

A large, modern wooden building with multiple stories and large windows, some of which are lit from within. The building has a curved glass-enclosed entrance area. The ground in front is covered in snow, and there are trees in the background.

# LONG RANGE DEVELOPMENT PLAN

March 2018

Oregon State University – Cascades  
Bend, Oregon



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A sepia-toned photograph of a vast, snow-covered forest. The foreground is a light-colored snowfield with several tall evergreen trees standing prominently. In the background, a dense forest of similar trees stretches across a hillside under a sky filled with soft, wispy clouds.

# EXECUTIVE SUMMARY





# EXECUTIVE SUMMARY

## Executive Summary

OREGON STATE UNIVERSITY-CASCADES (OSU-CASCADES) IS COMMITTED TO PROMOTING A RESILIENT FUTURE IN EVERY WAY—ENVIRONMENTALLY, ECONOMICALLY, SOCIALLY, AND CULTURALLY. THE LENSES OF SUSTAINABILITY; HEALTH & WELLNESS; AND ARTS, CULTURE & ENRICHMENT BRING TOGETHER AND FOCUS THE DIVERSE FACTORS THAT GUIDE THE PLANNING PROCESS.

A branch campus of Oregon State University, OSU-Cascades is the first and only campus based in Central Oregon offering baccalaureate and graduate degrees, fulfilling a long unmet regional demand. OSU-Cascades currently enrolls 1,215 undergraduate and graduate students and offers nineteen degree programs with a planned future enrollment of 5,000 headcount students.

The 128-acre OSU-Cascades campus is located on the west side of Bend, Oregon, approximately one mile southwest of downtown and a quarter mile west of the Deschutes River. OSU-Cascades will be an economic development engine for Central Oregon by providing jobs and services and by attracting partnerships with innovative industries. The university will increasingly become an important anchor institution with a wide-reaching positive impact on the region as enrollment, academic programs, partnerships, and the campus grow.

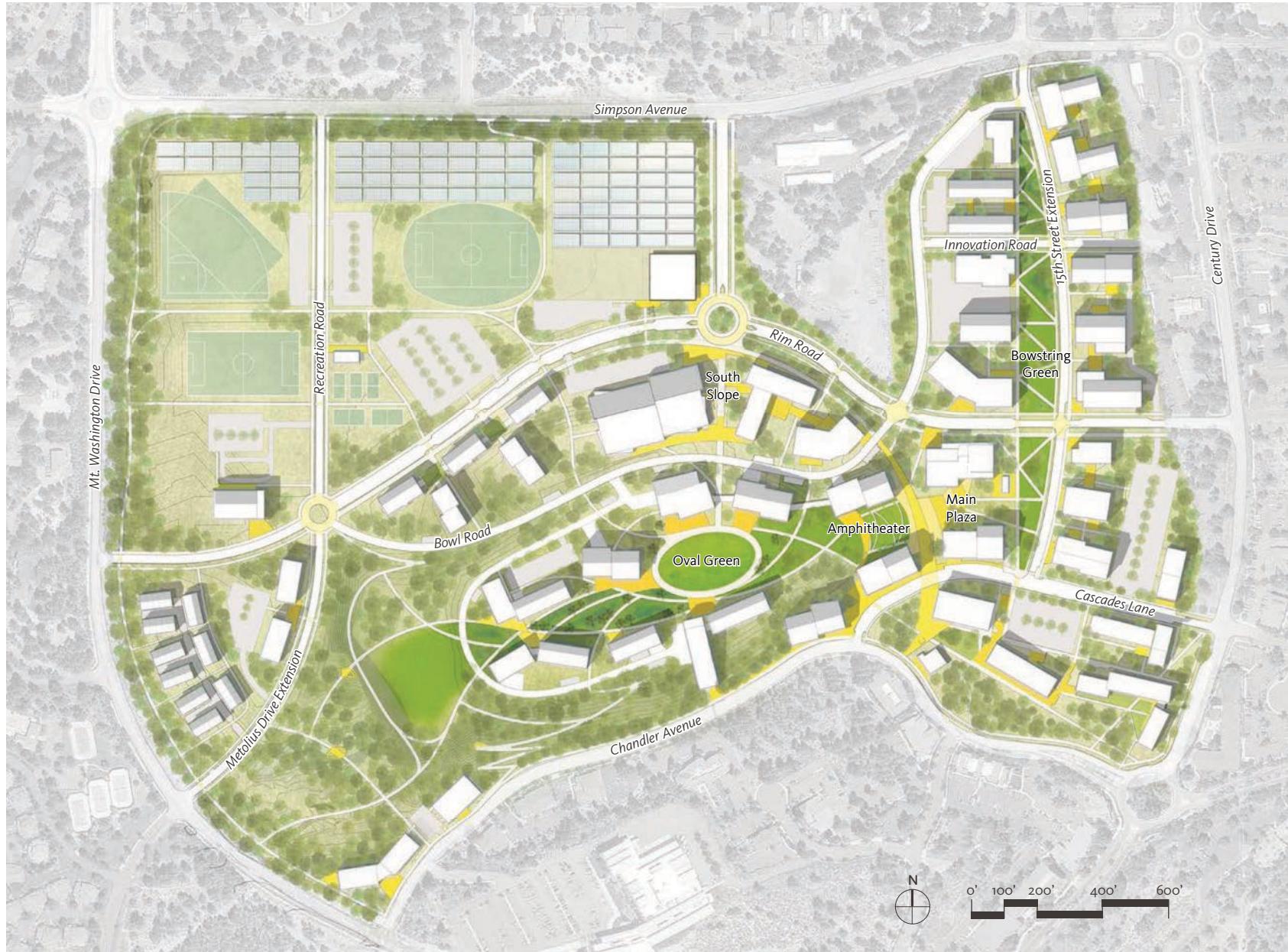
The purpose of this Long Range Development Plan (LRDP) is to ensure that future development occurs within the context of a cohesive vision for the OSU-Cascades campus.

The future campus physical framework will support the university's culture of innovation, sustainability, and wellness. In addition to physical transformation of the site, personal growth and education for the campus community and visitors are also integral to the OSU-Cascades long-term vision.

University goals for net zero energy, water, and waste will be addressed with creative solutions to campus infrastructure that will minimize dependency on precious resources. OSU-Cascades will establish itself as a leader in resilient design, providing a model for other university campuses and the surrounding Central Oregon community in sustainable development for arid climates.



▲ Illustrative South-North Section



▲ Illustrative Plan

## A Collective Vision

The OSU-Cascades LRDp is the culmination of a 30-year grassroots effort on the part of Central Oregonians to bring a university to the region. The planning process elicited many ideas, concerns, and goals from a broad range of stakeholders in internal OSU-Cascades committees as well as community advisory groups. Since 2015, OSU-Cascades has engaged more than two hundred Bend community volunteers in the planning of the new campus.

An extensive process of student engagement occurred during the development of the LRDp to discuss the qualities and character for OSU-Cascades that students envision for the campus.

Four key internal university committees, which included faculty, students, and staff, guided the long range development planning process and provided feedback to the planning team. The committees included:

- LRDp Steering Committee
- LRDp Faculty and Staff Committee
- Academic Curriculum Council
- Co-Curricular Council

Four advisory groups met from November 2015 through January 2016 and included interested community stakeholders, faculty, and staff. Advisory groups were organized by four topics:

- Health and Wellness Advisory Group
- Sustainability Advisory Group
- Arts, Culture, and Enrichment Advisory Group
- Community Integration Advisory Group

The work of these groups built on previous planning efforts including a Campus Expansion Advisory Committee (CEAC), which offered invaluable input to the university.



▲ Internal stakeholder committee meeting 2016

# Development Program

The program for the OSU-Cascades Long Range Development Plan consists of core academic, administrative, campus life, housing, and support space for a planned 5,000 student headcount enrollment.

The space needs analysis projected a customized program tailored to the unique needs of the OSU-Cascades campus. Based on this analysis, there is a need for 1,200,000 gross square feet (GSF) of new space; this new space includes 605,000 GSF of non-residential space and 595,000 GSF of residential space for 1,700 new student residential beds.

Additional program elements that support the vision and mission of the university, but are beyond the core and campus life needs, could also be accommodated on campus, depending on the availability of land and partnership opportunities with local entities. Potential additional elements that were identified by the university and advisory groups include the following:

- Early learning center, which could include child-care facilities and a laboratory school
- Additional recreation facilities that could be shared with the community
- Innovation District
- Conference facilities
- Middle market housing

## LRDP Program Summary

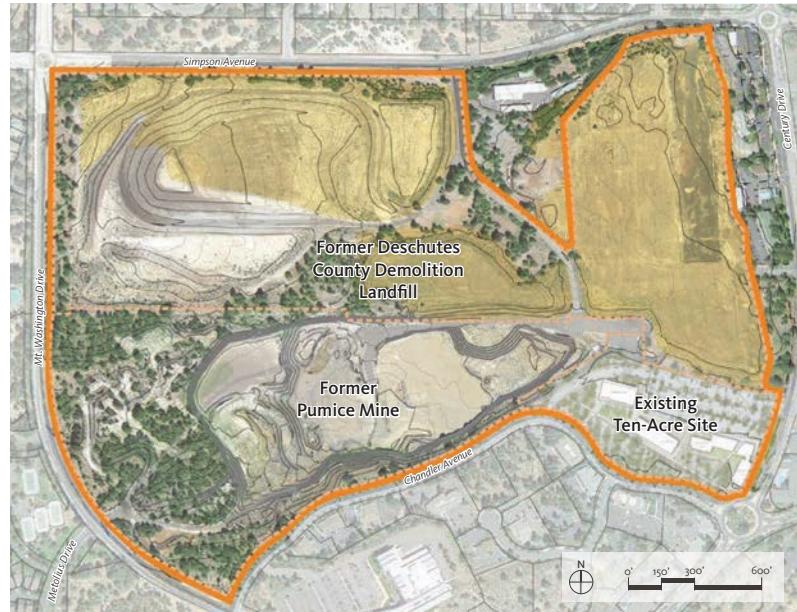
	Existing Space (ASF)	Total Space Needs (ASF)	New Space Need (ASF)	ASF to GSF Factor	New Space Need/Program (GSF)
<b>Core Campus Space</b>					
Classrooms	22,479	46,000	24,000	0.63	37,000
Teaching Labs	6,351	39,000	33,000	0.63	52,000
Research Labs		24,000	24,000	0.63	38,000
Office and Support	26,885	104,000	77,000	0.63	123,000
Library and Study	3,400	51,000	47,000	0.63	75,000
Flexible Work Space	2,281	21,000	18,000	0.63	29,000
Media		5,000	5,000	0.63	8,000
<b>Campus Life Space</b>					
Assembly		14,000	14,000	0.63	22,000
Exhibition		4,000	4,000	0.63	6,000
Dining	6,965	18,000	11,000	0.63	18,000
Lounge and Social Space	1,766	16,000	14,000	0.63	22,000
Retail	2,957	8,000	5,000	0.63	8,000
Meeting	433	10,000	9,000	0.63	15,000
Support	1,330	34,000	33,000	0.63	52,000
Healthcare		3,000	3,000	0.63	4,000
Indoor Recreation	1,762	59,000	57,000	0.60	96,000
<b>TOTAL NON-RESIDENTIAL</b>	<b>76,609</b>	<b>455,000</b>	<b>379,000</b>		<b>605,000</b>
Residential					
(1,700 additional beds)					595,000
<b>TOTAL</b>					<b>1,200,000</b>

## Site Context

The OSU-Cascades site is comprised of three major site areas, each with differing conditions:

- The existing ten-acre site is the location of the initial development of the campus. This site represents the first phase of development and was completed in 2017. It includes the following buildings: Tykeson Hall, a 43,650-sf academic center; the 86,000-sf Residence Hall that accommodates approximately 314-beds; and the 27,000-sf Dining/Academic Building.
- An adjacent 46-acre parcel that includes a former pumice mine with excavation depth up to one hundred feet and second growth ponderosa tree stand. This site will require reclamation prior to development.
- An adjacent 72-acre parcel was a former Deschutes County construction and demolition landfill, which will require remediation and reclamation prior to development. The parcel is comprised of three distinct areas which each had specific periods of activity and will have differing requirements for remediation.

Reclamation of the landfill will be carried out in phases. Combining the remediation and reclamation efforts will allow the full 128-acre site to be shaped and prepared in a beneficial and efficient manner to the proposed campus development.



▲ Existing Site Conditions

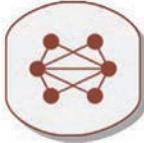


▲ Existing Pumice Mine Site Photo

# Plan Framework

The following principles guide the plan framework.

*PERMEABLE &  
CONNECTED*



As a future regional center for community wellness, arts, recreation, education, and symbiotic partnerships, the campus will be permeable at its edges, welcoming to the public, and engaged with the Bend and Central Oregon. Multi-modal mobility will promote sustainable and equitable transportation regionally and locally.

*SUSTAINABLE &  
RESILIENT*



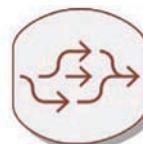
The campus will be developed in the most sustainable way possible, beginning with rehabilitation of the site into an ecologically-rich high desert landscape. A broad approach to resilience, including social and economic resilience will supplement and support the triple net zero environmental resilience goals.

*INSPIRATIONAL &  
MEMORABLE*



The campus community will witness and participate in the transformation of the site into a physical celebration of Central Oregon. The university's identity and core values will drive development that is uniquely of its place and leaves students, faculty, staff, and visitors healthier and more conscientious than when they arrived.

*INTEGRATED &  
INNOVATIVE*



A strategic mix of uses, flexible spaces, and the living lab landscape will promote interdisciplinary learning and interaction. The Innovation District and other co-located symbiotic partnerships will promote the university's entrepreneurial spirit and support academic, social, economic, and research goals.

# Central Plan Ideas

## Site Transformation

The history of the 128-acre site is one of industry and bounty. Lumber was harvested from the site in the early twentieth century before transitioning into surface mining operations. As pumice deposits diminished, select areas of the site were used for disposal of construction waste under the operation of Deschutes County. The site is currently underutilized given its central location, but the university has taken the unique opportunity to rehabilitate it into an ecologically-enriched campus that contributes positively to the Bend community and Central Oregon region.

To honor the unique character of the existing site's landscape, the campus will be graded into a series of terraces stepping down to a "bowl," which will maintain some of the geology exposed through the historical use of the site while allowing accessible transitions between levels of the campus. Building siting will be integrated into the slopes to optimize dramatic views. Sensitive development strategies will honor the natural landscape conditions and create successful, active gathering spaces.

## Resilience

To achieve the university's goals for net zero energy, water, and waste, the infrastructure system will evolve with campus build-out to accommodate changing needs and developing technology. Flexibility, redundancy, and low-resource systems form the foundation of the campus resilience strategy.

The campus will function as a regional central for economic development, learning, and cultural enrichment. Strategic

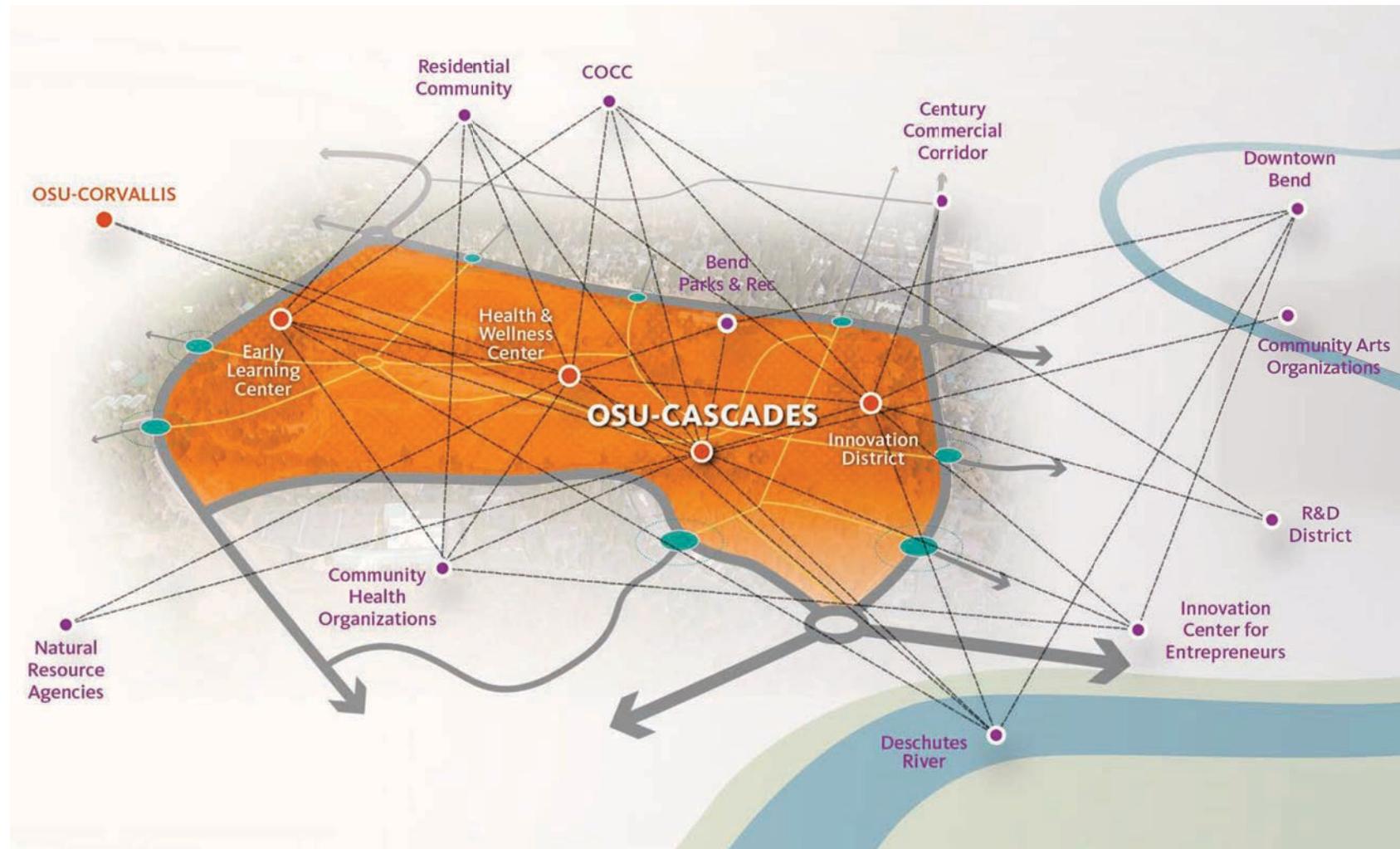
partnerships like those in the Innovation District will support economic resilience for the entire region. The university will also promote social resilience through an inclusive environment for an increasingly diverse population. The future campus is envisioned to be a center for access, which will include education, resources, and affordable campus housing options. Learning opportunities, shared facilities, and wellness resources will be available to the public, resulting in a mutually-beneficial relationship between the university and region.

## Open Space

The distinctive topography and views of the Cascade Range are key drivers for the campus design. Open spaces will vary from active gathering spaces to more passive natural areas and include such spaces as the Bowstring Green, Cascades Plaza, Amphitheater, Oval Green, South Slope, and West Woodlands. When development is complete, over 50 acres of new open space will be created to connect the campus and community.

## Community Connections

An integrated multi-modal network of streets, paths, and trails will traverse the campus and extend to the surrounding city and regional circulation systems. OSU-Cascades is well-connected to community arts organizations, health organizations, natural resource agencies, and regional industries. The campus development will nurture these relationships and promote collaboration opportunities.



▲ Campus Community Connections



▲ Campus Design Concept

## Mixed-Use Development

Buildings will provide a mix of campus uses along key corridors. Active uses, such as campus life, food venues, and research displays, will be located on the ground floors. These mixed-use corridors will define a vibrant street or path edge, connect to the open-space network, and create welcoming places for the campus community as well as the public.

## Resources

A primary goal is to develop a campus that has a net-neutral or net-positive impact on energy, water, and waste generation, given the predicted resource demand impacts of population growth in Central Oregon. The university's goal is to be self-reliant for some of the resources typically delivered from outside infrastructure. Working closely with the City of Bend and industry partners, OSU-Cascades will ensure that energy, water, and waste systems are highly sustainable and efficient for the campus while also integrating with the established utility infrastructure network and rate system. Low campus resource demand will benefit municipal and utility systems by contributing to overall regional sustainability and resilience.

## Implementation

To ensure that development occurs within the context of a cohesive vision for the OSU-Cascades campus, the LRD<sup>P</sup> establishes a physical framework that includes land use, open space, circulation, infrastructure, and design guidelines for urban design, buildings, and landscape.

The campus will develop over a long period of time. Phasing will depend on many factors including funding; city, county, and state approvals; enrollment growth; and partnership agreements. Remediation and reclamation strategies will also be important determinants of phasing.





# 1 | INTRODUCTION



# 1 | INTRODUCTION

## 1.1 LRDp Purpose and Scope

THE PURPOSE OF THIS LONG RANGE DEVELOPMENT PLAN (LRDP) IS TO ENSURE THAT FUTURE DEVELOPMENT OCCURS WITHIN THE CONTEXT OF A COHESIVE VISION FOR THE OREGON STATE UNIVERSITY-CASCADES (OSU-CASCADES) CAMPUS. COMPREHENSIVE PLANNING GUIDES STRATEGIC DECISION-MAKING ABOUT RESOURCE ALLOCATION, GROWTH, AND DEVELOPMENT IN THE SHORT AND LONG TERM.

The following components comprise the LRDp:

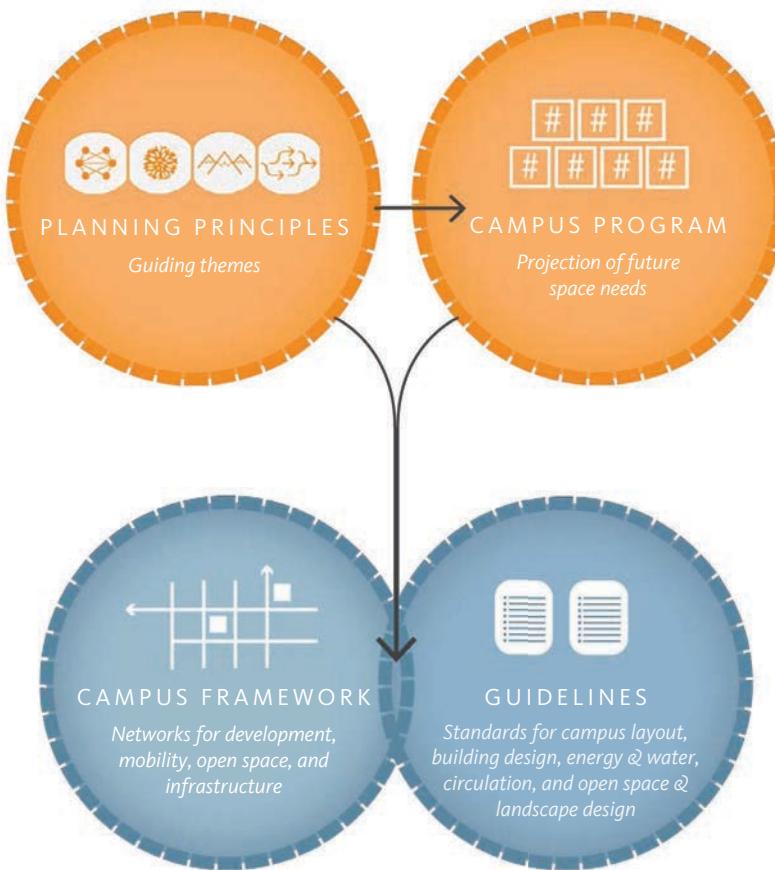
1. *Campus Program:* High-level space needs assessment based on existing and projected space needs
2. *Planning Framework:* Physical systems that support the university's future growth
  - Development: land use organization and proposed campus build-out strategy
  - Open space: integrated urban design and landscape systems that form the physical connections of the campus and express the sense of place
  - Mobility: circulation systems to get people to, from, and around the future campus
  - Infrastructure: networks needed to serve the campus and meet net zero goals for water, waste, and energy
3. *Guidelines:* Standards that guide the future design and implementation of the campus
  - Campus layout
  - Building design
  - Energy and water
  - Circulation
  - Open space and landscape design

Analysis of the surrounding context, site and building conditions, stakeholder input, and review of past work informs the *planning principles* which function as the overarching objectives of the Long Range Development Plan. The planning principles represent OSU-Cascades' priorities to guide campus planning.

The *campus program* is developed under the influence of the planning principles as well as a series of metrics tailored to the university's long-term vision to estimate the amount and types of spaces that are necessary to support the university's goals.

Both the campus program and planning principles inform the *campus framework* and *guidelines*, which spatialize the future campus and determine how the plan could be implemented when needs and resources arise.

Each component of the LRDP was developed using an iterative process and required robust stakeholder engagement. Together, the components create a campus master plan that represents the needs and values of OSU-Cascades and ensures that future incremental development and investment is in line with the long-term vision for the campus.



▲ Figure 1: Long Range Development Plan Components

## 1.2 Mission, Vision, and Ethos

### University Background

OSU-Cascades is a branch campus of Oregon State University that is committed to promoting a resilient future in every way—environmentally, economically, socially, and culturally. OSU-Cascades is the first and only campus based in Central Oregon offering baccalaureate and graduate degrees, fulfilling a long unmet regional demand.

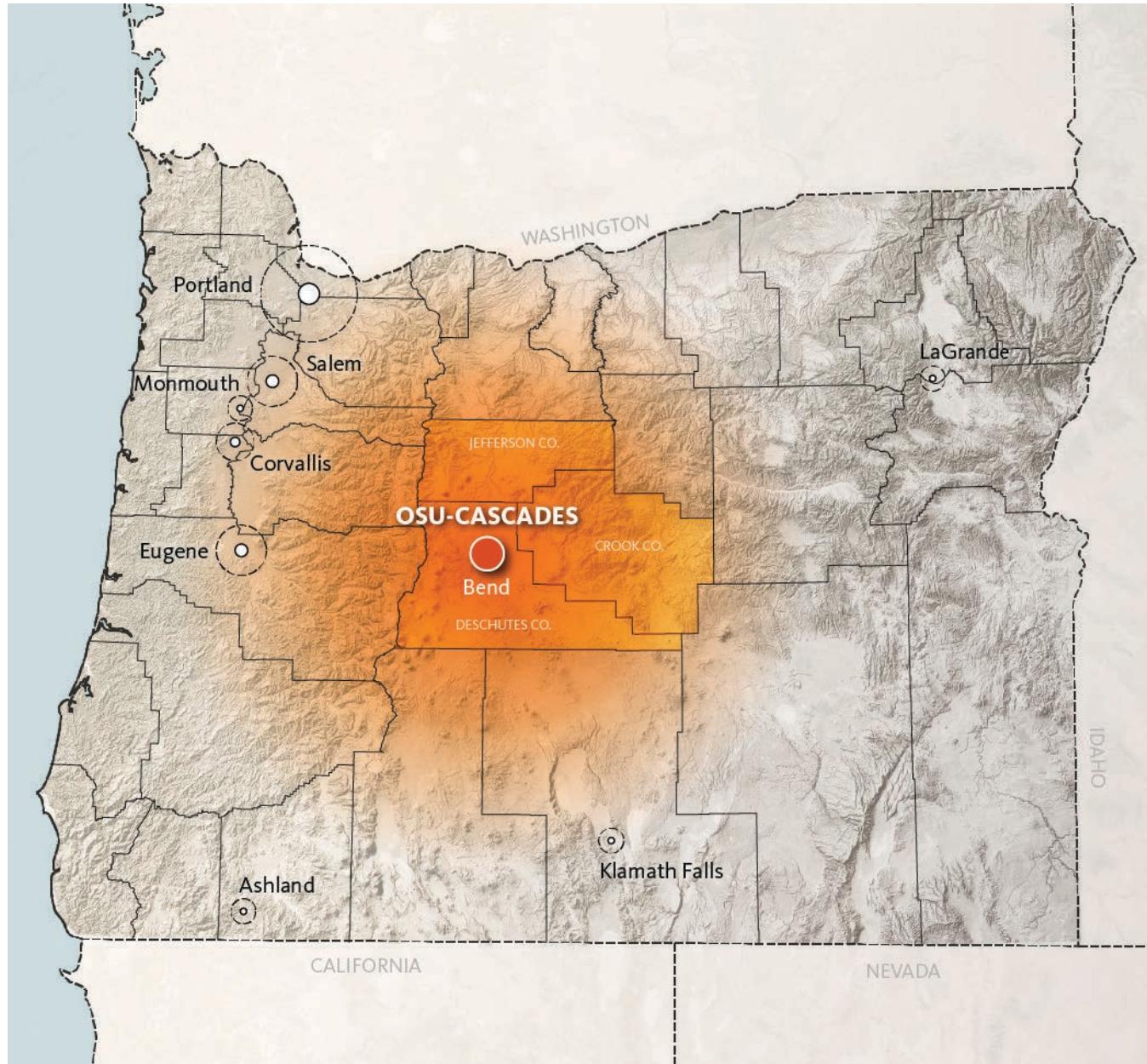
As an Oregon State University campus, OSU-Cascades adheres to policies and standards outlined by the OSU Board of Trustees and OSU leadership. For rules specific to OSU-Cascades, three Councils form the foundation of the governance structure, with OSU-Cascades faculty and staff serving in leadership roles on each. Recommendations made by the Councils are presented to the OSU-Cascades Leadership Team for final adoption. Standing and ad hoc committees provide further representation for members of the campus community, and include the Diversity Committee, Teaching and Research Excellence Committees, Safety Committee, and Sustainability Committee.

OSU-Cascades currently enrolls 1,215 undergraduate and graduate students and offers nineteen degree programs. Since 2001, OSU-Cascades has provided upper level education to Central Oregon residents and others. While the “2+2” student transfer partnership with Central Oregon Community College (COCC) is expected to continue, in 2015 the university expanded to become the first four-year institution in Central Oregon. Since then, enrollment has been growing, with a long-term target of a 3,000-5,000-student headcount.

### Population Served

Because OSU-Cascades did not admit lower-division undergraduates until 2015, the average age of OSU-Cascades students is higher than typical four-year universities at 27 years old. OSU-Cascades enrolls many non-traditional students that attend part-time or are older adults. While universities are generally increasingly serving these non-traditional populations, OSU-Cascades can expect a higher number of younger freshman and sophomore students with the campus and program offering growth, which could bring down the average age of students over time.

OSU-Cascades currently enrolls 18% minority students and 35% first-generation college students and expects to continue to serve these populations, especially as minority populations grow. Offering expanded services and resources for academic excellence, language retention, technology utilization, food preferences, and familial living styles can support minority and first-generation college students. The university strives to be a center for access for all students through an inclusive environment that celebrates diversity and provides the necessary resources and support for student success.



< Figure 2: Regional Location

OSU-Cascades meets  
a previously unfulfilled  
regional need for higher  
education in Central Oregon.

## Campus History

Plans were approved in 2012 to expand the OSU-Cascades campus in Bend to a four-year university, offering a range of undergraduate and graduate degrees. At that time, the university purchased and renovated the Graduate & Research Center building to allow for short-term growth while exploring land purchase options for a future campus.

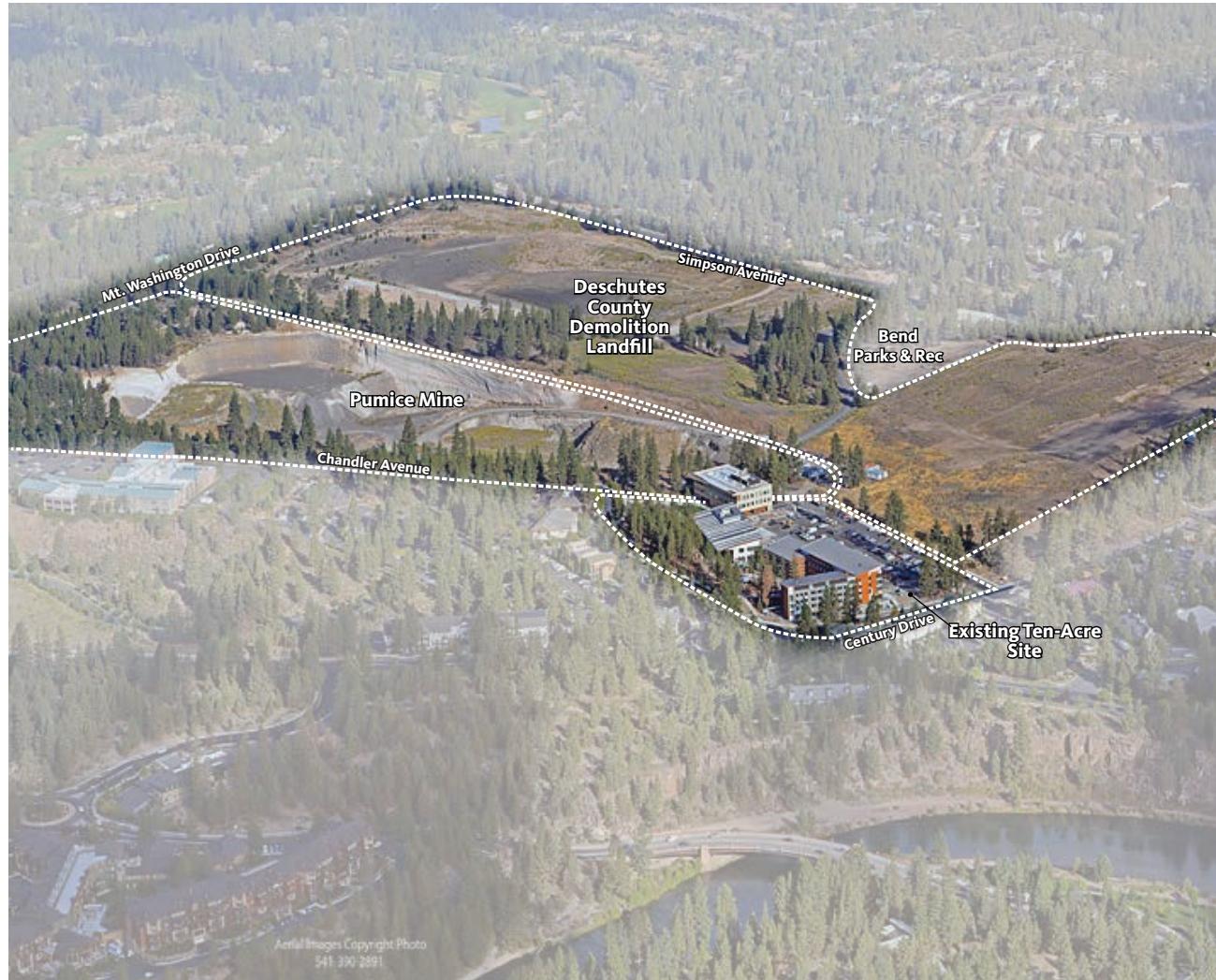
In 2013, OSU-Cascades purchased a ten-acre site at the intersection of SW Chandler Avenue and SW Century Drive in Bend to make way for future campus expansion. Concurrently, the university invited community input on the vision for the campus. These discussions led to a series of recommendations that have been integral to long-term campus planning and development.

Construction of the ten-acre campus began in the summer of 2015 and includes an academic building called Tykeson Hall, the Dining/Academic Building, and Residence Hall along with internal streets, paths, and parking. In 2016, Tykeson Hall opened on the new campus, and the university finalized purchase of the adjacent 46-acre parcel, a former pumice mine. OSU-Cascades anticipates securing the final purchase of an additional 72-acres in 2018, resulting in a total of 128-acres of contiguous land for the OSU-Cascades campus.

The LRDP planning process began in earnest in 2016, led by OSU-Cascades staff and the Page/SERA consultant design team. The team completed studies on the site conditions as well as engaged university and community stakeholders to develop a campus framework for long-term growth. The analysis, conclusions, and vision of this plan are summarized in this document.



▲ Existing OSU-Cascades Graduate & Research Center (Google Earth)



◀ Figure 3: Existing Site Areas  
(photo from Aerial Images)

## OSU-Cascades Mission and Vision

Being a mission-driven university, OSU-Cascades relies on the values of the campus community as guiding principles for the approach to campus development. These ideals demonstrate the priorities and ethos of OSU-Cascades and, therefore, frame the LRDP recommendations.

### Mission

*As the branch campus of Oregon's leading public research university, Oregon State University–Cascades provides globally relevant education, research and outreach. Our students develop the knowledge and critical thinking ability to lead informed lives, serve their communities and enhance their careers. OSU-Cascades is committed to the diversity and sustainability of the campus and surrounding community.*

### Vision

*Oregon State University–Cascades will be a comprehensive four-year university and major contributor to the vitality of the unique Central Oregon community and environment. It will be a destination of choice for students, faculty and staff seeking teaching and research excellence within a dynamic, inclusive and student-centered campus community.*

## Ethos and Values

The core values described in the 2014-2018 Oregon State University Strategic Plan, which include both the Corvallis and Cascades campuses, are as follows:

- Accountability
- Diversity
- Integrity
- Respect
- Social responsibility

These values are the overarching ideals for Oregon State University as a whole. They clearly influence the values stated in the 2008 OSU-Cascades Strategic Plan, shown below:

- Critical thinking
- Life-long learning
- Diversity and respect
- Collaboration, service and community involvement
- Excellence in scholarship
- Sustainability

The emphasis on personal development and community engagement within the stated values of the OSU system and OSU-Cascades are the foundation for long-term campus planning.

## 1.3 OSU-Cascades Long-Term Planning Drivers

In addition to supporting the university's mission, vision, and core values, OSU-Cascades has collaboratively developed a stakeholder-driven long-term campus vision through engagement with the campus community and Bend neighbors.

Shared values shaped program and planning decisions throughout the campus planning process. These OSU-Cascades-specific objectives intersect with national and international campus planning trends and considerations, all of which frame the LRDP's planning approach.

### Sustainability

Resilience and sustainability are key themes in the university's ethos and values and are integrated into all planning decisions—from establishing an efficient and flexible program, to ecologically rehabilitating a severely disturbed site. Goals to develop a triple net zero campus—water, waste, and energy—drive many of the decisions around campus infrastructure.

Economic and social resilience are equally important as ecological resilience for the university and local Bend community. The long-term campus goal is to create an inclusive environment that supports underrepresented populations and brings robust economic development to the region.

### Community Engagement

Meaningful and consistent community engagement has been a priority throughout the LRDP planning process and will continue as the campus develops over time.

OSU-Cascades is committed to working with the community to create a new campus that will have a positive impact on Bend and Central Oregon by providing services, resources, and economic development. The campus is envisioned to be a permeable and connected place that is welcoming to the public and seamlessly integrated into the Bend urban fabric.

### Flexibility and Future-Proofing

There is no way to predict the exact conditions and long-term future needs of OSU-Cascades. However, setting goals, designing for flexibility, and studying trends are all strategies that are useful in future-proofing a planned campus.

Designing for flexibility is one of the most important strategies in creating a campus worthy of an innovative and ambitious future. In addition to the physical spaces being flexible, the way the spaces are used must also be flexible to accommodate future changes such as demographics, economics, academics, and the community.

Reference to trends and precedents in campus design provides a broader context to understand the future direction of campus planning. The following trends have been studied and observed generally in campus planning along with considerations specific to OSU-Cascades that impact the particular needs of this university.

## Demographic Trends

Nationally, the demographics of universities are changing. There is increasing diversity in university enrollment throughout the country. Minorities, especially Hispanics, are expected to continue to comprise a growing percentage of university students. This shift will influence cultural expectations and needs in a range of campus design and operational areas. Developing a campus that cultivates and celebrates diversity is a high priority for future planning at OSU-Cascades.

An increase in first-generation college students requires more robust services than were necessary in the past. Counseling and tutoring are critical to guiding first-generation students to success. Access to and proficiency with technology may also be a consideration with these students. Providing sufficient space, resources, and dedicated staff contributes to the students' ability to participate in increasingly technologically focused coursework.

Globally, universities are experiencing an increase in non-traditional students which can include part-time, commuter, and older students. Though OSU-Cascades expects to balance this growth with the continued development of a four-year residential university, the university is maintaining an on-going commitment to serving non-traditional students. Establishing a welcoming environment through communal spaces and "landing pads" for commuter students is one way to create a strong sense of inclusiveness within the campus community.



▲ National and OSU-Cascades enrollment demographics are shifting.

## Techological Innovations

Technology changes rapidly and a campus must be able to respond to these shifts in ways that best serve the university's goals. Most classes today have at least some interface with technology including digital submissions, online resources, and group chat discussions. Curriculum can be offered fully online, through hybrid courses, or in virtual simulation. Faculty and staff have a range of technological needs to connect on- and off-site with students, other faculty, or those at other institutions. The application of technology depends on the particular needs of the student, faculty member, researcher, or staff member, so future campus facilities must allow flexibility to provide a variety of systems as well as the ability to accommodate new technological innovations and uses.

## Evolution of Education and Learning

The university educational context is beginning to focus more on interdisciplinary learning strategies. OSU-Cascades currently prides itself on a collaborative culture that encourages students to look beyond disciplinary boundaries and attempt to solve the problems of the future, whatever those may be. As the university grows, maintaining the strong sense of interdisciplinary learning and research must be addressed both in curriculum decisions and physical facilities.

Active learning strategies empower students to take control of their own education and think critically. In the classroom, instructors act as facilitators to support student-led exploration and problem-solving. These strategies influence how the classroom design supports collaborative interaction, flexibility of engagement, and technology support. Beyond the classroom, students are encouraged to engage in real world experiences like research, internships, and study abroad to learn by doing and contribute to their communities in a more tangible way. OSU-Cascades has a strong commitment to active and experiential learning methods, which will shape curriculum and campus planning decisions moving forward. Some learning opportunities may come from partnerships with outside organizations. In addition to sending students and faculty out into the community, development on the 128-acre campus will support the opportunity for co-location of non-profits, research partners, or collaborative business entities to cultivate and promote an entrepreneurial spirit within the student experience on campus.



▲ Evolutions in technology and teaching approaches have led to a higher demand for active learning classrooms, which require flexibility and a range of available resources.





## 2 | PLANNING CONTEXT



# 2 | PLANNING CONTEXT

## 2.1 Long Range Development Planning Process

The LRDP planning process consisted of three main phases:

### Discovery

The purpose of the Discovery phase was to learn about the campus through analysis and understanding the stakeholder's concerns, needs, and ideas. The Discovery phase produced a defined set of planning principles, the projected campus space needs program, an analysis of the existing site conditions, and preliminary thoughts on opportunities for campus infrastructure.

### Exploration

The Exploration phase involved testing physical configurations for the future campus and how different uses might be organized. A series of alternative concept plans were developed and include building site locations, land use designations, open space structure, infrastructural systems, and mobility networks. These conceptual drawings provided opportunities for feedback and discussion with stakeholders. At the end of the Exploration phase, a preferred alternative plan and a set of possible net zero strategies were selected to refine in the final phase of the LRDP planning process.

### Synthesis

The Synthesis phase refined the preferred alternative concept plan based on feedback from stakeholders and develops specific guidelines and strategies for future implementation. The final product of the Synthesis phase is the Long Range Development Plan, which pulls together and summarizes the key conclusions from the planning effort and is codified in this document.



▲ Figure 4: Long Range Development Planning Process



^ Community Meeting to Review the Draft Plan 2017



^ Internal Stakeholder Committee Meeting 2016

## Stakeholder Engagement

Many ideas, concerns, and goals regarding the campus development were voiced throughout the planning process. A broad range of stakeholders participated on both internal OSU-Cascades committees and community advisory groups. These groups provided valuable feedback on a diverse range of topics.

MORE THAN 200 COMMUNITY VOLUNTEERS HAVE HELPED TO PLAN THE CAMPUS.

### Internal Stakeholder Engagement

Four key internal committees guided the LRDp planning process and provided feedback to the planning team throughout.

The *LRDP Steering Committee*'s role was to establish a shared understanding of the planning, design, and technical issues of the Long Range Development Plan and to set a clear direction for subsequent phases of work. Ultimately, the LRDp Steering Committee made recommendations to the OSU-Cascades vice president.

The *LRDP Faculty and Staff Committee* evaluated and provided feedback to the design team on overall campus development. The LRDp Faculty and Staff Committee was tasked with communicating the status of the planning process with the campus community as well as making recommendations to the LRDp Steering Committee.

The *Academic Curriculum Council*'s purpose was to review the Long Range Development Plan within the context of the curriculum. Their goal was to support implementation of the long-term educational mission and ensure OSU-Cascades continues to provide high-quality academic programs for

students. This committee recommended a future projection for academic programs. The Academic Curriculum Council was comprised of faculty from various disciplines throughout the university to provide a balanced perspective to OSU-Cascades leadership on the university's academic future. Long-term enrollment, teaching methods, and academic program projections from this committee were used to develop the academic components of the campus program.

The *Co-Curricular Council* evaluated, reviewed, and established co-curricular learning and campus community development opportunities in alignment with the long-term OSU-Cascades goals and mission. This committee recommended new co-curricular programs and changes to existing programs to OSU-Cascades leadership. This committee's priorities were to organize the campus to best support the university's desire to have an inclusive, transformative, and unique campus environment.

Outside of the formal committees, current OSU-Cascades students were engaged throughout the planning process in interactive activities and workshops to solicit input and ideas. The Associated Students of Cascades Campus (ASCC) leadership provided support to engage and communicate with students, giving critical feedback to define priorities for campus growth.



▲ Figure 5: Internal Stakeholder Engagement Timeline

## Community Advisory Groups

OSU-Cascades formed the Campus Expansion Advisory Committee (CEAC) in April 2013 to help inform and gather input from the Central Oregon community as it expands to a four-year university in Bend. The CEAC provided expertise on important issues OSU-Cascades and the community face as the new campus develops in West Bend, including transportation and parking, infrastructure, business partnerships, neighborhood livability, and sustainability. OSU-Cascades has incorporated, and continues to incorporate, many of the committee's recommendations in campus planning and implementation decisions.

In advance of the OSU-Cascades LRDP process, four community advisory groups met from November 2015 through January 2016 and focused on the areas of Health and Wellness; Sustainability; Arts, Culture, and Enrichment; and Community Integration. A range of interested stakeholders participated, including residents of Bend, subject area experts, and OSU-Cascades students, faculty, and staff. These groups built on the work of the previous CEAC task forces that were convened in 2013 and continued to provide expertise and insight to campus leaders for priority considerations.

The *Health and Wellness Advisory Group* discussed recommendations and concerns to ensure that wellness remains a priority to OSU-Cascades in the LRD<sup>P</sup>. To embed this value into the campus culture, the group suggested that health and wellness be integrated into the academic curriculum and that outside partnerships be formed with local health care providers and others. Encouraging active transportation options and other wellness initiatives and programs available to the campus community were also priorities expressed by the group.

The *Sustainability Advisory Group* envisioned a future OSU-Cascades campus that is a model for sustainable design and best practices, leaving a lasting impression and becoming an integral part of the university's identity. The future campus buildings, landscape, and infrastructure would be an interactive "living laboratory" to inspire as well as educate. This group encouraged the university to prove the business case for sustainable development and secure strategic collaborative partnerships to share resources, expertise, and commitment to implement and maintain long term sustainability and resilience innovation.

The *Community Integration Advisory Group* was tasked with considering community impacts of the future campus. They supported the economic development benefits OSU-Cascades could bring to the area and envisioned methods for integrating the campus into the urban fabric of Bend. This group was concerned with traffic congestion and the availability of housing proximate to the campus. Recommendations were made for a compact mix of uses including attractive on-campus housing options and connections to robust pedestrian, bicycle, and transit facilities. The edges of the campus were another important topic for this group. The north and west boundaries were envisioned as quieter buffers, where the south and east boundaries were characterized as more active and inviting.



▲ Community Integration Advisory Group, December 2015

The *Arts, Culture, and Enrichment Advisory Group* discussed strategies to support OSU-Cascades as a regional hub for the arts. The group recommended that arts and culture offerings should build organically from the university's current foundation, strengths, and curriculum. To connect more fully to the Central Oregon region, the university is urged to collaborate with outside organizations and make arts and culture accessible to the local community.

## 2.2 Regional & Community Context

### Campus Location

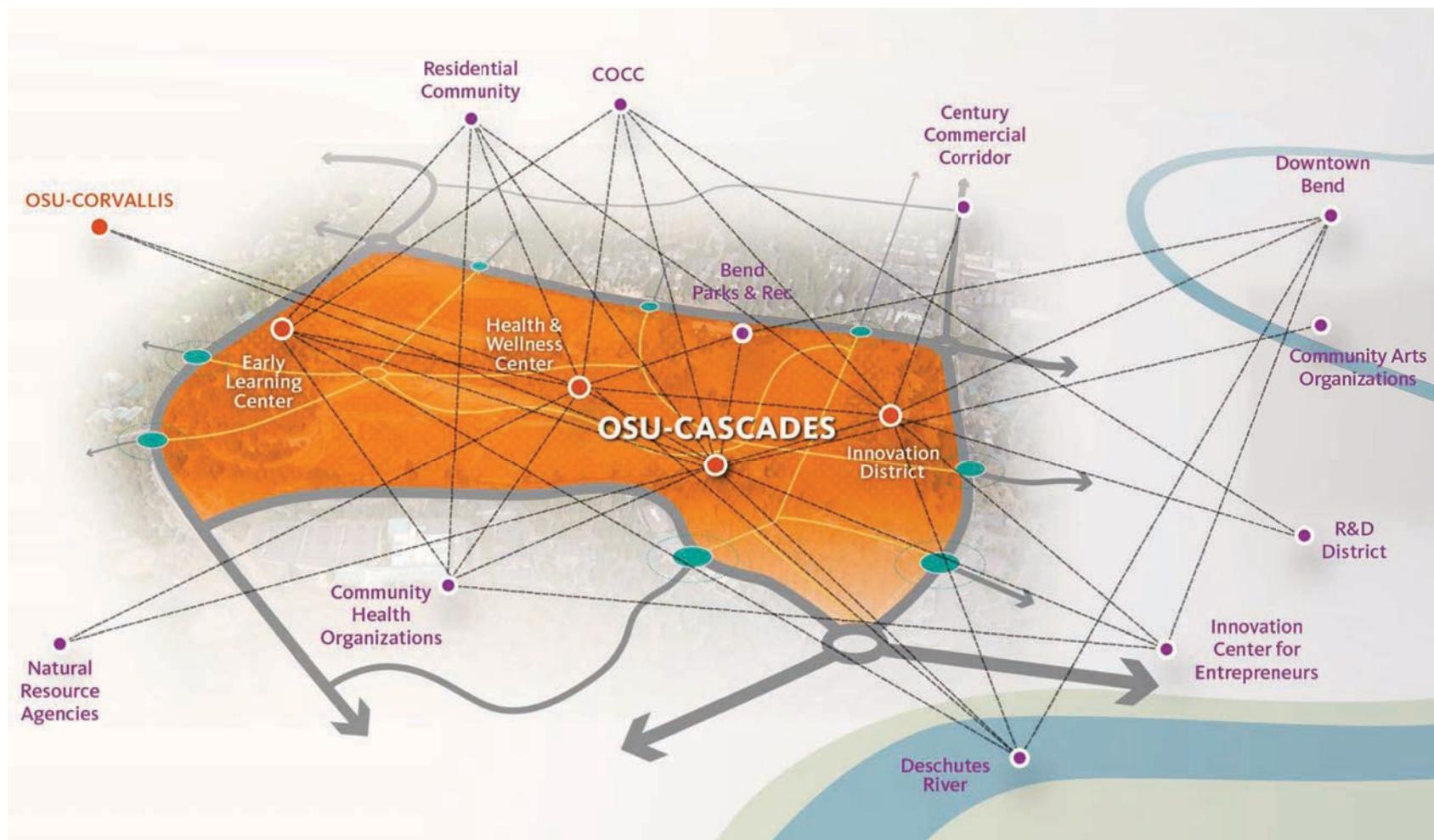
The future 128-acre site for the OSU-Cascades campus includes the current ten-acre campus, a former pumice mine, and adjacent demolition landfill. It is located on the west side of Bend, Oregon, about a mile southwest of downtown and a quarter mile west of the Deschutes River. The site is bordered by residential, commercial, and retail uses. Residential neighborhoods are located to the north and west along Mt. Washington Drive and SW Simpson Avenue, while retail and commercial activities occur to the east along the Century Drive/14<sup>th</sup> Street corridor. The Century Washington Center business park is located to the south

across SW Chandler Avenue and includes primarily medical and office uses with some planned multi-family housing and retail.

OSU-Cascades is expected to be an economic development engine for Central Oregon by providing jobs and services, creating an educated workforce, and attracting partnerships with innovative industries. As enrollment, academic programs, partnerships, and the campus grow, the university will increasingly become an important anchor institution with a wide-reaching positive impact on the region.



▲ Figure 6: Campus Context



^ Figure 7: Campus Community Connections

OSU-Cascades strives to leverage the many local and regional programmatic connections to enrich the academic mission of the university and provide a positive impact on the Bend community.

## City of Bend

### Regulatory Context

In 2017, the City of Bend completed an Urban Growth Boundary revision which includes an updated Mixed-Use zoning designation. This regulatory change impacts the types and densities of uses that are permitted on the campus. OSU-Cascades is working closely with the city to ensure that the university's Long Range Development Plan aligns with the city's vision.

The Bend Development Code (BDC) was also recently revised with expanded requirements for master plan applications. The BDC identifies the criteria for city agencies, commissions, and councils to evaluate how institutional master plans are approved and incorporated into the city's overall development plan. The master plan application requirements share many components with the LRDP.

### Bend Central Westside Plan

The City of Bend completed the Central Westside Plan in May 2016 following an extensive public process to address rapid development on the city's central west side. The plan primarily addressed land use and transportation issues for the study area, generally bounded by Mt. Washington Drive, NW Portland Avenue, and the Deschutes River. Relevant recommendations for

the OSU-Cascade campus were for campus development as the preferred mixed-use land use. In addition, transition zones were recommended as neighborhood buffers along Mt. Washington Drive and SW Simpson Avenue.

The plan also expressed a preference for the large 128-acre campus site to be divided into blocks to facilitate access for the city's multi-modal transportation network. The plan recommends introducing street and pedestrian connections through the campus in addition to improving nearby intersections to accommodate traffic moving to and through the campus.

### Resources and Infrastructure

With a strong commitment to sustainability and resilience, OSU-Cascades set long-term goals to achieve net zero energy, water, and waste with new campus development. In order to meet these goals, the university proposes to provide energy generation through the use of renewable systems such as solar power and geo-exchange networks. A central utility plant, which incorporates the use of woody biomass material is under consideration. On-site water treatment facilities could capture and filter water by-products for non-potable uses on the campus.

The university is working closely with the city to ensure that energy, water, and waste systems are highly sustainable and efficient for the campus while also fitting in with the city's overall infrastructure network and rate system.

## Transportation

### Existing Streets and Transit Service

The OSU-Cascades campus site is bounded by three arterial streets, SW Simpson Avenue to the north, SW Century Drive to the east, and Mt. Washington Drive to the west. A local street, SW Chandler Avenue, bounds the southern edge of the site.

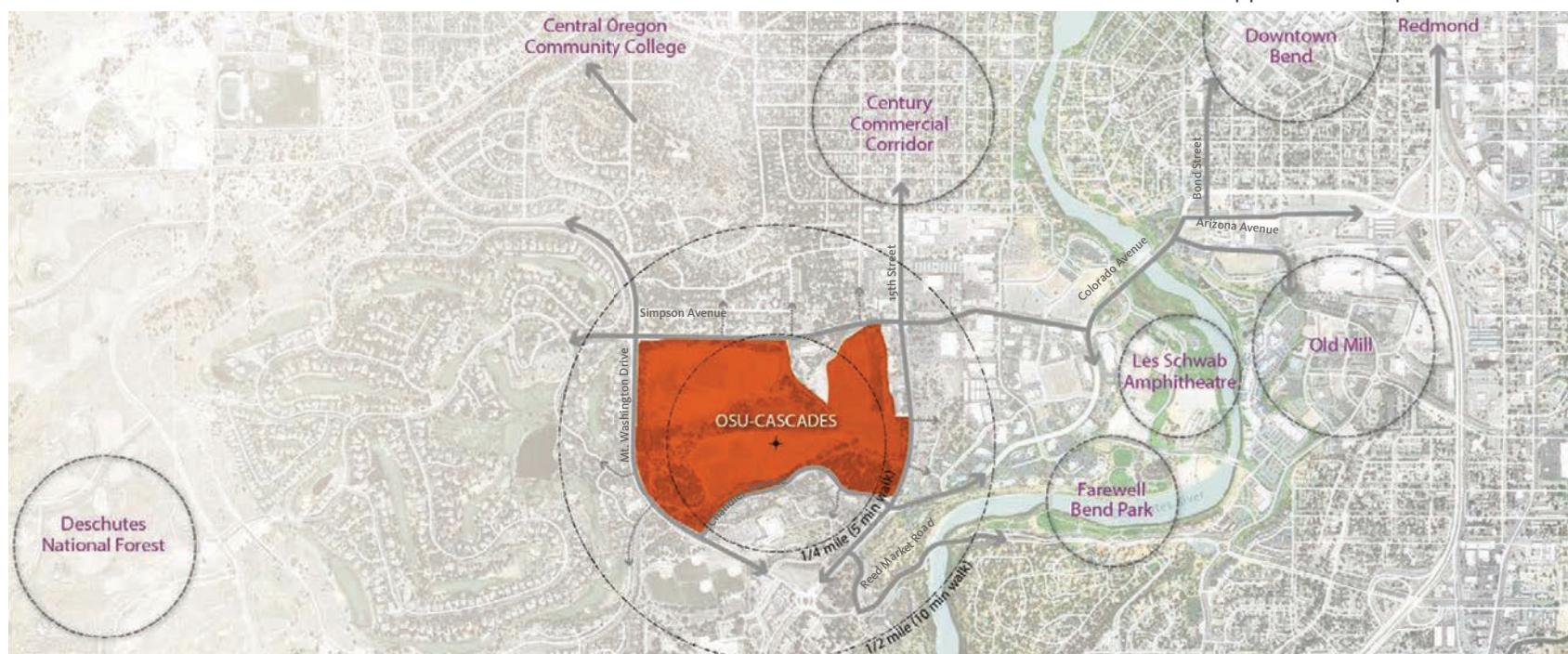
Cascades East Transit (CET) currently has three bus routes that service the campus from downtown Bend and Hawthorne Station along with connections between Central Oregon Community College and OSU-Cascades. As the CET network continues to grow and expand, more route connections are anticipated.

### Existing Pedestrian and Bicycle Facilities

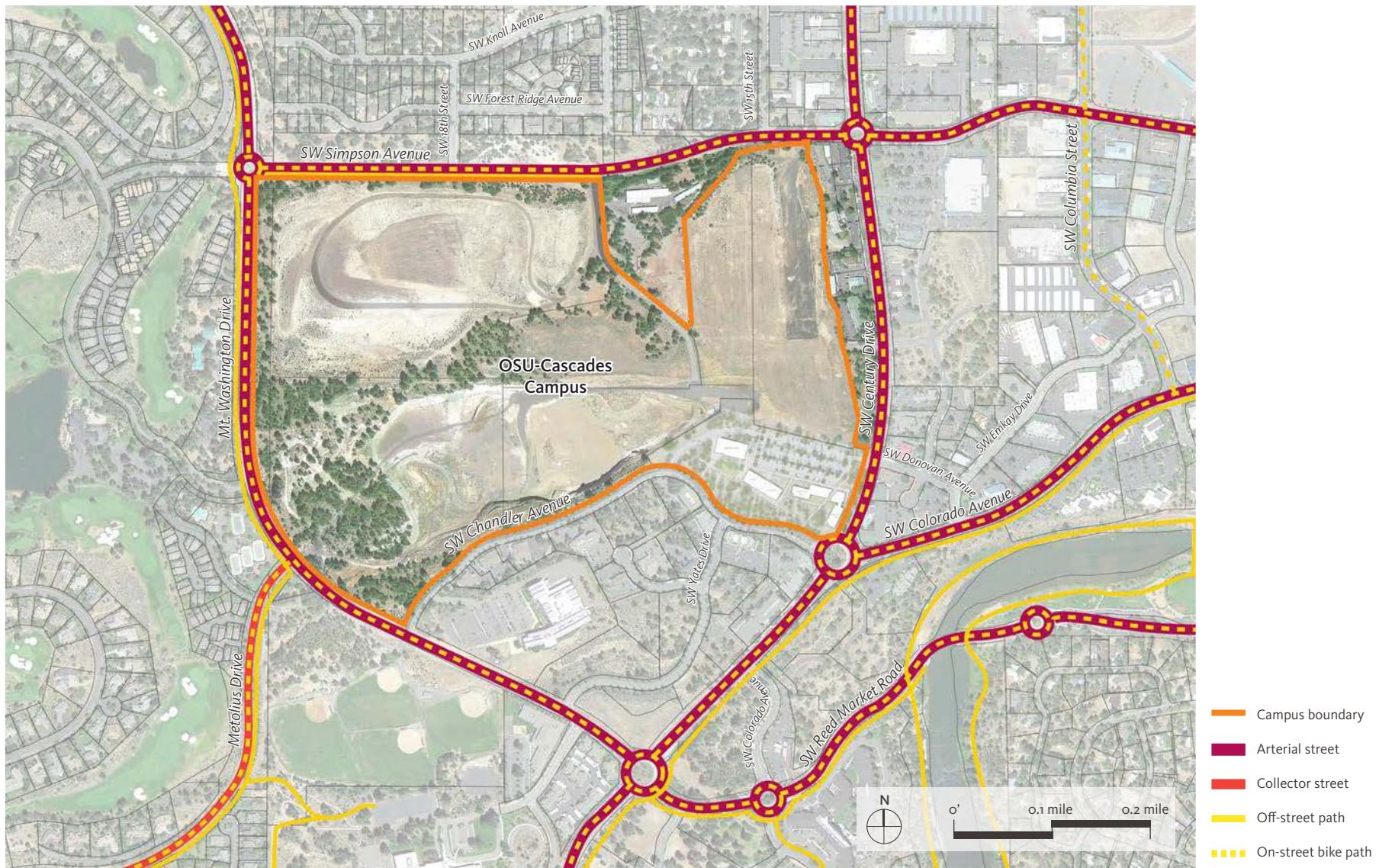
The OSU-Cascades campus has good bicycle and pedestrian connectivity to surrounding areas. Sidewalks and trails near the access to nearby neighborhoods, commercial areas, and important open spaces, such as the Deschutes Riverbend Park.

Three of the streets bounding the campus, SW Century Drive, Mt. Washington Drive, and SW Simpson Avenue, have dedicated bike lanes. In addition to SW Simpson Avenue, SW Colorado Avenue and SW Reed Market Road also have dedicated bike lanes that connect the campus to the river paths, recreation areas, the Old Mill District, and downtown Bend to the east.

SW Century Drive bike lanes lead north to the 14th Street commercial corridor. This connection provides ready access to retail, food, and services that will supplement campus amenities.



▲ Figure 8: Bend Community Context



▲ Figure 9: Existing Circulation

## Community Input

The university convened the Transportation Task Force in 2014 to address potential concerns about increased traffic congestion and parking from OSU-Cascades' campus growth. The group provided input and recommendations to OSU-Cascades to mitigate traffic impact on the surrounding area. Recommendations focused on creating attractive and affordable biking, walking, carpool, and transit options as alternatives to reliance on single occupancy vehicle driving. They also suggested providing ample on-campus parking so that those who drive can park on campus rather than on surrounding streets.

In 2016, the Community Integration Advisory Group recommended transportation strategies that could lead to a nearly car-free campus, focusing primarily on non-driving transportation options like transit, walking, and biking. Shuttle service to remote parking and on-campus car sharing were recommended to supplement the other, more active, transportation modes.

## Transportation Demand Management (TDM)

OSU-Cascades has committed to prioritizing transportation that is sustainable, healthy, and efficient. To minimize driving, OSU-Cascades has implemented a series of policies that support alternative transportation options. Transportation demand management strategies help to reduce or redistribute vehicular travel demand and increase the use and effectiveness of other modes of transportation. These measures apply to students, faculty, staff, visitors, and vendors; they support the most efficient use of transportation resources to, from, and within the future OSU-Cascades campus.

Transportation demand management strategies have already led to an improved mode split for OSU-Cascades. In the fall of 2016, the following achievements were noted:

- CET bus ridership increased by 78%.
- In the first two weeks of the term, an average of 50 bicycles were ridden to campus per day.
- Ninety-six members had joined the campus bike-share program, generating 320 bike trips.
- The university invested in two Zipcars® for students and community members to use rather than bringing their own vehicles.
- More than 300 students joined the Drive Less. Save More: OSU-Cascades program, which hosts events and provides resources to help take advantage of non-driving modes.
- Over 100 students and employees had logged 6,500 non-single occupancy vehicles miles.

The university worked with a transportation consultant to conduct a Transportation Impact Analysis (TIA) to evaluate how a 5000-student campus could affect the surrounding transportation infrastructure. While the successfully implemented policies and programs appear to be reducing the amount of vehicle trips to the campus, the university took a conservative approach and did not rely on any reductions of trips in the traffic analysis models in planning for off-site transportation impacts.

## Student Housing

As reflected in the Community Integration Advisory Group's report in 2016, housing costs in Bend have been increasing and are a concern for residents. The Central Oregon Rental Owners Association 2016 Rental Survey reports a 0.62% rental vacancy in Bend and a 1.04% rental vacancy in the Central Oregon region. This low vacancy explains why rental costs are increasing. Median home sale prices have been rising steadily since 2011 and have recently overtaken the previous peak median price from 2006, as shown in Figure 10 below.

THE OREGONIAN STATES,  
“THE BIG RUN-UP IN PRICES—  
COMBINED WITH A SEVERE  
SHORTAGE OF RENTAL  
HOUSING—HAS MADE BEND  
ALL BUT UNAFFORDABLE  
FOR EVEN MIDDLE CLASS  
RESIDENTS, TURNING THE  
CITY INCREASINGLY INTO  
A PLAYGROUND FOR THE  
WEALTHY.”

Concern for rising housing costs is clear in discussions with OSU-Cascades stakeholders and the Bend community. The limited affordable housing options in Bend have begun to impact OSU-Cascades' recruitment and retention of faculty, staff, and students. A local study shows that affordable, middle market housing for households earning between



▲ Figure 10: Home Sales Prices in Bend, OR since 2004 (Trulia.com)

\$50,000 and \$90,000 is extremely deficient in Bend.

Some Central Oregon community members expressed concern that OSU-Cascades' plans for expansion will contribute more pressure on the local housing market, as well as increase traffic and parking issues for the surrounding area.

To more fully investigate the community's concerns and feedback, OSU-Cascades convened a Housing Task Force in 2014, which stated the following goals for housing:

- Establish a “primarily residential” university campus.
- Accommodate as many students as possible (i.e., nearly all non-local students on campus or within 1/2 mile in university-owned or university-affiliated housing).
- Create a vibrant, dynamic campus that students want to be on both in and out of classes.
- Make the price of on-campus housing competitive with off-campus options.

These goals reinforce the concept of a compact, mixed-use campus that allows students to live, learn, and play nearby.

By providing on-campus housing, OSU-Cascades can address additional housing demand and mitigate the traffic impacts by cutting back on the percentage of commuter students driving to campus.

OSU-Cascades is committed to creating a rich and immersive first-year experience that centers around first-year students living on campus. This type of program typically encourages or requires first-year students to live on campus. The long-term requirements have not yet been determined but will develop as more is known about future enrollment and demand.



▲ Former pumice mine, looking west



▲ Area 3 of Deschutes County demolition landfill site

## 2.1 Existing Site Conditions

### Site Description

The existing OSU-Cascades site is comprised of three major areas, each with differing conditions:

- The existing ten-acre site, where the initial development of the campus is located
- A former pumice mine that is approximately 46 acres in total area comprised by a pit with varying depths up to approximately one hundred feet adjacent to a Ponderosa second-growth forest
- A former Deschutes County construction and demolition landfill, which is approximately 72 acres

The campus site consists of multiple parcels as shown in Figure 11. The 46-acre site title report identified several easements, including:

- Pacific Power & Light for transmission and distribution lines
- City of Bend for water distribution line(s)
- Deschutes County for “construction and roadway slope”

Both the pumice mine and the former landfill will require significant preparation prior to their use for campus development.



▲ Figure 11: Existing Site Conditions

- City parcel
- Site boundary
- Major site areas
- Former landfill areas
- 10-foot contour
- 2-foot contour

## Site Work Considerations

The pumice mine will require reclamation, including stabilization of the steep existing walls of the pit<sup>1</sup>. There is historic evidence of a seismic fault and jointing on the site, but geotechnical reports indicate there are limited or negligible risks of liquefaction or surface rupture at this location. Further geotechnical review will occur when site stabilization has been completed and future building are developed. The primary risk of slope instability associated with potential seismic activity will be addressed during reclamation efforts. Re-grading per the recommendations in the geotechnical study will be part of the site preparation work for future campus development.

The western area of the pumice mine has the highest site elevations, with rolling topography and second-growth tree stands, along with some areas disturbed by earlier mining activities. An area of disturbed soils in the northern portion of this area is noted in geotechnical reports and was likely used for “staging and fill stockpiling” associated with mining operations.

The former landfill will require remediation prior to development. It is comprised of three distinct fill areas from specific periods of fill activity. The oldest and easternmost area, noted as Area One, is the least stable and primarily contains material from the former wood mills in the vicinity. This fill area experiences pyrolytic activity

reaching temperatures up to 200°F as a result of organic material degeneration and has small amounts of material that will need to be removed to specialized disposal facilities.

As determined by a parallel study, remediation of the landfill will be a multi-phase process, as described in *Chapter 4: Planning Framework*. Combining the reclamation and remediation efforts will allow the full site to be shaped and prepared in a way that is most beneficial and efficient for future campus development.

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<sup>1</sup> Carlson Geotechnical: Report of Supplemental Geologic Reconnaissance & Preliminary Slope Stability Analysis for Eastern Portion of OSU Cascades 46-Acre Site 1707 & 1757 SW Simpson Avenue Bend, Oregon, May 21, 2014 and Carlson Geotechnical: Report of Preliminary Geotechnical Investigation OSU Cascades 46-Acre Site 1707 & 1757 SW Simpson Avenue Bend, Oregon, July 25, 2014

## Existing Campus

In 2011, OSU-Cascades purchased and renovated the 28,000-square-foot (sf) Graduate & Research Center building on SW Columbia Street in Bend. This building is intended to remain in use at least until the campus expansion is complete enough to co-locate all academic offerings together on the new campus.

In 2014, the existing ten-acre site was purchased, and development began for the first phase of the new OSU-Cascades campus. The ten-acre site includes the following buildings:

- Tykeson Hall, the new 43,650-sf academic center, includes classrooms, teaching labs, offices, student gathering and work areas, and a computer lab. The building is three-stories, approximately forty-six feet high, and opened in September 2016.
- The 300-bed Residence Hall opened in January 2017. It is 86,000 square feet (sf) and includes single, double, triple, and apartment-style suites. There are community lounge spaces and fitness facilities on the ground floor of the Residence Hall. The building varies in height with three- and four-story wings with a maximum height of approximately fifty-six feet.
- The 27,000-sf Dining/Academic Building also opened in January 2017. The Dining/Academic Building is two floors and approximately thirty-seven feet high. It includes a coffee shop, informal gathering spaces, 250-seat dining hall, classrooms, a multi-faith room for reflection, and offices

Future campus expansion will connect to the existing ten-acre development to create one seamless and integrated campus environment.



▲ Figure 12: Ten-Acre Site Plan





# 3 | CAMPUS PROGRAM



# 3 | CAMPUS PROGRAM

The OSU-Cascades LRDP assumes a student headcount enrollment of 5,000 students, which will require new academic, campus life, recreation, housing, and other spaces to support this growth. The total projected long-term campus growth is approximately 1.2 million square feet, which includes student housing for 1,700 new beds. This growth will be added to the initial campus development of approximately 159,000 square feet and housing for 300 beds.

Additional types of space were identified through the planning process that are beyond the core needs of the campus but would support the vision and mission of the university. These additional spaces, such as expanded recreation facilities, child care, or conference facilities, could be developed as a collaboration with university partners.

## Methodology

The space need projections were developed through an iterative process involving the university's LRDP Project Planning Team, the LRDP Steering Committee, the LRDP Faculty and Staff Committee, the Academic Curriculum Council, and the Co-Curricular Council.

Initial program estimates were generated using a space planning model that projects needs for a range of institutional space types, including classrooms, teaching labs, research labs, office space, library and study areas, recreation facilities, co-curricular space, healthcare amenities, housing, and campus support space. The model primarily applies the national space planning guidelines of the Council for Education Facility Planners International (CEFPI)—the most widely accepted higher education space planning guidelines in the U.S.—together with OSU-system guidelines, where available. The model calculation integrates demographic, academic planning, and other data supplied by OSU-Cascades, that results in space projections reflecting OSU-Cascades' unique needs to support its mission and vision.

The space needs generated by the model were compared to the university's existing space to establish the incremental space need for growth to 5,000 students. Existing space includes Tykeson Hall, Dining/Academic building, and Residence Hall, as well as the space in the Graduate & Research Center. The incremental space needs for growth were converted from assignable square feet (ASF) to gross square feet (GSF) to generate the LRDP program.

The following is a summary of the campus program development process and proposed LRDP program.

## 3.1 Academic Program and Demographic Data

The academic program and demographic data that were used in the space needs model as the basis for the LRDp program are summarized below.

### Academic Program Data

For planning purposes, the Academic Curriculum Council grouped current and anticipated academic programs needed to reach the 5,000 enrollment target within the following academic program categories.

- Art & technology
- Education
- Engineering
- Enterprise
- Field science
- Lab science
- Health and wellness
- Liberal/social science
- Other

Each program area contains courses that the university currently delivers or expects to deliver over the planning period. They reflect current thinking about course offerings that will support the university's strategic academic vision.

### Demographic Data

The Academic Curriculum Council provided supporting data for each academic program area, including headcount and full time equivalent (FTE) undergraduate and graduate enrollment, credit hours for majors and non-majors, contact hours for classroom and lab courses, and projections for needed staff and faculty.

### Enrollment Projections

Enrollment is projected to be approximately 5,000 headcount students and approximately 3,900 FTE. The breakdown of enrollment by program area and level (undergraduate and graduate) is summarized in Table 1.

▼ Table 1: LRDp Student Headcount and FTE for 5,000 Enrollment Target

UNDERGRADUATE	Headcount	FTE
Art & Technology	405	310
Education	143	107
Engineering	495	396
Enterprise	893	714
Field Science	566	422
Health and Wellness	607	446
Lab Science	568	456
Liberal/Social Science	759	552
Other	52	28
<b>Total Undergraduate</b>	<b>4,488</b>	<b>3,432</b>
GRADUATE	Headcount	FTE
Art & Technology	24	24
Education	70	70
Engineering	58	52
Enterprise	30	27
Field Science	80	72
Health and Wellness	234	203
Lab Science	30	27
Liberal/Social Science	0	0
Other	0	0
<b>Total Graduate</b>	<b>526</b>	<b>475</b>
<b>TOTAL ENROLLMENT</b>	<b>5,014</b>	<b>3,907</b>

### Faculty Headcount and FTE

Faculty headcount for the 5,000 student enrollment target was projected in proportion to enrollment. Faculty FTE was calculated using a headcount to FTE ratio of 0.9 for tenure track faculty, 0.8 for instructors, and 0.3 for adjunct faculty. These ratios were provided by the Academic Curriculum Council.

Faculty headcount and FTE projections for the 5,000 enrollment level are summarized in Table 2.

▼ Table 2: LRDp Faculty FTE for 5,000 Enrollment Target

FACULTY POSITION	Headcount	FTE
Tenure Track Faculty	95	85
Instructor	132	106
Part-Time	473	142
<b>Total Faculty</b>	<b>700</b>	<b>333</b>

## Staff Headcount and FTE

Staff full-time and part-time headcount were supplied by OSU-Cascades and confirmed by the Academic Curriculum Council. For FY 2020, staff headcount for the 5,000 student enrollment target was projected in proportion to enrollment, and staff FTE was generated using a headcount to FTE ratio of .5. Staff FTE are summarized in Table 3.

▼ *Table 3: LRDp Staff FTE for 5,000 Enrollment Target*

STAFF POSITION	FTE
Senior Leadership	23
Professional Staff	106
Classified Staff	63
Graduate Students	0
Total	192

## 3.2 Program Objectives

### Core Academic Space

#### Classrooms

The following objectives were considered when projecting classroom space needs for OSU-Cascades.

- Provide a range of sizes and types.
- Support flexibility for alternative pedagogies and active learning.
- Maximize room utilization.
- Encourage collaboration and engagement.
- Integrate technology.

The classroom space factors accommodate a range of classroom sizes and types to support different pedagogies and a variety of disciplines that are anticipated to evolve over time. To accommodate active learning and flexibility, classroom station sizes are higher than those for traditional tablet desks or fixed-seat lecture halls. However, this additional space need is balanced by OSU-Cascades' commitment to high utilization and longer-than-typical scheduling times, both of which generate reductions in overall space needs.

## Teaching and Research Labs

The following objectives were considered when projecting laboratory space needs for OSU-Cascades.

- Provide dedicated spaces when necessary and flexible spaces when possible.
- Balance utilization with equipment and space specialization.
- Provide preparation and storage rooms for sensitive set-ups.
- Integrate technology to facilitate flexible use.
- Use moveable benches and furniture for a variety of group work spaces, where appropriate.
- Encourage transparency and interdisciplinary interaction.
- Incorporate brainstorming spaces in addition to hands-on work spaces.

Lab station sizes were identified for labs ranging from shared, interdisciplinary spaces to specialized academic program spaces. Flexible labs support a variety of disciplines and courses; they typically contain moveable furniture for group and individual work, portable screens, and moveable lab counters with equipment, fume hoods, lab support, and preparation space. Because of their flexibility, these labs tend to have higher station sizes than more traditional labs, as well as higher overall utilization.



▲ IDEA Center Flexible Lab, Austin College



▲ The Foundry Maker Space, Duke University (Mark Herboth Photography, LLC)

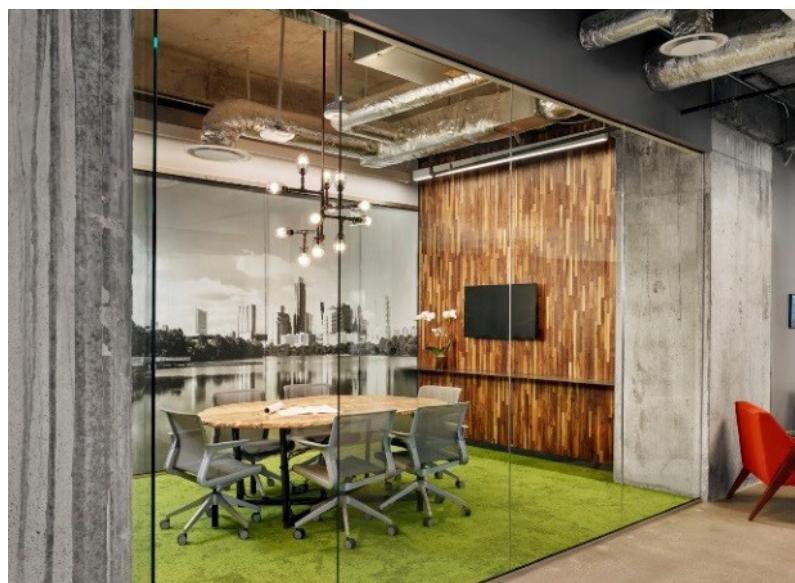
## Office and Support Space

The following objectives were considered when projecting office and support space needs for OSU-Cascades.

- Balance the need for collaboration with the need for privacy.
- Encourage informal gathering and interaction between faculty, staff, and students.
- Maintain an interdisciplinary environment as the campus grows over time.
- Allow for productive quiet time for faculty and staff.
- Provide space for faculty to store materials.
- Create private spaces for meetings.

To maximize space efficiency, space factors for offices and work stations were projected to be somewhat lower than those found in typical university settings. Offices will consist of private offices for work, supplemented by generous meeting, service, and support space to foster a collaborative workplace environment.

Support spaces will include conference rooms, group work areas, flex space, and sound privacy booths. This approach emphasizes shared and collaborative space over private office space.



▲ Shared collaborative office space

## Library, Learning Support, and Resource Space

The following objectives were considered when projecting library, learning support, and resource space for items such as technology, and equipment for student projects and research.

- Establish a shared space for the university community.
- Emphasize openness, collaboration, and flexibility.
- Provide a variety of space sizes and types for different types of work and study.
- Allow as much flexibility as possible in furnishings and configurations.
- Create space for an evolution in resources and collections.
- Accommodate a variety of student and faculty resources and activities.

Learning support and resource space reflects an evolution in thinking around libraries, where physical collection space is reallocated to other types of functions, such as maker spaces, media labs, and collaborative meeting spaces.

Space needs for the range of learning support and resource spaces were identified by the university's Academic Curriculum Council and compared to institutions with similar enrollments. This approach generated an allocation for learning support and resource space that can accommodate a range of functions as needs are identified in the future. Library, learning support, and resource spaces may be located together or distributed in different areas of the campus



▲ *iLoft Learning Commons, Lorain County Community College*



▲ *Dell Medical School, University of Texas at Austin*

## Campus Life and Housing Space

### Campus Life

Campus life space would support a range of co-curricular activities necessary to support the university's vision and mission. The CEFPI guidelines were used to establish an overall assignable square footage for co-curricular space, which could be used to accommodate a range of co-curricular spaces and activities. Potential spaces and space demand within each category were identified through discussions with the LRDP Project Planning Team, Steering Committee, and Co-Curricular Council. The following table identifies the campus life function categories and the priority spaces that were identified by these groups within each category.



▲ Gathering and lounge space in student housing at 2400 Neutes,  
University of Texas at Austin

▼ Table 4: Campus Life Space Types

SPACE CATEGORY	POTENTIAL SPACES INCLUDED
Assembly	Theater, event, and conference space: <ul style="list-style-type: none"><li>• Flat floor, flexible event space for +/- 500 students</li><li>• Auditorium for +/- 350 students</li></ul>
Exhibition	Student research and project exhibition space
Dining	Dining hall, café, or other food service
Lounge	Student social and collaboration space, including space for commuter students
Retail	Bookstore and retail: <ul style="list-style-type: none"><li>• Retail with branded gear and student supplies</li><li>• IT retail and support</li><li>• Print shop</li><li>• Thrift or exchange shop</li><li>• Small international grocery store</li></ul>
Social Space	Game, TV, and informal indoor recreation space
Meeting	Student clubs and organizations, i.e., interfaith center
Healthcare	Health center, clinic, or wellness center <ul style="list-style-type: none"><li>• Potential integration with recreation, academic programs, child care</li><li>• Basic mental health services on campus with one or two exam rooms, reception area, refrigeration for vaccines</li><li>• Space for outside partners for temporary clinics, i.e., dental, vaccination</li></ul>
Recreation and Athletics	Intercollegiate and intramural sports and recreation <ul style="list-style-type: none"><li>• Space for non-physical/outdoor activities</li><li>• Yoga studios and weight rooms</li><li>• Equipment check-out and storage</li></ul>
Support	Storage, day lockers, shop, service, and other campus support space

Dining space can be distributed throughout campus, rather than concentrated in a single dining facility. Food access could include small “grab-and-go” shops, cafés, coffee shops, and food trucks in addition to a food court or traditional dining hall.

As a growing institution, OSU-Cascades is developing its identity around athletics programs with long-term athletics space needs to be determined by demand and available resources. Current athletics activities take advantage of the regional off-site natural amenities and include sports such as skiing, kayaking, and cycling.

Space projections for recreation and athletics uses are designed to accommodate a range of fitness and recreation facilities and to support space for off-site athletics programs. The space projections in the LRDP program could accommodate a range of spaces such as a competition gymnasium, basketball courts, practice gym, swimming pool, weight training and fitness room, racquetball court, locker rooms, and storage space.



▲ Shocker Dining Hall, Wichita State University

## Housing

Providing adequate housing on campus is an important issue for both the university and the Bend community due to the rising cost and limited supply of housing near the campus. On-campus housing supports the university’s goals of being a living-learning campus and to provide affordable housing options for students. The university is also exploring the potential for affordable faculty and staff housing in the future.

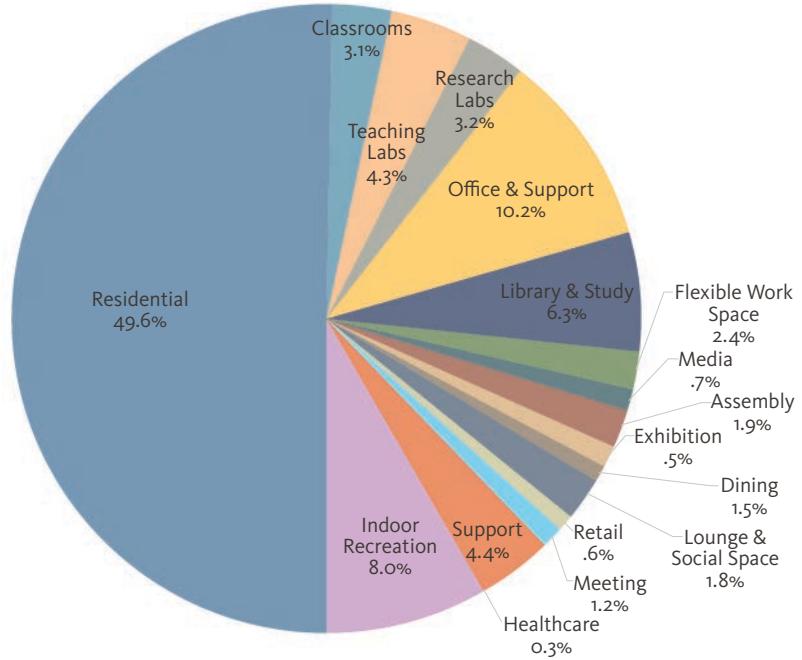
The LRDP housing program assumes 40 percent of headcount enrollment could be accommodated on campus with a total of 2,000 beds (1,700 net new beds in addition to the existing 300 beds). Based on the diverse demographics of the OSU-Cascades students, the space projections assume a range of unit types, including single rooms, semi-suites, suites, micro-housing, and apartment-style units.



▲ Fitness space in student housing at 2400 Neutes, University of Texas at Austin

### 3.3 LRDP Program Summary

The space needs generated by the space planning model were compared to existing campus space to generate an incremental space need for planned enrollment growth to 5,000 students. A net-to-gross factor was applied to convert assigned square footage (ASF) to gross square footage (GSF) for the LRDP program. The new space need is shown in Figure 13 and summarized in the following table.



▲ Figure 13: New Space Need/Program (GSF)

▼ Table 5: LRDP Program Summary

	Existing Space (ASF)	LRDP Space Needs (ASF)	New Space Need (ASF)	ASF to GSF Factor	New Space Need/Program (GSF)
<b>Core Campus Space</b>					
Classrooms	22,479	46,000	24,000	0.63	37,000
Teaching Labs	6,351	39,000	33,000	0.63	52,000
Research Labs		24,000	24,000	0.63	38,000
Office and Support	26,885	104,000	77,000	0.63	123,000
Library and Study	3,400	51,000	47,000	0.63	75,000
Flexible Work Space	2,281	21,000	18,000	0.63	29,000
Media		5,000	5,000	0.63	8,000
<b>Campus Life Space</b>					
Assembly		14,000	14,000	0.63	22,000
Exhibition		4,000	4,000	0.63	6,000
Dining	6,965	18,000	11,000	0.63	18,000
Lounge and Social Space	1,766	16,000	14,000	0.63	22,000
Retail	2,957	8,000	5,000	0.63	8,000
Meeting	433	10,000	9,000	0.63	15,000
Support	1,330	34,000	33,000	0.63	52,000
Healthcare		3,000	3,000	0.63	4,000
Indoor Recreation	1,762	59,000	57,000	0.60	96,000
<b>TOTAL NON-RESIDENTIAL</b>	<b>76,609</b>	<b>455,000</b>	<b>379,000</b>		<b>605,000</b>
Residential					
(1,700 additional beds)					595,000
<b>TOTAL</b>					<b>1,200,000</b>

## Outdoor Recreation and Athletics

An outdoor recreation and athletics program is typically determined based on available suitable land and the university's desire to accommodate specific athletics programs. The Co-Curricular Council stated that there is unlikely to be a robust intercollegiate athletics program, such as football, but there is potential to develop a variety of club sports and intramural programs based on student interests and involvement. While most of the recreational activities that current and future student populations would participate in tend to focus on regional opportunities (i.e., skiing, cycling, kayaking), the Co-Curricular Council supported developing programs that reflect OSU-Cascades' place in the community and shifting student population. Available land resources would be programmed for campus recreation fields and courts, such as multi-purpose fields, tennis courts, and sand volleyball courts. These options and their associated land area, based on the National Intramural-Recreational Sports Association (NIRSA) guidelines and nature of potential activities, are described in Table 6.

▼ *Table 6: Outdoor Recreation and Athletic Courts and Fields Program*

OUTDOOR RECREATION SPACE NEEDS	Minimum Acres	Maximum Acres
Tennis Courts	0.75	1
Sand Volleyball Court	0.15	1
Basketball Court	0.2	1
Shared Multi-purpose Field*	2.5	3
Baseball and Softball Field	3.5	5
Soccer and Lacrosse Field	2.25	4
Multi-purpose Rec Field	1.5	4

\*Includes baseball, softball, soccer, ultimate Frisbee, etc.

## Additional Space

Additional program elements beyond the academic core and campus life needs, could be provided on campus, depending on the availability of land and partnership opportunities with local entities. Potential additional elements that were identified include the following:

- Early Learning Center, which could include child care facilities and a laboratory school (K-6 or K-8)
- Conference facilities
- Additional recreation facilities potentially shared with the community
- Innovation District partners
- Art Spaces

Preliminary space needs were estimated for these additional program elements to understand potential impacts, but specific functional characteristics and demand of each element remain to be determined. Preliminary considerations for each element were discussed with the LRDG Steering Committee and Co-curricular Council.

### Early Learning Center

- An on-campus child care location is preferred
- Both full-day and drop-in care are needed
- The site should have convenient parking and a covered drop-off area
- There is potential to integrate child care with academic programs and campus facilities (i.e., the school, health and wellness center, recreation, and outdoor space)
- There is potential to partner with a local community child care provider
- The university is investigating potential partnerships with the Bend-La Pine School District for a K-5 or K-8 laboratory school
- Due to land constraints, the school district is open to alternative “urban models” for the school, requiring a smaller footprint than typical schools

### Hospitality and Conference Facilities

- A residence hall could provide conference or event accommodations during the summer.
- Academic programs such as hospitality could be delivered through an off-campus partnership at a local hotel.
- Conference space is desirable and would address a broader need within the Bend community.

### Recreation Facilities

- The university has held discussions with the Bend Parks and Recreation District (BPRD) concerning the potential to provide shared campus and community recreation facilities.
- A partnership with BPRD would create the potential opportunity to develop facilities earlier in the campus development process and would create the opportunity for cost-sharing.
- Planning for recreation facilities should allow for potential expansion as the campus grows.

### Innovation District

The university's vision for an Innovation District is to create a mixed-use district that enhances the university's academic mission, fosters mutually beneficial partnerships, and encourages community engagement with the campus. Program elements that may be established in the Innovation District will emerge as the university explores opportunities with compatible partners. Potential uses include a business incubator, co-working spaces, shared research space, offices, small-scale commercial or food service, and affordable residential apartments.

### Other Facilities

Several other program elements were identified as potential uses that could be accommodated on the campus, depending on the availability of land and funding opportunities. These potential uses include art gatherings and display, museum, welcome center, business incubator, and renewable energy generation. The Innovation District or other partnerships may create opportunities to establish these uses on the campus or provide the services off-site.





## 4 | PLANNING FRAMEWORK



# 4 | PLANNING FRAMEWORK

## 4.1 Plan Overview: Transformation

THE INTENT OF THE LONG RANGE DEVELOPMENT PLAN IS TO DESIGN A CAMPUS THAT IS TRANSFORMATIVE, PHYSICALLY AND EXPERIENTIALLY. THE OSU-CASCADES SITE IS SEVERELY DEGRADED AND HAS BEEN A CONSPICUOUS GAP IN THE BEND URBAN FABRIC FOR GENERATIONS. THE FORMER LANDFILL AND PUMICE MINE WILL BE REHABILITATED INTO A CAMPUS THAT IS BOTH ECOLOGICALLY ENRICHED AND A POSITIVE CONTRIBUTOR TO THE BEND COMMUNITY.

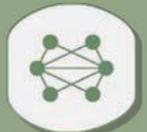
The future campus physical framework will support the university's culture of innovation, sustainability, and wellness. In addition to physical transformation of the site, personal growth and education for the campus community and visitors are integral to the OSU-Cascades long-term vision. Beyond intellectual development, students should leave healthier and more conscientious than when they arrived. Visitors will have opportunities to experience the campus itself as a learning experience through visible and interactive examples of sustainable systems and university research in action.

Aspirational goals for net zero energy, water, and waste will require a variety of integrated design and operational solutions for campus infrastructure to minimize dependency and impact on precious environmental resources.

OSU-Cascades will establish itself as a leader in resilient design and be a model for other university campuses as well as the surrounding Central Oregon community for sustainable development in arid, high desert climates. As an innovator, OSU-Cascades intends to lead the way toward a broader transformation of sustainable and resilient development practices.

# Planning Principles

## PERMEABLE & CONNECTED



As a future regional center for community wellness, arts, recreation, education, and symbiotic partnerships, the campus will be open and welcoming to the public and engaged with the Bend and Central Oregon community.

## SUSTAINABLE & RESILIENT



The campus will be developed in the most sustainable and resilient way possible, beginning with rehabilitation of the site into an ecologically diverse landscape. Efficient and flexible buildings will allow growth without over-building, and a flexible physical framework will allow change over time as the campus and community evolve.

## INSPIRATIONAL & MEMORABLE



The campus community will witness and participate in the transformation of the dramatic site as the campus grows and evolves into an interactive living lab that celebrates the Central Oregon setting.

## INTEGRATED & INNOVATIVE



A strategic mix of uses and flexible spaces will promote interdisciplinary learning and interaction. The Innovation District will express the university's entrepreneurial spirit.

## 4.2 Development Plan

### Campus Design Concept

The 128-acre landscape is the primary structure of the OSU-Cascades campus framework. The combination of the unique topography resulting from industrial activity and mountain views of the Cascade Range are key drivers for the campus organization. To balance existing topography, the site will be graded with a series of terraces stepping down to “the Bowl” to effectively enhance the campus’s unique character. Buildings will be located and oriented to capture dramatic views and the natural landscape context. A diverse range of landscape and building organization patterns is reflected in key outdoor places such as the Bowstring Green, Cascades Plaza, Amphitheater, Oval Green, South Slope, and West Woodlands. These open areas will gracefully link the campus and surrounding neighborhoods while repairing the site and maximizing connectivity.

An integrated multi-modal network of streets, paths, and trails will weave through the campus and extend to the surrounding city and regional circulation systems. Buildings will be designed with active uses on the ground floors along key mobility corridors. Active uses could include student organizations and clubs, lounges, food venues, maker spaces, and research displays. These mixed-use corridors will define a vibrant street or path edge, connect to the open space network, and create open and welcoming spaces for the campus community and the public.



▲ Figure 14: Campus Design Concept

## Campus Organization

The OSU-Cascades Long Range Development Plan physical framework is organized in response to the institutional vision, unique site conditions, sustainability goals, and operational requirements.

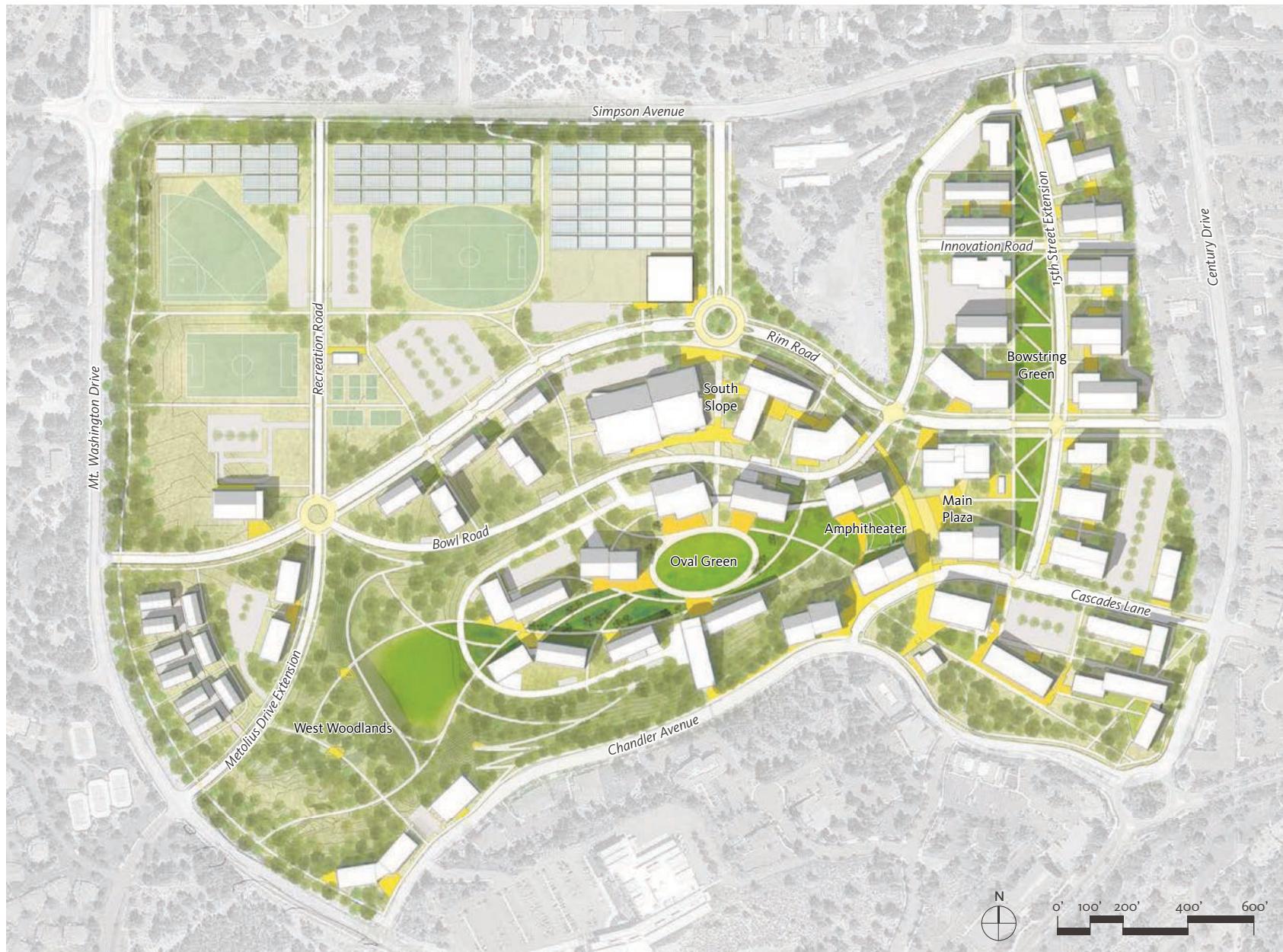
The Bowl, at the center of the future campus, will take its general form from the depression of the former pumice mine site, but the land will be shaped so that the bottom sits at a higher elevation and the edges slope down more gradually. Buildings organized concentrically around the center will contain the majority of new academic and campus life program with some residential and partnership buildings. Moving from street-level to the center of the Bowl will occur through cascading open spaces such as the Amphitheater and South Slope. Paths and roads will also spiral down, bringing people gradually to the lower elevation at the center of the Bowl.

An urban mixed-use Innovation District will be developed on the east side of the campus. It will be comprised of strategic industry and research partners, housing, and small-scale retail. The Innovation District will physically and programmatically link the Bowl, existing ten-acre site, and the Bend community at a key nexus of the future campus. Innovation District buildings will be organized along the Bowstring Green and intermixed with academic and campus life buildings at the south end, promoting opportunities for collaboration.

The west end of the campus will be a quieter and more natural setting than the active areas at the center. It will be comprised of a residential village, trails, natural areas, and a future Early Learning Center, which is envisioned as a partnership to provide child care and an elementary school. The West Woodlands area

will be ecologically rehabilitated to become a rich habitat for native species. It will include trails, viewing areas, and outdoor research opportunities for academic programs.

The northwestern area of the campus will be dedicated primarily to outdoor recreation, surface parking, and infrastructure. Fields, courts, and a field house may be shared between the community and campus. Solar arrays and the central utility plant are located along the northern edge of the campus.



▲ Figure 15: Illustrative Campus Plan

## Site Work and Shaping

As noted in *Chapter 2: Planning Context*, the existing 128-acre site has three major areas: the existing ten-acre site where OSU-Cascades campus development has occurred; the pumice mine which is dominated by a 100-ft deep excavation with steeply sloped walls; and the former Deschutes County demolition landfill, which requires select remediation prior to use for campus development.

The ten-acre site is buildable without significant site preparation, and the first three buildings of the OSU-Cascades campus have been located in this area. This site may see future infill over time, but it is not a priority for development in the short to medium term.

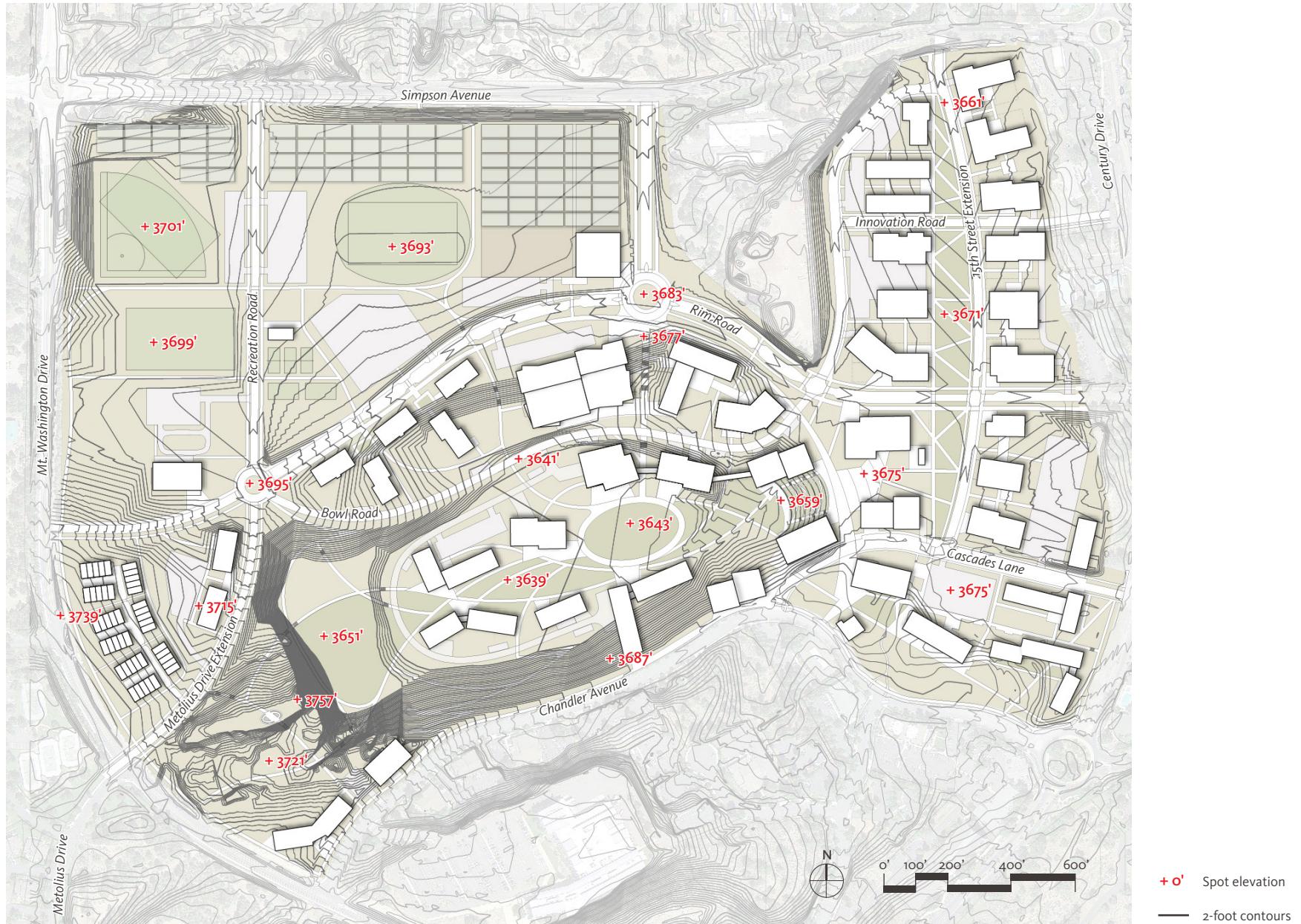
The pumice mine site is the primary location of core campus development and will become the Bowl and West Woodlands areas. Through regrading and reclamation of the surrounding area, the topography will be sculpted to achieve multiple objectives:

- Stabilize the slopes of the former pumice mine as required by the Oregon Department of Geology and Mining Industries.
- Create terraces to accommodate the necessary buildings, paths, and landscape treatments that provide ADA accessible conditions and are easily maintained.
- Shape the Bowl to define key areas for community gathering on an oval green of natural turf and encircled by buildings that will contain academic, campus life, and student housing.
- Accommodate the first phase of geo-exchange system installation, which will ultimately provide 100% of campus cooling and 30% of campus heating demands.
- Collect, filter, and recycle wastewater to be used for non-potable water needs using a water treatment landscape.

The resulting grading, as shown in Figure 16, is a site shaping strategy that will create a dynamic campus shaped around the Bowl at the heart of the site.



▲ Existing OSU-Cascades campus

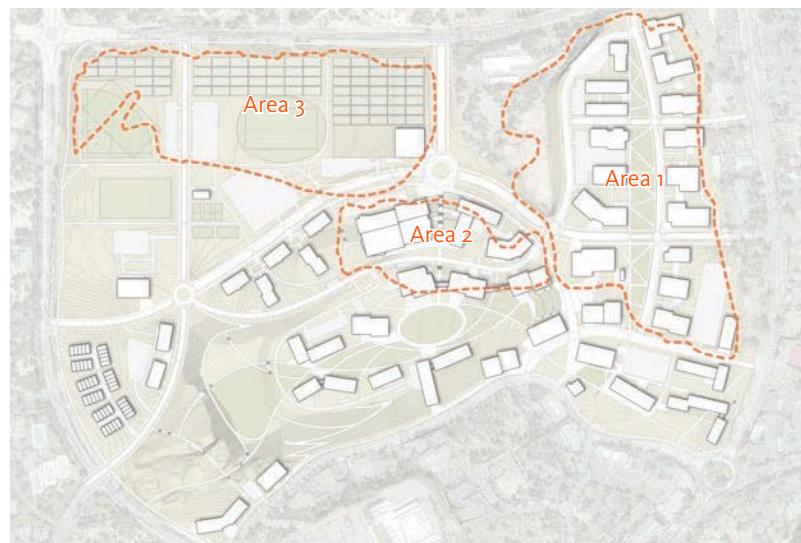


▲ Figure 16: Site Work and Shaping Concept

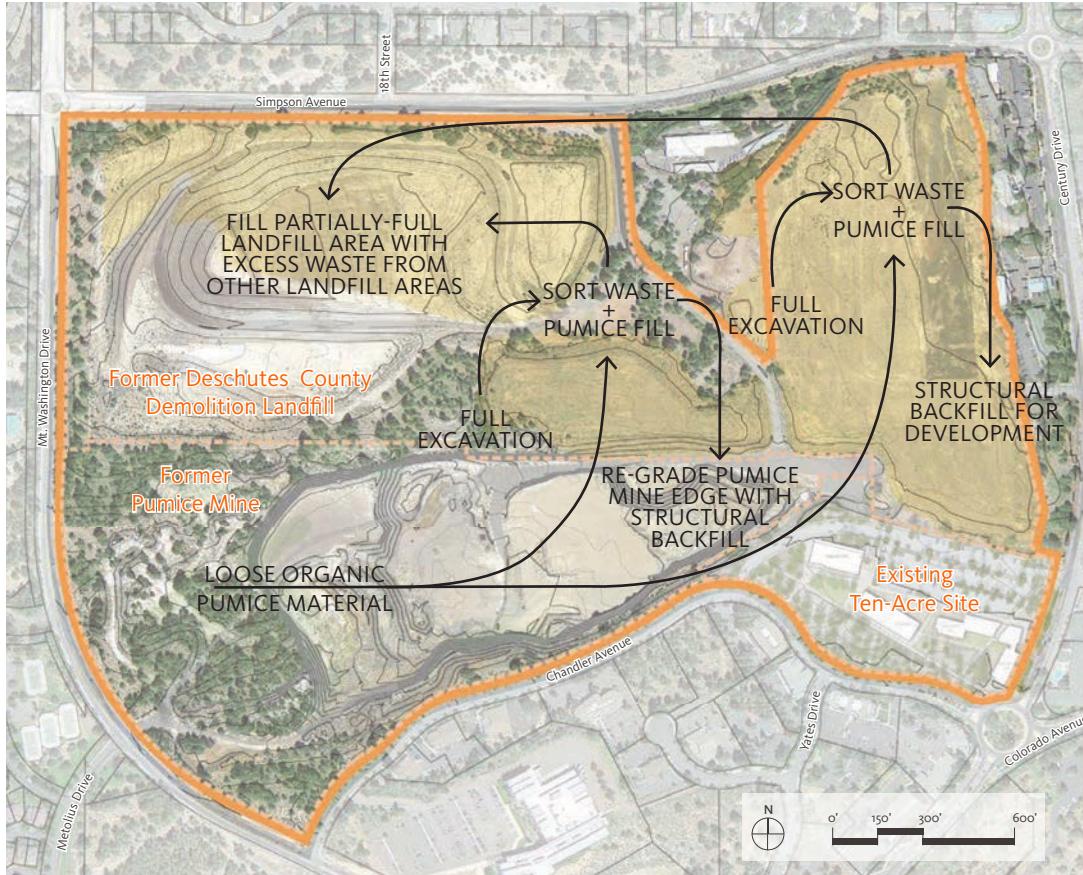
The landfill site area has been the subject of a detailed remediation plan developed in parallel to the LRDP. This plan will be implemented in multiple phases and calls for a multifaceted approach to individually address each of the landfill's sub-areas, which are shown in Figure 17:

- *Area 1*, the easternmost fill area, will be fully excavated, and materials will be sorted. Tires and other materials requiring disposal will be sent to an appropriate disposal site. Organic fill material, which comprises the majority of the fill, will be sifted, processed, and blended with on-site pumice to achieve a blend that can be used for structural backfill. The resulting excavated area will be backfilled with this blended material, creating a suitable site for the future Innovation District. This work will occur during the second phase of the campus development.
- *Area 2*, which is in the south central portion of the landfill and directly adjacent to the pumice mine area, will also be fully excavated. The materials will be sorted and blended in the same fashion as the *Area 1* organic fill material, described above. The excavated area will be re-graded in conjunction with the pumice mine reclamation, resulting in the Bowl at the center of the future campus. The scope of this work will occur during the first phase of campus development.
- *Area 3*, in the northwestern portion of the landfill, has remaining capacity and will retain its regulatory status as a landfill. As a part of the remediation, this area will receive material from the other fill areas as needed. Once remediated and graded, the area will have development limitations but will be appropriate for uses such as surface parking, recreation fields, and energy infrastructure such as photovoltaic arrays. The scope of this work will occur during multiple phases of the campus development.

The reclamation of the pumice mine and the remediation of the landfill are mutually beneficial projects. The pumice mine benefits from the introduction of fill material, reducing the extremes of elevation change that are present today, while the landfill areas benefit from the use of loose pumice from the mine to blend with fill material, creating backfill suitable for development. Utilization of on-site grading materials significantly reduces truck traffic on regional roadways. Procedures will be established to contain, mitigate, and control potential dust and odor from excavation activities. The community benefits are numerous from revitalization of brownfield sites for public use to reduced construction activity on public streets.



▲ Figure 17: Existing Landfill Areas Superimposed over Plan



▲ Figure 18: Conceptual Site Work Strategy



▲ Area 3 of Deschutes County demolition landfill site



▲ Former pumice mine, looking west

## Program Allocation

OSU-Cascades will develop a highly interdisciplinary and collaborative campus culture by creating facilities that serve a mix of program uses, both vertically and horizontally. This approach provides opportunities for students, faculty, staff, and the community to interact with each other and engage with the important innovations generated on campus.

While the academic facilities are in the centralized core of the campus, distributing uses throughout the campus encourages people to move around to access classrooms, food, housing, and recreation. This configuration will create rich opportunities to run into friends, colleagues, and classmates, building a sense of community and fostering collaboration.

The LRD<sup>P</sup> proposes that few, if any, buildings contain exclusively one type of program. Instead, the majority of buildings will have a mix of uses. Communal campus life spaces will be integrated into many buildings, particularly on the ground floor. This approach will identify spaces as belonging to the campus community, rather than any particular group or academic discipline. Active ground floor spaces promote a sense of safety and comfort as people move through the campus.

## Academic

Academic space includes classrooms, teaching labs, research areas, and offices. It is envisioned that academic space will be distributed throughout the campus but primarily located in the existing ten-acre site and Bowl areas. The estimated academic program projected to support a 5,000-student campus are distributed among eight academic buildings, with potential for an additional academic building located at the southwestern corner of the site.

Three primarily campus life buildings will also include a significant amount of academic space to complement the functions of those buildings. Those buildings include the existing Dining/Academic Building, the Assembly Hall, and the Student Success Center, described later under Campus Life.

Smaller academic spaces are anticipated to be included in housing buildings to support live-learn opportunities; in campus life buildings such as the Health & Wellness Center, where the kinesiology and other academic programs may find important synergies; and potentially in the central utility plant, to integrate campus infrastructure energy and sustainable programming with academic and research programs.



▲ Figure 19: Campus Primary Program Allocation

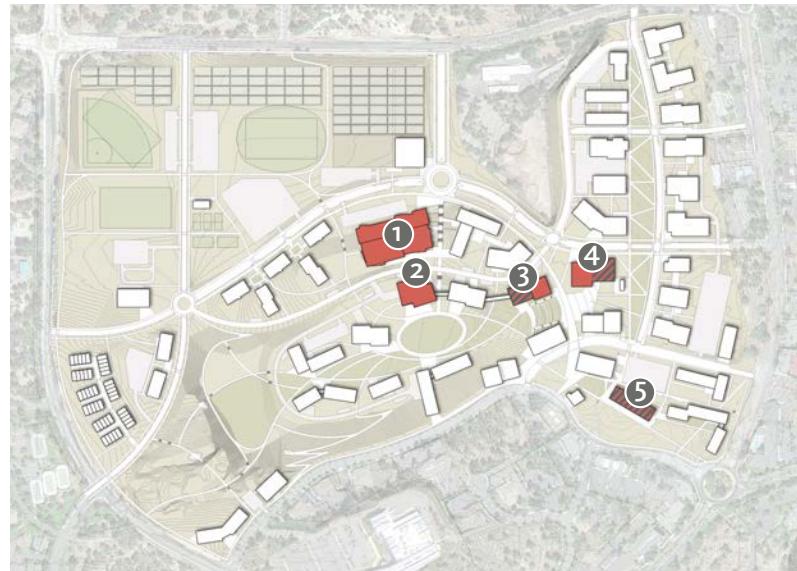
## Campus Life

Campus life spaces such as recreation, gathering, exhibition, and dining will be well-distributed throughout the OSU-Cascades campus to foster a sense of openness, connection, and welcome for students, faculty, staff, and community members. These communal spaces will not belong to any particular group, but are intended to be inviting and engaging to all.

Campus life space will occupy portions of many residential and academic buildings, particularly on the ground level along key pedestrian routes and important open spaces. The largest concentration of campus life space will be located in five buildings, as shown in Figure 20.

The buildings proposed to contain the most campus life are:

- ① *Health & Wellness Center*: This innovative approach to a recreation center will include fitness, wellness, and learning spaces at a dramatic location, overlooking the heart of campus and accessible to primary campus access roads and parking.
- ② *Dining Commons*: The proposed dining facility will provide a variety of dining options to students, faculty, staff, and the broader community. The Dining Commons will include supporting campus life programming and connect to a large plaza and the Oval Green. The design could potentially incorporate a roof deck overlooking the Bowl.
- ③ *Student Success Center*: The centrally-located Student Success Center will act as a hub for active campus life functions, providing meeting rooms, commuter lounges, and student organization offices. The student life amenities will be intermixed with academic uses like classrooms, offices, and learning support. Small grab-and-go food options may also be integrated at activity nodes.



▲ Figure 20: Primary Campus Life Buildings

- ④ *Assembly Hall*: This building will serve the campus, Innovation District, and community with larger, flexible spaces for meetings and conferences. Academic programs will use the Assembly Hall to accommodate large lecture courses.
- ⑤ *Dining/Academic Building*: This existing building combines a large multi-use dining hall, coffee shop, and open campus life space with classrooms and offices.

## Housing

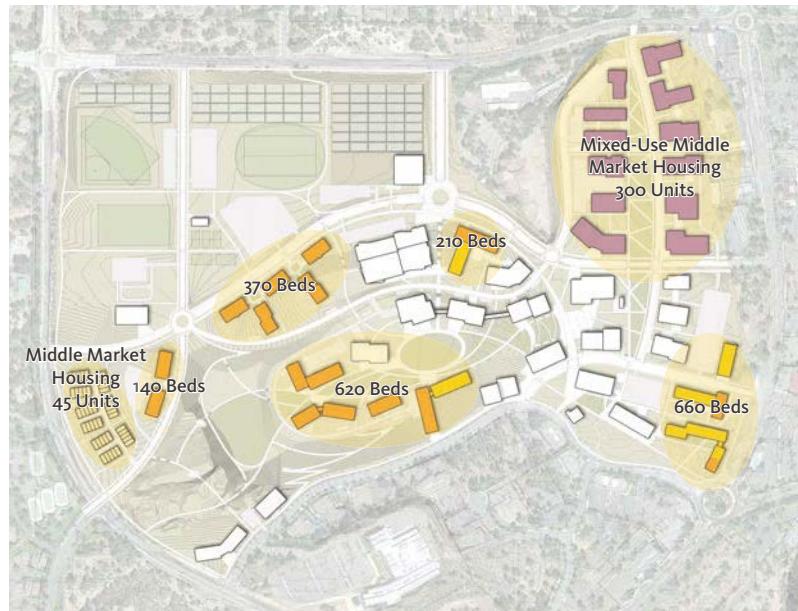
The LRDp assumes that the university will provide on-campus housing for 40 percent of students with additional middle-market housing available to others in the campus community. This housing percentage is significantly higher than many peer institutions but is integral to the university's strategy to strengthen the sense of community by providing affordable housing, which also mitigates impacts on the local housing market.

A variety of housing types are planned to appeal to a diverse population of students, including traditional first-year residence hall housing as well as apartment housing for more independent students. Residence hall style housing will primarily be located on the east side of campus near the existing Residence Hall to establish a community of lower-division students, who are more likely to be attracted to this housing type. Clustering lower-division students, particularly first year students, supports the university's goal of nurturing a holistic first-year experience.

Apartment housing will be distributed throughout the campus but will primarily be located toward the quieter west end. Apartments are intended to be of modest size with in-unit kitchens, similar to off-campus market units.

In addition to student housing, middle market housing options have been identified to fill a need for affordable housing in a local market experiencing increasing costs and diminishing availability. Forty-five townhome units are planned for the west side of campus, near Mt. Washington Drive. This quiet village will provide a transition area between the residential neighborhood to the west and the rest of the campus.

Middle market housing will also be integrated into the upper floors of mixed-use Innovation District buildings.



▲ Figure 21: Campus Housing

- Residence hall student housing
- Apartment style student housing
- Middle market housing
- Mixed-use partner and middle market housing

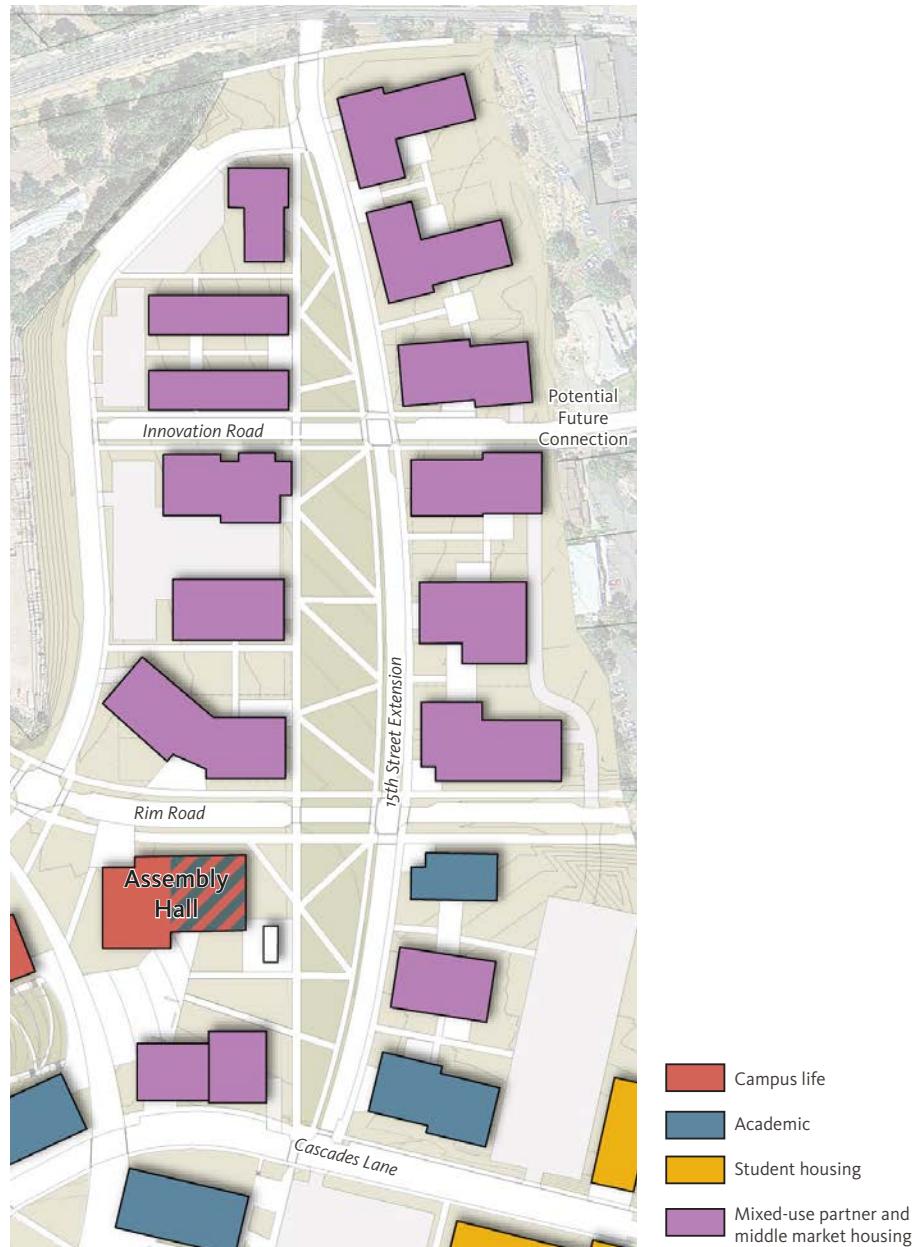
## Innovation District

The Innovation District will be located on the northeast side of the campus along the proposed SW 15th Street extension with connection to the Central Westside businesses. It is envisioned to be an urban mixed-use environment that is primarily comprised of industry and research partners that have strategic, symbiotic connections to the university.

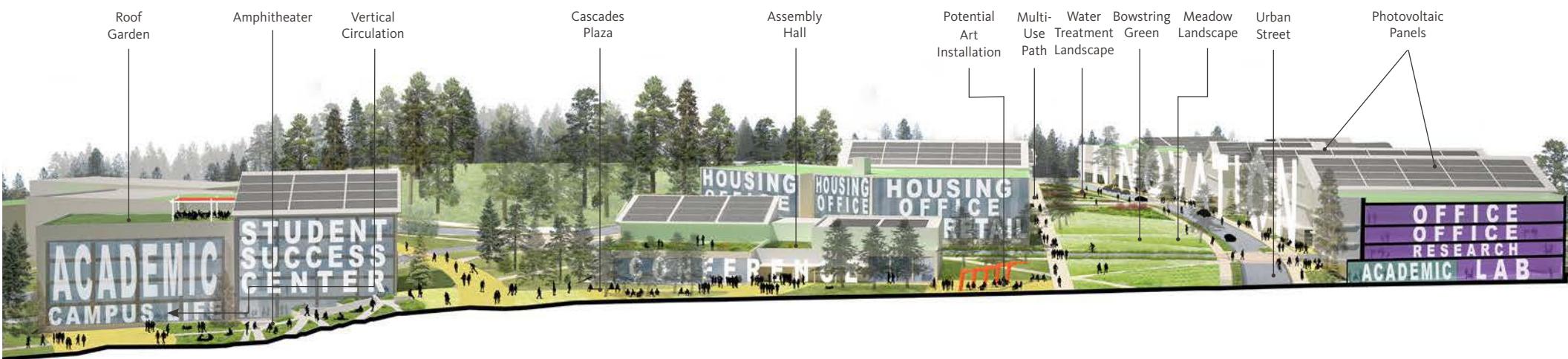
OSU-Cascades describes the Innovation District as “a figurative handshake between academic-led instruction and research and industry-led innovation. At the same time, this home to world-class research and study will blend seamlessly with neighboring communities.”

The boundary between the core campus and the Innovation District is blurred by intermixing academic and partnership buildings at the interface of the campus academic core and the Innovation District. This arrangement supports both the university and Innovation District partners by creating common ground and key adjacencies to allow for shared research, training, and resources.

Small-scale ground floor retail, academic research spaces, and middle market housing are expected to be integrated throughout this mixed-use district to create a vibrant urban environment.



▲ Figure 22: Innovation District



▲ Figure 23: Illustrative West-East Section

**PERMEABLE &  
CONNECTED**



The landscape will form the primary structure of the campus and connect to local open space systems like the Deschutes River parks and recreation areas. Campus open spaces will create an open, welcoming environment for both the campus community and the public.

**SUSTAINABLE &  
RESILIENT**



The OSU-Cascades campus will be designed to exemplify a resilient high desert landscape through water sensitivity, ecological rehabilitation, and habitat development. In addition, wellness opportunities such as exercise and reflection will be integrated throughout the campus landscape to support the university's commitment to personal health.

**INSPIRATIONAL &  
MEMORABLE**



OSU-Cascades and the larger community have expressed a strong interest in creating a campus landscape that feels uniquely "of Central Oregon" while also sustainable, functional, and attractive. Flexible spaces for reflection, inspiration, and play in the campus landscape will create opportunities for placemaking that cultivate a sense of ownership and investment in the campus.

**INTEGRATED &  
INNOVATIVE**

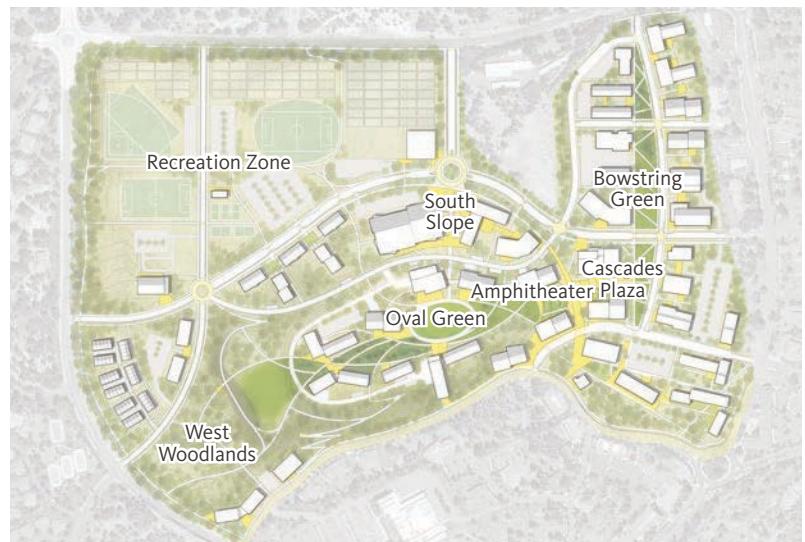


Academic and campus life spaces will seamlessly blend into the outdoors through active plazas, the Amphitheater, and outdoor learning spaces. These landscapes will provide informal opportunities for gathering and collaboration, cultivating a culture of openness and community. In addition, integrating interactive research and learning opportunities throughout the campus will transform the landscape into a living laboratory for students, faculty, staff, and visitors.

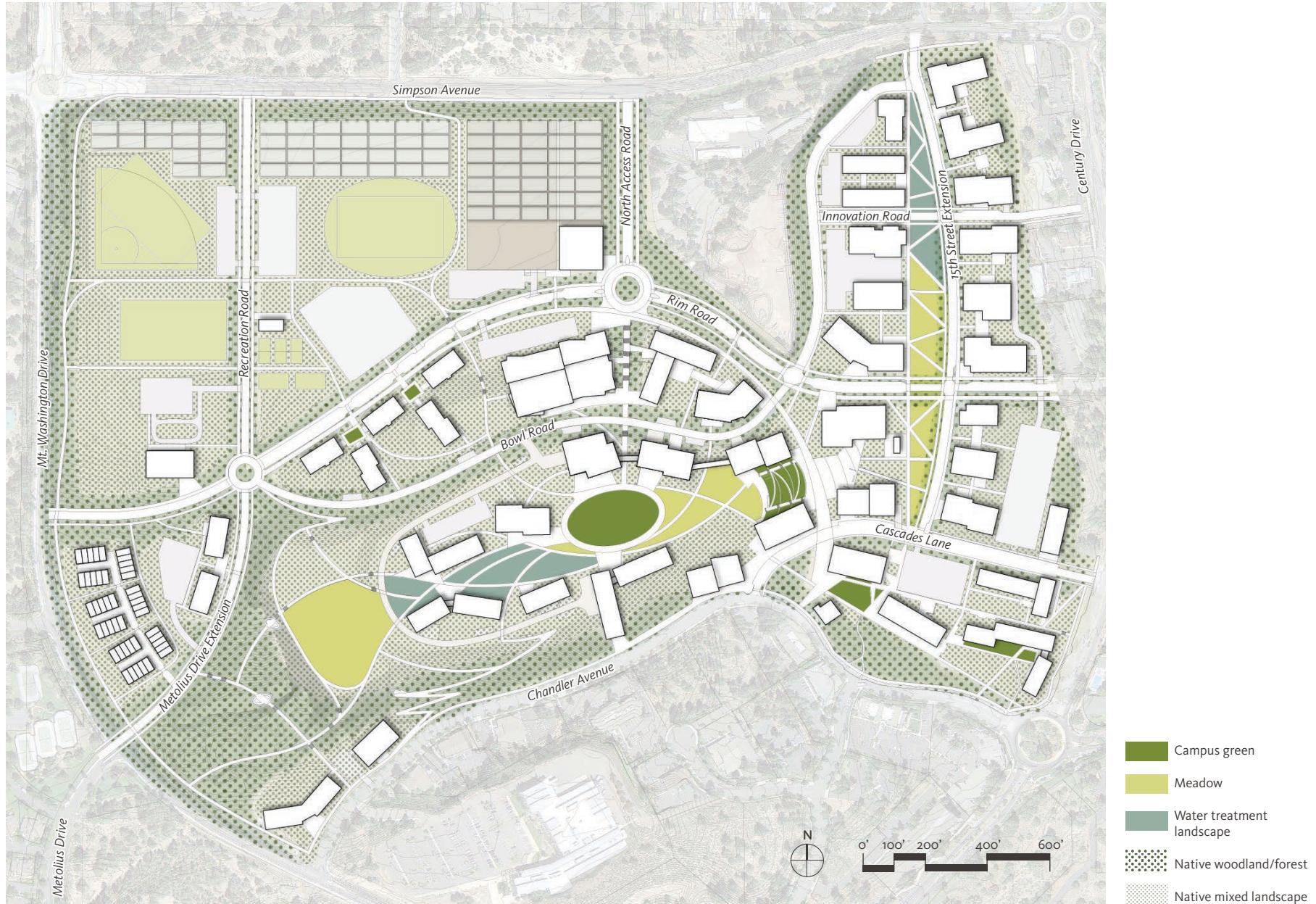
## 4.3 Open Space Network

The character and spirit of the OSU-Cascades campus will be felt most acutely in the outdoor spaces. The open space network will collectively become the heart of the campus as well as a connection to the larger community.

The campus will be structured around performative landscape systems that will function as integral campus infrastructure. A network of open spaces will support wellness, recreation, and a pedestrian-oriented mobility system. The campus landscape will also manage water from rainfall as well as recycled water to be re-used for non-potable campus uses. In addition, the landscape will be a key aspect of the ecological rehabilitation of the site that will re-connect the site to the larger ecological system, creating habitat opportunities on-site and supporting regional wildlife corridors.



▲ Figure 24: Campus Open Space Network



▲ Figure 25: Campus Landscape Types

## Landscape Types

### Campus Greens

The OSU-Cascades campus is located in the high desert of Central Oregon. Due to the irrigation and maintenance requirements of turf grass in this climate, green lawns will be provided sparingly, in favor of a more native campus landscape treatment.

Specific campus locations warrant the use of campus greens due to their multi-purpose and high-traffic nature. Spaces such as the Oval Green and the Amphitheater are expected to be venues for major campus events such as graduation, orientation, performances, and others. In addition, they will provide large areas for informal recreation, outdoor classes, gathering, and relaxation. These greens will be designed to be durable to withstand the variety and intensity of uses.

Smaller green lawns may also be integrated into clusters of student housing to provide students more intimate courtyards.



▲ *McHenry Library at University of California, Santa Cruz*



▲ *Belo Center for New Media at University of Texas at Austin*

## Meadow

As a heavily disturbed site, the OSU-Cascades campus will require significant ecological rehabilitation to once again function effectively as a part of the local ecological system. Restoring native plant meadows throughout the campus will provide key habitat opportunities for local species and improve site hydrology through integrated stormwater collection, filtering, and recharge.

The primary campus meadows will be located in the Bowl, within the Innovation District's Bowstring Green, and as a transition area between the active areas of campus and the more wooded west end of the site.



▲ Central Oregon Meadow

## Native Woodlands

The campus landscape plan incorporates protection and expansion of native woodlands. These areas will provide high-value habitat to many species and create opportunities for on-site learning for students studying native ecological systems. Denser forested areas will establish natural buffers along the major roads surrounding the campus to promote a peaceful and natural-feeling campus environment as well as mitigating the impact of campus activity on the nearby neighborhoods.



▲ Central Oregon Woodland

## Water Treatment Landscape

OSU-Cascades has set a goal to achieve a net zero water balance, which will likely include on-site wastewater recycling. Water treatment wetlands will be integrated into the campus landscape to filter wastewater that can then be re-used for non-potable water requirements like irrigation, toilet flushing, and other uses.

The water treatment gardens will make this innovative system visible to the campus community and visitors, supporting the campus's vision to become an interactive living laboratory. The landscapes themselves will include attractive and context-appropriate plantings for people to enjoy and learn about the water recycling process.

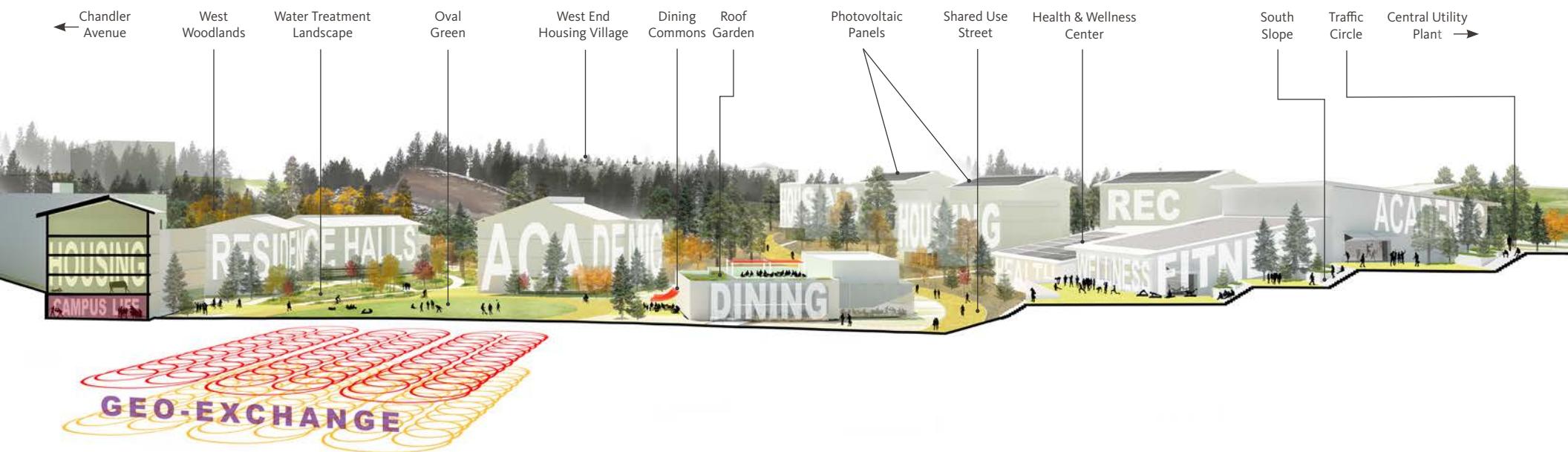
More description of the campus water management strategy is included in the infrastructure section of this chapter.



▲ *Omega Institute for Sustainable Living*



▲ *Brooklyn Botanical Gardens (Weiss Manfredi)*



▲ Figure 26: Illustrative South-North Section

## Open Space Uses

### Wellness and Recreation Resources

Health and wellness are critical to the vision for the future OSU-Cascades campus. Opportunities for recreation, fitness, and reflection are integrated throughout the campus landscape, in addition to the amenities provided within the buildings, as described previously in this chapter.

Recreation fields and courts will be clustered toward the northwest quadrant of the campus. To use space efficiently, these fields will primarily be multi-purpose for intramural athletics, club sports, and informal recreation. If OSU-Cascades chooses to participate in intercollegiate athletics in the future, these fields and courts may be sufficient to support a limited athletics program.

Bicycling, hiking, running, and other informal recreation opportunities will be possible throughout the campus using the many paths and trails as well as the lawn areas. Paths will meander through the west end of campus and will exhibit a range of difficulty due to the varied terrain.

Small platforms and overlooks will be dispersed along the paths to provide areas of respite in the West Woodlands. A key goal for the campus landscape is to balance active outdoor spaces with opportunities for quiet reflection, promoting both physical and mental wellness throughout the campus.

### Social and Cultural Resources

The Amphitheater, Oval Green, Cascades Plaza, South Slope, and Bowstring Green will host the primary social and cultural resources. These spaces will be the main gathering spaces for the

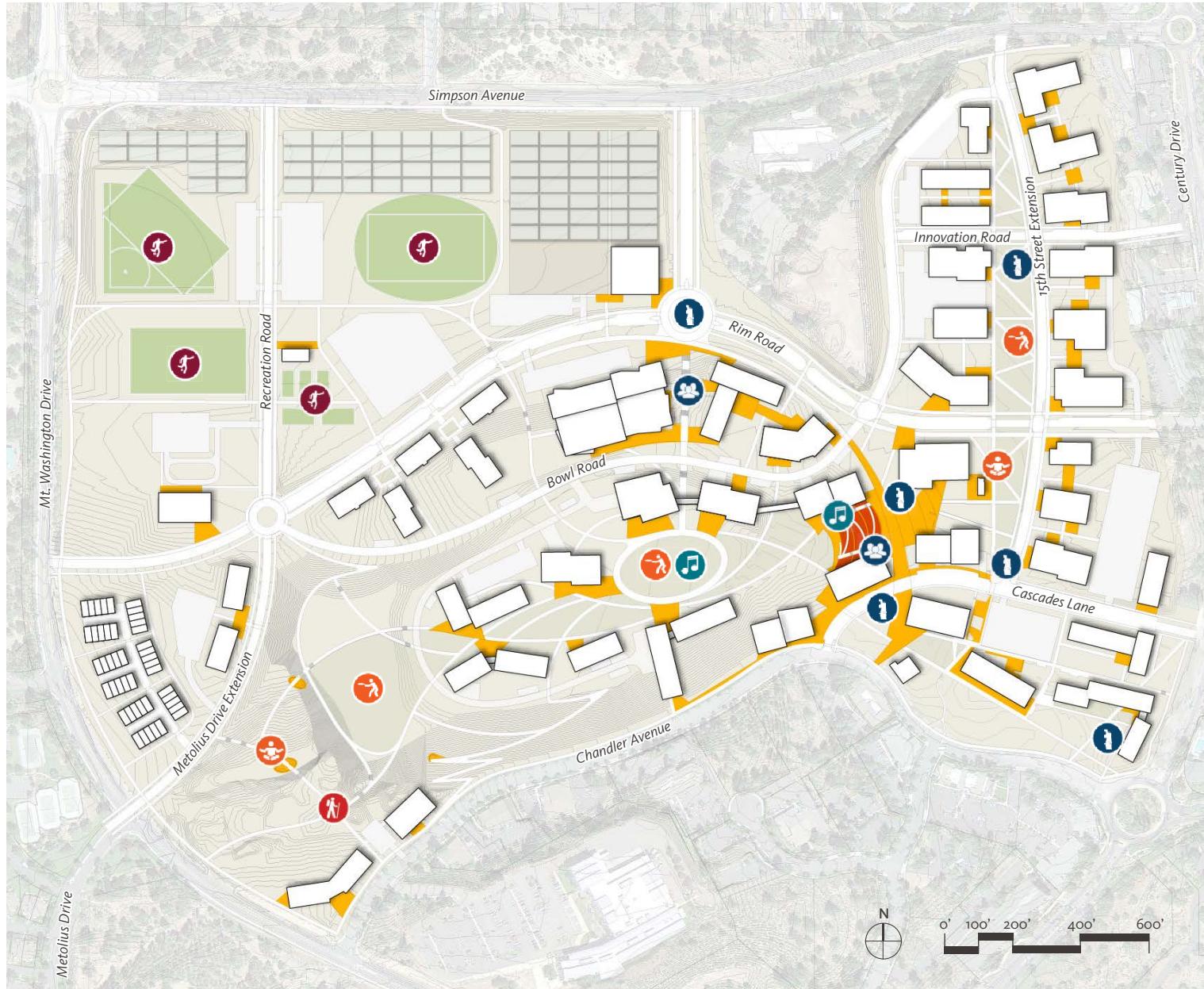
campus and are envisioned to have the visibility and generous space to accommodate outdoor art installations, performances, and events. As resources for both the campus and larger community, this public open space network will make up the social and cultural heart of the campus.

### Living Laboratory

The campus landscape is organized to provide the campus community and visitors varied opportunities to learn about the natural environment of Central Oregon, research happening at the university, and the sustainable infrastructure implemented to support a resilient campus. This living laboratory will consist of both formal and informal spaces integrated throughout the campus.

Formal spaces such as the Amphitheater, Oval Green, Cascades Plaza, and South Slope can be used for outdoor lectures either for university classes or larger community events. The platforms and overlooks nestled into the woodlands will provide more intimate opportunities for classes or other groups to gather together, observe, and discuss lessons and research.

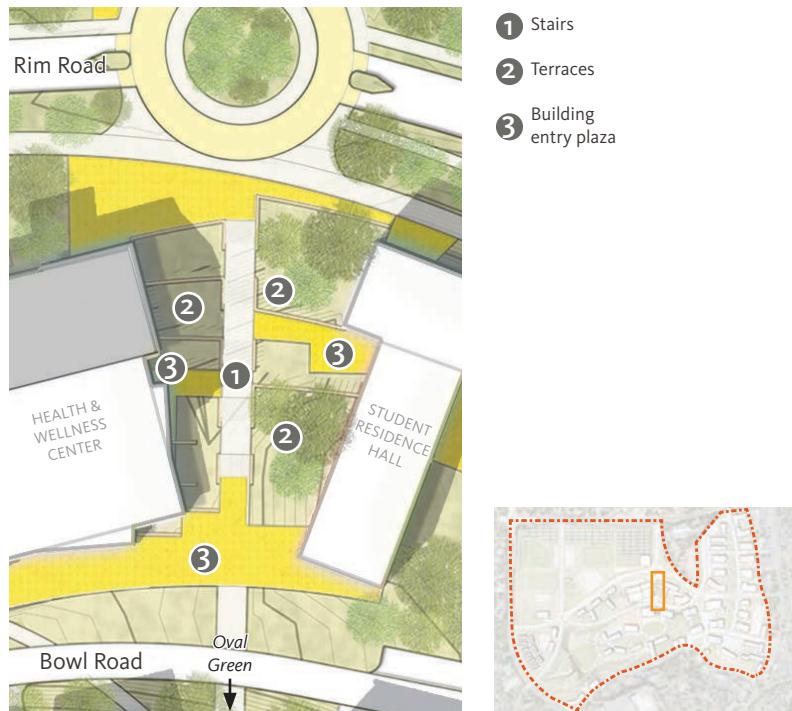
Informal outdoor spaces and natural landscapes on campus will promote learning outside the classroom. Opportunities for research, study group gathering areas, and interpretive signage will be integrated throughout the campus. The landscape should remain flexible enough to accommodate a variety of learning and research opportunities. There will be robust potential for informal outdoor learning about the site transformation, ecological rehabilitation, habitat development, sustainable infrastructure, or outdoor exhibits for student work such as research or art.



▲ Figure 27: Open Space Uses

## South Slope

Similar to the Amphitheater, the South Slope will serve as both a circulation space and a key campus open space. The slope extends between the Rim Road and the Bowl, providing sunny, south-facing terraced plazas on either side of the stair. The terraces will provide campus gathering areas and offer outdoor spaces for the Health & Wellness Center programs, such as fitness or yoga classes on days with nice weather. Accessible routes will be provided through use of interior elevators in the Health & Wellness Center and ramps integrated with the landscape.



▲ Figure 28: South Slope



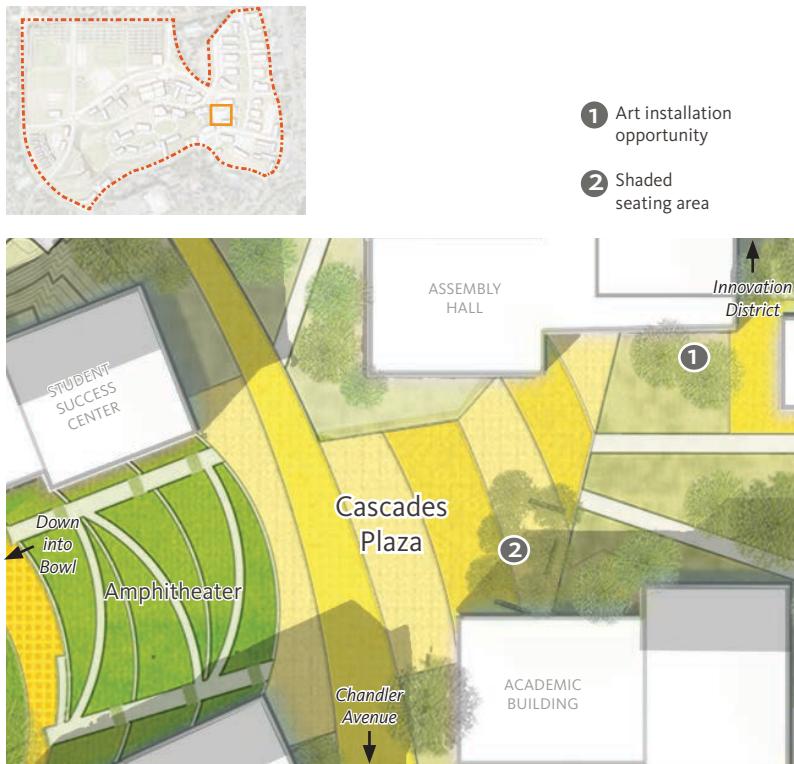
▲ Barangaroo Reserve (PWP Landscape Architecture)



▲ Catlin Gabel Elementary School

## Cascades Plaza

Cascades Plaza will be a key interconnecting “campus heart” between the existing ten-acre site, the Bowl, and the Innovation District. It will afford dramatic views over the Bowl and across to the cliffs on the west end of campus. This plaza will be a large, active open space used for daily circulation and gathering as well as events, such as those from the surrounding buildings like the Assembly Hall or Student Success Center.



▲ Figure 29: Cascades Plaza



▲ Campus Park at Umeå University (Thorbjörn Andersson and Sweco Architects)

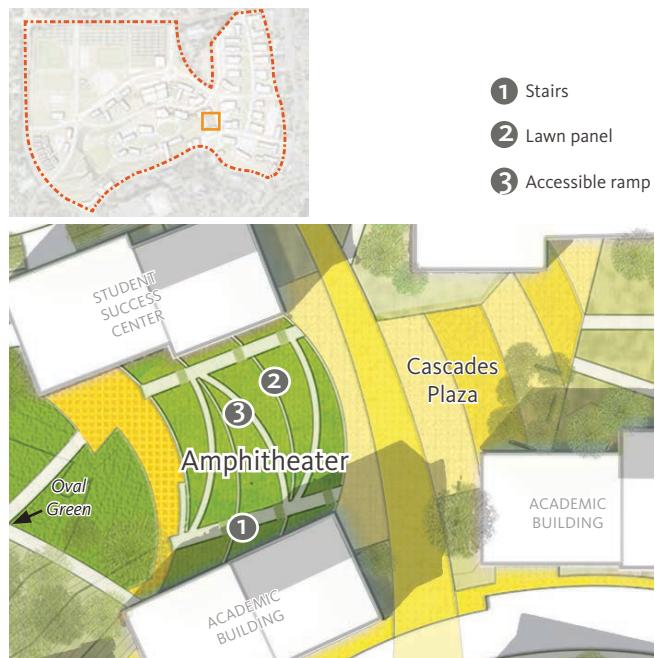


▲ Apple Store Plaza, San Francisco

## Amphitheater

The Amphitheater will be both an active campus open space and a functional space to ease the transition between the top and bottom of the Bowl. It will be designed for universal access with stairs and accessible ramps that wind down the Amphitheater. The Student Success Center building to the north will also provide vertical circulation through the building with interior elevators and stairs for connectivity between elevation levels.

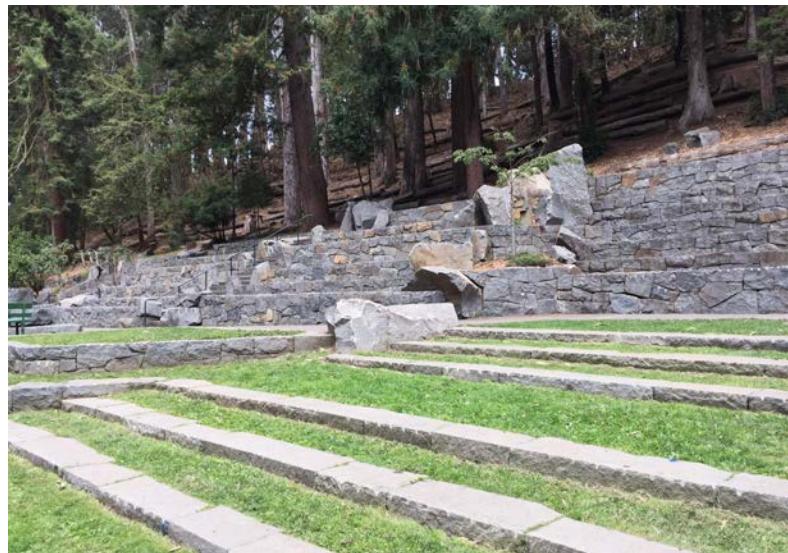
Lawn panels extend up the Amphitheater to create a large seating area appropriate for ceremonies or performances. When not used for formal events, the Amphitheater levels will be available for campus community members to relax, study, and gather while looking out across the sweeping views of campus.



▲ Figure 30: Amphitheater



▲ Sloped lawn at Boston College (Stephen Stimson Associates)



▲ Stern Grove Amphitheater

## Oval Green

The Oval Green will be the main lawn area at the center of the campus. Located at the base of the Bowl, the green will be visible from much of the core campus area. Due to irrigation demand, green lawns will be integrated sparingly into the primarily native campus landscape. To maximize the utility of this green, it will be designed to be multi-functional, durable, and flexible.

As a flat lawn that's just under an acre, the Oval Green will be able to accommodate events such as graduation, career fairs, and performances. It will also accommodate informal recreation for the campus community and public. Picnics, study groups, and exercise are all possible uses for the Oval Green.

Two academic buildings, a residential building, and the Dining Commons will be arranged around the Oval Green through large connecting entry plazas. The activity from these buildings will be able spill out onto the green and energize the space throughout the day and week.

The Oval Green will also contain critical campus energy infrastructure. Two levels of geo-exchange coils are proposed to be installed beneath the lawn when early site grading occurs. These coils will connect to the central utility plant and campus buildings to modulate indoor temperatures, keeping thermal energy use low.



▲ University of Texas at El Paso Campus Transformation Project (Ten Eyck)

- ① South Slope
- ② Building entry plaza



▲ Figure 31: Oval Green

## Bowstring Green

The Bowstring Green will be the key open space spine for the Innovation District. It will run north to south on the eastern end of the campus along the SW 15<sup>th</sup> Street extension. This green will include a native meadow landscape as well as water treatment gardens, which will treat wastewater from the Innovation District buildings for non-potable reuse, dramatically reducing potable water demand.

The Innovation District buildings will front the Bowstring Green along the SW 15<sup>th</sup> Street Extension and the main north-south multi-use path. Building faces will create an urban edge with active uses along both sides of the green. The Bowstring Green will accommodate public art as well as learning and research opportunities. Paths and designed spaces for activity will connect the Innovation District and bring people into the landscape, showcasing not only the natural beauty, but also ecological rehabilitation, habitat creation, and sustainable water management.



▲ Regeneron (W Architecture)



▲ Figure 32: Bowstring Green

## West Woodlands

As the OSU-Cascades campus transitions from east to west, the landscape will gradually transform from that of an active campus to a more informal, natural environment. Paths will wind up the varied topography and rock formations with small look-outs nestled within the native woodlands. The paths will vary in grade, treatment, and use. Some paths will be designed to meet accessibility requirements and form switchbacks up the rock edges while some trails will be more recreational in nature for hiking and mountain biking.

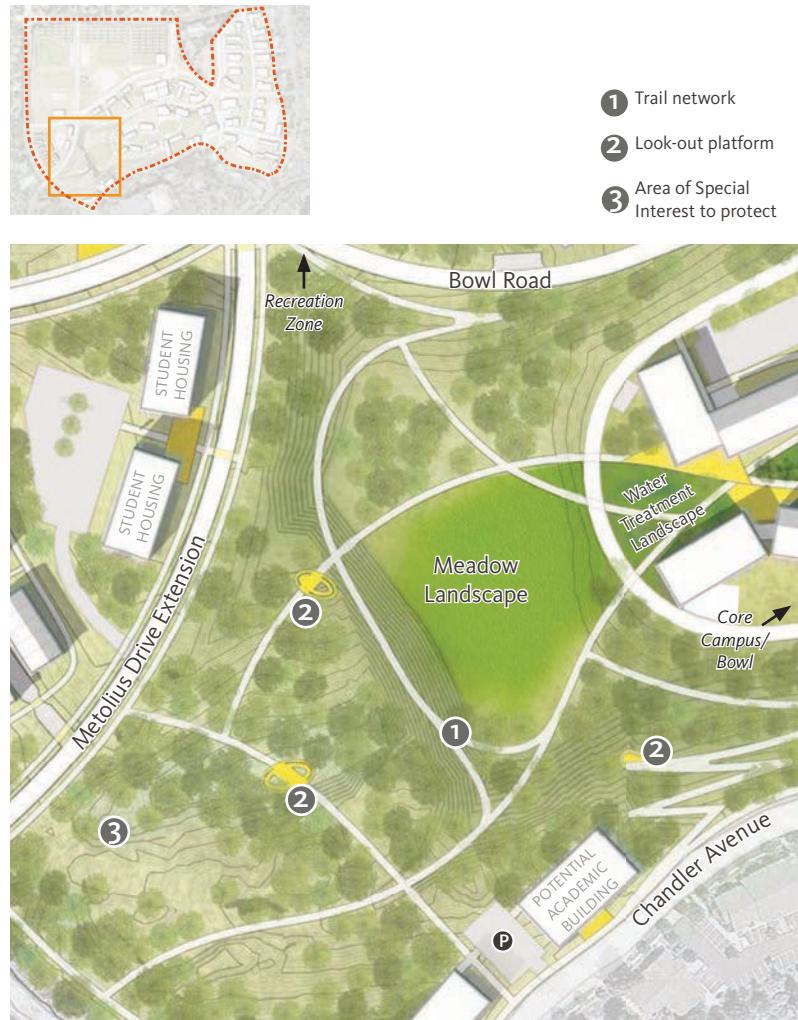
The west end of campus will see the greatest future habitat potential. This natural area not only creates a serene respite from the activities of the city and campus, but it also provides opportunities for learning, research, and recreation. The dense forest edge will establish a soft transitional buffer from the activities of the campus to the surrounding residential neighborhoods.



▲ Example multi-use trail



▲ Return to native landscape conditions



▲ Figure 33: West Woodlands

## Recreation Area

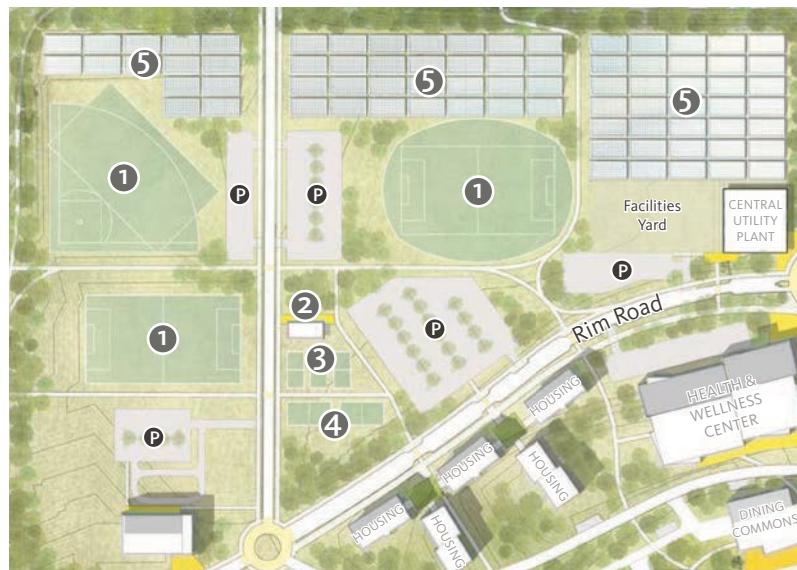
Recreation fields and courts will be clustered together with photovoltaic solar arrays and surface parking areas in the northwest quadrant of the campus. Development is limited for this area due to the structural limitations and cost implications for building on this former landfill area.

Tennis and volleyball courts will be located near a small field house that will include restrooms, storage, and potentially concessions. With land efficiency in mind, the softball and baseball fields are co-located and combined with an overlapping multi-purpose field. Three additional multi-purpose fields, which support a wide variety of activities, will allow OSU-Cascades the flexibility to determine which types of recreation and athletics are most appropriate for the campus community over time.



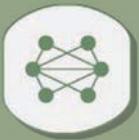
▲ Multi-purpose field (UW Bothell)

- ① Multi-purpose fields (synthetic turf)
- ② Field house
- ③ Tennis courts
- ④ Volleyball courts
- ⑤ Photovoltaic arrays



▲ Figure 34: Recreation Area

**PERMEABLE &  
CONNECTED**



The OSU-Cascades future campus will transform the large, currently impenetrable site into smaller blocks. This new street network will integrate with the city fabric using multiple access points and welcoming gateways. A multi-modal transportation network will connect the campus to key destinations for the university and community.

**SUSTAINABLE &  
RESILIENT**



Active transportation, such as walking and bicycling, are beneficial for personal wellness as well as mitigating environmental and traffic impacts. Robust transportation demand management strategies will discourage driving and parking by encouraging less impactful modes like bicycling, walking, and transit.

**INSPIRATIONAL &  
MEMORABLE**



OSU-Cascades will provide leadership in responsible mobility strategies with opportunities to demonstrate achievable best practices. As the campus grows and alternative transportation becomes more ingrained in the university culture, these practices will become part of the university identity and brand, attracting students, faculty, and staff that share these core values.

**INTEGRATED &  
INNOVATIVE**



Multi-modal streets and paths will be organized to encourage interaction and serendipitous meetings, opening up opportunities to collaborate and innovate. The future campus will provide accessible paths through the landscape as well as inside buildings, creating opportunities to witness the activities and innovation occurring.

## 4.4 Mobility

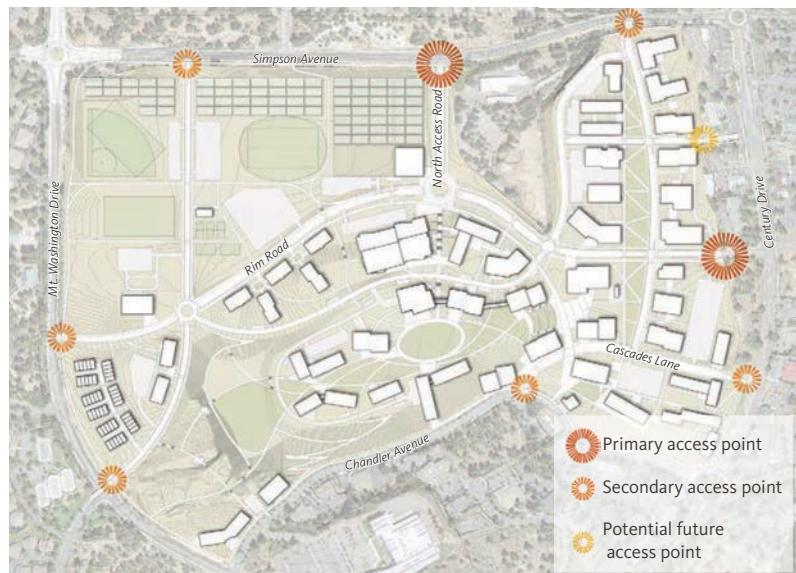
### Streets

The future street network for the OSU-Cascades campus will transform what has been a large and inaccessible area into a permeable and welcoming part of Bend.

### Campus Access

The campus will be accessed along multiple points from the four primary bordering streets of SW Century Drive, SW Simpson Avenue, Mt. Washington Drive, and SW Chandler Avenue. Primary vehicular campus entrances are planned from SW Simpson Avenue and SW Century Drive for ease of access to parking facilities and potential transit service. Dedicated and shared access points for pedestrians and bicycles will be provided from the primary bordering streets.

Secondary vehicular campus access will occur on Mt. Washington Drive and SW Chandler Avenue for local access for deliveries, housing residents, emergency services, and recreation users. The SW 15<sup>th</sup> Street Extension vehicular access will primarily serve the Innovation District.



<sup>^</sup> Figure 35: Campus Access Points

### Campus Street Designations

#### Primary Campus Streets

While there are no arterial or collector streets planned for the future campus, there will be two primary streets that will accommodate most of the campus traffic. The Rim Road is the primary east-west connection between SW Century Drive and Mt. Washington Drive. The proposed connection to SW Century Drive is at Taylor Court. There are two proposed traffic circles along the Rim Road to manage traffic flow at intersections. Raised crossings will be installed at key intersections to control traffic speeds and draw attention to pedestrian/bicycle corridors. The North Access Road is the other primary campus street and provides the main campus entrance from SW Simpson Avenue to the north.

Primary campus streets will include multi-modal facilities, including bicycle and pedestrian infrastructure and

accommodation for potential future transit routes and additional transit stops. Future discussions with the local transit authority will confirm the feasibility of system connectivity. Future transit stops are proposed to be located along the Rim Road that serve high volume program areas, including north of the Assembly Hall, adjacent to the Health & Wellness Center, and in proximity to housing, recreation, and parking to the west.

#### Secondary Campus Streets

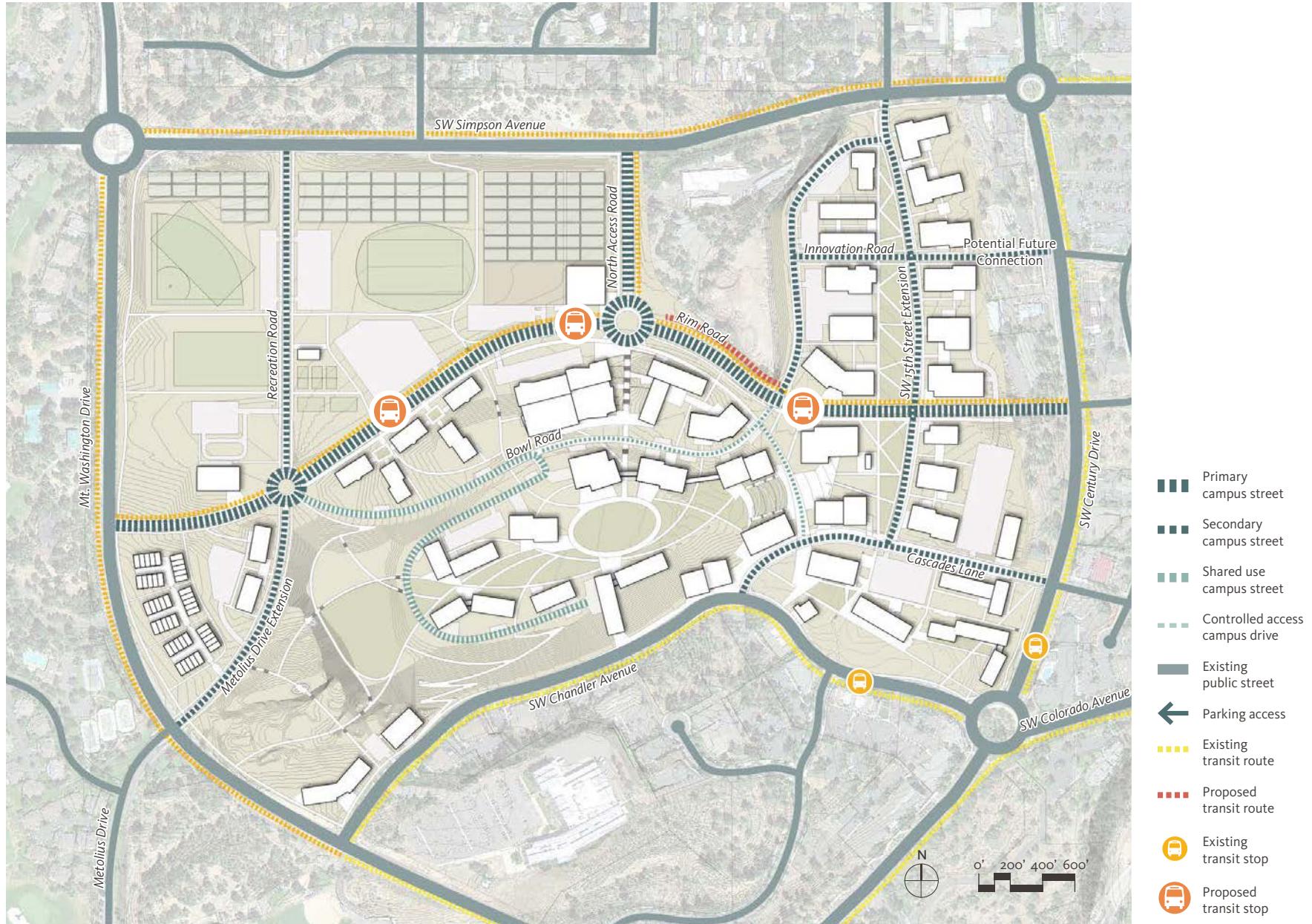
Most of the campus streets, including the Metolius Drive extension, the SW 15<sup>th</sup> Street extension, Recreation Road, Cascades Lane, and Innovation Road, are envisioned to function as secondary campus streets that distribute traffic to specific parts of the campus such as driveways and parking. Therefore, they will be designed to accommodate lower traffic volumes and include bicycle and pedestrian infrastructure to create well-rounded multi-modal streets.

#### Shared Use Campus Street

The Bowl Road is a shared use street that loops to the Rim Road at the east and west ends and descends down into the lowest level of campus. This street is intended to accommodate primarily pedestrian and bicycle traffic with limited vehicular access. Vehicle traffic will be regulated to only allow permitted vehicles, emergency services, and maintenance and delivery traffic.

#### Controlled Access Campus Drive

The east portion of the Bowl Road will have traffic control devices to limit vehicle traffic to permitted vehicles only (ADA, emergency vehicles, maintenance and delivery) and preserve a pedestrian quality to the street. Active building faces and path-like paving along the Bowl Road will reinforce the comfortable pedestrian quality of this street.



▲ Figure 36: Street Network

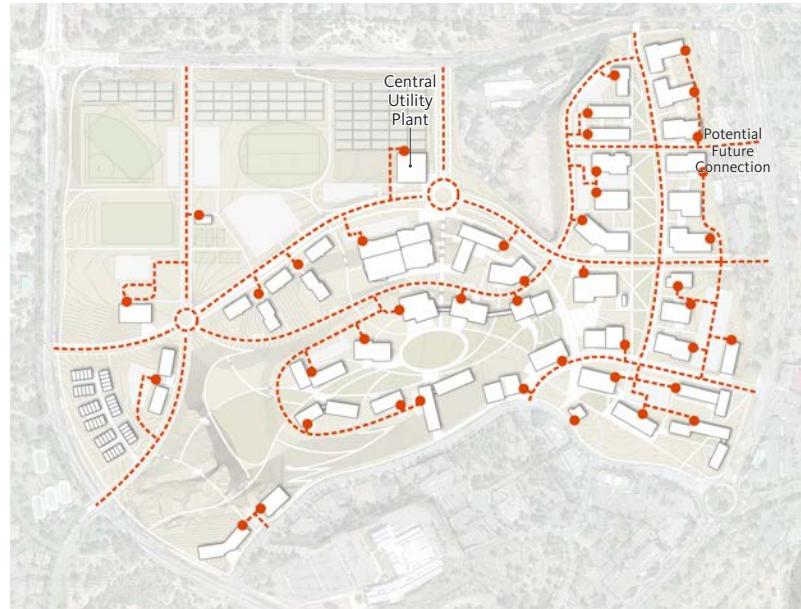
## Loading and Service

Providing adequate access for loading and service is critical to establish a functioning campus. The dramatic topography of the site and emphasis on the pedestrian experience requires efficient service access that is safe and functional.

Wherever possible, loading and service zones will occur in parking lots adjacent to the buildings being served. This is achievable for the majority of the buildings on campus, including the existing ten-acre site area, most of the Innovation District, the Early Learning Center, the Health & Wellness Center, and the housing on the west end of campus. The buildings along the Rim Road will typically be served with loading zones designated along the street.

Buildings on the north side of the Bowl will have loading and service from the controlled access portion of the Bowl Road and buildings on the west and south sides of the Bowl will be serviced from the limited access shared-use street.

The central utility plant will require the most service and loading access. A designated loading area in the facilities yard off of the Rim Road has been identified.

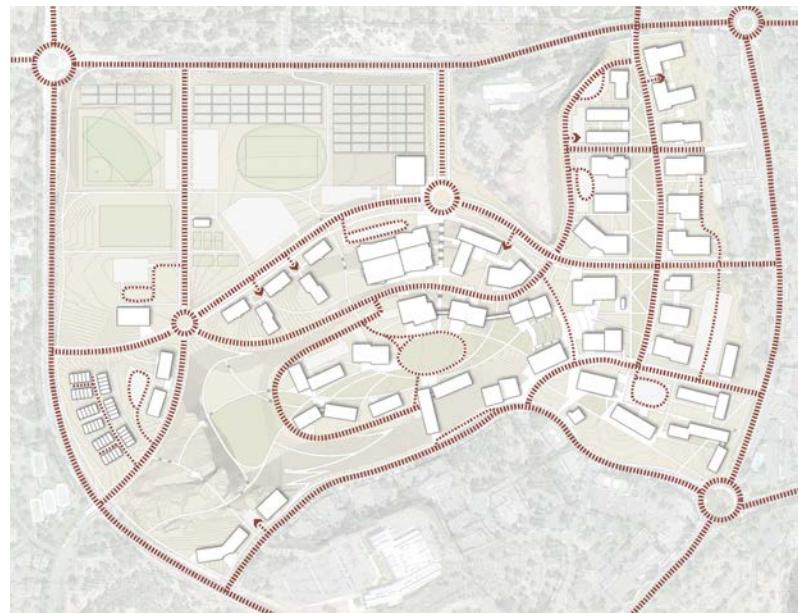


▲ Figure 37: Loading and Service

- Loading and service access
- Loading area

## Emergency Access

Emergency vehicles need the ability to access all campus buildings, so the streets and drives will be designed to accommodate these types of vehicles. Where emergency vehicles require access over plazas or paths, the paving surface and surrounding ground area will be structurally reinforced to support heavy trucks. Providing pull-offs, turnarounds, and alternate routes will allow for increased safety to ensure emergency vehicles can access campus areas efficiently.



▲ Figure 38: Emergency Access

- Street or access drive
- Additional emergency vehicle access

## Parking

OSU-Cascades is committed to promoting an integrated multi-modal transportation network that reduces dependency on driving and parking on campus. Developing robust pedestrian and bicycle infrastructure along with providing free transit passes and incentives to carpool are some of the transportation demand management measures that will allow for a 20% reduction in the amount of parking required by city code. This projected parking demand reflects the minimum amount of parking developed on campus, but additional capacity could be made available.

An important benefit to strategic transportation demand management is the ability to track and respond to changing parking needs. Ride-sharing services and the potential for autonomous vehicles are emerging trends that may shift the pressure to provide parking.

Reducing reliance on driving alone to campus not only improves environmental quality, personal health, and traffic congestion, but it also decreases the amount of valuable land the campus needs to dedicate to parking. Instead of surface parking lots, this space can be used for buildings, campus open space, or ecological restoration.

The campus is envisioned to be a pedestrian-and-bike-friendly environment that is safe and comfortable for all. The majority of parking will be located on the perimeter of the campus, while also providing convenient access to the key campus open spaces and pedestrian routes to the heart of campus. This strategy prioritizes active pedestrian corridors by minimizing vehicular conflicts. Due to the centralized organization of the campus, parking locations are no more than a five to ten minute walk to reach most areas of campus. Managing parking with short and long term permits is a possible consideration to better control where people are able to drive and park on campus.

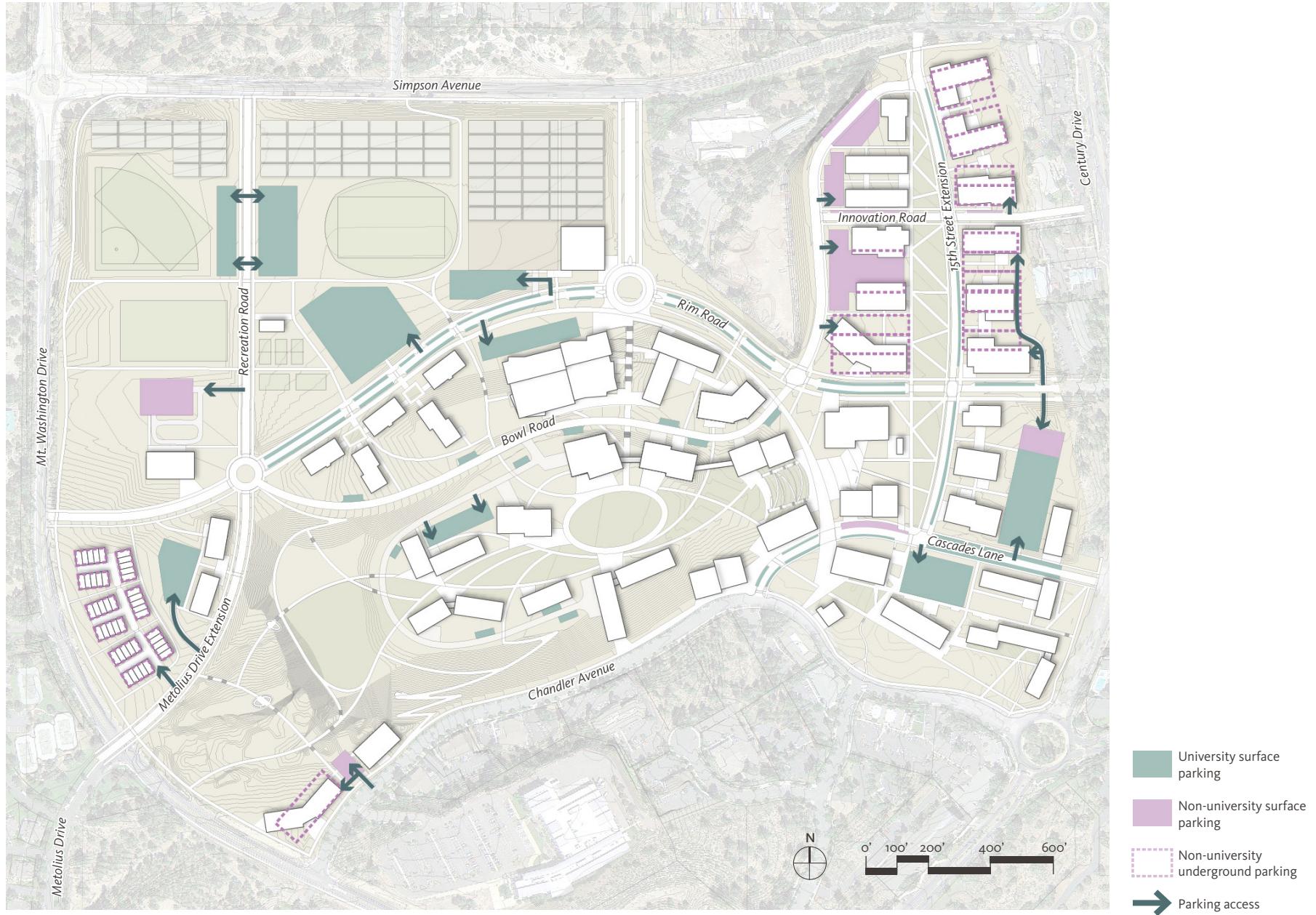
Parking for university uses is assumed to be surface parking, including some on-street parking in both parallel and perpendicular configurations. It will be concentrated toward the eastern and northwestern edges of campus to maintain a pedestrian-friendly environment in the interior campus core. A limited amount of short-term, loading, special permit, and required accessible parking will be located in the Bowl and along the Bowl Road.

Non-university parking is designated for partnership buildings such as the Early Learning Center or Innovation District buildings. Each of these buildings will require parking as projects develop. The Innovation District is envisioned as an active urban environment with ground floor amenities serving the pedestrian corridors with parking planned to be located behind or beneath the buildings.

▼ *Table 7: Parking Provided on Campus*

UNIVERSITY PARKING	NON-UNIVERSITY PARKING
Surface Parking	750
Underground Parking	--
On-Street Parking	150

*Note: Quantities may change.*



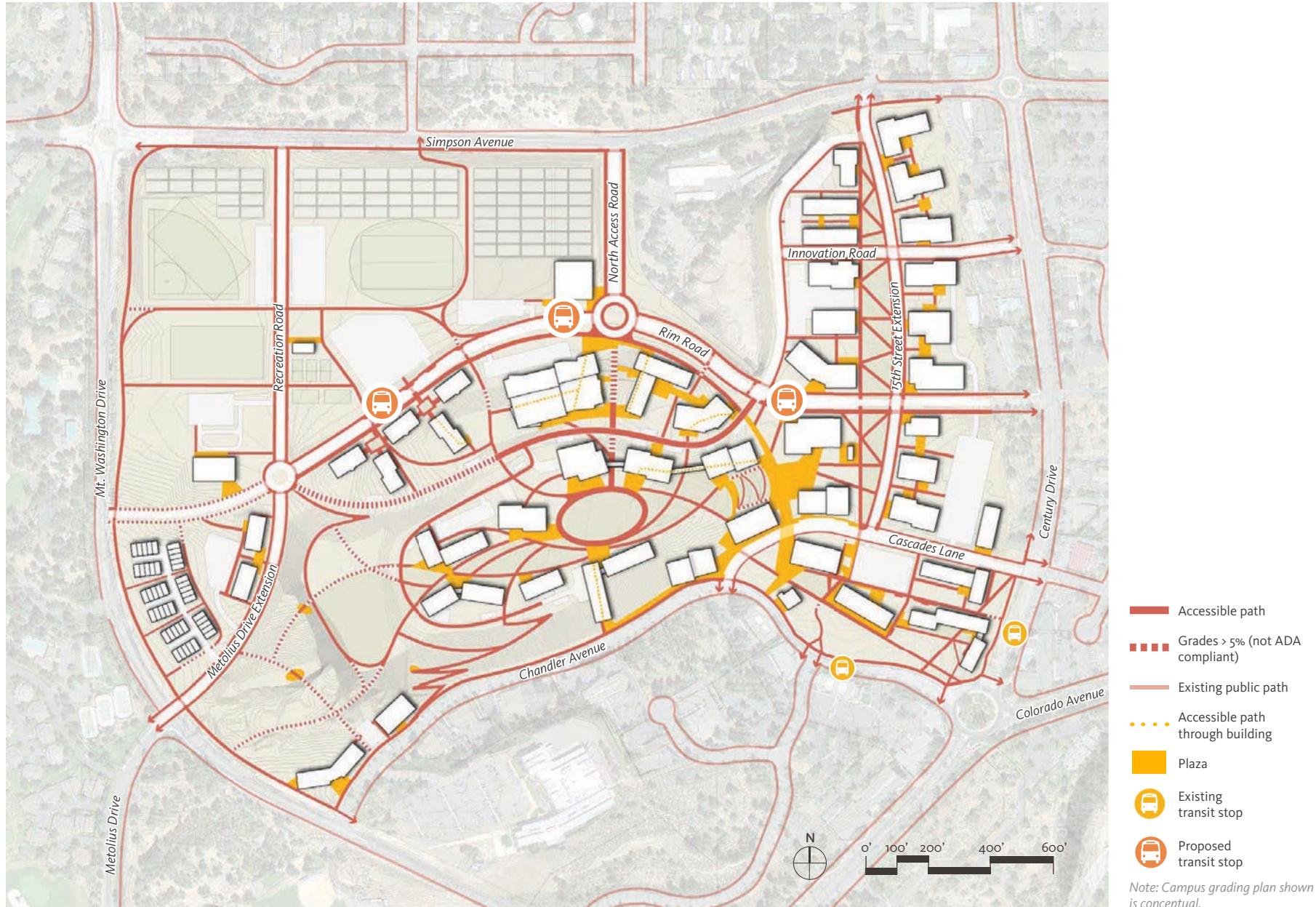
▲ Figure 39: Parking

## Pedestrian Network

Walking is expected to be a primary mode of circulation at OSU-Cascades, and therefore, a network of pedestrian paths will connect the campus. Formal paths and sidewalks crisscross the Innovation District while paths meander through the core campus into the Bowl. The west side of the Bowl toward the West Woodlands will have paths and trails that engage with the native landscape for recreation and respite from the active campus areas.

The site topography, primarily on the western portion of the Bowl, will require select paths to slope at a greater than five percent grade and will not be considered ADA-accessible. Redundant paths will provide a variety of options to move through the site and ensure alternate accessible routes are available.

Vertical circulation (elevators and stairs) within buildings will also supplement the outdoor paths by bringing people from one level to another. The Student Success Center and Health & Wellness Center are buildings that are expected to provide easy access between primary campus terraces using internal elevators.



▲ Figure 40: Pedestrian Network

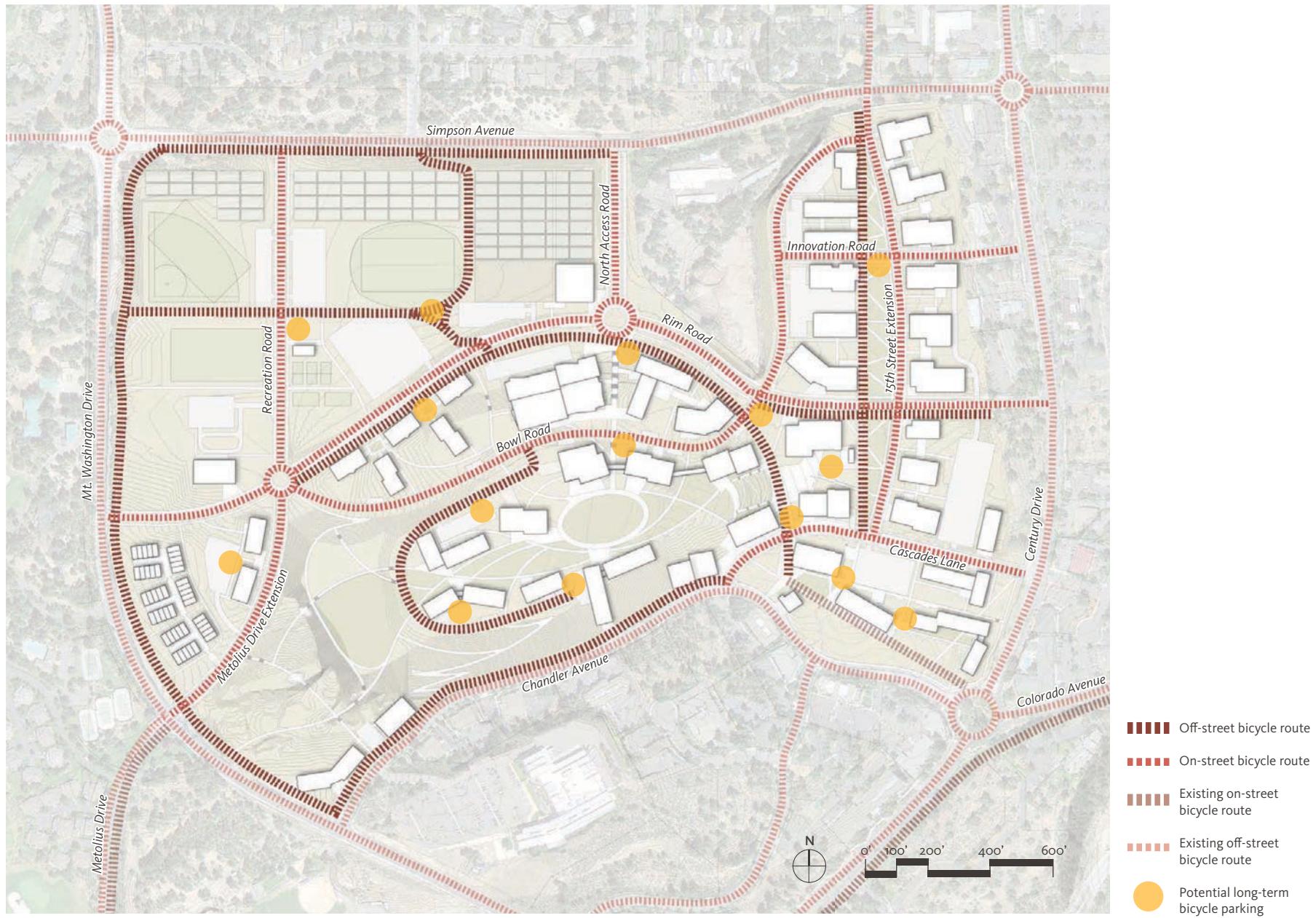
## Bicycle Network

OSU-Cascades has an existing bike share program and a growing population of bike enthusiasts. A robust bicycle infrastructure network will be critical to connect the campus safely to the neighboring communities without relying heavily on private vehicles. The Deschutes River paths, downtown Bend, the Old Mill District, and the NW 14<sup>th</sup> Street/SW Century Drive commercial corridor are within easy biking distance. The city of Bend is continually expanding bike routes to surrounding neighborhoods.

All campus streets will have integrated bicycle facilities to promote multi-modal circulation. There will also be several off-street multi-use paths serving major bike routes through campus. These paths will be separated from vehicular traffic to create comfortable bicycle connections for people moving throughout the campus.

Each building will have adjacent bicycle parking provided, and the campus will provide larger hubs of bicycle parking for long-term bike storage. These hubs may include amenities such as bike repair stations as well as covered and secured bicycle parking.

Showers, lockers, and other amenities for bicycle commuters will be integrated into select future buildings.



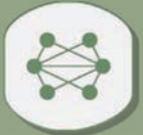
▲ Figure 41: Bicycle Network

**SUSTAINABLE &  
RESILIENT**



The university's goal to achieve net zero energy, water, and waste will require a creative approach to these systems. Infrastructure is planned to evolve over time with the campus development to accommodate changing needs and technologies. Flexible, redundant, and efficient systems will form the foundation of a resilient campus.

**PERMEABLE &  
CONNECTED**



The campus infrastructure system will have a positive impact on the overall sustainability of Bend and the region, with reduced dependence on municipal systems, which will reserve capacity for other development.

**INSPIRATIONAL &  
MEMORABLE**



OSU-Cascades strives to be a leader for sustainable and innovative infrastructural systems. By establishing the campus as an interactive living laboratory, students, faculty, staff, and the community will participate in and learn from the campus infrastructure.

**INTEGRATED &  
INNOVATIVE**



Creative approaches to campus infrastructure will create opportunities to integrate academic research and teaching into the development of the physical campus. OSU-Cascades' investigation into the potential for biomass energy generation is advancing the regional and national conversation about this approach.

## 4.5 Infrastructure

OSU-Cascades has set the aspirational goal to become triple net zero, realizing that this will occur over many years and multiple phases of campus development. Triple net zero means the campus will balance energy, water, and waste utilization with energy generation, water capture, and material reuse. Through the LRDp planning process, sustainable infrastructure approaches and implementation measures were explored and recommended.

The proposed infrastructure will minimize the campus's dependence on environmental resources and allow for long-term resilience while remaining financially and logically viable. The infrastructure approach is intended to serve the campus operations as well as exhibit leadership in sustainable campus development, particularly in the high desert climate.

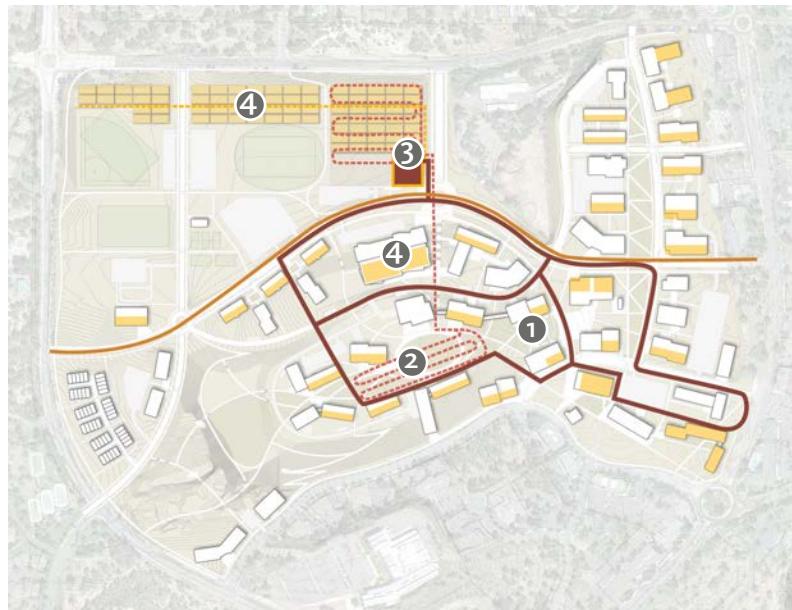
### Energy

OSU-Cascades has a stated long-term goal to become a net zero energy campus at or after full campus build-out. For the LRDp, OSU-Cascades is using the National Renewable Energy Laboratory definition for a Zero Energy Campus:

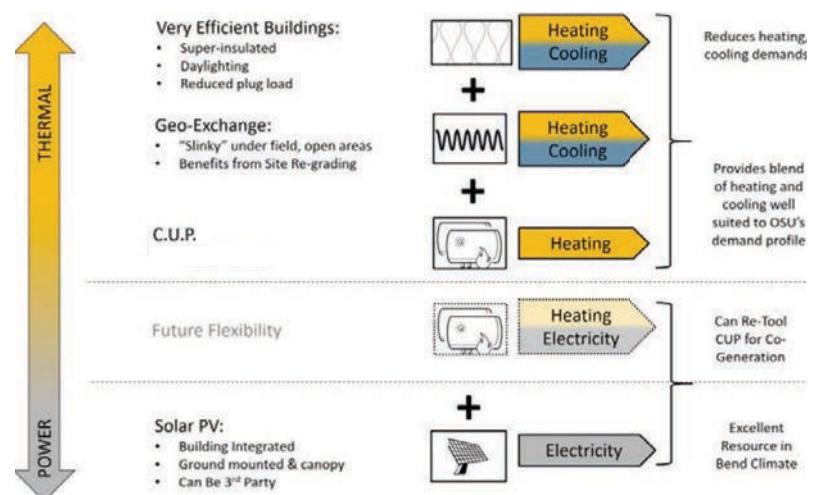
*An energy-efficient campus where, on a source energy basis, the actual annual delivered energy is less than or equal to the on-site renewable exported energy.*

The proposed energy system for the campus includes several coordinated approaches to energy management and supply as shown in Figure 42 and described below:

- ① Highly efficient, climate-responsive buildings with building design standards that include high-performance envelopes, operable windows, efficient equipment, and plug load management to minimize heating and cooling demand
- ② Geo-exchange system for thermal energy, providing heating and cooling where necessary and appropriate
- ③ Central utility plant with boilers fueled by either natural gas or biomass to supplement the thermal energy supplied by the geo-exchange system
- ④ Photovoltaic panels both on building roofs and racks on the ground to provide renewable electrical energy



▲ Figure 42: Proposed Energy Infrastructure



▲ Figure 43: Path to Net Zero Energy

## Renewable Electrical Energy Options

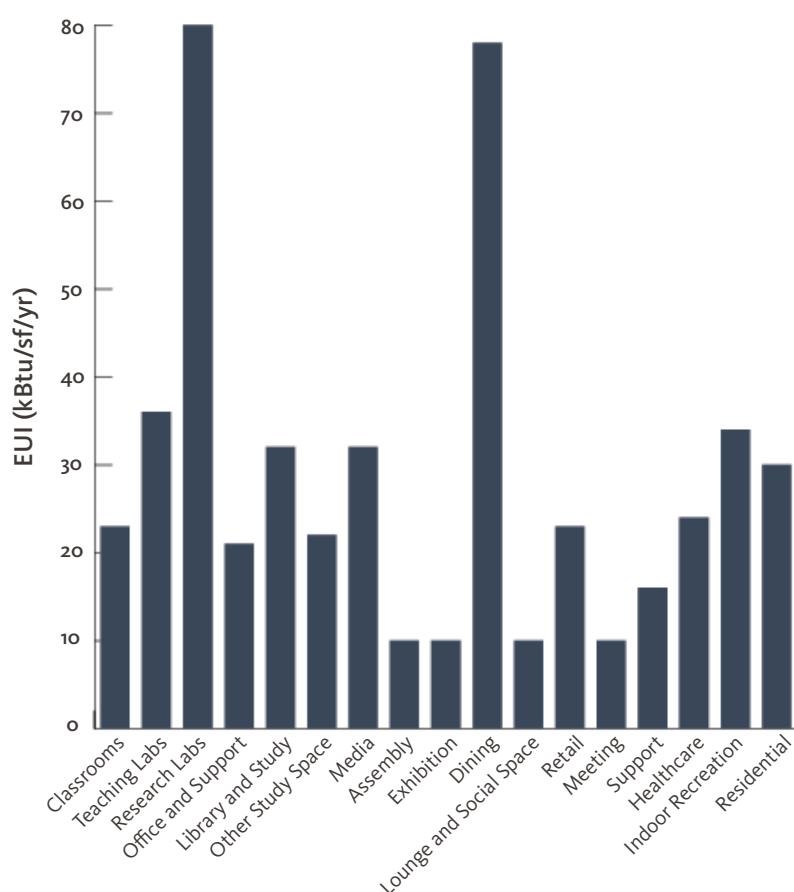
The following table summarizes the various electrical energy options that were explored during the planning process.

✓ *Table 8: Renewable Electrical Energy Sources Considered for the LRD*

OPTION	DESCRIPTION	COMMENTS	EVALUATED?
Wind	Renewable energy using multiple turbines	Inadequate wind resources	No
	Connect to utility grid	Higher maintenance needs	
		Intermittent generation	
Photovoltaic	Roof mounted, canopy mounted, and ground mounted photovoltaic panels	Abundant solar resources	Yes
	Connect to utility grid	Low maintenance Costs declining	
Cogeneration added to central utility plant	Using an organic Rankine cycle generator with the biomass boiler to generate electricity along with heat	Can combine with any of the thermal biomass options	No Consider for future
	System sized for the heat load of the campus	Would not run in the summer unless a need for heat was found Additional maintenance	

## Energy Efficiency Metrics: EUI

The LRD establishes Energy Use Intensity (EUI) targets for each building type. These EUIs were developed to allow the university to attain net zero energy within the overall energy strategy. More detail on these performance measures is outlined in *Chapter 5: Campus Development Guidelines*.



▲ *Figure 44: Proposed Building EUI Standards*

### Efficiency: The Key to Net Zero Energy

Buildings with efficient envelopes are the key to achieving net zero energy. Investments in efficient windows, roof and wall insulation, sunshades, and other conservation strategies reduce energy use over the lifetime of the building and are essential to minimizing the required heating and cooling capacity.

The LRDp analysis considered three levels of building performance: Good, Better, and Best:

- **Good buildings** will align with Oregon Energy Code requirements.
- **Better buildings** will be approximately 30% better than code-compliant buildings.
- **Best buildings** will require 70% less energy than typical buildings and 50% less than code-compliant buildings. This level would align with the Architecture 2030 guidelines, a program developed with the goal of reducing building-related energy use to a degree that would significantly reduce the risks associated with climate change.

Investments in efficiency are also investments in resiliency. These proactive measures reduce the university's long-term operating costs and vulnerability at times of rapidly fluctuating energy pricing.

Creating more efficient buildings requires fiscal strategies that invest more in up-front capital expenses but result in long-term savings in operating expenses. Incentive programs such as those offered by the Energy Trust of Oregon can also help reduce the additional capital expense needed for these investments

### Thermal Energy Options

The following table summarizes the various thermal energy options that were explored during the planning process.

▼ *Table 9: Thermal Energy Sources Studied and Considered*

OPTION	DESCRIPTION	COMMENTS	EVALUATED?
Natural gas	Centralized or decentralized Creates heating water and domestic hot water	Fossil fuel based	Yes
Biomass	Centralized or decentralized Creates heating water and domestic hot water for campus Uses wood	Carbon neutral Needs separate cooling source	Yes
Biomass or natural gas with geo-exchange	Horizontal "Slinky" system using the ground as a heat sink Geo-exchange provides full cooling and 30% of heating	Low temperature system Provides future flexibility	Yes
Geo-exchange	Horizontal "Slinky" system using the ground as a heat sink Geo-exchange provides full cooling and 100% of heating for campus buildings	Heating/cooling loads unbalanced Ground temperature issues Not cost effective	No
Geo-exchange with air source heat pump	Horizontal "Slinky" system using the ground as a heat sink Geo-exchange provides full cooling and some % of heating Heat pumps provide balance of heating energy	Heat pumps increase need for photovoltaic panels	No

## Ground Source Heat Exchange

Ground source heat exchange, or geo-exchange, is a strategy that is highly effective in the high desert climate of Bend, Oregon. The system uses the earth below campus to regulate temperature through a system of coiled pipes laid underground.

Heat will be transferred from the ground into the coil's fluid, which is typically water with anti-freeze, and then delivered to campus buildings for heating. In warmer months, the system can do the opposite; excess heat from buildings can be transferred into the ground, cooling the spaces. In effect, the geo-exchange system uses the grounds of the campus as a battery, where energy can either be stored or withdrawn.

The ground source system is particularly attractive for OSU-Cascades because of the significant amount of earth-moving required to prepare the site for development. As the remediation and grading processes occur, the heat loop pipes will be placed, reducing the typically high cost of trenching. The system will be designed to balance the amount of heating and cooling over an annual cycle, eliminating the risk of a long-term tendency to disrupt the natural ground temperature.

## Central Utility Plant and Energy Distribution Loop

Because the overall demand for heating is projected to be significantly higher than that for cooling, the thermal energy system will also include a central utility plant (CUP) with a boiler system to boost and supplement the ground source heating system. A set of boilers will be located in the CUP that will supplement heat for the geo-exchange loops.

These boilers will be designed to be powered by either natural gas or rapidly renewable fuels such as biomass. The university has participated in studies of biomass fuel to better understand the trade-offs relative to cost, reliability, health factors, and carbon emissions reduction goals. These studies are on-going and will inform the university's decision for the final design of the CUP's boiler system.

In addition to the central utility plant, the energy system will include a set of distribution pipes to most campus facilities, which will deliver thermal energy (heating or cooling) to heat exchangers in each building. This centralized system has several inherent advantages beyond its compatibility with the geo-exchange system. The condensing water loop used to distribute this thermal energy around the campus can provide heat recovery because some facilities can draw heat from the system, while others can push unwanted excess heat into the system at the same time. In addition, a central utility plant allows facility managers to more readily upgrade equipment and optimize maintenance activities. Rather than replace old boilers or furnaces building-by-building, centralized equipment can be updated in one location, allowing the university to keep up with increasing efficiencies with future equipment design.

The distribution system and CUP will also allow flexibility for OSU-Cascades to consider pursuing co-generation, which involves simultaneously generating electrical energy and thermal energy. This approach does not currently have a positive benefit-cost balance, but this could change in the future as energy prices and carbon markets continue to shift.

## Carbon Emissions Considerations

OSU-Cascades is a signatory to the American College & University Presidents' Climate Challenge, which commits institutions to analyze and track their activities which result in carbon emissions, as well as to develop a Climate Action Plan to reduce emissions.

### Biomass: A Regional Resource

Woody biomass is one option being considered as an energy source. The intent is to use regionally-sourced wood waste, which is currently burned in the forest as part of regional forest thinning practices.

Benefits and risks of this fuel source are being analyzed by OSU-Cascades and regional partners through a series of studies. Key considerations include:

- **Fuel stability & forest health:** Understanding the impact of biomass use relative to other options and confirming the projected lifetime of the fuel source.
- **Emissions:** Exploring any potential local and regional impacts from emissions compared to other fuel sources.
- **Carbon:** Woody biomass fuel is consistent with several leading definitions of carbon neutrality, although this is a topic of ongoing debate among policymakers.

## Water

### Water and Wastewater Strategy Overview

While Bend and Central Oregon benefit from the Cascade Mountains' seasonal snowfall, the region is climatically a high desert and part of the arid West. Water management will become an issue of increasing focus in coming years. The university, working with the community task forces, has set a goal to achieve net zero water use on the campus. The LRD process has taken that goal as a principle and developed a set of strategies that will allow OSU-Cascades to attain that goal over time.

Defining net zero water use was a key first step, as the term is interpreted and applied differently by various organizations and is approached differently than energy. The United States Environmental Protection Agency (EPA) defines net zero water as:

*... limiting the consumption of water resources and returning it back to the same watershed so as not to deplete the resources of that region in quantity or quality over the course of the year.*

With this definition adopted for the purposes of the LRD, the following water principles have been established:

- *Conserve:* Use the minimum amount of water needed.
- *Protect:* Clean the water used on campus, making it safe for humans and other species.
- *Replenish:* Recharge groundwater as high up in the watershed as possible, allowing it to support downstream uses.

<sup>1</sup> [https://www.epa.gov/water-research/netzero-concepts-and-definitions](https://www.epa.gov/water-research/net-zero-concepts-and-definitions)

A key standard applied to the LRDP is the idea of site water balance, or seeking to limit potable water consumption to the level of rainfall on the site annually, under pre-development conditions. Annual precipitation averages approximately 34 million gallons per year on the OSU-Cascades campus site. This figure will serve as a maximum potable water budget for the LRDP analysis.

The proposed water system has multiple components that together create an integrated water system:

- *Conservation* through highly efficient fixtures in buildings and water-efficient and native landscaping, minimizing irrigation demand
- *Dual-plumbing* of buildings to allow use of recycled water when required campus-scale infrastructure is developed
- *Stormwater treatment* using bioretention facilities (bioswales and stormwater planters) and other landscape features to treat and infiltrate water near developed areas to reduce demand on the storm sewer system and replenish groundwater resources
- *On-site wastewater recycling* to provide non-potable recycled water for toilet flushing, irrigation, and possibly laundry use

The total amount of wastewater expected to be produced at full build-out is approximately 140,000 gallons per day (gpd) during the school-year. OSU-Cascades may choose to treat only the amount of water needed for non-potable uses, sending the remaining wastewater to the city sewer.

### Wastewater Recycling

On-site water recycling is becoming increasingly common across the arid West, with both private and municipal systems being developed in many communities. For the OSU-Cascades campus, two primary systems appear to be most appropriate.

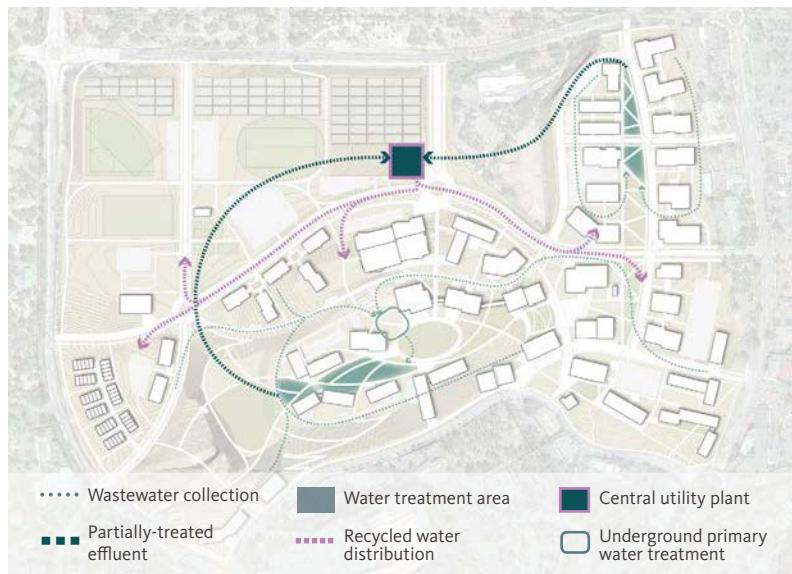
- **Membrane Bio-Reactor (MBR):** An MBR is a compact, enclosed, self-contained wastewater treatment system. It can treat wastewater to the highest standards, although it is relatively energy-intensive and requires frequent membrane replacement.
- **Passive wastewater treatment wetlands:** Constructed wetlands combine an enclosed tank system for initial settling of solids from wastewater with an open landscape feature that uses carefully selected plants to purify water.



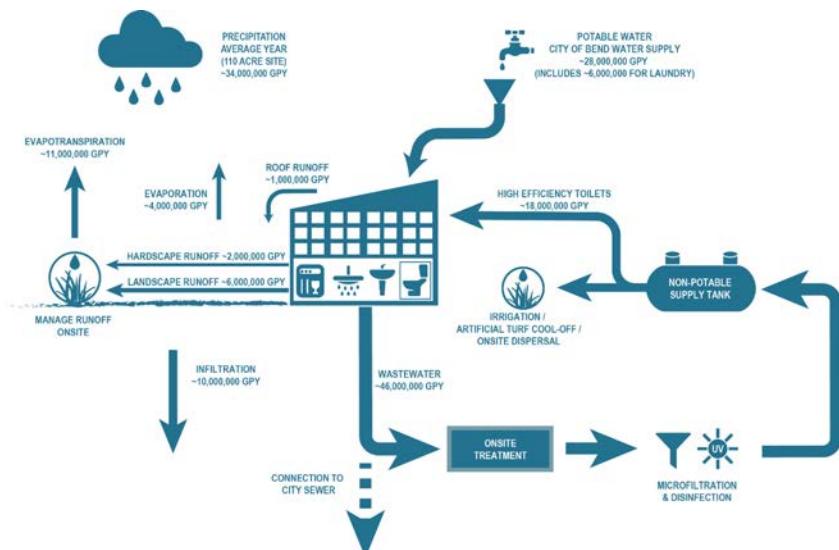
▲ The character of wastewater treatment facilities can vary to fit in to the context. At left, the facility at the Desert Living Center in Las Vegas has the character of a gulch within the arid setting. At right, the facility at Hassalo on Eighth in Portland fits into its more urban context.

Various technologies have been identified for a campus on-site treatment system, including a membrane bioreactor and passive treatment wetlands. A separate system for the Innovation District is proposed, allowing some redundancy while also letting the systems be managed separately to optimize based on their different use profiles.

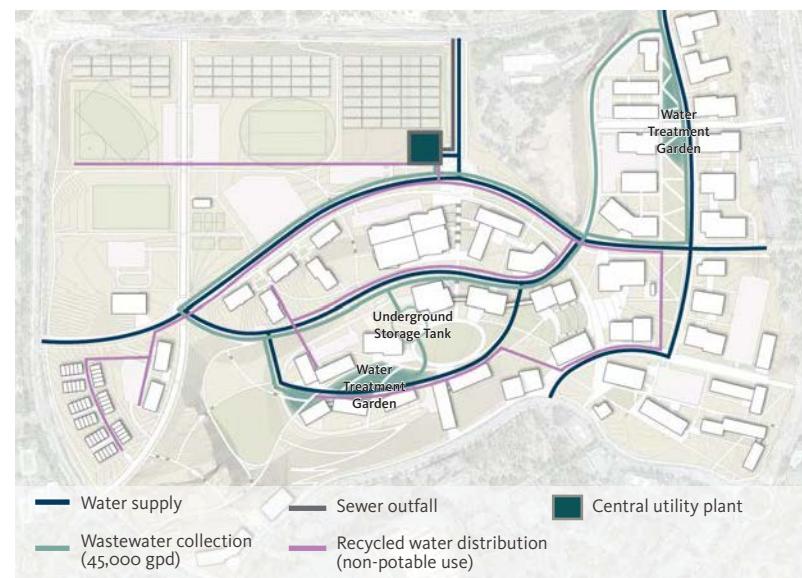
The LRD analysis indicates that the campus will have a demand of approximately 66 million gallons per year, as a baseline—that is, using conventional systems for supplying water and removing sewage. However, the proposed strategies described here will allow potable water use to be reduced to less than half of the demand under conventional systems, to approximately 28 million gallons per year, including laundry, at campus build-out. An additional 18 million gallons of recycled non-potable water will be used for toilet flushing. Using recycled water for laundry demand as well could further reduce potable demand by approximately 6 million gallons per year.



▲ Figure 45: Conceptual Reclaimed Water System



▲ Figure 46: Water System Summary



▲ Figure 47: Proposed Water Infrastructure

## Integration with City of Bend Water Systems

While some of the proposed systems can significantly reduce demand for potable water, the university system will be fully connected to the City of Bend water supply and sewer system, as required by city policies. The university will not be “off the grid” but will instead use these innovative systems to drive down potable water demand while also reducing sewage effluent being discharged into the municipal sewer, extending the capacity of the city’s water and sewer infrastructure. The proposed systems will be permitted and operated according to Department of Environmental Quality (DEQ) standards.

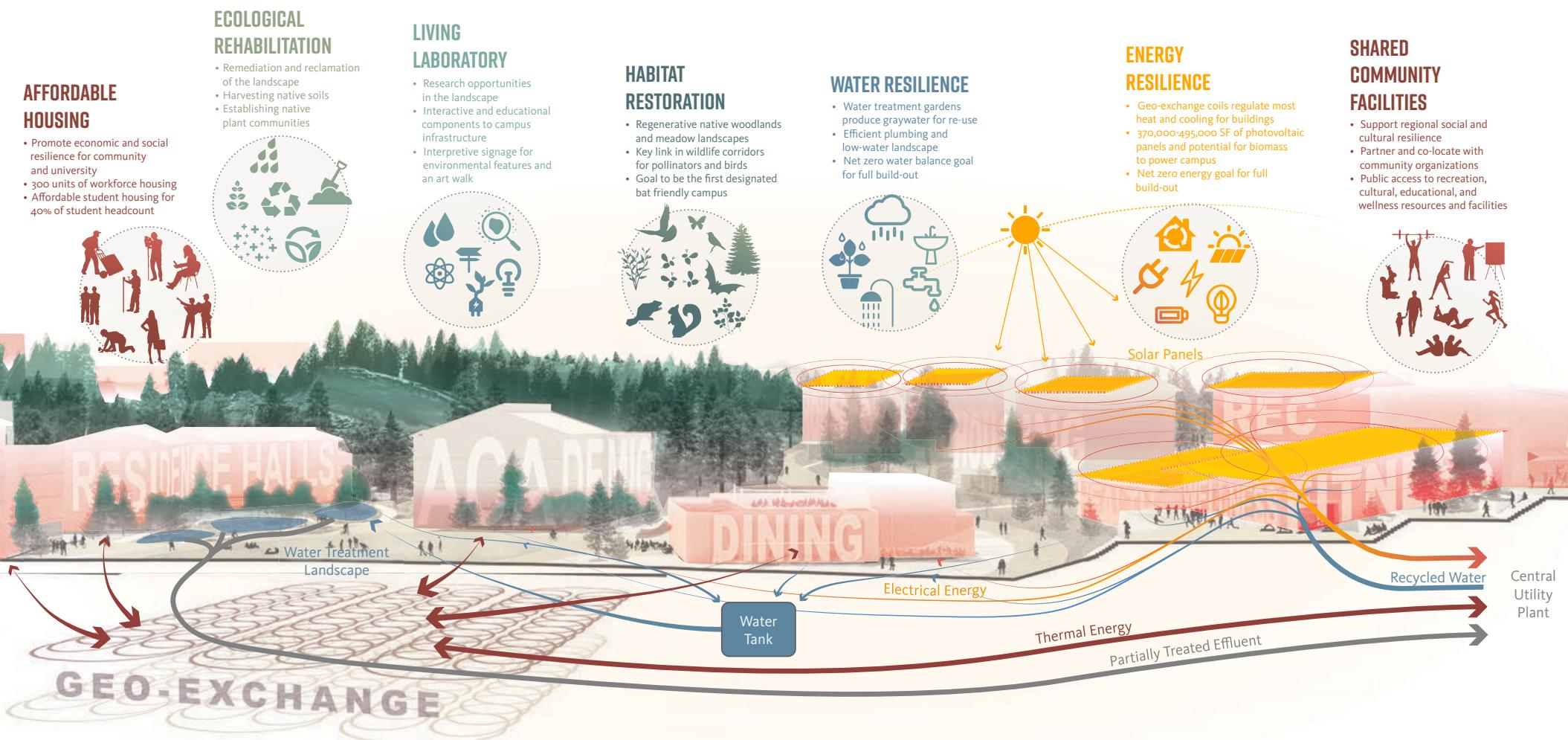
All of the proposed systems have been approved in multiple Oregon jurisdictions, although some will be new to the City of Bend. OSU-Cascades will partner with the city and DEQ to test and analyze these systems prior to seeking full approval for design. The university’s commitment to best practices for water management will help make this scarce resource available for other community needs into the future. With that goal in mind, OSU-Cascades will continue to collaborate on long range infrastructure planning, allowing all parties to plan their investments and revenues accurately.

## Waste

OSU-Cascades seeks to operate as a zero waste campus. This goal requires active management of materials, both in procurement and in seeking disposal options as markets for sale and/or disposal of sorted recyclable materials are dynamic and can shift with little notice. As OSU-Cascades grows, its material streams may be large enough to influence some markets for material recovery, and close coordination with regional vendors, Deschutes County, and other agencies may promote more recovery options in the future.

For all the reasons above, a zero waste goal will primarily affect operations, including student life and outreach. It will have some infrastructure requirements:

- A portion of the facilities and maintenance yard will be established for materials sorting and temporary storage, which will allow campus-generated materials to be held until batches of marketable scale can be generated. Examples of materials that may be sorted include plastics, metals, glass, hazardous materials, and compost.
- Each building will have appropriate areas for source-sorting of the primary materials that can be recycled.



▲ Figure 48: An Integrated Resilient Campus





## 5 | CAMPUS DEVELOPMENT GUIDELINES



*Photo by Aerial Images*

# 5 | CAMPUS DEVELOPMENT GUIDELINES

## Introduction

DESIGN GUIDELINES ESTABLISH CRITERIA TO GUIDE FUTURE CAMPUS DEVELOPMENT. WHILE EACH PHASE OF CAMPUS GROWTH WILL HAVE UNIQUE CONDITIONS AND CHALLENGES, THE GUIDELINES ARE INTENDED TO ENSURE THAT THE CAMPUS IS COMPLETED IN A CONSISTENT MANNER WITH THE UNIVERSITY'S AESTHETIC, FUNCTIONAL, AND PERFORMANCE GOALS.

The guidelines address five primary areas of campus development:

### *Campus Layout*

- Building Location, Massing and Scale
- Urban Design
- Entry Orientation
- Accessibility
- Defensible Space

### *Building Design*

- Building Orientation
- Public Areas
- Building Durability
- Regional Materials & Design Principles
- Foundation & Retaining Systems
- Waste Management

### *Energy & Water*

- Energy Use Intensity
- Passive Heat Control Measures
- Solar Ready Buildings

- Efficient Building Lighting and Plug Loads
- Plumbing Standards

### *Circulation*

- Streets
- Parking (off-street)
- Multi-Use Paths
- Integrated Transit

### *Open Space & Landscape Design*

- Campus Context
- Campus Character
- Ecology and Habitat
- Accessibility
- Planting
- Water Management
- Site Materials
- Site Elements
- Site Lighting
- Site Preparation and Construction

## CAMPUS LAYOUT

# BUILDING LOCATION, MASSING, AND SCALE

### INTENT

OSU-Cascades aspires to create a campus that is compact and walkable with building massing of appropriate size for adjacent exterior open spaces. This will allow the character of the site to be defined by natural features and the built environment.

▼ *Table 10: Building Dimension Guidelines*

TYPE OF BUILDING	Height (ft)	Number of Floors	Floor Plate Depth (ft)	Floor Plate Length <sup>4</sup> (ft)
Academic / Campus Life	65	4 <sup>1</sup>	~85	up to 180
Residential	55	5 <sup>2</sup>	55-65	up to 200
Innovation District / Mixed-Use	65	3-4 preferred	60-70	up to 150

Notes:

1. 65' height is established by city code. See code for definition of height relative to adjacent grade.

2. Residence halls on grades may be able to accommodate an additional floor, based on the height determination and prevailing grade. See city code.

3. Floor depths are guidelines for balancing use types and daylighting strategies. Daylight analysis should be performed on final building designs to optimize floor layouts.

4. Lengths shown in the LRDP plan diagrams are up to 200 ft. For buildings longer than 110 ft, a significant offset in the long facades should be introduced so that no plane is continuous for longer than 90 ft. Offsets can include a recess or bay of at least 4 ft in depth and 15 ft in length or an offset plane of at least 4 ft.

### CRITERIA

- Refer to the dimension guidelines in Table 10 for overall building massing.
- Building heights should not exceed requirements established by the master plan approved by the City of Bend for the OSU-Cascades campus and identified in the Bend Development Code.
- Maintain a minimum of 50 feet of separation between buildings to allow for daylight and views from and between buildings.
- Vary the building massing and height of building areas to avoid large continuous facades and create dynamic exterior spaces with visual interest.
- Use building massing to address regional environmental factors:
  - Plan plazas and buildings to avoid full shading of outdoor spaces during fall and spring.
  - Reduce impact of prevailing winds on outdoor spaces.
- Consider the surrounding context in building design, especially for facilities located on the campus edge.
- Consider building orientation to maximize views and solar access.

## CAMPUS LAYOUT

# URBAN DESIGN

### INTENT

As a pedestrian-priority zone with a network of open spaces forming multiple hearts on the campus, OSU-Cascades' future development will require thoughtful consideration of how buildings shape key active corridors and open spaces.

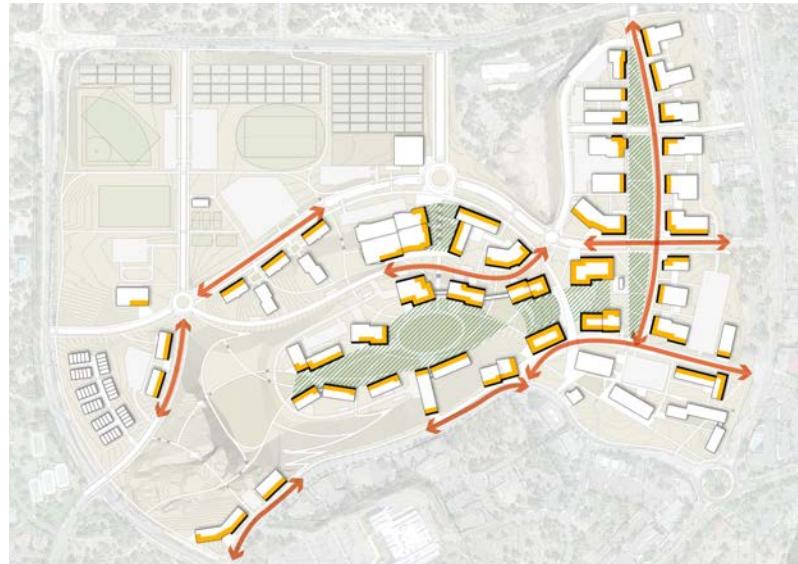
### CRITERIA

#### *Active Edges*

- Locate active program such as food service, convenience retail, and other campus life spaces along the ground floors of buildings where designated as active edges in Figure 49.
- Locate primary building entrances along active edges, where possible.
- Employ transparent façade treatments for ground floors of active edges.
- Use massing, texture, material change, and other architectural techniques to provide visual interest and promote a human-scaled pedestrian realm.

#### *Build Perimeters*

- Define building edges where perimeters are designated in Figure 49.
- Building perimeters should comply with requirements established by the master plan approved by the City of Bend for the OSU-Cascades campus and identified in the Bend Development Code.



▲ Figure 49: Active Edges and Build Perimeters

*Active edges front important active corridors and/or campus open spaces. Future development along these key spaces will contribute to shaping the spaces themselves and promote a sense of continuity along their edges.*

- Use building façades to shape key open spaces and circulation corridors, creating urban-feeling street walls.
- Provide periodic breaks in building perimeters to create opportunities for pedestrian movement and promote diversity in façade treatment and massing.
- Where appropriate or necessary, use landscape treatments instead of buildings to hold the street edge or define a key open space.

## CAMPUS LAYOUT

# ENTRY ORIENTATION

### INTENT

Building design should support walking, transit, and biking through the coordinated design of facilities and the public realm.

### CRITERIA

- Locate the primary entries to all buildings at entry plazas, streets, and/or pathways that comprise the campus circulation network.
- Provide exterior protection, such as overhangs, for all building entrances.
- Building entrances should comply with requirements for providing weather protection established by the master plan approved by the City of Bend for the OSU-Cascades campus and identified in the Bend Development Code.
- Consider protection from winter prevailing winds when locating building entrances.

Related to other guidelines, as described in this chapter:

- Orient primary entries to face the identified accessible path network.
- Create visibility at entries to support defensible space.



▲ Primary entries to Tykeson Hall face the major walkways established on the campus, providing equally convenient access for all, whether arriving by foot, bicycle, transit, or private vehicle.

## CAMPUS LAYOUT

# ACCESSIBILITY

### INTENT

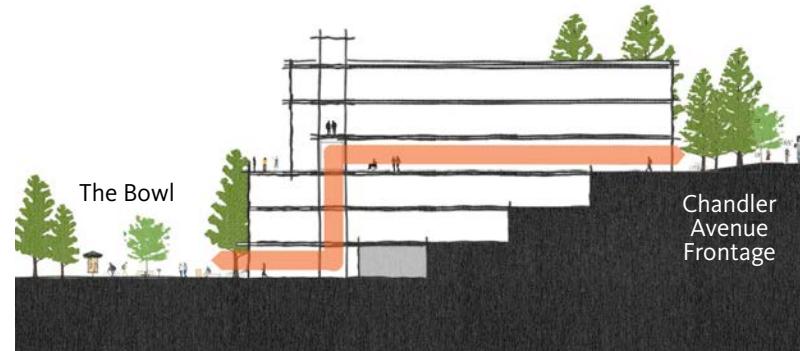
OSU-Cascades will be a fully accessible campus and provide multiple routes to ensure accessibility within the context of dramatic campus topography.

### CRITERIA

Buildings and site development on the OSU-Cascades campus should comply with the current edition of Oregon State University's best practice standards for environmental accessibility.

Multiple approaches to site accessibility are established by the LRDP and should be integrated to provide choice and redundancy:

- Connect facilities to accessible travel paths.
- Use elevators in select campus buildings to facilitate ease of vertical movement between major elevations of the site. The building circulation system should be secured independently from the building to allow use outside of building hours.
- Allow vehicular access and permitted parking areas to all building sites for those with mobility challenges.



▲ In key locations, building elevators will support vertical mobility on the site, providing a direct route of travel from the upper areas of the campus to the Bowl, at the heart of the site.

### VERTICAL CIRCULATION >

Elevators located adjacent to—rather than within—buildings can serve both the building's needs and general site circulation. (Example: Lewis & Clark College)



## CAMPUS LAYOUT

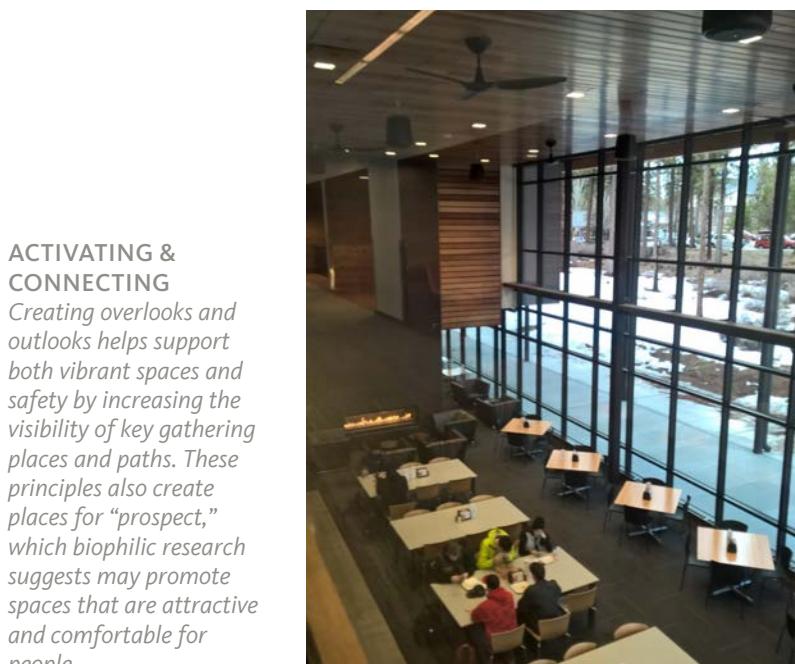
### DEFENSIBLE SPACE “EYES ON THE STREET”

#### INTENT

Building design should be integrated with the adjacent site design to support campus vitality and campus safety by creating good visibility between gathering areas indoors and outdoors.

#### CRITERIA

- Use program layout and fenestration to connect active indoor gathering areas with major exterior paths and open spaces as shown in Figure 49.
- Create overlooks for study and meetings to increase visibility to public areas.
- Create clear areas at building entries, with good visibility from indoors to out.
- Select landscape plantings that are either low to the ground or with a canopy of a height that does not obscure a person hiding along key paths.
- Design lighting to light paths and entries adequately.



#### ACTIVATING & CONNECTING

*Creating overlooks and outlooks helps support both vibrant spaces and safety by increasing the visibility of key gathering places and paths. These principles also create places for “prospect,” which biophilic research suggests may promote spaces that are attractive and comfortable for people.*

## BUILDING DESIGN

# BUILDING ORIENTATION

### INTENT

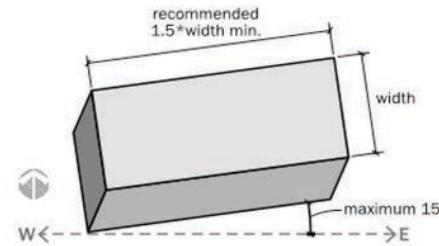
Buildings on the OSU-Cascades campus should be oriented thoughtfully to optimize energy performance while engaging the campus pedestrian network and shaping quality outdoor spaces.

### CRITERIA

Buildings should be proportioned to have a length at least 1½ times their width, and should be oriented as follows:

- Building setbacks should comply with requirements established by the master plan approved by the City of Bend for the OSU-Cascades campus and identified in the Bend Development Code.
- To the extent feasible, and consistent with other key design goals, orient academic and campus life buildings with their long axis generally in the east-west direction (within 12-15 degrees).
- Optimize residential building orientation for multiple factors, including solar access to student rooms, energy performance, formation of outdoor rooms to support student life, and views.

*NOTE: The LRDp plan shows conceptual layouts for buildings that meet the intent of these guidelines. Project design teams are encouraged to bring creative solutions to all projects, while addressing these performance goals.*



< Buildings with their long axis in the east-west orientation (or < 15° from east-west orientation) generally have the best energy performance.



^ OPTIMAL ORIENTATION

The LRDp extends the orientation strategies established on the existing ten-acre site to future facilities, while addressing urban design goals, including buildings that engage streets.

## BUILDING DESIGN

### PUBLIC AREAS

#### INTENT

Buildings at OSU-Cascades should promote dynamic, active spaces through careful program organization. Campus development should also take full advantage of the dramatic regional setting, creating special places that capture local and regional views.

#### CRITERIA

- Locate active public or semi-public uses of buildings on the ground floor, especially at campus edges and major plazas or walkways, as shown in Figure 49.
- Create semi-public spaces on upper floors to capture views to the Cascade Range, where possible. When located on upper floors, access to semi-public spaces should be available to the full campus community with consideration for security and safety.



#### ▲ OPTIMIZING VIEWS

*Views to the outdoors should be recognized as an amenity for the whole campus community.*

## BUILDING DESIGN

# BUILDING DURABILITY

### INTENT

Create buildings that will be long lasting, cost effective, and will not require excessive maintenance labor or operational costs. Select materials and design strategies appropriate to the Bend climate.

### CRITERIA

- Prepare life-cycle costing of durable materials and systems for major building enclosure systems.
- Demonstrate long-term adaptability, including strategies to allow building envelope systems and building services to be de-coupled from primary systems (i.e., structure).
- Follow best practices for envelope design to ensure an appropriate climate response for extreme Central Oregon winter or summer conditions.
- Comply with the current edition of Oregon State University's construction standards.
- Limit the use of materials that require short-term (< 5 years) on-going maintenance such as painting or staining in areas difficult to reach from standard ground apparatuses or accessible deck areas.



▲ Thoughtful construction methods and building systems like overhangs can minimize long-term degradation by the elements.

## BUILDING DESIGN

# REGIONAL MATERIALS & DESIGN PRINCIPLES

### INTENT

Create architecture and built environments that have a character consistent with Central Oregon traditions and a contemporary design vocabulary.

### CRITERIA

OSU-Cascades is committed to creating buildings that showcase building technologies and materials developed and manufactured in the state of Oregon and Pacific Northwest. The established wood products industry in Oregon is a prime example of local resources that also meet a fundamental goal for the OSU-Cascades campus to fortify a strong connection with the region through the design of its buildings. The use of regional wood products could vary from incorporating mass timber structural components, such as cross laminate timber, to the use of juniper for aesthetic applications. Using these materials supports rural economic development initiatives in central and eastern Oregon as well as local mills.

Building materials will respond to environmental conditions while addressing durability and ease of maintenance criteria.

Building colors will reflect the natural palette of Central Oregon with warm earth tones and neutral accents. Protective finishes will be applied and maintained to function effectively in the high desert environment and potentially harsh weather conditions.

Use the following preferred materials and systems for future development on the OSU-Cascades campus:

- Source materials with regional priority to provide visual continuity with available resources.
- Use exterior materials in durable finishes including metal panel, stone, concrete, concrete composite panel, masonry, or wood siding.
- Wood finishes, with appropriate protection from weather, are encouraged as a character-defining element.
- Use structural systems as appropriate for building size, location and programming. Timber structures, including cross-laminated systems, should be evaluated as a regional priority.
- All roofs should be designed with snow loading and snow drift best practices. Sloped roofs should use metal roof panels. A limited use of compositional roof shingles may be considered for student residential projects.

Avoid the following exterior materials as they are not considered appropriate for this campus context:

- Vinyl siding
- Plywood or Oriented Strand board (T1-11 and similar)
- Stucco
- Faux stone
- Exposed concrete block, unless used as a minor element within a façade composition and incorporating textured blocks for accent



▲ Science Center, COCC Bend (Pinnacle Architecture)



< Wood structural systems,  
Deschutes Public Library

*Defining elements of  
contemporary Central Oregon  
design include:*

- Exposed wood structure
- Shed roof forms
- Focused use of fenestration



▲ Existing OSU-Cascades buildings  
(top: Residence Hall, bottom: Dining/Academic Building)



▲ Cascades Academy (Henneberry Eddy Architects)

## BUILDING DESIGN

# FOUNDATION & RETAINING SYSTEMS

### INTENT

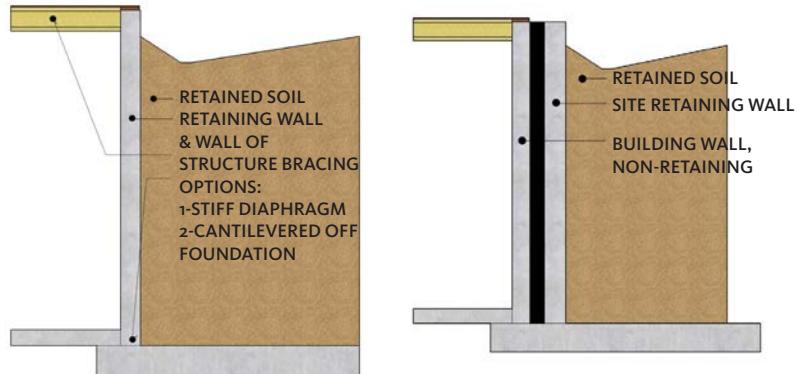
The OSU-Cascades campus topography will be shaped through the reclamation and remediation process as discussed in *Chapter 4: Planning Framework*, resulting in a series of elevation shifts. The LRDP provides for most building sites to be on level areas with select buildings deliberately engaging site slopes. These guidelines provide early guidance to design teams approaching each site type.

### CRITERIA

The following foundation and retaining systems are expected to be most effective in areas where buildings engage slopes, and should be explored in addition to other appropriate design solutions.

- For buildings where slope retention is not necessary, shallow mat and slab-on-grade foundation types would be appropriate.
- Where buildings engage the site slopes and their walls act as retaining walls, construct walls that are either:
  1. Self-supporting cantilevered foundation walls or
  2. Walls braced by a rigid diaphragm created in the floor structure at the top of the foundation wall span.

In all cases, confirm geotechnical bearing strength after site mass grading has been accomplished.



### ▲ POTENTIAL RETAINING CONDITIONS

*In select areas, buildings will engage the slopes on the site, and may require that building walls act as retaining walls. These can be of two primary types: 1) self-supporting cantilevered foundation walls or 2) walls braced by a rigid diaphragm created in the floor structure at the top of the foundation wall span.*

## BUILDING DESIGN

# WASTE MANAGEMENT

### INTENT

The OSU-Cascades campus aspires to operate as a net zero waste campus. Providing well-distributed waste sorting stations allows for high collection rates and informing students and others of the university's waste management goals. Collection of materials is contingent on available regional recycling abilities.

### CRITERIA

- Provide space for sorting stations accommodating up to five major bins on each floor of residential, academic, and administrative buildings.
- Locate bins in areas where students and staff gather, and/or near major exits.
- Provide locations for bins near major outdoor gathering areas.
- For compostable materials, ensure collection systems contain odor and liquids.
- Provide protection over exterior collection systems.



### ^ DISTRIBUTION COLLECTION STATIONS

*Providing sorting option bins for users to sort commonly recycled materials reduces labor by facilities staff and increases marketability of materials.*

## ENERGY & WATER

# ENERGY USE INTENSITY (EUI)

### INTENT

All building and operational development should contribute to OSU-Cascades' goal of a net zero energy campus by reducing building heating and cooling loads.

### CRITERIA

Prepare a preferred design alternative that meets the Energy Use Intensity (EUI) targets specified in Table 11.

▼ Table 11: Campus Target EUI by Building Type

TYPE OF BUILDING	Typical EUI	Proposed Design EUI
<b>Academic</b>		
Classrooms	71	23
Teaching Labs	120	36
Research Labs	265	80
Office and Support	70	21
Library and Study	104	32
Flexible Work Space	71	22
Media	104	32
<b>Campus Life Space</b>		
Assembly	31	10
Exhibition	31	10
Dining	224	78
Lounge and Social Space	31	10
Retail	74	23
Meeting	31	10
Support	50	16
Healthcare	73	24
Indoor Recreation	43	34
<b>Residential</b>	116	30
<b>TOTAL</b>	<b>101</b>	<b>33<sup>1</sup></b>

Note: Overall EUI increased from 29.9 to 32.8 to account for the existing buildings which did not meet the proposed design targets.

## ENERGY & WATER

# PASSIVE HEAT CONTROL MEASURES

### INTENT

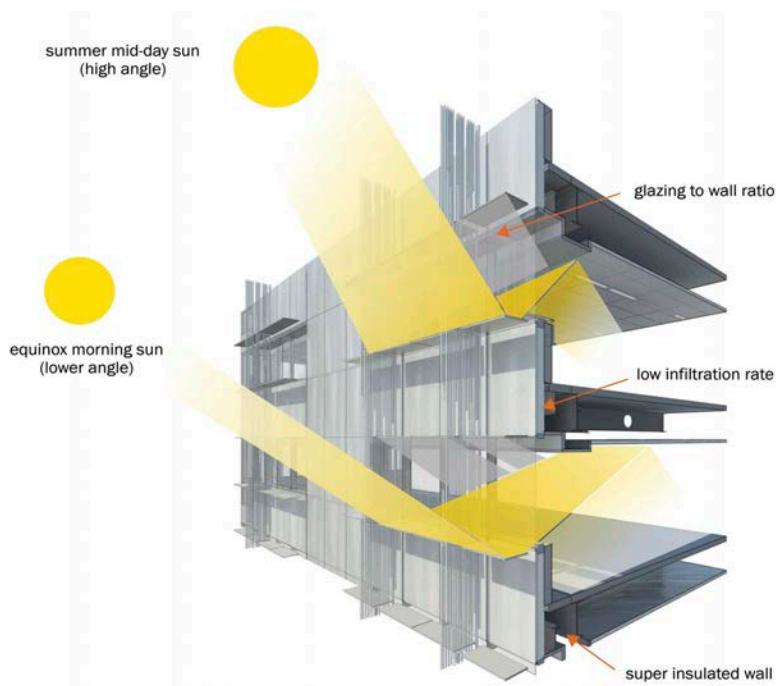
The overall building design with appropriate envelope enclosure can significantly reduce extreme heat gain in summer while allowing heat gain in colder months.

### CRITERIA

Use passive design measures to reduce heat gain in warm seasons and allow heat gain in winter:

- Provide overhangs and shading devices to reduce heat gain.
- Select glass and window assemblies that optimize daylight while controlling for heat gain or loss.
- Optimize the window-to-wall ratio to achieve daylighting benefits without unwanted heat gain or loss.
- Limit amount of heat-generating spaces with southern or western exposure.
- Evaluate direct and indirect gain passive solar systems in building design.
- Provide stack ventilation, where appropriate.

Related Guidelines: *Building Orientation* is a primary measure for passive heat control.



▲ Integration of both horizontal and vertical shading, operable windows, and high performance glazing can provide occupant comfort while minimizing equipment loads.

## ENERGY & WATER

### SOLAR-READY BUILDINGS

#### INTENT

Buildings should support energy goals by design and construction that accepts rooftop photovoltaic (PV) panels and dedicated area for other supporting equipment, even if they are not installed at the time of construction.

#### CRITERIA

- Include roof structural systems that can support live loads of a range of commercial PV panels.
- Identify capacity for inverters and other required equipment in electrical room(s).
- Run conduits that connect roof areas to electrical equipment rooms.



▲ This solar PV array was installed on a recreation center by a third-party, after the building's completion. A solar-ready design helps facilitate this type of partnership. (Portland Parks & Recreation: East Portland Community Center)

## ENERGY & WATER

# EFFICIENT BUILDING LIGHTING & REDUCED PLUG LOADS

### INTENT

Development should contribute to campus-wide net zero energy goals with reduction of internal energy loads.

### CRITERIA

- Specify efficient lighting systems with occupancy control sensors.
- When completing daylighting design, include controls that turn off lighting when adequate daylight is present.
- Use Energy Star rated appliances.
- Evaluate the following strategies and provide benefit-cost analyses for their use in all building projects.
  - Occupancy sensor controlled receptacles
  - Sub-metering of loads



▲ The value of well-designed daylighting strategies has been rediscovered. In addition to energy-savings benefits, day-lit spaces improve learning outcomes and have positive impacts on occupants' comfort. Good daylighting includes window sizing, location, glazing type, and controls. (SOU RCC building, Medford, OR)

## ENERGY & WATER

# PLUMBING STANDARDS

### INTENT

OSU-Cascades is planning to be a water-neutral campus at full build-out. To accomplish this goal in the arid high desert, best practices will be implemented, including on-site treatment and water recycling. Low water volume plumbing fixtures with automatic sensor on lavatories should be installed to minimize water demand. In early phases of campus development, pilot projects will be implemented to evaluate effectiveness of proposed designs in achieving water balance. These pilot projects will support broader approval and implementation of water-recycling infrastructure. The campus will invest in “purple pipe” within buildings that will allow for the use of recycled water supplies when they are available.

### CRITERIA

Provide dual plumbing to all future campus buildings, allowing the use of recycled water for the following non-potable uses:

- Toilet flush water
- Mechanical make-up water
- Irrigation, whether permanent or for plant establishment
- Considered for laundry water



### ^ DUAL PLUMBING

*Purple pipe is the agreed standard way of indicating that a water supply is recycled, non-potable water. A second dual supply line is run to appropriate fixtures to deliver this water.*

# CIRCULATION

## STREETS

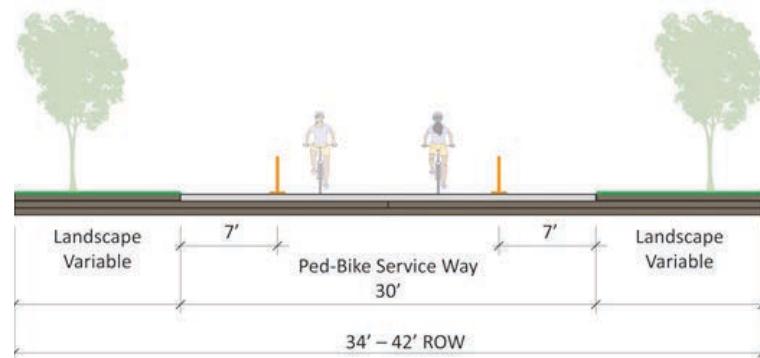
### INTENT

The future campus will provide a network of streets that allow multi-modal access from all parts of the broader community. Street design should support a safe campus environment, communicate a sense of place, and support connectivity by managing potential nuisances associated with traffic.

### CRITERIA

The proposed street network shown in Figure 36 identifies the major street types for each route on campus. These guidelines identify the functional and design parameters for each type. Final street designs should comply with requirements established by the master plan approved by the City of Bend for the OSU-Cascades campus and identified in the Bend Development Code along with the following requirements:

- Use City of Bend adopted standards for pavement design, sub-grades, and related technical performance factors.
- Accommodate utilities and easements as indicated in the LRDP and refined with development of final infrastructure plans.
- Incorporate OSU-Cascades standards for lighting, signage, and street furnishings.



### ▲ BOWL ACCESS DRIVE

A controlled access drive into the Bowl will allow select vehicles to the heart of the campus. While this area is intended to be relatively free of vehicles, this drive allows for deliveries, emergency access, accessibility parking, maintenance, and other required access.

## CIRCULATION

### PARKING (OFF-STREET)

#### INTENT

Parking on the campus should be designed to be minimally intrusive to the campus environment and limit vehicle traffic in primary pedestrian areas.

#### CRITERIA

- Parking quantities identified in the LRDP are based on the City of Bend Development Code.
- Manage the parking supply in coordination with the university's transportation demand management (TDM) strategy.
- Comply with City of Bend code for parking layout dimensions.
- Provide dedicated, clear, and safe pedestrian routes through parking lots.
- Identify location for snow removal/storage in parking lot design.
- Integrate stormwater management facilities for parking areas into landscaped areas.
- Incorporate trees and other landscaping into parking lot



▲ *Parking stalls should be screened and landscape elements integrated.  
(Bend Parks and Rec parking lot)*

design in a manner that enhances their appearance and breaks down the scale of large surface areas. Utilize native, deciduous trees that provide shade in warmer months but allow light passage in colder months. Incorporate existing trees into parking lot design to the extent feasible.

## CIRCULATION

### MULTI-USE PATHS, GENERAL

#### INTENT

The OSU-Cascades proposed campus pedestrian network, as shown in Figure 4o, is configured to create a comfortable and safe environment, giving priority to pedestrians and other non-vehicular travel. In select areas the network will also provide vehicular access for campus users with disabilities along with service and emergency vehicles. Path design shall contribute to a safe environment where human-powered modes takes priority.

#### CRITERIA

Choose the appropriate path section based on the LRDP pedestrian network designations and confirm that the selected path design addresses the following:

- Consider winter weather and related factors such as snow removal.
- Reference exterior furnishing guidelines.
- Where paths are noted as contributing to the accessible travel network, design should follow standards for maximum running slopes and other design parameters to comply with the current edition of Oregon State University's best practice standards for environment accessibility. Note that these requirements are more stringent than ADA requirements in some areas.



▲ The Stanford Perimeter Trail is a good precedent for a successful multi-use path for both the campus and community (Stanford University)

Where a path is also designated as part of the emergency access path network, the following criteria also apply:

- Follow city fire code for Fire Apparatus Access Roads and coordinate final path design with the appropriate City of Bend agencies.
- Consider winter weather including ice and snow removal.

See also the following guidelines: *Site Elements*, *Site*

## CIRCULATION

### INTEGRATED TRANSIT

#### INTENT

Support transit ridership by integrating service into the campus and making the rider's experience safe, convenient, and accessible.

#### CRITERIA

- Coordinate transit stops with transit providers to optimize for operational considerations and safety.
- Locate transit stops adjacent to active areas and where they are visible from adjacent facilities.
- Provide shelter, good lighting, and street furnishings at transit stops.



▲ ACTIVE TRANSIT HUB

*When transit stops are integrated into active areas, they feel safer and are more desirable to wait and make connections. Elements include:*

- ① *Visible, comfortable transit stops*
- ② *Shelter to provide protection from weather such as sun, wind, and snow*
- ③ *Amenities such as refreshments and Wi-Fi*
- ④ *Comfortable furnishings*
- ⑤ *Good lighting for security and comfort*
- ⑥ *Adjacent active uses that support defensible space*

## OPEN SPACE & LANDSCAPE DESIGN

### CAMPUS CONTEXT

#### INTENT

Site landscape design should highlight the campus's location in Bend and Central Oregon, reflecting the local ecological and cultural context and lending a strong sense of identity to the campus.

#### CRITERIA

- Utilize plant materials that are native to or compatible with the Central Oregon Ponderosa Pine-Bitterbrush-Bunchgrass Sage landscape.
- Emulate the Central Oregon native planting appearance through the creation of informal planting areas.
- Select site furniture and elements that are derived from, or compatible with, local wood, stone, and other materials.
- Harvest and re-establish any acceptable native planting from development sites, if available.



^ CENTRAL OREGON PLANT PALETTE

*The OSU-Cascades site is characterized by Central Oregon native woodland and scrub landscapes. Site planting should be compatible with this native palette.*

## OPEN SPACE & LANDSCAPE DESIGN

### CAMPUS CHARACTER

#### INTENT

The campus design should highlight the distinct topographic character of Central Oregon and of the site, including the dramatic slopes of the pumice mine.

#### CRITERIA

- Develop grading approaches that provide accessible and level building sites while acknowledging the vertical nature of the site in select areas.
- Visually highlight site restoration through the use of grading and planting.



▲ PUMICE MINE WALLS

*The OSU-Cascades existing site is characterized by dramatic site walls and steep topography from the former pumice mining operation. Site reclamation should preserve some of the exposed geology during grading of campus topography.*

## OPEN SPACE & LANDSCAPE DESIGN

## ECOLOGY & HABITAT

### INTENT

Development of the OSU-Cascades campus should have a positive impact on site ecological health and habitat.

### CRITERIA

- Utilize native plants that provide habitat for appropriate local and regional threatened species, including bats and pollinator insects.
- Incorporate ecological design into educational signage and course curricula.
- Consider the goals of local and regional wildlife and environmental agencies in site design.
- Where appropriate, integrate elements such as small enclaves into landscape design to provide habitat for bats, birds, and other desired species.



### ^ BAT SPECIES

*Twelve species of bats call Central Oregon home. Campus design should help sustain the local and regional population of multiple bat species by augmenting existing habitat and reducing disturbances.*

## OPEN SPACE & LANDSCAPE DESIGN

# ACCESSIBILITY

### INTENT

Design the campus landscape to provide convenient and safe access and engagement for persons of all physical abilities. All improvements should comply with the current edition of Oregon State University's best practice standards for environmental accessibility.

### CRITERIA

- Provide accessible routes throughout the campus to allow persons of all abilities to access and experience all areas of the campus.
- Integrate sloped walks and site ramps into the campus design, where needed, so they can be conveniently utilized by the entire campus population.
- Utilize slip-resistant finishes in paved areas.
- Consider how to mitigate the build-up of snow and ice on pedestrian paths and in parking lots in terms of accessible routes.
- Ensure that all landscape development complies with the current edition of the Americans with Disabilities Act (ADA) Standards for Accessible Design and the Oregon State University's best practice standards for environmental accessibility.



### ^ ACCESSIBILITY

*Integrate accessible routes in the campus to provide seamless transitions throughout for all campus users.*

## OPEN SPACE & LANDSCAPE DESIGN

### PLANTING

#### INTENT

Trees, shrubs, and other plants located on the campus should contribute to the campus environment, support pedestrian comfort, reinforce the university's identity and sustainability values, and contribute to local and regional ecological goals.

#### CRITERIA

- Utilize planting in landscape design to create comfortable and distinctive outdoor environments.
- Use plants that are native or climate appropriate, reflecting the local ecology and the Central Oregon landscape. Install plants in naturalistic patterns to honor native landscapes.
- Install native plant habitats that support pollinators in patches throughout the campus.
- Minimize the use of supplemental irrigation.
- Utilize landscape to screen parking and loading areas, where possible.
- Preserve native plant materials that are present on the site, where possible.



▲ NATIVE LANDSCAPES

*A signature of the campus will be the restoration and healthy establishment of native plantings.*

## OPEN SPACE & LANDSCAPE DESIGN

# WATER MANAGEMENT

### INTENT

Campus development should acknowledge the value of water as a critical resource in Central Oregon.

### CRITERIA

- Integrate stormwater management into site landscape design and highlight it for educational purposes.
- Design stormwater infrastructure to mimic natural hydrologic processes and maximize stormwater recharge.
- Capture rain and snow melt from buildings to use for non-potable uses.
- Incorporate wastewater treatment in consolidated areas of the campus to maximize the efficiency of treatment facilities.



### ▲ WATER MANAGEMENT

*Both stormwater and treated wastewater should be integrated into the campus landscape as a symbol of the university's commitment to stewardship of this important resource.*

## OPEN SPACE & LANDSCAPE DESIGN

### SITE MATERIALS

#### INTENT

Materials used for paving and other landscape elements should support campus function, enhance the campus environment, and ensure safety.

#### CRITERIA

- Utilize materials in site paving and furniture that are locally-sourced, when possible, and reference the Bend and Central Oregon context.
- Utilize durable surface treatments to support heavy use, and minimize the need for long-term site maintenance.
- Select site materials that are comprised of non-toxic and recycled materials with minimal embodied energy.
- Incorporate pervious materials, where possible, to facilitate rainwater infiltration.
- Consider alternatives to asphalt in traffic areas to the extent feasible, while ensuring that surfaces can support emergency and delivery vehicles where necessary.
- Utilize paving materials to distinguish pedestrian zones from vehicular areas and enhance pedestrian safety.
- Integrate building materials into site elements to help integrate indoor and outdoor spaces.



^ SITE MATERIALS

*Campus materials should provide comfort, durability, and be of a palette compatible with the Central Oregon setting.*

- Give consideration to the reflective and absorptive properties of wall materials to maximize human comfort.
- Utilize modular paving materials, where appropriate, so that select portions can be removed and replaced as maintenance is required.

## OPEN SPACE & LANDSCAPE DESIGN

### SITE ELEMENTS

#### INTENT

The family of furniture and site elements such as walls, ramps, bollards, receptacles, bicycle racks, and signage should help create visual cohesion across the campus as well as a comfortable, distinct setting.

#### CRITERIA

- Install a variety of seating throughout the site to encourage the use of outdoor spaces.
- Provide movable tables, chairs, or benches, where possible, to accommodate groups of varying sizes and allow multiple seating arrangements.
- Utilize common site furniture and elements across the campus.
- Consider locations for site furniture from the start of the design process so that their placement is deliberate and unobtrusive.
- Select waste receptacles that prevent wildlife scavenging and protect water infiltration.
- Locate bicycle racks at major building entries and ensure rack design and placement complies with city code.
- Select site furniture that is constructed with durable materials and fabrication methods in finishes that consider solar gain and user comfort.



▲ FLEXIBLE SEATING

*Flexible seating and tables enables users to adapt campus spaces to meet their specific needs. This adaptability will allow for impromptu gatherings and add to campus vitality.*

- Incorporate art installations into campus open spaces to inspire creativity and reflection. Art should celebrate the campus' natural and community context within Bend and Central Oregon.
- Locate interpretive signage throughout the site to educate people about site features and campus activities.

## OPEN SPACE & LANDSCAPE DESIGN

### SITE LIGHTING

#### INTENT

Site lighting should contribute to the campus environment and ensure safety while minimizing disturbance to habitat and adjacent property.

#### CRITERIA

- Select lighting to create a cohesive family of fixtures derived from similar or complementary materials.
- Provide pedestrian lighting along all pathways, spaced to provide consistent coverage. Light natural areas of the site less intensely, while also ensuring pedestrian comfort and safety.
- Integrate lighting into landscape elements such as ramps, walls, or railings.
- Ensure that campus lighting does not illuminate or disturb surrounding neighborhoods.
- Ensure that all lighting fixtures conform to current City of Bend outdoor lighting standards and international Dark Sky Association standards, including such requirements as full-cutoff features, minimal glare, efficient light sources, and the use of motion sensors, where appropriate.
- Select lighting to minimize disturbance to bats and other desirable animals or insects.



#### ▲ SITE LIGHTING

*Integrating lighting into the landscape will enable safe and comfortable nighttime use and enhance campus character.*

## OPEN SPACE & LANDSCAPE DESIGN

### SITE PREPARATION & CONSTRUCTION

#### INTENT

Existing and imported soils should be utilized to maximize the long-term growth and health of the landscape.

#### CRITERIA

- Undertake measures to remove and preserve site topsoil in advance of building or infrastructure construction.
- Utilize soil with minimal weed seed. Test and pre-treat soils as necessary.
- Identify and implement an invasive plant management plan prior to and during construction.
- Treat any imported soils prior to use on campus to ensure invasive seeds or plants are eliminated.
- If native topsoil is present, stockpile it on site for future use in planting areas. In compacted areas adjacent to buildings, remove and scarify gravel and other materials mechanically prior to installation of an un-compacted native topsoil soil.



▲ LONG-TERM LANDSCAPE VITALITY

*Through the careful and thorough preparation of site soils, the campus landscape will thrive over the long term.*







# 6 | IMPLEMENTATION



# 6 | IMPLEMENTATION

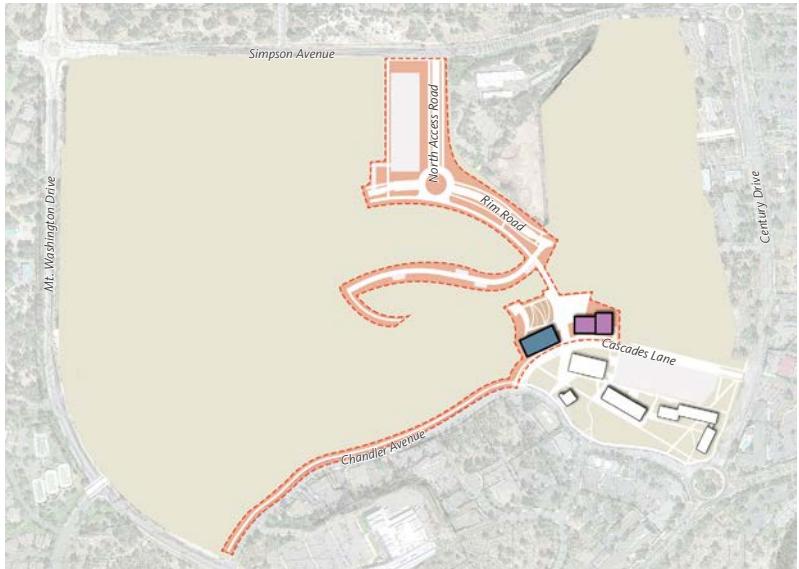
## 6.1 Sequencing

The campus will develop over a number of years. Phasing will be dependent on many factors, including availability of funding, enrollment growth, and potential partnership development agreements. Site grading and reclamation of the pumice mine as well as the landfill remediation approach are also important determinants of phasing. Based on the reclamation strategy, infrastructure plan, and ten-year capital plan, the preliminary phasing strategy is expected to follow the sequence of steps listed in Table 12.

✓ *Table 12: Sequencing*

PHASE OF CAMPUS DEVELOPMENT	SEQUENCE OF STEPS
Phase 0	<ul style="list-style-type: none"><li>• Partial landfill remediation of Area 2</li><li>• Pumice mine reclamation and Bowl grading</li></ul>
Phase 1	<ul style="list-style-type: none"><li>• Roadway and utility infrastructure at North Access, Bowl, and Rim Roads</li><li>• Academic building</li><li>• Additional surface parking and landscape</li><li>• First phase of Student Success Center</li><li>• Central utility plant and facilities yard</li><li>• Student housing in the Bowl</li><li>• Potential Innovation Partnership development</li></ul>

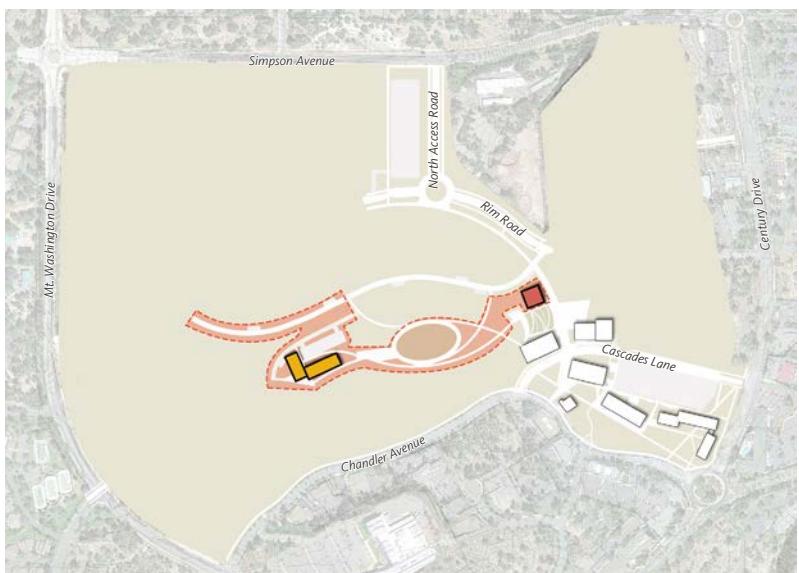
PHASE OF CAMPUS DEVELOPMENT	SEQUENCE OF STEPS
Phase 2	<ul style="list-style-type: none"><li>• Partial landfill remediation of Area 1 and 2</li><li>• Academic building</li><li>• First phase of Health &amp; Wellness Center and recreation field</li><li>• Student housing in the Bowl</li><li>• Roadway and utility infrastructure at Innovation District and Rim Road</li><li>• Additional parking and landscape</li><li>• Potential Innovation District partnership/middle market housing development</li></ul>
Phase 3	<ul style="list-style-type: none"><li>• Partial landfill remediation of Area 1 and 3</li><li>• Roadway and utility infrastructure at Recreation and Rim Roads</li><li>• Academic buildings</li><li>• Housing and dining buildings in the Bowl</li><li>• Additional parking and landscape</li><li>• Potential Innovation District partnership/middle market housing development</li></ul>
Phase 4	<ul style="list-style-type: none"><li>• Roadway and utility infrastructure at Metolius Drive extension</li><li>• Academic buildings</li><li>• Second phase of the Student Success Center</li><li>• Second phase of the Health &amp; Wellness Center</li><li>• Student housing at Rim Road/Metolius Drive/SW Century Drive</li><li>• Completed recreation fields and courts</li><li>• Ground-mounted photovoltaic arrays</li><li>• Additional parking and landscape</li><li>• Potential Innovation District partnership/middle market housing development</li></ul>



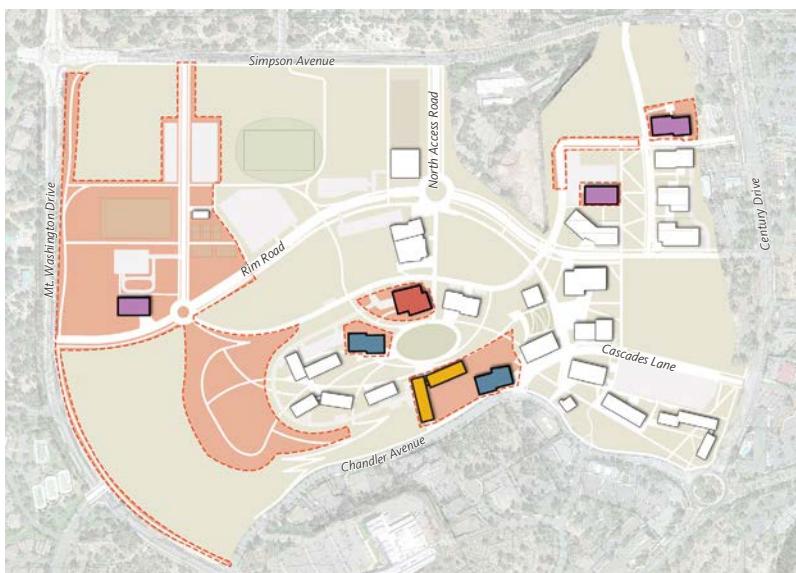
^ Figure 50: Phase 1A



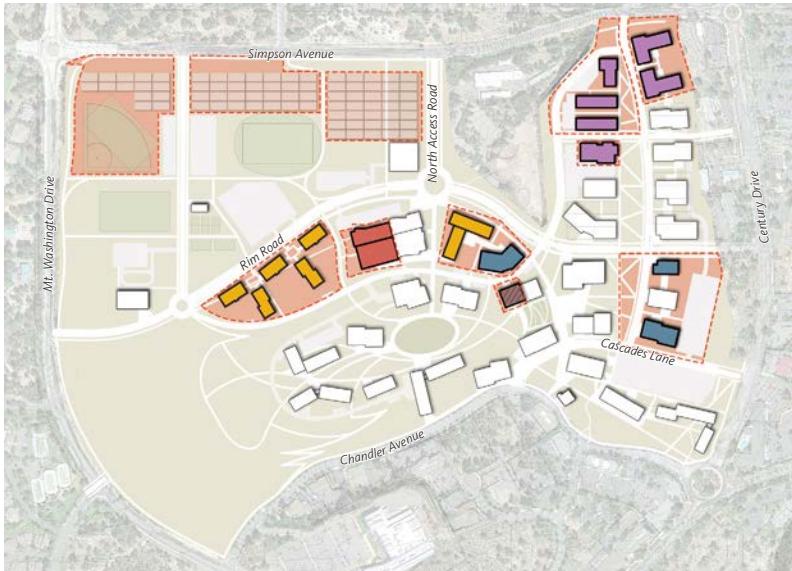
^ Figure 52: Phase 2



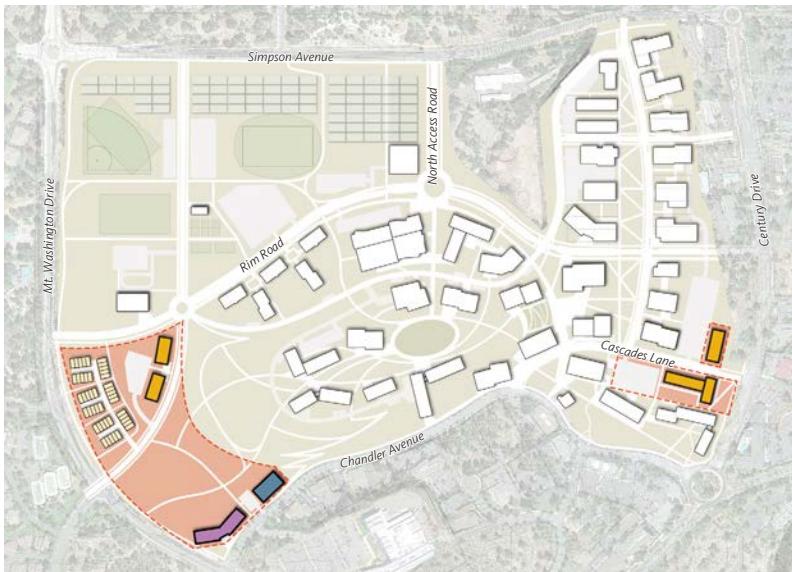
^ Figure 51: Phase 1B



^ Figure 53: Phase 3



^ Figure 54: Phase 4A



^ Figure 55: Phase 4B

## 6.2 Plan Continuity

The LRDP along with other institutional planning documents and the city-approved master plan should be the basis for ongoing campus development. A committee that aligns with the OSU-Cascades governance structure should be established to ensure continuity of the development plan and design guidelines. The development review committee should include members with strong professional and institutional knowledge who can evaluate the compliance of proposed landscape and building projects for the campus.

A recommended development review committee schedule for evaluating all proposed campus development projects would be at three project phases:

1. Early pre-schematic stage
2. End of schematic design
3. End of design development

Additional presentations may be required if substantial design changes are made at a later stage of development. At least one member of the development review committee may be assigned to participate in the designer selection process. A primary consideration for selection of architects, landscape architects, and contractors should be their demonstrated ability to work within the LRDP and campus development guidelines to produce facilities that will be an asset to the campus as a whole as well as to any campus stakeholders that will use the new facilities.



# ACKNOWLEDGMENTS

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