

The University of British Columbia Okanagan Campus

Innovation Precinct Structure Plan

November 26, 2018



THE UNIVERSITY OF BRITISH COLUMBIA

ACKNOWLEDGEMENT

We begin by acknowledging that UBC's Okanagan campus is located on the unceded territory of the Syilx (Okanagan) peoples and that UBC's activities take place on Indigenous lands throughout British Columbia and beyond.

The Syilx Okanagan people have been here since time immemorial. In September 2005, the Okanagan Nation Alliance officially welcomed UBC to Okanagan territory in a ceremony, Knaqs npi'ismist, where UBC signed a Memorandum of Understanding with the Okanagan Nation Alliance. The university works with the Okanagan Nation in the pursuit of campus plans for UBC Okanagan in respectful acknowledgement of the Syilx Okanagan people's stewardship of their territory for thousands of years.

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FOREWORD

The University of British Columbia Okanagan Campus is a distinctive expression of UBC's commitment to being a place of transformative learning, research excellence and engagement. As a new campus of a globally recognized university, UBC Okanagan aspires to be a model of innovative and interdisciplinary programming, providing seamless learning experiences and connections between students, faculty, alumni and local and global communities.

The 2015 *UBC Okanagan Campus Plan* focuses on the experience of the place and on creating an outstanding learning environment with enhancements to public spaces, informal learning spaces, recreation, facilities and other amenities. It identifies a range of opportunities for greater participation and integration with our partners in research, local and regional economic development, transportation and community building. This includes identification of space on campus for investment in research partnerships, ranging from an innovation precinct for land-intensive uses to smaller spaces integrated with or near existing research facilities.

The 2015 *Campus Plan* provides planning principles to direct the development of the Innovation Precinct. This Innovation Precinct Structure Plan (the *Structure Plan*) is the result of a planning process to explore potential development opportunities in more detail. It provides a structure for the precinct that positions the University to work with potential innovation and research partners with clarity on the framework within which development should occur and with flexibility to respond to specific planning and program requirements, including investment opportunities.

1 PURPOSE AND VISION

1.1 APPLICATION AND INTENTION

The *Innovation Precinct Structure Plan* (IPSP) provides planning and design principles, a physical framework and urban design guidelines to guide the University of British Columbia Okanagan in creating innovation and research space and facilities on the University's Innovation Precinct lands over the next 20 years and beyond and that support its academic, financial, community and whole systems integration objectives as set out in policy documents including the *Academic Vision*, the *Campus Plan*, the *Whole Systems Infrastructure Plan* and the *Integrated Rainwater Management Plan*.

The physical framework identifies generalized development sites and phases and offers direction regarding their access and servicing requirements. It also provides a vision and development framework to position the University to engage and inspire potential partners with aspirations to work with UBC faculty and students at the Okanagan campus.

1.2 VISION

The vision for the Innovation Precinct's development is embedded in the *Campus Plan Vision*. The over-arching vision statements for the campus stress both innovation and research excellence, providing a context for the *Structure Plan's* guiding planning principles.

Campus Plan Vision

The *UBC Okanagan Campus Plan's* Vision, principles and strategies were developed in support of the University's strategic plan and academic mission. The Vision for the University's Okanagan Campus in *Aspire: Envisioning Our Future* states:

The Okanagan Campus aspires to be a model of innovation and interdisciplinary programming as an expression of the University's core commitments— transformative student learning, research excellence, and community engagement.

The *Campus Plan* Vision Statement, developed in consultation with the UBC Okanagan community for the 2015 *Campus Plan*, guides the physical evolution of the University's Okanagan Campus over the next 20 years:

The University of British Columbia's Okanagan Campus aspires to be a centre for learning and innovation that produces global citizens through transformative personal growth and collaboration. Its people, places, and activities are linked by a shared commitment to fostering community, and supporting social and ecological well-being. Deeply connected to the landscape, the campus is an accessible, intimate, and welcoming environment—a catalyst for positive change.

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The intention for the Innovation Precinct (IP) is to create a world class physical ‘vessel’ for creativity, experimentation and innovation. The IP will be a dedicated space where the best and brightest minds converge to solve critical challenges and deploy innovative new technology solutions. The core intention is for IP activities to be: integrated, interdisciplinary, industrial and academic. The space will be further enlivened as an attractive and connected place with mixed uses, including: housing, small scale ancillary commercial and public amenities.

1.3 CONTEXT

The Innovation Precinct responds to its regional and local context.

Regional Context

The Innovation Precinct, and UBC’s Okanagan Campus, are located in the northeast part of the City of Kelowna, adjacent to Kelowna International Airport (YLW), Highway 97 and extensive industrial and residential areas. Collectively, this area is a major and rapidly growing educational, research, employment, industrial, travel and residential hub: the ‘Okanagan Gateway’ within the rapidly growing, entrepreneurial City of Kelowna located in the heart of the Okanagan Valley. UBCO has developed excellent relations with local and regional governments, businesses and other institutions up and down the valley.

Looking to the future, the Innovation Precinct represents a unique and exciting opportunity for a creative, collaborative and interdisciplinary regional hub, where knowledge creation and diffusion occurs, with local, regional and global impact. Regional and global research and development partnerships will be developed around topics such as: aviation, technology, health, sustainable materials and infrastructure, high-value agriculture, social innovation and community resilience.

The Innovation Precinct will be well-connected to the world through direct access to Kelowna International Airport and its many connection points to research, business and other networks worldwide. It will also be well-connected locally and regionally, given it is adjacent to the major north-south highway corridor in the Okanagan, Highway 97, and a growing network of local roadways, transit routes and active transportation corridors.

Local Context

The Innovation Precinct comprises approximately 30.9 gross hectares and occupies the northeast quadrant of the campus with access from Innovation Drive. The precinct is generally bounded by Innovation Drive to the east, University Way to the south, the escarpment and regional gas pipeline to the west and the Okanagan Golf Course to the north. Much of the site is generally at the elevation of the light industrial and business park lands around the highway and separated from the main campus by an escarpment.

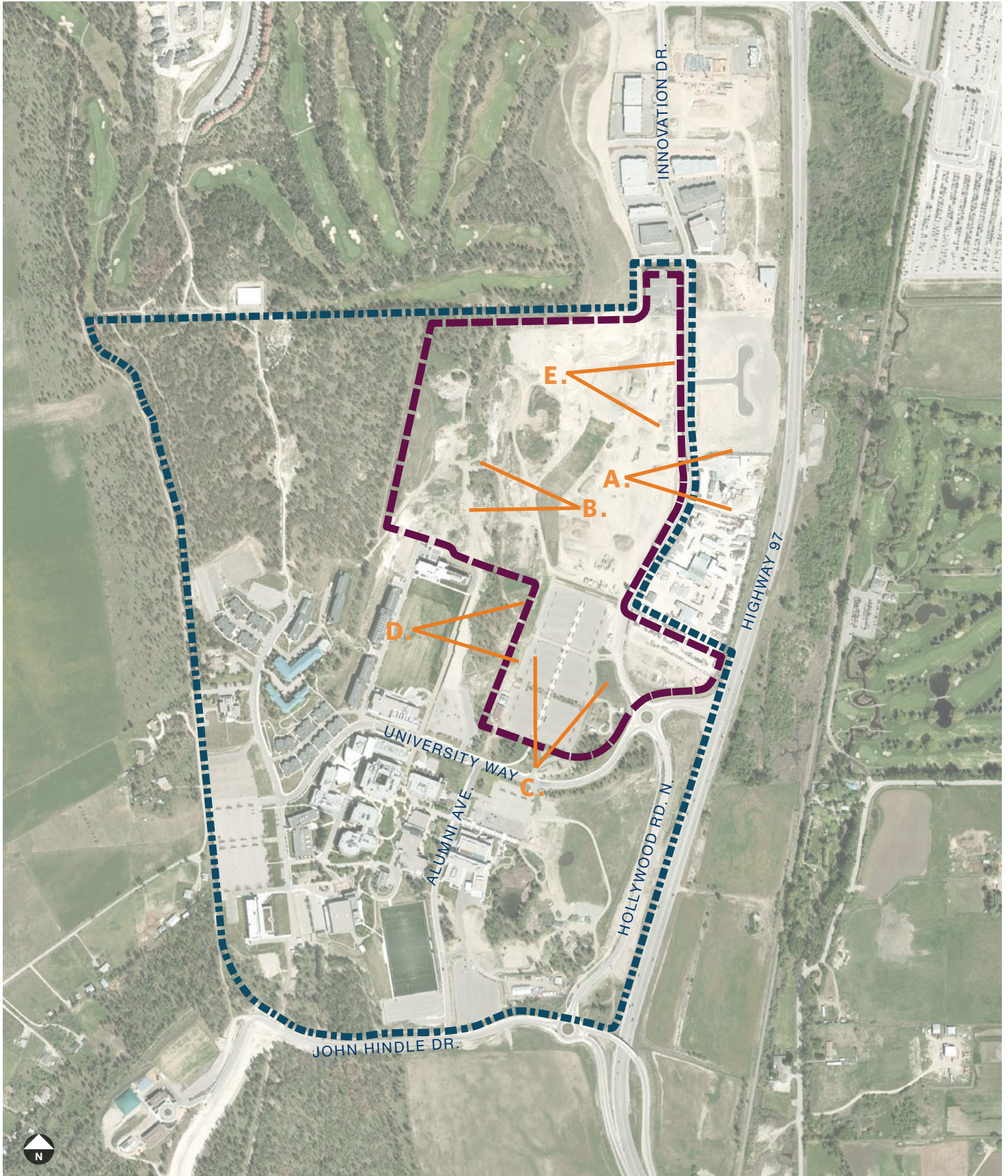
The UBC Okanagan campus is located within the City of Kelowna. As a result, development within the Innovation Precinct is subject to the City's bylaws, permits and approval processes.

The current site-specific zoning for the campus (CD20 – Comprehensive University Development Zone) applies to the majority of the Innovation Precinct and allows a full range of academic, research and supporting land uses essential to a university. The zoning also regulates density, site coverage and building heights, among other aspects. The intended land uses and development for the Innovation Precinct are accommodated under the existing university zoning without requiring amendment.

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BIRD'S EYE VIEW OF THE INNOVATION PRECINCT SITE IN ITS LOCAL CONTEXT



SITE AND SURROUNDING CONTEXT AND VIEWS

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VIEWS OF THE INNOVATION PRECINCT



A. VIEW TOWARD INDUSTRIAL PARK



B. VIEW TO ESCARPMENT AND UPPER BENCH



C. VIEW TO NORTH VALLEY



D. NORTHEAST VIEW FROM ESCARPMENT



E. EAST VIEW FROM ESCARPMENT

1.4

PLANNING AND DESIGN PRINCIPLES

The *Innovation Precinct Structure Plan* builds on the *UBC Okanagan Campus Plan* principles and strategies to create a welcoming and connected campus, to celebrate place, to create a vibrant community and to manage growth through a whole systems sustainability lens, as well as those of the *Whole Systems Infrastructure Plan* and the *Integrated Rainwater Management Plan*.

Through consultation and working closely with campus leadership and campus and community planning staff, a set of planning principles specific to the Innovation Precinct were developed:

CONNECTIVITY AND INTEGRATION

- Connect and integrate the Innovation Precinct with the campus, the community and Kelowna
- Provide research facilities that engage local industries and the UBC Okanagan academic community including both arts and sciences
- Create an interdisciplinary catalyst that promotes innovation for UBC Okanagan and the Kelowna economy
- Facilitate social interactions among people in the Innovation Precinct and with the campus and adjacent industrial area
- Provide access to amenities both on and off-site.

CLARITY AND FLEXIBILITY

- Provide a road map for development of the Innovation Precinct over the short and long-term, facilitating efficient phasing
- Promote a clear vision for interdisciplinary partnerships and effective communications with potential partners
- Ensure efficient use of the land and its management
- Optimize flexibility to accommodate and site uses with a range of parcel sizes and varied uses
- Work within the financial and marketing constraints of the site and its locational resources.

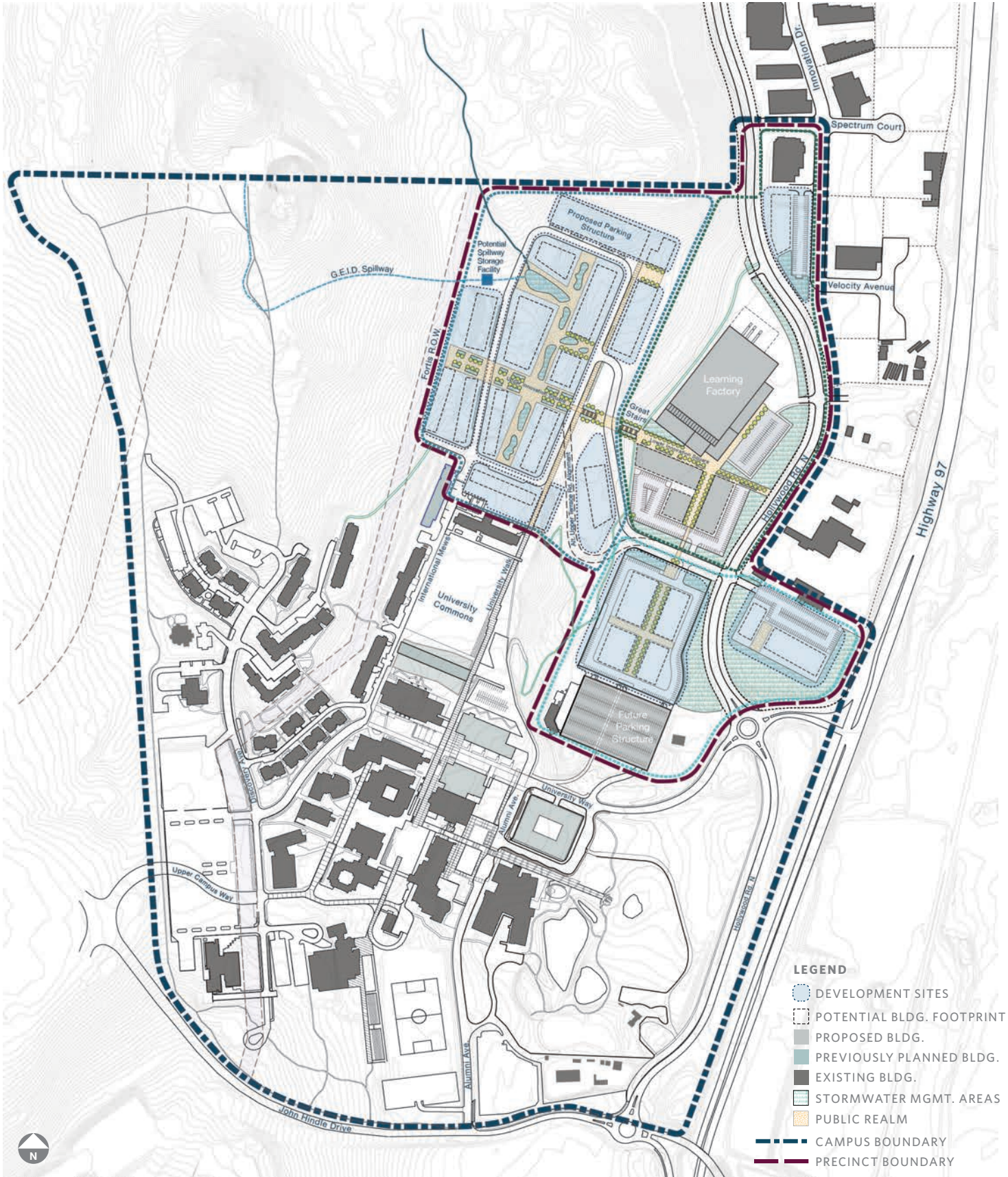
SUSTAINABILITY

- Integrate sustainable strategies for rainwater management, energy systems, regenerative infrastructure and landscape eco-services
- Seek to achieve the *Whole Systems Infrastructure Plan's* 2050 goals for multiple sustainability performance
- Design buildings with attention to sustainable objectives for quality, innovation and holistic integration of functions
- Support campus landscape and ecology to enhance ecosystems services and biodiversity
- Develop an effective and realistic parking strategy that ensures adaptability to an evolving transportation landscape and supports broader sustainability objectives
- Support the continued transition to more sustainable transportation modes, including transit, cycling and carpooling/ride sharing.

PLACEMAKING

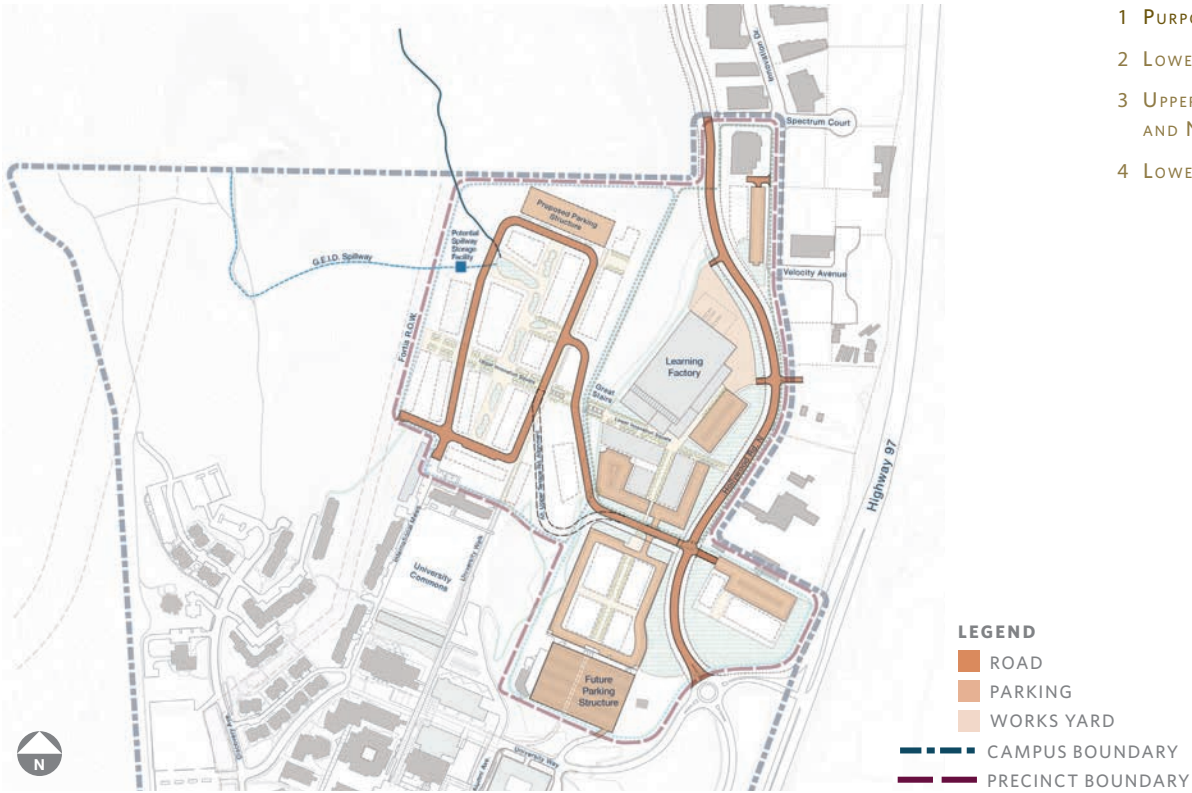
- Build on the sense of place of the campus and its Okanagan setting
- Ensure a high quality public realm and amenities
- Take advantage of slopes and views to integrate the Innovation Precinct with the upper campus and as a generator of form
- Acknowledge the language and culture of the Syilx (Okanagan) people in whose territory the campus is situated.

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INNOVATION PRECINCT CONCEPT PLAN

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VEHICULAR CIRCULATION DIAGRAM



PUBLIC REALM, PEDESTRIAN AND CYCLIST ROUTE DIAGRAM

1.5

PLANNING SCOPE AND SUB-AREAS

The *Innovation Precinct Structure Plan* is composed of three sub-areas that have been structured with boundaries that correspond to their potential for development within immediate, medium and long-term time horizons.

Lower Precinct North Sub-Area

The area bounded by a realigned Hollywood Road North on the east, the toe of the escarpment on the west, and the existing large campus parking lot (Lot H) on the south is the focus of the IPSP. This area is readily developed and well served by road access and nearby servicing infrastructure. It is currently undeveloped and requires neither significant regrading nor removal of vegetation to be prepared for construction.

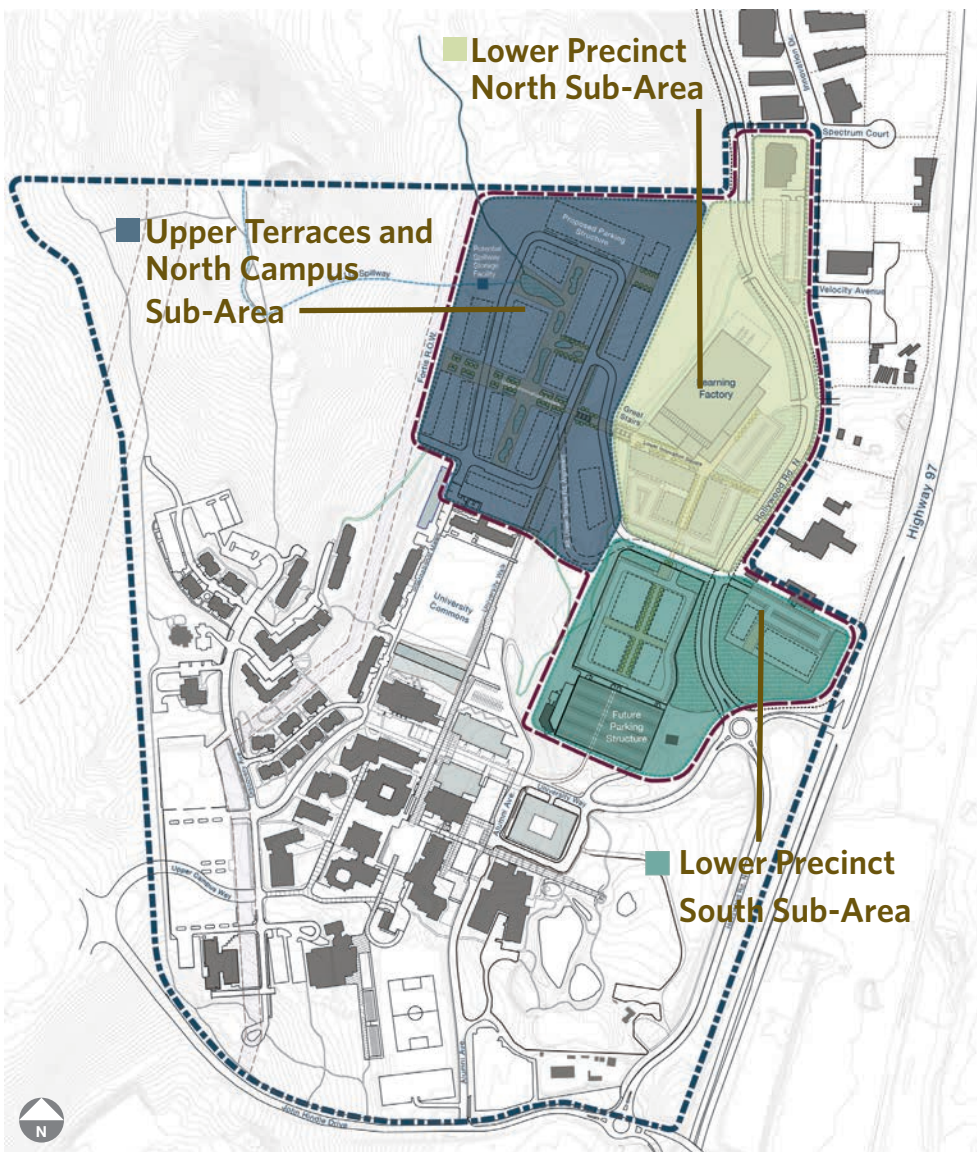
Upper Terraces and North Campus Sub-Area

Initial design studies identified the need for a substantial investigation of the development potential of the Upper Terraces as part of planning for the North Campus. The design of road and servicing access across the Upper Terraces will be a key determinant of the North Campus plan and should not be advanced ahead of a more complete understanding of the urban planning and design requirements for the North Campus.

Lower Precinct South Sub-Area

The existing large campus parking lot (Lot H) provides a significant proportion of the surface parking for the campus. As development progresses on campus, smaller parking lots are being displaced and putting demands on Lot H even as transit and transportation demand management improvements are made. Temporary parking has been added to the site on the east side of Hollywood Road North. These areas are considered as longer-term Innovation Precinct sites but will remain in parking use over the shorter-term while the Lower Precinct North is developed.

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SUB-AREA SIZES AND POTENTIAL BUILDING CAPACITIES

Lower Precinct North

Overall: 105,064m²

Building Footprint: 21,390m²

Gross Floor Area (avg. 2 storeys): 42,780m²

Upper Precinct

Overall: 119,350m²

Building Footprint: 23,057m²

Gross Floor Area (avg. 3.5 storeys): 81,765m²

Lower Precinct South

Overall: 84,102m²

Building Footprint: 10,413m²

Gross Floor Area (avg. 4 storeys): 41,652m²

SUB-AREAS OF THE INNOVATION PRECINCT

1.6 PLANNING PROCESS

The planning process for the IPSP began in 2016 building on the directions of the 2015 *Campus Plan*, the 2016 *Whole Systems Infrastructure Plan* and the 2017 *Integrated Rainwater Management Plan*. Over the course of the project, workshops were held that brought together campus leadership, faculty, planning and operations staff from the Okanagan and Vancouver campuses and members of the consultant team.

	Process and Outcomes
Workshop 1	<ul style="list-style-type: none"> ▪ Define needs, expectations and aspirations ▪ Establish draft planning principles ▪ Identify measures of success
Workshop 2	<ul style="list-style-type: none"> ▪ Review site assessment studies ▪ Day-long design charrette to prepare conceptual plans
Workshop 3	<ul style="list-style-type: none"> ▪ Review and refine updated conceptual options ▪ Consider short and long-term servicing infrastructure requirements
Workshop 4	<ul style="list-style-type: none"> ▪ Focus on the public realm, design character and potential amenities

Over the course of the project, several key decisions regarding the directions for the *Structure Plan* emerged:

- The future location of the Hollywood Road North alignment was critical to achieving coherent and flexible development parcels within the Innovation Precinct
- The potential of the Upper Terraces is closely interrelated with the overall development potential of the North Campus and related decisions to its servicing, especially with adequate road access
- The acquisition by the University of 1540 Innovation Drive expands the development potential of the site created on the east side of the planned realignment of Hollywood Road North
- The IPSP includes consideration of the parking needs of both the precinct and the wider campus community, with this area providing approximately 1,200 existing parking spaces. Considerable uncertainty exists around what the medium and long term requirements for proximate parking will be in a future with expanded transportation options to campus.

Over the build-out period of this plan, anticipated changes include improved transit services, enhanced cycling facilities, additional vehicle sharing options and the introduction of ride-hailing services and autonomous vehicles. As transportation options continue to improve,

transportation demand management efforts will become more and more effective at shifting behaviour. Given this uncertainty, a conservative approach has been taken within this structure plan, ensuring adequate parking supply while allowing for flexibility and adaptation over time.

- The IPSP responds to the *Integrated Rainwater Management Plan* with surface retention/wetland features and provides for significant infiltration for the entire catchment area for the 1 in 100 year storm event. Rainwater management requirements will need to be reconciled during precinct phasing and subsequent detail design for individual development parcels.

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ILLUSTRATIVE RENDERING OF THE UBC LEARNING FACTORY, PLAZA AND GREAT STAIRS

2 LOWER PRECINCT NORTH

2.1 SITE AND EXISTING CONDITIONS CONTEXT

The Lower Precinct North is currently a disturbed brownfield site that was previously used for gravel extraction. With revisions to existing geo-well infrastructure, it is readily developable. It is located with access from a realigned Hollywood Road North roadway and is adjacent to current and zoned industrial lands, including the Airport Business Park to the north.

2.2 DEVELOPMENT POTENTIAL, FEASIBILITY AND PHASING

The Lower Precinct North is identified as the first phase of development since it requires no displacement of surface parking and can be serviced from extensions of campus or municipal infrastructure.

UBC and the City of Kelowna have agreement on a revised alignment for the future extension of Hollywood Road North that will shift the roadway eastwards at UBC's northern boundary and connect it with the existing Innovation Drive, thereby creating a larger contiguous Lower Precinct North land area with the City road along the precinct boundary. This alignment is incorporated into the preferred concept options and is currently in the approvals process with the City of Kelowna.

The Lower Precinct North includes the property acquired by the University at 1540 Innovation Drive within the Airport Business Park zoned lands (CD15 Zone). Consolidation of this parcel with campus lands and use for academic purpose would necessitate rezoning to the University's CD20 zoning as well as amendment to the City's Official Community Plan (OCP).

2.3 LAND USE AND DEVELOPMENT OBJECTIVES

The land uses under consideration include office, industrial and research as dominant uses with potential for academic, food services, daycare and recreation amenity supporting uses. The development objectives of the University are consistent with best practices for innovation and research parks on University lands: these lands should be reserved for partnerships that benefit the University's academic mission as well as provide financial returns.

Although there are hopes for an efficient rate of development, it is key that the limited amount of land in the Innovation Precinct is recognized and used for purposes that benefit the University's academic and campus development vision. The financial and market studies undertaken during the IPSP process demonstrate

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that there are alternative and more affordable lands in the vicinity for businesses that seek proximity to UBC Okanagan but do not offer an attractive package of collaborative uses.

A review of four innovation and research districts with similarities to UBC Okanagan and a general literature review generated a set of characteristics of successful business parks to be considered for the IPSP:

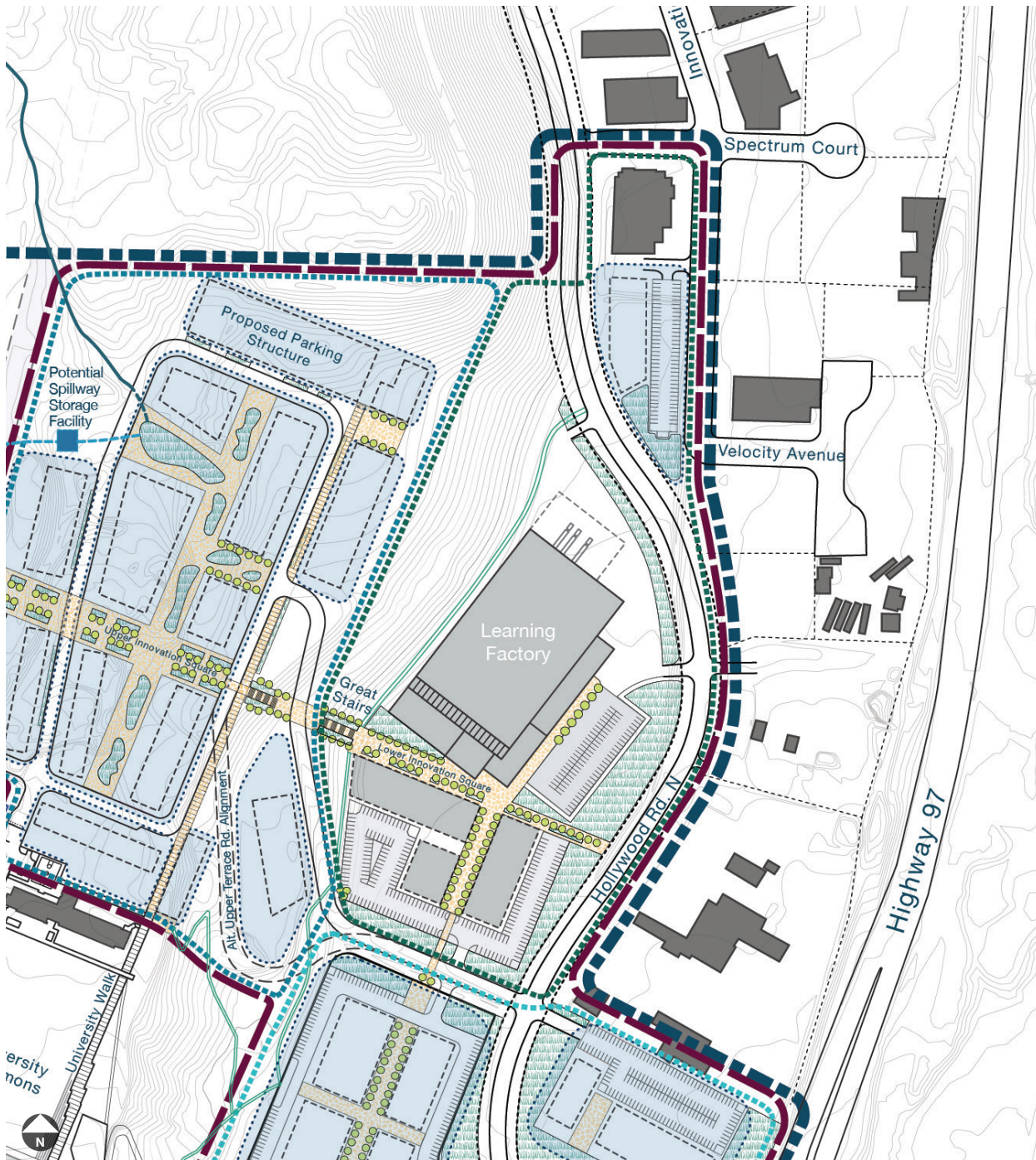
- Champions provide sustained, high level attention and support for the project
- Effective, professional leadership facilitates networking among entrepreneurs, researchers and investors
- Funding is designated and sustained with both public funding and active private participation
- Bridging institutions, such as the North Carolina Board on Science and Technology, help preserve the vision of the park over the long period it takes for parks to mature and become successful
- Soft infrastructure, the positive human capital built over many years of investment in education, skills training and public policies, encourages an entrepreneurial culture and networks of professionals
- Effective metrics help management set goals and gauge the effectiveness of the park.

The case studies also identified applicable best practices for the Innovation Precinct at UBC Okanagan:

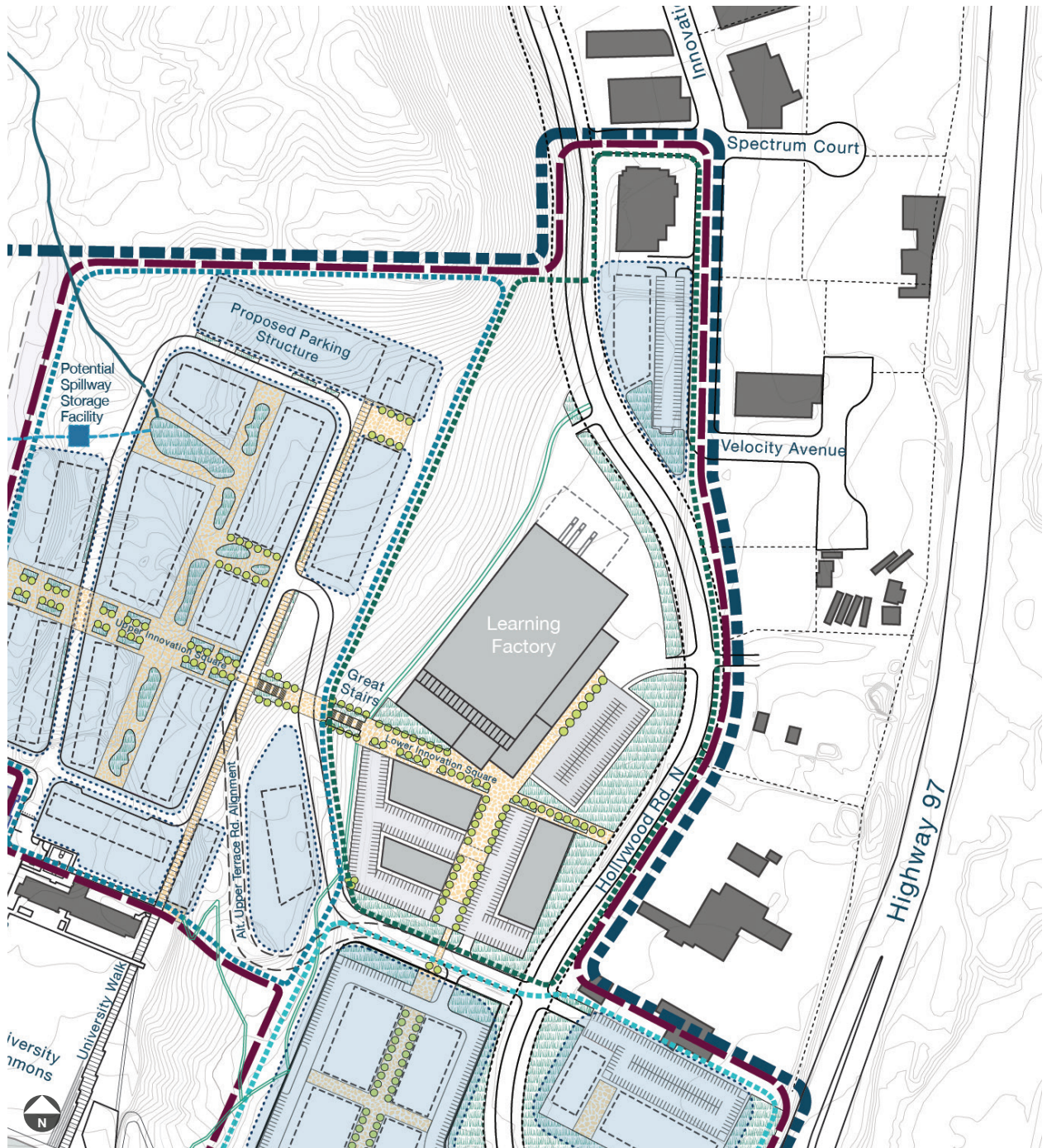
- A strong science and industry base at the University and in the community
- The availability of finance
- The presence of entrepreneurs
- The presence of trust networks at an individual level
- The opportunity for collaboration among universities, businesses and other organizations
- High quality buildings of 3-5 storeys; lower scale structures are not placed on sites with frontages on prime pedestrian routes in core areas
- Pursuit of partnerships that offer a benefit to the University
- Flexibility with regard to the types of research rather than a focus on one specific research concentration
- The University retains control of approving partners/tenants in the park and also retains ownership of the land but does not always participate in the ownership of buildings
- Revenue to the University is primarily derived from ground rent on leases of 30 to 50 years

- Site design allows for parcel creation to evolve to meet the needs of individual partners; parcel sizes vary within identified development blocks
- There is a desire to create a dense, pedestrian oriented area or route
- All cases are working to build in diversity and activity by including uses such as: recreation centres, conference centres, daycare, maker spaces, retail and food vendors.

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ILLUSTRATIVE CONCEPT FOR THE LOWER PRECINCT NORTH



ALTERNATIVE POTENTIAL BUILDING CONCEPT - LOWER PRECINCT NORTH

2.4 LAYOUT AND PARCELIZATION

The layout and parcelization of the Lower North Precinct is shaped by the future right-of-way for Hollywood Road North. The bulk of the lands are west of the right-of-way and a small parcel is created on the east side that is appropriate to the needs of a compact research facility. The northern portion of the area west of Hollywood Road North has been tested to accommodate the proposed UBC Learning Factory facility but could also be designed to support several smaller buildings. As proposed, the UBC Learning Factory would provide a unique facility and opportunity for UBC faculty and researchers to partner with private industry to undertake industrial/manufacturing research, processes and production on a large scale.

South of the UBC Learning Factory facility site is a large parcel that could accommodate one large footprint use or several smaller, more typical innovation/research buildings and associated parking and loading areas. The illustrated development scheme depicts a cluster of buildings with typical building dimensions that could house individual larger uses or several smaller uses in a multi-tenant arrangement. The number and heights of buildings is constrained by the zoning requirements for parking.

Parking is assumed to be provided on-site for all new uses in the Lower North Precinct, but consolidated where possible to minimize the space requirement. In addition to minimizing demand for parking, bus stops will be located nearby and the parcels will be served by cycling facilities that connect to the urban areas of Kelowna and to the north.

2.5 CIRCULATION AND TRANSPORTATION

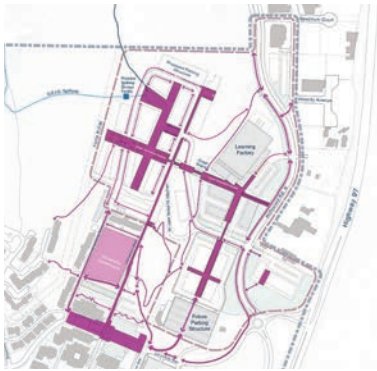
Planning for the new Hollywood Road North alignment has been done concurrently with the IPSP. It will have limited access points as a municipal arterial road. The *Structure Plan* has been shaped by the effort to limit access from Hollywood Road North to three intersections along the frontage of the Lower North Precinct and to make each intersection a through connection:

- At the north end of the precinct with access to the Learning Factory site. The research site to the east of Hollywood Road North is required to have access from Innovation Drive
- At a midpoint with access to parking for the Learning Factory and for private developments across Hollywood Road North
- At the north edge of Parking Lot H for a major access to the south parcels of the Lower North Precinct, for a new entry into Parking Lot H and for a potential future local road access to the North Campus.

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VEHICULAR CIRCULATION



PUBLIC REALM

The only local campus road anticipated to be required to serve the Lower North Precinct is proposed between Parking Lot H and the south edge of the precinct and will connect to the Upper Terraces to prevent precinct traffic using roads in the core of the campus. Several conceptual road alignments are possible traversing the escarpment. Two possible alignments are shown in the Innovation Precinct Illustrative Concept. The preferred alignment would need to be determined through further road design studies. The road should be scaled to become one used by a wide range of vehicles including fire trucks and delivery trucks.

Several pedestrian greenway routes will serve the Lower Precinct North:

- The pedestrian route that extends north-south through the middle of Parking Lot H will continue northward to Lower Innovation Square
- A major stairway connection, the Great Stairs, from the central square will provide a route to the North Campus
- The pedestrian route from University Walk to Parking Lot H will intersect with a new greenway along the toe of the slope atop a utility corridor for district energy piping and communications conduit. It will intersect with the east-west Great Stairs at a terraced landing and lead to the sidewalk on Hollywood Road North near the north campus boundary.

2.6 URBAN DESIGN DIRECTIONS

The Innovation Precinct will be differentiated from the main UBC Okanagan campus due to the scale and uses of its buildings. Treatment of the public realm, landscape materials and furnishings, lighting and wayfinding designed in conformance with campus standards should be used in order to express that the precinct is a part of the larger UBC Okanagan identity.

The *UBC Okanagan Design Guidelines* express in specific details and materials the design directions of the *Campus Plan*. UBC is currently in the process of preparing a new updated version. The guidelines provide general guidance to the design, materiality, landscape character and integration with the Okanagan landscape that is desired in the Innovation Precinct as a part of UBC Okanagan as well as specific design direction on accessibility, green buildings, paving, street furniture and lighting. Also the *UBC Wayfinding - Exterior Signage Standards and Guidelines* (2017) provide specific guidance on exterior building and overall wayfinding signage.

The design directions below are intended to supplement the above campus-wide design guidelines and apply generally to the entire Innovation Precinct.

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OKANAGAN GRASSLAND AND PINE LANDSCAPE CHARACTER

Streetscapes/Street Cross-Sections

Two streetscape types are located within the Innovation Precinct:

- Hollywood Road North. This municipal road will be designed as an arterial road to the standards of the City of Kelowna. The cross-section on the facing page represents the anticipated allocation of the right-of-way, varying where a central turning lane is required.
- Local campus road access to the Upper Terraces and North Campus. The cross-section on the facing page is based on a preliminary analysis of capacity and will need to be refined as part of further road design studies and the detailed master plan process for the Lower North Campus. A two lane road offering a lane in each direction, on-street shared bike lanes and no on-street parking is proposed.

Pedestrian and Cycling Paths

Pedestrians and cyclists will be accommodated primarily on the three greenway routes across the site (refer to section 2.5). These are envisioned as shared pathways. Both Hollywood Road North and the new local road to the North Campus will have sidewalks and on-street bike routes.

Bike racks should be provided in the central plaza area to serve the Learning Factory and encourage use of this grouping of outdoor amenities. Other innovation/research buildings should provide bike racks near to worker and visitor entrances. Secure bike parking and end of trip facilities for staff will be required in each building to accommodate commuter cyclists. Bike parking also needs to comply with the City of Kelowna's zoning requirements.

Public Realm/Open Space Amenities

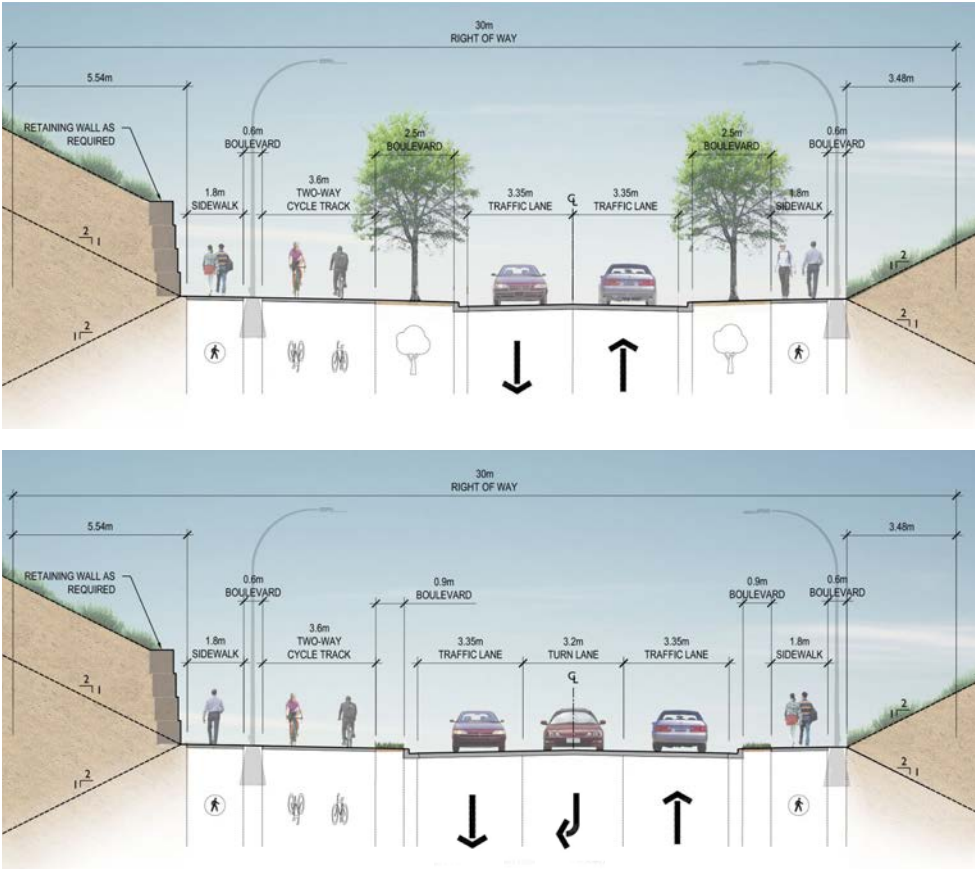
A social heart for the Innovation Precinct should be located at the intersection of the two major greenway routes through the Lower Precinct North: the extension of the greenway link from Parking Lot H and the proposed perpendicular link from Hollywood Road North up the Great Stairs to the Upper Terraces and North Campus.

This central plaza is the focus of a cluster of public realm amenities at this intersection of routes and should be designed as a social collision space where people will gather, converse and eat outdoors in good weather. (Refer to precedent images on page 34.)

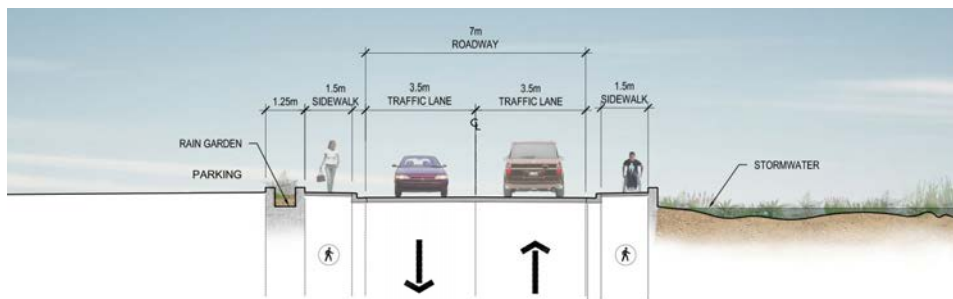
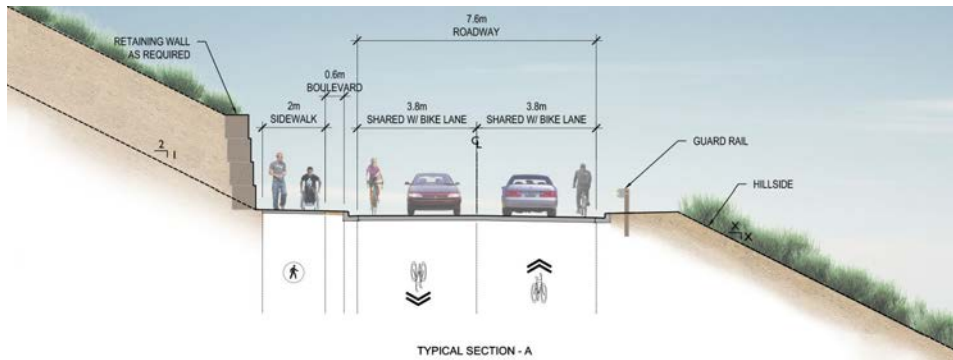
Open space amenities should include (refer to precedent images on pages 30 and 31):

- Seating in a variety of configurations for groups and individuals including tables for outdoor eating and for use of laptop computers, locations with shade and weather protection and places with good sun orientation

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TYPICAL HOLLYWOOD ROAD NORTH CROSS-SECTIONS



TYPICAL LOCAL ROAD CONNECTION TO NORTH CAMPUS CROSS-SECTIONS

- Rainwater gardens as landscape features with urban detailing to catch runoff from roofs and paved areas for integration into the overall surface rainwater system
- Mature trees in areas for shade in hot weather
- Opportunities for social and recreational activities through all the seasons
- Opportunities to express indigeneity through acknowledging the language and culture of the Syilx (Okanagan) people, as well as indigenous flora and fauna
- Night lighting for safety and security and also for visual interest
- Public art integrated into the overall plaza design, potentially related to the research and innovation activities in adjacent buildings.
- Signage and wayfinding information.



ILLUSTRATIVE RENDERING OF THE LOWER PRECINCT NORTH

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PRECEDENTS FOR OUTDOOR AMENITIES

Landscape Character

The Lower Innovation Precinct is tucked at the base of an escarpment where the northward growth of the campus will occur over time. The slopes are a grassland landscape with stands of pine forest that has been established on recently disturbed areas previously used for gravel extraction. This Okanagan landscape will provide the backdrop to the innovation and research buildings on the flat land fronting Hollywood Road North.

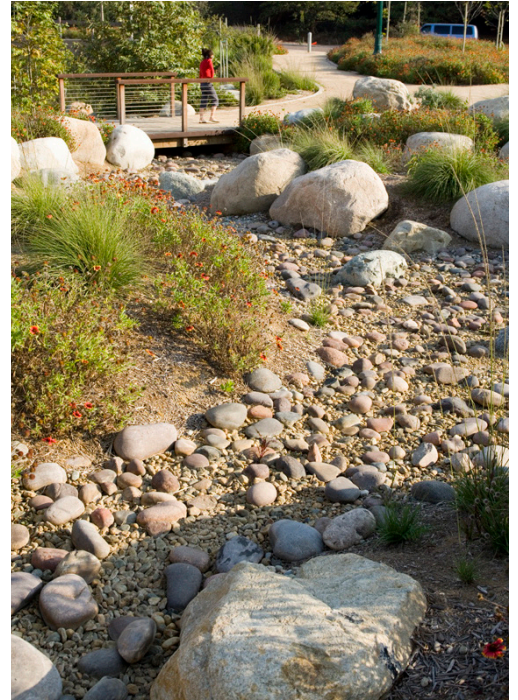
Planting design for the Innovation Precinct presents an opportunity to strengthen the legibility and relationship of the precinct with the established campus and surrounding indigenous landscape setting. Native plants are preferred over non-native as an aesthetic and environmental approach. Thoughtful consideration should be given to plants that provide interest in four seasons and that are low water use and low maintenance.

The requirements of the *UBC Okanagan Integrated Rainwater Management Plan* (2017) for the campus result in surface wetland and swale features around the buildings and parking lots in the precinct and along the edges of Hollywood Road North (also refer to section 2.7). These swales should be planted with trees and water-tolerant grasses and reeds to achieve a naturalized appearance while tolerating periods of dry weather (refer to images on page 33). The resulting character of Hollywood Road North will be strip of naturalized plantings that will be a visual buffer for the UBC Learning Factory and other potential large scale facilities from the Hollywood Road North corridor.

The internal central open space will have a contrasting, urban and contemporary landscape character where the central pedestrian spine of the Lower Precinct South intersects with the Great Stairs to the Upper Terraces and North Campus (refer to images on page 34). This central plaza should be designed to include:

- A plaza for informal gathering and outdoor eating with ample and varied seating opportunities that encourage group interaction and casual conversations
- An adjacent cafeteria or food outlet, if feasible given the number of people who will be working in the area
- Location of building program elements that can provide views into the adjacent buildings such as lobby and atrium spaces, lunch rooms, classrooms and study spaces
- Public art, perhaps on a scientific or innovation theme
- Surface rainwater features with an urban character.

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PRECEDENTS FOR SURFACE RAINWATER AMENITIES



PRECEDENTS FOR CENTRAL PLAZA IN THE NORTH INNOVATION PRECINCT

Building Siting, Heights and Massing

Although the zoning permits up to six storey structures, the buildings in this sub-area will likely range in height from one to three storeys due to their space program and relationship to parking requirements. One storey buildings will be industrial spaces where very high ceilings are required for the planned industrial activities; the UBC Learning Factory facility is an example of a grouping of program uses on several storeys around a central high-head space.

Buildings will typically have one side that is best suited to face public spaces and major circulation routes with the primary entry, lobby and concentration of interior spaces that welcome visitors and research partners. Other facades may have truck loading or other service areas or large expanses of mostly windowless walls. Consequently, the orientation of the best façade towards the most important adjacencies should be carefully considered. Likewise, large blank walls should be sited where they can be screened with landscape or nestle into a hillside slope. Opportunities to improve the appearance of exposed blank walls will be pursued through architectural and landscape elements where they are unavoidably located adjacent to public areas.

Building Character

Buildings should consider the design guidelines for the campus with regard to siting, materials and colour palette. However, the typology for innovation/research/industrial buildings varies from academic and student residential uses with larger typical footprints, facades with a significant percentage of blank walls, loading and service areas and on-site surface parking. High quality design and building materials should be used, especially on the building frontages that address City or campus streetscapes and public spaces.

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BUILDING CHARACTER PRECEDENTS

Building Sustainable Design Features

Buildings should consider inclusion of design features that address the University’s sustainability objectives, including: design elements that collect and channel rainwater in visible ways such as gutters, chains, rain barrels and splash blocks, green walls and roofs, water collection and detention on roofs, details to promote energy efficiency such as louvers and sun shades, passive construction and consideration of solar and prevailing wind orientation.

Parking, Loading and Arterial Road Access

Innovation and research parks associated with universities in urban locations can utilize underground parking to create districts with an urban character. However, the Innovation Precinct is adjacent to available industrial land zoned for a similar range of uses that is currently marketed at costs that do not rationalize underground or structured parking. It is therefore assumed that, at least in its initial phases, developments within the Innovation Precinct will provide parking and loading at grade on a site by site basis in the ratios set by the City of Kelowna Zoning By-Law which vary based on the specific uses included in the building program. Parking should be designed to be compact and minimize space requirements and paved surface areas to the extent feasible.

Over time, parking needs may diminish as alternative transportation options are improved through industry/technological advances and successful implementation of broader transportation demand management initiatives. Portions of the provided surface parking could then potentially be repurposed for additional development, public realm enhancements or to serve other needs. The design of buildings and associated parking should therefore consider potential for longer term changes in demand and anticipate adaptive reuse of areas devoted to parking.



BUILDING CHARACTER PRECEDENT

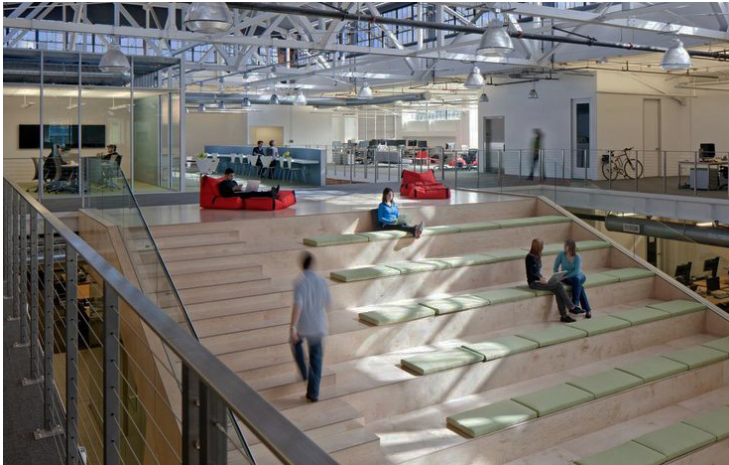
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BUILDING CHARACTER PRECEDENTS



PRECEDENTS FOR ENGAGED INDOOR - OUTDOOR RELATIONSHIPS



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PRECEDENTS FOR INTERIOR SPACES FOR INNOVATION AND RESEARCH

2.7

INFRASTRUCTURE AND SERVICING STRATEGIES

The *Innovation Precinct Structure Plan* has investigated infrastructure and servicing needs with a focus on the Lower North Innovation Precinct as the first and most understood phase of development.

Integrated Rainwater Management Plan

The *Whole Systems Infrastructure Plan* (WSIP, 2016) discusses several aspirations and strategies related to integrated rainwater management. Low Impact Development (LID) methods are recommended to help address both water quality and water quantity of the rainwater runoff on the campus. The Plan recognizes that rainwater sustains wetlands that are important for the campus from biodiversity, educational and recreational points of view. The WSIP places an emphasis on expanding the permanent and seasonal wetland complexes on campus not only to assist with mitigating rainwater rate and flow, but also to enhance the ecological and biodiversity functions on campus.

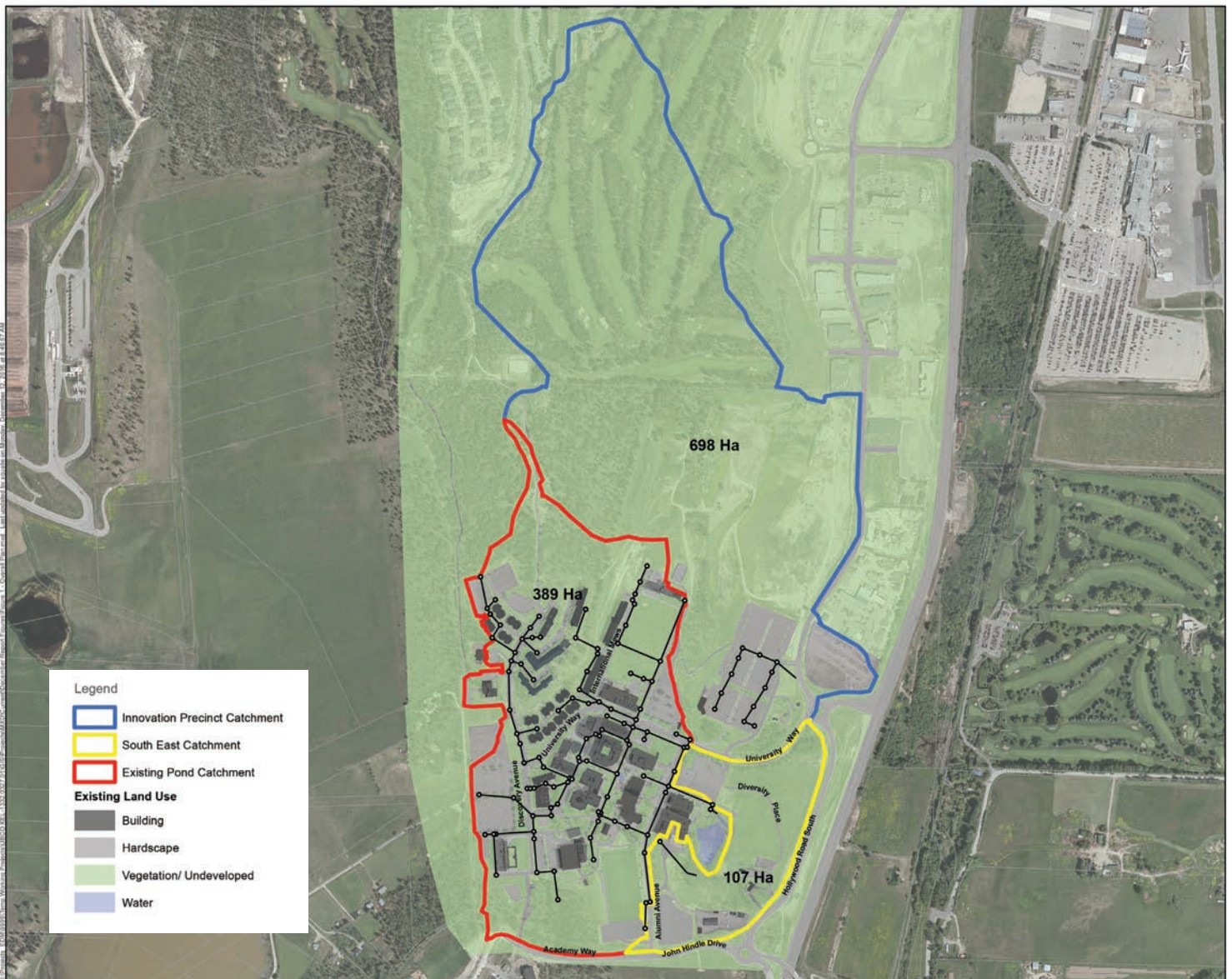
Building on the WSIP aspirations and policies, the *Integrated Rainwater Management Plan* (IRMP, 2017) recommends several integrated strategies for the campus:

- Collect and filter rainwater in parking lots and other large impervious areas to enhance an expanded network of wetlands. This addresses both the rainwater goal for the control and retention of all rainwater on-site and the objective of providing additional natural landscaped areas for enhanced biodiversity functions.
- Infiltrate runoff from buildings and impervious surfaces using Low Impact Development (LID) methods including: rain gardens, rain barrels, bioswales, green roofs, vegetative strips and roof storage.

The IRMP identifies the Innovation Precinct as part of an Innovation Precinct Catchment Area that extends well beyond the campus boundaries (refer to facing plan). The IRMP recommends that, given the high permeability of the native soils and the land base required to create an effective wetland, a single centralized constructed wetland and recharge basin be created. The IRMP identifies two alternative locations for this major wetland and recharge basin within the Innovation Precinct, both of which correspond with development sites in the *Innovation Precinct Structure Plan*.

The IRMP lays out the fundamental requirements for rainwater management in the Innovation Precinct, along with the predicted cumulative design flows. These preliminary design flows represent the 1:100 year event with consideration for climate change. Unlike what has occurred on the main campus, it is recommended that future conveyances be sized for the major flow. The IRMP anticipates that following the Innovation Precinct land use planning and preliminary design

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EXISTING RAINWATER CATCHMENT AREAS

process, the hydrodynamic modeling and infrastructure sizing should be checked and updated as required.

The IRMP servicing concept for the Innovation Precinct area is described as follows:

- Site controls are to be applied at the site level in accordance with calculations presented in the IRMP requiring that 25mm of retention be provided for all new impervious surfaces.
- Given the rapid infiltration capacity for this area (estimated at 1 meter per day), modeling suggest that no runoff should be created for storms equal to or less than the 1:5 year. However, this is highly dependent on the successful application of distributed LID controls. Failure to achieve distributed retention systems will have a significant impact on cumulative runoff rates and volumes. In turn, this may have significant influence on the sizing of the communal water treatment and recharge systems. It is recommended that these systems be sized conservatively.
- UBC is responsible to provide an emergency spillway on its lands for the Glenmore Ellison Irrigation District (GEID) reservoir located at the University's northern boundary. The GEID overflow route previously designed should be extended to and through the Upper Terraces and North Campus area. The specific routing is flexible and will be governed by topography and the layout of development.
- It is proposed that the Purcell Courts expansion area (an area that roughly corresponds to the Upper Terraces and North Campus sub-area) drain into the Lower Innovation Precinct for treatment and disposal given that the systems within the main campus are already overtaxed. Two potential routings for this flow are identified: one short-cutting down slope to a conveyance system expected to coincide with the anticipated new local campus access road and an alternate alignment along the south limits of the Lower North Campus development area, merging with the GEID overflow and runoff from development the within the Upper Terraces and North Campus. It is also proposed that a cut-off channel be constructed upslope of Purcell Courts to protect against any seepage or overland flow that may be generated from the slope. It may be advisable to conduct a site specific geotechnical investigation along this alignment to determine groundwater levels. This may dictate the need for a subsurface French drain in addition to a surface swale.
- The existing drainage ditch along the north edge of Lot H will be largely maintained, however it is recommended that minor bank erosion issues be addressed. The decision to largely maintain this ditch in its current condition is due to the presence of the Spadefoot Toad. This ditch should be provided with an overflow to a new rainwater treatment and disposal facility to prevent its current spill eastwards off campus and over Innovation Drive.

The IRMP anticipates that, with successful application of LID facilities for all future growth, there is expected to be little to no runoff generation for the 1:2 and 1:5 year events. However, this is not true for Lot H, which is reliant on the existing north edge ditch, which does not infiltrate as intended and is inadequate to manage the parking area. As such, the IRMP's recommended centralized constructed wetland and recharge basin was largely to be sized to service Lot H, as no flow is anticipated from other growth areas for a 1:2 year event provided successful application of LID's as recommended. The IRMP's recharge basin is sized for 100% retention and disposal for all runoff generated up to and including the 1:100 year event and should account for anticipated climate change.

The critical design values for the constructed wetland were a predicted peak inflow rate of 0.47 cubic meters/second and a treatment volume of 825 cubic meters (total 1:2 year, 24 hour volume entering wetland) resulting from the future condition with development and climate change. Unlike the recharge basin storage volume which represents only a portion of the incoming runoff hydrograph volume, the wetland is anticipated to treat the entire incoming runoff hydrograph volume.

The critical design values for the recharge basin are 1.88 cubic meters/second for an inflow rate and 3,652 cubic meters for a storage volume; both of which are for the 1:100 year climate change event. The recharge basin storage volume

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PRECEDENT FOR A SURFACE RAINWATER SWALE AS BUFFER ALONG HOLLYWOOD ROAD

is calculated as only the temporary storage volume for the portion of the runoff hydrograph that exceeds the infiltration capacity of the basin.

The IRMP states that the ultimate disposal of generated runoff within the catchment area, particularly to achieve 100% retention within the UBC Okanagan property, is reliant on a recharge facility. During the preparation of the IRMP, UBC Okanagan endorsed a recharge basin over a network of recharge wells. It was recommended that the recharge basin depth not exceed 1.5 meters of live storage depth, and should have a standard 0.6 meters of freeboard above the high water level, for a total basin depth of 2.1 meters. Cut slopes were suggested at 4:1, but are flexible provided they are not steeper than 3:1. Signage is required to warn of rapid water level changes.

Sizing assumes that the infiltration rate remains constant, regardless of the water depth in the basin. A basin surface area of 2,500 square meters is estimated. Additional area for the 0.6 meter freeboard slope and an access buffer, approximately 3 meters wide, is required above this, resulting in a total land base requirement of 3,700 square meters. When combined with the constructed wetland, the total minimum land base estimated for the facility is 0.59 hectares, which is smaller than the land base of the existing pond on the main campus (roughly 0.9 hectares).

Sizing of a recharge basin within the Innovation Precinct is highly dependent on the application of LID practices and the total development area. Sizing of the recharge basin must be verified through a comprehensive engineering design process for the Innovation Precinct. Except during significant storms when temporary storage is required, the recharge basin would be expected to be dry and void of shallow ground water. As such, it will not support plant life, other than perhaps desert species (succulents). Landscape architects need to be creative to offer visual appeal to the recharge basin facility, but it is critical that finishing elements and uses do not impact the infiltration capacity. The pre-treatment water quality systems and regular maintenance to remove any deposited debris are important.

With a predicted maximum storage volume of 3,652 cubic meters, the maximum storage depth of the recharge basin is predicted to reach 1.46 meters. However, the IRMP recommends that the basin offer a live storage depth of 1.5 meters, offering a total available volume of 3,750 cubic meters. Additional safeguard storage of 2,200 cubic meters is proposed within the 0.6 m freeboard zone.

Environmental Mitigation and Habitat Enhancement

The IRMP also addresses a range of environmental mitigation recommendations and conservation and enhancement opportunities that are relevant to the Lower Precinct North.

Recommendations regarding the existing ditch servicing Lot H along its north edge where the proposed new local road is located include:

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- Disturbance to the existing ditch should be avoided to minimize potential impacts to the Great Basin Spadefoot Toad, a blue-listed species under the BC Conservation Data Centre and listed as Threatened on Schedule 1 of the Species at Risk Act (SARA). The ditch provides suitable breeding habitat for these toads. Any maintenance activities should occur during late summer (late July to early September) outside of the anticipated breeding period.
- Potential opportunities for conservation and enhancement of the area around the existing ditch are also identified including adding cattails and riparian grasses along the parking lot to improve water quality and habitat, deepening sections of the ditch to allow for a longer period of water retention, improving stormwater quality before it enters the ditch by providing a vegetated buffer along the parking lot edge to filter runoff from the parking lot before it enters the ditch, planting native trees (e.g., aspen, alder, birch, etc.) along the south side of the ditch to provide shade and reduce evaporation and maintaining habitat connectivity to allow for the migration of adult spadefoot toads to woodland habitats.

Conservation and enhancement opportunities for future constructed wetlands and recharge basins are also noted in the IRMP:

- Provide access from the wetland to the area between the Lower Precinct North and the Upper Terraces and North Campus to allow for wildlife migration to upland foraging habitats
- Incorporate suitable native aquatic and riparian species within the design of the constructed wetland. It is possible, however, that this wetland may be ephemeral and may go through periods of drought. Plants should be selected accordingly.
- Ensure the wetland has an impermeable liner to minimize infiltration
- Explore establishing a spadefoot population in the constructed wetland via translocation of adults from less suitable habitats (i.e., the Lot H ditch)
- Provide access to suitable turtle nesting sites with light soils and little vegetative cover with south exposure and incorporate basking rocks and logs, in shallow water areas with emergent and floating vegetation
- Control/prevent the establishment of invasive plant species that out-compete native species and establish a buffer of native vegetation adjacent to the wetland
- Add artificial snags for perching and cavity nesting.

Innovation Precinct Implementation Strategy

The IRMP notes that the Innovation Precinct requires a systematic implementation process involving, in order of priority:

- Using this IRMP as a guide, conduct a land use planning process to identify land base and siting of necessary controls; both LID site controls and communal treatment and disposal controls. In the process decide on precinct being “pipeless” or not. This will be an important decision to design of site grading and buildings.
- Conduct site specific infiltration testing at the precise locations of planning infrastructure
- Review and update technical analysis based on earlier implementation steps
- Consider implementing a temporary water quality forebay and recharge basin to serve the early phases of development, and then when the highest risk construction activities are complete, retrofit the facilities into their final constructed wetland and recharge basin form. This is subject to the time horizon of planned development of Innovation Precinct and UBCO’s success of the IRMP’s Sediment and Erosion Control Criteria.

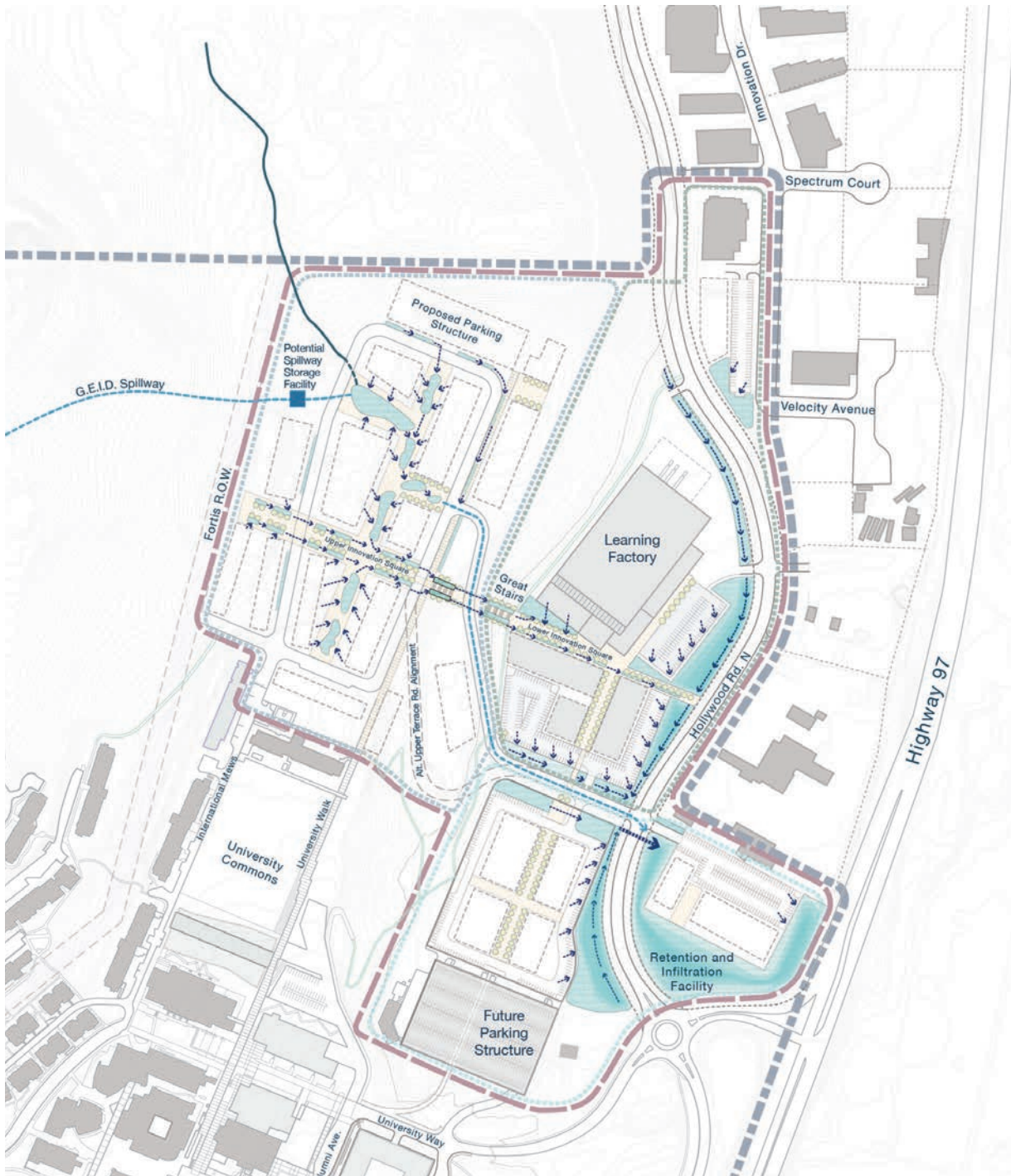
Conceptual Rainwater Servicing Strategy

The conceptual rainwater servicing strategy for the Innovation Precinct builds on and enhances the approach presented in the *Integrated Rainwater Management Plan* (IRMP) that advocates for one large surface rainwater catchment feature that combines wetland and recharge basin. The need and value of land for development within the Innovation Precinct has necessarily shaped the rainwater servicing strategy to one that provides as a first priority a series of distributed and connected wetlands and retention facilities which then connect to a primary recharge basin. The overall volume to be managed within the Innovation Precinct is expected to be consistent with predicted cumulative design flows set out in the IRMP and would need to be calculated according to IRMP requirements based on proposed development as well as the overall contributory upslope catchment area. At minimum each development site is expected to manage its rainwater on site.

The illustrated concept on the facing page represents the conceptual area required for wetland by the IRMP supplemented by swales in areas that can be readily integrated into the landscape, primarily in areas that buffer Hollywood Road North or that reinforce the character of the public realm amenities of the Innovation Precinct.

The short-term retention and infiltration of rainwater during and immediately after rain events is proposed to occur in distributed features on development sites utilizing facilities that potentially include: short-term retention of rainwater on hard surfaced areas, such as surface parking lots that is released in a controlled flow to swales and wetlands and underground features under parking lots, plazas and local roadways such as recharge wells and short-term storage that release into wetlands and swales for slowed recharge. These distributed features are more costly than providing the one surface recharge basin proposed by the IRMP, but

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ILLUSTRATED CONCEPTUAL RAINWATER CATCHMENT AREAS AND FLOWS

free up additional land and create flexibility for development while allowing for a potentially smaller recharge basin facility at the system terminus on the east side of Hollywood Road North, north of the University Way roundabout.

The development site immediately north of the University Way roundabout is currently used as an interim parking lot and is considered as a later phase of Innovation Precinct development. The extent of surface wetland, other rainwater management features and/or recharge basin facility required to be delivered on this site will be dependent on the extent to which earlier phases of the Innovation Precinct and Upper Terraces and North Campus development have achieved the objectives of the IRMP for rainwater retention and infiltration on each development parcel and within common spaces within the Innovation Precinct west of Hollywood Road North.

Phasing plans for the Innovation Precinct will need to address temporary rainwater management in a progressive manner, consistent with the IRMP and with the ultimate IPSP rainwater servicing strategy.

District Energy

District energy is a feature of the UBC Okanagan campus strategy for whole systems integration. Low carbon district energy infrastructure assists UBC meet its requirements under the BC Climate Leadership Plan, which includes payment of an annual carbon offset liability. The University is currently studying the extension of district energy northward to serve the Innovation Precinct and, in time, the Upper Terraces and North Campus. Current preliminary assessment indicates that district energy for the Lower Precinct North will be extended northward from an expanded facility at the southwest corner of Parking Lot H. An alignment at the toe of the slope is proposed for consideration at the detailed design stage where it would coincide with a proposed greenway route.

There are two existing wells for the District Energy system within the Lower Precinct North that will need to be decommissioned and relocated within the immediate area should these locations conflict with development plans. The new well(s) would need to be commissioned and operational before taking the old wells out of service.

Utilities

A summary of utilities and servicing considerations is provided below, based on a Technical Memorandum prepared for the Innovation Precinct by Associated Engineering Ltd. Key conclusions include:

- The existing gravity sanitary sewer system and downstream pump station (City of Kelowna) have flow from external locations that will need to be considered when determining capacity at time of development for the Lower Innovation Precinct

- Planned expansion of water capacity by the Glenmore Ellison Irrigation District (GEID) will serve the entire Innovation Precinct
- Electrical services to UBC Okanagan are provided by FortisBC. The current electrical infrastructure is adequate to provide low voltage load services. Developments in the Innovation Precinct that will require high load services will likely require an upgrade of the FortisBC infrastructure. As a general practice, FortisBC requires Statutory Right of Ways (SRWs) from the University for all primary conduit and transformer locations on campus.
- The current area for redevelopment has an existing FortisBC gas transmission main running through the southeast part of the precinct at University Way and Hollywood Road North that services the UBC Okanagan development; it should be adequate for Innovation Precinct development.

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3 UPPER TERRACES AND NORTH CAMPUS

3.1

SITE AND EXISTING CONDITIONS CONTEXT

The *Campus Plan* (2015) illustrates the northward expansion of campus development for additional student residence buildings along an extension of International Mews. The upper north campus and the terraces between the upper north campus and the lower precinct have substantial capacity for future development with a site area roughly equivalent to the campus's existing academic core.

These lands have been disturbed in the past during gravel extraction activities that left the grades uneven as vegetation has regrown. There is potential for development plans that would regrade the area to create buildable sites on terraces that step downward to the south and east and permit local road access with gentle to moderate grades.

3.2

DEVELOPMENT POTENTIAL, FEASIBILITY AND PHASING

The Upper Terraces and the North Campus lands represent long-term development potential for a wide range of uses including academic, university housing, student residences, innovation and research partnership buildings and related campus amenities within mixed use developments. Assuming a mix of approximately one third academic buildings, one third research buildings and one third student residences and an average height of four to six storeys, a preliminary capacity of the sub-area generates 81,765 square meters of gross development potential.

It is anticipated that the next major update of the *Campus Plan* will confirm the University's intention for these lands, including their access and servicing requirements. The need for development of these sites will be determined by future program requirements and research partnerships that will set the timing and phasing of their development.

3.3

LAND USE AND DEVELOPMENT OBJECTIVES

Development of the Upper Terraces and North Campus will be directed by the vision, objectives and principles of the *Campus Plan*. Site specific development objectives include:

- Meeting the recommendations of the *Whole Systems Infrastructure Plan* (WSIP)
- Meeting the University's *Integrated Rainwater Management Plan* (IRMP), an integrated rainwater management plan that addresses sustainable

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and best practice objectives to detain and infiltrate rainwater to ensure that rainwater runoff does not exceed predevelopment rates, to further reduce flows off-site and to address the need to protect the campus from rainwater flows originating off-site, including the Glenmore Ellison Irrigation District (GEID) overflow. (Refer to Section 2.7.)

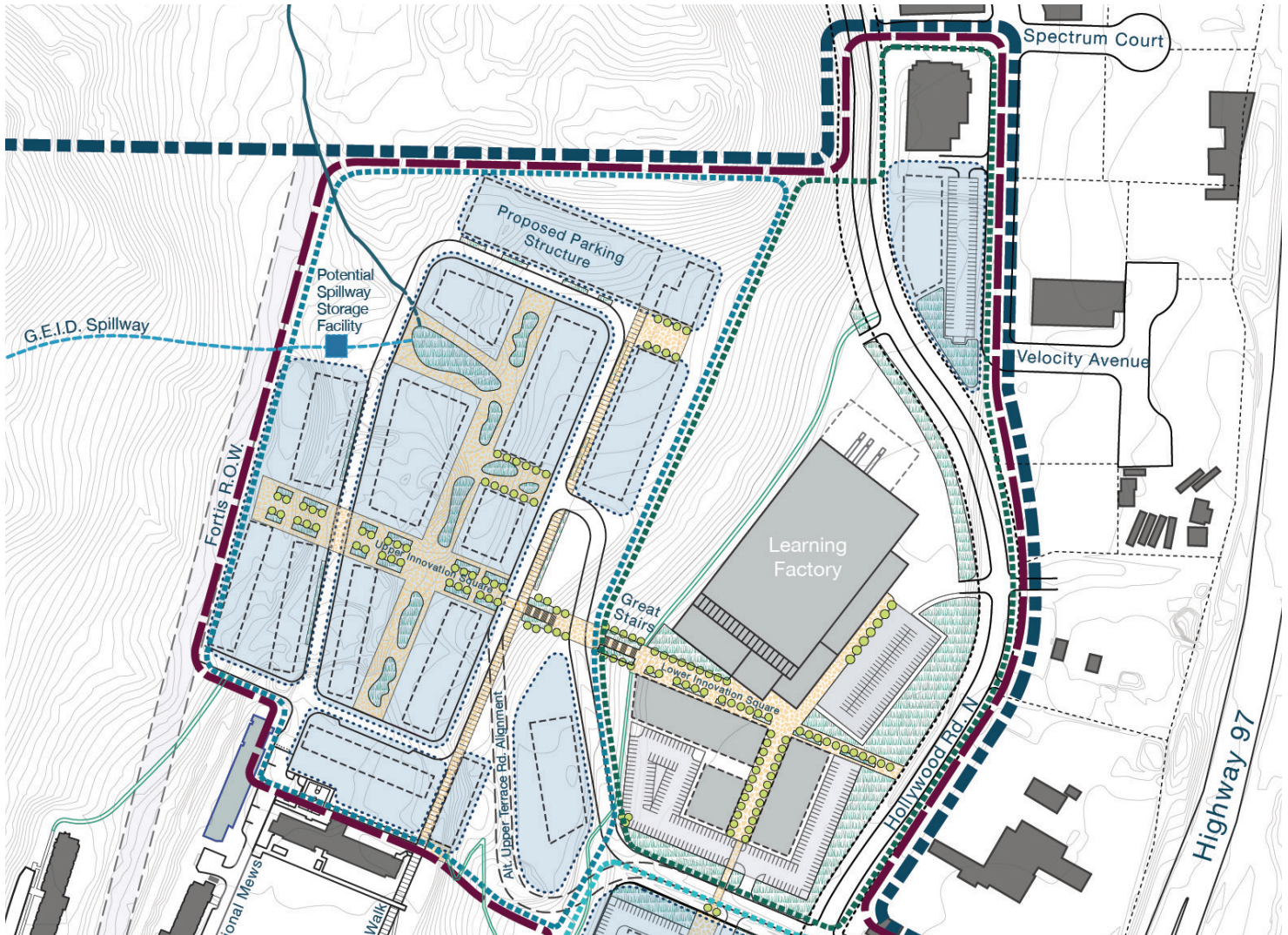
- Retaining existing stands of pine forest and indigenous landscape where feasible in balance with site regrading to achieve an accessible, walkable and developable extension of campus
- Creating small scale indigenous micro-habitats, including integration with rainwater management retention and infiltration/recharge basins.

3.4

LAYOUT, PARCELIZATION AND CIRCULATION

Several optional site layouts for the Upper Terraces and North Campus were explored as part of the IPSP. These preliminary studies demonstrated that:

- These sites are highly adaptable to a variety of program and building typologies
- Direct and relatively gentle pedestrian and cyclist connections can be provided by the extensions of International Mews and University Walk
- The greenway and Great Stairs that cross the central plaza in the North Innovation Precinct should be designed in anticipation of providing access to substantial campus expansion within the North Campus
- Vehicular access would be primarily from the east via Hollywood Road North and a new local road intersecting it within the Lower Innovation Precincts
- Parking requirements for the Upper Terraces will be accommodated in a large parking structure accommodating approximately 960 spaces, with rental housing parking requirements being served by a subsurface parkade with direct access .
- Parcel and local road layout would be determined by the types of uses planned for the area given the variation in building footprint dimensions for different potential uses
- Walking distances to the core of the current campus would suggest the need and opportunity for new amenities to serve the North Campus that could also benefit users of developments within the Lower Innovation Precincts.



CONCEPTUAL PLAN OF THE NORTH CAMPUS AND UPPER TERRACES

3.5 URBAN DESIGN PRINCIPLES

The urban design principles will include those already embedded in the *Campus Plan* (2015), those for the Lower Precinct North (see Section 2.6) and further updates when the North Campus expansion and development are considered in detail. Preliminary design explorations suggest that key urban design principles would include:

- Buildings should be sited to take advantage of sloping topography and to resolve changes in grade within building forms to the greatest extent possible to avoid retaining walls and long flights of external stairs

- Efforts should be made to retain stands of existing trees and indigenous landscape where feasible
- Rainwater management features including ponds, wetlands and swales should be integrated into the overall landscape design and open space concept
- Views should be managed from buildings eastward to the valley including consideration of rooftop and patio design to be overlooked from uphill viewpoints.



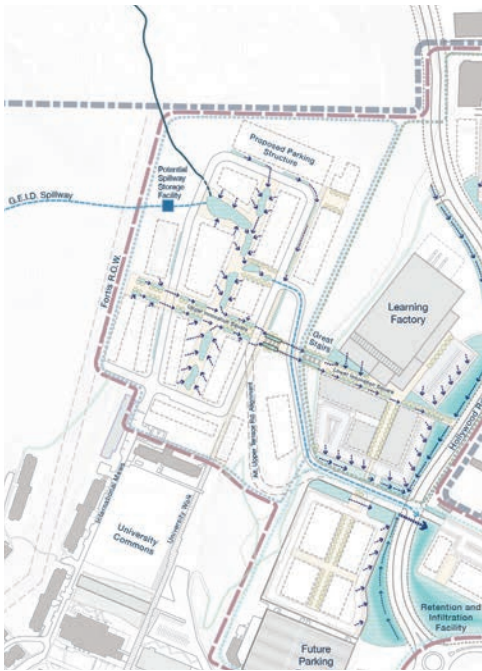
ILLUSTRATIVE AERIAL RENDERING OF THE NORTH CAMPUS AND UPPER TERRACES

3.6 INFRASTRUCTURE AND SERVICING STRATEGIES

The infrastructure and servicing planning for the Upper Terraces and North Campus will be addressed in future planning studies and will determine the roads and service corridors to extend services to this currently unserviced part of campus.

Work on the IPSP suggests several servicing directions for this area:

- The area is planned as part of the IPSP zone for integrated rainwater management and will need to ensure that rainwater flows are maintained at current levels or improved so that the rainwater management strategy for the Lower Innovation Precinct is adequate into the long-term future
- The IRMP concept for the proposed Purcell Courts expansion and any further expansion north of the Purcell Residence anticipates draining into the Lower Innovation Precinct for treatment and disposal and will require a central collection point on the Upper Terraces. (Refer to Section 2.7.)



CONCEPTUAL RAINWATER
MANAGEMENT STRATEGY



PUBLIC REALM, PEDESTRIAN AND
CYCLIST CONNECTIONS

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- The University is currently studying the extension of district energy to best service the North Campus and Upper Terraces. This work will determine whether district energy services could be extended through the planned expansion of the facility on the west side of Lot H along the toe of the slope within the IPSP Lower Precincts and then within the road area for the local road that will provide access to the North Campus from the Lower Precinct North.
- The Upper Terraces and North Campus have existing sanitary infrastructure for connection at the south end of proposed development on International Mews which is 200 diameter or greater and has available capacity for future flows



ILLUSTRATIVE RENDERING OF THE NORTH CAMPUS LOOKING SOUTH TO THE CENTRAL CAMPUS

- Local roads, paths and greenways will be determined through future detailed planning coordinated with the planning of infrastructure and servicing corridors
- UBC's commitment to providing an emergency overflow/spillway from the Glenmore Ellison Irrigation District (GEID) reservoir at the campus's northern boundary will need to be accommodated into the Innovation Precinct rainwater servicing system down through the Upper Terraces and North Campus to the Lower Precinct North. Specific infrastructure to accommodate expansion north of the Purcell Residence and the GEID overflow will need to be identified through the Innovation Precinct site planning process and subsequent studies, as only conceptual alignments for the overflow route could be identified by the IRMP.

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ILLUSTRATIVE RENDERING OF THE NORTH CAMPUS CROSSROADS LOOKING EAST TO THE VALLEY BEYOND

4 LOWER PRECINCT SOUTH

4.1

SITE AND EXISTING CONDITIONS CONTEXT

The Lower Precinct South is comprised of a large existing parking lot (Lot H), the largest concentration of surface parking of the campus and a parcel located to the north of the University Way roundabout that has recently been converted to interim surface parking use.

Parking Lot H is located at the base of the escarpment on the flats shared with the Lower Precinct. This location is generally out of key views from the upper campus and is connected by pedestrian paths that negotiate the steep adjacent escarpment. Further to the 2015 *Campus Plan*, the notion of any further permanent expansion of campus parking within the Innovation Precinct has been reassessed with the current interest in innovation and research development opportunities in the Innovation Precinct.

The parcel north of the University Way roundabout is identified in the *Integrated Rainwater Management Plan* and in Section 2.7 of the IPSP as a location for a surface recharge basin to support the Innovation Precinct's rainwater servicing strategy. (See Section 2.7.) However with its interim use for parking, the site is considered to be a longer-term development site for the Innovation Precinct, pending identification of alternative parking locations and implementation of transportation demand management strategies for reducing parking demand.

The timing and need to provide the recharge basin on this site as the terminus to the Innovation Precinct's rainwater servicing system, and its relative size and footprint, will depend on development elsewhere in the Innovation Precinct and the capacity of the Precinct's existing constructed wetland and retention facilities to manage required flows and volumes with 100% retention on campus lands.

4.2

DEVELOPMENT POTENTIAL, FEASIBILITY AND PHASING

The development potential of the Lower Precinct South has a number of uncertainties associated with it, given the need for continued use as surface parking for the campus. Alternative parking strategies and potential for parking demand to decrease in the future with improved transit and new technologies will be determined in the future. Additionally, the timing and need to provide a rainwater recharge basin depends on development elsewhere in the Precinct.

Short-term Retention of Lot H Parking

In the short-term, Lot H will be retained as surface parking with several planned changes:

- Plans for the extension and upgrading of Hollywood Road North have determined that the current access from Hollywood Road into Lot H is too

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close to the roundabout for queuing. A new parking lot access is planned along the north side of Lot H from the new local campus access road.

- Removal of the access drive from Hollywood Road North into Lot H frees up an area between Lot H and the Hollywood Road North right-of-way for a rainwater detention pond. It is noted that several statutory right of ways (SRWs) for utility companies exist in this same area and plans for development here would need to be reconciled with these agreements.
- The Geoexchange Facility is currently located at the southwest corner of Lot H. It is planned for expansion and will require improved vehicular access for trucks that will trigger a redesign of Lot H with the potential loss of some parking spaces to accommodate this access
- A local campus access road to the Upper Terraces and North Campus is proposed along the north boundary of Lot H. This road will be required to permit development at the south end of the Lower Precinct North and for the new access to Lot H and, in the longer-term, for access to development sites on the Upper Terraces and North Campus, pending more detailed planning of those areas.

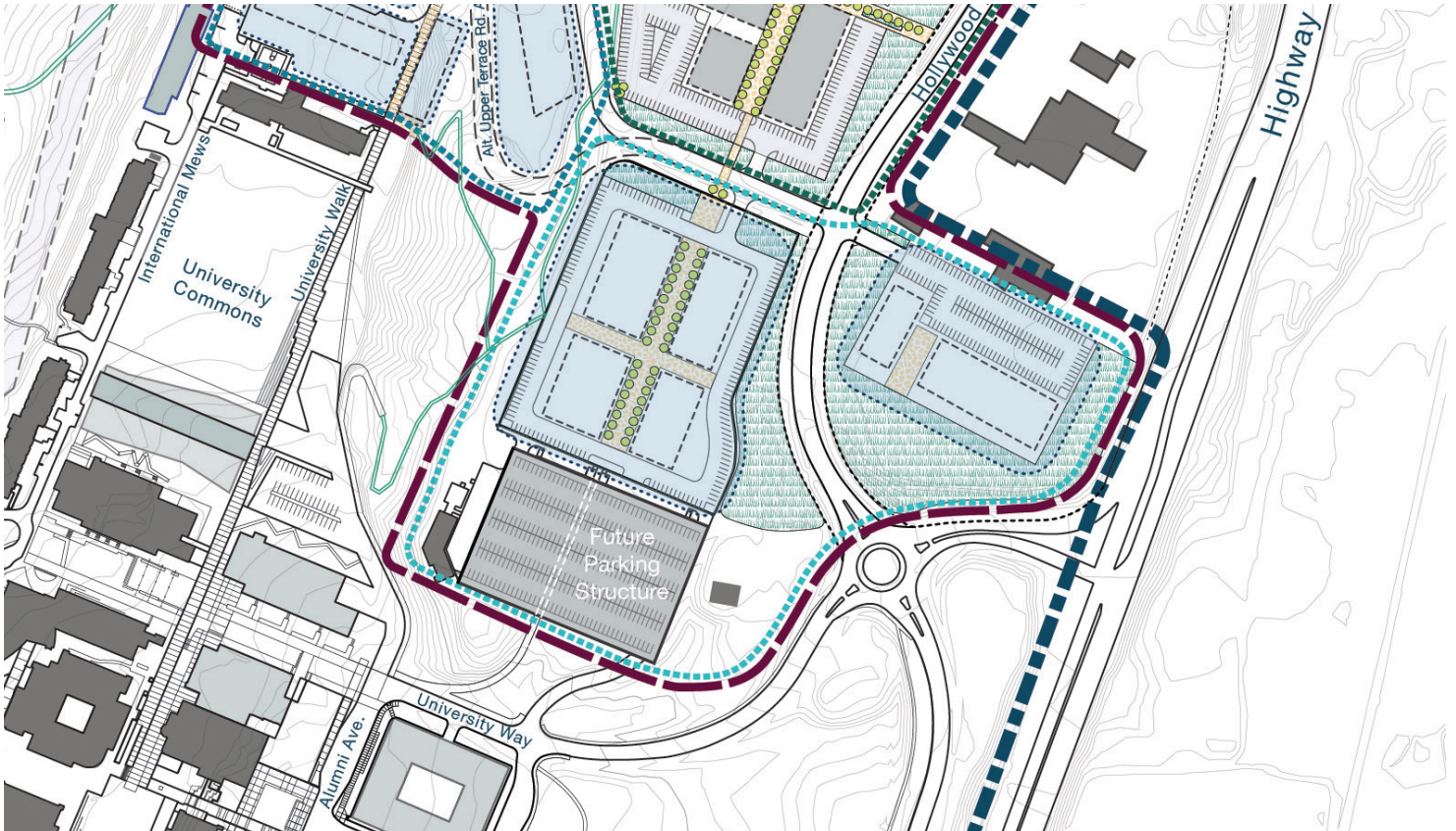
Longer Term Redevelopment Potential

In the longer-term, both Lot H and the site north of the roundabout have significant potential for innovation, research, academic and related amenities to be developed. However, the loss of parking needs to be made up either elsewhere on campus or through the construction of a parking structure. The current market values of land in the adjacent private industrial and business park areas suggest that the cost of construction of structured parking significantly exceeds the price of serviced sites developed with their parking requirements met with surface lots.

If the University is successful in shifting travel demand to more sustainable modes (e.g. transit, cycling and carpooling/ridesharing), these parking requirements may decline, making it easier to meet demands through on-site surface lots and/or reducing the total cost of structured parking.

Development on these sites may trigger the need to find replacement parking for some or all of the displaced parking. There are no available surface sites so structured parking would need to be constructed. A design study indicates that a parking structure of three or four storeys located at the south end of Lot H would bring the roof up to the elevation of the adjacent campus around the intersection of University Way and Alumni Avenue and would provide spaces for approximately 900-1200 cars (refer to illustration on the facing page). Implementation of a parking structure of this scale would enable approximately 21,275 square meters of development area available to its north.

Additionally, the development potential of the site located immediately north of the University Way roundabout will be dependent on the recharge basin and the extent of surface wetland and other rainwater management features required to be delivered here. In turn, the extent of these facilities will be dependent on



CONCEPTUAL PLAN FOR THE LOWER SOUTH INNOVATION PRECINCT

the degree to which earlier phases of the Innovation Precinct and North Campus development have achieved the objectives of the IRMP for rainwater retention and infiltration on each development parcel.

4.3 LAND USES AND DEVELOPMENT OBJECTIVES

The land uses suited to the Lower Precinct South include the full range under consideration for the Lower Precinct North with the possible addition of academic buildings if required by future *Campus Plan* updates.

4.4 LAYOUT AND PARCELIZATION

A range of layout and parcelization opportunities are possible for Lot H and will be dependent on:

- Access being provided from the new local access road at the north edge of the site

- The amount of developable area based on whether the structured parking lot is located at the south end of Lot H or if all campus-serving parking is relocated to another site
- The types of uses to be accommodated may range from one large use that would occupy the entire site to smaller buildings on several parcels.

The conceptual development concept on Lot H is illustrated with the assumption that, should a parking structure be constructed to make additional Innovation Precinct sites available, most of the required parking for staff and faculty users would also be included in the parking structure in order to make more building site area available. A small amount of surface parking would likely be provided for visitors and deliveries.

The site north of the roundabout is suited to one larger parcel or a cluster of smaller research/office buildings including multi-tenant arrangements.

4.5

CIRCULATION AND TRANSPORTATION

Depending on the number of parcels required by the size and types of land uses, it is anticipated that the north-south pedestrian greenway in the middle of Lot H would be integrated adjacent to a new local road on alignment with the proposed new access to Lot H from the north. It would likely provide the vehicular access that will be needed for the expanded District Energy Facility. The design of the new local access road should preserve the connectivity of the greenway and minimize east-west vehicular crossings of it. A pedestrian route through the new parking structure should provide continuity for the greenway.

Access to the site north of the roundabout will be located on Hollywood Road North across from the intersection of the new local access road to the Upper Terraces and North Campus.

Parking Lot H currently has 960 surface parking spaces. The illustration on the facing page indicates the approximate footprint of a parking structure that would have 900 spaces on three floors or 1200 spaces on four floors. The residual space on Lot H for development would be approximately 21,276 square meters.

4.6

URBAN DESIGN PRINCIPLES

The urban design principles for the campus as a whole and for the Lower Precinct North would apply to the Lower Precinct South. (See Section 2.6.) Depending on the extent of development potential and the parking relocation strategy that is adopted, the Lower Precinct South may either be adequately served by amenities and social spaces in the campus core and Lower Precinct North or may warrant an additional new central gathering and socializing space along the central greenway spine.

4.7

INFRASTRUCTURE AND SERVICING STRATEGIES

As a later phase of development, servicing capacities will depend on the extent to which other campus projects have either used available capacity or new utility infrastructure has been added in the intervening time. The Lower Precinct South is subject to the requirements of the *Integrated Rainwater Management Plan* and forms part of the the overall Rainwater Servicing Strategy for the Innovation Precinct, with requirements to retain the existing drainage ditch along the north edge of H Lot and for providing on-site retention and infiltration, notably through the provision of retention facilities and a recharge basin at the terminus of the Innovation Precinct's rainwater servicing system. (See Section 2.7.)

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