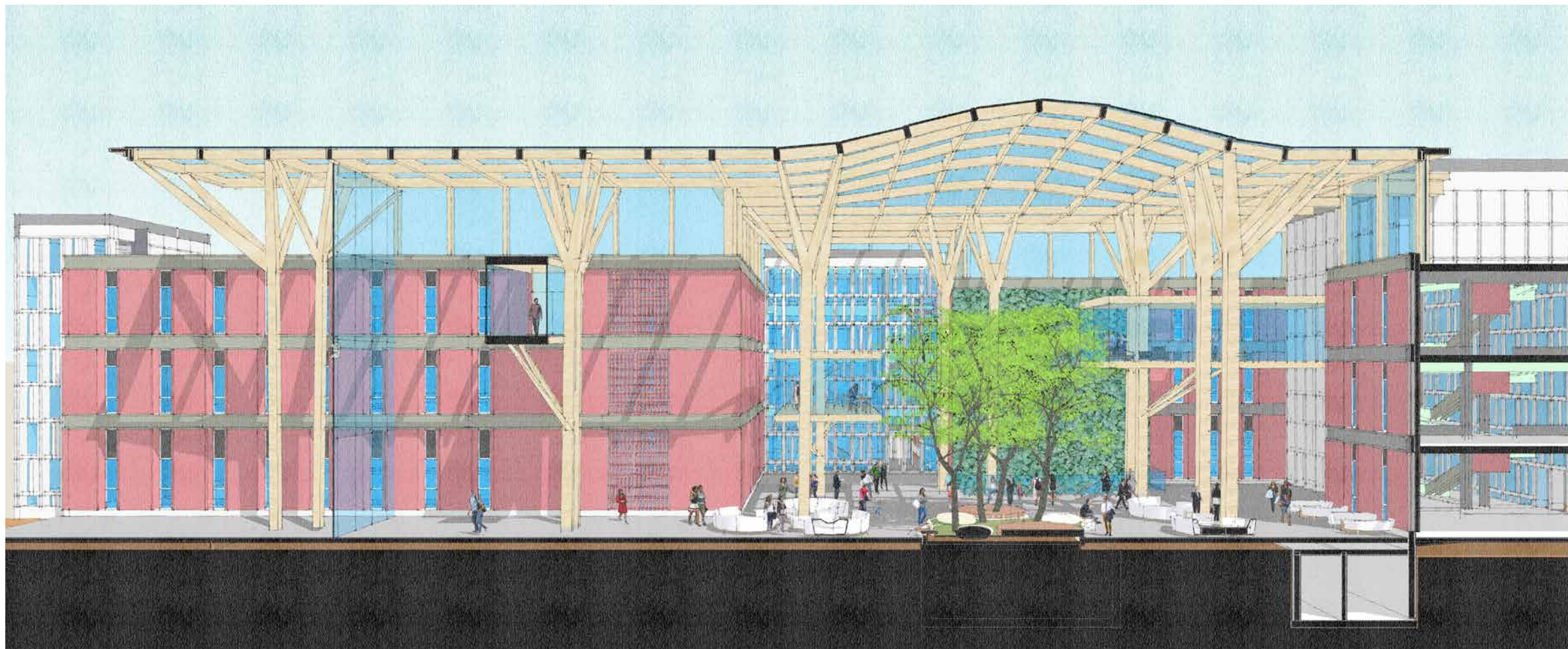


The new skylight roof will take advantage of the existing walls of the building to create a four-storey enclosed atrium. Housing a mass timber structure will allow for organic shapes to be formed in contrast with the existing austere facades.

Within the Atrium, platforms containing seating and tables are located at various heights and function as intimate breakout and study spaces within the larger four-storey volume. At the ground level, indoor landscape planting, a green wall, and clusters of informal seating and study areas create a large, lively collaborative atmosphere at the heart of the campus. An opening in the floor surface connects the atrium space with the tunnel system below, providing natural light, pedestrian connections, and wayfinding improvements. The Atrium will serve as the first major indoor node of activity south of the new Library Road pedestrian-priority street and student residences farther to the north.

Rendered views of proposed (or "potential") enclosed Atrium space with seating and study spaces at various heights. Indoor trees and mass timber beams bring nature into the space.



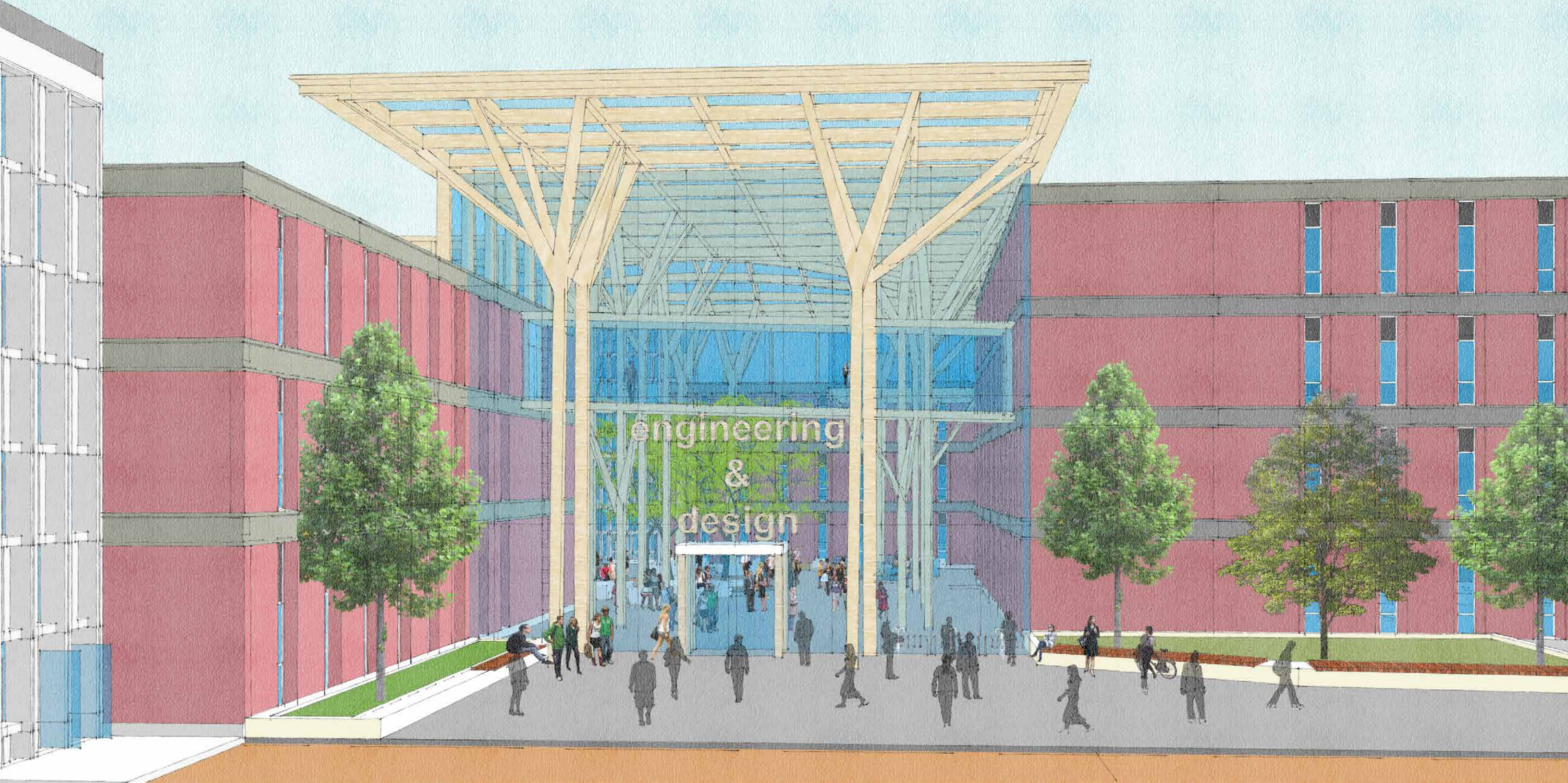


- ▶ A staircase descending into the tunnels will create opportunities to bring in natural light, air, and vibrancy.

A bridge linking the two southern building wings will improve overall circulation, accessibility and wayfinding.



On the south elevation, a new transparent façade will act as the main entrance to the building. A row of tree-like columns will offer character to the entryway and provide shelter through the glazed canopy.



4.2.2 Nideyinàn East Expansion and Renovation

W2



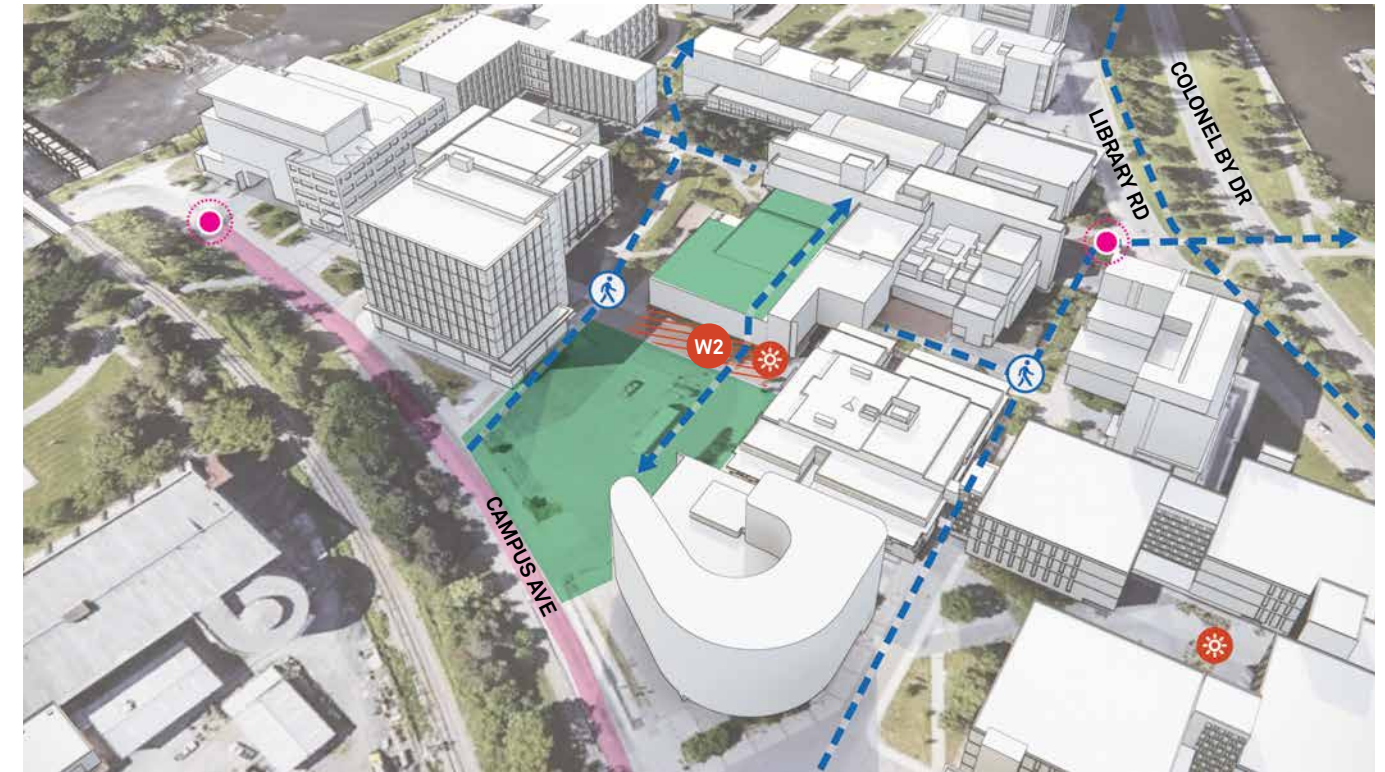
Throughout consultation and engagement activities for the Campus Master Plan Update, the Nideyinàn was referenced as the building on campus with the most opportunities for improvements in wayfinding, quality of space, and legibility.

As the Nideyinàn expanded and eventually connected to the Tory Building to the west, pedestrian circulation became more challenging. Presently, a series of enclosed stairways in the centre of the building provide access to various spaces and services. Wayfinding is challenging and cannot be resolved with clearer signage— a more legible circulation path with visual connections between components of the building will help in orientation and present opportunities for the creation of new social, study, and collaboration space with integrated vertical circulation and access to upper levels of the building.







The OSMP presented opportunities for the creation of a new Campus Avenue Quad, framed by the Nideyinàn to the west, Architecture and Nicol Buildings to the north, and the Health Sciences Building to the south. A key recommendation to address many of the issues identified above, as well as to create a strong, welcoming arrival point framing the western edge of the new quad, involves the construction of a narrow eastern addition to the Nideyinàn.

The addition opens the building's east, north, and south facades, creating a new legibility for building navigation from the outside and interior, tying together various components vertically in a tall glass volume. Within the new space, an open stair connects social and collaboration space at the ground floor with existing food services and additional collaboration and study space above, ultimately connecting to a new rooftop terrace and glazed walkway. The generous naturally lit walkway provides direct access to the building's central food, beverage, and student services, and to the Tory Building to the west.

Development & Public Space Opportunities

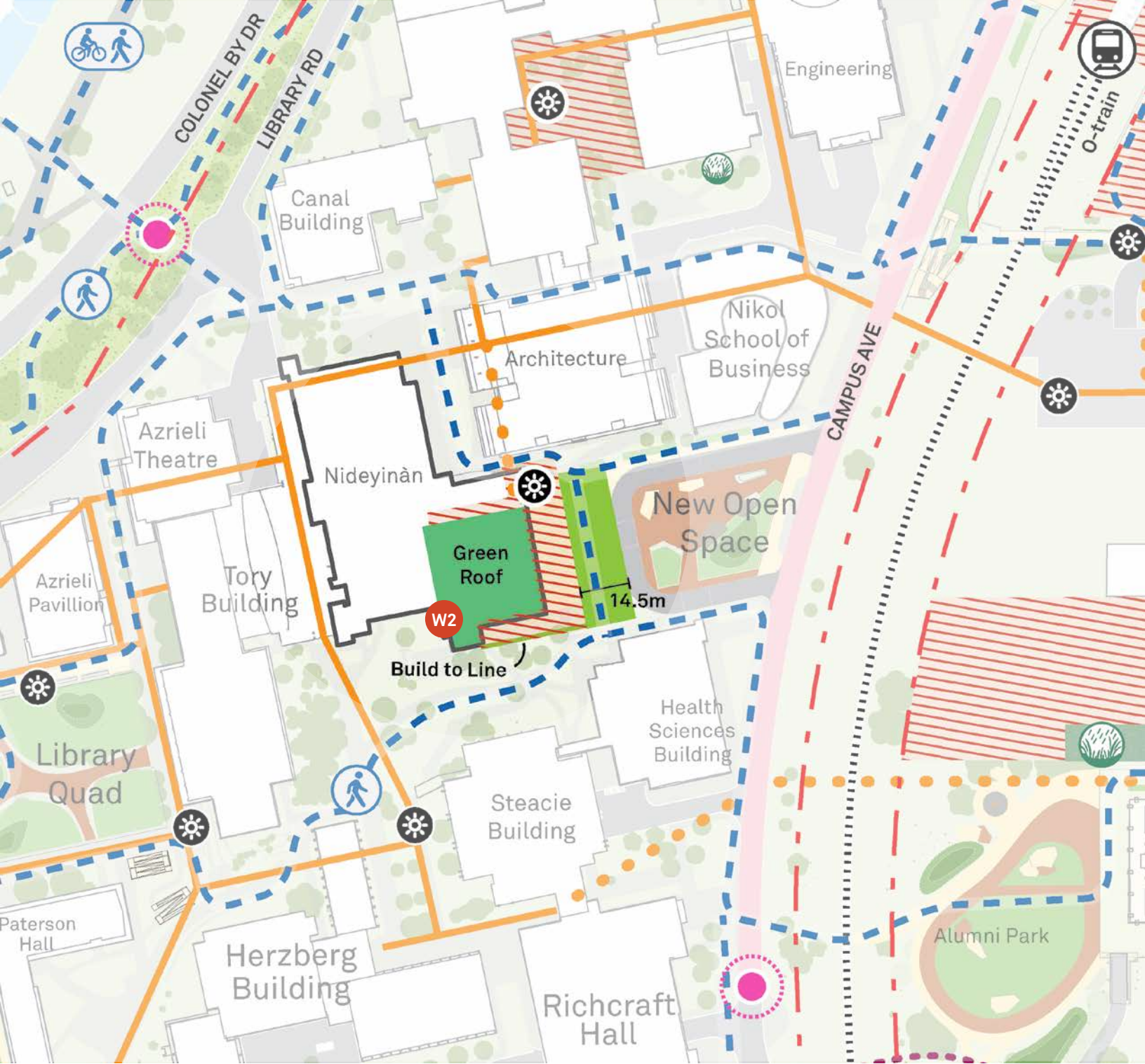


Site W2 opportunities and existing condition. View looking southwest.

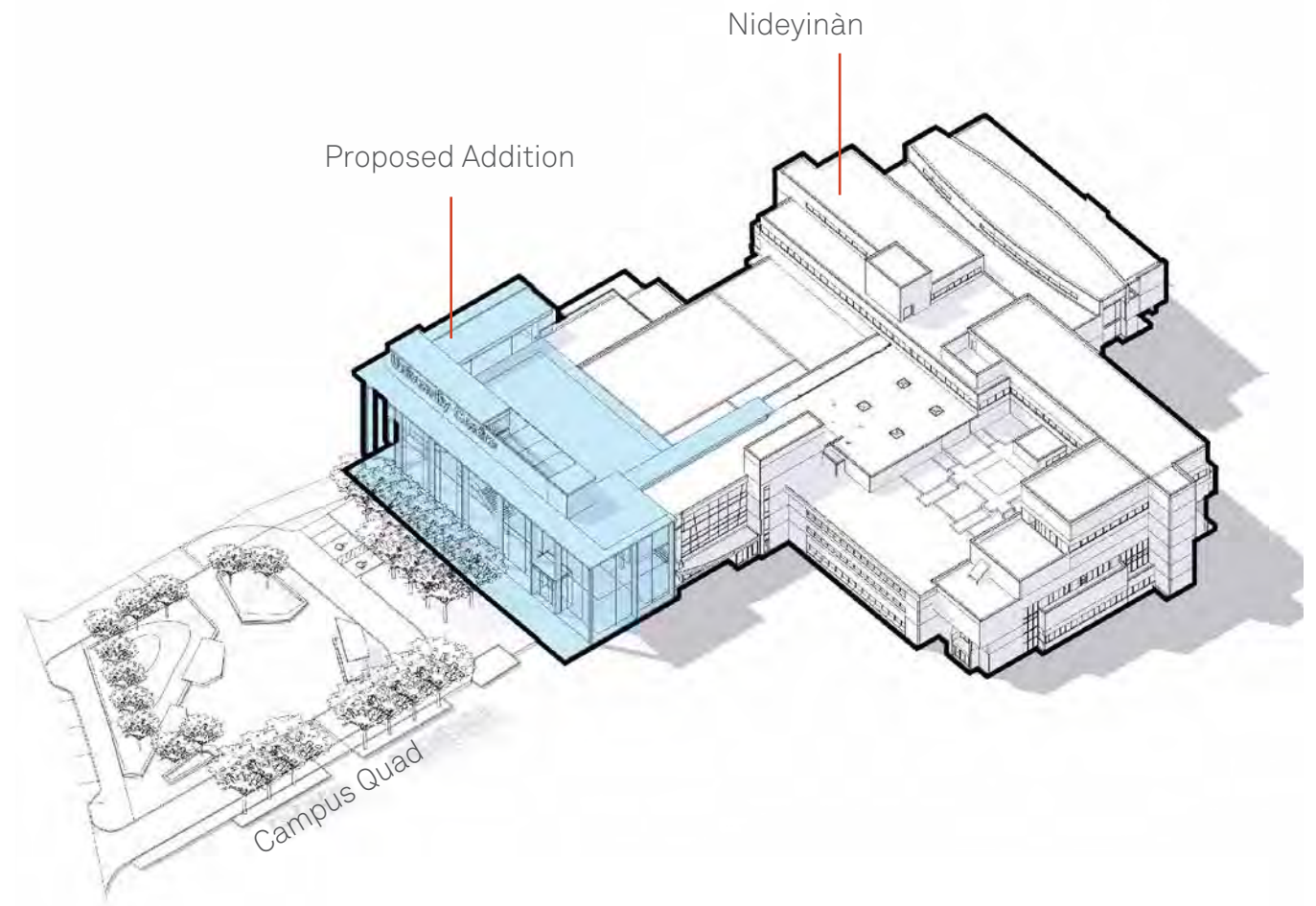
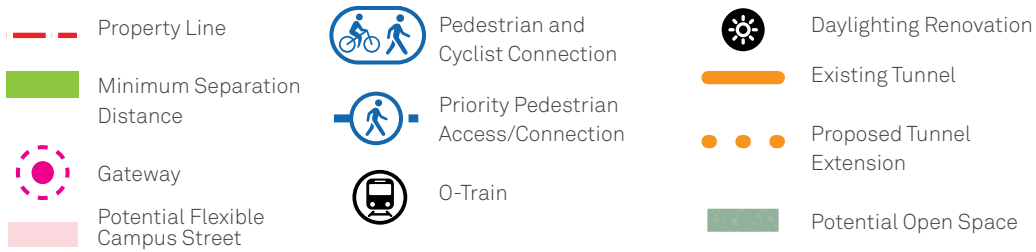
-  Bioswale
-  Gateway
-  Potential Development Site
-  Potential Flexible Campus Street
-  Pedestrian Connection
-  Daylighting Renovations
-  Proposed Open Space & Enhanced Landscape



Site W2 potential development. View looking southwest.



The above illustration shows the Nideyinàn Addition's potential buildable area, separation distance from the Campus Quad, adjacent pedestrian connections, and context.



The eastern addition to the Nideyinàn improves legibility and provides a new vertical connection to the ground floor of the Tory Building. The renovated façade will frame the new Campus Avenue Quad with an inviting and transparent tall volume.

Exploded axonometric view showcasing the proposed building addition.



The existing eastern entrance and food court of the Nideyinàn will be expanded and renovated to improve wayfinding and offer new social spaces for students. The building intervention aims to brighten up the interior and provide a prominent visual connection to a staircase leading to a publicly accessible green roof.

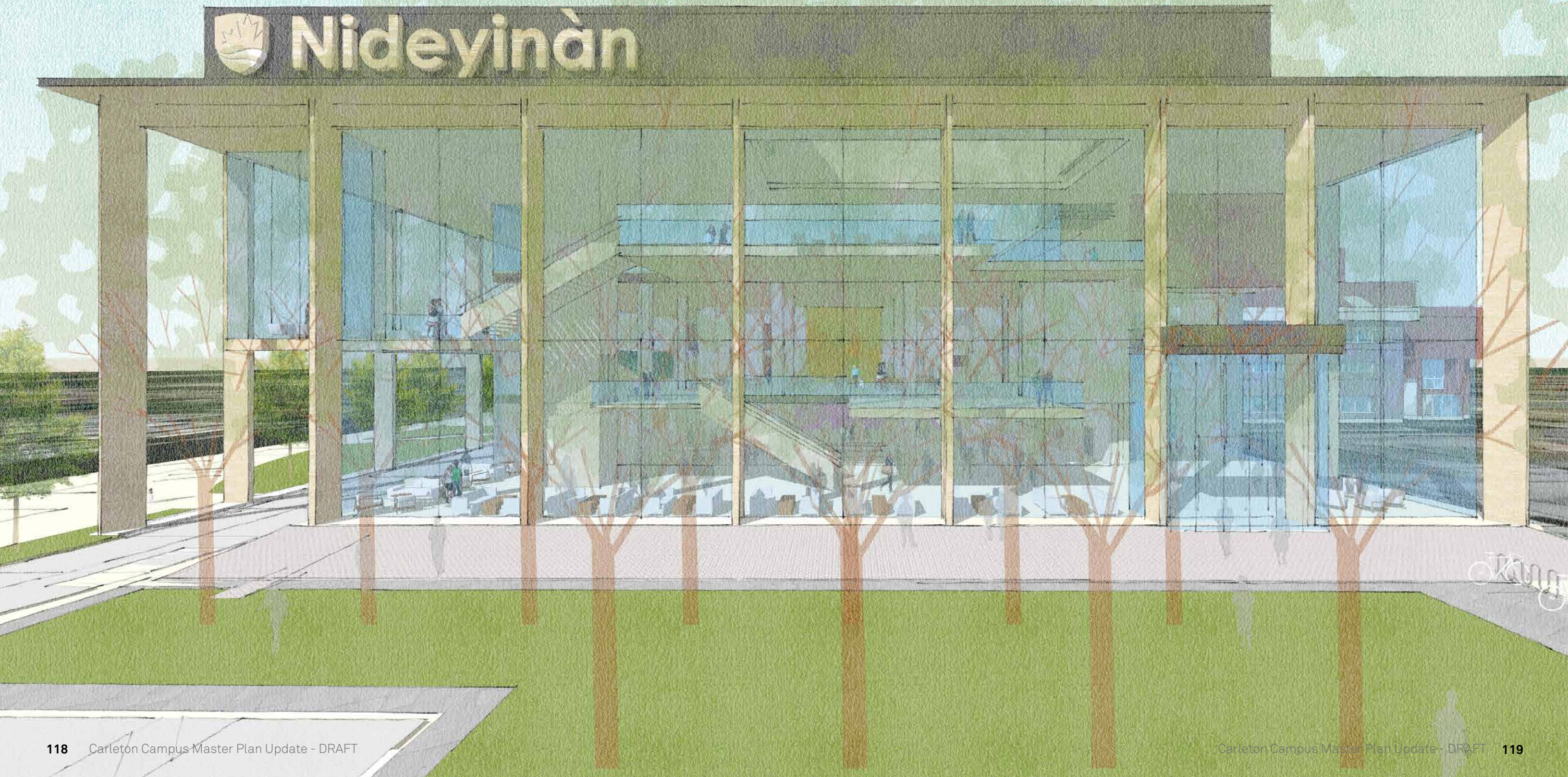


Wayfinding signage complements the clear visual procession and the height of the addition expands the social uses of the building.



The new east atrium of the Nideyinàn will provide informal study and social spaces that will benefit from the natural light, air, and expansive new atrium space. It will also provide rooftop access to the existing food court which students and faculty can use during the warmer seasons.

The generously glazed facade reaches over 16 meters in height and will be designed to minimize the impact of modifying the loading bay at the southeast corner of the building. By providing a transparent façade and featuring high quality architectural design and sustainable materials, the Nideyinàn will be transformed into a notable landmark for students, faculty, and visitors.



4.2.3 Learning Pavilion

W3



An intimate space near the southwest corner of the campus provides an opportunity to create a small-scale learning pavilion structure that can provide space, services, and programming that is suited to a quiet, calm, natural location on campus. Surrounded by trees and overlooking the Rideau River, the location presents itself as an escape from the intensity of the central campus and provides opportunities for quiet learning, reflection and dialogue, as well as offers services and resources in a sensitive environment. As a location of respite, the Learning Pavilion would be low in scale and relate in material, massing, and scale with its natural surroundings.

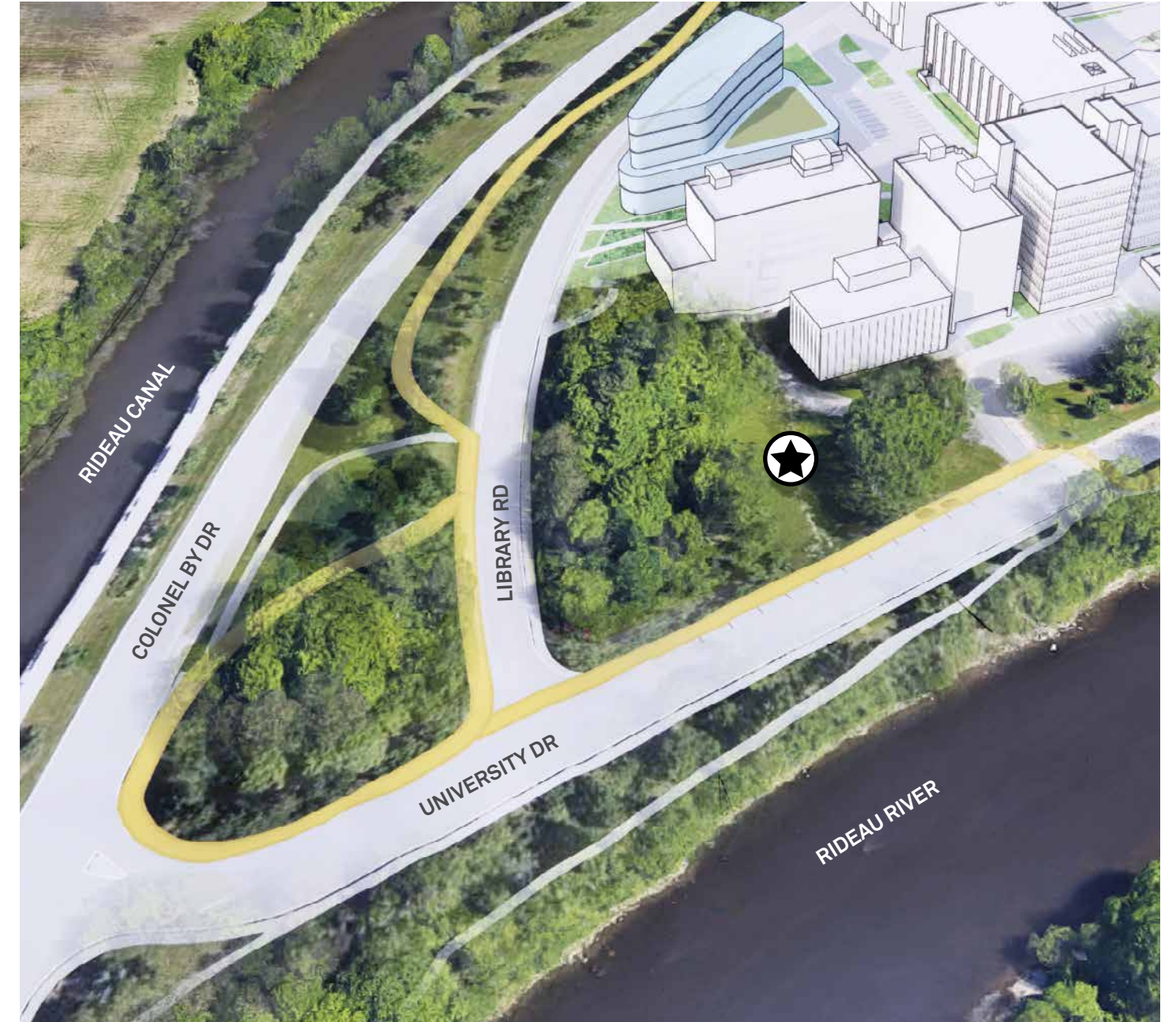


Agropur Campus (BC2 Consulting Group Inc. © Immophoto)



Rendering of a land-based learning pavilion with a naturalized bioswale wrapping around the open-air structure. (Memorial University of Newfoundland © Brook McIlroy)

Development & Public Space Opportunities



Potential location for a Learning Pavilion. View looking northeast.

★ Learning Pavilion Site

4.2.4 Institutional Building

W4








A primary large development site to accommodate future institutional growth on the west campus is located in the existing parking lot (P1) north of the VSIM building and west of Southam Hall. The site provides opportunities for new spaces in a four- to six-storey form. Facing Library Road to the west and the VSIM building to the south, the site allows for frontages that directly front and address Library Road, presenting a new face of the campus toward NCC lands to the west and neighbours across the Rideau Canal.

Preserving service and delivery access between the site and Southam Hall, a new green space can be created as a forecourt to the VSIM building and a pedestrian entry point to the campus from the west. A combination of at-grade and tunnel connections will close the loop of access in the southwest corner of campus, allowing pedestrian circulation from the MacOdrum Library, through the new building, and connecting to VSIM, the Social Science Research Building, and the Human Computer Interaction Building, all of which are presently terminus locations of the campus' interior pedestrian network.

Development & Public Space Opportunities



Site W4 opportunities and existing condition. View looking southwest.

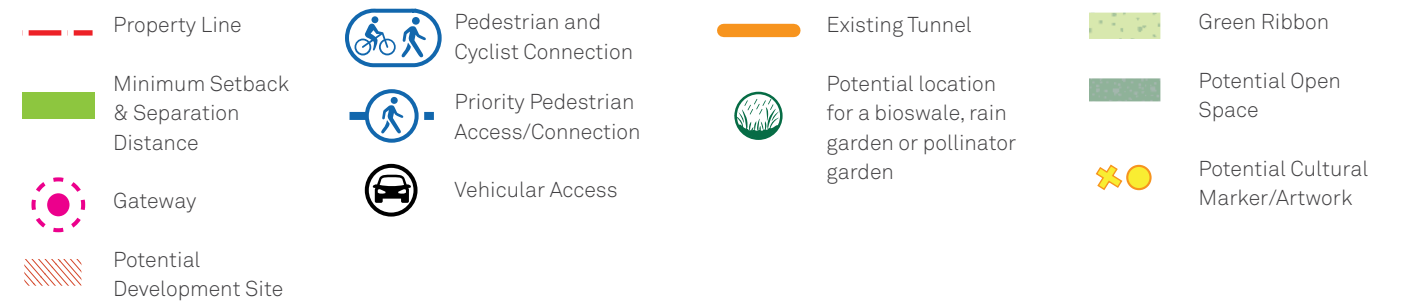
-  Bioswale
-  Potential Development Site
-  Gateway
-  Pedestrian Connection
-  Proposed Open Space & Enhanced Landscape



Site W4 potential development. View looking southwest.



The above illustration shows Site W4's potential buildable area, setbacks, pedestrian connections, and potential open spaces, and context.



◀ A potential open space nestled between W4 and the Visualization and Simulation Building could provide outdoor seating, study spaces, and pollinator gardens. (Little C mixed-use development, Rotterdam © CULD / Juurlink [+] Geluk)

4.3 East Campus Precinct Plan

The East Campus Precinct is comprised of approximately 60 acres (24 ha) of land south and east of University Drive, west of Bronson Road and north of the Rideau River. The East Campus Precinct is a highly visible growth area for buildings and open space, and is intended to be the next area to accommodate future campus buildings once sites within the West Campus Precinct are not longer available or suitable for planned capital projects.

Currently, the East Campus Precinct includes a mix of recreational, academic, administrative, Grounds and Maintenance buildings as well as surface and structured parking (some to be demolished). The East Campus Precinct, together with the long term development intended for the North Campus Precinct will help connect Carleton to its eastern boundary at Bronson Avenue, the Ottawa South neighbourhood Brewer Park, and the surrounding City. The East Campus includes a large segment of the proposed Green Ribbon network, which will also improve the campus' eastern boundary at Bronson Avenue, as well as provide new pathways and views to the Rideau River.

The envisioned Wellness Hub, as a significant expansion to Alumni Hall, is intended to be a highly visible new building, seen by visitors as they travel along Bronson Avenue to and from the campus. Bronson Avenue is a city owned street, currently under review by the City of Ottawa to include traffic calming measures and enhanced cycling facilities. The Canada Lands Corporation's Confederation Heights Master Plan is underway to develop the 465 acre underused Federal lands, south of Carleton, over the next 25 Years for a vital transit-oriented, mixed use community that will also serve as a Federal Hub.

Evolution of the Rail Corridor

Since its beginnings, Carleton's campus has been bisected by a rail corridor whose evolution to municipal transit has made it a more critical contributor to the liveliness of the campus. Beginning as a freight rail line extending southeast from a roundhouse and train yard at Bayview Road and Wellington Street, the corridor originally accommodated high speed heavy locomotives and freight. As rail transportation evolved, freight through the corridor gave way to regional passenger rail service. Soon, full frequent bi-directional rapid Light Rail Transit service will arrive on campus for the first time.

Carleton has traditionally developed buildings in proximity to the rail corridor respecting a 30-metre minimum setback for noise, vibrations, and safety concerns. While appropriate for high-speed freight rail corridors, a minimum setback is no longer appropriate in the context of urban LRT service corridors. Rather, new buildings containing non-residential uses can safely be located at or near the property line adjoining the transit corridor. When properly designed, noise and vibration concerns can be successfully mitigated. Although the setback requirement has not been officially relaxed, for the purposes of the Campus Master Plan Update, future building footprints adjacent to the rail line have been located within the 30-metre setback. It is recommended that the university pursue negotiations with relevant authorities to lift the restrictions on rail corridor setbacks for future buildings on campus, to preserve valuable development sites and realize a more compact, walkable campus.



Map
East Campus Precinct

- E# Potential Building
- - - Precinct Boundary
- Existing Building
- Planned Building
- Green Ribbon Trail
- Work under development prior to the CMPU

4.3.1 Future East Precinct Development Sites

E1 & E2

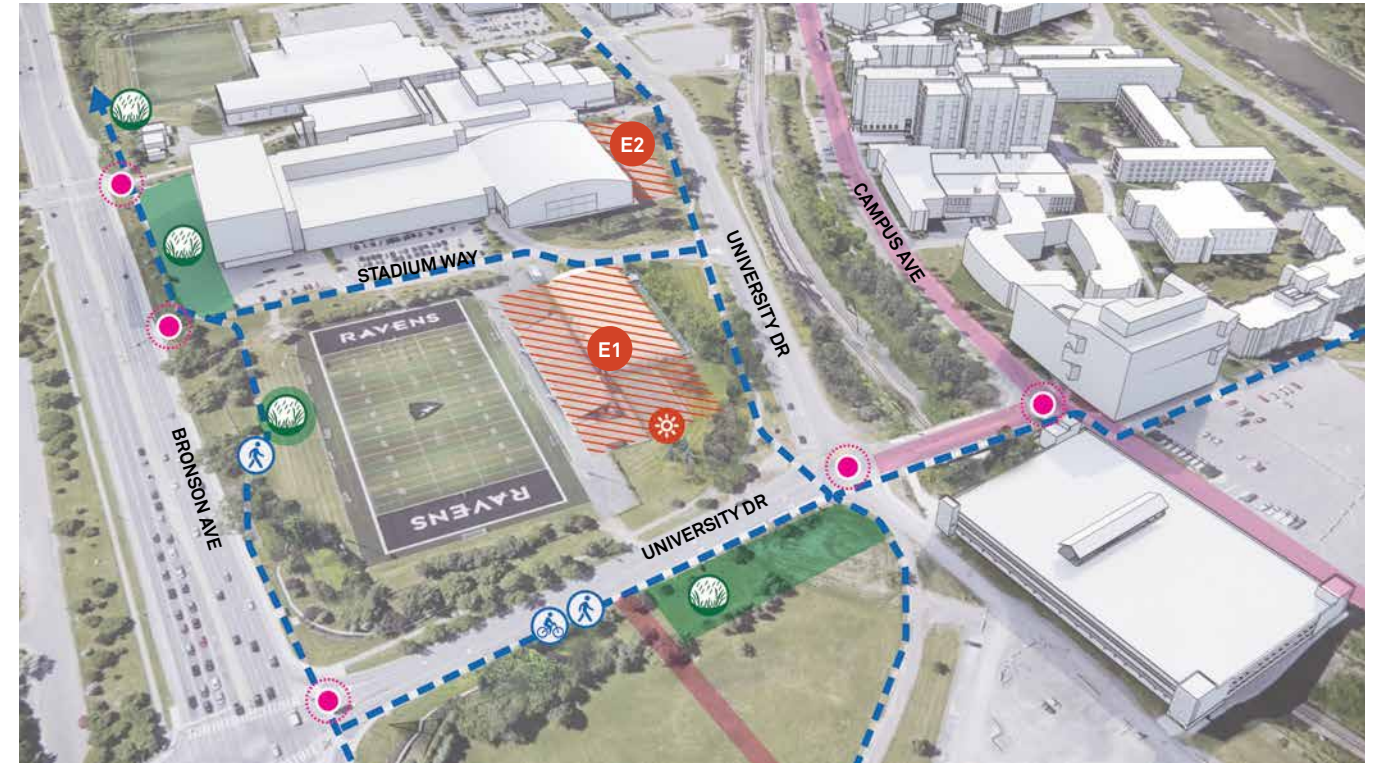
In comparison to the more developed West Campus Precinct, where future development sites are fewer and grade changes limit infill and expansion opportunities, the East Campus Precinct has several building opportunities that when undertaken should combine a high level of site and open space design:



E1 Academic, ancillary use or recreational facility expansion on the Tennis Centre arena air dome, adjacent to the seating MNP Park stadium stands. This site at the eastern side of University Drive is limited in its capacity for a new building due to the need to maintain the significant and mature tree canopy on the site, including the tree line on the west side of the Tennis Centre, and on the east northern edge of University Drive. A midrise academic, ancillary use or recreational facility would be appropriate and sited to frame the corner of University Drive and Stadium Way.

E2 A building expansion on P12 parking lot, west of the Field House for recreational/food service/student commons space. The proposed building expansion will provide a more attractive and accessible building along this extensive blank wall of the Field House.

Development & Public Space Opportunities



Site E1 and E2 opportunities and existing condition. View looking southwest.

- Bioswale
- Gateway
- Potential Development Site
- Potential Flexible Campus Street
- Pedestrian Connection
- Daylighting Renovations
- Proposed Open Space & Enhanced Landscape



Site E1 and E2. View looking southwest.



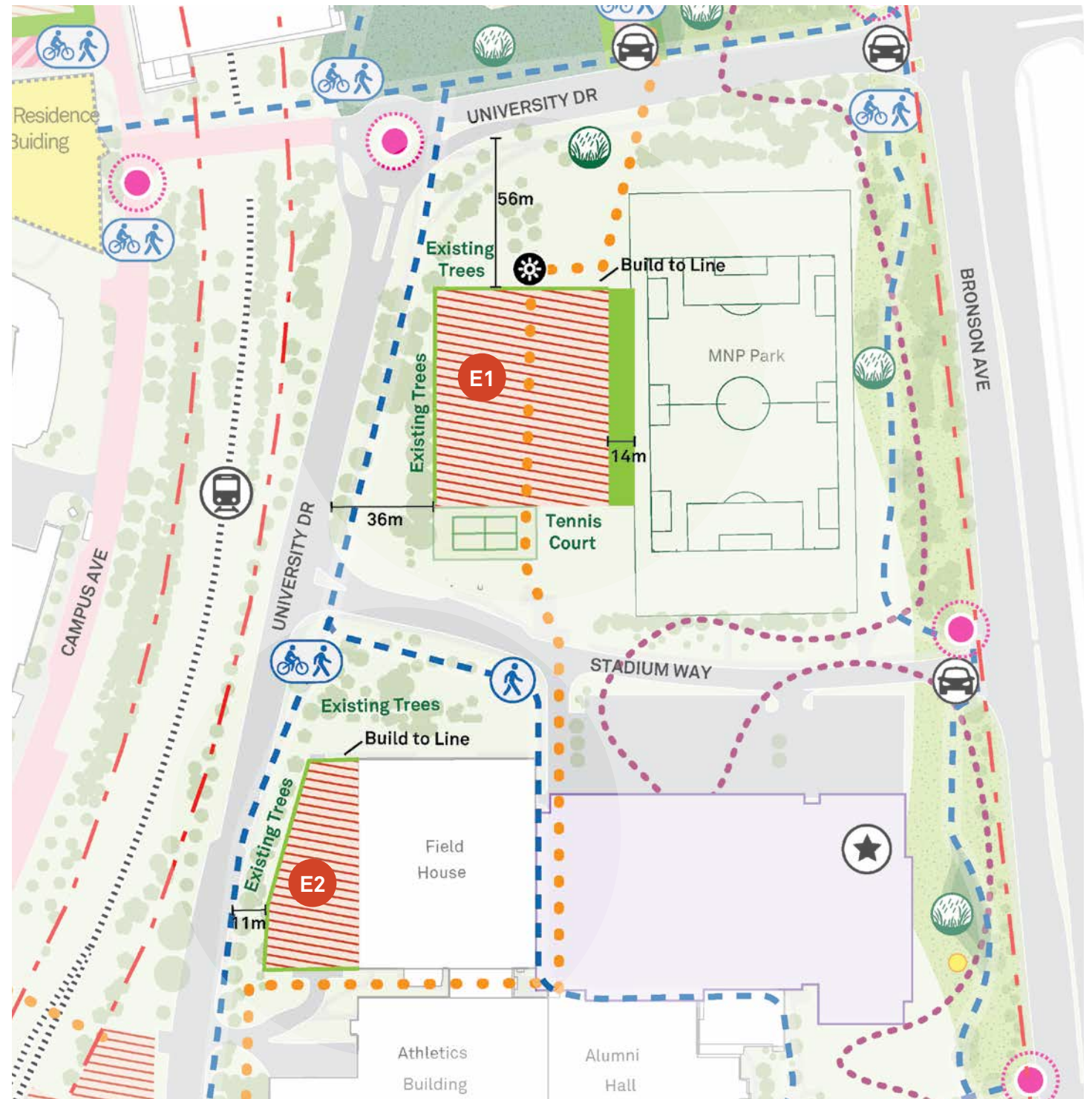
Site E1 has potential to house an indoor running track for athletes and students to use during the winter months. (Toronto Pan Am Sports Centre © University of Toronto & City of Toronto)



The proposed tunnel expansion connecting to the potential Wellness Hub, Site E1 and E2 could feature curated content, including dynamic installations, film, and interactive media of previous Carleton University sports achievements. (© Nike)



The image above shows a bright red tennis clubhouse which acts as an advert for sports and movement. The rooftop also doubles as an expansive seating area for game spectators. Housed inside the structure are utility areas, changing rooms, and kitchen facilities. (Amsterdam Tennis Clubhouse, Netherlands © MVRDV)



The above illustration shows Site E1&E2's potential buildable area, setbacks, pedestrian connections, potential open spaces, and context.

- Property Line
- Minimum Separation Distance
- Gateway
- Potential Flexible Campus Street
- ★ Work completed prior to the CMPU but under development
- 🚶 Pedestrian and Cyclist Connection
- 🚶 Priority Pedestrian Access/Connection
- 🚗 Vehicular Access
- 🚊 O-Train
- Potential Development Site
- ☀️ Daylighting Renovation
- Existing Tunnel
- Proposed Tunnel Extension
- ✂️ Potential Cultural Marker/Artwork
- 🌿 Potential location for a bioswale, rain garden or pollinator garden
- Green Ribbon
- Potential Open Space
- Flood Plain

4.3.2 Mixed-Use Transit Hub E3



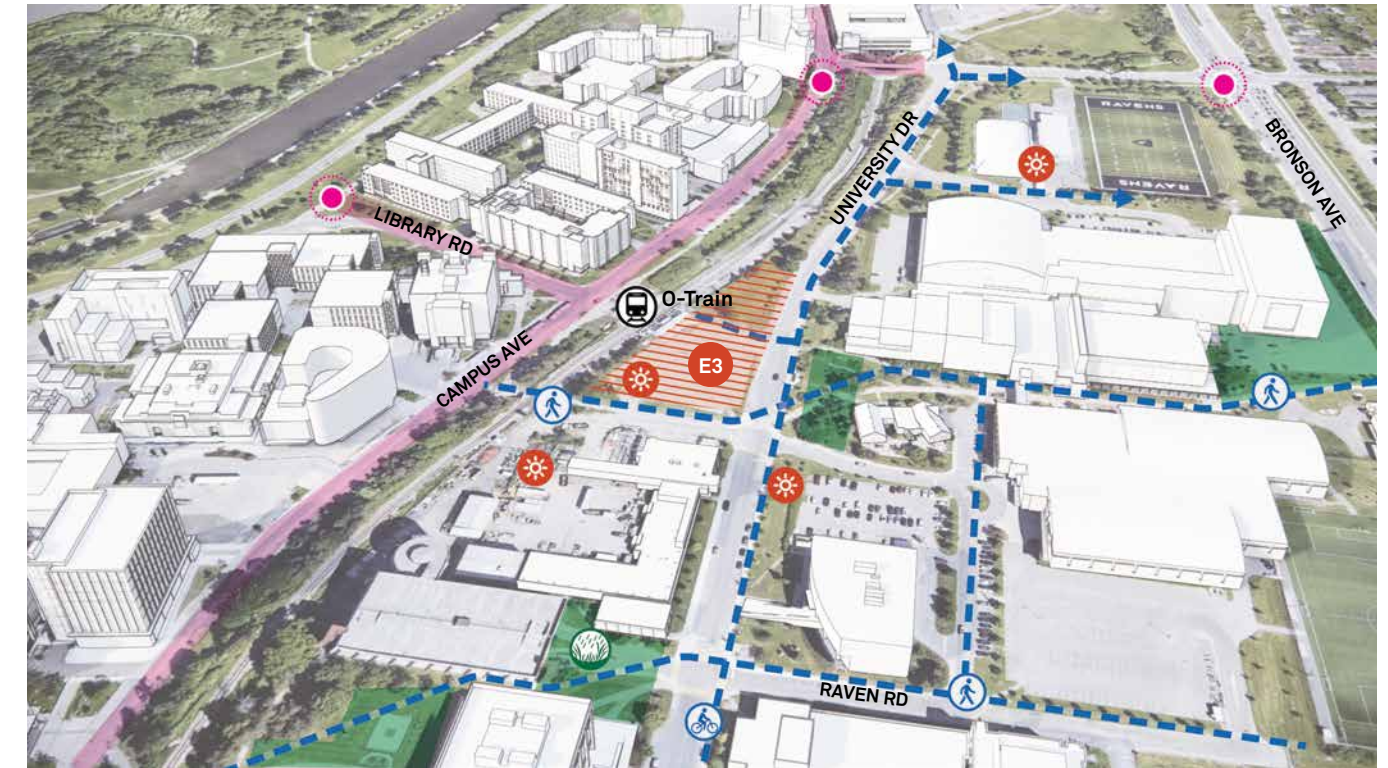
Carleton University is at an exciting point in its evolution where soon, rail-based rapid transit will be more convenient, accessible, and frequent than ever before. Improvements to transit access can be coordinated with efforts to create a pedestrian-friendly, walkable campus with pedestrian-priority complete and shared streets.

The Mixed-Use Transit Hub project provides an opportunity to create a consolidated welcoming entry point and front door at the core of the campus for all transit users, whether arriving by LRT train or bus. The proposed Transit Hub will be replacing the P4 parking lot, located on the west side of University Drive and will be a focus for arrival to Carleton. The Hub will offer a range of opportunities for the university including, a reduction in on campus traffic and a multi-modal transportation area for central campus arrival by O-Train and bus. The central location of the Hub will stimulate opportunities for easier access to new buildings and facilities within the East Campus Precinct. By directing all bus transit to both University Drive and Raven Road

depending on direction of travel, traffic volumes on Campus Avenue will decrease to accommodate pedestrian-friendly streets. Paratransit vehicles and those with accessible parking permits will be encouraged to use the campus' full network of shared and complete streets to park, pick up, and drop off as near as possible to their destinations.

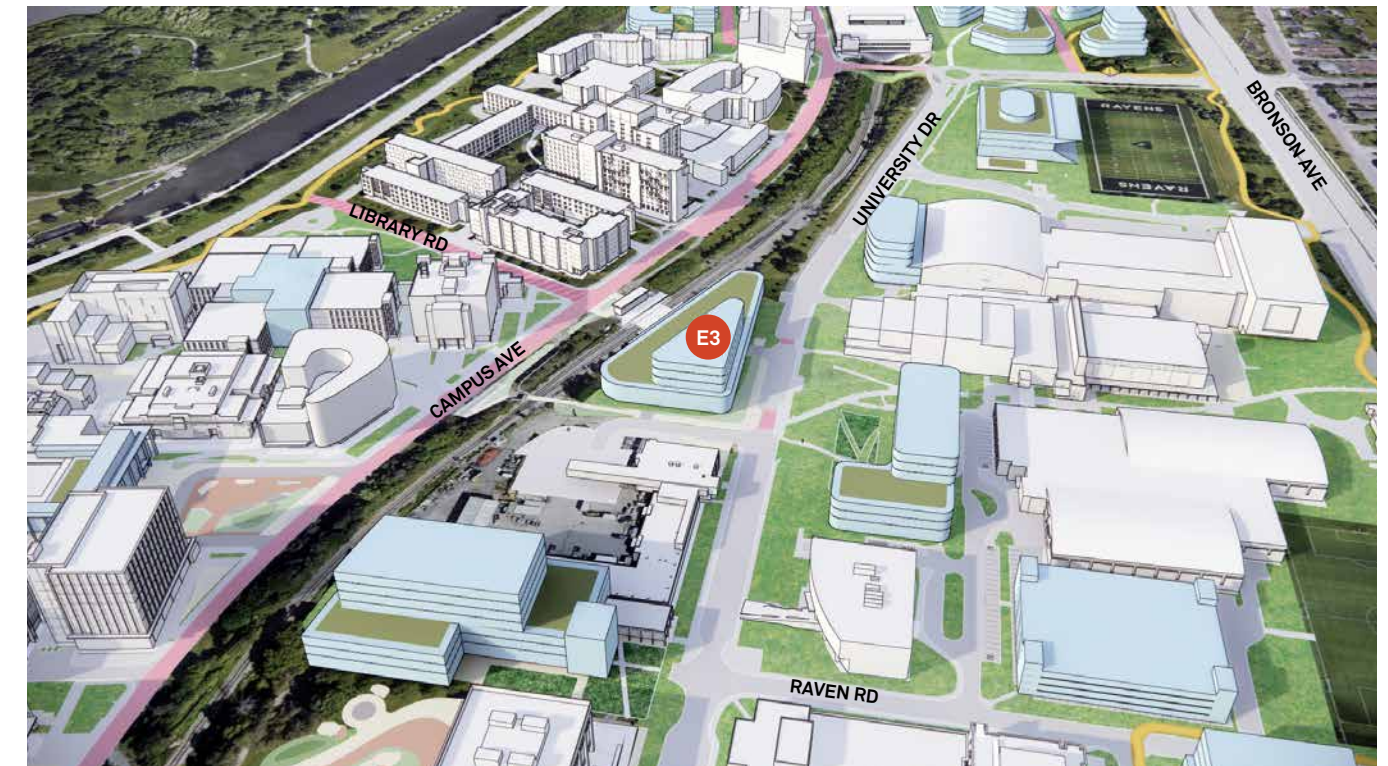
The Mixed-Use Transit Hub project will accommodate safe, weather-protected waiting and loading areas for train and buses within a mixed-use activity hub that also provides services, support, and flexible social spaces on upper levels for students, faculty and staff, and the extended community. With opportunities for leasable retail and food and beverage facilities, the building can begin to introduce a new mix of uses that will be expanded as the east and north campus continue to grow. At four- to six-storeys in height, the Mixed-Use Transit Hub will accommodate an array of programming and become a central social hub that bridges the East and West Campus Precincts.

Development & Public Space Opportunities



Site E3 opportunities and existing condition. View looking northwest.

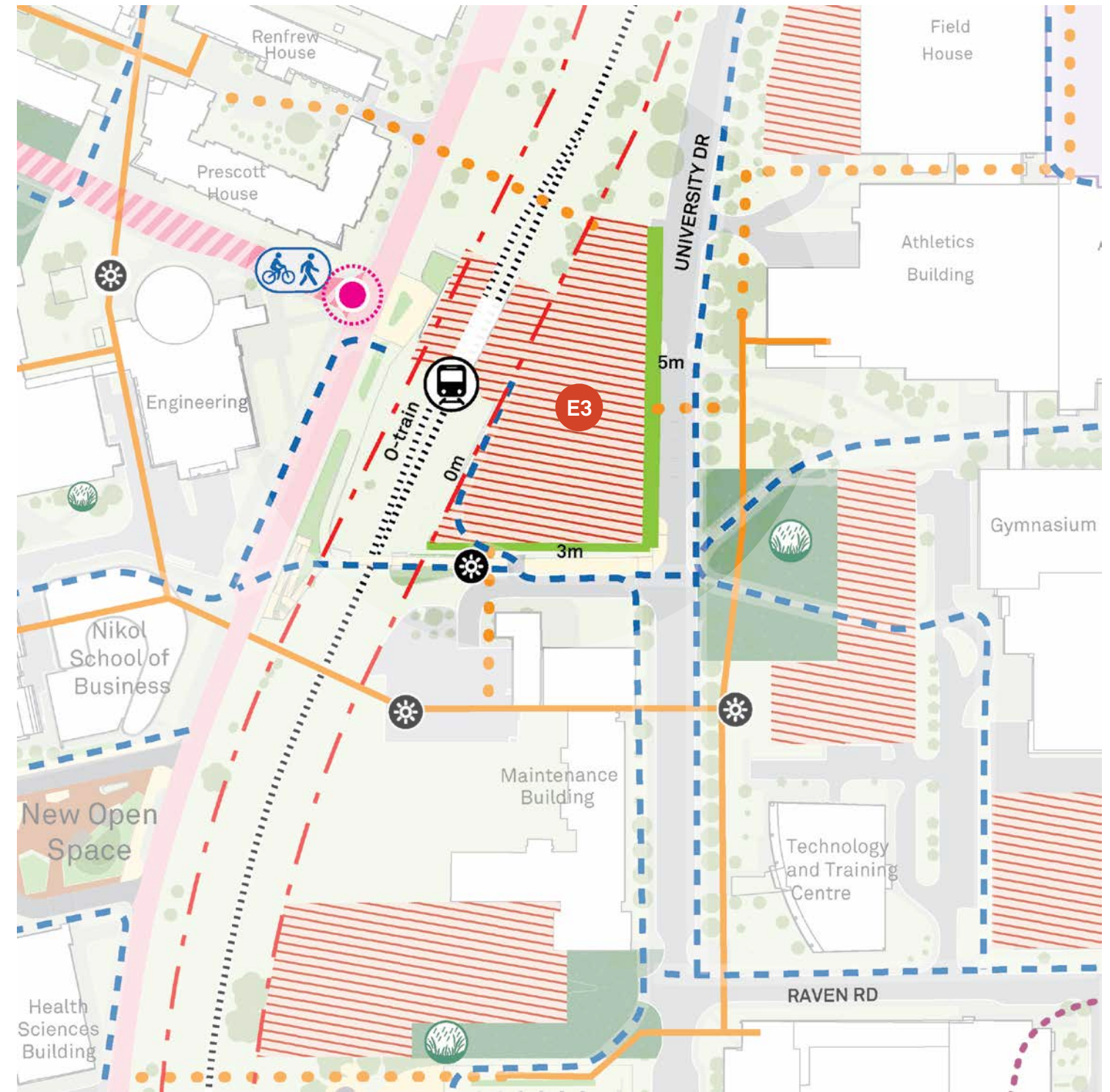
- Bioswale
- Gateway
- Potential Development Site
- Potential Flexible Campus Street
- Pedestrian Connection
- Daylighting Renovations
- Proposed Open Space & Enhanced Landscape



Site E3, Mixed-Use Transit Hub. View looking northwest.



The proposed Mixed-Use Transit Hub could be comprised of many services and programs such as: comfortable, enclosed passenger waiting areas, restrooms, secured bike parking, showers, student study spaces, and offices. (Coralville Intermodal Facility, Iowa, United States; © Neumann Monson Architects)



The above illustration shows Site E3's potential buildable area, setbacks, pedestrian connections, potential open spaces, and context.



4.3.3 Raven Road Sites

E4

An Academic Building on parking lot P11, located north of the Technology and Training Centre building. Potential structured parking in close proximity to the Transit Hub may be considered as part of this building site. The L-shaped building is configured to create a front courtyard/garden facing University Drive. A five to seven storey academic building would be appropriate in this location.

E5

A Facilities Building expansion, or stand-alone building on P9 (parking garage) planned for demolition. The planned demolition of P9, north of Alumni Park, provides an important new site and academic building opportunity. The site is located at several key view termini including from the new Rideau River pedestrian bridge, the O-Train platform and future Transit Hub and the terminus of Raven Road. The landmark location of this site should influence the form and mass of the future building, as it will be visible from all four sides. Building height in this location should maintain the generally midrise scale of existing and proposed buildings (six to eight storeys), however, moderate height above this range may be appropriate to accommodate future academic programs and promote the buildings stature, while ensuring the building design and massing maintains appropriate scale and mitigates sun/shadow and wind impacts.

E4, E5, E6 & E7



E6

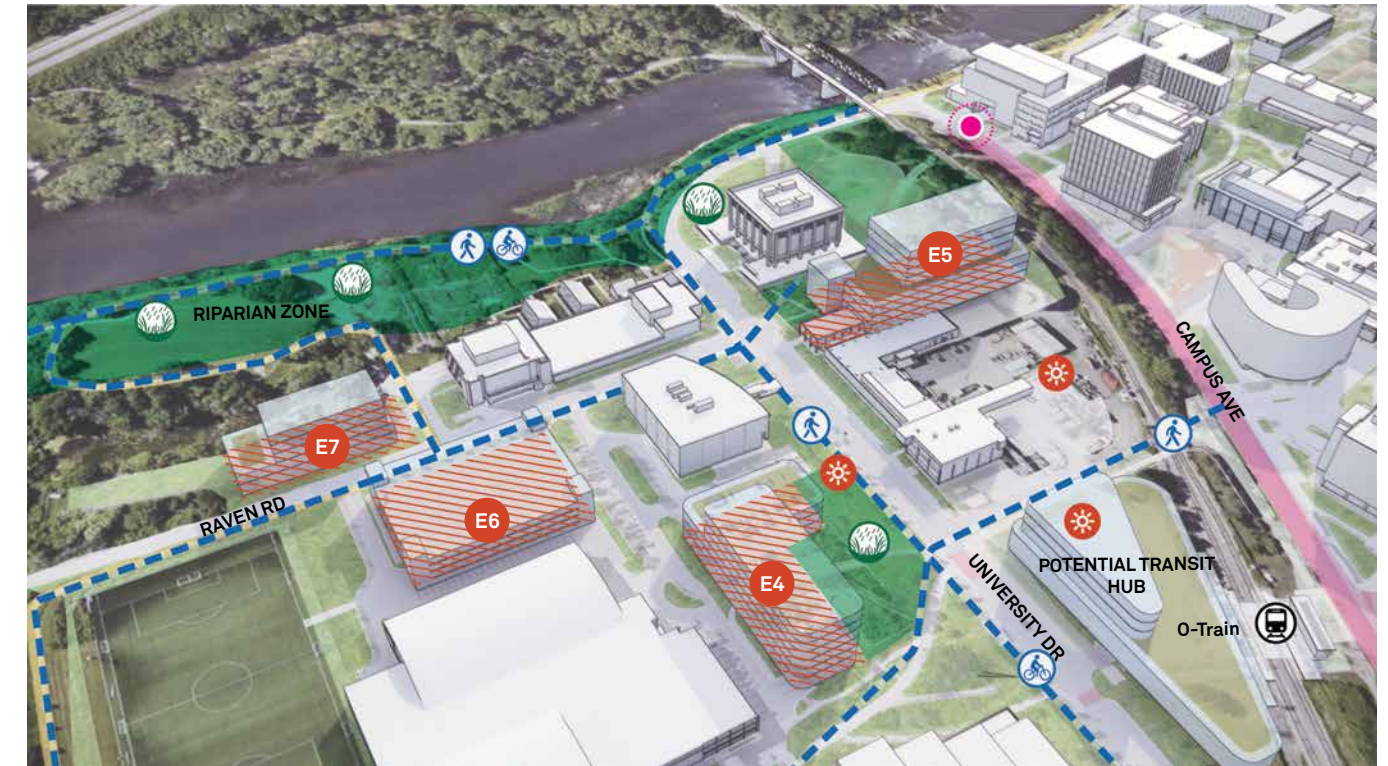
An academic building and/or potential parking garage on lot P3, located on the north side of Raven Road. This is a significant site opportunity south of the Carleton Ice House. The building can be a potential structured parking facility if access to parking is made available from Raven Road, either in and out from Bronson Avenue, or in only from Bronson and out via University Drive. Structured parking should be screened from view by wrapping the building on the first two to three levels with academic uses fronting onto Raven Road.

E7

An academic building on a portion of lot P14, located on the south side of Raven Road. A narrow site on the P14 parking lot, east of the National Wildlife Research Centre, is a special location near the Rideau River and is surrounded by mature trees. A new academic facility related to natural sciences or expanded programs for the Wildlife Research Centre could be accommodated in a five to seven storey structure.

Note: potential future development on and/or adjacent to Raven Road must be flood-proofed, or include preventative measures that mitigate flood risk.

Development & Public Space Opportunities



Site E4-E7 potential opportunities and existing condition.

- Bioswale
- Pedestrian Connection
- Gateway
- Daylighting Renovations
- Potential Development Site
- Potential Flexible Campus Street
- Proposed Open Space & Enhanced Landscape



Site E4-E7 potential development.



Example of a multi-use parking structure with a rooftop synthetic turf sport field that reduces irrigation by 50,000 gallons of water per week, filters water, and reduces discharge into the environment. (Claremont, CA. Watry Design, Inc. © Pomona College)



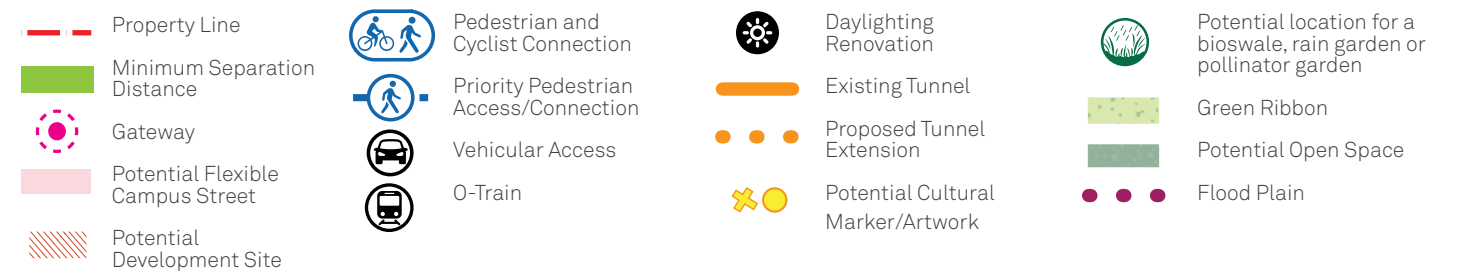
Potential parking garages could have solar panels on the roof and exterior facades. In the above image, Humber College's parking garage also includes office, retail and commercial spaces. (Toronto, Turner Fleischer Architect Inc. and Newton Group Ltd © Turner Fleischer Architect)



Site E5 has a potential to improve student experience on campus by establishing a welcoming entry and focal point at the intersection of University Dr and Raven Rd. (Toronto, Turner Fleischer Architect Inc. and Newton Group Ltd © Turner Fleischer Architect)



The above illustration shows Raven Road Sites (E4-E7) potential buildable areas, setbacks, pedestrian connections, potential open spaces, and context.



4.4 North Campus Precinct Plan

Carleton's North Campus Precinct is comprised of approximately 32 acres (12 ha) of undeveloped land area and represents a significant future opportunity for resilient and sustainable campus growth. The Plan Update considers a similar pattern of new development from the 2016 Campus Master Plan, centered around a large oval shaped common, and an integrated new street and pathway network, including enhanced vehicular access from Bronson Avenue and Colonel By Drive. This CMP Update includes the Green Ribbon on the north and eastern boundaries where buildings and open space can connect to the campus' wide pathway network. Future use of the North Campus Precinct will be determined by the university's Leadership, but as Ottawa and its neighbourhoods, including Confederation Heights grow along the university boundaries, and transit and access to Carleton increases, the CMP Update illustrates an opportunity to approach the future of the northern lands differently.

Opportunities may include a mix of uses in addition to academic program expansion. Leases to business, partnerships with the City of Ottawa and other stakeholders, similar to models such as Lansdowne Park in Ottawa, can attract commercial, housing, and other complementary uses to Carleton. This mix of uses can be a catalyst to Carleton University moving towards a more vibrant, enriched academic institution within the City and Region, where the campus and surrounding community have access to commercial services such as cafes/restaurants,

banks, and grocery stores. Specialized housing for seniors, Indigenous Peoples and affordable housing options can also be considered. Schools for children, like the University of Toronto Institute of Child Study and University of Toronto Schools, may also be considered at Carleton.

This significant land holding has inherent flexibility for future buildings and infrastructure, and to consider development as part of a comprehensive plan, where building sites and open space are coordinated to promote a beautiful, and memorable area of campus that fosters and reflects an enriched and sustainable learning environment.

Buildings will generally be taller towards the edges near Dow's Lake and transition to a mid-rise character towards the East and West Campus Precincts. This would maximize sunlight access within the mixed-use district. Due to the long-term development potential of this area, further studies would be required to determine optimal building heights and specific uses. Buildings at the north end and eastern edge of the North Campus Precinct should be designed to contribute to campus visibility as they will be viewed from the city and neighbourhood.



Map
North Campus Precinct

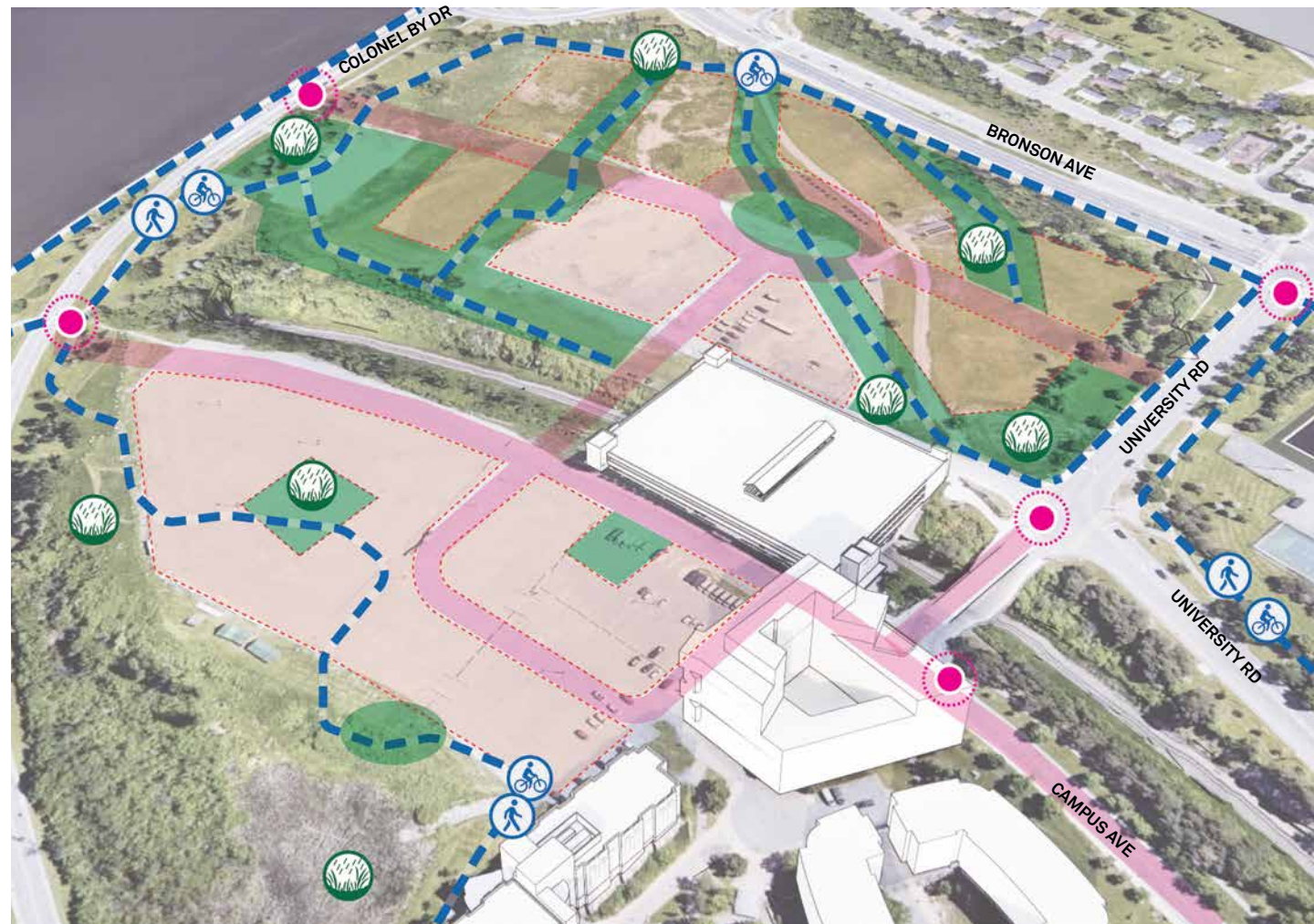
- N# Potential Building
- Precinct Boundary
- Existing Building
- Planned Building
- Green Ribbon Trail
- ★ Work under development prior to the CMPU

4.4.1 Mixed-Use Campus







N1 - N16

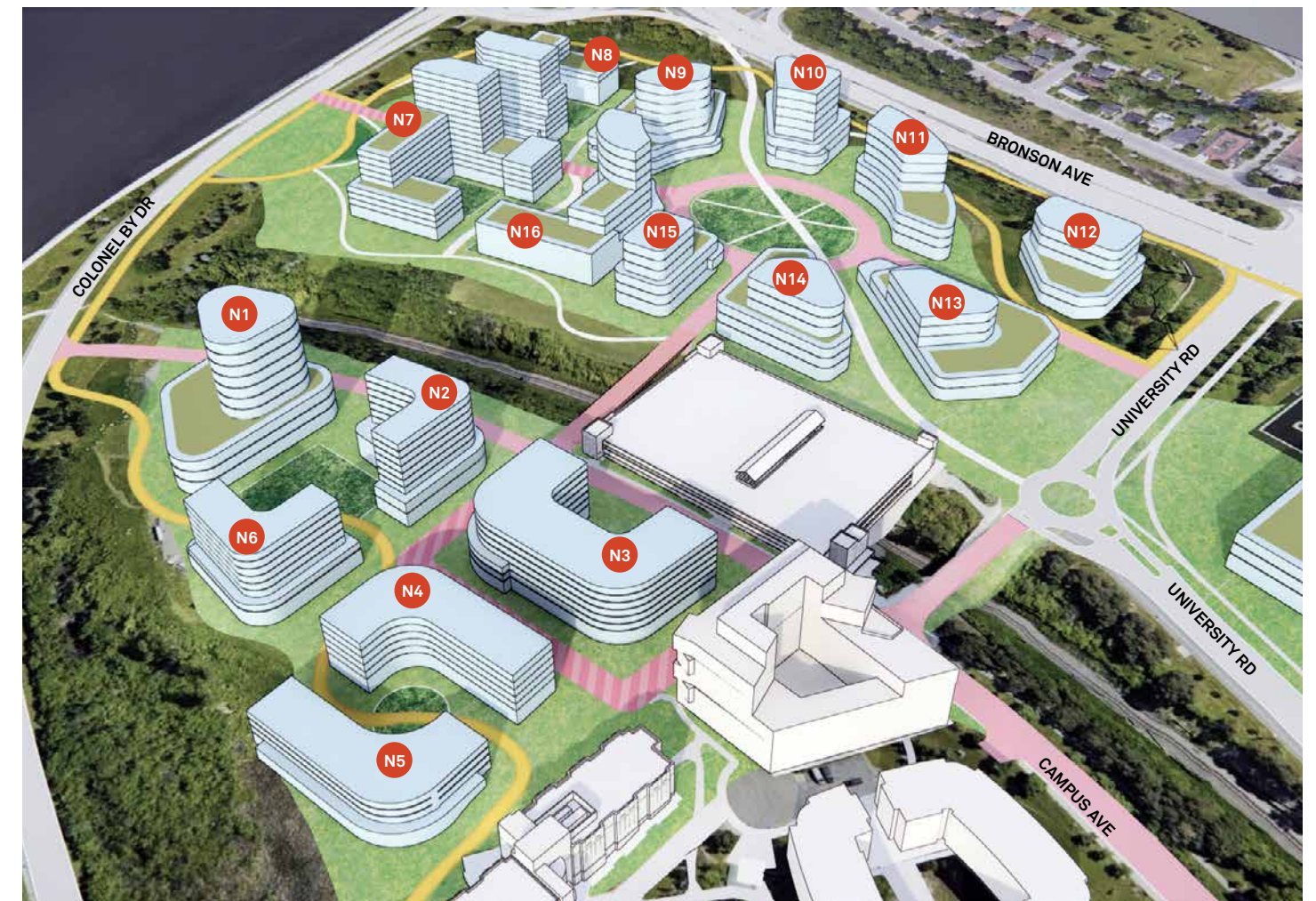


Development & Public Space Opportunities



North Campus Precinct opportunities and existing condition. View looking northeast.

-  Bioswale
-  Pedestrian Connection
-  Gateway
-  Potential Development Site
-  Proposed Open Space & Enhanced Landscape
-  Potential Flexible Campus Street



North Campus Precinct potential developments. View looking northeast.



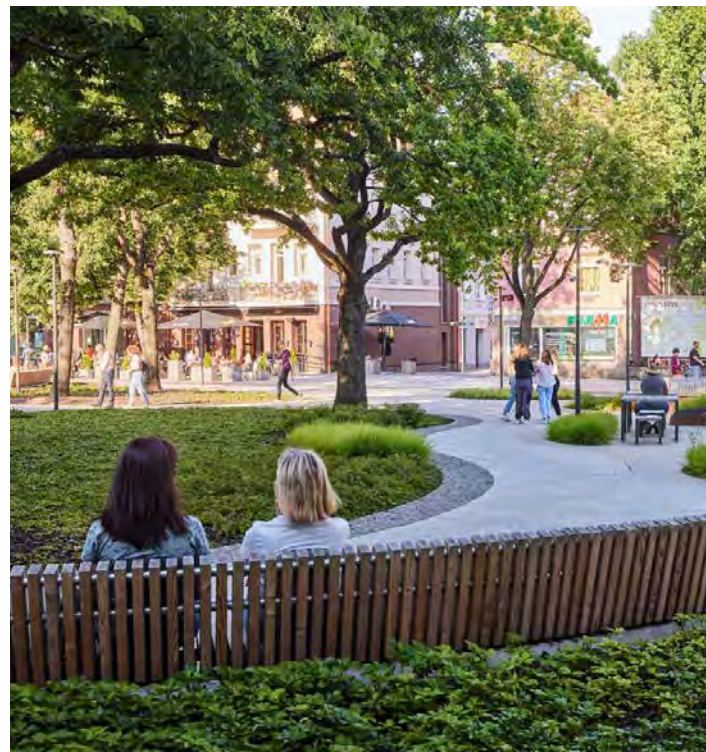
► Example of a green oval shaped common framed by campus buildings. (Rendering of Campus Albano, Stockholm, Sweden © Nivå landskapsarkitektur)



Street edges in the North campus Precinct should be visually engaging and contribute to the streetscape through high quality use of materials, colours, and patterns, interior and exterior illumination, views into a building or courtyard, and street plantings. (United States, Aidlin Darling Design © Bruce Damonte)



Inner courtyards have an opportunity to host places to meet, play or relax in shade gardens while featuring sustainable water management practices. (Urban Campus Lieven, Amsterdam © Bureau B+B)



Naturalized areas with soft, curved edges and seating can create slower, more intimate settings on campus. (Panevežys, Lithuania, 501 Architects © Norbert Tukaj)



The above illustration shows the North Campus Precinct's potential buildable areas, setbacks, separation distances, expanded tunnel system, potential open spaces and pedestrian connections.

- | | | | |
|--|---------------------------------------|-----------------------------------|---|
| Property Line | Pedestrian and Cyclist Connection | Daylighting Renovation | Potential location for a bioswale, rain garden or pollinator garden |
| Minimum Setbacks & Separation Distance | Priority Pedestrian Access/Connection | Existing Tunnel | Green Ribbon |
| Gateway | Vehicular Access | Proposed Tunnel Extension | Potential Open Space |
| Potential Flexible Campus Street | O-Train | Potential Cultural Marker/Artwork | Flood Plain |
| Priority Pedestrian Street | Potential Development Site | | |



North precinct potential developments. View looking southwest,

4.5 The Multi-Campus Strategy

Creating unity and awareness between Carleton’s main campus, Kanata North Campus and the Carleton Dominion-Chalmers Centre (CDCC) is an important step. Establishing a multi-campus strategy that highlights the critical role that Carleton’s specialized satellite campuses play in the university’s strategic and academic missions.

Offering unique spaces and programming for academic purposes, as well as community and industry partnerships, collaborations, and outreach, the Kanata North and CDCC campuses should be featured in campus mapping, wayfinding, marketing, and communication materials as integral components of Carleton University. An example of integrating all three campuses is shown on the opposite page. This multi-campus approach should be used for online wayfinding maps, 3D campus illustrations, and communications materials that highlight the university’s physical locations.

This Campus Master Plan Update recommends undertaking a focused study in the near-term that brings together staff, students, and faculty from Carleton’s Main Campus, Kanata North, and the CDCC to develop a high-level Multi-Campus Strategy for the university. This strategy will help inform optimum approaches to branding, communication, mobility and wayfinding, and the establishment of new systems that can support all three campuses, leveraging each of their strengths.

The following list presents potential opportunities that can be explored as part of the Multi-Campus Strategy Study.

- Explore transit and active mobility options for movement between campuses including LRT and bus connections, cycling corridors, inter-campus bike and e-bike share systems, inter-campus shuttle service, and others.
- Establish consistent branding that highlights the unique aspects of each satellite campus while uniting them under the Carleton University brand.
- Highlight connections to civic infrastructure nearby (parks, services) that can be leveraged as advantages of each satellite campus’ unique urban setting.
- Publicize research, partnerships, and community outreach occurring at each of the satellite campuses, encouraging members of the Carleton community to visit the satellite campuses.
- Create a supply chain system that enables efficient transfer of materials between campuses and readily-available supplies in local satellite storage.
- Explore further opportunities for cross-pollination and partnerships between academic departments and with the surrounding community and industry.
- Further develop relationships between Carleton’s academic and research departments and industry as collaborators, co-op employers, and research partners.



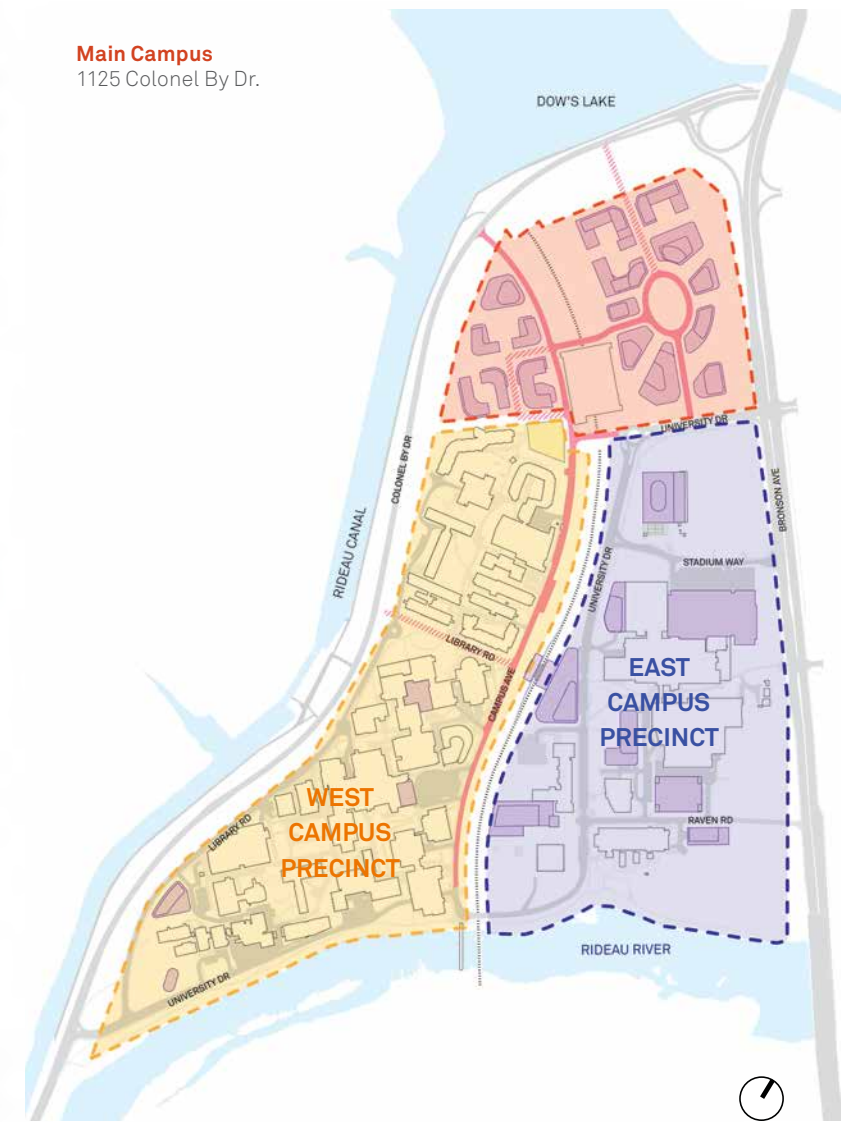
Campus Locations



Dominion-Chalmers Centre
355 Cooper St.



Kanata North Campus
350 Legget Dr. Unit #101



Main Campus
1125 Colonel By Dr.

Potential opportunities specific to the CDCC include:

- Ensure accessibility for all users into and within the Centre by employing principles of Universal Design (reference Section 5.1 of this report).
- Recognize and honour historical and ongoing trauma for members of the Indigenous community related to the Centre’s historical origins as a religious building.
- Explore opportunities to use the CDCC as part of Carleton University’s work towards Reconciliation with Indigenous Peoples.
- Highlight the Centre’s spectacular architecture and performance space to students, faculty, and staff on the main campus to encourage visits and use of the CDCC.
- Leverage the use of the Centre by community groups to engage and reach out to Carleton’s neighbours in downtown Ottawa and the larger region.
- Explore opportunities for the university to directly fund portions of the Centre as non-revenue-generating spaces for academic and administrative support, community outreach, and student collaboration.
- Leverage the downtown urban location, performance venue, and heritage architecture to expand academic offerings to students in multiple departments and faculties (i.e., history, drama, geography, architecture, sociology, music, etc.)



5.0 Implementation Framework

- 5.1 Implementation and Phasing Strategy
- 5.2 Plan Review and Update

5.1 Implementation and Phasing Strategy

Through the engagement and planning process for the Campus Master Plan Update, Carleton's leadership and staff have expressed a desire for a balanced approach to infrastructure planning. The Campus Master Plan Update needs to be flexible in proposing short-term facilities while programming for long-term future development on campus. This strategy is essential in fulfilling both immediate needs and long-term goals for improvements, enhancements, and accommodation of growth on campus. Preparation for a robust short-term and long-term framework requires a general understanding that programmatic space allocation is dynamic and dependent on several strategic and financial factors.

The long-term growth potential on campus for future mixed-use institutional, residential, commercial, retail, and potential multi-level parking space is tremendous. However, the Campus Master Plan Update acknowledges that each development project will occur incrementally over several years as a response to immediate space needs, aspirations for introduction of mixed uses, and as opportunities for funding of new academic and research-focused facilities arise. In the near term, enhancement of people-focused elements on campus is the priority. Encouragement of active mobility and transit use, collaboration, socialization, and enjoyment of the campus' spectacular natural setting and environments will significantly impact the campus community.

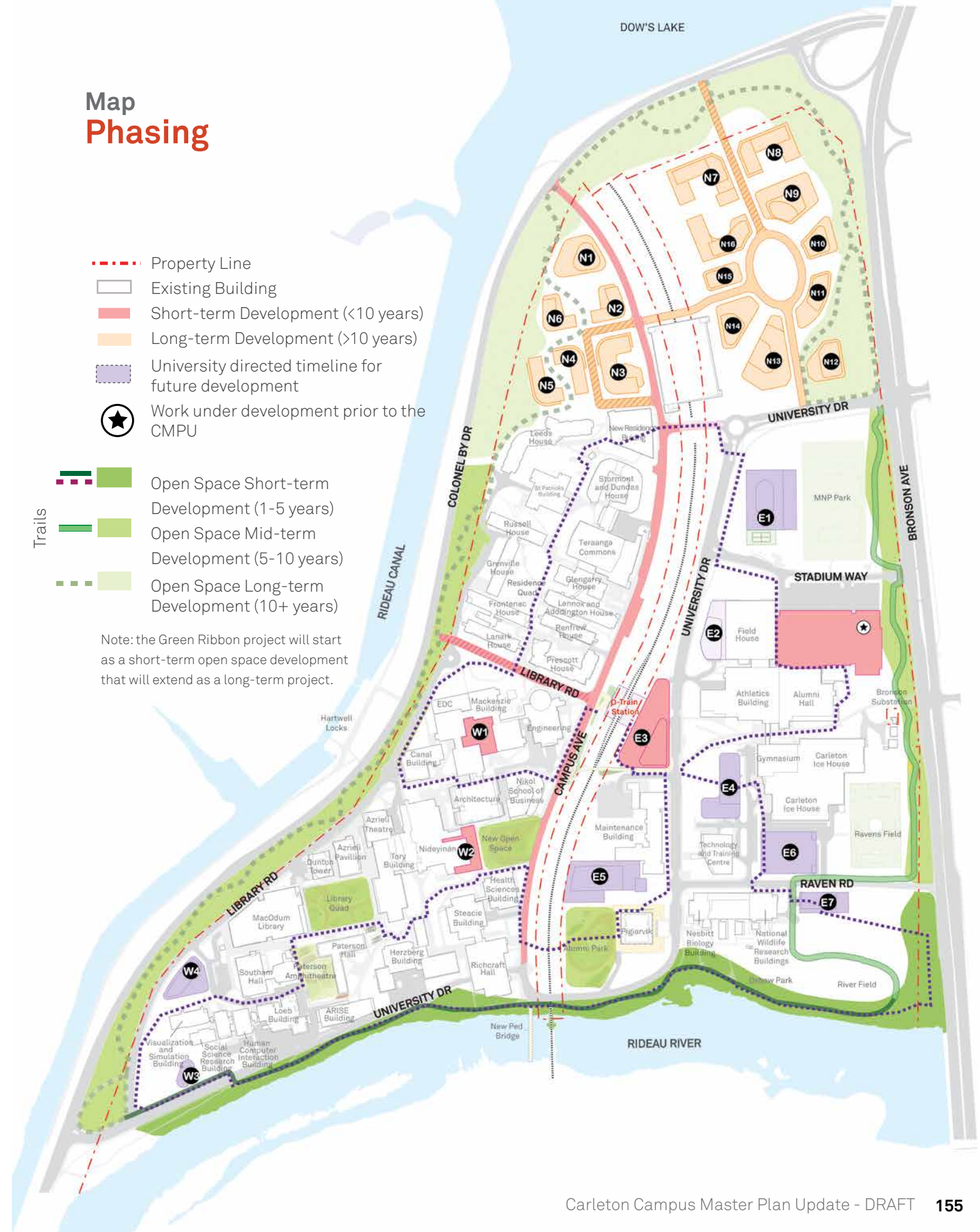
Coinciding with infrastructure upgrade projects, enhancements to Campus Avenue may be realized in the very near term. Projects including the Wellness Centre, Library Road shared street, Nideyinàn and Mackenzie Atrium expansions, and the central mixed-use Transit Hub should be prioritized over the next 10 years to improve the quality of campus life in all seasons and at all times of day. Future building footprints have been illustrated for long-term planning purposes and their realization will follow the strategic direction established by Carleton's leadership team.

Similar to the approach to buildings, enhancements to outdoor spaces will occur in multiple phases over several years. Priority projects include rehabilitating and enhancing the riparian zone and pathways at the edge of the Rideau River, implementing the Geological Time Trail, and the eastern edge of the Green Ribbon to reinforce local stormwater and water mitigation measures. Construction of the Campus Avenue Quad should coincide with the Nideyinàn expansion to create a spectacular new arrival point on campus. Future outdoor space projects including improvements to Alumni Park and the Main Library Quad, as well as completion of the western portions of the Green Ribbon could be realized in the medium-term. Finally, completion of the northern portion of the Green Ribbon may occur as planning for development of the North Campus Precinct takes place in the long-term.

Map Phasing

- - - Property Line
 - Existing Building
 - Short-term Development (<10 years)
 - Long-term Development (>10 years)
 - University directed timeline for future development
 - Work under development prior to the CMPU
-
- - - Open Space Short-term Development (1-5 years)
 - - - Open Space Mid-term Development (5-10 years)
 - - - Open Space Long-term Development (10+ years)

Note: the Green Ribbon project will start as a short-term open space development that will extend as a long-term project.





5.2 Plan Review and Update

The Carleton University Campus Master Plan Update provides a comprehensive and flexible framework to help guide future design and development decisions pertaining to sustainability, natural systems and open spaces, universal design and accessibility, transportation and mobility, and urban design.

A thorough review and update to the Campus Master Plan should take place every 5 to 10 years in response to the changing needs and priorities of Carleton University. Community and stakeholder consultation should be undertaken when changes are proposed, to ensure successful implementation of the Master Plan.

An aerial architectural rendering of a city block. The scene is dominated by a river on the left side, with a winding path or road along its bank. The buildings are depicted in a stylized, semi-transparent manner, showing their footprints and some structural details. A prominent tall, rectangular building is on the left. The overall color palette is muted, with greys, blues, and greens. The rendering is viewed from an elevated perspective, looking down at the city.

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