WSU

Basis of Design Document

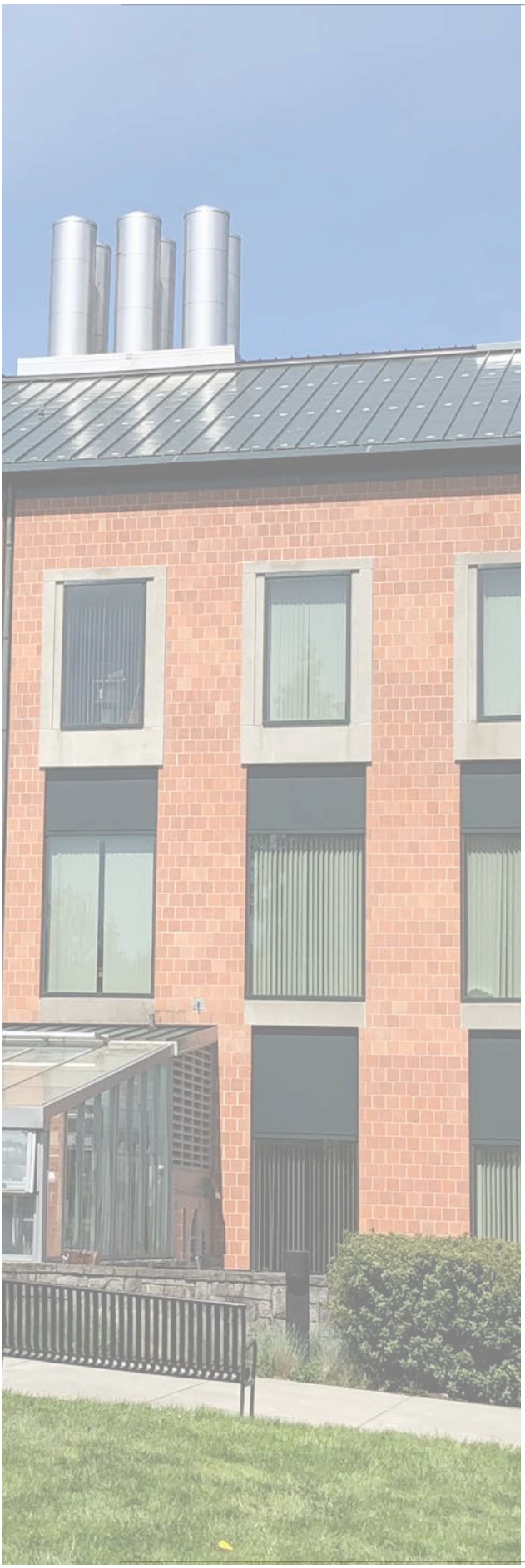
July 2019

WSU Vancouver

Life Sciences Building

State Capital Project No. 30000840
Integrus Project No. 21804.01

integrus ARCHITECTURE



1

executive summary

Problem Statement

WSU Vancouver opened as a branch campus in 1989, serving upper division and graduate students, and moved to its current location in 1996. In 2006, lower division students were admitted for the first time, immediately doubling scheduled lab sections from 17 to 35. 47% of current campus undergraduates are in STEM related majors, yet no new lab spaces have been added since the creation of the campus in 1996.

An independent report (Penson) was commissioned to identify existing degree programs which have high or medium potential for future growth of the campus. Key drivers were identified in high potential degrees currently offered on campus; high-demand majors offered by WSU (in general) but not currently on the Vancouver campus; and the integration of spaces on campus which are currently spread across multiple locations.

Both the lack of current lab spaces and the future strategic direction for the campus have identified the Life Sciences Building as a critical project for the continued growth of WSU Vancouver in its mission to serve Clark County and the State of Washington.

Goals

A series of guiding project goals were identified by the Steering Committee. In order of priority they include:

- Flexible, adaptable *teaching labs* that attract, and retain, students
- *Research labs* (wet and dry) including flexible and adaptable instruments that attract, and retain, new faculty
- An *expanded* and *comprehensive vivarium* to further research opportunities on campus
- Locate specialized use classrooms near labs to encourage experiences which *emphasize hands-on STEM education*
- Create opportunities for *spontaneous interdisciplinary interaction* across all levels
- Increase *access to faculty* by providing office space near research labs
- Acknowledge the *key role* that *graduate students* play in the campus environment through provision of offices, lounges, and amenities
- *Foster strategic partnerships* with the *community* and *industry*

Programmatic Needs

Restated in terms of area and occupancy, the proposed facility will be approximately 60,000 square feet. With active learning and collaboration at its core, roughly 80% of the proposed building area will be laboratory space and associated laboratory support space, split evenly between teaching and research labs. It will include six (6) teaching laboratories, each between 1,260 and 2,025 square feet, serving 24 students each. Twelve (12) separate research laboratories will be provided, including nine (9) with associated vivarium spaces. In various configurations by discipline, each research lab suite will total approximately 700 square feet. Individual offices are provided for 29 faculty, 6 post-doctoral researchers, and 20 graduate students.

	Type of Space					
	Teaching Lab	Research Lab	Lab Support	Administrative	Offices	
Net Assignable Building Square Footage (NASF)	10,600	10,500	33,393	512	6,405	36,567
Gross Building Square Footage	**17,373**	**17,210**	**54,732**	**839**	**10,498**	**59,933**
Percentage of Total Building by Type of Space	28.99%	28.71%	91.32%	1.40%	17.52%	

Site

Guided by the WSU Vancouver Campus Master Plan, which calls for a series of hierarchical courtyards along the Mount Saint Helens view corridor, the selected building site places the new facility among the three existing science buildings on campus

shaping a communal open space. Important aspects of the site that should be considered include:

- Establishment of an identifiable campus presence/entity for all the science buildings and the associated courtyard.
- A visible public entry and parking for community engagement activities.
- Dedicated vehicular access for programs to address field activities, outdoor demonstration programs, and the sensitivities associated with delivery of live-animal subjects and supplies.
- Creation of a connection to future parking in alignment with the campus Master Plan.
- Creation of a connection, either physical or implied, to the existing Computer Science and Engineering Building.
- The ability to share greenhouse resources across multiple locations and expand capacity.

Sustainability

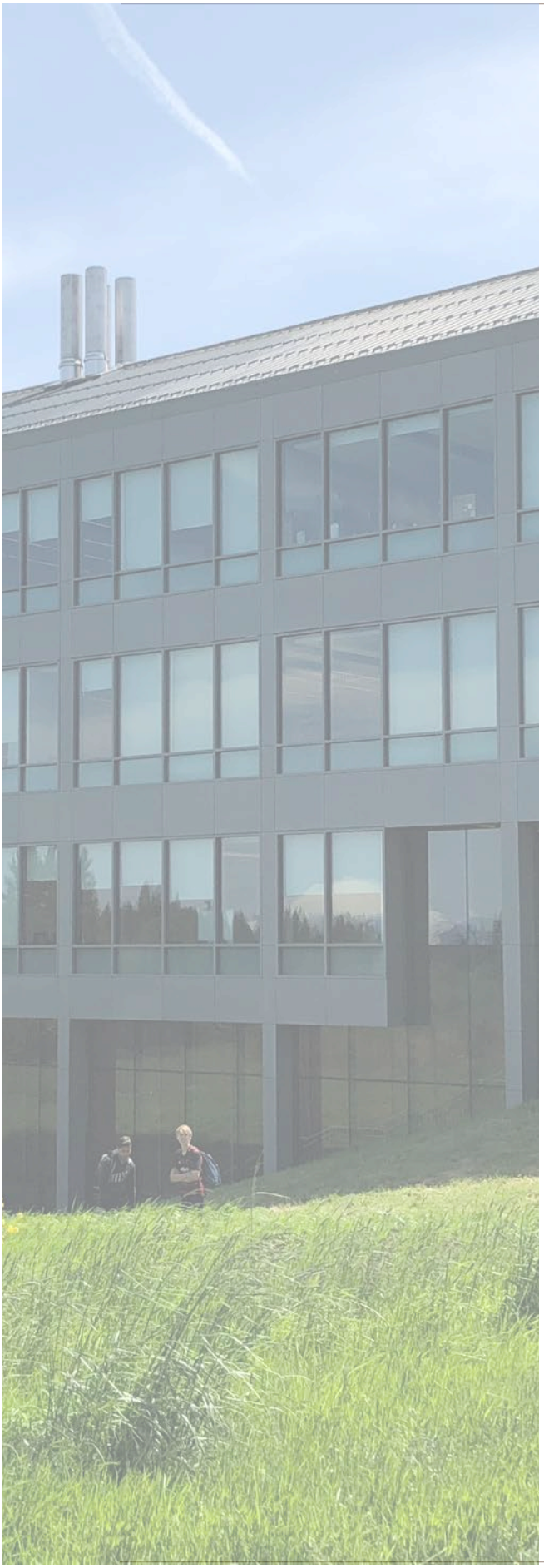
The project is targeting LEED Silver (v4) and will comply with the State Greenhouse Gas Emissions Policy.

Pre-Design Executive Steering Committee Members

We wish to thank the following Committee for their time and commitment toward the WSU Vancouver Life Sciences project:

Lynn Valenter	WSU Vancouver, Vice Chancellor
Bill Hooper	WSU Vancouver, Associate Vice Chancellor for Facilities Services
Christine Portfors	WSU Vancouver, Associate Vice Chancellor, Research and Graduate Education
Linda Eddy	WSU Vancouver, Director & Associate Dean, College of Nursing
Amy Wharton	WSU Vancouver, Director & Associate Dean, College of Arts and Sciences
Allison Coffin	WSU Vancouver, Associate Professor of Neuroscience
Marc Kramer	WSU Vancouver, Associate Professor of Environmental Chemistry
Jason Baerlocher	WSU Facilities Services

Consultant Team	
Brian Carter	Integrus Architecture, Principal, Project Executive
Becky Barnhart	Integrus Architecture, Principal, Managing Principal
Burcin Moehring	Integrus Architecture, Lab Planner
Daniel Gero	Integrus Architecture, Project Architect



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problem statement

2.1 The Problem Statement

WSU Vancouver opened as a branch campus in 1989, serving upper division and graduate students, and moved to its current location in 1996. In 2006, lower division students were admitted for the first time, immediately doubling scheduled lab sections from 17 to 35. No new labs have been created on campus since the addition of lower division classes yet WSU Vancouver continues to grow and 47% of current campus undergraduates are in STEM related majors.

Additional facilities are required by 2020 to support general enrollment and program growth in Nursing, Biology, Neuroscience, Chemistry, and Engineering. Currently more than 101 sections per term are offered through maximum utilization of teaching labs; however, WSU Vancouver is over capacity for general science instructional labs and is challenged to accommodate new growth. Without additional general science labs, many undergraduate students will be unable to register for Chemistry, Biology, or other classes requiring wet labs, creating a choke point in fulfilling general degree requirements for all majors – especially those in the STEM and healthcare fields which require multiple teaching labs.

WSU is tasked to meet State of Washington targets for undergraduate and graduate student enrollment over the next several years, strategic master planning for future growth, and completion of those projects which will be critical. The existing classroom building (VCLS), Science and Engineering Building (VSCI), and Clark Center (VCCN) were not originally designed for the type of teaching and research that is being performed by the Biology, Environmental Science, Nursing, and Chemistry Departments. While small-scale renovations have been conducted to address these needs, the mechanical retrofits cannot provide sufficient air circulation – resulting in facilities which cannot meet accreditation standards and the ability of researchers to acquire grants and conduct tasks critical to their research. Outdated and inefficient electrical services pose a safety hazard and do not adequately protect critical research, resulting in lost time and results. In general, lab and teaching facilities lack modern research lab features and are not located in a proximate manner. This compromises the ability of faculty members to perform their work and capitalize on potential synergies across the various departments.

2.2 Project Needs

2.2.1 Purpose of the Project

Since 2003, WSU has identified a Life Sciences Building within both long-term Strategic Plans and Master Planning documents as a critical project for the continued growth of WSU Vancouver in its mission to serve Clark County and the State of Washington.

The Life Sciences Building will increase WSU's capacity to carry out fundamental teaching and research needed to advance Washington's industries. This is an exciting area that is crucial to the State economy. To compete, WSU needs to support and attract new scientists and students as well as retain highly productive faculty members active in life science research and education through provision of a new 50+ year building. During the pre-design process, faculty took a critical look at their current spaces, labs, and long-term programmatic needs to best serve the faculty, researchers, students, the University, and the State. This document integrates strategic program initiatives with an evaluation of existing, aging facilities and the additional space needs of each department.

The project is envisioned as a 60,000 gross square foot multi-story instructional facility bringing components of Vancouver's basic, translational, applied, and clinical health programs together in one location on campus, including Nursing, Neuroscience, Psychology, and Molecular Biology. As the Vancouver campus is out of space for new labs, this building fills a critical need by providing teaching and research laboratories for multiple disciplines in STEM-related fields. It includes specialized, dedicated vivarium space to house animals for instructional labs and federally-funded research programs, meeting regulatory requirements and expansion of vivarium-based programs.

2.2.2 Facility Needs

WSU Vancouver has undertaken an extensive review of unmet facility needs on the campus in the context of overall planning for the Life Sciences Building. The following excerpts have been taken from the Penson report (Appendix C) identifying existing degree programs which have high or medium potential for growth.

1. Growth in current degrees with high potential

While the overall trend is toward growth, with 6% more degrees granted across all bachelor's and master's programs in 2015 over 2013, there was not a significantly higher rate of growth in the identified high potential and medium potential programs.

2. High-demand majors offered by WSU but not currently offered at Vancouver

The Penson report looked at national survey and local survey data and identified the most in-demand majors not currently offered in Vancouver as Communication, Chemistry, and Mathematics.

The current lab spaces are deficient to meet the demand for undergraduate degrees in STEM courses including Biology, Environmental Science, Chemistry, Math, and Psychology.

The planning committee identified the following areas to be addressed in order to advance knowledge through teaching, research, innovation, and creativity across the wide range of academic disciplines:

- Teaching labs: The number, the size and the technology of teaching labs are inadequate to support the STEM education at this campus.
- Vivarium: Currently the spaces related to the Vivarium are located within different buildings and some of the spaces do not comply with AAALAC standards. Also, the Vivarium lacks some of the support spaces such as Dirty Storage, Cage Wash, Quarantine/Procedure Room, etc. and does not have enough animal holding rooms limiting the amount of research that can be conducted. Appropriate security measures for this type of facility cannot be accommodated within the existing retrofitted space.
- Vivarium Research Labs: There are not an adequate number and size of this type of research labs to support the curriculum.
- Research Labs: The number, the size, and the technology of research labs are inadequate to support the demand at this campus. The current research labs were not originally designed to accommodate flexible, modular, and sharable research labs.
- Nursing: The Nursing Department lacks a designated classroom with AMS equipment, study lounge, adequate offices, and storage. The facilities on the Vancouver campus are currently deficient as they do not comply with current Nursing accreditation standards.
- Greenhouse: The current Greenhouse does not have an adequate number of climate rooms to accommodate various temperatures and humidity to conduct desired experiments.
- Conference Rooms: The number and size of the conference rooms to support the listed departments are inadequate and not adequately AV supported.
- Offices and Administrative Spaces: There are not enough designated offices and administrative spaces to support the programs in the Life Sciences and Nursing at this campus.
- General Support Spaces such as Storage, Cold Rooms, etc.: There are not enough storage spaces for the listed departments. Some of the shared spaces, such as Cold Rooms, Walk-In Freezer Room ,etc., are not conveniently located in proximity to all the departments who need to use them.

3. Location on Campus, type of space

Courses from the listed departments are currently spread across campus and would benefit from being integrated in one location where faculty can interact and students can better understand the progression from one level to the next. All departments will benefit from sufficient faculty office spaces and flexible, technologically current teaching and research labs, classrooms, Greenhouse, and Vivarium that can be configured to meet different curricula and learning needs.

Please refer to **Section 9, Appendix A – WSU Campus Utilization Table** for futher information on FTE Capacity.

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vision, mission, and goals

3.1 Vision

Washington State University Vancouver will be a positive force in bettering the lives of the people of Southwest Washington and beyond by contributing outstanding research; expanding access to the highest-quality university education where student success is central; and engaging with community partners to address the needs of our changing world.

3.2 Mission

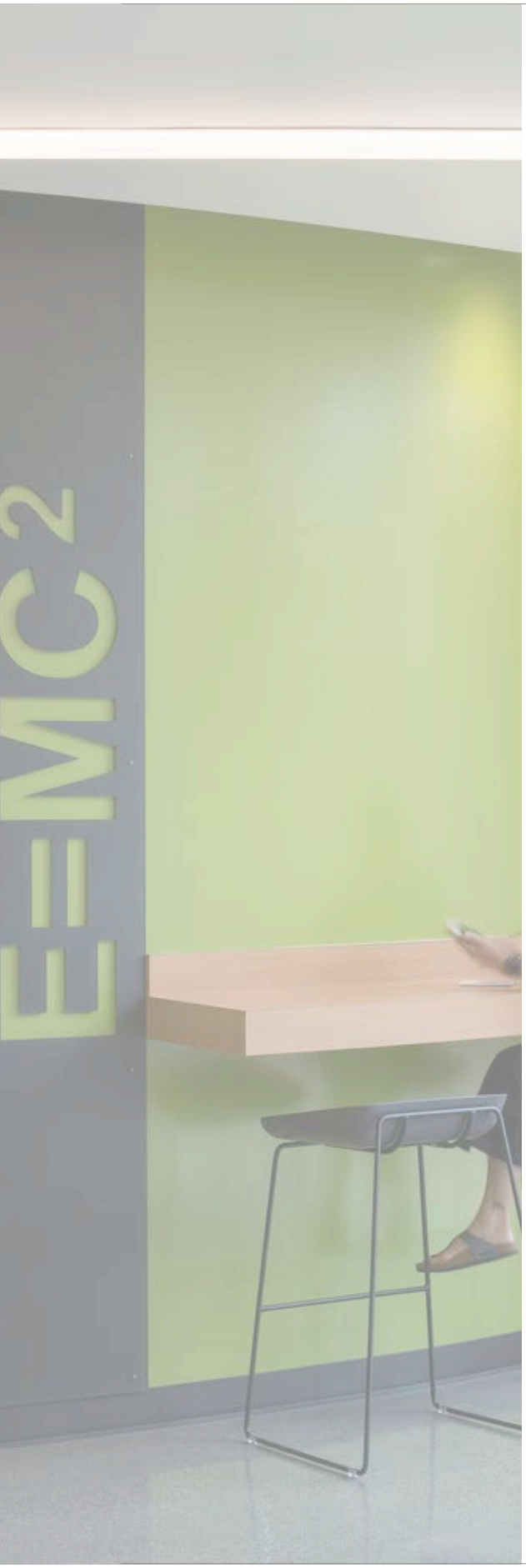
Washington State University Vancouver is dedicated to its land-grant tradition "for openness, accessibility and service to people." The campus mission stands on five pillars:

- To advance knowledge through research, innovation, and creativity across a wide range of academic disciplines.
- To extend knowledge through innovative educational programs in which students and emerging scholars are mentored to realize their highest potential and assume roles of leadership, responsibility, and service to society.
- To apply knowledge through local and global engagement that will improve quality of life and enhance the economy of the state, nation, and world.
- To address the need for social justice, equity, and a culture of inclusion in our society.
- To collaborate with partners to build the bonds that unite a healthy community.

3.2 Project Goals

Based on a series of discussions with the Steering Committee for the project, the following goals have been identified as guiding principles for the future WSU Vancouver Life Sciences Building. Goals are listed in order of priority as determined by the committee.

1. Flexible, adaptable **TEACHING LABS** that attract, and retain, students.
2. **RESEARCH LABS** (wet and dry) including flexible and adaptable instruments that attract, and retain, new faculty.
3. An **EXPANDED** and **COMPREHENSIVE VIVARIUM** to further research opportunities on campus.
4. Locate specialized use classrooms near teaching/research labs to encourage experiences which **EMPHASIZE HANDS-ON STEM EDUCATION**.
5. Create opportunities for **SPONTANEOUS INTERDISCIPLINARY INTERACTION** across all levels.
6. Increase **ACCESS TO FACULTY** by providing office space near research labs.
7. Acknowledge the **KEY ROLE** that **GRADUATE STUDENTS** play in the campus environment through provision of offices, lounges, and amenities.
8. **FOSTER STRATEGIC PARTNERSHIPS** with the **COMMUNITY** and **INDUSTRY**.



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programmatic summary

4.1 Programmatic Needs

The proposed project is envisioned as a multi-story instructional facility to bring all components of Vancouver's basic translational, applied, and clinical health programs together in one location on campus, including Biology, Molecular Biology, Environmental Science, Neuroscience, Nursing, and Chemistry. This building will fill the critical need for instructional laboratories for undergraduate and graduate science courses. It will also expand the vivarium capacity to support instruction as well as research programs and add both teaching and research laboratories and faculty offices. Comprehensive Site development, including extension of the underground utilities and an incremental extension of the Mt. St. Helens pedestrian corridor, is part of this project. Preparing students for careers in STEM fields and continued development of collaborative associations are consistent with Vancouver's emphasis on regional economic development. Many of Clark College's Nursing students currently continue their training through WSU Vancouver Nursing programs.

Research conducted by these faculty has high scientific impact and is regularly highlighted by the local and national press. They are discovering:

- What drugs may prevent hearing loss.
- How stress may increase hearing loss.
- How the brain is changing with drug addiction and how drug related memories may be reduced to prevent relapse.
- How the brain changes in people with Parkinson's disease such that they cannot understand speech as well.
- How the brain becomes tolerant to opioids so painkillers don't work anymore.

In addition to high quality research and training of students, the Neuroscience faculty are extensively engaged in outreach activities that encourage students starting in middle school to be excited about science. They have created novel curriculum that integrates art into learning about the brain. These outreach endeavors particularly focus on attracting underrepresented minorities into STEM disciplines in higher education.

Through the Pre-Design process, all departments have taken a critical look at their current spaces and at what spaces need to be developed in order to best serve the students, the University, and Vancouver. There are several critical programmatic needs driving the Life Sciences project that will be solved through the construction of a new facility.

After series of visioning workshops and planning committee meetings, the following project needs were identified:

- Teaching labs
- A new Vivarium which will comply with AAALAC and include:
  - Adequate support spaces such as Dirty Storage, Cage Wash, Quarantine/Procedure Room, etc.
- Vivarium Research Labs
- Nursing designated classroom
- General Research Laboratories
- Greenhouse with climate rooms
- Offices and Administrative Spaces
- General Support Spaces such as Storage, Cold Rooms, etc.

The WSU planning Committee established that both the teaching and the research laboratories should be flexible and incorporate active learning.

4.2 Nature of Space

With active learning and collaboration at its core, roughly 80% of the proposed building area will be laboratory space and associated laboratory support space, split evenly between teaching and research labs. This includes one dry classroom and two small conference rooms for reviewing research activities. The remaining space is allocated to faculty and student offices – also evenly divided among graduate students, post-doctoral researchers, and faculty.

Restated in terms of area and occupancy, the proposed facility will be approximately 60,000 square feet. It will include six (6) teaching laboratories, each between 1,260 and 2,025 square feet, serving 24 students each. The 1,000 square foot classroom will also serve 24 students. Twelve (12) separate research laboratories will be provided, including nine (9) with associated vivarium spaces. In various configurations by discipline, each research lab suite will total approximately 700 square feet. Individual offices are provided for 29 faculty, 6 post-doctoral researchers, and 20 graduate students.

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Percentage of Total Building by Type of Space	28.99%	28.71%	91.32%	1.40%	17.52%	

4.3 Considerations for Building Configuration

The new facility will be a four-story building of 60,000 gross square feet that steps down the slope of the existing campus. Undergraduate student spaces such as Teaching Laboratories will be located near a courtyard and campus walkway, highly visible and accessible to students with their adjacency to the courtyard and other science buildings. Faculty, post-doctoral, and graduate student spaces such as Research Laboratories and Vivarium will be located on the far end of the building, where high visibility and easy access are not desired. This also provides adjacency to parking and the main road for vehicle access and field research staging.

With student spaces on the east end and research spaces on the west, the core of the building should be an open collaboration area where the two come together. A goal of the facility is to encourage interaction between faculty and students of all levels and areas of study. By locating open study space, meeting rooms, and overlapping office suites at the center of the building, the environment itself will foster a culture of interaction and the sharing of knowledge.

Because the existing surrounding campus buildings are three stories, so will be the new building on its campus side/courtyard elevation. Because it's a four-story building, at this end the lowest level will be depressed into the earth. This condition mirrors the existing Computer Science & Engineering Building, establishing a direct outdoor connection between the two buildings, igniting spontaneous interaction between researchers and supporting the sharing of resources.

4.4 Organizational Concepts

Classroom/Office Concept:

WSU Vancouver currently has a deficit of appropriately sized teaching and research spaces on campus making it difficult to schedule appropriate space on campus and limiting the WSU Vancouver's ability to offer some courses as noted in the 10-year Master Plan.

In order to gain greater utilization, efficiency, and enhance student activity in the new building a "neighborhood" concept has been included. Each "neighborhood" will consist of a grouping of like sized labs adjacent to faculty offices and placed along a central circulation spine. This allows the building to be built on an economical structural module and allows for interchangeability of

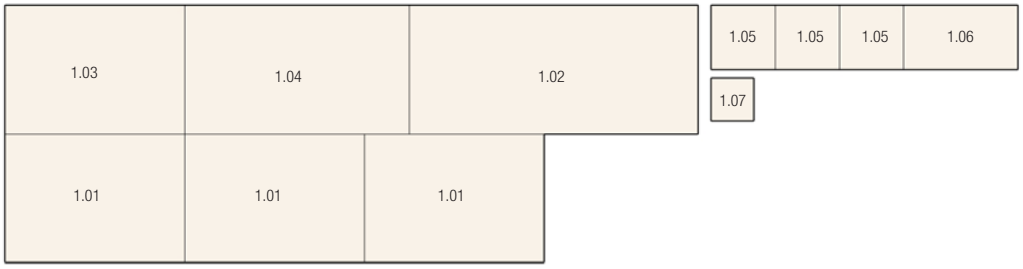
"neighborhoods" between departments, maximizing teaching and research lab use.

The central circulation spine is seen as an opportunity to create a "living room" for students to encourage cross pollination between departments and create opportunities for collaboration.

A variety of teaching lab types will be provided ranging from general, multi-purpose, flexible teaching labs to designated General Chemistry, Inorganic Chemistry, and Nursing Labs. This variety of space will not only meet the current needs of the departments but will maximize shared laboratory use and accommodate future technological advances.

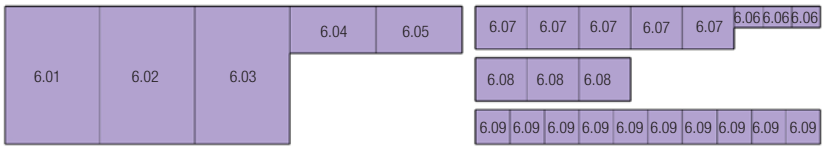
Teaching Labs: Labs are dispersed all throughout the campus, preventing student/faculty collaboration between the disciplines. Inadequate Biology, Environmental Studies, and Chemistry labs at this campus prevent attracting and retaining students.

TEACHING LABS
PROGRAM BLOCKS



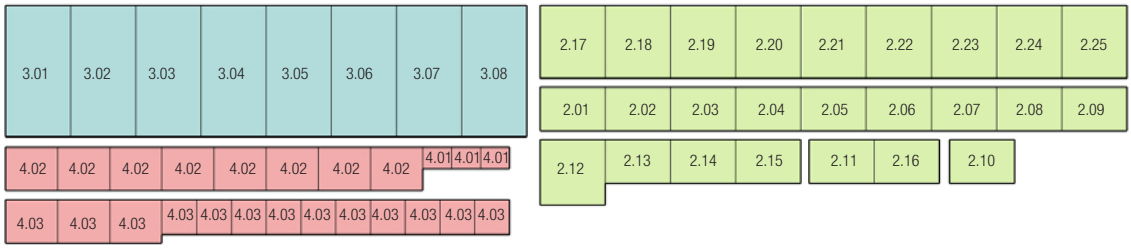
Research Labs: Both wet and dry research labs are inadequate and dispersed throughout the campus hindering collaboration. The existing labs are not flexible and do not accommodate diverse use of the labs. The number of fume hoods and sinks in the labs are inadequate too.

GENERAL RESEARCH
PROGRAM BLOCKS



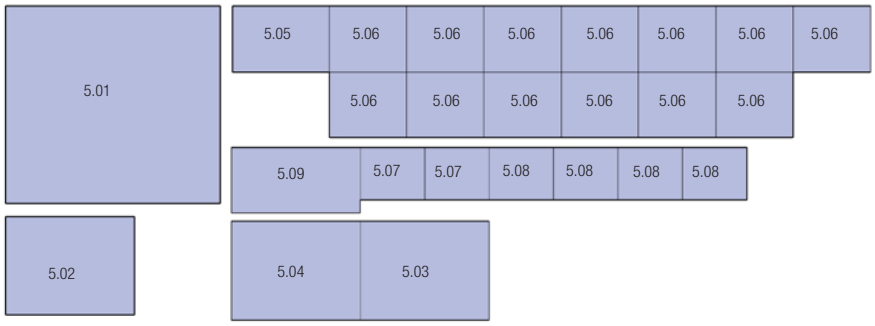
Vivarium: Vivarium space is insufficient; it needs additional animal holding rooms and more research labs. Without them, WSU's research opportunities are inhibited. Also, the existing vivarium is located on the upper floor of a building. Associated spaces cannot be located within it, requiring transportation of animals to multiple locations. These conditions make security difficult and providing a more serviceable location in the building is desirable.

VIVARIUM RESEARCH
PROGRAM BLOCKS



Nursing: The Nursing Program requires an AMS-equipped classroom, study-lounge, offices and storage.

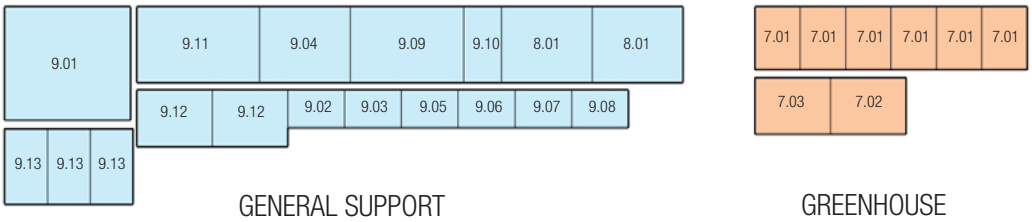
NURSING PROGRAM



Chemistry: The Chemistry Program requires organic and inorganic Teaching Labs and lab support spaces.

Biology and Environmental Studies: The labs are housed in cramped and outdated spaces in The Science and Engineering Building. The fragmented locations of the teaching and research labs and the support spaces on this campus has discouraged student interaction and teaching flexibility. Biology and Environmental Studies, Nursing, Chemistry, Greenhouse, and the Vivarium are currently spread across campus and will benefit from being proximate to each other. Classrooms and labs can accommodate class size needs and provide flexibility and ability to adapt to multiple different teaching styles. Faculty offices will be integrated closer to classrooms, teaching labs, research labs, and student study areas for increased faculty-student availability and interaction. Close proximity of departments will strengthen the program relationships. Students will benefit through the state-of-the art laboratories that have modern technology and flexibility that the labs currently serving the programs lack.

GENERAL SUPPORT & GREENHOUSE



WSU Vancouver campus will accommodate more students and increase enrollment and degree completion.

4.5 Data Gathered

Appendix B contains the Predesign Questionnaire which includes the personal opinions, hopes, challenges, and dreams of the users/faculty regarding the New Life Sciences Building and the campus.

The data gathered by this survey was used while developing the Program Space List.

4.6 Assumptions Used

In exploring and defining the needs of the facility, it was necessary to make certain assumptions.

- The standards developed in the State Facilities Evaluation and Planning Guide were used.
- Space needs are projected to the year 2030.
- Shared use of space will be planned whenever possible. A number of spaces will be joint use, meaning priority of the space is given to one department but it is available to all when not otherwise scheduled.

4.7 Preliminary Space Summary

The following Preliminary Program Space Summary lists the areas determined by the Pre-Design Committee to be necessary for the combined departments to function to the greatest benefit of the WSU Vancouver. The total net assignable square footage for the program is 35,647 square feet. This makes the total gross square footage, at 61% efficiency, approximately 59,999 square feet. Given the preliminary nature of this document, the project's lab planner should verify the programmatic needs of the individual labs. For the purpose of this study an allocation of 700 sf / PL (some split space = 450 + 250 for PI's) was utilized.

This list represents the "Base Program."

13-May-19		Type of Space						
Space ID	Type of Space	Teaching Lab	Research Lab	Lab Support	Admin	Offices	Quantity	Total
		All areas are Net Assignable Square Feet (NASF) unless noted otherwise						
	1.0 Teaching Labs							
1.01	General - Teaching Labs (flexible, multi-purpose) (physics, bio, environ)	1,260					3	3,780
1.02	Nursing - Standardized Patient Lab including 2 adjacent exam rooms	2,025					1	2,025
1.03	Chemistry - Gen Chem/Inorganic Chem Lab	1,260					1	1,260
1.04	Chemistry - Organic Chem Lab	1,575					1	1,575
					Subtotal # Teaching Labs		**6**	
1.05	Flexible Prep Rooms for Teaching Labs, Storage, Appliances			220			3	660
1.06	Chemical Stockroom/Storeroom - Teaching Labs			400			1	400
1.07	Lab Assistant					100	1	100
	Net Teaching Lab SF	8,640		1,060		100		9,800
	Grossing factor (61% Net:Gross Efficiency)							1.639
	Gross Teaching Lab SF	14,161		1,737		164		**16,062**
	2.0 Vivarium							
2.01	Animal Housing 1 - Zebrafish		150				1	150
2.02	Animal Housing 2 - Zebrafish		150				1	150
2.03	Animal Housing 3 - Amphibians		150				1	150
2.04	Animal Housing 4 - Rats		150				1	150
2.05	Animal Housing 5 - Rats		150				1	150
2.06	Animal Housing 6 - Mice		150				1	150
2.07	Animal Housing 7 - Mice		150				1	150
2.08	Animal Housing 8 - Future Faculty Flex		150				1	150
2.09	Animal Housing 9 - Future Faculty Flex		150				1	150
					Subtotal # Animal Housing		**9**	
2.10	Entry Area			150			1	150
2.11	Dirty Storage			150			1	150
2.12	Cage Wash/Clean Storage (BSL-2)/Prep Lab			225			1	225
2.13	Bedding			150			1	150
2.14	Quarantine/Procedure Room			150			1	150
2.15	Staging Room			150			1	150
2.16	Storage			150			1	150
	Vivarium Research Labs (1/3 of total 700 SF allocation per researcher)							
2.17	Vivarium Research Lab 1 - Zebrafish		250				1	250
2.18	Vivarium Research Lab 2 - Zebrafish		250				1	250
2.19	Vivarium Research Lab 3 - Amphibians		250				1	250
2.20	Vivarium Research Lab 4 - Rats		250				1	250
2.21	Vivarium Research Lab 5 - Rats		250				1	250
2.22	Vivarium Research Lab 6 - Mice		250				1	250
2.23	Vivarium Research Lab 7 - Mice		250				1	250
2.24	Vivarium Research Lab 8 - Future Faculty Flex		250				1	250
2.25	Vivarium Research Lab 9 - Future Faculty Flex		250				1	250
					Subtotal # Vivarium Research		**9**	
	Net Vivarium SF		3,600	1,125				4,725
	Grossing Factor (61% Net:Gross Efficiency)							1.639
	Gross Vivarium SF		5,900	1,844				**7,744**

13-May-19

Space ID	Type of Space	Teaching Lab	Research Lab	Lab Support	Admin	Offices	Quantity	Total
		Type of Space						
		All areas are Net Assignable Square Feet (NASF) unless noted otherwise						
	3.0 "Split" Research Labs (Located Outside of Vivarium, 2/3 of total 700 SF allocation per researcher)							
3.01	Research Lab 1 - Faculty		450				1	450
3.02	Research Lab 2 - Faculty		450				1	450
3.03	Research Lab 3 - Faculty		450				1	450
3.04	Research Lab 4 - Faculty		450				1	450
3.05	Research Lab 5 - Faculty		450				1	450
3.06	Research Lab 6 - Faculty		450				1	450
3.07	Research Lab 7 - Future Faculty Flex		450				1	450
3.08	Research Lab 8 - Future Faculty Flex		450				1	450
	Net Split Research SF		3,600					3,600
	Grossing Factor (61% Net:Gross Efficiency)							1.639
	Gross Split Research SF		5,900					**5,900**
	4.0 Vivarium-Based Research Offices							
4.01	Administrative Work stations				32		3	96
4.02	Faculty Offices					120	8	960
4.03	Post Doctoral Offices					120	3	360
4.04	Graduate Offices					64	10	640
	Net Vivarium-Based Research Office SF				96	1,960		2,056
	Grossing Factor (61% Net:Gross Efficiency)							1.639
	Gross Vivarium-Based Research Office SF				157	3,212		**3,370**
	5.0 Nursing							
5.01	Classroom (AMS Equipped)	1,000					1	1,000
5.02	Study Lounge			300			1	300
5.03	General Storage			300			1	300
5.04	Storage - Telehealth (clean: dirty side)			300			1	300
5.05	Academic Director's Office					150	1	150
5.06	Faculty Offices					120	13	1,560
5.07	Hoteling Workstation Station (flexible)					80	2	160
5.08	Staff Offices (1 reception office closed & 3 open workstations)				80		4	320
	Net Nursing SF	1,000		900	320	2,070		4,290
	Grossing Factor (61% Net:Gross Efficiency)							1.639
	Gross Nursing SF	1,639		1,475	524	3,393		**7,031**
	6.0 Biology/Environmental Science							
6.01	Research Lab 1 - Faculty		700				1	700
6.02	Research Lab 2 - Faculty		700				1	700
6.03	Research Lab 3 - Faculty		700				1	700
					Subtotal # Research Labs		**3**	
6.04	Autoclave Room/Equipment Rm (w/ 2 machines) and glass washing			220			1	220
6.05	Ref/Freezer Room			220			1	220
6.06	Administrative Work Stations				32		3	96
6.07	Faculty Office					120	5	600
6.08	Post Doctoral Office					120	3	360
6.09	Graduate Student Work Stations					64	10	640
	Net General Research Lab SF		2,100	25,283	96	1,600		4,236
	Grossing Factor (61% Net:Gross Efficiency)							1.639
	Gross General Research Lab SF		3,442	41,440	157	2,622		**6,943**
	7.0 Greenhouse							
7.01	Greenhouse w/ 6 climate rooms		1,200				1	1,200
7.02	Headhouse/Potting			300			1	300
7.03	Greenhouse Storage			300			1	300
	Net Greenhouse SF		1,200	600				1,800
	Grossing Factor (61% Net:Gross Efficiency)							1.639
	Gross Greenhouse SF		1,967	983				**2,950**
	8.0 AMS Seminar Conference Rooms							
8.01	AMS Conference Rooms	480					2	960
	Net AMS SF	960						960
	Grossing Factor (61% Net:Gross Efficiency)							1.639
	Gross AMS SF	1,573						**1,573**

13-May-19

Space ID	Type of Space	Teaching Lab	Research Lab	Lab Support	Admin	Offices	Quantity	Total
		Type of Space						
		All areas are Net Assignable Square Feet (NASF) unless noted otherwise						
	9.0 General Support Spaces (building-wide amenities)							
9.01	Field and Lab Equipment Storage/Staging & Sample Storage			1,000			1	1,000
9.02	Walk-In Cold Room (For research)			150			1	150
9.03	Walk-In Freezer Room			150			1	150
9.04	Equipment Room, Major Instrumentation			475			1	475
9.05	Microscope Room			150			1	150
9.06	Central Stores - Flammable Storage			150			1	150
9.07	Central Stores - Solvent Storage Chem Waste Storage			150			1	150
9.08	Central Stores - Gas Cylinders			150			1	150
9.09	Metal & Wood Shop - Maker or Incubator Space			600			1	600
9.10	Electronics Repair Shop - Part of Maker or Incubator Space			200			1	200
9.11	Collaborative Student Group Study			650			1	650
9.12	Storage Spaces			300			2	600
9.13	Administrative Work Area (supplies, printing, paper storage)					225	3	675
	Net General Support Spaces			4,425		675		5,100
	Grossing Factor (61% Net:Gross Efficiency)							1.639
	Gross General Support Spaces			7,253		1,106		**8,359**

The Base Program reflects the desires of the steering committee and the construction market at the writing of this document. Should adjustments be made during the programming process, the following "accordion list" of priorities has been provided to assist design teams in prioritizing opportunities should betterment be achievable or value engineering required.

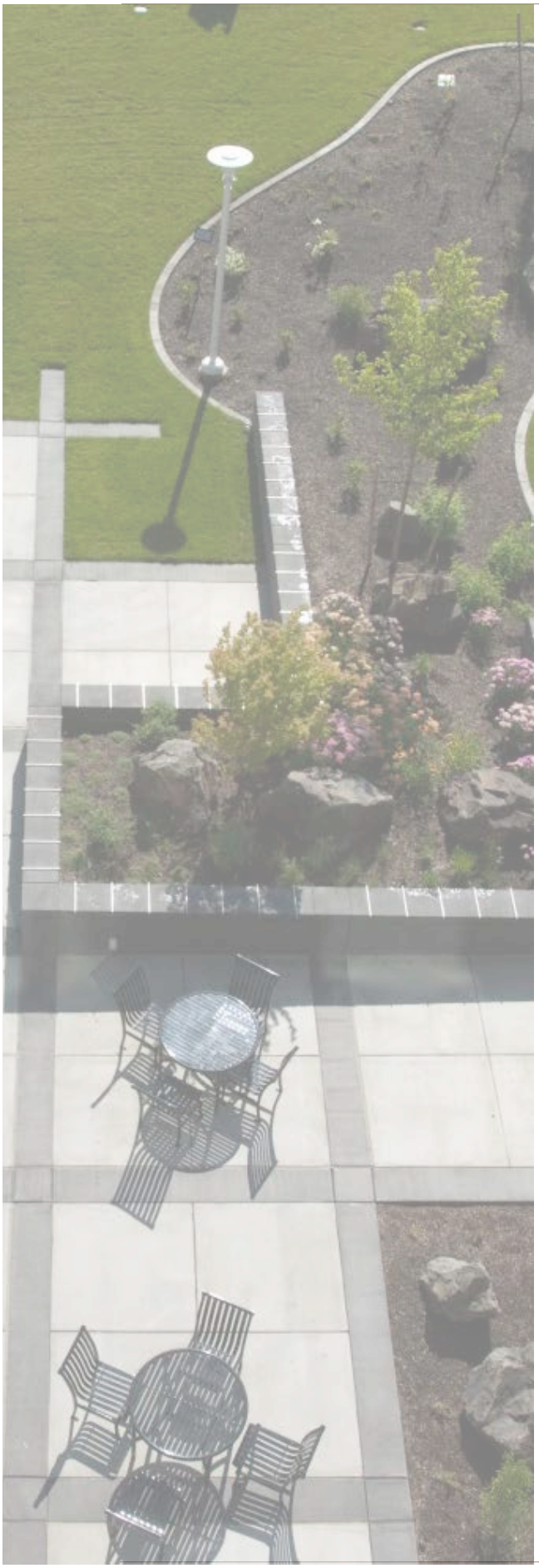
First Added — BETTERMENTS

- PRIORITY 3: Additional Outdoor Research Infrastructure (covered/adjacent to Greenhouse)
- PRIORITY 2: Additional Growth Space (common infrastructure/shared resources)
- PRIORITY 1: Additional Lab Growth (& associated office/support)

BASE PROGRAM

First Deleted — VALUE ENGINEERING

- PRIORITY 1: Maker Spaces (Space IDs 9.09, 9.10)
- PRIORITY 2: Field Lab and Equipment Storage (Space ID 9.01)
- PRIORITY 3: Greenhouse (Space IDs 7.01, 7.02, 7.03)



5
site

5.1 Master Plan Coordination

5.1.0 Zoning - City of Vancouver

WSU Vancouver is located within an adopted urban growth area. The project may facilitate population growth and attract employment growth, particularly of family wage jobs.

Regional coordination during project development: The campus has a long-term development agreement that accounts for campus growth up to 14,000 students (current head count is about 3,500). Adoption of this plan required traffic mitigation (since completed) as well as coordination with infrastructure required to support growth. This was approved by the community development department at Clark County. Additional project-specific engagement with utility providers, etc. will occur as part of the mandatory project development process.

No additional public local funds are planned to be leveraged in this project. Financial and in-kind support from foundations and/or other private-sector partners are to be determined.

Environmental outcomes and the reduction of adverse environmental impacts will be examined during the design process. In 2007, a Supplemental Environmental Impact Statement was completed to evaluate impacts from the 2007 Campus Master Plan. This report included the Life Sciences Building and anticipated environmental effects under the State Environmental Policy Act. No anticipated environmental impact is anticipated for this project.

5.1.1 WSU Vancouver Campus Master Plan

The original 1992 WSU Vancouver Campus Master Plan outlined concepts and guidelines for developing the siting, orientation, and form of campus facilities at its inception. The most recent update was issued in 2007, with the main goal of establishing a baseline for continued growth of the campus over the next two decades. It was based on the expectation of a total enrollment of approximately 14,000 students, which equates to 9,000 full time equivalent (FTE) students by 2023. It is the 2007 update that is the basis for this Study.

A more recent update to the Campus Master Plan is currently underway and shall be completed subsequent to this Predesign Study. Therefore, this Study is performed with the understanding that the update shall conform to concepts generated herein.

5.1.2 Master Plan Concept – A Hierarchy of Open Spaces Along Major Axes

The 2007 Master Plan carries forth the campus development and organizational guidelines established in the original Master Plan. With the completion of the early buildings and infrastructure, the Campus Center was created at the intersection of the Mount St. Helens and Mount Hood view corridors. These are the major organizational axes and primary walkways on campus, and the open space where they intersect is the campus focal point. Accentuated by the Firstenburg Fountain, this space is to remain the largest and most active public gathering space on campus.

Of the two axes, the Mount Saint Helens view corridor is the longer and more dominant. The Master Plan calls for campus expansion to proceed from south to north along it, so as the university has grown it has become the spine of development and its primary pedestrian walkway.

A hierarchical system of open spaces defined by scale and intended level of use was also outlined in the original Master Plan. Along each view corridor, a series of primary open spaces has been identified, each with a unique character. Between each primary open space, a transition space occurs. At these transitions, buildings should be placed closer to the axis with building activity focused to enliven the corridor. Secondary spaces, more intimate in scale, are located off the primary axes. They should cater to small gatherings, study, and quiet activity. Third in the hierarchy are front yards, located where a building site faces parking areas or roads. Front yards should provide a landscape buffer between vehicle circulation and the building and create an introduction to the campus.

5.1.3 Instructional Goals

WSU Vancouver's Instructional Goals for the upcoming years includes a series of strategic directions and priorities. Amongst these strategic directions and priorities for future is the goal to "re-imagine teaching and research labs and infrastructure to best support teaching and learning in all areas of the institution."

The WSU Vancouver – Life Sciences project supports this mission by providing the campus with additional appropriately sized, flexible labs that will serve many of the faculty and students on campus. In addition, this project addresses sustainability goals of the campus. The project will create a learning environment that will embed sustainable practices and philosophies. Also, it will increase collaboration with other campus entities.

5.1.4 Permitting, Local Government Ordinances, Neighborhood Issues

The WSU Vancouver Campus is identified within the county comprehensive plan as a "PF" designation for University and is zoned as a "U" designation. The Life Sciences Building is located within the WSU Vancouver campus and is identified within the capital facility plan for WSU Vancouver. It is not included in the county capital facilities plan as county funds are not anticipated to contribute to project funding.

In accordance with previous agreements with Clark County, and as part of this project, WSU will be required to provide additional parking for the campus. Additional study and coordination with Clark County on parking needs will be required as the project moves into design; however, schedule impacts are not anticipated from this effort.

5.1.5 Local Jurisdiction will be contacted.

WSU Vancouver is currently in the process of updating the campus Master Plan and has coordinated with Clark County as part of this effort. WSU will work closely with Clark County throughout the Basis of Design and Design-Build process to coordinate requirements including the permitting process.

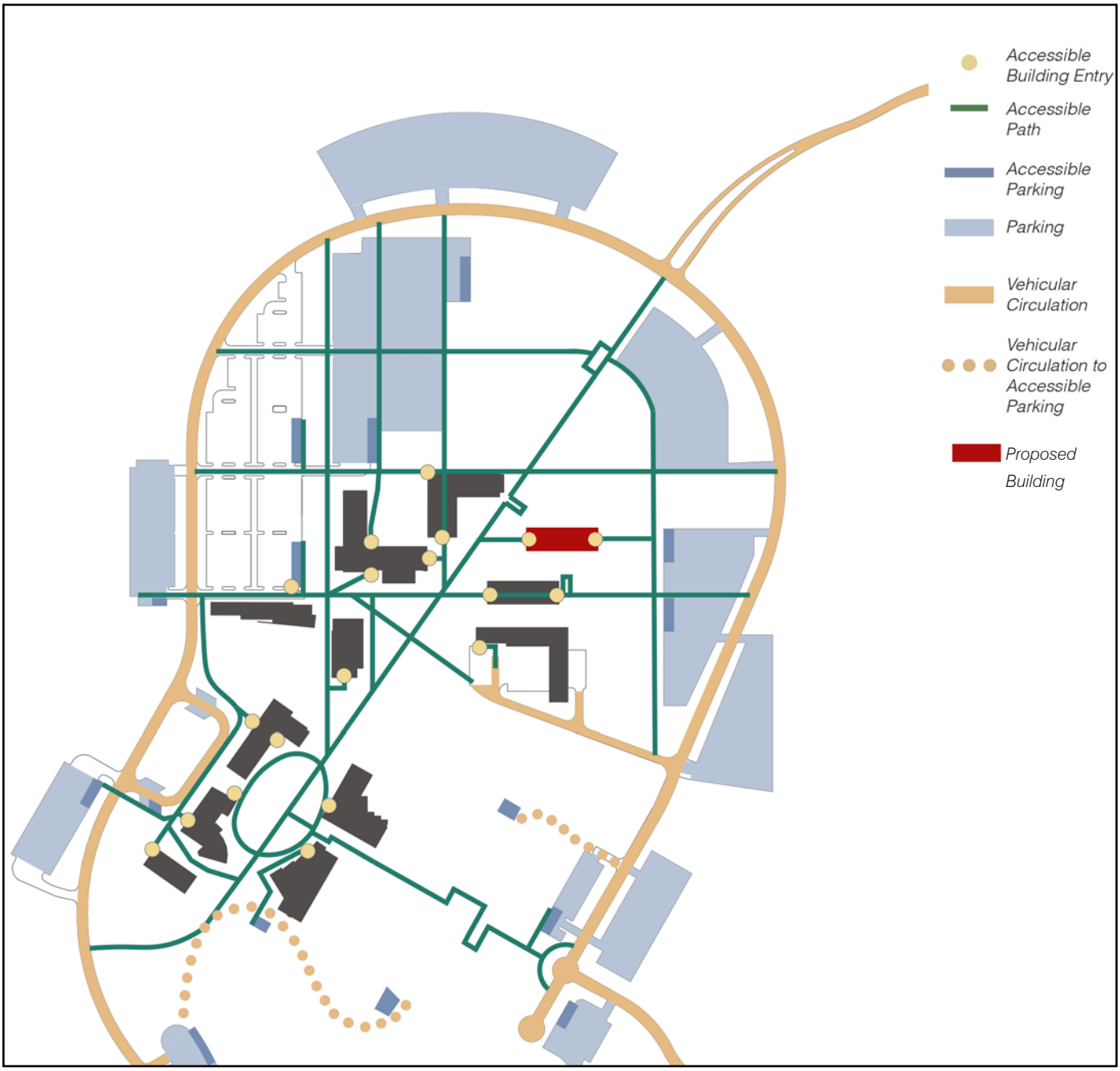
As the proposed site is already zoned for University use, no community stakeholder meetings are anticipated as part of the permitting or approval process.

Master plan Update Concept Drawing

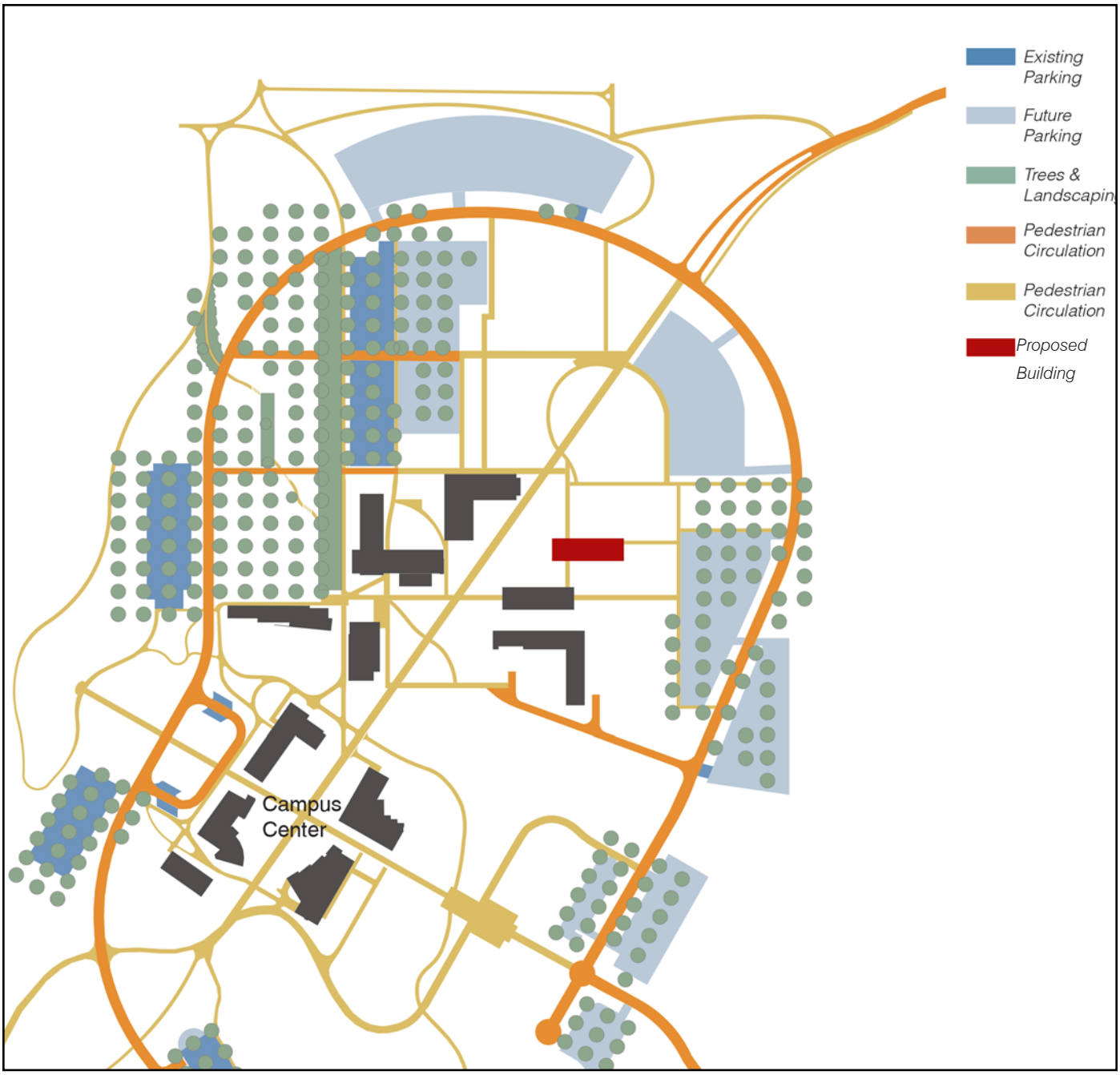
1. Administration Building
2. Classroom Building
3. Library
4. Student Commons
5. Early Childhood & Education Facility
6. Physical Plant Building
7. Engineering Sciences Building
8. Physical Plant Addition
9. Firstenburg Fountain
10. Multimedia Classroom Building
11. East Entrance
12. Main Entrance
13. Emergency & Pedestrian Entrance
14. Pedestrian Entrance
15. Student Services Center
16. Applied Technology Building
17. Clark Center
18. Sculpture Garden
19. Undergraduate Classroom Building

Proposed Building

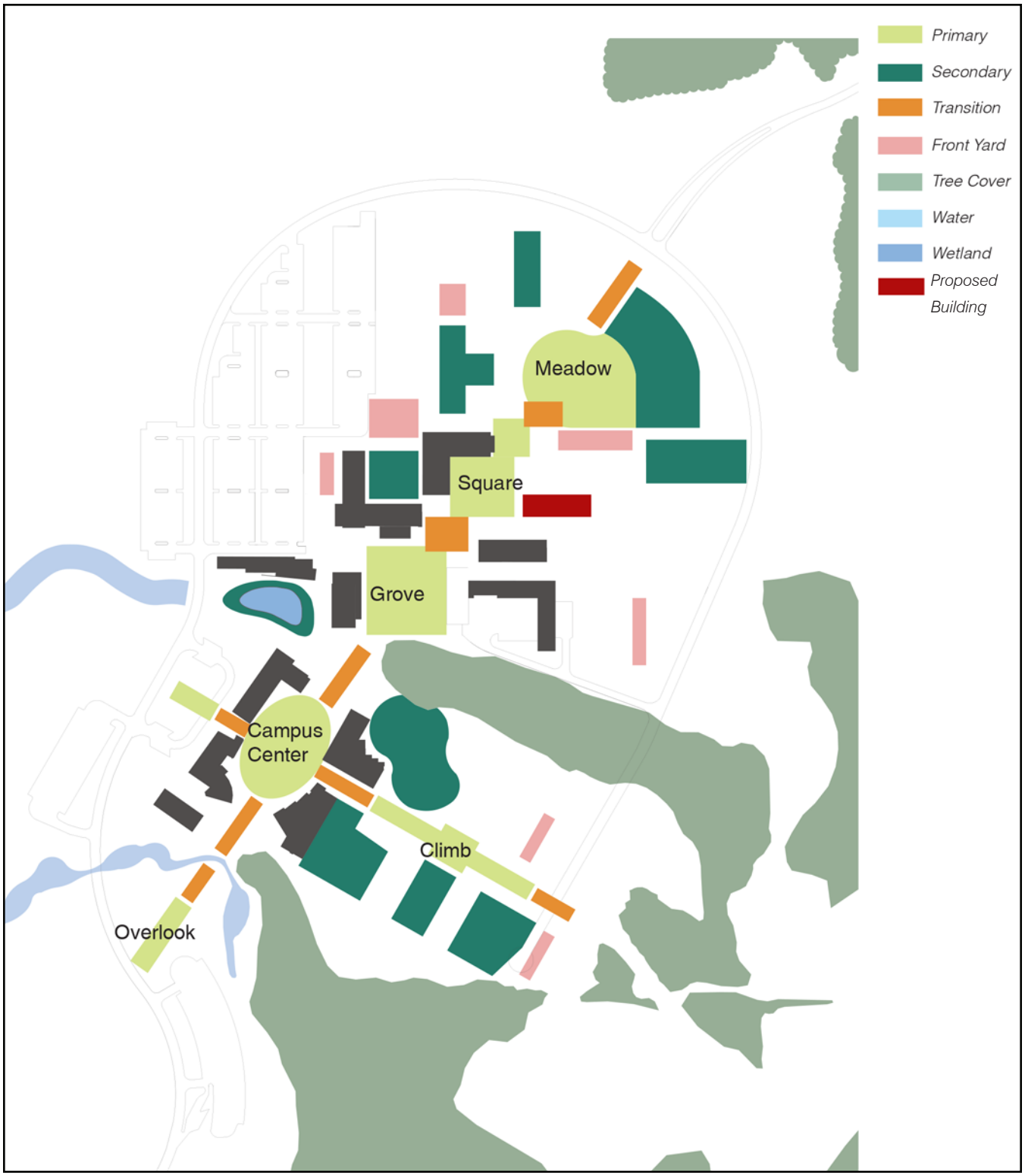
Accessibility for the disabled



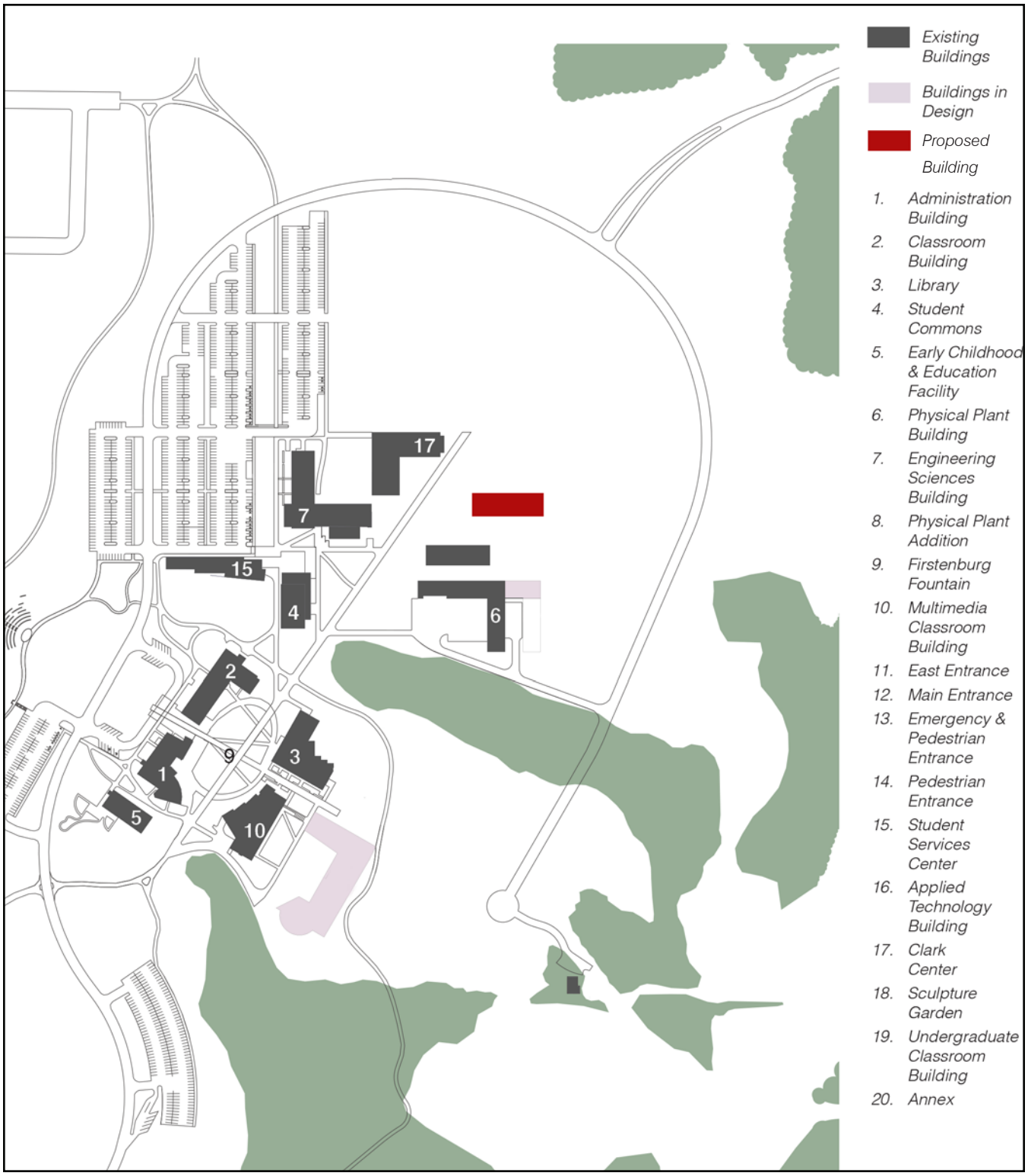
Parking Facilities



Hierarchy of Open Spaces



Existing Conditions Map



5.2 Site Analysis

5.2.1 Potential Building Sites

The WSU Vancouver Campus Master Plan calls for campus expansion to proceed south to north along its primary pedestrian walkway, known as the Mount Saint Helens View Corridor. Because the existing science buildings are the most recent to have been built, they are clustered at its north end. Undeveloped space around them is immediately available for construction. Accordingly, each of the building sites studied are in this location, qualified for development in the Master Plan, and adjacent to the existing science buildings.

5.2.2 Building Sites Studied

Three sites were selected by the WSU Executive Committee for analysis by the design team. Building configurations were developed for each site study as follows.

Site 1 – The Science Courtyard Scheme. This site is directly north of the existing Computer Science & Engineering Building. The resulting scheme is an L-shaped building that forms a courtyard with the other science buildings. While this solution creates a courtyard, which is one objective of campus master plan, it also limits development of a future building with frontage on the courtyard. Therefore, it was not selected for further exploration.

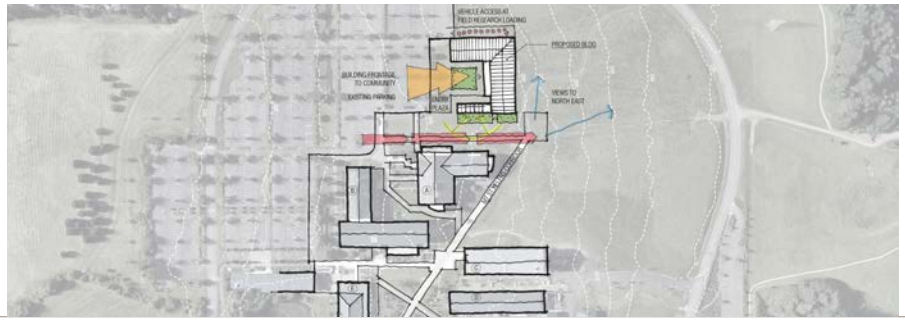
Site 2 – The Science Corridor Scheme. This site is to the north and east of the existing Computer Science & Engineering Building. It takes the form of a bar-shaped building extending west to east. Like the scheme described above, it forms a courtyard with the other science buildings, but it also connects the courtyard to future parking and leaves space available for a future building on the courtyard. For this reason, this site and scheme were selected for continued exploration.

Site 3 – The Science Connection Scheme. This site is directly north of the Clark Center. It was studied because of its adjacency to the existing parking area. The possibility of creating a new campus entry was seen as an opportunity to enrich the presence of the science program on the public edge of the campus and to connect it to the community. But because there is no way of establishing a courtyard with the other science buildings, or connecting meaningfully to the Clark Center, this scheme was not selected for further study.

SITE 1 - THE SCIENCE COURTYARD SCHEME

SITE 2 - THE SCIENCE CORRIDOR SCHEME (Selected)

SITE 3 - THE SCIENCE CONNECTION SCHEME



5.3 Selected Building Site

The selected building site (Site 2, described above) places the new facility among the three existing science buildings on campus which form three sides of an open space. The new building will define the fourth, establishing a well-defined "science courtyard" with an affiliated building on each edge. This organization is guided by the WSU Vancouver Campus Master Plan, which calls for a series of hierarchical courtyards along the Mount Saint Helens View Corridor. While helping to define the science courtyard, the position and shape of the new building will allow a future building to share courtyard frontage in its northeast corner.

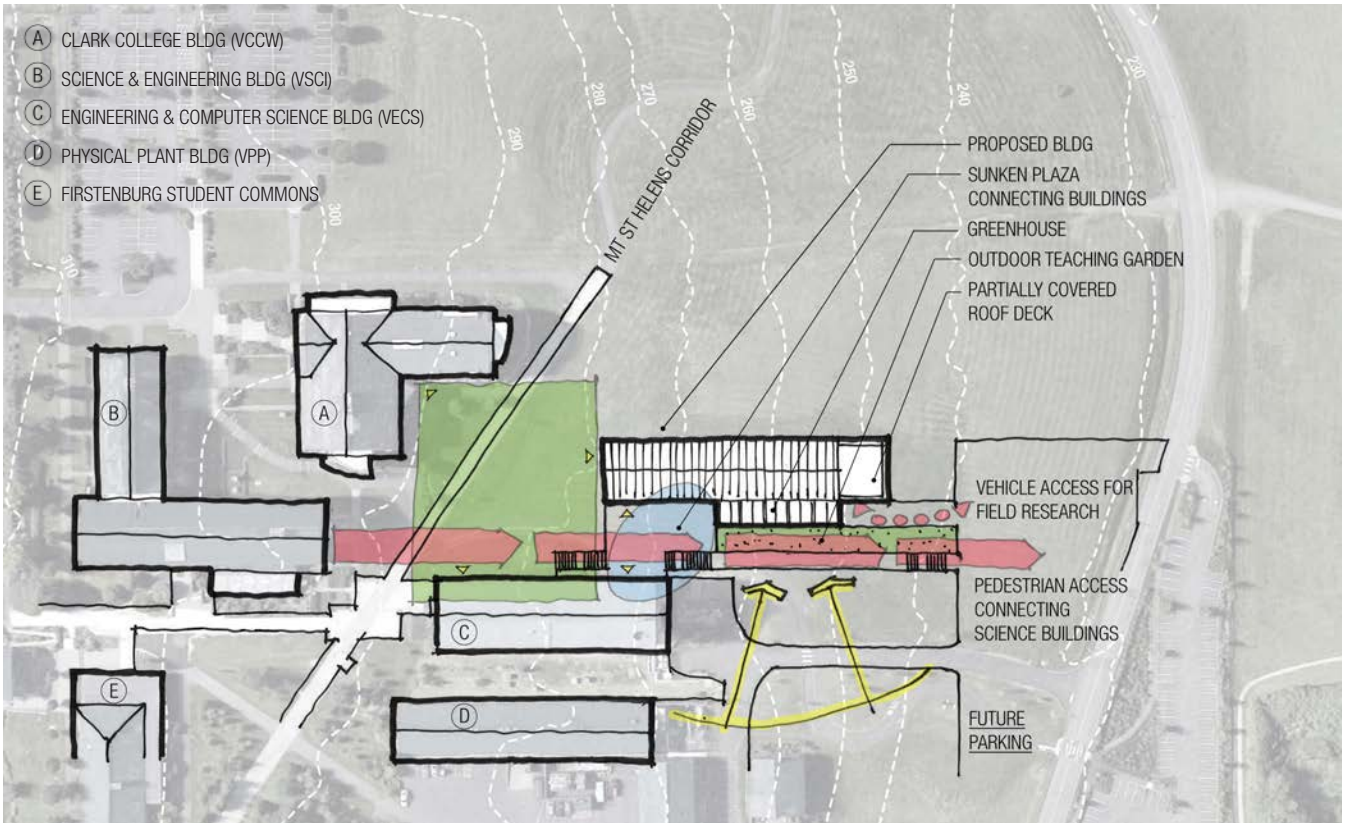
Taking the shape of a bar-building, the new facility forms a bridge from the science courtyard to a new parking area, which is indicated in the campus master plan. While existing north-campus buildings turn their backs to the forthcoming parking, this one will engage it directly, inviting visitors into the science courtyard through a series of terraced plazas. These will be developed both as a welcoming promenade and a series of outdoor learning areas. In this way the new facility will establish a new Science Campus Corridor, using stairs, ramps, landscaping, and paving to energize a new dynamic campus entry.

The Science Campus Corridor will serve the science programs and the campus in two ways, each of which provide multiple benefits.

1. Direct connection to future parking

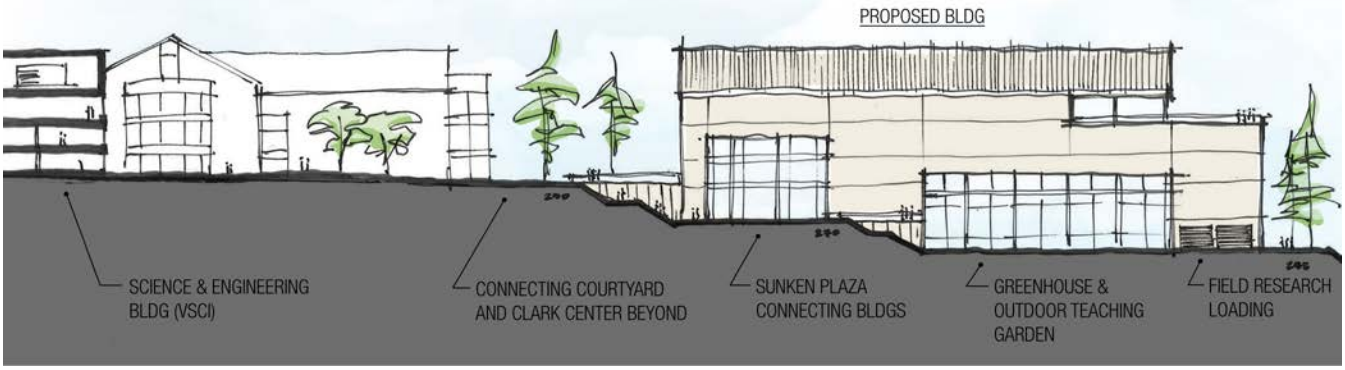
- Establish an identifiable campus entry to the science buildings and courtyard.
  - While abundant parking exists on the west side of existing science buildings, pedestrian access for students and faculty is indirect and complicated. This solution resolves that and elevates the presence of the science program from the campus perimeter.
- Public presence for community engagement.
  - Community engagement is an integral part of the nursing program, which will be well-served by the visible public entry and adjacent parking. Additionally, the programmed Maker Space is intended to spawn innovative entrepreneurial ventures between university affiliates and non-affiliates.
- Dedicated vehicle access for science program use.
  - Field research performed by multiple science disciplines requires dedicated loading space, specialized equipment storage, and climate control for field sample storage. All of this needs a coordinated staging area with direct access to laboratory facilities. Currently these amenities are relegated to an inadequate storage facility in a remote campus location several miles from the science buildings.
  - Vivarium research requires the delivery of live-animal subjects. This culturally-sensitive and highly important research requires a discrete location for vehicle loading. Direct access to parking and the perimeter road will serve this function. Privacy will be created by providing a separate loading zone and screening it from other access points at this end of the building.
  - Greenhouse research and teaching activities require vehicle loading as well as adaptable outdoor demonstration space. The greenhouse location along the outdoor corridor provides vehicular access and puts this dynamic science element on observable and stimulating display. The proposed east-west bar building provides broad southern exposure to maximize sunlight conditions.

Site 2 - Science Corridor Scheme



PLAN AT SITE 2
1"= 50'-0"

- LINKS EXISTING SCIENCE BUILDINGS WITH NEW BUILDING ALONG A NEWLY FORMED OUTDOOR SCIENCE CORRIDOR, CONNECTING TO FUTURE EAST PARKING LOT.
- THREE STORY ENTRY WING CREATES STRONG PRESENCE ON CAMPUS CORRIDOR, RELATING TO SURROUNDING BUILDING HEIGHTS AND HELPING DEFINE EAST EDGE OF SCIENCE COURTYARD.
- SHIFT IN FLOOR LEVELS RESPONDS TO DROP IN NATURAL GRADE, RESULTING IN POSSIBLE ROOF DECK.
- LOWER LEVEL SHARED PLAZA CREATES STRONG CONNECTION TO EXISTING ENGINEERING & COMPUTER SCIENCE BUILDING.
- GREENHOUSE ACTIVATES SCIENCE CORRIDOR WITH ADJACENT OUTDOOR TEACHING GARDEN.
- VEHICLE ACCESS FOR FIELD RESEARCH AND VIVARIUM LOCATED NEAR EAST PARKING, CAN BE SCREENED WITH VEGETATION.



SECTION AT SITE 2
1"= 25'-0"

2. Linking the Science Buildings

- Direct connection to the existing Computer Science & Engineering Building.
  - The new building is configured to connect to this building across a sunken outdoor plaza. With open glass walls opening toward each other where the buildings overlap, the plaza will join various science disciplines together in a collaborative forum. During the course of this Study, science faculty noted that data analysis resources exist in this building that could be extensively utilized by their research. Establishing a convenient relationship between them will economize resources and encourage interdisciplinary collaboration.

- Aligned connection to the existing Engineering & Life Sciences Building.
  - A primary goal for the new facility is to unify WSU Vancouver's science programs. Continual growth in these programs means that not all departments can be under one roof, but geometrically linking the buildings will encourage interaction across departments. The new facility will have a direct linear connection to the Sciences and Engineering Building, preserving the strongest possible connection between fully independent buildings.

- Shared Greenhouse resources.
  - The existing greenhouse has been outgrown by the multiple programs using it, so the new facility includes a second greenhouse on the Science Campus Corridor. In addition to being a dynamic and inspiring facility on display in this high-traffic area, additional greenhouse capacity will allow expansion of research for multiple departments. Additionally, the linear connection of one facility to another will allow students and faculty convenient access and shared resources.

Campus Context

The existing surrounding campus buildings are three stories, so the new building will also be three stories on its campus / courtyard elevation. As previously stated, the new building is four-stories, so at this end the lowest level will be depressed into the earth. This condition mirrors the existing Engineering and Computer Science Building, establishing a direct outdoor connection between the two buildings, accommodating interdisciplinary collaboration and supporting the sharing of resources.

Nearly every building on campus is red brick with gabled metal roofs. Recent building design incorporated this material palette while adding metal panels where an expression of open lightness is appropriate. The new building will follow these precedents.

5.4 Site Location

5.4.1 Ownership, Easements and Setbacks

The site and surrounding areas are well within WSU campus boundaries.

WSU owns the campus property. No land acquisition is required and no easements exist.

5.4.2 Surrounding areas

The proposed building site is surrounded with sufficient open space to develop the building with serviceable pedestrian and vehicular circulation. No significant modification to site features of adjacent buildings is anticipated.

5.4.3 Environmental Impacts

There are no environmentally sensitive areas near the project site. No mitigation or special considerations are needed.

5.4.4 Parking and Access

The building site is serviced by existing parking lots located approximately 450 feet west and 650 east. As indicated in the Master Plan, ample future parking is designated for development directly east of the building site. Maintenance, fire and field research vehicular access to the southeast corner of the building is available from the WSU Entrance Road to the east. Existing pedestrian access along the Mount Saint Helens View Corridor will be maintained. Existing pedestrian and ADA access from existing parking lots will be maintained and new pedestrian access from new parking area will be provided.

5.4.5 Site, Paving and Surfacing

Concrete walks are proposed for all pedestrian walkways and ramps and will meet ADA accessibility requirements. A minimum of 10' paved area will surround the new building for access and maintenance/window cleaning. Pavement to provided fire access will be provided to the new building.

5.4.6 Construction and Phasing Impact on Surrounding Areas

The availability of open space around the construction is sufficient such that construction can occur in a single phase. Ample space will be available for construction activities and material stock-piling to occur without impacting existing buildings or operations. Classes are anticipated to continue without interruption and campus activities should not be affected.

5.5 Site Work and Stormwater Requirements

5.5.1 Demolition

The site is currently undeveloped and primarily consists of open grass space. Demolition for the project will be completed in accordance with the approved Temporary Erosion and Sedimentation Control (TESC) and Demolition Plans. The new building is proposed on the northeast extents of the existing campus. Construction access and separation during construction is feasible.

5.5.2 Earthwork

A TESC Plan meeting the Minimum Requirements of the 2015 Clark County Storm water Manual and the 2012 Stormwater Management Manual for Western Washington (SWMMWW) will be required to obtain project permits. A Construction Stormwater Pollution Prevention Plan (SWPPP) will be prepared in accordance with the 2015 Clark County Stormwater Manual and SWMMWW. The total disturbed area will be greater than one (1) acre and there is the potential for discharging sediment-laden runoff off-site during construction activities. As a result, applying for coverage under Washington's Department of Ecology (DOE) National Pollutant Discharge Elimination System (NPDES) General Permit will be required.

5.5.3 Temporary Erosion Control

Overall, the topography of the project area slopes from west to east at approximately 5%-15%. In general, the site consists of fine silts, is moderately well drained and is in the hydrologic soils Group C (Per UC Davis NRCS Soil Web). Grading design will provide positive drainage away from buildings and will meet ADA accessibility requirements.

5.5.4 Stormwater Management

The site is part of a previously adopted stormwater master plan and has flow control facilities in place to meet the treatment and flow control requirements for the proposed development/construction activities. Water quality treatment and quantity control (detention) for the proposed improvements will be provided at Pond "E" facilities with its current capacity. On-site conveyance facilities will be required to have enough flow capacity to route the 10-year storm event. In accordance with Chapter 7 of the 2015 Clark County Stormwater Manual, the minimum main size will be 12-inch diameter. The project intent is to meet the 2015

Clark County Stormwater Manual and the project intends to meet the Low Impact Development (LID) performance standards that are described in the 2015 Clark County Stormwater Manual. The project also intends to meet the LEED Silver certifications for stormwater. The on-site soils indicate low potential for infiltration. Downspout locations will be coordinated with the architect and conveyed to the proposed detention system. Footing drains, consisting of perforated pipe wrapped with clean crushed rock, will be installed around the new building's footings.

5.6 Utility Work

5.6.1 Sanitary Sewer

The new building will be serviced by the existing 8" private sanitary sewer line east of the existing Applied Technology Building that connects to a sewer line along the WSU Entrance Road. A new 8-inch PVC sanitary sewer mainline will be constructed on-site and extended +/- 420 feet from the existing private sanitary sewer line manhole nearest the WSU Entrance Road northwest to the new building location. No existing sanitary sewer capacity issues are known. The on-site sanitary sewer line and associated appurtenances will be privately owned and maintained. 6-inch PVC sanitary sewer lateral piping will be used for connecting to the new sanitary sewer mainline. Cleanouts and/or pigging ports will be constructed at dead ends.

5.6.2 Water System

The new building will be serviced by the existing 10" C-900 PVC waterline running along the Mt. St. Helens view Corridor. The new 8" PVC waterline will be constructed on-site and extended +/-400 feet from the existing 10" to the west along the Mt. St. Helens Corridor. No existing water capacity issues are known. The on-site water lines and associated appurtenances will be within a 15' Public Water Easement dedicated to Clark Public Utilities. Fire hydrant spacing will be analyzed to meet local agency and fire code requirements. One new fire hydrant is expected to provide adequate coverage. One 2" potable water meter and backflow device w/vault that will service the new building will be provided. A new 6" fire service line will be provided to the fire sprinkler room within the building. A new DCVA w/vault, post indicator valve and fire department connection will also be provided. Fire service will require a Washington State approved backflow prevention assembly which will be located within the building.

5.6.3 Chilled/Heated Water

Chilled and Heated Water lines will be extended to the new building location from the service lines located along the Mt. St. Helens View Corridor.

5.6.4 Dry Utilities

Power, gas, and communication lines will be extended to the new building location from the service lines located along the Mt. St. Helens View Corridor. Power and gas service connections to the new building will be metered.

5.6.5 Mechanical

Chilled water will be extended from the manhole connections in the service spine located under the walkway west of the proposed building site to the ground level mechanical room.

The 6" existing chilled water connections serving the ATC building to the south of the proposed site may conflict with the siting of the Life Sciences Building, if so that service will require relocation

5.6.6 Electrical

Normal and emergency/standby power will be extended from the existing manhole connections in the service spine located under the walkway west of the proposed building site to the electrical service entrance (pad mounted transformers and medium voltage switches) on grade outside the building and to the main electrical room on the ground floor of the building.

5.6.7 Technologies

Fiber and fiber connections will be extended from the existing manhole connections in the service spine located under the walkway west of the proposed building site to the MDF for the building on the ground floor. Services will need to be extended to accommodate redundant connections as noted in the technical section of the Basis of Design.

5.7 Problems Requiring Further Study

- Potential relocation of existing chilled water lines serving ATC building.
- Need to add additional chiller in Power Plant to support new building.
- Wireless access control devices have been a standard approach for WSU. As these devices rely on batteries and are currently designed Campus is considering transition to an optical network solution in lieu of the standard UTP copper cable approach to station cabling for communications. Optical network has been indicated as an optional approach within the Technologies portion of the Basis of Design.

5.7.1 Identify planned IT systems that affect the building plans (dark fiber, AMS conferencing)

- The facility will be served throughout with a wired and wireless IT system to support the needs of students and faculty. Telecommunications rooms on each floor that are vertically aligned are required to support these services.
- Distance learning and other audiovisual systems requiring production services are typically provided within the program spaces planned for this building.
- The University has been working on establishing enhanced wireless services through cellular carriers. The Technology portion of the Basis of Design indicates a requirement to provide a Radio Room to support these services (and possibly other local utility services relying on radio broadcast signals) within the penthouse, and a requirement for capacity to add antennas to support these services on the roof.

6
sustainability

6.1 Greenhouse Gas Emissions Reduction Policy

WSU will comply with the State mandated Greenhouse Gas Emissions Reduction Policy in accordance with ESSB 5560, RCW 70.235.070 implemented in 2010, the emissions limits, and reduction of vehicle miles traveled by 2050 in accordance with RCW 47.01.440. The environmental impact of the project on the proposed site will be addressed in a comprehensive SEPA report; no anticipated environmental impact is anticipated for the project.

6.2 LEED Scorecard

LEED v4 for BD+C: New Construction and Major Renovation

Project Checklist

Project Name: WSU Vancouver Life Sciences

Date: 26-Jun-18

Y	?	N			
1			Credit	Integrative Process	1

4	3	10	**Location and Transportation**		16
		1	Credit	LEED for Neighborhood Development Location	1
1			Credit	Sensitive Land Protection	1
		2	Credit	High Priority Site	2
1	1	3	Credit	Surrounding Density and Diverse Uses	5
1		4	Credit	Access to Quality Transit	5
	1		Credit	Bicycle Facilities	1
1			Credit	Reduced Parking Footprint	1
	1		Credit	Green Vehicles	1

8	2	0	**Sustainable Sites**		10
Y			Prereq	Construction Activity Pollution Prevention	Required
1			Credit	Site Assessment	1
2			Credit	Site Development - Protect or Restore Habitat	2
1			Credit	Open Space	1
2	1		Credit	Rainwater Management	3
2			Credit	Heat Island Reduction	2
	1		Credit	Light Pollution Reduction	1

3	4	4	**Water Efficiency**		11
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
1	1		Credit	Outdoor Water Use Reduction	2
1	3	2	Credit	Indoor Water Use Reduction	6
		2	Credit	Cooling Tower Water Use	2
1			Credit	Water Metering	1

13	11	9	**Energy and Atmosphere**		33
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
6			Credit	Enhanced Commissioning	6
6	6	6	Credit	Optimize Energy Performance	18
	1		Credit	Advanced Energy Metering	1
	2		Credit	Demand Response	2
		3	Credit	Renewable Energy Production	3
1			Credit	Enhanced Refrigerant Management	1
	2		Credit	Green Power and Carbon Offsets	2

11	2	0	**Materials and Resources**		13
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
3	2		Credit	Building Life-Cycle Impact Reduction	5
2			Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
2			Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
2			Credit	Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit	Construction and Demolition Waste Management	2

3	10	3	**Indoor Environmental Quality**		16
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
1	1		Credit	Enhanced Indoor Air Quality Strategies	2
	3		Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
1	1		Credit	Indoor Air Quality Assessment	2
	1		Credit	Thermal Comfort	1
	2		Credit	Interior Lighting	2
		3	Credit	Daylight	3
	1		Credit	Quality Views	1
	1		Credit	Acoustic Performance	1

5	1	0	**Innovation**		6
4	1		Credit	Innovation	5
1			Credit	LEED Accredited Professional	1

3	1	0	**Regional Priority**		4
	1		Credit	Regional Priority: Demand Response	1
1			Credit	Regional Priority: Construction Indoor Air Quality Management Plan	1
1			Credit	Regional Priority: Building Product D&O- Enviromental Product Declarations	1
1			Credit	Regional Priority: Building Product D&O- Sourcing of Raw Materials	1
				Indoor Water use reduction (Alternate Option)	

51	34	26	**TOTALS**	Possible Points:	110

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

7

estimate and assumptions

7.1 Scope

Washington State University requests capital funds to build the new Life Sciences Building.

The new building will be designed for an expected life of 50+ years. Biosciences, Neurosciences, teaching and research labs, Environmental Science, and Nursing will be included in the new building. The project will provide flexible teaching and research space on campus to support research and address accreditation deficiencies. These assumptions are made at the writing of this document. They provide background insight into the cost estimate but should not be interpreted as a standard to be followed. Standards listed in the RFQ take precedence over the information in this section of the BODD.

7.2 Assumptions

In the framing the project, the following assumptions have been made which affect the calculation of project costs:

1. Project will be delivered with Progressive Design Build methodology.
2. Construction will be twenty-two months in duration and will commence in Summer of 2021.

In the selection of materials and systems for the new Life Sciences Building, the design architect should keep in mind the following assumptions:

3. Good design practice suggests a palette of materials which will harmonize with those of the existing campus, but not be limited by them.
4. Materials selected for construction must exhibit the proper balance between utility, durability, economy, aesthetics, and curb appeal.
5. Materials, products and equipment should follow the established campus standards where appropriate in order to maximize efficiency in maintenance.
6. As a major public building, the new Life Sciences Building must utilize the principles of sustainable design. There is a need to relate well to the environment, i.e. to be "environmentally friendly," maximize energy conservation, and utilize renewable resources and recycled products as evidence of the facility's social conscience and technical prowess. In accordance with Washington State standards, the facility will attain LEED Silver Certification as a minimum.

7.3 Cost Estimate

ESTIMATED COSTS SUMMARY

Phase	Description	QTY	UOM	$ / UOM	Cost
1	Life Sciences Building	59,999	BGSF	$585.72	$35,142,615
2	Sitework	47,500	SGA	$37.53	$1,782,467
3	General Conditions & Support Services	22	MO	$120,000	$2,640,000
Total Estimated Construction Cost		**59,999**	**BGSF**	**$659.43**	**$39,565,082**

7.4 Outline Specifications

Pursuant with the assumptions noted in Section 5.1.2, the following outline specifications were created. These specifications provide the basis of the construction cost estimate for the project.

Division 1

- **Sustainable Building Construction Practices.** Project must achieve LEED Silver. See attached LEED scorecard for potential achievable credit options. Contractor is responsible for all construction related activities.

Division 2

- **Existing Conditions.** Demolition of site concrete

Division 3

- **Cast-in-Place Concrete.** Natural color, form finish or light sandblasted. Reinforced with Grade 60 deformed billet steel; 4000 psi minimum compressive strength.
- **Precast concrete.** Color and finish to match cast-in-place concrete.
- **Polished concrete.** For high traffic areas such as lobbies and corridors.

Division 4

- **Concrete Unit Masonry.** ASTM C90, Type I, Grade N normal weight units; smooth face and or split face.
- **Brick Veneer Masonry.** Medium to dark red color, standard modular, normal or econ size, mission (wire cut) or smooth face; veneer construction.

Division 5

- **Structural Steel.** ASTM A992 or A572 hot-rolled carbon steel shapes for beams and girders; ASTM 500 cold-formed carbon steel tubing; ASTM A53 welded and seamless steel pipe.
- **Steel Joists.** Open-web steel joists with bridging, seats and anchors; custom-designed, SJI and ICC certifications required.
- **Steel Roof Deck.** Fluted sheet steel sections; galvanized for roof deck.
- **Steel Stairs and Railings.** Tubular steel stringers, concrete pan treads; tubular railings and guardrails; prime painted interior; galvanized exterior.
- **Ornamental Metal Railings.** Structural tempered glass balustrade guard railing system.

Division 6

- **Exterior Sheathing.** ASTM C1177 or C1278, fire-resistant (Type “X”), water-resistant exterior gypsum sheathing board.
- **Rough and Finish Carpentry.** Construction lumber grades; Douglas Fir/Larch species; anchors and grouting of hollow metal frames in non-masonry walls.
- **Custom Millwork.** AWI Premium quality, custom designed and fabricated millwork, including cabinetry, panels, base and trim pieces, shelving and window sills with hardwood or hardwood-veneer products; stained with clear finish.
- **Solid Surfacing Fabrications.** Composite decorative sheet consisting of natural quartz crystals in a proprietary binder.

Division 7

- **Board Insulation.** Rigid polystyrene or polyisocyanurate boards for perimeter foundation wall.
- **Blanket Insulation.** For exterior stud wall and soffit construction; fiberglass. For interior partitions, fiberglass sound attenuation batts or for fire-rated walls.
- **Metal Wall Panels.** Preformed metal siding system for exterior walls, with related flashings and accessory components.
- **Roofing.** Single-ply, mechanically-attached EPDM, PVC or TPO sheet; roof insulation of polyisocyanurate and high density extruded polystyrene; complete with all flashings and accessories; 15-year warranty required.
- **Manufactured Sheet Metal Roofing.** Standing seam sheet metal roofing. Fluoropolymer coating as selected.
- **Roof Hatches.** Roof hatches by Babcock-Davis, Bilco, Nystrom or approved equal. With telescoping safety post and guardrail at roof level.
- **Applied Fireproofing.** Spray or trowel-applied for protection of structural steel framing and roof deck in fire-rated assemblies. W.R. Grace “Monokote MK-6”, Isolotek International “Blaze-Shield” or approved equal. Intumescent fireproofing, if required, at exposed structural steel.

Division 8

- **Doors and Frames.** Standard steel frames, standard steel doors and/or flush wood doors.
- **Access Doors and Frames.** Milcor, J.L. Industries, Karp Associates, Nystrom or approved equal.
- **Overhead Coiling Counter Doors.** Electrically-operated, overhead coiling doors.
- **Aluminum-Framed Entrances and Storefronts.** Thermally-isolated extruded aluminum storefront with fixed sash and swinging aluminum doors; anodized finish; glazed with low-E insulating glazing.
- **Glazing Aluminum Curtain Walls.** Thermally-isolated, extruded aluminum with steel reinforcement where required; anodized finish; fixed and operating sash.
- **Translucent Wall and Roof Assemblies.** Supported aluminum framed sloped system with sandwich panels of translucent skins separated with an aluminum grid. Panel System: Structurally reinforced translucent panel system, with supplementary support framing, shop fabricated, factory prefinished, with related flashings, anchorage and attachment devices. Standard aluminum flashing, integral beam covers and perimeter sealants.
- **Glass.** Exterior- 1" insulated panels, tinted exterior pane, low E (emissivity) film coated, tempered in traveled areas or float glass elsewhere.
- **Finish Hardware.** Schlage locksets, Primus security key system; keyed to WSU system.

Division 9

- **Gypsum Board Assemblies.** Exclusive 5/8" Type "X" gypsum wallboard finished to a Level 4 per Gypsum Association GA-214.
- **Floor Tile.** Ceramic tile (matte or abrasive finish) in toilet rooms; brick, slate or porcelain pavers in public lobby and circulation areas.
- **Wall Tile**. Glazed ceramic tile in toilet rooms.
- **Suspended Acoustical Ceilings.** 9/16" wide grid system in public areas, standard 15/16" wide grid in utility areas. Mid-range ceiling tile, rated and non-rated, white in color.
- **Resilient Flooring.** Commercial grade vinyl composition tile in utility areas and elsewhere as scheduled, sheet vinyl or linoleum in areas requiring minimal joints in flooring for cleaning.
- **Carpet.** Tile and/or broadloom carpet. Mid-cost range, nylon, loop pile, patterned, without pad in executive and staff offices, conference rooms, training rooms, studies and public areas requiring acoustical control.
- **Painting**. Primer and finish coats, low VOC, latex base, semi-gloss and flat enamel, stipple texture finish. Latex-based epoxy paints in toilets where frequent cleaning and an impervious surface are required.
- **Tackable Wall Panels.** Tack Wall with trim accessories, adhesively applied to large wall areas or mechanically mounted in panels. On one or more walls in corridors, conference Rooms, training rooms, and study and display areas.

Division 10

- **Signage.** Aluminum-framed plastic plaques with raised white lettering and Grade 2 braille text; fixed text strip; products by Andco, APCO, ASI, Vomar or approved equal; wall-mounted with stand-offs, individual brushed aluminum letter on exterior walls.
- **Liquid Marker Boards and Tackboards.** Porcelain enamel on steel surfaces in aluminum frames, fixed assemblies, wall mounted. In conference rooms, training rooms, and some offices.
- **Toilet Compartments.** Toilet partitions shall be constructed of Solid Color Reinforced Composite material, which is composed of dyes, organic fibrous material, and polycarbonate/phenolic resins.
- **Wall and Door Protection.** High-impact stainless steel or aluminum corner guards, with retainer clips; to 4 feet high at exposed, vulnerable wall corners in high-traffic areas. Products by Balco, MM Systems, Construction Specialties or approved equal.

- **Operable Walls.** Modernfold, Hufcor, Kwik-Wall or equal, fabric covered, power operated with integral door or access panel and marker board surfaces where required.
- **Toilet Accessories.** Stainless steel and plated metal dispensers, receptacles, grab bars, mirrors and holders. Products by Bobrick, Bradley, McKinney Parker, ASI or approved equal.

Division 11

- **Fall Protection System.** Fall protection utilizing a steel tie down system consisting of anchor pedestals, tensioned catenary cable, shock absorbing lanyard and safety harness. Products by Guardian Metal Products or approved equal.
- **Residential Equipment.** Appliances for food storage and washing. Refrigerator/freezer, dishwasher.
- **Projection Screens.** Standard and video formats as necessary, electric operation, recessed mounting, washable matte finish screen surface and automatic-operated closure panels.
- **Video Projector Mounts.** Video projector mounting bracket and related attachment components provided by Chief Manufacturing (RPA Series).

Division 12

- **Entry Mats.** Pedimat M2 at all primary entrances 10'-0" in length to meet LEED requirements.
- **Window Coverings.** 2" Blinds at exterior windows, 1" blinds at all interior windows and relites.
- **Blackout Shades or Roller Shades.** Room darkening roller shades for windows, motor operated.

Division 14

- **Hydraulic Elevators.** Otis, Montgomery Kone, or ThyssenKrupp; minimum 4,000 pound capacity.

Division 20

- Basic Mechanical Requirements
  - Furnish labor, materials, and equipment necessary for completion of work unless indicated or noted otherwise. Put all systems into full operation and adjust to specified conditions. Pay all permits and fees levied by utility companies and/or governing agencies.
- Sustainable Building Construction Practices
  - LEED Objective: Provide requirements necessary to achieve identified LEED IEQ credit and documentation in accordance with LEED requirements.
    - MR Credit 2.1 Construction Waste Management
    - IEQ Credit 3.1 Construction IAQ Management Plan During Construction
    - IEQ Credit 3.2 Construction IAQ Management Plan Post Construction
    - IEQ Credit 4.1 Low emitting Materials-Adhesives and Sealants
    - IEQ Credit 4.2 Low emitting Materials-Paints _
- **Seismic Provisions.** Seismic supports for mechanical equipment in accordance with the Seismic Design Category (SDC) established by the Structural Engineer for this project. Supports shall be provided in accordance with ASCE Chapter 7.
- **Project Finalization.** Operation and maintenance manuals, owner instruction on training and maintenance, record drawings, and system/equipment guarantees.
- **Testing, Adjusting, and Balancing.** Air, hydronic and domestic hot water distribution systems shall be balanced to conditions specified and indicated on the drawings by an AABC or NEBB Certified balancing agency.
- **Mechanical Commissioning Support.** The mechanical and plumbing equipment and systems are to be commissioned. The contractor has specific responsibilities for scheduling, coordination, startup, testing and documentation. Coordinate all

commissioning activities with the Commissioning Authority. It is anticipated that the Commissioning Authority will work under direct contract with the Owner.

1. APPLICABLE CODES
   a. The Piping Systems will be designed in accordance with the following Codes:
      1) 2015 International Plumbing Code with Washington Amendments
      2) 2015 International Fuel Gas with Washington Amendments

2. APPLICABLE GUIDELINES AND STANDARDS
   a. The Piping Systems will be designed in accordance with appropriate portions of the following Guidelines and Standards:
      1) The American Institute of Architects Academy of Architecture for Health (AIA), 2006 Guidelines for Design and Construction of Hospital and Health Care Facilities
      2) National Fire Protection Association (NFPA) guidelines and standards including the following:
         a.) NFPA 54 National Fuel Gas Code, Current Edition
         b.) NFPA 55, Compressed Gases and Cyrogenic Fluids Code, Current Edition
         c.) NFPA 70, National Electric Code, Current Edition
      3) Biosafety in Microbiological and Biomedical Laboratories, Fifth Edition
      4) LEED (Leadership in Energy and Environmental Design), Version 3.0
      5) ANSI Z358.1 Emergency Eyewash and Shower Equipment
      6) American Society of Plumbing Engineers (ASPE) data books

<u>Division 21</u>

- **Fire Protection.** Complete fire protection system in accordance with: Local Codes and Fire Authority, Owner's Insurance Underwriter, and National Fire Protection Association including Pamphlet No. 13.

Fire Protection Base Design Criteria

1. APPLICABLE CODES, GUIDELINES AND STANDARDS:
   a. The Fire Protection Systems will be designed in accordance with the following Codes, Guidelines and Standards:
      1) NFPA 13, Installation of Sprinkler Systems, Current Edition
      2) NFPA 14, Installation of Standpipe Hose Systems, Current Edition
      3) NFPA 24, Installation of Private Fire Service Mains, Current Edition
      4) NFPA 30, Flammable and Combustible Liquids Code, Current Edition
      5) NFPA 45, Fire Protection for Laboratories Using Chemicals, Current Edition
      6) NFPA 72, National Fire alarm and Signaling Code, Current Edition
      7) NFPA 101, Life Safety Code, Current Edition
      8) Local and State Fire and Building Codes
      9) Insurance carrier recommendations

2. STANDPIPE SYSTEM
   a. System Description
      1) When required, the building and greenhouse will be protected by a hydraulically designed, Class I Standpipe System without hoses or hose cabinets.

3. WET PIPE SPRINKLER SYSTEM
   a. System Description
      1) The building and greenhouse will be protected throughout with hydraulically calculated sprinkler systems, which except for special protection needs, will be wet pipe systems. All areas of the building will be protected per NFPA 13, including electrical rooms (switchgear, transformers, generators, closets, etc.), garage, loading docks, stair towers, exterior canopies, and mechanical rooms.

4. DRY PIPE SPRINKLER SYSTEM
   a. System Description
      1) Areas of the building subject to temperatures below 40°F will be protected by a dry pipe sprinkler system, these include loading dock, outside seating area, and aviary.

Division 22

- This section applies to piping within the building and connection with outside utility lines 5 feet from the building where applicable:
  - Hot and Cold Water Piping-Copper Type L
  - Sanitary Waste and Vent Piping-Above Grade-Service Weight Cast Iron
  - Sanitary Waste and Vent Piping-Below Grade-ABS, PVC or Service Weight Cast Iron
  - Roof and Overflow Drain Pipe-Service Weight Cast Iron
  - Indirect Waste Piping-Copper Type L or M
  - Storm Drain Piping (Above Grade): Cast Iron
  - Storm Drain Piping (Below Grade): PVC, ABS, Cast Iron
- **Gauges and Meters.** Provide temperature and pressure gauges at plumbing equipment.
- **Supports, Anchors, Curbs, Seals and Flashings.** Provide pipe hangers, sleeves and plates, equipment stands, housekeeping pads, curbs, seals and caulking, and flashing for finished plumbing systems.
- **Vibration Isolation**. Furnish and install vibration isolation mountings for all plumbing pumps, compressors, and any other motorized equipment installed under this contract.
- **Piping Insulation.** Insulate domestic hot and cold water and rainwater piping systems including pipe fittings and roof drain sumps.
- **Mechanical Identification.** All plumbing valves, equipment, and access doors and panels shall be tagged for identification. Piping systems shall be labeled and color-coded with a color banding system.
- **Plumbing Equipment.** Provide floor cleanouts, wall cleanouts, trap primers, water hammer arrestors, floor drains, backflow preventers, water heaters, water heater storage tanks, and domestic water circulating pumps. Hose bibs shall be provided at each bank of lavatories and around the building perimeter.
- **Plumbing Fixtures**
  - Fixtures shall be complete with fittings, trim, supplies, traps supports, and carriers to make a complete installation.
  - Fixtures will be provided with chrome plated brass trim and stop valves.
  - Water closets and urinals will be vitreous china, siphon jet pattern with low flow water conserving flush valves.
  - Lavatories will be vitreous china with sensor operated faucets.
  - Sinks will be 18 gauge stainless steel with single lever faucets.
  - Water closets will be wall mounted.
  - Appropriate “Barrier Free” fixtures will be provided in accordance with ADA requirements, for handicapped use. ADA fixtures shall be provided with electric powered infrared sensor operated flush valves and faucets.
  - Drinking fountains shall be stainless steel, refrigerated and shall be constructed in accordance with ADA requirements.

- Water Conservation: The following items will be reviewed by the design team and WSU for Water Conservation and Long Term Campus Standardization /Maintenance considerations: Dual flush (1.6/1.0 GPF) water closets, ultra-low flow water closets (1.28 GPF), pint flow urinals, and 1.5 GPM showers. Lavatory faucets will deliver 0.5 GPM.

1. STORM AND CLEARWATER DRAINAGE
   a. System Description
      1) A storm drainage system will be provided to convey rainwater from roof and area drain to site storm sewers.
      2) Secondary roof drainage will be accomplished by using a dedicated piped overflow drainage system separate from the primary storm drainage system which will connect to storm risers. Clearwater waste from air handling units, coolers, and other devices and equipment that discharge clear water will be conveyed by gravity and connect to the building sanitary drain.

2. SANITARY WASTE AND VENT
   a. System Description
      1) A sanitary waste and vent system will be provided for all plumbing fixtures and other devices that produce sanitary waste. Plumbing fixtures will be drained by gravity through conventional soil, waste and vent stacks, and building sewers to the site sewer.
      2) All fixtures will have traps and will be vented through the roof. Vent terminals will be located away from air intakes, exhausts, doors, openable windows, and parapet walls at distances required by the plumbing code.
      3) All vivarium waste will be considered sanitary waste. All fixtures located within the vivarium will be connected to the sanitary waste and vent system.
      4) All floor drains, floor sinks, and indirect waste receptors will be provided with automatic trap primers.

3. LABORATORY WASTE AND VENT
   a. System Description
      1) Plumbing fixtures in laboratories and laboratory support spaces will be provided with a drainage system separate from the sanitary drainage system.
      2) The laboratory waste system will drain by gravity to the exterior of the building and connected to the site sanitary sewer system at the manhole.
      3) Above and below ground laboratory waste and vent piping will be Schedule 80 flame-retardant polypropylene pipe, ASTM D4101, with electronic socket fusion joints.

4. DOMESTIC WATER
   a. System Description
      1) Domestic water will be provided to all toilet room fixtures, electric water coolers/drinking fountains, sinks, emergency shower/eyewash units, vivarium sinks and any other devices that require a domestic water supply.
      2) Hot water at 120°F will be provided to all fixtures and devices that require hot water. The emergency fixtures (showers and eyewashes) will be supplied with tepid water.
      3) The building's water system will be isolated from the municipal water system by a duplex reduced pressure backflow preventer located downstream of the water meter.
      4) Domestic hot water will be produced.
      5) The hot water system temperature will be maintained by recirculating the hot water through a continuous loop with an in-line circulating pump.
      6) Tepid water to emergency fixtures will be provided by a master thermostatic mixing valve with cold water bypass device. System will be recirculated to the mixing valve for temperature maintenance.
      7) The domestic hot and cold-water systems will be Type L copper tube with wrought copper fittings and soldered joints. Solder will be lead-free, 95-5 type solder. Piping 2-1/2" and larger and located in mechanical equipment rooms may be rolled groove mechanical joints.

5. PLUMBING FIXTURES
   a. System Description
      1) All plumbing fixtures will be new, commercial grade products.
      2) Plumbing fixtures designated as barrier-free will be manufactured and installed in accordance with local, state, and federal accessibility requirements.
   b. Equipment and Material
      1) Water closets will be wall hung, vitreous china, with elongated bowls. Flush valves will be diaphragm type, 1.28-gallon flush.
      2) Urinals will be wall-hung, vitreous china. Flush valves will be diaphragm type, 0.125-gallon flush.
      3) Lavatories will be vitreous china. Faucets will be hot and cold mixing type, sensor operated, AC power, 0.5 gpm flow control. Refer to architectural floor plans for areas with hall hung units and counter mounted units.
      4) Sinks will be countertop mounted stainless steel. Faucets will be hot and cold mixing type. Sinks in break rooms will be fitted with insta-hot water dispensers.
      5) Laboratory sinks will be by casework. Faucets will be supplied with the casework and installed by the Division 22 contractor.
      6) Showers will be pre-manufactured enclosures with pressure balanced shower valves. Barrier-free showers will also have with hand spray with hose adjustable, adjustable wall bar, grab bars and fold up seat.
      7) Drinking fountains will be wall mounted, single level, stainless steel with bottle fillers.
      8) Janitor sinks will be floor mounted, precast terrazzo, drop front, with stainless steel splash panels. Faucets will be hot and cold mixing type with hose connections and vacuum breakers.
      9) Exterior hose bibbs will be flush mounted, freeze resistant, with vacuum breakers and loose key operators.
      10) Mechanical room hose bibbs will be surface mounted, with vacuum breakers.
      11) Emergency shower and eyewash units will be recessed stainless steel, pull down eyewash pan and drain discharge exposed above the floor.

6. LABORATORY WATER SYSTEM
   a. System Description
      1) All sinks and equipment located in laboratories and lab support spaces that require water will be supplied from a dedicated water system that is completely separate from the domestic water system. The laboratory water system will be isolated from the incoming water system by duplex reduced pressure backflow preventers.
      2) Hot water at 125°F will be provided to all fixtures and equipment requiring hot water.
      3) Laboratory hot water will be produced by duplex, steam-fired, semi-instantaneous water heaters. Tube bundles will be single wall. Equipment (autoclaves, glass wash, cage wash, etc.) that requires higher water temperatures shall be provided with optional booster heaters that come with the equipment.
      4) The hot water system temperature will be maintained by recirculating the hot water through a continuous loop with an in-line circulating pump.
      5) Water hammer arrestors will be provided at all solenoid valves and at other potential water hammer sources.
      6) The laboratory hot and cold-water system piping will be Type L copper tube with wrought copper fittings and soldered joints. Solder will be lead-free, 95-5 type solder. Piping 2-1/2" and larger and located in mechanical equipment rooms may be rolled groove mechanical joints.
      7) The hot water system will be insulated to maintain temperature. The cold-water system will be insulated to prevent condensation from forming. Isolation valves will be provided at all riser connections, branch piping run-outs to fixture groups, and at fixtures and devices requiring maintenance.

7. NON-POTABLE WATER SYSTEM
   a. System Description
      1) Non-potable water system will provide make-up water to mechanical (HVAC) systems such as heating hot water. A reduced pressure backflow preventer will protect the domestic water supply and will be sized for 100% of the design load.
   b. Design Criteria
      1) The piping will be sized to limit the velocity in any section of the system to a maximum of 8 fps.

c. Equipment and Material
   1) Water hammer arrestors will be provided at all solenoid valves and at other potential water hammer sources.
   2) The non-potable water system piping will be Type L copper tube with wrought copper fittings and soldered joints. Solder will be lead-free, 95-5 type solder. Piping 2-1/2" and larger and located in mechanical equipment rooms may be rolled groove mechanical joints.
   3) The non-potable water system will be insulated to prevent condensation from forming.
   4) Isolation valves will be provided at all riser connections, branch piping run-outs to fixture groups, and at fixtures requiring maintenance.

8. HIGH PURITY WATER
   a. System Description
      1) A system will be provided to produce and distribute water meeting the quality requirements of CLSI Clinical Laboratory Reagent Water (CLRW).
      2) Minimum water purity for central equipment RO/DI water system is College of American Pathologists (CAP) Type II. This requirement shall be met at each outlet.
      3) Pure water will be continuously circulated in closed loops to users throughout the lab areas of the building. Piping will be polypropylene.
      4) A pure water storage tank will be provided to ensure that water is available for distribution in the event that the production system is shut down.
      5) The system will be automatically monitored and controlled by a dedicated PLC based control system that will send a discrete alarm signal to the Building Management System in the event of deviations.

9. LABORATORY VACUUM
   a. System Description
      1) Laboratory vacuum air will be provided to all laboratory areas as programmed. Vacuum will terminate at laboratory outlets or equipment connections as required.
      2) The piping system will be sized to limit pressure drop across the system to maximum of 3" of mercury vacuum.
      3) The pumps will be controlled by pressure switched in receiver set to operate between 23" and 26" of mercury vacuum. Each pump will be sized for 100% of the maximum total demand. The pumps will be controlled on lead/lag/alternate basis.
      4) Laboratory vacuum will be produced by duplex expandable, rotary vane vacuum pumps. Pumps will be base mounted. Vacuum will pass through a liquid separator and an ASME rated vertical receiver prior to passing through the pumps.
      5) Laboratory vacuum piping will be Type L copper, ASTM B88 with soldered joints.

10. LABORATORY COMPRESSED AIR
   a. System Description
      1) Laboratory grade compressed air from a central location will be provided to all laboratory areas at a pressure of 100 psig and a dewpoint of -40°F. An additional pressure regulator will be provided at an accessible location in the ceiling of each floor.
      2) Compressed air piping system will be sized based on 1 scfm per outlet plus any flow required for individual pieces of equipment. Diversity factors will be applied to laboratory outlets as indicated below:
      3) The compressors will be controlled by pressure switches in receiver set to operate between 100 and 115 psig. Each compressor will be sized for 100% of the maximum total demand. The compressors will be controlled on lead/lag/alternate basis.
      4) Laboratory grade compressed air will be produced by duplex, oil-free rotary screw air compressors. Compressors will be base mounted. Air will be treated with coalescing filters, charcoal filters and particulate filters and dried with duplex heatless desiccant air dryers. Compressed air will be stored in an ASME rated vertical receiver with outlet pressure regulator.
      5) Compressed air piping system will be ASTM B-280 Type L, oxygen cleaned copper piping with brazed joints.

11. NATURAL GAS
    a. System Description
        1) Natural gas is anticipated to be piped to laboratory outlets as required to meet building needs. Gas pressure will be determined based on equipment requirements. Natural gas is anticipated to be a centrally piped and distributed system to serve lab and fume hood gas outlets. Natural gas will be extended to the building from the natural gas main on the site. It is anticipated that the gas meter will be located at grade at the service entrance to the building.

12. LABORATORY NITROGEN
    a. System Description
        1) A central nitrogen system will be provided to serve outlets as required by the Owner. The system will consist of a multi bottle manifold located near the loading dock, vertical distribution on each floor and horizontal distribution to the outlets on each floor. Nitrogen piping will be ASTM B-280 Type L, oxygen cleaned, with brazed joints.

Division 23

- **Motors.** Electrically driven or electrically connected HVAC equipment shall be of a type which shall conform to any applicable standards of the National Bureau of Standards of the United States Department of Commerce or the standards of the Underwriters Laboratories or another nationally recognized testing laboratory. Equipment items shall bear the UL label or equivalent.
- **Gauges and Meters.** Provide temperature and pressure gauges at heating and cooling coils and equipment.
- **Supports, Anchors, Curbs, Seals and Flashings.** Provide pipe hangers, sleeves and plates, equipment stands, housekeeping pads, curbs, seals and caulking, and flashing for finished HVAC systems.
- **Hydronic Piping**. Furnish and install complete heating, chilled water and heating water piping systems. Pipe: black steel schedule 40, copper type L.
- **Hydronic Specialties**. Provide hydronic accessories for proper system operation including expansion tanks, air vents, air separators, pressure reducing valves, strainers, relief valves, balancing valves.
- **Vibration Isolation**. Furnish and install vibration isolation mountings for all fans, air handling units, pumps, compressors, and any other motorized HVAC equipment installed.
- **Mechanical Identification**. All HVAC valves, equipment, and access doors and panels shall be tagged for identification. Piping systems shall be labeled and color-coded with a color banding system.
- **HVAC Insulation**. Insulate HVAC systems as follows:
    - HVAC Piping Insulation. Insulate chilled water supply and return pipe and fittings. Insulate refrigerant suction and hot gas piping and fittings. Insulate heating water supply and return pipe and fittings.
    - Equipment Insulation. Insulate heating and cooling equipment including valves, pumps, tanks, etc.
    - Duct Insulation. Insulate all supply air ducts. Insulate all outside air ductwork.
- **Energy Management and Control System.** The Energy Management Systems shall communicate with the existing Siemens control system and shall be fully compatible with the existing architecture and campus network. The heating and ventilation system will be controlled from an automated direct digital control (DDC) system. The system will start/stop and stage equipment based on occupancy of the building and individual room heating, cooling and ventilating requirements. All equipment controllers will be electronic and shall have complete standalone capabilities. Controller shall communicate all points of information to the Energy Management System operator's terminal. The campus Energy Management System has a central operator's terminal (personal computer) where the campus facility personnel. This building shall communicate with the existing terminal.
- **Variable Frequency Drives**. Furnish and install microprocessor based Pulse Width Modulated adjustable frequency AC drives. Drives shall be UL labeled and accept inputs from the Energy Management Control system for control of speed for variable volume pumping and fan systems. Drives shall be complete with protection circuits.
- **HVAC Pumps**. Provide circulating pumps for closed loop heating and cooling hydronic systems.

- **Refrigerant Piping and Specialties**. Furnish and install refrigerant piping systems as indicated. Refrigerant pipe: Type ACR.
- **Chemical Water Treatment**. Provide equipment, chemicals, and service to treat closed hydronic systems for corrosion and freeze protection where system is subject to freezing.
- **Ductwork**. Supply, return and general exhaust sheet metal ductwork and shall be galvanized steel constructed in strict accordance with the latest edition of SMACNA standards for HVAC duct construction and with the International Mechanical Code. The use of round flexible duct shall be limited to connections to diffuser and air terminal units.
- **Ductwork Accessories**. Provide balancing dampers with regulators, air turning vanes, fire and/or smoke dampers and flexible equipment connections as required for a complete and operational duct systems.
- **Power Ventilators.** Provide exhaust fans for toilet, high use copy machines, and custodial areas.
- **Air Terminal Units**. VAV with integral hot water reheat coil. Fan powered and single duct terminal types will be considered.
- **Air Outlets and Inlets**. Provide air inlets and outlets including grilles, registers, diffusers, and wall louvers.
- **Air Cleaning Devices**. All fan systems shall be protected with filter sections.
- **Air Cooled Condensing Units**. Self-contained, packaged, factory assembled and pre-wired units suitable for outdoor use consisting of cabinet, compressors, condensing coil and fans, integral sub-cooling coil, controls, liquid receiver, and protective coil covers/screens.
- **Air Handling Units**. Air handling units shall be modular type, prepackaged by the manufacturer, and shall include fans, heating hot water and chilled water coils, filter, and mixing box sections.

HVAC Base Design Criteria

1. APPLICABLE CODES
   a. The Mechanical Systems will be designed in accordance with the following Codes:
      1) Washington Administrative Code
      2) 2015 International Mechanical Code with Washington Amendments
      3) 2012 Washington State Energy Code with Seattle Amendments
      4) 2015 International Fire Code with Washington Amendments
      5) 2015 International Building Code with Washington Amendments

2. APPLICABLE GUIDELINES AND STANDARDS
   a. The Mechanical Systems will be designed in accordance with appropriate portions of the following Guidelines and Standards:
      1) Laboratory Design Guidelines
         a) In general, the laboratory design Guidelines have been developed using appropriate information from the following Standards:
         b) ACGIH Industrial Ventilation - A Manual of Recommended Practice (the latest edition).
         c) ANSI/AIHA Z9.5 2003 - Laboratory Ventilation Standard.
         d) OSHA 29 CFR Part 1910 - Occupational Exposures to Hazardous Chemicals in Laboratories.
         e) ASHRAE Standard 110-1995 - Method of Testing Performance of Laboratory Fume Hoods.
      2) National Fire Protection Association (NFPA) guidelines and standards including the following:
         a) NFPA 30 - Flammable and Combustible Liquids Code, 2008 Edition.
         b) NFPA 45 - Fire Protection for Laboratories Using Chemicals, 2004
         c) NFPA 54 - National Fuel Gas Code.
         d) NFPA 72 - National Fire Alarm Code.
         e) NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems, 2009 Edition.
         f) NFPA 92B - Guide for Smoke Management in Malls, Atria, and Large Areas, 2009
         g) NFPA 101 – Life Safety Code, 2009 Edition.
         h) NFPA 110 – Standard for Emergency and Standby Power Systems, 2010 Edition.

3) Occupational Safety and Health Administration (OSHA)
4) ASHRAE Standard 62.1 Ventilation for Acceptable Indoor Air Quality, 2007 Edition
5) American Industrial Hygiene Association (AIHA) guidelines and standards
6) Guide for the Care and Use of Laboratory Animals (U.S. Department of Health and Human Services.)
7) FM Global Property Loss Prevention Data Sheets, as determined and defined by Owner.

3. OUTDOOR DESIGN CONDITIONS
   a. Summer
      1) Dry-Bulb Temperature = 84°F
      2) Wet-Bulb Temperature = 67°F
         a) (Based on 0.5% dry-bulb and mean coincident wet-bulb temperature for Seattle, WA – University of Washington in Recommended Outdoor Design Temperatures Washington State, as published by Puget Sound Chapter, ASHRAE, April 1986.)
   b. Winter
      1) Dry-Bulb Temperature = 22°F Based on 0.296% dry-bulb conditions for Seattle, Washington.
         a) (Based on 0.2% dry-bulb conditions for Seattle, WA – University of Washington in Recommended Outdoor Design Temperatures Washington State, as published by Puget Sound Chapter, ASHRAE, April 1986.)

4. INDOOR DESIGN CONDITIONS
   a. Office, Conference and Administrative Support Areas
      1) Dry-Bulb Temperature
         a) Summer = 75°F ± 3°F
         b) Winter = 70°F ± 3°F
      2) Relative Humidity = No Control
   b. Laboratory and Laboratory Support
      1) Dry-Bulb Temperature
         a) Summer = 75°F ± 2°F
         b) Winter = 70°F ± 2°F
      2) Relative Humidity = No Control
   c. Vivarium Holding Rooms
      1) Dry-Bulb Temperature = 64-79°F ± 2°F (year-round)
      2) Relative Humidity = 30-70% ± 3% (year-round)
   d. Vivarium Procedure Rooms
      1) Dry-Bulb Temperature = 66-70°F ± 2°F (year-round)
      2) Relative Humidity = 30-70% ± 3% (year-round)
   e. IDF, MDF, and Telecommunication Rooms
      1) Dry-Bulb Temperature
         a) Summer = 72°F ± 2°F
         b) Winter 68°F ± 2°F
      2) Relative Humidity = No Control
   f. Mechanical and Electrical Rooms
      1) Dry-Bulb Temperature
         a) Summer = 94°F Maximum
         b) Winter = 60°F Minimum
      2) Relative Humidity = No requirement
   g. Elevator Machine Room
      1) Dry-Bulb Temperature
         a) Summer = 94°F ± 3°F Maximum
         b) Winter = 60°F± 3°F Minimum
      2) Relative Humidity = No requirement
   h. Unoccupied Spaces
      1) Dry-Bulb Temperature = 65-95°F

2) Relative Humidity = No Control

i. Greenhouse Research Climate Rooms

1) Dry-Bulb Temperature = 55-85°F ± 3°F

2) Relative Humidity = 30-80% ± 10% (year-round)

j. Greenhouse Corridor

1) Dry-Bulb Temperature

a) Summer = 75°F ± 10°F

b) Winter = 75°F± 10°F

2) Relative Humidity = No Control

5. HEATING AND COOLING LOADS

a. Electrical

1) Offices and Administrative Support Areas

a) Lighting = 1.5 watts per sq. ft

b) Equipment = 2.0 watts per sq. ft

2) Conference Rooms

a) Lighting = 1.5 watts per sq. ft

b) Equipment = 2.0 watts per sq. ft

3) Open Laboratory

a) Lighting = 1.62 watts per sq. ft

b) Equipment = 10.0 watts per sq. ft

4) Laboratory Support Spaces (Procedure Rooms)

a) Lighting = 1.62 watts per sq. ft

b) Equipment = 15 watts per sq. ft

5) Laboratory Support Spaces (Equipment Corridors)

a) Lighting = 1.62 watts per sq. ft

b) Equipment = 25 watts per sq. ft

6) Vivarium Rooms

a) Lighting = 1.62 watts per sq. ft

b) Equipment = 3.0 watts per sq. ft

7) Tissue Culture/Procedure Room

a) Lighting = 1.62 watts per sq. ft

b) Equipment = 10.0 watts per sq. ft

8) Sterilizing and Supply

a) Lighting = 3.0 watts per sq. ft

b) Equipment = 15.0 watts per sq. ft or actual equipment load

9) Procedure Rooms

a) Lighting = 2.0 watts per sq. ft

b) Equipment = 10.0 watts per sq. ft

10) Locker Rooms

a) Lighting = 1.5 watts per sq. ft

b) Equipment = 0 watts per sq. ft

11) Corridor

a) Lighting = 0.7 watts per sq. ft

b) Equipment = 0 watts per sq. ft

12) Storage Rooms

a) Lighting = 1.0 watts per sq. ft

b) Equipment = 0 watts per sq. ft

13) Greenhouse Climate Rooms

a) Lighting = 10.0 watts per sq. ft

b) Equipment = 2.0 watts per sq. ft

b. Occupancy
   1) The occupancy heat rejection will be based on 2009 ASHRAE Handbook of Fundamentals, Chapter 18 for Moderately Active Office Work or:
      a) Sensible = 250 Btuh/person
      b) Latent = 200 Btuh/person
   2) The number of occupants in each space will be based on ASHRAE Standard 62.1-2007 or the actual occupant density listed in the facility program.
   3) Occupancy Schedule
      a) 24 hours per day, 365 days per year.

c. Infiltration
   1) The building heat loss calculations will include an infiltration load based on 1.5 cfm of infiltration air per linear foot of exterior wall with windows, per floor level, and 1.0 cfm of infiltration air per linear foot of exterior wall without windows, per floor level.
   2) The following infiltration rates will be used for doors:
      a) 200 cfm per door for exterior main doors
      b) 5 cfm per square foot for exterior overhead doors

6. VENTILATION RATES
   a. The minimum ventilation (outdoor air) rates will be as follows (ach=air changes per hour. ACH value indicated for supply air is for positive pressure room and for exhaust air, for negative pressure room):
      1) Offices, Conference and Administrative Support Area.
         Based on Table 6-1 of ASHRAE 62.1 Standard 2007.
      2) Laboratories and Laboratory Support Areas.
         Occupied: 6 ach, minimum
         Unoccupied: as needed for pressurization requirements
      3) Vivarium:
         Animal Procedure Rooms: 12 ach
         Animal Holding Rooms: 15 ach (including Quarantine Rooms, Conventional Animal Rooms)
         Glasswash/Cagewash: 30 ach (may be reduced if capture of moist air is accomplished at the source)

7. HEATING HOT WATER SYSTEMS
   a. System Description
      1) The heating hot water system will serve preheat coils in the air handling units, reheat coils in the air terminal units, fin tube, and various independent unit heaters. The system will consist of gas-fired condensing boilers, distribution pumps, and distribution piping system.
      2) Alternative: A modular heat recovery chiller will provide preheat to the heating hot water loop based on the amount of process chilled water production and the amount of heat already rejected to the lab hot water preheat tank.
      3) Heating hot water will be distributed at supply temperature of 130°F.

8. CHILLED WATER SYSTEM
   a. System Description
      1) Chilled water will be supplied to the building from the campus chilled water system. Underground pre-insulated piping will be extended from the chilled water connection point to the building service entrance.
      2) The chilled water system will serve cooling coils at air handling units and any process loads at approximately 42°F with a 15°F temperature drop.
      3) A load of approximately 300tons is anticipated for the building.

9. STEAM AND CONDENSATE SYSTEM (BOILER PLANT WITHIN BUILDING)
   a. System Description
      1) Steam will be generated at 100 psig by boilers located with the building mechanical room. Steam will be saturated.
      2) The system will include Deaerator, feedwater pumps, boilers, and vertical and horizontal distribution through the building. Non-contact steam will be pumped back to the deaerator.

3) A chemical treatment and water softening system will be provided
4) The steam will be used at the generated pressure and reduced appropriately as a heat source in the facility for the following applications:
   a) Humidification
   b) Cagewash Equipment
   c) Glasswash Equipment (non-contact)
   d) Autoclaves/Sterilizers
5) Two boilers each sized for 2/3 of the design load will be provided for redundancy

10. LABORATORY/OFFICE AIR HANDLING SYSTEM
    a. System Description
    1) Multiple air handling units will serve the laboratory, lab support, vivarium and office spaces. System will be single duct, variable air volume, reheat system, providing heating and cooling to the spaces. Total capacity of approximately 110,000 CFM is anticipated.
    2) System will consist of factory fabricated custom air handling units.
    3) Air handling units will operate in parallel as a single supply air system.
    4) Air from offices will be returned to the air handling unit.
    5) Air serving vivarium areas will be separated into a designated duct system in the penthouse and humidified to support those areas.
    6) Air handling unit will operate 24 hours per day, 365 days per year.
    7) Heat recovery coils will be provided to recover heat from general exhaust system.
    8) Ductwork will not be lined. Sound attenuating flexible duct up to 6 ft in total length, will be provided at the supply diffusers to control noise. Sound attenuators at the discharge of air terminal devices will not be provided unless required to meet noise criteria.
    9) Variable volume pressure independent air terminal devices will be utilized in the open lab, lab support, vivarium, corridors, offices, etc. Constant volume pressure independent air terminal devices will be utilized for supply to warm/cold rooms.
    10) Ductwork will be constructed in accordance with SMACNA Standards for appropriate pressure class.

11. COMBINED LABORATORY EXHAUST SYSTEM
    a. System Description
    1) Building will be served by a central exhaust air system. The system will combine laboratory fume hood, snorkel, canopy hoods, and Class II Type A2 biosafety cabinet exhaust with general exhaust.
    2) System will consist of multiple exhaust fans located in the penthouse and connected to a common exhaust fan inlet plenum. The fans are intended to operate in parallel and will each be sized for 25% of the design load. Each system will operate 24 hours per day, 365 days per year.
    3) Laboratory exhaust system will be variable air volume. Fans will have packless type sound attenuating devices on the exhaust main.
    4) Heat recovery coil will be provided at the inlet of the fan. 30% pleated filters will be provided at the inlet of coil. Heat recovery coils and filters will be located in penthouse. The heat recovery pumps will be stopped when heat recovery is not effective to reduce system energy consumption.
    5) Pressure independent, variable volume, exhaust air terminal devices will be provided to serve general exhaust grilles in lab and non-lab areas. Pressure independent, constant volume or variable volume, exhaust air terminal devices as required will be provided for the fume hoods, snorkel, canopy, biosafety cabinets, and constant volume spaces.
    6) High pressure/high velocity exhaust ductwork will be utilized between the exhaust air terminal devices and the central exhaust plenum. Sound attenuating devices at the air terminals will not be provided unless required to meet noise criteria. Six feet of sound attenuating flexible ductwork will be provided at general exhaust grilles (but not at fume hoods) to control noise.

12. FUME HOOD AND LABORATORY AIR FLOW CONTROL SYSTEM
    a. System Description
    1) Each lab space will have a stand-alone fume hood and/or laboratory controller which will control the space

temperature, fume hoods, and pressurization.
2) Pressurization will be controlled by supply air/exhaust air tracking.
3) Each fume hood will have a low flow alarm to indicate if fume hood face velocity falls below a specified level.
4) Fume hood and laboratory air flow control system will be on emergency power.
5) Systems will be by Johnson Controls, Phoenix, or Seimens.
6) Laboratory controls will be distributed architecture.

13. VIVARIUM EXHAUST SYSTEM
    a. System Description
        1) Vivarium will be served by a central exhaust air system. The system will serve animal holding rooms, quarantine rooms, segregation rooms, etc.
        2) System will consist of two exhaust fans connected to a common exhaust fan inlet plenum and will be located on the roof. The fans are intended to operate in lead/standby operation and will each be sized for 100% of the design load. Each system will operate 24 hours a day, 365 days per year.
        3) Vivarium exhaust system will be constant volume.
        4) Pressure independent constant volume exhaust air terminal devices will be provided to serve exhaust in animal holding rooms, cagewash, etc. Animal holding room air terminal devices will be constant volume.

14. CAGEWASH EXHAUST SYSTEM
    a. System Description
        1) Cagewash area will be served by a central exhaust air system.
        2) System will consist of one exhaust fan connected to a plenum and will be located on the roof. The system will operate 24 hours per day, 365 days per year.
        3) System will be variable air volume while the exhaust fans operate at constant volume to maintain a constant stack discharge velocity. A static pressure sensor in the exhaust fan inlet plenum modulates an outside air bypass damper, introducing the required outside air into the plenum to maintain a constant flow rate through the fans. Fans will have packless type sound attenuating devices on the exhaust main, and the outside air by-pass duct.
        4) Pressure independent, two position constant volume exhaust air terminal devices will be provided to serve exhaust grilles in cage washing area, cage washing equipment, and autoclaves.

15. GREENHOUSE CLIMATE ROOMS AIR HANDLING SYSTEMS
    a. System Description
        1) Six small fan coil units will condition each of the climate rooms in the greenhouse area. System will be recirculating single duct, constant volume with economizer control, heating, cooling, and humidification.

16. BUILDING AUTOMATION SYSTEM
    a. Building Control System Description
        1) Mechanical systems will be controlled and monitored through a DDC based Environmental Monitoring and Control System (EMCS) with distributed processing at the local level. Electric actuation will be utilized for terminal unit control
        2) The EMCS will include all necessary hardware and software to comply with the metering requirements of the campus
        3) All vivarium holding rooms will include at least three pre-programmed air change rate values, corresponding to unoccupied mode, partially occupied mode and full operation.
    b. Vivarium Monitoring System Description
        1) The vivarium monitoring system will be provided to manage, control, monitor and report on environmental and security statuses of the vivarium holding and procedure spaces. The design intent is to provide interface and reporting tools to meet best practices for care and use of laboratory animals.
        2) The design documentation will make use of specific manufacturers and equipment as basis of design to provide a level of quality and functionality that is to be specific for procuring and integration into the completed facility.
        3) Systems will be designed in conformance to existing client standards, where available, and to current industry standards.
    c. Green House Control System Description

1) The greenhouse network system(s) will be provided to manage, control, monitor and report on environmental security statuses of the greenhouse spaces. The design intent is to provide interface and reporting tools to meet best practices for care and use of organics.
2) The design documentation will make use of specific manufacturers and equipment; it is not intended to dictate a sole-sourcing of the equipment, but to provide a level of quality and functionality that is to be specific for bid and integration into the completed facility.
3) Systems will be designed in conformance to existing client standards, where available, and to current industry standards.

Division 26

- **Conduit**. Galvanized steel metal conduit shall be used inside building. Non-metallic conduit shall be used underground, except at transitions. Metal conduit shall be rigid metal conduit, intermediate metal conduit, electrical metallic tubing, or flexible metal conduit. Non-metallic conduit shall be schedule 40 PVC. Conduit shall be concealed wherever possible. EMT 2" and smaller is required to be color coded for different electrical systems in accordance with WSU standards. Minimum conduit size shall be 1/2". Minimum conduit size shall be 3/4" for home runs.
- **Building Wire and Cable**. All branch wiring shall be copper, minimum size #12AWG. All branch circuits shall be installed with dedicated neutral conductors. Feeders less than 200A shall be copper. Feeders 200A and larger shall be copper or compact stranded aluminum. All building wire shall be color coded in accordance with NEC.
- **Wiring Devices**. Switches and receptacles outlets shall be specification grade. GFI type outlets shall be provided where outlets are mounted within 6 feet of a sink.
- **Grounding and Bonding**. Grounding materials shall be copper, except ground rods shall be copper-clad steel. Grounding electrode shall be provided per code requirements.
- **Distribution Switchboards**. Switchboards shall be free-standing dead-front style. Main service over-current protection device shall be equipped with ground fault protection when required by the NEC. Distribution devices shall be factory-installed, group-mounted circuit breakers. Switchboard shall be mounted on a 2" concrete housekeeping curb. All bus bars shall be copper or tin-plated aluminum.
- **Panelboards**. Panelboards shall be dead-front circuit breaker type with proper interrupting capacity. All panelboards shall be provided with 42 available circuits and door in door construction. All bus bars shall be copper or tin-plated aluminum.
- **Lighting**. The predominant lighting source throughout the facility shall be LED or fluorescent lamps shall be T8 or T5. In general, areas will be illuminated in accordance with Illumination Engineering Society (IES) recommendations. Compact fluorescent lamps will be minimized to the fullest extent possible. Incandescent sources will avoided. Exit signs shall have stencil-cut letters with LED sources. Exit and egress lighting shall be furnished with battery stand-by units. Exterior lighting will be LED. Site and exterior building lighting will be located around the perimeter and along pedestrian sidewalks to provide sufficient illumination for egress and to accommodate future video surveillance system.
- **Packaged Engine Generator.** Emergency power generation shall be provided by means of a diesel fueled engine/generator set. Generator set shall be sized to supply emergency and legally-required standby loads. Additionally, the generator will be configured to supply optional standby loads through an automatic load pick-up and shedding system. Generator set shall include a weather proof sound attenuating enclosure for outdoor installation. Operation of the generator will be monitored on a multi function system designed to report most normal failures such as low cooling fluid temperature, low starting batteries, over-crank, overload, high water temperature, etc. There is the potential for a natural gas option.

1. APPLICABLE CODES
   a. The information technology systems will be designed in accordance with the following codes:
      1) NEC — Current National Electrical Code with Washington Amendments
      2) City of Vancouver — Building and Permitting Services
      3) IBC 2015 — International Building Code with Washington Amendments
      4) ADA — Americans with Disabilities Act Accessibility Guidelines

2. APPLICABLE GUIDELINES AND STANDARDS
   a. The information technology systems will be designed in accordance with the following guidelines and standards:
      1) IEEE Institute of Electrical and Electronics Engineers
      2) TIA-526-7 Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant.
      3) TIA-526-14A Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant.
      4) TIA 568.0-.4 Commercial Building Telecommunications Cabling Standards
      5) TIA 569 Commercial Building Standard for Telecommunications Pathways and Spaces
      6) BICSI TDMM BICSI Telecommunications Distribution Methods Manual
      7) WSU Design and Construction Standards
      8) WSU-VAN Classroom Podia AV Setup
      9) UL Underwriters Laboratories

3. LOAD CALCULATION CRITERIA
   a. Telecommunications Station Cabling and Outlets – supporting voice, data, wireless, CATV, CCTV, Audiovisual, Digital Signage, Building Facilities Network, Metering, Monitoring, etc.

	Functional Area	Cables	Backbox Outlets
1)	Offices/Reception/Conference/Support	3-10	1-6
2)	Corridor/Hallway	4-8	4-8
3)	Lab	36-60	12-20
4)	Lab Support	8-12	4-6
5)	Greenhouse	12-20	6-10
6)	Computer Workstation/Copy Room	1-2	2-4
7)	Elevator Machine Room	2-4	1-2
8)	Mechanical Room/Electrical Room	4-8	2-4

   b. Communication Systems Backbone Requirements – Intrabuilding and Interbuilding
      1) Copper: 50 Pair interbuilding armored and gel-filled, redundant, from MDF to UCB and from MDF to CSL. 50 Pair intrabuilding from MDF to each IDF.
      2) Single-Mode Fiber Optic: 96 strands interbuilding armored and filled, redundant, from MDF to UCB and from MDF to CSL. 48 strands intrabuilding from MDF to each IDF.
   c. Wi-Fi Services
      1) Interior: 100% coverage at 2.4GHz and 5.0GHz, cabling infrastructure design to provide highest available bandwidth based on room occupancy expectations, and general coverage for normally unoccupied areas.
      2) Exterior: coverage of exterior public gathering space, 2.4GHz and 5.0GHz to highest available bandwidth based on coverage area.
   d. Security Services
      1) Card readers are required at main entries to the building and departments. Classrooms and conference rooms are scheduled spaces and shall be provided with card readers. Storage and secure rooms, especially within the lower level spaces including the vivarium, maker spaces and greenhouse shall be provided with card readers to limit personnel with acceptable access levels.
      2) Cameras shall be provided around the site, provided on the exterior of the building to view public spaces and spaces where services might enter the building.
      3) Security and observational cameras shall be provided interior to the building at access-controlled entries, in corridors and by doors interior to the building that are access control. Cameras shall also be provided within the vivarium and viewable to vivarium staff within holding spaces and key storage spaces.

4. EQUIPMENT SIZING CRITERIA
   a. Provide Head End Termination Equipment equal to the requirements determined for station outlet connectivity of all systems plus growth of 20%.
   b. Pathways Requirements
      1) Cable pathways will be sized with a minimum of 50% spare capacity, or spare pathways will be provided to allow for growth. Typical pathway sizing is as follows:

a) Outdoor Interbuilding - 100% spare capacity over initially installed cabling, primarily 4" conduit with (3) innerducts per. (6) conduits will be provided from service corridor to building. Refer to the Utility Extension and Relocation requirements in the overall report for additional information.
b) Indoor Intrabuilding - Fill to 50% of maximum allowed by code. Primarily continuous j-hook/saddles supports, sleeves and cable tray. Conduits and sleeves shall be sized to be equivalent to the cable tray capacity (typically 18" wide x 4" deep), and vertical sleeves will be equivalent to the ladder tray capacity (typically 18" wide x 2" deep).
c) Cable trays must be accessible and below the ceiling plane in general corridor and public spaces. Cable trays will be protected in these areas utilizing a corridor soffit design. Cable trays in vivarium and other spaces with organics shall be installed above an accessible ceiling, or large conduit, j-box and branch conduit design will be employed.
d) Station – 1.25" minimum conduit size

2) Pathways will be installed to connect MDF and IDFs in an efficient manner.

c. IDF and MDF Room requirements include lighting, electrical power distribution, cooling, other environmental considerations, and fire protection.

1) General
a) The MDF will be located on a lower level and will be near the base of the stacked of IDFs. The MDF will be connected to the service spine via conduits to bring redundant copper and fiber backbone services.
b) IDFs will be located on each additional level above or below the MDF.
c) Rooms shall be centrally located to assure a single room required per floor.
d) Suspended ceilings should not be provided in MDF or IDFs.
e) Floors, walls, and ceilings in the support rooms will be treated to minimize dust and the potential for static electricity. All walls will be covered with fire treated plywood (3/4" thick, 8 ft high, A-C grade). Walls should be 2 hour rated.
f) All backbone fiber optic cabling will be installed in flexible, nonmetallic innerduct. This innerduct will protect the cables and segregate conduits and conduit sleeves when outside of conduit.
g) All copper station cable will terminate to rack-mounted patch panels.
h) All fiber optic backbone will terminate to rack-mounted enclosures. Copper backbone cables will be terminated to wall-mount 110 blocks and cross-connected to rack-mount patch panels.
i) All copper and fiber optic patch panels will be installed in 7-ft high standard TIA/IA 19" equipment racks. Horizontal and vertical cable management will be provided in all equipment racks.
j) The cable raceway system will consist of a combination of cable tray, conduit, surface raceway, ladder rack, and D-rings. The ladder rack and D-rings will only be used in the MDF and IDF rooms. Cable pathways from the system outlets to the IDFs will use conduit, cable tray above accessible ceilings, and conduits will be used to bridge segmented portion of cable tray.
k) The communication systems grounding system will provide equipment protection in all support rooms. Ground bars and conductors will be provided to minimize the potential difference between the grounding system and the electrical sources powering the IT equipment.

2) Main Distribution Frame (MDF)
a) The building MDF provides a protected environment for terminating all backbone cables and outlets in the basement and sub-basement.
b) The MDF requires approximately of 240 total sq. ft of space in a minimum dimension of 12 ft by 20 ft.
c) Minimum of (4) 4" conduits for campus backbone connection will be provided to utility tunnel.

3) Intermediate Distribution Frames (IDF)
a) The IDF provides a protected environment for terminating backbone cabling and station cabling for each floor service area.
b) The IDF requires approximately of 190 sq. ft of space, in a minimum dimension of 11 ft by 18 ft.

4) Radio Distribution Support
a) The penthouse shall provide for a 120 sq. ft space, in a minimum dimension of 10 ft by 12 ft. This room will be connected to the building communications riser system described with the MDF and IDFs above. This room will be provided with utilities similar to the IDFs to support both service provider and potential utility or emergency radio service needs. Conduits shall be provided to connect this space to the roof for possible antenna requirements.

d. Support Equipment
   1) General
      a) No piping or ductwork will pass over or through any MDF or IDF room. Piping and ductwork used to provide services to these rooms will be coordinated with the anticipated communications equipment layout within the rooms.
   2) Electrical Requirements
      a) MDF and IDF rooms will be connected to the building normal power source.
      b) Electrical service for the MDF will be sized at 30 watts per square foot. Electrical service for the IDF will be sized at 50 watts per square foot.
      c) MDF and IDF rooms will be lit to a minimum of 50-foot candles between the equipment rack rows (measured at 3 ft above the floor) and will provide adequate vertical surface illumination to the bottom of racks.
   3) Mechanical Requirements
      a) MDF and IDF support rooms will be maintained at between 68 and 72°F with 30% to 50% relative humidity at all times. If the building HVAC system cannot provide continuous operation or adequate capacity to meet these criteria, supplemental cooling units will be installed.
      b) Cooling requirements for the MDF will be sized at 30 watts per sq. ft. An 80% diversity factor can be applied to this load.
      c) Cooling requirements for the IDF will be sized at 50 watts per sq. ft. A 50% diversity factor can be applied to this load.
   4) Piping Requirements
      a) The MDF and IDFs will be sprinkled and include protective cages around the sprinkler heads, and heads shall be heat-activated.

Electrical Base Design Criteria

1. APPLICABLE CODES
   a. The Electrical Systems will be designed in accordance with the following Codes:
      1) City of Vancouver — Building and Permitting Services
      2) WAC — Washington Administrative Code
      3) 2017 — National Electrical Code/w Washington amendments
      4) 2015 — International Building Code/w Washington Amendments
      5) ADA — Americans with Disabilities Act Accessibility Guidelines

2. APPLICABLE GUIDELINES AND STANDARDS
   a. The Electrical Systems will be designed in accordance with appropriate portions of the following Guidelines and Standards.
      1) IEEE — Institute of Electrical and Electronics Engineers
      2) IESI — Illuminating Engineering Society of North America
      3) NECA — National Electrical Contractors Association
      4) NEMA — National Electrical Manufacturers Association
      5) NFPA — 72, 101, 110, 780
      6) UL — Underwriters Laboratories
      7) WSU — Design and Construction Standards

3. LOAD CALCULATION CRITERIA
   a. Normal Connected Loads (VA/SQ FT)

	Functional Area	Lighting	Receptacles
1)	Offices/Reception/Conference/Support	1.0	3.5
2)	Corridor/Hallway	0.8	0.5
3)	Lab	1.5	12
4)	Lab Support	1.5	30
5)	Greenhouse	13.5	2.5

6) Computer Workstation/Copy Room	1.0	4.0
7) Elevator Machine Room	1.0	4.0
8) MDF Room	1.0	50.0
9) IDF Room	1.0	80.0
10) Mechanical Room/Electrical Room	1.5	3.5

4. EQUIPMENT SIZING CRITERIA
   a. Secondary Design Voltages
      1) Motors 1/2 HP or larger — 480V, 3 phase, 3 wire
      2) Motors less than 1/2 HP — 120V, 1 phase, 3 wire
      3) General Lighting — 277V, 1 phase, 3 wire
      4) Receptacles — 120V, 1 phase, 3 wire
      5) Specialty Lighting — 120V, 1 phase, 3 wire
   b. Equipment Sizing Criteria
      1) Branch Circuit Load Calculations
         a) Lighting — Actual Installed VA
         b) Receptacles — 180 VA per outlet
         c) Special Outlets — Actual installed VA of equipment served
         d) Motors — 125% of Motor VA (largest motor only; 100% for any others on same branch circuit)
      2) Demand Factors
         a) Lighting Feeders — 125% of installed VA
         b) Receptacles — 100% of first 10 kVA installed plus 50% of balance
         c) Motors — 125% of VA of largest motor plus 100% of VA of all other motors
         d) Fixed Equipment — 100% of total VA installed
      3) Minimum Bus Sizes
         a) 480Y/277V Lighting Panels — 100A
         b) 480V Equipment Panels — 225A
         c) 208Y/120V Equipment Panels — 225A
         d) 208Y/120V General Panels — 225A
         e) Receptacle Panels — 100A

Lighting and Branch Wiring

1. ELECTRIC SERVICE
   a. System Description
      1) Primary electric service, rated at 15 kV, is derived from the Physical Plant medium-voltage distribution system. System Voltage is 12,470 volts. The building will be served by extending an existing set of loop circuits to the building location.
      2) Emergency/Optional Standby Service will be provided by extending feeders from the Physical Plant building to the building location.
      3) The primary service is a loop configuration, which will require a new pad-mount loop switch at the building service location.
      4) The 480Y/277volt, service entrance rated, switchboards will be in a main electrical room in the building.
      5) The 12.47kV/480Y/277volt transformers shall be sized at 80% of the load.
      6) The emergency power room shall be 2-hour rated.
      7) Conductors will be of EPR insulation, rated 15-kV, and be of copper material.
      8) Conduits will be rigid galvanized steel.
      9) Man-holes will be concrete.

2. NORMAL POWER SERVICES AND DISTRIBUTION
   a. System Description
      1) Secondary electric service is 480Y/277 volts and will be distributed from a 3,000-amp switchboard.

2) Electrical distribution in the building will be distributed on each floor from one stacked electrical room. There will be a 480Y/277-volt distribution panel in each room. The distribution panel will serve a 208Y/120-volt distribution panel via a 480Y/277-208Y/120-volt transformer. Eight 100-amp, 208Y/120-volt branch-circuit panels will be served from this distribution panel. Branch panels will be distributed on the floor. A lighting riser will feed a maximum of (3) lighting panels tapped from the riser. Taps to fixed-mounted circuit breakers and 100-amp 480Y/277V lighting panelboards will occur in each room.
3) Electrical distribution to the mechanical equipment will be served from an 800-amp, 480Y/277-volt distribution panel in each mechanical room.
4) A central, Uninterruptible Power Supply (UPS) system will not be designed for installation under this Project.
5) A central power conditioning system will not be designed for installation under this Project.
6) Motor Control Centers (MCCs) will not be utilized for this project.

3. EMERGENCY/STANDBY SERVICE AND DISTRIBUTION
   a. System Description
      1) Emergency and Optional Standby power will be derived from the existing distribution equipment at the Physical Plant. New 480Y/277-volt circuits will be routed to the building.
      2) Automatic Transfer Switches and distribution panels, located in the building, will provide the source for distribution in the building.
      3) Optional Standby equipment loads include telecommunication equipment, freezers, cold rooms, vivarium animal support equipment, vivarium fan systems, some greenhouse fan systems, some growth chamber systems, elevators, and selected control systems (EMCS, LDAS, access control, CCTV).
      4) Standby mechanical distribution panels will be located in the mechanical rooms.
      5) Standby branch-circuit panelboards and emergency egress lighting panels will be located in the electrical rooms on each floor.
      6) A central, uninterruptible power supply (UPS) system will not be designed for installation under this project.
      7) The entire Emergency/Standby power distribution system will consist of conduit and wire. Busway will not be used in any portion of this system.
      8) As required by code, the feeders and branch circuit wiring to emergency loads (lighting, fire alarm, smoke control, and telecommunications) will be in dedicated raceway. Individual feeders will originate at the emergency distribution panel and will rise through the building to serve the emergency lighting panels. The emergency branch circuit panelboards will be served from the emergency lighting panels via the distribution transformer.
      9) Individual standby equipment feeders will originate at the standby equipment distribution panel and will rise through the building to serve the standby equipment distribution transformers. The transformers will serve 208Y/120V distribution panels which will in turn serve the individual standby equipment branch circuit panelboards.

4. POWER QUALITY SYSTEMS
   a. System Description
      1) The electrical system architecture will be designed for power quality by limiting power losses, minimizing sags, spikes and harmonics through the electrical system distribution design. This will be accomplished by separating equipment loads from mechanical loads, use of surge protective devices, and K-rated isolation transformers.
      2) A centralized power conditioning unit will not be designed for this project.

5. POINT OF USE SYSTEMS
   a. System Description
      1) A complete branch circuit wiring system will be provided to supply power to receptacles, lighting fixtures, and other outlets for utilization equipment.
      2) Building Support: one duplex receptacle within 25ft of mechanical equipment. Otherwise, on duplex receptacle every 250 sq. ft.
      3) Conference: one duplex on each wall every 12 ft on center. For conference rooms over 240 sq. ft, one duplex in a shared function floor box. For assembly spaces, one duplex in a shared function floor box in three locations across the front of the space.

4) Circulation: One duplex every 50' on center and within 25' of the ends of the corridors.
5) Vivarium: Outlets shall be equipped with a cast back box and cast weatherproof cover.
6) Vivarium: Provide a 12kW lighting inverter to back-up vivarium lighting systems in the basement.
7) Lab Shared Equipment and Support Areas: Dedicated outlets spaced evenly for equipment shall be provided for lab support. Specialty outlets shall be provided for specialty equipment such as 208V freezers.
8) Offices: One quad outlet and two duplex outlets.
9) Restrooms: One GFCI duplex.
10) Storage Rooms: One duplex for 150sf.
11) Site Receptacles: At entry and loading dock areas.

6. POWER MONITORING SYSTEMS
   a. System Description
      1) The power monitoring system will consist of discrete metering equipment, network cabling and programming to integrate with Building Management System which will do the totalization and graphical representation (GUI).
      2) Meters will be located at 480Y/277V service entrance switchboards; lighting riser feeder breaker; each ATS, and process equipment panelboards. Mechanical loads will be measured at the VFD and the unit equipment by the Building Management System.
      3) Mains shall be metered and reported directly back to the Campus metering and monitoring system.
      4) Categorized submetering systems shall be reported back to the Campus Energy Monitoring and Management System (EMMS).
      5) Provide switch position monitoring for all medium voltage switches, main and ties via Form-C contacts.
      6) Power monitoring systems equipment will be designed to support LEED EA Credit 5, Measurement and Verifications and the Washington State Energy Code.

7. GROUNDING SYSTEM
   a. System Description
      1) A complete low-impedance grounding electrode system will be provided for this facility. The grounding electrode system will include the main water service line, structural steel, and Ufer ground. The equipment grounding system will extend from the building service entrance equipment to the branch circuit. All grounding system connections will be made using irreversible compression connections or exothermically welded connections (required for grounding conductors of size 1/0 or larger).
      2) Bonding jumpers will be provided as required across pipe connections to water meters, dielectric couplings in a metallic cold-water system, and across expansion/deflection couplings in conduit and piping systems.
      3) Feeders and branch circuits will be provided with an equipment ground conductor. Under no circumstances will the raceway system be used as an equipment grounding conductor.

8. LIGHTNING PROTECTION SYSTEM
   a. A lightning protection system per NFPA 780 will not be provided.

9. LOW-VOLTAGE SYSTEMS CABLE ROOMS (SCR)
   a. System Description
      1) Provide SCRs on all levels.
      2) SCRs will be approximately 3 ft x 8 ft, provide access with double doors from a building corridor.
      3) SCRs should not require access through any other locked space or special lift.
      4) SCRs provide panel layout space for CAAMS, fire alarm, BAS, clock systems, and other miscellaneous component needs.

10. FIRE ALARM SYSTEM
    a. System Description
       1) Fire alarm system will be a fully addressable system as manufactured by Simplex. The fire alarm system will be comprised of smoke detectors, heat detectors, duct detectors, voice-evacuation speakers, and visual signaling

devices. The system will be connected to the campus monitoring loop.
2) The fireman's entrance panel will be equipped with voice-evacuation controls and a stairwell security over-ride switch. The voice-evacuation system will be available to the building manager as an emergency communications system.
3) The fire alarm system will comply with requirements of NFPA 72 for a protected premise signaling system except as modified and supplemented by this document.
4) Main fire alarm control panel will be located in the building electrical room; distributed panels will be placed as required throughout the facility.
5) Fire alarm annunciator panel with fireman's voice access will be mounted at the main building entrance.
6) Audio/visual devices will be installed in all areas of the building in accordance with the NFPA, ADA Guidelines, and the International Building Code.
7) Heat detectors will be installed in areas that are not feasible for smoke detectors.
8) Fire alarm system will be linked with the campus central system.

Division 27

- **Telecommunications.** Outlets shall be provided for telecommunications equipment as required by the program. Minimum system performance shall meet or exceed CAT 6 standards. Each outlet shall be provided with cables to the floor telecommunications closet. Telecommunications (voice and data) wiring shall be distributed using cable tray raceways. Telecommunications wiring shall utilize UTP cable and fiber optic technology. Selected areas will be equipped with wireless local area net working e.g. student study areas and others. Telecommunication rooms will be located throughout the facility in accordance with EIA/TIA 569. Connection to campus telecommunication infrastructure will be provided.

1. GENERAL
   a. The voice and data structured cabling design will provide the LSB with a solid infrastructure to support all network-related services. This includes adequate space planning, security, power, cooling, and a high-quality structured cabling system. These components will provide the foundation to support the building occupants' communications needs well into the future.
   b. Voice and data systems shall include:
      1) Voice and data communications cabling
         a) Wireless communications cabling
         b) Cable access television distribution
         c) Closed circuit television distribution (security, audiovisual, clinical and observational)
         d) Audiovisual signal distribution
         e) Facilities network distribution
         f) Environmental and security monitoring of vivarium and greenhouse technology systems
         g) Equipment and space monitoring; and metering systems

2. VOICE AND DATA COMMUNICATIONS SYSTEM
   a. Design Criteria
      1) Horizontal and vertical cable plant and terminating equipment to support voice and data communications at workstations and as identified in programming.
      2) Wireless data will be designed to provide complete building coverage, and certain areas will be provided to cover higher density expectations as identified by users during programming.
      3) Cable plant
   b. Equipment and Materials
      1) The structured cable plant will be designed entirely to Category 6A performance requirements.
         a) The Vancouver Campus is considering transitioning services from Category 6A to a Passive Optical Network aligning to standards currently used on the Pullman Campus. The design criteria for Category 6A cable and components or Passive Optical Network approach should be verified prior to commencing design of the building.
      2) Terminating equipment to support horizontal voice and data communications will be designed entirely to Category 6A performance requirements. Patch panels to support head-end termination will be rack mounted and provided with cable management systems.

a) The Vancouver Campus is considering transitioning services from Category 6A to a Passive Optical Network aligning to standards currently used on the Pullman Campus. The design criteria for Category 6A cable and components or Passive Optical Network approach should be verified prior to commencing design of the building.

3) Voice and Data backbone cabling design standards will include multi-pair copper for voice, and single-mode fiber optic cabling for data.

4) Terminating equipment to support backbone cabling will be designed to support a modular cross-connect standard for multi-pair copper and fiber optic systems. Backbone riser copper will terminate to 110 style termination blocks and will be cross-connected to Telco style patch panels provided on racks. Interbuilding backbone cables will be terminated to fuse protected panels at both ends and transitioned to 110 blocks for connection to building backbone copper cabling. Fiber optic backbone will be terminated to enclosures that are rack mounted and supplied with coupler panels for pig-tail splices with LC style terminations.

c. Distribution

1) The structured cable plant will be distributed throughout the facility utilizing an independent infrastructure comprised of conduit, outlet boxes, non-continuous pathways (j-hooks, saddles) and cable tray.

3. AUDIOVISUAL SYSTEMS

a. Design Criteria

1) The audiovisual systems will be provided to assure high-quality, user-friendly, instructional and presentation technologies in program recognized spaces. The design intent is to provide interface and presentation tools that are similar from space to space (program dependent). Standardizing display technologies amongst similar rooms, source types, source interfaces, and control interfaces.

2) The design documentation will make use of specific manufacturers and equipment; it is not intended to dictate a sole-sourcing of the equipment, but to provide a level of quality and functionality that is to be specific for bid and integration into the completed facility.

3) Systems will be designed in conformance to existing client standards, where available, and to current audiovisual industry standards.

4) Video systems will support HD quality, high-resolution displays, image sizing will be optimized to display audience. Projectors, where used will be laser. Projection screens, where used, will be motorized.

5) Audio systems will provide clear, natural sound uniformly distributed throughout listening areas. Intelligibility will be greater than 0.75 STI in classroom environments.

6) Comparative displays shall be utilized in conferencing and teaching spaces.

7) Remote learning and education shall be supported from General Classrooms and conferencing spaces, document cameras and capacity for recording and playback will be accommodated along with codec requirements.

8) Digital signage/messaging system software and content programming by University.

9) Audiovisual system design will include cameras, displays, distribution equipment and controls to support clinical/observational requirements within department specific spaces such as the vivarium, as well as to support teleconferencing and remote learning/recording requirements and assistive listening audio systems.

b. Equipment and Materials

1) Meeting spaces will include AV source inputs (laptops, CATV, etc.), AV source switching, HD quality video display, sound reinforcement as required.

2) Teleconferencing spaces will include Loudspeakers for audio playback, video and audio teleconferencing equipment, AV sources (computers, laptops, CATV, document camera, etc.), AV source switching, HD quality video display, IP-based video teleconferencing cameras and codec, control systems.

3) Informal gathering spaces will include AV source inputs (laptops, CATV, etc.), AV source switching, HD quality video display, sound reinforcement as required, digital signage/messaging displays.

4) Classroom spaces will include sound systems with wireless microphones, loudspeakers, assistive listening devices, document cameras, AV source inputs and devices, AV source switching and wireless interfaces, HD quality video displays, control systems, instructional technologies and controls, cameras.

5) Current standards include:

a) Laser projectors are based on Panasonic PT-RZ570

b) Audio are based on AMX or Extron control switch with class D amplifiers, wireless UHF microphones by Audio

Technical, lectern gooseneck by Clock, and JBL Control series for program and 70v speakers.

c) Assistive listening is Williams Sound IR.
d) Wireless interface by Barco ClickShare.
e) Document Cameras are Elmo P30 or better.
f) BluRay optical players are Samsung.
g) Controls by Extron with switching, audio DSP, control, scaling and Extron touch screen controls.
h) Podia furniture where used is currently FSR, but design decisions must accommodate accessibility.

c. Distribution
1) The structured cable plant will be distributed throughout the facility utilizing an independent infrastructure comprised of conduit, outlet boxes, non-continuous pathways (j-hooks, saddles) and cable tray in support of audiovisual systems. IP audiovisual point-to-point cabling will be utilized. Equipment will be centralized within the communications rooms noted above.
2) 1.25", 1.50" and 2.0" conduits will be provided between connected backboxes for video and audio local distribution.

4. FACILITIES NETWORK SYSTEMS
a. Design Criteria
The facilities network system will be provided as a utility to support the Building Automation/Building Management systems provided through the mechanical and electrical control system.
1) The design documentation of the communications/structured cabling system provided above will include requirements to provide communications as utility to support BAS/BMS of the facility.
2) Network data communications and fiber optic backbone design will include support for facilities network at a panel, meter and device level.
3) Network cabling for the facilities network will account for devices and systems that are remotely (LAN and WAN) monitored, alarmed, and controlled – including vivarium and greenhouse spaces and equipment within and controlling these space as well as major electrical, mechanical and plumbing systems required to support the entire facility.

5. CAMPUS ACCESS CONTROL AND CCTV SYSTEMS
a. System Description
1) Software and hardware system to provide control and tracking of access to buildings and spaces.
2) The Access Control and CCTV Security systems will be made up of the following:
a) Conduit system to support campus card reader and intrusion detection system. Wired card reader devices will be required within vivarium and main entries and are preferred for all doors. Conduits will also be required to support request to exit devices, door contact devices, and pathway to designated to IDF and MDF rooms described above.
b) Power within the IDF will be provided to support distribution of low-voltage power to individual doors requiring Access Control service.
3) IP Security cameras are required, interior and exterior. Fixed, wide-angle views for interior spaces, PTZ on exterior. HD quality, low-light, addressable.

Division 28

- **Fire Alarm.** An addressable fire alarm system shall be provided. The fire alarm control panel shall be modular, addressable, solid state type with battery back up. Fire detection devices shall include manual stations, heat detectors, photoelectric smoke detectors, tamper switches and sprinkler flow switches. Fire annunciating devices shall include visual strobe lights and speakers. Devices shall be located in accordance with NFPA and ADA codes.
- **Security System/Access Control.** A complete security/access control conduit pathway and cabling system will be provided in accordance with WSU standards requirements. Security system and access control devices will be provided by WSU.

Division 31

- **Site Clearing.** Clearing, grubbing and rough grading.

- **Excavation.** Standard Excavation. Contingent Rock Removal Procedures.
- **Fill.** Structural backfill (under building) and non-structural fill for site use.

Division 32

- **Asphalt Paving.** Patching asphalt paving in adjacent road.
- **Concrete Paving.** Site sidewalks, aprons and curbs.
- **Pavement Markings.** Painted striping in parking areas, truncated cones and other devices for visually impaired.
- **Planting Irrigation.** Underground piping, valves and heads; electronic controller.
- **Soil Preparation.** Topsoil, soil enriching additives and enhancements.
- **Landscape Grading.** Finish grading, materials and accessories.
- **Seeding.** Kentucky Bluegrass and Fescue blend seed, maintenance care for first year.
- **Sodding.** Kentucky Bluegrass sod, soil amendments and lawn maintenance for first year.
- **Plants.** Dry land, native varieties requiring minimum maintenance.

Full Cost Estimate

ROEN ASSOCIATES

EXECUTIVE SUMMARY

Life Sciences Building **Revised June 26, 2018**

PROJECT INFORMATION

Owner:	WSU	Project Number	
Name:	Life Sciences Building	Estimate Date:	Revised June 26, 2018
Location:	Vancouver, WA	Building Area:	60,000
		Site Area:	47,500
Consultant:	Roen Associates 500 Union Street, Suite 927 Seattle, WA 98101	Contact Name: Telephone: E-mail:	Matt Wiggins (206) 343-1003 mattw@roenassociates.com
Spokane Office:	Roen Associates 121 South Wall Spokane, WA 99201	Contact Name: Telephone: E-mail:	Roger Roen (509) 838-8688 rogerr@roenassociates.com
Project Type:	Science Building		
Estimate Level:	PreDesign Estimate		
Project Start:	Q1, 2019	Project Duration:	22 months

Documents Reviewed:

	Document	A / E / C Firm	Date
Drawings:	N/A	Integrus	5/23/2018
Reports:	N/A		

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Construction Cost Summary

Owner: **WSU**

Project: **Life Sciences Building** **Revised June 26, 2018**

ESTIMATED COSTS SUMMARY

Phase	Description	QTY	UOM	$ / UOM	Cost
1	Life Sciences Building	59,999	BGSF	$585.72	$35,142,615
2	Sitework	47,500	SGA	$37.53	$1,782,467
3	General Conditions & Support Services	22	MO	$120,000	$2,640,000
	Total Estimated Construction Cost	**59,999**	**BGSF**	**$659.43**	**$39,565,082**

ADD ALTERNATES

Alternate 01 - Enhanced Heat Recovery **$104,593**

Alternate 02 - Dedicated Outside Air System **$369,150**

COMMENTS:

Progressive Design-Build delivery method is assumed

Assumes Q2, 2019 start and a 24 month schedule

No Site Frontage Improvements are included or anticipated

Metal Canopies and Column Wraps are not included

Roen Associates
121 South Wall Street
Spokane, WA 99201

WSU Life Sciences Building
Vancouver, WA
Pre-Design Budget

Project Owner:	**WSU**	Architect:	Integrus
Project Name:	**Life Sciences Building**	Project Duration:	22 MO
Project Location:	Vancouver, WA	Building GSF:	59,999
Project Start Date:		Site GSF:	47,500
Estimate Date:	Revised June 26, 2018		

ESTIMATE SUMMARY					
No.	Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost
A10	Foundations	59,999	BGSF	$7.35	$440,959
A20	Basement Construction	59,999	BGSF	$9.33	$559,750
B10	Superstructure	59,999	BGSF	$47.07	$2,824,244
B20	Exterior Enclosure	59,999	BGSF	$56.31	$3,378,265
B30	Roofing	59,999	BGSF	$9.91	$594,870
C10	Interior Construction	59,999	BGSF	$38.13	$2,287,666
C20	Stairs	59,999	BGSF	$6.40	$384,000
C30	Interior Finishes	59,999	BGSF	$27.90	$1,674,226
D10	Conveying Systems	59,999	BGSF	$4.92	$295,000
D20	Plumbing	59,999	BGSF	$58.00	$3,479,942
D30	HVAC	59,999	BGSF	$110.00	$6,599,890
D40	Fire Protection	59,999	BGSF	$5.50	$329,995
D50	Electrical	59,999	BGSF	$56.00	$3,359,944
E10	Equipment	59,999	BGSF	$32.23	$1,934,050
E20	Casework & Furnishings	59,999	BGSF	$3.55	$212,822
F10	Special Construction	59,999	BGSF	$3.40	$204,000
F20	Selective Demolition	59,999	BGSF	$0.00	$0
	Building Construction Subtotal				**$28,559,622**
	Design Contingency			15.00%	$4,283,943
	Subtotal				$32,843,565
	Contractor Mark Up (Overhead, Profit, Insurance, P&P Bond & Sub Bonds)			7.00%	$2,299,050
	Subtotal				$35,142,615
	No escalation included			0.00%	$0
	BUILDING GRAND TOTAL	59,999	BGSF	$585.72	**$35,142,615**

Estimate excludes soft costs such as design fees, permits, testing / inspections, construction change order contingencies, loose fixtures / furnishings and sales tax.

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WSU Life Sciences Building
Vancouver, WA
Pre-Design Budget

ROEN ASSOCIATES

DETAILED ESTIMATE					
No.	Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost
A10	**FOUNDATIONS**				
	Foundation Earthwork				
	Footing Excavation and Backfill	5,087	cy	$ 12.00	$61,043
	Footing Drains w/ Gravel	770	lf	$ 15.00	$11,550
	Foundations				
	Spread Footings (inc reinforcing)	24	cy	$ 550.00	$13,200
	Continuous Footings (inc reinforcing)	312	cy	$ 500.00	$155,931
	Perimeter Stem Wall - 12" (inc reinforcing)	270	sf	$ 40.00	$10,800
	Concrete Piers	30	cy	$ 750.00	$22,500
	Slab-on-Grade				
	Slab on Grade (inc reinforcing, base course and vapor barrier)	18,247	sf	$ 6.50	$118,606
	Misc. Concrete				
	Housekeeping Pads	1,000	sf	$ 10.00	$10,000
	Elevator Pits (including ladder, sump and waterproofing)	2	ea	$ 12,500.00	$25,000
	Set Column Anchor Bolts	36	set	$ 180.00	$6,480
	Grout Baseplates	36	ea	$ 125.00	$4,500
	Perimeter Insulation / Waterproofing				
	2" Rigid Polystyrene	270	sf	$ 3.00	$810
	Dampproofing	270	sf	$ 2.00	$540
	SUBTOTAL FOUNDATIONS	**59,999**	**BGSF**	**$7.35**	**$440,959**
A20	**BASEMENT CONSTRUCTION**				
	Basement Walls				
	Basement Wall - 12" (inc reinforcing)	3,076	sf	$ 40.00	$123,040
	Basement Stem Wall - 16" (inc reinforcing)	7,014	sf	$ 45.00	$315,630
	Waterproofing				
	Waterproofing and Protection Board of Concrete Walls	10,090	sf	$ 12.00	$121,080
	SUBTOTAL BASEMENT CONSTRUCTION	**59,999**	**BGSF**	**$9.33**	**$559,750**
B10	**SUPERSTRUCTURE**				
	Structural Steel				
	Steel Framing - Floor Decks, including mechanical penthouse level	700,157	lbs	$ 2.40	$1,680,376
	Steel Framing roof structure	198,343	lbs	$ 2.40	$476,023
	Metal Decking				
	Slab on Metal Floor Deck with Reinforcing	50,736	sf	$ 10.00	$507,360
	Roof Decking - Flat	3,000	sf	$ 3.75	$11,250
	Roof Decking - Sloped	18,559	sf	$ 4.00	$74,236
	Misc Steel				
	Exterior Canopies		None		
	Misc. Metals - Allowance	59,999	gsf	$ 1.25	$74,999
	Fireproofing				

Roen Associates
121 South Wall Street
Spokane, WA 99201

WSU Life Sciences Building
Vancouver, WA
Pre-Design Budget

No.	DETAILED ESTIMATE Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost
	Structural Steel Fireproofing				
	None per Architect				
	Firestopping - See Interior Partitions				
	SUBTOTAL SUPERSTRUCTURE	**59,999**	**BGSF**	**$47.07**	**$2,824,244**
B20	**EXTERIOR ENCLOSURE**				
	Exterior Wall Construction				
	Exterior Wall Assembly (int. GWB - Finished, vapor barrier, mtl studs, R-19 batt insul, sheathing, rigid insul, WRB)	34,810	sf	$ 19.00	$661,390
	Exterior Wall Finish				
	Masonry Veneer				
	Brick Veneer	12,500	sf	$ 40.00	$500,000
	Misc.				
	Galv. Steel Lintels	350	lf	$ 40.00	$14,000
	Sill Flashing	220	lf	$ 12.50	$2,750
	Metal Ribbed Panel with furring system	15,250	sf	$ 35.00	$533,750
	Metal Column Wraps		None		
	Exterior Soffits (includes framing)				
	Finish to Soffits (Allowance)	3,200	sf	$ 40.00	$128,000
	Exterior Windows				
	Storefront / Windows, Std Clear Anodized w/ Flashing	10,220	sf	$ 65.00	$664,300
	Curtain Wall, Std Clear Anodized w/ Flashing	6,400	sf	$ 105.00	$672,000
	4' Sunshade Allowance	570	lf	$ 160.00	$91,200
	Exterior Doors				
	Storefront Entry Doors, HW, per leaf	10	ea	$ 3,500.00	$35,000
	Push Button ADA Auto Operators	6	ea	$ 4,000.00	$24,000
	HM / HM Dr, HM Frame, HW, Complete - per leaf	1	ea	$ 2,500.00	$2,500
	Overhead Doors				
	Coiling (10 x 10)	1	ea	$ 5,500.00	$5,500
	Coiling (8 x 10)	1	ea	$ 4,500.00	$4,500
	Exterior Paint & Sealants				
	Masonry Water Repellants	12,500	sf	$ 1.15	$14,375
	Caulking and Joint Sealants	59,999	gsf	$ 0.25	$15,000
	Building Graphics				
	Allowance	1	ls	$ 10,000.00	$10,000
	SUBTOTAL EXTERIOR ENCLOSURE	**59,999**	**BGSF**	**$56.31**	**$3,378,265**

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DETAILED ESTIMATE					
No.	Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost
B30	**ROOFING**				
	Roof Coverings				
	Membrane Roofing System w/ Rigid Insulation	3,000	sf	$ 18.00	$54,000
	Membrane Roofing Lapping up Backside of Parapets	640	sf	$ 9.00	$5,760
	Protection Board	3,000	sf	$ 2.00	$6,000
	Metal Roof System w/ Rigid Insulation	18,247	sf	$ 27.00	$492,669
	Flashing and Sheet Metal				
	Flashings				
	Parapet Caps & Copings	160	lf	22.00	$3,520
	Misc. Roof Flashing & Blocking	5%	on	$558,429.00	$27,921
	Skylights				
	None				
	Roof Accessories				
	Roof Hatch and Access Ladder to Flat Roof	1	ea	$ 5,000.00	$5,000
	SUBTOTAL ROOFING	**59,999**	**BGSF**	**$9.91**	**$594,870**
C10	**INTERIOR CONSTRUCTION**				
	Partitions				
	GWB Partition (GWB - Finish 2 Sides, mtl studs, sound batts)	119,032	sf	$ 11.00	$1,309,354
	Misc. Carpentry - Allowance	59,999	gsf	$ 1.00	$59,999
	Sealants, Fire Caulking, ETC.	59,999	gsf	$ 0.40	$24,000
	Interior Glazing				
	Interior Storefront w/ 1/4" tempered glazing	896	sf	$ 60.00	$53,760
	HM Sidelights w/ 1/4" tempered glazing	1,946	sf	$ 45.00	$87,570
	Interior Doors, Frames, Hardware				
	HM / SCW Dr, HM Frame, HW, Complete - per leaf	149	ea	$ 1,800.00	$268,200
	HM / FRP Dr, SSHM Frame, HW, Complete - per leaf	44	ea	$ 3,500.00	$154,000
	Storefront Entry Doors, HW, per leaf	8	ea	$ 3,000.00	$24,000
	Railings				
	Railings at Slab openings	260	lf	$ 250.00	$65,000
	Fittings / Specialties				
	Visual Display Specialties				
	Marker Boards - LMB	34	ea	$ 750.00	$25,500
	Tack Boards	115	ea	$ 500.00	$57,500
	Toilet Partitions				
	ADA Stalls	8	stalls	$ 1,100.00	$8,800
	Standard Stalls	16	stalls	$ 900.00	$14,400
	Urinal Screens	8	stalls	$ 350.00	$2,800
	Toilet Accessories				
	Trash Receptacle	8	ea	$ 400.00	$3,200
	Coat Hooks	100	ea	$ 25.00	$2,500
	Mirror	16	ea	$ 120.00	$1,920

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	DETAILED ESTIMATE		Unit of	Unit	Total Estimated
No.	Description	Quantity	Measure	Cost	Cost
	Grab Bars	24	ea	$ 150.00	$3,600
	Sanitary Napkin Disposal	16	ea	$ 85.00	$1,360
	Sanitary Napkin Dispenser	4	ea	$ 450.00	$1,800
	Paper Towel Dispenser	96	ea	$ 175.00	$16,800
	Toilet Paper Dispenser	24	ea	$ 65.00	$1,560
	Toilet Seat Cover Dispenser	24	ea	$ 75.00	$1,800
	Soap Dispenser	96	ea	$ 85.00	$8,160
	Mop Holder	1	ea	$ 85.00	$85
	Signage (Code and Wayfinding)	59,999	gsf	$ 0.50	$30,000
	Misc. Specialties Allowance (FECs, Corner Guards, etc...)	59,999	gsf	$ 1.00	$59,999
	SUBTOTAL INTERIOR CONSTRUCTION	**59,999**	**BGSF**	**$38.13**	**$2,287,666**
C20	**STAIRS**				
	Stair Construction (inc. concrete, finishes & guard / hand rails)				
	Metal Stair, per floor to floor flight w/ landing (West)	5	ea	$ 40,000.00	$200,000
	Metal Stair, per floor to floor flight w/ landing (Center)	6	ea	$ 20,000.00	$120,000
	Metal Stair, per floor to floor flight w/ landing (East)	3	ea	$ 20,000.00	$60,000
	Elevator Pit Ladders	2	ea	$ 2,000.00	$4,000
	SUBTOTAL STAIRS	**59,999**	**BGSF**	**$6.40**	**$384,000**
C30	**INTERIOR FINISHES**				
	Wall Finishes				
	Paint to Walls, Doors, Frames and Misc.	59,999	gsf	$ 3.00	$179,997
	Restroom Wall Tile	3,175	sf	$ 16.00	$50,803
	Wood Wall Panels	1,008	sf	$ 40.00	$40,320
	Level 5 Finish with Epoxy Paint (Lower Level - Vivarium)	23,615	sf	$ 11.00	$259,760
	FRP Wall Panels (Janitor Closet)	64	sf	$ 2.50	$160
	Bases				
	Rubber Base	8,287	lf	$ 2.00	$16,574
	Ceramic Tile	454	lf	$ 18.00	$8,165
	Epoxy Base	2,547	lf	$ 12.00	$30,568
	Wood Base	2,562	lf	$ 24.00	$61,488
	Floor Finishes				
	Resilient Tile	18,344	sf	$ 6.00	$110,062
	Epoxy Flooring	10,630	sf	$ 12.00	$127,557
	Carpet Tile	28,421	sf	$ 5.00	$142,104
	Porcelain Tile	1,654	sf	$ 15.00	$24,806
	Sealed Concrete	696	sf	$ 1.25	$870
	Walk-Off Mat	256	sf	$ 8.00	$2,048
	Floor Prep / Moisture Vapor Reducer	59,999	sf	$ 1.00	$59,999
	Ceiling Finishes				

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No.	DETAILED ESTIMATE Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost
	ACT Ceiling	31,127	sf	$ 6.00	$186,760
	ACT Ceiling (Corridors)	10,620	sf	$ 8.00	$84,956
	Wood Ceiling (Corridors) Allowance	3,730	sf	$ 30.00	$111,900
	GWB Ceiling	8,946	sf	$ 5.00	$44,730
	GWB Ceiling, Painted	3,506	sf	$ 8.00	$28,048
	Exposed/Painted	2,072	sf	$ 2.00	$4,144
	Level 5 Finish with Epoxy Paint (Lower Level - Vivarium)	8,946	sf	$ 11.00	$98,406
	SUBTOTAL INTERIOR FINISHES	**59,999**	**BGSF**	**$27.90**	**$1,674,226**
D10	**CONVEYING SYSTEMS**				
	Elevators & Lifts				
	Passenger Elevator, 4 Stop	1	ls	$ 170,000.00	$170,000
	Passenger Elevator, 3 Stop	1	ls	$ 125,000.00	$125,000
	SUBTOTAL CONVEYING SYSTEMS	**59,999**	**BGSF**	**$4.92**	**$295,000**
D20	**PLUMBING**				
	Plumbing				
	System Complete per AEI email dated 5-31-18	59,999	gsf	$ 58.00	$3,479,942
	SUBTOTAL PLUMBING	**59,999**	**BGSF**	**$58.00**	**$3,479,942**
D30	**HVAC**				
	HVAC				
	System Complete per AEI email dated 5-31-18	59,999	gsf	$ 110.00	$6,599,890
	SUBTOTAL HVAC	**59,999**	**BGSF**	**$110.00**	**$6,599,890**
D40	**FIRE PROTECTION**				
	Fire Protection				
	System Complete per AEI email dated 5-31-18	59,999	gsf	$ 5.50	$329,995
	SUBTOTAL FIRE PROTECTION	**59,999**	**BGSF**	**$5.50**	**$329,995**
D50	**ELECTRICAL**				
	Electrical				
	System Complete per AEI email dated 5-31-18	59,999	gsf	$ 56.00	$3,359,944
	AV Equipment, By Owner - EXCLUDED			$ -	$0
	SUBTOTAL ELECTRICAL	**59,999**	**BGSF**	**$56.00**	**$3,359,944**

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No.	DETAILED ESTIMATE Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost
E10	**EQUIPMENT**				
	Lab and Classroom Equipment				
	Lab and Classroom Allowance (Fume Hoods, Casework, Etc.)	29,690	nsf	$ 65.00	$1,929,850
	Residential Equipment				
	Refrigerator	2	ea	$ 1,200.00	$2,400
	Dishwasher	2	ea	$ 650.00	$1,300
	Microwave	2	ea	$ 250.00	$500
	SUBTOTAL EQUIPMENT	**59,999**	**BGSF**	**$32.23**	**$1,934,050**
E20	**CASEWORK & FURNISHINGS**				
	Fixed Casework				
	P-Lam Casework (Break Room)	40	lf	$ 350.00	$14,000
	P-Lam Countertop (Break and Restrooms)	44	lf	$ 150.00	$6,600
	P-Lam Window Sills	1,100	lf	$ 40.00	$44,000
	Miscellaneous Casework	1	ls	$ 20,000.00	$20,000
	Window Treatment				
	Mini Blinds - Relites	1,946	sf	$ 7.00	$13,622
	Roller Shades	7,640	sf	$ 15.00	$114,600
	Moveable Furnishings				
	EXCLUDED			$ -	$0
	SUBTOTAL FURNISHINGS	**59,999**	**BGSF**	**$3.55**	**$212,822**
F10	**SPECIAL CONSTRUCTION**				
	Special Facilities				
	Greenhouse	1,200	sf	$ 150.00	$180,000
	Miscellaneous Greenhouse Equipment, Shading, Etc.	1,200	sf	$ 20.00	$24,000
					$0
	SUBTOTAL SPECIAL CONSTRUCTION	**59,999**	**BGSF**	**$3.40**	**$204,000**
F20	**SELECTIVE BUILDING DEMOLITION**				
	None				
	SUBTOTAL SELECTIVE BUILDING DEMOLITION	**59,999**	**BGSF**	**$0.00**	**$0**
Z10	**GENERAL REQUIREMENTS**				
	General Conditions				
	See Summary			$ -	$0
	SUBTOTAL GENERAL REQUIREMENTS	**59,999**	**BGSF**	**$0.00**	**$0**

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Vancouver, WA
Pre-Design Budget

Project Owner:	**WSU**	Architect:	Integrus
Project Name:	**Life Sciences Building**	Project Duration:	22 MO
Project Location:	Vancouver, WA	Building GSF:	59,999
Start Date:	Q1, 2019	Site GSF:	47,500
Estimate Date:	Revised June 26, 2018		

ESTIMATE SUMMARY					
No.	Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost
G10	Site Preparation	47,500	gsf	$10.60	$503,605
G20	Site Improvements	47,500	gsf	$14.34	$681,266
G30	Site Civil / Mech Utilities	47,500	gsf	$4.23	$200,700
G40	Site Electrical Utilities	47,500	gsf	$1.33	$63,000
G50	Other Site Construction	47,500	gsf	$0.00	$0
	Sitework Subtotal				**$1,448,571**
	Design Contingency			15.00%	$217,286
	Subtotal				$1,665,857
	Contractor Mark Up (Overhead, Profit, Insurance, P&P Bond & Sub Bonds)			7.00%	$116,610
	Subtotal				$1,782,467
	No escalation included			0.00%	$0
	SITE GRAND TOTAL	59,999	BGSF	$29.71	**$1,782,467**

Estimate excludes soft costs such as design fees, permits, testing / inspections, construction change order contingencies, loose fixtures / furnishings and sales tax.

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No.	DETAILED ESTIMATE Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost
G10	**SITE PREPARATON**				
	Mobilization	1	ls	35,000.00	$35,000
	Site Demolition & Relocation				
	Hardscape Demolition	4,670	sf	1.50	$7,005
	Landscape Demolition	43,500	sf	0.50	$21,750
	Misc. Site Clearing	1	ls	10,000.00	$10,000
	Site Earthwork				
	TESC and Tree Protection	1	ls	12,000	$12,000
	Clear and Grub	47,500	sf	0.15	$7,125
	Excavation				
	Site Cut / Fill - Allowance	2,700.00	cy	15.00	$40,500
	Basement Excavation Allowance	8,200.00	cy	23.00	$188,600
	Shoring Allowance	1.00	ls	25,000.00	$25,000
	Unsuitable Soil Allowance	1,000.00	cy	50.00	$50,000
	Import/Export	5,000.00	cy	18.00	$90,000
	Grading	47,500	sf	0.35	$16,625
	Hazardous Waste Remediation				
	None				
	SUBTOTAL SITE PREPARATON	**47,500**	**SGA**	**$10.60**	**$503,605**
G20	**SITE IMPROVEMENTS**				
	Site Paving / Concrete Work				
	Hardscape	25,360	sf	6.00	$152,160
	Retaining Walls	5,700	sf	48.00	$273,600
	Stairs	1,760	lf	60.00	$105,600
	Site Development				
	Railings	400	lf	175.00	$70,000
	Site Furnishings	1	ls	25,000.00	$25,000
	Landscaping			.	
	Irrigation (Modify Existing)	6,125	sf	1.50	$9,188
	Landscaping	6,125	sf	1.75	$10,719
	Import and Place Topsoil	125	cy	40.00	$5,000
	Trees	20	ea	500.00	$10,000
	Remediation of slopes and laydown areas	20,000	sf	1.00	$20,000
	SUBTOTAL SITE IMPROVEMENTS	**47,500**	**SGA**	**$14.34**	**$681,266**

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No.	DETAILED ESTIMATE Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost
G30	**SITE CIVIL / MECHANICAL UTILITIES**				
	Water Service				
	Service Meter	1	ea	$ 8,000.00	$8,000
	Domestic Water	400	lf	$ 35.00	$14,000
	Fire Water - Wet	400	lf	$ 60.00	$24,000
	Fire Water - Dry	80	lf	$ 60.00	$4,800
	Hydrant Assembly	2	ea	$ 4,500.00	$9,000
	Vault	1	ea	$ 7,500.00	$7,500
	FDC Connection	1	ea	$ 1,800.00	$1,800
	Tie-in at Existing	1	ea	$ 3,000.00	$3,000
	Sanitary Sewer Systems				
	Side Sewer	150	lf	$ 80.00	$12,000
	Clean Out	2	ea	$ 650.00	$1,300
	Storm Sewer Systems				
	Drain Line	1,050	lf	$ 40.00	$42,000
	RWL	1,500	lf	$ 30.00	$45,000
	Clean Out	2	ea	$ 650.00	$1,300
	Manhole/Inlets	6	ea	$ 3,500.00	$21,000
	Stone Columns				
	Other Civil / Mechanical Utilities				
	Gas	1	ls	$ 6,000.00	$6,000
					$0
	SUBTOTAL SITE CIVIL / MECHANICAL UTILITIES	**47,500**	**SGA**	**$4.23**	**$200,700**
G40	**SITE ELECTRICAL UTILITIES**				
	Electrical and Telecom Utilities				
	Joint utility Trench (trench & B'fill only)	350	lf	$ 28.00	$9,800
					$0
	Exterior Lighting				
	Site lighting (Allowance)	8	ea	$ 3,500.00	$28,000
	Site lighting trench (Allowance)	1,200	ls	$ 21.00	$25,200
					$0
	SUBTOTAL SITE ELECTRICAL UTILITIES	**47,500**	**SGA**	**$1.33**	**$63,000**
G50	**OTHER SITE CONSTRUCTION**				
	Service Tunnels				
	SUBTOTAL OTHER SITE CONSTRUCTION	**47,500**	**SGA**	**$0.00**	**$0**
Z10	**GENERAL REQUIREMENTS**				
	General Conditions				
	See Summary				
	SUBTOTAL GENERAL REQUIREMENTS	**47,500**	**SGA**	**$0.00**	**$0**

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Project Owner:	**WSU**	Architect:	Integrus
Project Name:	**Life Sciences Building**	Duration:	22 MO
Project Location:	Vancouver, WA	Project GSF:	59,999
Start Date:	Q1, 2019	Site GSF:	47,500
Estimate Date:	Revised June 26, 2018		

ALTERNATE ESTIMATES SUMMARY					
No.	Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost
1	Alternate 01 - Enhanced Heat Recovery	1	ls		$104,593
2	Alternate 02 - Dedicated Outside Air System	1	ls		$369,150
Total Alternate Estimates					**$473,743**

Estimate excludes soft costs such as design fees, permits, testing / inspections, construction change order contingencies, loose fixtures / furnishings and sales tax.

PROJECT COST ALTERNATES					
Alt No.	Description	Quantity	Unit of Measure	Unit Cost	Total Estimated Cost
1	**Alternate 01 - Enhanced Heat Recovery**				
	HVAC Option #1				
	Enhanced Heat Recovery	1	ls	85,000.00	$85,000
	SUBTOTAL				**$85,000**
	Contingency			15.00%	$12,750
	Markups (Insurance, Bond, OH & P, B&O Tax)			7.00%	$6,843
	No escalation included			0.00%	$0
	TOTAL ESTIMATED CONSTRUCTION COSTS				**$104,593**

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2	Alternate 02 - Dedicated Outside Air System				
	HVAC Option #2				
	Dedicated Outside Air System w/Chilled Beams and Chilled Sails	1	ls	300,000.00	$300,000
	SUBTOTAL				**$300,000**
	Contingency			15.00%	$45,000
	Markups (Insurance, Bond, OH & P, B&O Tax)			7.00%	$24,150
	No escalation included			0.00%	$0
	TOTAL ESTIMATED CONSTRUCTION COSTS				**$369,150**

8

preliminary code review

8.1 Applicable Building Codes

The governing codes listed below are per the Clark County Code Summary Requirements and Worksheet for New Construction.

Code Type	National Standard
Building	2015 International Building Code (IBC) WAC 51-50
Accessibility	ICC A117.1-2003 Accessible and Usable Buildings and Facilities
Mechanical	2015 International Mechanical Code WAC 51-52
Gas	2015 International Fuel Gas Code
Fire	2015 International Fire Code
Plumbing	2015 Uniform Plumbing Code WAC 51-56 & WAC 51-57
Electrical	2017 National Electrical Code
Energy	2015 Washington State Energy Code WAC 51-11 (WSEC)
Elevator	ANSI/ASME A17.1 - A17.7
Fire Sprinklers	NFPA 13
Fire Alarm (907) g	NFPA 72

8.2 Use and Occupancy Classification

IBC Chapter 3: Use and Occupancy Classification

The WSU Life Sciences Building shall have Group B as the primary occupancy classification with accessory Group S and incidental use areas.
Occupancy Group B
The new Life Sciences Building is an educational building for beyond grades 12 and therefore the building will be primarily classified as Group B.
Occupancy Group S (Accessory Occupancy)
The new Life Sciences Building includes, among others the use of a building or structure, or portion thereof, for storage that is not classified as a hazardous occupancy. It is assumed that substances stored within the building will be within the limits of what is considered hazardous and this will be monitored and evaluated as the project progresses.

8.3 Occupancy Separations

IBC Chapter 5, Section 508: Mixed Use and Occupancy

1. Accessory occupancies are those that are ancillary to the primary occupancy.
2. The allowable building height and area of a building containing accessory occupancies shall be based on the main occupancy (Sections 508.2.2 and 508.2.3).
3. The allowable height and number of stories of a building containing accessory occupancies shall be in accordance with Section 504 for the primary occupancy of the building.
4. Aggregate accessory occupancies shall not occupy more than 10 percent of the floor area of the story in which they are located.

Level	Level Gross sf.	10% Level Gross sf.	Accessory sf.	Check
Level 4	6,725 sf.	672 sf.	400 sf.	400 sf. < 672 sf.
Level 3	11,155 sf.	1,115 sf.	300 sf.	300 sf. < 1,115 sf.
Level 2	15,331 sf.	1,533 sf.	600 sf.	600 sf. < 1,533 sf.
Level 1	15,471 sf.	1,547 sf.	300 sf.	300 sf. < 1,547 sf.
Level 0	11,412 sf.	1,142 sf.	850 sf.	850 sf. < 1,142 sf.

5. No separation is required between accessory occupancies and the main occupancy (Section 508.2.4).

8.4 Incidental Uses

IBC Chapter 5, Section 509

1. Incidental uses shall not be individually classified but shall be included in the building occupancy within which they are located (Section 509.2).
2. Incidental uses shall not occupy more than 10% of the floor area of the story in which they are located (Section 509.3). The Boiler Room at Level 0 is 600 square feet and does not exceed 10 percent of the levels floor area.
3. Boiler rooms where the largest piece of equipment is over 15 psi and 10 horsepower are considered incidental uses and shall be separated by a 1-hour fire barrier or protected by an automatic sprinkler system (Table 509).

8.5 Construction Type

IBC Chapter 5: Allowable Building Heights and Areas (Table 503)

Type II-A (New Building Construction, fully sprinklered). Non-combustible framing.

8.6 Building Heights and Areas

IBC Chapter 5: General Building Heights and Areas

The New Construction will comprise approximately 60,000 gross square feet. Therefore, the allowable area, permissible increases and maximum square footage for Type II-A Construction based on Occupancy Group are tabulated below per Table 506.2 and equations Section 506.2.3 for single occupancy buildings with more than one story above grade.

Occupancy	Basic Allowable Area / Floor	*Basic Allowable Increases / Floor	Allowable Building Height
B	112,500 sf	Not required.	6 stories (85 feet)

* The Basic Allowable Floor Area in table 506.2 is more than the proposed square footage so no frontage increases are necessary.

Largest Designed Area / Floor	**Tallest Designed Building Height	Designed Number of Stories
15,471 sf	82 ft.	5 stories

** The tallest building height above grade plane has been measured from the mid-level plaza to the average height of the western most roof structure.

8.7 Fire Resistance Requirements

IBC Chapter 6: Types of Construction (Table 601)

Building Element	Fire Resistance Rating
Structural Frame:	1 hour
Bearing Walls- Exterior:	1 hour
Bearing Walls-Interior:	1 hour
Non-bearing - Exterior Walls / Partitions: (Table 602)	0 hour
Non-bearing- Interior Wall / Partitions:	0 hour
Floors (Including Beams & Joists):	1 hour
Roofs (Including Beams & Joists):	1 hour
Shaft Enclosures (713.4)*	1 hour & 2 hours

* Two-story openings. Two story openings shall be permitted as outlined in Section 712.1.9.

8.8 Atriums

IBC Chapter 4: Special Detailed Requirements Based on Use and Occupancy

An Atrium condition connecting four stories occurs at the westernmost stair and must meet the following criteria:

1. An Atrium is defined as an opening connecting two or more stories other than enclosed stairways, elevators, hoistways, escalators, plumbing, electrical, air-conditioning or other equipment, which is closed at the top and not defined as a mall (Section 404.1.1).
2. An approved automatic sprinkler system shall be installed throughout the entire building (Section 404.3). The area adjacent to or above the atrium need not be sprinklered provided that portion of the building is separated from the atrium portion by not less than a 2-hour fire barrier constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711 (Section 404.3, Exception 1). Where the ceiling of the atrium is more than 55 feet above the floor, sprinkler protection at the ceiling of the atrium is not required (Section 404.3, Exception 2).
3. A fire alarm system shall be provided per Section 907.2.14 and the system shall be activated in accordance with Section 907.5.
4. A smoke control system shall be installed per Section 909.
5. Atriums shall be separated from adjacent spaces by a 1-hour fire barrier per Section 406.6 or meet one of the exceptions listed in that section.
6. Additional requirements for standby power (Section 404.7), interior finishes (404.8), and exit access travel distance (404.9) shall be addressed.

8.9 Shaft Enclosures

BC Chapter 7: Fire and Smoke Protection Features

1. The provisions of this section shall apply to shafts required to protect openings and penetrations through floor, ceiling and roof assemblies. Interior exit stairways and ramps shall be protected in accordance with the requirements of Section 1023 (Section 713.1).

2. Shaft enclosures shall be constructed as fire barriers with a fire resistive rating of not less than 2 hours when connecting four or more stories and not less than 1 hour when connecting less than four stories (Section 713.4). Two story openings in other than Groups I-2 and I-3 shall be permitted as outlined in Section 712.1.9.

8.10 Occupant Load

IBC Chapter 10: Means of Egress (Table 1004.1.2)

Occupancy	Max. Floor Area in Sq. Ft. Per Occupant
Unconcentrated (tables and chairs)	15 net
Business Areas	100 gross
Classrooms & Teaching Labs	20 net
Labs	50 net
Accessory Storage Areas - Mechanical	300 gross

OCCUPANCY CALCS	OCC CLASS	SF	SF/OCC	OCCUPANTS
Classrooms	B	4,780	20	239
Labs	B	18,715	50	375
Breakout/Lobby	B	2,235	15	149
Offices	B	7,037	100	71
Conference	B	960	15	64
Mechanical/ Storage	B	1,840	300	7
General Bldg/ Circ.	B	22,077	100	221
Storage (Accessory)	S-1	2,350	300	8
			Total Occupants	**1,134**

8.11 Number of Exits Required

IBC Chapter 10: Means of Egress

1. Two exits shall be provided from any space where the design occupant load or the common path of egress travel exceeds the values listed in Table 1006.2.1.
2. Two exit access doorways should be provided at boiler rooms greater than 500 square feet in area with fuel fired equipment that exceeds 400,000 BTU input capacity. One of the exit access doorways is permitted to be a fixed ladder or alternating tread device. Exit access doorways should be separated by a horizontal distance equal to one-half the length of the maximum overall diagonal dimension of the room (Section 1006.2.2.1).
3. Each story shall have access to the minimum number of exits as specified in (Section 1006.3.1) as follows:

1-500	2 exits min
501-1,000	3 exits min
more than 1,000	4 exits min

4. If only 2 exits are required, they shall be placed a distance apart not less than 1/3 the maximum diagonal dimension of the area served when the building is equipped throughout with an automatic sprinkler system (Section 1007.1.1, Exception 2).

8.12 Means of Egress

IBC Chapter 10: Means of Egress

1. The total width of means of egress in inches shall not be less than the total occupant load served by the means of egress multiplied by 0.3 inches per occupant for stairways and by 0.2 inches per occupant for other egress components. (Section 1005.3.1 and Section 1005.3.2). The width shall not be less than specified elsewhere in this code (Section 1005.2). Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity or width to less than 50 percent of the required capacity or width (Section 1005.5).
2. Corridor fire-resistance rating:
   In occupancy Group B and Group S, no fire rating is required at corridor walls when the building is equipped throughout with an automatic sprinkler system (Table 1020.1).
3. The common path of egress travel, that portion of exit access (portion of a means of egress system that leads from an occupied portion of a building to an exit) which the occupants are required to traverse before two separate and distinct paths of egress travel to exits are available shall not exceed 100 feet for occupancy Groups B and S, provided the building is equipped throughout with an automatic sprinkler system, (Table 1006.2.1).
4. The travel distance to an exit shall not exceed 300 feet for occupancy Group B and 250 feet or occupancy Group S-1 provided the building is equipped throughout with an automatic sprinkler system, (Table 1017.2).

8.13 Stairways

IBC Chapter 10: Means of Egress

1. Minimum clear width between handrails of an exit stairway considered part of the accessible means of egress shall be 48 inches (Section 1009.3). Areas of refuge are not required at stairways in buildings equipped throughout with an automatic sprinkler system (Section 1009.3 Exception 5).
2. Maximum rise is 7", minimum tread is 11" (Section 1011.5.2). A flight of stairs shall not have a vertical rise greater than 12 feet between floor levels or landings (Section 1011.8).
3. A stairway extending to the roof shall only be required in buildings four stories or more above grade plane. Access to the roof from the top story shall be permitted by an alternating tread device, ship's ladder or permanent ladder (Section 1011.12).
4. Interior exit stairways and interior exit ramps shall be treated as shaft enclosures and constructed in accordance with Section 713. In other than Groups I-2 and I-3 occupancies, exit access stairways that serve, or atmospherically communicate between only two stories are not required to be enclosed. Such interconnected stories shall not be connected to other stories (Section 1019.3, Exception 1).
5. Stairways shall have a minimum headroom clearance of 80" (Section 1011.3).
6. There shall be a floor or landing at the top and bottom of each stairway. The width of landings shall not be less than the width of stairways they serve. Every landing shall have a minimum width measured perpendicular to the direction of travel and equal to the width of the stairway. Such dimension need not exceed 48 where the stairway has a straight run. (Section 1011.6).
7. Handrails shall be uniform and not less than 34 inches high and no more than 38 inches high (Section 1014.2). Handrails shall return to a wall, guard or the walking surface. Where handrails are not continuous between flights, they shall extend 12 inches horizontally beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser (Section 1014.6).

8.14 Plumbing Fixtures

IBC Chapter 29: Plumbing Systems

PLUMBING FIXTURE CALCULATIONS					
(MINIMUM PLUMBING FACILITIES PER TABLE 2902.1)					
GROUP B: 1,126 OCCUPANTS					
	SEX	OCCUPANTS	WC	URINALS	LAVS
	FEMALE	563	13	-	9
	MALE	563	7	6	9
	DRINKING FOUNTAINS		12 REQ'D FOR 1,710 OCCUPANTS		
GROUP S-1: 8 OCCUPANTS					
	SEX	OCCUPANTS	WC	URINALS	LAVS
	FEMALE	4	1	-	1
	MALE	4	1	-	1
	DRINKING FOUNTAINS		1 REQ'D FOR 78 OCCUPANTS		
			TOTALS REQUIRED		
			WC	URINALS	LAVS
			14 F & 10 M	6 M	10 F & 10 M
			4 DRINKING FOUNTAINS REQ'D		

1. Drinking fountains shall be located on an accessible route and shall not be in toilet rooms (Section 2902.5).
2. Occupant loads over 30 shall have one drinking fountain for the first 150 occupants, then one per each additional 500 occupants (Section 2902.5.1).
3. In multi-story buildings drinking fountains shall be provided on each floor having more than 30 occupants (Section 2902.5.2).
4. In all occupancies that require more than two drinking fountains per floor, bottle filling stations shall be permitted to be substituted for up to 50 percent of the required number of drinking fountains (Section 2902.5.4.2).

9
appendices

A

WSU classroom utilization table

AVAILABILITY OF SPACE

Project Name: Vancouver Life Sciences Building

Campus location: WSU Vancouver Campus

REQUIRED FOR ALL CATEOGRIES EXCEPT ACQUISITION AND INFR STRUCTURE

Identify the average number of hours per week each (a) classroom seat and (b) classroom lab is expected to be utilized in Fall 2018 on the proposed project's campus. Please fill in the gold shaded cells for the **campus** where the project is located.

(a) General University Classroom Utilization	
Fall 2017 Weekly Contact Hours	26,253
Multiply by % FTE Increase Budgeted	0%
Expected Fall 2018 Contact Hours	26,253
Expected Fall 218 Contact Seats	1834
Expected Hours per week Utilization	**14.3**
HEBC GUC Utilization Standard	22
Difference in Utilization Standard	-35%

(b) General University Lab Utilization	
Fall 2017 Weekly Contact Hours	7,523
Multiply by % FTE Increase Budgeted	0%
Expected Fall 2018 Contact Hours	7,523
Expected Fall 2018 Class Lab Seats	612
Expected Hours per Week Utilization	**12.3**
HECB GUL Utilization Standard	16
Difference in Utilization Standard	-23%

If the campus does not meet the 22 hours jper classroom seat and/or the 16 hours per class lab HECB utilization standards, describe any institutional plans for achieving that level of utilization.

Accounting for projected annual enrollment growth, classroom and lab utilization will approach the current HECB standard by the time this facility opens. Because the campus was originally built for upper division and graduate coursework in liberal arts and professional disciplines and has since expanded four year degree programs with empahsis on STEM disciplines, the type of facilities required (science/technology-based) has changed. While there is space available, there is not enough teaching and lab space designed for basic science courses. See full description provided in the proposal narrative, section 9.

B

predesign questionnaires

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WSU Vancouver Life Sciences
Predesign Questionnaire

WSU Vancouver is in the process of studying a future Life Sciences building on the campus including overall size and location of the building. As part of this effort, we would like to know your personal opinions, hopes, challenges, and dreams regarding the building and the campus. To help us better understand the culture on campus and to identify specific goals for this facility, please answer as many of the follow questions as you can. Thank you for your time and input!

Please tell us a little about yourself, the types of spaces you use, and your area of focus.

Name Barb Sorg Email ~~barbsorg@vetm~~ barbsorg@wsu.edu

Academic Unit: Neuroscience Lab 45 56

Are you faculty or staff? Faculty

What percentage of your time is devoted to teaching? 20-25 research? ~70 65.

Which rooms do you use the most? (Bldg & Room #) VCLS 316-317-318

On a typical day, during which time slots are your labs in use? 9-5

What is the typical size (# of people) of a teaching lab? research lab? → ~6 people on average, sometimes 8 or so.

What is the proportion of staff to researchers within your lab? ~~Not Applicable~~ 100% Research

- What is the single most important need on the WSU Vancouver campus?

  Title Congregation space for undergraduates, staff, & faculty. more staff, place for people to congregate (an inviting place)

- What is your favorite part of the campus?

  People! The location & views

- What is your vision for a Life Sciences facility on the WSU Vancouver campus? What specific problems would this vision resolve?

  Research & teaching space that is flexible for changing needs. And space that is inviting. This building needs a space to collaborate (think coffee-house-type space) and white walls in research areas. Also, incubation space for entrepreneurial research/business.

- What is the single most important need of your College/Program/Department?

  Growth - more researchers to meet the needs of students interested in biomedical sciences

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- How is your College/Program/Department's accreditation affected by your current facility?

  Animal facilities are barely passing muster.
  We have no cage sterilization facility, which puts our animals (& therefore research) in great jeopardy if any illnesses arise.

- Is growth anticipated within your College/Program/Department? If so, what barriers exist to achieving that growth? What is the timeline for the growth?

  Yes. Right now, funds for hiring new faculty & staff.
  Timeline: In next 5 years, maximum faculty hires in Neuroscience is probably 2 more.

- Do you readily collaborate with any other Colleges/Programs/Departments on campus? Are the groups currently located near each other? If not, how would proximate space benefit your ability to collaborate?

  I haven't collaborated on this campus. I have collaborated w/ 3 departments @ OHSU because they have the needed facilities & we do not. Proximate space w/ needed equipment would hugely facilitate collaboration!

- Does your current lab/classroom meet your needs? If not, what is needed?

  Space-wise, it does currently. Equipment-wise, there are some limitations.
  The space that is very constrained is vivarium space.

- Does the current design of the rooms and furniture support the desired pedagogy for your courses?

  yes. More or less just fine.

- Is a demonstration bench or hood desirable?

  yes - will have to figure out how many chemical/biological hoods will be needed.
  I like each lab having their own, if we have this luxury!

- What type of teaching station is desirable? (fixed, movable, podium with AV technology, etc.)

  I have to defer to people teaching labs, but movable keeps it flexible for many different needs.

- One trend in lab design involves movable benching/casework that connect to utilities with to allow spaces to adapt over time. What type of benching do you have in your current space? Is there a need for greater flexibility?

  Not movable, but I think it should be for this new building. yes, definitely a need for greater flexibility between labs (& even within 1 lab).

- Do you have fume hoods in your current space? If so, how many?

  1 fume hood (actually 2, but I use/need only 1.

- If you utilize fume hoods within a teaching lab, do you utilize a demonstration style in your courses or more of one-on-one style of instruction?

  N/A.

- If you conduct research, is growth anticipated in your area of study at WSU? If so, how will this growth affect your staff size and composition?

  I am likely to stay @ approx.
  8 people or so for my lab size.

- What types of teaching/research technologies do you find most helpful? Core facilities for microscopy, molecular work, I'd like core facilities for rodent behavioral work, but there are currently only 2 of us doing this, so it is less realistic.

- Do you utilize any highly sensitive equipment (light/vibration/acoustics) or conduct studies where the participants environment impacts the outcome of a study? If so, please tell us about these needs.

  Rat behavior. Sound & light greatly impact the behavior.

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Please tell us a little about yourself, the types of spaces you use, and your area of focus.

Name Roschelle Fritz Email shelly.fritz@wsu.edu

Academic Unit: Nursing (Lab ? #)

Are you faculty or staff? faculty

What percentage of your time is devoted to teaching? 40 research? 50

Which rooms do you use the most? (Bldg & Room #) 210E; 210B; VECS 105; VECS 121

On a typical day, during which time slots are your labs in use? —

What is the typical size (# of people) of a teaching lab? research lab? 5-15

What is the proportion of staff to researchers within your lab? —

- What is the single most important need on the WSU Vancouver campus?

  More graduate level everything: students, lab space, research, classroom integration

- What is your favorite part of the campus?

  The spaces for socializing (e.g., outdoor eating area by the cafe)

- What is your vision for a Life Sciences facility on the WSU Vancouver campus? What specific problems would this vision resolve?

  Research meets classroom. I envision interdisciplinary labs, maybe an "institute"; bright, open, flexible, modern.

- What is the single most important need of your College/Program/Department?

  Clinical lab training space.

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- How is your College/Program/Department's accreditation affected by your current facility?

  —

- Is growth anticipated within your College/Program/Department? If so, what barriers exist to achieving that growth? What is the timeline for the growth?

  —

- Do you readily collaborate with any other Colleges/Programs/Departments on campus? Are the groups currently located near each other? If not, how would proximate space benefit your ability to collaborate?

  Engineering - Computer Science (emerging collaborators)
  Human Development

- Does your current lab/classroom meet your needs? If not, what is needed?

  —

- Does the current design of the rooms and furniture support the desired pedagogy for your courses?

  Only partially

- Is a demonstration bench or hood desirable?

  —

- What type of teaching station is desirable? (fixed, movable, podium with AV technology, etc.)

  Small group & podium with AV

- One trend in lab design involves movable benching/casework that connect to utilities with to allow spaces to adapt over time. What type of benching do you have in your current space? Is there a need for greater flexibility?

  —

- Do you have fume hoods in your current space? If so, how many?

  —

- If you utilize fume hoods within a teaching lab, do you utilize a demonstration style in your courses or more of one-on-one style of instruction?

  —

- If you conduct research, is growth anticipated in your area of study at WSU? If so, how will this growth affect your staff size and composition?

  yes, ↑ staff size, ↑ graduate students & RAs

- What types of teaching/research technologies do you find most helpful?

  Computer stations with large screens, small group table arrangements, fast internet, strong wifi, ↑ bandwith & capacity for growth, servers

- Do you utilize any highly sensitive equipment (light/vibration/acoustics) or conduct studies where the participants environment impacts the outcome of a study? If so, please tell us about these needs.

  Equipment somewhat sensitive. Secure storage & processing area (dirty → clean) most important.

  ① Telehealth equip: smart tablets, Pulse Oximeters, BP machines, Glucometers, Scales, etc — all bluetooth connected

  ② motion, contact, light sensors

  ③ Computer equip.

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Please tell us a little about yourself, the types of spaces you use, and your area of focus.

Name Tracy Klein Email taklein@wsu.edu

Lab #10

Academic Unit: Nursing

Are you faculty or staff? Faculty

What percentage of your time is devoted to teaching? 40% research? 50%

Which rooms do you use the most? (Bldg & Room #) For teaching: VECS 120 and VECS 125

On a typical day, during which time slots are your labs in use? Skills lab for nursing teaching is in use 1-2 times a month

What is the typical size (# of people) of a teaching lab? research lab? Our research is not in a bench lab setting. Teaching classrooms/seminars may range from 5-40.

What is the proportion of staff to researchers within your lab? Skills labs may require two professors or a professor and an assistant.

lab #11

- What is the single most important need on the WSU Vancouver campus? An updated skills lab/simulation area for medical and nursing would have a significant impact on the quality of teaching. We can rent this now but it would be nice to have our own and also to be able to do extensive faculty training. A skills lab for medicine/ nursing could also include a home based setting, as many procedures and visits now occur in the home or community.

- What is your favorite part of the campus? The walking trails and the library.

- What is your vision for a Life Sciences facility on the WSU Vancouver campus? What specific problems would this vision resolve? My vision would include collaborative design in meeting areas and placement of faculty. We would not have a row of all nurses, all pharmacists, all physicians. The offices would be mixed and perhaps designed around several central meeting and administration places. However, I do not want cubicles! We need private office space to work, write and meet with students.

- What is the single most important need of your College/Program/Department?

  In addition to a clinical skills lab/simulation update, I believe we need a true faculty lounge where faculty can meet together and collaborate or socialize. More advanced kitchen facilities and space are important as well, so that we can prepare and eat healthy meals.

- How is your College/Program/Department's accreditation affected by your current facility?

  I have not seen a negative or positive impact. It may come up in future review as simulation is built into the curriculum and this is not present in Vancouver.

- Is growth anticipated within your College/Program/Department? If so, what barriers exist to achieving that growth? What is the timeline for the growth? We are almost fully staffed with faculty. I see growth with support staff potentially which impacts their working space and needs.

need is this sldg?

- Do you readily collaborate with any other Colleges/Programs/Departments on campus? Are the groups currently located near each other? If not, how would proximate space benefit your ability to collaborate? See my other comments on proximity. We would logically collaborate with education, psychology, policy, prevention science, neuroscience, medicine, and pharmacy. As it is now, I am not familiar with other faculty because they are not physically located near me.

- Does your current lab/classroom meet your needs? If not, what is needed? Our classrooms are stretched with the need for more videoconferencing/AMS able classrooms. These are fully booked at all times.

- Does the current design of the rooms and furniture support the desired pedagogy for your courses? I have not seen it yet.

- Is a demonstration bench or hood desirable? Not for what we do.

- What type of teaching station is desirable? (fixed, movable, podium with AV technology, etc.) I am open to ideas. I am comfortable with podium with AV technology.

- One trend in lab design involves movable benching/casework that connect to utilities with to allow spaces to adapt over time. What type of benching do you have in your current space? Is there a need for greater flexibility? NA with my profession.

- Do you have fume hoods in your current space? If so, how many?

- If you utilize fume hoods within a teaching lab, do you utilize a demonstration style in your courses or more of one-on-one style of instruction?

- If you conduct research, is growth anticipated in your area of study at WSU? If so, how will this growth affect your staff size and composition? I anticipate even more work in the community. This will not so much impact staff as make it necessary to have meaningful places for community engagement and collaboration in our space. It is also important that we can work across distances with video and telemetry support built into all our spaces.

- What types of teaching/research technologies do you find most helpful? Interactive white boards, integrated computer/video and excellent internet/phone connectivity. Please don't build the walls with brick!

- Do you utilize any highly sensitive equipment (light/vibration/acoustics) or conduct studies where the participants environment impacts the outcome of a study? If so, please tell us about these needs. Not at this time.

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Please tell us a little about yourself, the types of spaces you use, and your area of focus.

Name Jose VAZQUEZ-BELLO Email jose.vazquez-bello@wsu.edu

Academic Unit: C.A.S. 7 Psychology lab #12

Are you faculty or staff? faculty

What percentage of your time is devoted to teaching? 100% research?

Which rooms do you use the most? (Bldg & Room #) It varies over semesters but have some VMB-221, VSCI-101; VCLS-150; VECS-124; VSCI-19.

On a typical day, during which time slots are your labs in use? M, Tu, W, Th, F. (Varies per semester)

What is the typical size (# of people) of a teaching lab? research lab? 24 teaching

What is the proportion of staff to researchers within your lab? N/A (I do not know)

- What is the single most important need on the WSU Vancouver campus?
  Increase enrollment

- What is your favorite part of the campus? My office

- What is your vision for a Life Sciences facility on the WSU Vancouver campus? What specific problems would this vision resolve? A dream place to inspire/nurture to study STEM pathways.
  It will increase Education in the SW of the State.

- What is the single most important need of your College/Program/Department?
  To have proper installations for lecture/Lab delivery to STEM Areas.

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- How is your College/Program/Department's accreditation affected by your current facility?

  Enough to pass accreditation.

- Is growth anticipated within your College/Program/Department? If so, what barriers exist to achieving that growth? What is the timeline for the growth?

  It is anticipated increase of students but not at a rate expected. Parking fees, scheduling courses are some barriers.

- Do you readily collaborate with any other Colleges/Programs/Departments on campus? Are the groups currently located near each other? If not, how would proximate space benefit your ability to collaborate?

  I try to collaborate w/ other programs but very difficult to materialize ideas. Groups are within a mile, so yes we are nearby. A common AREA for all faculty to meet would be nice.

- Does your current lab/classroom meet your needs? If not, what is needed?

  Space is shared among LABS, so dedicated labs would benefit needs. Lecture rooms are not designed for science delivery!

- Does the current design of the rooms and furniture support the desired pedagogy for your courses?

  Not really; other types of rooms (design) are needed for current trend in pedagogy on learning/instruction.

- Is a demonstration bench or hood desirable?

  YES

- What type of teaching station is desirable? (fixed, movable, podium with AV technology, etc.)

  fix, long bench for demostrations and podium with AV tech.

- One trend in lab design involves movable benching/casework that connect to utilities with to allow spaces to adapt over time. What type of benching do you have in your current space? Is there a need for greater flexibility?

  In LAB (for physics) it is okay. For ASTRONOMY there are no facilities at all. For ASTRONOMY it is require high ceiling and access to roof.

- Do you have fume hoods in your current space? If so, how many?

  Yes; Not needed for my use.

- If you utilize fume hoods within a teaching lab, do you utilize a demonstration style in your courses or more of one-on-one style of instruction?

  N/A

- If you conduct research, is growth anticipated in your area of study at WSU? If so, how will this growth affect your staff size and composition?

No research in my own, but I do anticipate some reseach in my AREA in the Long run.

- What types of teaching/research technologies do you find most helpful?

concrete equipment (demostration Kits); virtual technologies and internet access.

- Do you utilize any highly sensitive equipment (light/vibration/acoustics) or conduct studies where the participants environment impacts the outcome of a study? If so, please tell us about these needs.

Yes; for instance in the study of light (electromagnetism) controlling switches; courtains are a must.
in the study of fluids (liquids, gasses) no proper installations/equipment available.
In the study of astronomy no room with equipment to project patterns into.

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Please tell us a little about yourself, the types of spaces you use, and your area of focus.

Name _____Benjamin Ladd_____ Email____benjamin.ladd@wsu.edu_____

Academic Unit: ____Psychology/CAS_____

Are you faculty or staff? _____faculty_____

What percentage of your time is devoted to teaching? ___50%_____ research?__50%_____

Which rooms do you use the most? (Bldg & Room #) ____VCLS 116, 208, various classrooms in VMMC, VLIB, VUB_____

On a typical day, during which time slots are your labs in use? __Varies based on current projects_____

What is the typical size (# of people) of a teaching lab? N/A research lab? _5-8_____

What is the proportion of staff to researchers within your lab? __mostly student researchers_____

- What is the single most important need of your College/Program/Department?

Better research space for human subjects research.

- How is your College/Program/Department's accreditation affected by your current facility?

N/A, although could result in breach of human participant confidentiality

- Is growth anticipated within your College/Program/Department? If so, what barriers exist to achieving that growth? What is the timeline for the growth?

Maybe. Have a proposal for a Master's in Clinical Psychology program, which would greatly increase both our faculty and grad student body. If approved, program could go online in 2020. Would need confidential spaces for clinical services and research. These spaces would need to be separate.

- Do you readily collaborate with any other Colleges/Programs/Departments on campus? Are the groups currently located near each other? If not, how would proximate space benefit your ability to collaborate?

Not currently. May in future, but shared/proximate space would likely not be important.

- Does your current lab/classroom meet your needs? If not, what is needed?

No. Need private interview room(s), as well as private office space for research assistants.

- Does the current design of the rooms and furniture support the desired pedagogy for your courses?

N/A.

- Is a demonstration bench or hood desirable?

N/A.

- What type of teaching station is desirable? (fixed, movable, podium with AV technology, etc.)

Variable depending on the course. Mostly podium with AV technology.

- One trend in lab design involves movable benching/casework that connect to utilities with to allow spaces to adapt over time. What type of benching do you have in your current space? Is there a need for greater flexibility?

N/A.

- Do you have fume hoods in your current space? If so, how many?

No.

- If you utilize fume hoods within a teaching lab, do you utilize a demonstration style in your courses or more of one-on-one style of instruction?

- If you conduct research, is growth anticipated in your area of study at WSU? If so, how will this growth affect your staff size and composition?

Yes. I am a junior faculty member growing my lab. In future, hope to have as many as 10 students/staff at any given time.

- What types of teaching/research technologies do you find most helpful?

- Do you utilize any highly sensitive equipment (light/vibration/acoustics) or conduct studies where the participants environment impacts the outcome of a study? If so, please tell us about these needs.

No.

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WSU Vancouver Life Sciences
Predesign Questionnaire

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Please tell us a little about yourself, the types of spaces you use, and your area of focus.

Name ___Renee Magnan_____ Email: renee.magnan@wsu.edu

Academic Unit: Psychology_____

Are you faculty or staff? _____Faculty_____

What percentage of your time is devoted to teaching? ____50_____ research?_____50_____

Which rooms do you use the most? (Bldg & Room #) __VCLS 208R, VCLS 116, assorted classroom. _

On a typical day, during which time slots are your labs in use? __Variable... anywhere from 8AM to 8PM; weekends included_

What is the typical size (# of people) of a teaching lab? research lab? ___Research lab: 2-6 individuals_____

What is the proportion of staff to researchers within your lab? __All student or post bacc research assistants____

- What is the single most important need on the WSU Vancouver campus?

Space to expand and to accommodate the needs of our growing faculty and student (undergraduate and graduate) population.

- What is your favorite part of the campus?

Because of the small campus, it provides greater opportunity to meet and learn from others outside of my area.

- What is your vision for a Life Sciences facility on the WSU Vancouver campus? What specific problems would this vision resolve?

Up-to-date equipment and resources for students (and faculty) interested in a variety of types of science-based research. While unlikely, it would be amazing if "science" could incorporate more than hard sciences like biology and chemistry.

- What is the single most important need of your College/Program/Department?

In psychology, many of us need to have the ability to conduct research with human subjects which has a nuanced set of requirements. Perhaps most important is necessity for maintaining and protecting confidentiality of individuals who volunteer to participate. Having secured areas for conducting studies and securing data is critical and a requirement to receive approval for conducting the research. While we don't have a lot of equipment needs, we do need consideration of how rooms are designed to benefit the research.

- How is your College/Program/Department's accreditation affected by your current facility?

N/A

- Is growth anticipated within your College/Program/Department? If so, what barriers exist to achieving that growth? What is the timeline for the growth?

Yes. We have a proposal under review for a masters program that would require two new tenure track faculty within the next two years. Barriers include a need for additional space for in-coming faculty (meeting necessary criteria) and a clinic space.

- Do you readily collaborate with any other Colleges/Programs/Departments on campus? Are the groups currently located near each other? If not, how would proximate space benefit your ability to collaborate?

I have, but am not currently. Realistically, close proximity to neuroscience folks would be most advantages to me. Additionally, being able to collaborate with individuals who could run various tests on saliva and blood samples.

- Does your current lab/classroom meet your needs? If not, what is needed?

A major consideration is that the current set up of the lab area makes it difficult to utilize the space effectively. Individual labs are quite small and populated with research assistants. Thus, sessions with participants cannot be conducted in shared space and require disruption of RA tasks so that the room can be used.

- Does the current design of the rooms and furniture support the desired pedagogy for your courses?

N/A

- Is a demonstration bench or hood desirable?

N/A

- What type of teaching station is desirable? (fixed, movable, podium with AV technology, etc.)

Podium with AV tech

- One trend in lab design involves movable benching/casework that connect to utilities with to allow spaces to adapt over time. What type of benching do you have in your current space? Is there a need for greater flexibility?

N/A

- Do you have fume hoods in your current space? If so, how many?

N/A

- If you utilize fume hoods within a teaching lab, do you utilize a demonstration style in your courses or more of one-on-one style of instruction?

N/A

- If you conduct research, is growth anticipated in your area of study at WSU? If so, how will this growth affect your staff size and composition?

Yes. Our goal is to add at least two new faculty. Space (offices, labs) would require reallocation of current space as they could not be integrated within the current experimental psychology lab area.

- What types of teaching/research technologies do you find most helpful?

- Do you utilize any highly sensitive equipment (light/vibration/acoustics) or conduct studies where the participants environment impacts the outcome of a study? If so, please tell us about these needs.

- Research lab, share.

- Mikros

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which one of 8? Lab?

Please tell us a little about yourself, the types of spaces you use, and your area of focus.

Name Jonah Piovia-Scott Email jonah.piovia-scott@wsu.edu

Academic Unit: Biological Sciences

Are you faculty or staff? faculty

What percentage of your time is devoted to teaching? 45 research? 45

Which rooms do you use the most? (Bldg & Room #) VSCI: 230E (personal office), 205 (research lab) 219 (animal room), 7 (animal space with environmental chambers)

On a typical day, during which time slots are your labs in use? 9-630

What is the typical size (# of people) of a teaching lab? research lab? 24, 8

What is the proportion of staff to researchers within your lab? 3 grad students, 1 postdoctoral researcher, 4 undergraduate students

- What is the single most important need on the WSU Vancouver campus?

  more space for research wet labs, vivariums, grad student and postdoc offices

- What is your favorite part of the campus?

  The forest and the views

- What is your vision for a Life Sciences facility on the WSU Vancouver campus? What specific problems would this vision resolve?

  An increase in available space that preserves the collaborative, cross-disciplinary research community that makes WSUV special.

- What is the single most important need of your College/Program/Department?

  see above

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- How is your College/Program/Department's accreditation affected by your current facility?

I'm not sure

- Is growth anticipated within your College/Program/Department? If so, what barriers exist to achieving that growth? What is the timeline for the growth?

Yes, wet lab and office space (i.e., lack thereof) is currently constraining growth in biological sciences

- Do you readily collaborate with any other Colleges/Programs/Departments on campus? Are the groups currently located near each other? If not, how would proximate space benefit your ability to collaborate?

I collaborate with faculty in the School of the Environment. Our current close proximity facilitates this collaboration

- Does your current lab/classroom meet your needs? If not, what is needed?

yes, although a better interface with the greenhouse area would be helpful

- Does the current design of the rooms and furniture support the desired pedagogy for your courses?

Mostly, furniture that facilitates ~~the ability to have~~ student ~~conduct~~ group discussions could be helpful

- Is a demonstration bench or hood desirable?

- What type of teaching station is desirable? (fixed, movable, podium with AV technology, etc.)

- One trend in lab design involves movable benching/casework that connect to utilities with to allow spaces to adapt over time. What type of benching do you have in your current space? Is there a need for greater flexibility?

fixed. I like the idea of some flexibility in furniture, e.g. tables on casters with drop-down electrical outlets

- Do you have fume hoods in your current space? If so, how many?

yes, 1

- If you utilize fume hoods within a teaching lab, do you utilize a demonstration style in your courses or more of one-on-one style of instruction?

N/A

- If you conduct research, is growth anticipated in your area of study at WSU? If so, how will this growth affect your staff size and composition?

Yes, the school of biological sciences expects to add faculty at WSUV in the near future

- What types of teaching/research technologies do you find most helpful?

- Do you utilize any highly sensitive equipment (light/vibration/acoustics) or conduct studies where the participants environment impacts the outcome of a study? If so, please tell us about these needs.

- climate-controlled animal facilities
  - sub-ambient temperature (10-15 °C)
  - higher than ambient humidity (eg 80 %)

- biosafety level 2 lab and animal facilities

- biological safety cabinet is needed for sterile work with microbial cultures

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Please tell us a little about yourself, the types of spaces you use, and your area of focus.

Name __Jon Anderson_____ Email___jon_anderson@wsu.edu_____

Academic Unit: __Chemistry, Science, College of Arts and Sciences_____

Are you faculty or staff? _____Faculty_____

What percentage of your time is devoted to teaching? __100 % paid teaching but 40% not paid

Which rooms do you use the most? (Bldg & Room #) VCLS 50, VMMC 202P, VSCI 207 and VSCI 217 and VSCI 118_____

On a typical day, during which time slots are your labs in use? ___8AM-5Pm_____

What is the typical size (# of people) of a teaching lab? _24 students plus instructor and 2 aids_____

What is the proportion of staff to researchers within your lab? _____Teaching lab 8:1_____

- What is the single most important need on the WSU Vancouver campus?

  Delivery of the highest quality education, in a safe, supportive environment..

- What is your favorite part of the campus?

  The connection students can have with instructor and the closeness to relevant research.

- What is your vision for a Life Sciences facility on the WSU Vancouver campus? What specific problems would this vision resolve?

  We need to support our students and grow our program first and only provide for growth within science research relative to the size of our science programs. We could offer a degree in chemistry, and support research if we had more teaching lab space for chemistry specific content. There are safety needs for teaching chemistry, namely access to fume hoods which typically limit space, but also limit teaching content. It is inefficient to have students waiting for a turn at the hood. The two major classes in chemistry "organic" and "inorganic" should have separate laboratories to reduce cross contamination and safety issues. Furthermore, chemistry is becoming more reliant on instruments, which require rooms with high pressure cylinders and computers, so additional room to be able to expand into analytical chemistry, to support local research and industry with trained graduates. This also would improve placement of our graduates.

- What is the single most important need of your College/Program/Department?

I can only answer that relative to my experience, in this case Chemistry. Cross contamination is inconvenient and dangerous. Moving dangerous chemicals in crowded lab space is a threat to student and staff safety. Both of these would be greatly reduced with fume hoods at every bench. Most big universities and even many junior colleges have this simple need. With, separate spaces for the two main branches as noted above, and both with sufficient hood and sink space, we would be ready to grow. Currently, we can only continue to get by and not withstanding a new facility, an enormous expense and likely an entire year without teaching chemistry we might be able to refit our current facilities. Not teaching chemistry for a year would not be a viable option for most science students, therefore they would go elsewhere.

- How is your College/Program/Department's accreditation affected by your current facility?

I do not have knowledge of this specifically. I understand we are regulated on many levels based on what the chemistry department in Pullman has established. Their facilities are set up more as I mentioned above and what I would like to see our campus have.

- Is growth anticipated within your College/Program/Department? If so, what barriers exist to achieving that growth? What is the timeline for the growth?

Our program is growing rapidly. Chemistry both inorganic and organic are required in most science degrees, therefore the max capacity in chemistry is likely limiting the growth rate.

- Do you readily collaborate with any other Colleges/Programs/Departments on campus? Are the groups currently located near each other? If not, how would proximate space benefit your ability to collaborate?

Chemistry teaching lab doesn't collaborate.

- Does your current lab/classroom meet your needs? If not, what is needed?

We get by, but it is obvious and at times awkward and embarrassing that we do not have the hood space to meet the student's needs. Scheduling is a challenge to allow for concurrently running classes which also lead toward safety concerns related to cross contamination.

- Does the current design of the rooms and furniture support the desired pedagogy for your courses?

Thank you for asking, No, it doesn't. There are large conduit columns throughout the lab that block the vision of students during lecture and again block the instructors view of students during the experiments. Not having those columns would improve visual communication greatly.

- Is a demonstration bench or hood desirable?
  - Very much so, currently the instructors bench is to small and filled with materials to be functional as a demonstration bench. This would be very helpful.

- What type of teaching station is desirable? (fixed, movable, podium with AV technology, etc.)

Fixed would be preferable but I could imagine having monitors at each bench could be helpful and might interface with new technology.

- One trend in lab design involves movable benching/casework that connect to utilities with to allow spaces to adapt over time. What type of benching do you have in your current space? Is there a need for greater flexibility?

I think fixed benches make the most sense, but I would think if students gained a locking cabinet that allowed them to store a few things, it would improve their satisfaction.

- Do you have fume hoods in your current space? If so, how many?

Our teaching lab has 3 fume hoods for 24 students. At times we will have to work in pairs, with 2 students per hood and then rotate groups through the hoods. This reduces the chance that every student will get to work in the hood, as it maybe only one in the group will do the work. This is does not support good laboratory technique

- If you utilize fume hoods within a teaching lab, do you utilize a demonstration style in your courses or more of one-on-one style of instruction?

We do not have a teaching/demonstration hood, rather we have to explain using pictures and descriptions rather than physical demonstrations.

- If you conduct research, is growth anticipated in your area of study at WSU? If so, how will this growth affect your staff size and composition?

My research utilizes analytical instruments, and as noted above, the reliance on extremely sensitive instruments are growing in popularity and importance and becoming commonplace. I understand we are having to surplus instruments that are not as in demand in order to make space for newer.

- What types of teaching/research technologies do you find most helpful?

In general chemistry lab, the audio-visual projectors are very helpful. Monitors at every bench would be an exciting step toward the future.

- Do you utilize any highly sensitive equipment (light/vibration/acoustics) or conduct studies where the participants environment impacts the outcome of a study? If so, please tell us about these needs.

No, I use a highly sensitive instrument that could affect other instruments depending relative to air quality, but not through vibrations or light.

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Please tell us a little about yourself, the types of spaces you use, and your area of focus.

Name _____Adenike Otoikhian_____ Email: adenike.otoikhian@wsu.edu

Academic Unit: _____College of Arts and Sciences - Chemistry_____

Are you faculty or staff? _____Faculty_____
What percentage of your time is devoted to teaching? _____70 %_____ research?_____

Which rooms do you use the most? (Bldg & Room #): VUB 1 (Lecture); VCLS 50 (chemistry lab); VCLS 150 (physics lab)
On a typical day, during which time slots are your labs in use? Fall Semester: Monday - Friday
Spring: Tuesday – Friday
Summer: Tuesday and Thursday

What is the typical size (# of people) of a teaching lab? research lab? 24 students per instructor, per teaching lab.

What is the proportion of staff to researchers within your lab? N/A

- What is the single most important need on the WSU Vancouver campus?
  Chemistry laboratory space with adequate fume hoods for organic and analytical chemistry.

- What is your favorite part of the campus? VUB 1 – large classroom that allows for interaction among students during group discussion. There is enough space for the instructor to be able to work around each group.

- What is your vision for a Life Sciences facility on the WSU Vancouver campus? What specific problems would this vision resolve?
  A facility with a number of teaching lab spaces for chemistry and physics courses, equipped with adequate fume hoods, equipment and instruments that allows for green science. This vision would help increase enrollment in our STEM courses, produce graduates with hands-on experiences ready to enter the work force.

- What is the single most important need of your College/Program/Department?
  Chemistry lab spaces with adequate fume hood and equipment. Stockroom and workspace for lab support staff.

- How is your College/Program/Department's accreditation affected by your current facility?
  Our current facility supports our current accreditation but requires more space and fume hood.

- Is growth anticipated within your College/Program/Department? If so, what barriers exist to achieving that growth? What is the timeline for the growth?
  We have been growing and yes, more growth is anticipated in the physical sciences program. To be able to continue to grow, we need more lab space to be able to offer more lab section of the courses in physics and chemistry. Our current lab space, for chemistry, is running at maximum capacity. We need lab space dedicated to organic and analytical chemistry. There is also a need for a lab space for Astronomy.

- Do you readily collaborate with any other Colleges/Programs/Departments on campus? Are the groups currently located near each other? If not, how would proximate space benefit your ability to collaborate?

- Does your current lab/classroom meet your needs? If not, what is needed?
  No. We need more fume hoods in the one chemistry lab that we have right now. However, there is no physical space to install the fume hoods in this room. We also need space for lab equipment.

- Does the current design of the rooms and furniture support the desired pedagogy for your courses?
  VCLS 50 is adequate but not fully equipped for general chemistry. The design of the furniture makes it difficult to communicate lab instructions to the students.
  No, it is not adequate for organic and analytical chemistry. There is not enough fume hoods to support the number of students in each lab section. Hence for our CHEM 347 lab, which is offered in summer in part because of space and scheduling limitations in fall and spring semesters, we have had to limit the enrollment to 18 students because of fume hood space issues. Even though we have bench spaces to accommodate 24 students.

- Is a demonstration bench or hood desirable? Yes.

- What type of teaching station is desirable? (fixed, movable, podium with AV technology, etc.)
  Fixed podium equipped with the latest AV technology.

- One trend in lab design involves movable benching/casework that connect to utilities with to allow spaces to adapt over time. What type of benching do you have in your current space? Is there a need for greater flexibility?
  The benches in the current space are fixed in place.

- Do you have fume hoods in your current space? If so, how many? Yes, 3 with only 2 fully functioning.

- If you utilize fume hoods within a teaching lab, do you utilize a demonstration style in your courses or more of one-on-one style of instruction? We do not have a teaching demonstration fume hood.

- If you conduct research, is growth anticipated in your area of study at WSU? If so, how will this growth affect your staff size and composition?
  Growth is anticipated in the physical sciences program. With a BA in chemistry program, enrolled students would be expected to get involved in some type of chemistry related research. This would therefore require us to hire more chemistry faculty and support staff.

- What types of teaching/research technologies do you find most helpful? Projects and doc-cam.

- Do you utilize any highly sensitive equipment (light/vibration/acoustics) or conduct studies where the participants environment impacts the outcome of a study? If so, please tell us about these needs.

  Not right now. In the future, if we acquire NMR spectrometer, yes sensitivity would be an important factor in determine where it would be housed.

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Please tell us a little about yourself, the types of spaces you use, and your area of focus.

Name ____Edward J. Valente, Ph.D._____ Email___ valentee@up.edu

Academic Unit: _____Science Programs - Chemistry_____

Are you faculty or staff? ____Adjunct Faculty_____

What percentage of your time is devoted to teaching? ___at WSU-V, 100%_____ research?___at WSU-V 0%, but I have had a research student at WSU-V, and when I did it was more like 90/10%

Which rooms do you use the most? (Bldg & Room #) _____VCLS-50_____

On a typical day, during which time slots are your labs in use? ___Depends, I have Fall Monday evening assignments, and Spring Thursday afternoon and evening assignments in the laboratory facilities..

What is the typical size (# of people) of a teaching lab? capacity for 24 students + instructor
research lab? should have room for 3 students + mentor

What is the proportion of staff to researchers within your lab? not applicable to me

- What is the single most important need on the WSU Vancouver campus?
  If programs related to the sciences are to grow, then more laboratory space (chemistry, biology, physics) will need to be provided along with attendant storage, preparation and/or stockroom space

- What is your favorite part of the campus?
  At WSU-V, the "quad" with the fountains is my favorite part.

- What is your vision for a Life Sciences facility on the WSU Vancouver campus? What specific problems would this vision resolve?
  If by "life sciences" you mean biology and pre-med/pre-pharmacy/pre-vet etc, then you will need a microbiology lab and a dedicated organic chemistry laboratory. The OChem lab could also be used for analytical chemistry.

- What is the single most important need of your College/Program/Department?
  A) Equipment (but probably also space to put equipment accessible to students)
  B) Increased laboratory space

- How is your College/Program/Department's accreditation affected by your current facility?
  Local chemistry program is not a full BS degree yet, so American Chemical Society accreditation is a future possibility. More space, faculty and a fuller program would be needed.

- Is growth anticipated within your College/Program/Department? If so, what barriers exist to achieving that growth? What is the timeline for the growth?
  I have watched modest growth over the last 8 years. The facilities are now being nearly fully utilized. It is time for a review and a vision for the future. Both space and schedule time will limit our ability to grow.

- Do you readily collaborate with any other Colleges/Programs/Departments on campus? Are the groups currently located near each other? If not, how would proximate space benefit your ability to collaborate?
  I am not able to provide information on this question.

- Does your current lab/classroom meet your needs? If not, what is needed?
  Yes and no. Yes, the space (VCLS50) is a good space for 24 students. It is adequate for Geneeral Chemistry. Hood space is not adequate for Organic Chemistry, which is a one-term class. There is very little instrumentation space. A dedicated lab for organic chemistry would be ideal, with stockroom and instrumentation space.

- Does the current design of the rooms and furniture support the desired pedagogy for your courses?
  Yes, for the most part, it is adaptable for what we do. It is adequate for General Chemistry, not entirely useful for organic chemistry and organic analysis. Not supportive for analytical chemistry, or instrumentation.

- Is a demonstration bench or hood desirable?
  Yes.

- What type of teaching station is desirable? (fixed, movable, podium with AV technology, etc.)
  A laboratory workbench with down draft hood, audi-visual controls, power, water, etc.

- One trend in lab design involves movable benching/casework that connect to utilities with to allow spaces to adapt over time. What type of benching do you have in your current space? Is there a need for greater flexibility?
  Benches are fixed, and at standing height – ideal for chemistry (not biology). The fixed utilities,(power, water, air, vacuum, etc) are plumbed.

- Do you have fume hoods in your current space? If so, how many?
  Yes, there in VCLS-50.

- If you utilize fume hoods within a teaching lab, do you utilize a demonstration style in your courses or more of one-on-one style of instruction?

Hoods are for use by students as needed, and for waste handling. There are not enough hoods in VCLS-50 for organic chemistry, and barely enough, possibly not enough, for good safety in General Chemistry.

- If you conduct research, is growth anticipated in your area of study at WSU? If so, how will this growth affect your staff size and composition?
  N/A

- What types of teaching/research technologies do you find most helpful?
  N/A.

- Do you utilize any highly sensitive equipment (light/vibration/acoustics) or conduct studies where the participants environment impacts the outcome of a study? If so, please tell us about these needs.
  We use a t able-top infrared spectrometer which is not highly sensitive. We should have anuclear magnetic resonance spectrometer for organic chemistry, which does require a dedicated, possible secure, space.

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Please tell us a little about yourself, the types of spaces you use, and your area of focus.

Duncan Thomas thomasdu@wsu.edu
Faculty (Instructor) in Arts and Science, Environmental Science Dept and Biology Dept

What percentage of your time is devoted to teaching? 100% research? 0%

labs 3

Which rooms do you use the most? (Bldg & Room #) many teaching rooms, VSCI 101 and 109 labs, greenhouse

On a typical day, during which time slots are your labs in use? _whenever use is scheduled

What is the typical size (# of people) of a teaching lab? research lab? 24 though 20 is better

What is the proportion of staff to researchers within your lab? N/A

What is the single most important need on the WSU Vancouver campus?. Some important needs are:
better parking arrangements, free parking in remote lots,
lactation rooms,
solar panels on roofs,
Bird-safe windows in new (and all) buildings
Assistance for injured students/others including medical assistance and well-distributed information on where to find it. Free electric carts, wheelchairs to move between classes
Better access to buildings for delivery pick up of class materials. Access routes and 30-min permitless parking spots.

- What is your favorite part of the campus? The undeveloped part, which I use for biology and environmental science outdoor labs and for the collection of lab material.

- What is your vision for a Life Sciences facility on the WSU Vancouver campus? What specific problems would this vision resolve?

More lab space, more teaching labs dedicated to specific classes, a lab where food can be prepared and sampled; greenhouse units dedicated to undergraduate use, greenhouse units for a living plant collection for undergrad use, easily accessible delivery bay with 30 min oen parking

- What is the single most important need of your College/Program/Department?

More lab/greenhouse space for teaching (and maybe extra support staff)

- How is your College/Program/Department's accreditation affected by your current facility?

Maintaining our high teaching standards requires increased commitment from staff and faculty as space becomes limited and multiple uses increase

- Is growth anticipated within your College/Program/Department? If so, what barriers exist to achieving that growth? What is the timeline for the growth?

Growth is occurring. Space and lab resources are constraints

- Do you readily collaborate with any other Colleges/Programs/Departments on campus? Are the groups currently located near each other? If not, how would proximate space benefit your ability to collaborate?

  no

- Does your current lab/classroom meet your needs? If not, what is needed?

No, I need my own lab space for teaching where I can store material on shelves and in refigerators and freezers and leave lab projects set up.

- Does the current design of the rooms and furniture support the desired pedagogy for your courses?

No, I use a lot of hands-on materials for teaching which are hard to use in a standard lecture room and labs are mostly unavailable or too small

- Is a demonstration bench or hood desirable?

yes

- What type of teaching station is desirable? (fixed, movable, podium with AV technology, etc.)

Av technology that actually works is needed. Many of the projectors we currently have do not produce strong images. I need plenty of space in addition to a podium, additional benches at the fromt of labs and lecture rooms

- One trend in lab design involves movable benching/casework that connect to utilities with to allow spaces to adapt over time. What type of benching do you have in your current space? Is there a need for greater flexibility?

Fixed benches, these are fine

- Do you have fume hoods in your current space? If so, how many?

Yes. One is adequate for my needs

- If you utilize fume hoods within a teaching lab, do you utilize a demonstration style in your courses or more of one-on-one style of instruction?

  Demonstration

- If you conduct research, is growth anticipated in your area of study at WSU? If so, how will this growth affect your staff size and composition?

N/A

- What types of teaching/research technologies do you find most helpful?

Plenty of refridgerators and freezers, lots of storage space, good microscope setups where images from dissecting and compound scopes can be clearly displayed on the A/V. Adequate greenhouse bench space and storage for greenhouse supplies

- Do you utilize any highly sensitive equipment (light/vibration/acoustics) or conduct studies where the participants environment impacts the outcome of a study? If so, please tell us about these needs.
- No

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WSU Vancouver Life Sciences
Predesign Questionnaire

WSU Vancouver is in the process of studying a future Life Sciences building on the campus including overall size and location of the building. As part of this effort, we would like to know your personal opinions, hopes, challenges, and dreams regarding the building and the campus. To help us better understand the culture on campus and to identify specific goals for this facility, please answer as many of the follow questions as you can. Thank you for your time and input!

Please tell us a little about yourself, the types of spaces you use, and your area of focus.

Bio #?

Name ___John Harrison_____
Email___john_harrison@wsu.edu_____

Academic Unit: ___School of the Environment_____

Are you faculty or staff?
_____Faculty_____

What percentage of your time is devoted to teaching? ____40_____ research?____50_____

Which rooms do you use the most? (Bldg & Room #) _____VSCI 230B, 216, 218, 215, 18, 7, 118_____

On a typical day, during which time slots are your labs in use? _____9-5_____

What is the typical size (# of people) of a teaching lab? research lab? _____

What is the proportion of staff to researchers within your lab?
_____2:7_____

- What is the single most important need on the WSU Vancouver campus?

  Research and teaching labs

- What is your favorite part of the campus?

  Tower room in VADM

- What is your vision for a Life Sciences facility on the WSU Vancouver campus? What specific problems would this vision resolve?

  Vibrant space for research and teaching related to environmental and biomedical life sciences

- What is the single most important need of your College/Program/Department?

  Research labs

- How is your College/Program/Department's accreditation affected by your current facility?

  NA

- Is growth anticipated within your College/Program/Department? If so, what barriers exist to achieving that growth? What is the timeline for the growth?

  Yes. We are limited by a lack of research lab space, teaching lab space, and office space for graduate students.

- Do you readily collaborate with any other Colleges/Programs/Departments on campus? Are the groups currently located near each other? If not, how would proximate space benefit your ability to collaborate?

  I collaborate with faculty in Math. I'm not sure whether co-location would really enhance our collaboration. I also collaborate with researchers at other campuses and institutions, both in the US and abroad.

- Does your current lab/classroom meet your needs? If not, what is needed?

  Yes, though more opportunities to meld teaching with labs and demos are always welcome and sought

- Does the current design of the rooms and furniture support the desired pedagogy for your courses?

  Yes, it's generally OK.

- Is a demonstration bench or hood desirable?

  Bench would be good. Hood isn't necessary for me.

- What type of teaching station is desirable? (fixed, movable, podium with AV technology, etc.)

  Can really work with whatever at this point, but AV tech is key.

- One trend in lab design involves movable benching/casework that connect to utilities with to allow spaces to adapt over time. What type of benching do you have in your current space? Is there a need for greater flexibility?

  I have permanent bench space in my current lab. Don't really need more flexibility.

- Do you have fume hoods in your current space? If so, how many?

  Yes, I have 4 hoods in my lab.

- If you utilize fume hoods within a teaching lab, do you utilize a demonstration style in your courses or more of one-on-one style of instruction?

  NA

- If you conduct research, is growth anticipated in your area of study at WSU? If so, how will this growth affect your staff size and composition?

  Yes, growth is expected. I anticipate additional tenure track hires, who will require graduate student and lab space.

- What types of teaching/research technologies do you find most helpful?

  Access to web and power point

- Do you utilize any highly sensitive equipment (light/vibration/acoustics) or conduct studies where the participants environment impacts the outcome of a study? If so, please tell us about these needs.

  Temperature fluctuations can affect the sensitivity of one of our instruments, a membrane inlet mass spectrometer. Otherwise, I'm not aware of this sort of issue with our other instruments.

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Please tell us a little about yourself, the types of spaces you use, and your area of focus.

Name _____Marc G Kramer_____
Email__marc@wsu.edu_____

Academic Unit: ___School of the Environment_____

Are you faculty or staff?
_____Faculty_____

What percentage of your time is devoted to teaching? _____30_____ research?___70_____

Which rooms do you use the most? (Bldg & Room #) _____VSCI 203 VSCI 204, Greenhouse bays_____

On a typical day, during which time slots are your labs in use?
_____40_____

What is the typical size (# of people) of a teaching lab? research lab? _____

What is the proportion of staff to researchers within your lab?
_____1:1_____

- What is the single most important need on the WSU Vancouver campus?

  Major instrumentation facility

- What is your favorite part of the campus?

  The Laboratories/infrastructure we have to do science

- What is your vision for a Life Sciences facility on the WSU Vancouver campus? What specific problems would this vision resolve? Major instrumentation and more research labs

117 S. Main Street, Suite 100 Seattle, WA 98104 206.628.3137 FAX 206.628.3138

A Professional Service Corporation with offices in Seattle and Spokane

- What is the single most important need of your College/Program/Department?

More research labs and storage space

- How is your College/Program/Department's accreditation affected by your current facility?

n/a

- Is growth anticipated within your College/Program/Department? If so, what barriers exist to achieving that growth? What is the timeline for the growth?

  We have had to turn down several recent faculty hires because we do not have wet lab space to accommodate them

- Do you readily collaborate with any other Colleges/Programs/Departments on campus? Are the groups currently located near each other? If not, how would proximate space benefit your ability to collaborate?

  Yes. Neuro and Biology.

- Does your current lab/classroom meet your needs? If not, what is needed?

  No. More space including more bench space, space for instrumentation and teaching space for wet chemistry

- Does the current design of the rooms and furniture support the desired pedagogy for your courses?

  ?

- Is a demonstration bench or hood desirable?

  yes

- What type of teaching station is desirable? (fixed, movable, podium with AV technology, etc.)

Felible with computer lab/wet lab capability and classroom use.

- One trend in lab design involves movable benching/casework that connect to utilities with to allow spaces to adapt over time. What type of benching do you have in your current space? Is there a need for greater flexibility?

  Yes.

- Do you have fume hoods in your current space? If so, how many?
-
- Barely. I need more space

- If you utilize fume hoods within a teaching lab, do you utilize a demonstration style in your courses or more of one-on-one style of instruction?

  N/a

- If you conduct research, is growth anticipated in your area of study at WSU? If so, how will this growth affect your staff size and composition?

  I will need more wet laboratory space, more storage space, more office space for graduate stude

- What types of teaching/research technologies do you find most helpful?

A versital wet lab / computer lab space would be helpful

- Do you utilize any highly sensitive equipment (light/vibration/acoustics) or conduct studies where the participants environment impacts the outcome of a study? If so, please tell us about these needs.

Yes. I use a range of highly sensitive analytic instrumentation and our lab group has a need for major instrumentation space to accommodate bigger equipment with specifalized HVAC/electrical/space needs

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Please tell us a little about yourself, the types of spaces you use, and your area of focus.

Name ___Allison Coffin_____ Email_____allison.coffin@wsu.edu_____

Academic Unit: _____Neuroscience_____

Are you faculty or staff? ____Faculty_____

What percentage of your time is devoted to teaching? ___40%_____ research?_____50%_____

Which rooms do you use the most? (Bldg & Room #) ____VCLS rooms 314, 320, 321, and my office (VCLS 208U)___ ____

On a typical day, during which time slots are your labs in use? __VCLS 321 is used 10-7 Monday-Friday, sporadically on the weekends. VCLS 320 is the animal facility. 314 gets occasional use and is a multi-user space._____

What is the typical size (# of people) of a teaching lab? research lab? __10 people in my research lab, although usually 3-7 are working at any one time._____

What is the proportion of staff to researchers within your lab? __All are researchers._____

- What is the single most important need on the WSU Vancouver campus?
  Increased enrollment and residence halls!
  Specific to this project: Larger, newer, and more collaborative research space.

- What is your favorite part of the campus?
  Beautiful mountain views, great colleagues and students.

- What is your vision for a Life Sciences facility on the WSU Vancouver campus? What specific problems would this vision resolve?
  Open, flexible lab spaces with bench space that can be used by different faculty, with regularly spaced equipment bays for shared equipment. Also smaller flexible procedure rooms to be used for microscopy, electrophysiology, animal behavior, or other research needs. The new facility would also include larger, updated animal facilities with flexible spaces to allow for different animal species to be housed as needed, and with procedure rooms for surgeries and other procedures. This vision would facility collaboration across disciplines, allow for cost-savings by sharing equipment, and provide the needed lab and animal space to conform to modern lab practices and grow our research programs. The space would also incorporate

graduate student desk space adjacent to the labs, allows students to work near the lab and to grow the grad student community.

- What is the single most important need of your College/Program/Department?
  More lab and animal animal facility space.

- How is your College/Program/Department's accreditation affected by your current facility?
  I don't think it is, but it's surprising, given that our vivarium probably doesn't meet accreditation requirements.

- Is growth anticipated within your College/Program/Department? If so, what barriers exist to achieving that growth? What is the timeline for the growth?
  Yes, we plan to grow neuroscience/biomedical research. The goal is to hire two new faculty in the next 5 years. The biggest barrier is lab and vivarium space – we don't have any lab space to offer a new faculty member, nor animal facilities for additional research animals.

- Do you readily collaborate with any other Colleges/Programs/Departments on campus? Are the groups currently located near each other? If not, how would proximate space benefit your ability to collaborate?
  I collaborate with Cynthia Cooper in the School of Biomedical Sciences. Our labs and fish facilities are in separate buildings, which hinders both collaboration and shared animal care duties. Having a shared fish facility would reduce the overall animal care workload. Having neighboring lab facilities would facilitate collaboration and reduce stress on research fish – we often hand-carry fish between buildings.

- Does your current lab/classroom meet your needs? If not, what is needed?
  Mostly, but not completely. Neighboring student desk space is important, as if a larger lab that could accommodate an electrophysiology rig.

- Does the current design of the rooms and furniture support the desired pedagogy for your courses?
  Mostly. My classes require configurable tables and chairs (for lecture vs. small or large-group discussion), which are available in most of the smaller classrooms. Ideally, future rooms would include video recording options - I teach communication classes and like the ability to record student presentations.

- Is a demonstration bench or hood desirable?
  A demonstration microscope or bench would be helpful.

- What type of teaching station is desirable? (fixed, movable, podium with AV technology, etc.)
  Podium with AV is preferred, fixed is fine.

- One trend in lab design involves movable benching/casework that connect to utilities with to allow spaces to adapt over time. What type of benching do you have in your current space? Is there a need for greater flexibility?
  Yes, moveable benches would be great. Right now I have fixed benches. Greater flexibility would allow me to configure my lab in a different way.

- Do you have fume hoods in your current space? If so, how many?
  Yes, one fume hood, which is sufficient. I also use a biosafety cabinet in a neighboring lab.

- If you utilize fume hoods within a teaching lab, do you utilize a demonstration style in your courses or more of one-on-one style of instruction?
  Not used.

- If you conduct research, is growth anticipated in your area of study at WSU? If so, how will this growth affect your staff size and composition?
  I always anticipate growth! I anticipate bringing in 1-2 additional graduate students in the next few years, and transitioning from part-time to full-time research technicians. This is of course all dependent on my grant funding.

- What types of teaching/research technologies do you find most helpful?
  Teaching technologies: Standard AV. It would be helpful to have classroom computers to use for online demonstrations, but most students bring their own computers or tablets. The biggest need for me is AMS or other video-conferencing options for classes and meetings, including document cameras for showing documents across campuses.

  Research technologies: Our biggest needs are in microscopy and cell/molecular biology, including dedicated microscope suites, bench space for cell/molecular instruments, and a tissue culture suite.

- Do you utilize any highly sensitive equipment (light/vibration/acoustics) or conduct studies where the participants environment impacts the outcome of a study? If so, please tell us about these needs.
  My lab studies hearing. Therefore, vibration and acoustics have a drastic effect on our research. All animal facilities (for fish, mice, and other research animals) need to be low vibration and quiet. Labs need to be relatively quiet as well. A small space with reasonable sound isolation would facilitate behavioral experiments (not a sound booth, but something with some acoustic dampening).

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Please tell us a little about yourself, the types of spaces you use, and your area of focus. Lab #5 Sa

Name ___Michael Morgan_____ Email_____mmmorgan@wsu.edu_____

Academic Unit: _____Psychology/Neuroscience_____

Are you faculty or staff? _____Faculty_____

What percentage of your time is devoted to teaching? ____40%_____ research?____40%_____

Which rooms do you use the most? (Bldg & Room #) _____VCLS 310, 317, 319_____

On a typical day, during which time slots are your labs in use? People are 9-5; Automated testing of rats occurs all 24 hours__

What is the typical size (# of people) of a teaching lab? research lab? ___About 8 people work in the lab_____

What is the proportion of staff to researchers within your lab? __2 technicians; 1 graduate student; 5 undergraduates_____

- What is the single most important need on the WSU Vancouver campus?

- What is your favorite part of the campus?

- What is your vision for a Life Sciences facility on the WSU Vancouver campus? What specific problems would this vision resolve?

An animal care facility that includes a cage washing machine.
Multiple small testing rooms.

- What is the single most important need of your College/Program/Department?

- How is your College/Program/Department's accreditation affected by your current facility?

- Is growth anticipated within your College/Program/Department? If so, what barriers exist to achieving that growth? What is the timeline for the growth?

Yes, Neuroscience would like to grow. The limitations are lab space and money to hire someone.

- Do you readily collaborate with any other Colleges/Programs/Departments on campus? Are the groups currently located near each other? If not, how would proximate space benefit your ability to collaborate?

- Does your current lab/classroom meet your needs? If not, what is needed?

My lab needs are met. The animal care facility could be better.

- Does the current design of the rooms and furniture support the desired pedagogy for your courses?

- Is a demonstration bench or hood desirable?

I need on e fume hood in my lab.

- What type of teaching station is desirable? (fixed, movable, podium with AV technology, etc.)

- One trend in lab design involves movable benching/casework that connect to utilities with to allow spaces to adapt over time. What type of benching do you have in your current space? Is there a need for greater flexibility?

- Do you have fume hoods in your current space? If so, how many?

One.

- If you utilize fume hoods within a teaching lab, do you utilize a demonstration style in your courses or more of one-on-one style of instruction?

- If you conduct research, is growth anticipated in your area of study at WSU? If so, how will this growth affect your staff size and composition?

- What types of teaching/research technologies do you find most helpful?

- Do you utilize any highly sensitive equipment (light/vibration/acoustics) or conduct studies where the participants environment impacts the outcome of a study? If so, please tell us about these needs.

C

penson report

Washington State University Vancouver

Report of Academic Planning Process

November, 20, 2014

WASHINGTON STATE UNIVERSITY VANCOUVER

Washington State University Vancouver
Report of Academic Planning Process

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Appendices

A. Project Background and Goal

Washington State University (WSU), one of two research universities in the state, was founded in 1890 as the state's land-grant institution. It is a Carnegie Doctoral/Research Extensive University with a 2013 enrollment of 27,642 in undergraduate, graduate, and professional programs: 19,446 at WSU Pullman; 1,367 at WSU Spokane; 3,097 at WSU Vancouver, 1,347; at WSU Tri-Cities; and 2,376 in WSU Online. (http://about.wsu.edu/about/facts.aspx)

Established in 1989 as the urban research campus of Washington State University, WSU Vancouver served solely upper division undergraduates and graduate students. In 2006, the campus admitted its first freshmen and sophomore students and become a more traditional four-year institution. Transfer students still constitute approximately two-thirds of the WSU Vancouver student population, with the majority transferring from community colleges in Southwest Washington, particularly Clark College.

Fifty-five percent of the student body is female, 45% male. Students of color represent 18.5% of total enrollment. WSU Vancouver has over 11,000 alumni, 75% of whom remain in the area.

Washington State University Vancouver employs more than 140 full time faculty and offers 19 bachelor's degrees, nine master's degrees, two doctorate degrees and more than 37 fields of study. As part of a distinctive public, land grant and research institution, WSU Vancouver seeks to enhance the intellectual, creative, and practical abilities of the individuals, institutions and communities it serves.

Southwest Washington continues to be the area of the state with the most limited access to public higher education, while demand for college graduates remains strong.

Since its inception, one of the primary goals of WSU Vancouver has been to serve as a catalyst for the growth and development of Southwest Washington, and it has developed its academic programs and research agenda in response to regional needs. As it observes its 25th anniversary WSU Vancouver wishes to build upon this foundation and grow to 5,000 students by 2020 in order to provide additional educational opportunities for local student and the baccalaureate educated graduates to meet workforce needs.

Toward these ends, the goal of the project was to facilitate a highly collaborative process to identify areas for expanding academic programs and research at WSU Vancouver and to identify implications for marginally refining WSU Vancouver's mission statement.

B. Description of Process

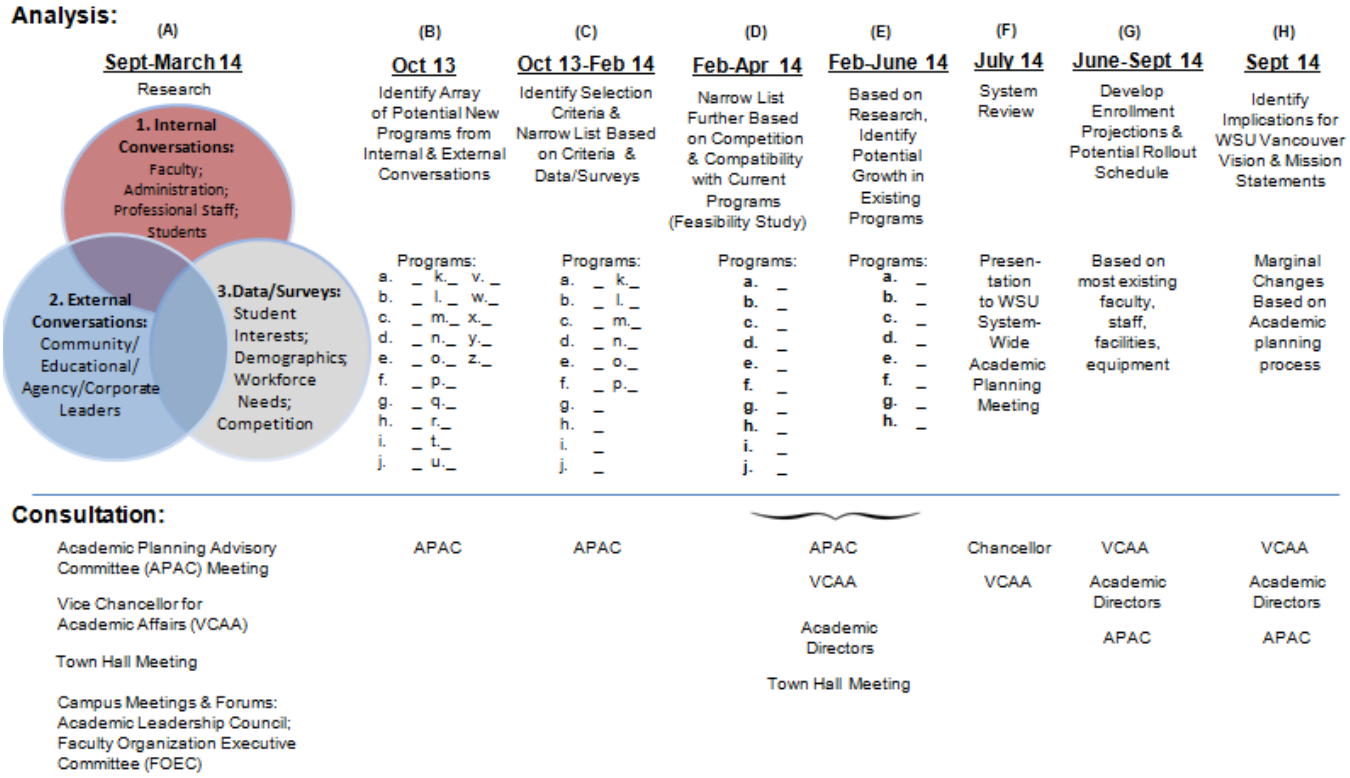
The approach was based on a number of guiding principles, including:

- Customize the work plan to fit the unique needs and circumstances of WSU Vancouver
- Build from work already done
- Be guided from a representative group
- Engage key stakeholders on campus and in the community
- Identify the timelines for starting new programs
- Minimize planning jargon by using a conversational approach that addresses key questions

The following graphic shows the steps the planning process. There were two parallel tracks:

- Analysis, which involved conducting research, drawing implications, formulating program and research opportunities, and projecting enrollments.
- Consultation, which involved sharing finding and implications with the WSU Vancouver campus community for feedback and recommendations.

While the process took place largely in linear fashion, some activities overlapped. One in particular was Research, which began in Fall 2013 and continued through much of the process.



The process was guided by an Academic Planning Advisory Committee made up of a cross section of the academic units and governing groups:

- Linda Frederiksen, Head of Access Services, Library
- Steve Henderson, Assistant Professor College of Arts & Sciences
- Kim Hiatt, Associate Director of Admissions, Student Affairs
- Renee Hoeksel, Professor & Assistant Dean, College of Nursing
- Mistie Josephson, Business Growth, Map Manager, College of Business
- Stephen Kucer, Professor, College of Education
- Carolyn Long, Chair, Associate Professor, College of Arts & Sciences
- Jennifer Miltenberger, Director, Development and Alumni Relations
- Tahira Probst, Assistant Vice Chancellor for Academic Affairs
- Suzanne Smith, Director, Human Development/College of Education
- Lynn Valenter, Vice Chancellor for Finance and Operations

- Scott Wallace, Associate Professor, School of Engineering & Computer Science

Preparation for the project took place in Spring 2013 and extended through the summer, culminating with a meeting of the Academic Planning Advisory Committee in early fall to further review and refine the process. Subsequently, the project proceeded along the following steps, which followed the foregoing chart.

A. **Research:** As the graphic shows, there were three types of research that began in the fall and extended through much of the project:

1. **Internal Conversations with Faculty, Administration and Professional Staff**: The process began with a meeting of internal conversations, the first of which was an academic town hall meeting attended by approximately 100 faculty and professional staff where the Chancellor and Vice Chancellor for Academic Affairs shared their perceptions on the possibilities for WSU Vancouver and the role of this process. Following this, the consultants made a PowerPoint presentation of the process.

   The town hall meeting then broke into small groups where participants discussed the following questions, which were intended to jump-start the planning process:
   a. Looking into a crystal ball to its ideal future, what is WSU Vancouver most known for?
   b. What would you say to attract a search's top choice to entice him or her to come to WSU Vancouver? What would you like to say, but cannot?
   c. What programs and research would you pitch a donor considering a large gift to WSU?
   d. How would you incorporate technology/online/hybrid delivery at WSU Vancouver?
   e. What more could occur across WSUV disciplines – within the WSU and with other institutions?
   f. What major internal and external forces will have the most impact on the future of WSU Vancouver?

   Following the town hall meeting, the consultants had conversations with faculty and professional staff either in small groups to further discuss the process (e.g., Faculty Organization Executive Committee, Academic Leadership Council); and selected administrative and professional staff to seek information about WSU Vancouver relevant to the planning process.

   There was also an open forum for students that focused primarily on which academic programs they wish WSU Vancouver would offer either to round out their own academic program or as an alternative to their program. Though only a small group of about 25 students, it was a good cross section, in terms of gender, age, ethnicity and year in college.

2. **Conversations with Community, Educational, Agency and Corporate Leaders:** After the on-campus conversations and through November, the consultants had conversations in person or by phone with approximately 60 leaders and practitioners in key sectors in the Portland/Vancouver Metropolitan Statistical Area (MSA) as well as with community leaders and economic development agencies. The individuals fell into two broad categories:
   a. Education, health care, social services and community development
   b. Heavy industry, high tech, software development, energy/utilities, economic development and the environment

   The purpose of the conversations was to obtain their insights and ideas about the current and future needs of the region and the implications for WSU Vancouver. To this end, the individuals were asked questions about a number of topics, including:
   a. Challenges facing Vancouver and the surrounding community;
   b. Positions where they are doing the most hiring and those that are the most difficult to fill;
   c. Changes they see coming in their profession that will impact skills they are looking for, hence academic preparation; and,
   d. For those in education, trends they see in the academic and career interests of their students.

   The findings from these conversations were analyzed for their implications for programs at WSU Vancouver.

3. **Data and Surveys:** The following information was compiled and research conducted to inform the planning process:
   a. Population and demographic trends
   b. Workforce supply and demand
   c. WSU Vancouver degree programs and enrollment trends
   d. Student interests

B. **Identify Array of Potential New Programs from Internal and Community Conversations:** The consultants presented to the Academic Planning Advisory Committee a summary the small-group discussions at the town hall meeting, the on-campus meetings and conversations with regional leaders and practitioners. The programs identified by these groups became a large set of potential new programs.

C. **Identify Selection Criteria and Narrow List of Potential New Programs:** In order to narrow the large set of potential new programs, the Academic Planning Advisory Committee used a broad consultative process to identify selection criteria. Simultaneously, with considerable assistance by the University, the consultants summarized the findings from the internal and external conversations and gathered the data on regional workforce needs. The consultants developed a table using the Department of Labor broad job categories (e.g., Business) and subcategories (e.g., Accounting, Finance, Operations) viewing them as akin to academic disciplines and sub-disciplines. In addition to data on demand, supply and unmet need, the table also included the following on each job category:
   a. The level of potential offerings: bachelors, masters
   b. The level of corporate and community support (High, Medium, Low)
   c. The regional competition (Washington, Oregon; public and private)
   d. The ranking (High, Medium, Low) for each selection criteria

   The Academic Planning Advisory Committee and the consultants held an extended meeting where the tables were presented and discussed. The result was an initial list of 21 potential new academic programs and two centers. Subsequently, the list of 21 programs was trimmed to 14 -- 10 high-interest programs and 4 of secondary interest.

D. **Narrow List Further Based on Competition and Congruence with Current Programs:** The consultants then conducted an in-depth study of the 14 programs to assess their feasibility relative to how much current and future needs were met by graduates from similar academic programs at competing institutions. Based on that analysis, programs were divided into most, moderately and least feasible. The program-by-program analysis and a brief description of each program were shared in meetings with the Academic Planning Advisory Committee and the WSU Vancouver's Academic Leadership Council. Following these meetings, the consultants met in subgroups, consisting of the Vice Chancellor for Academic Affairs and the Academic Directors whose academic offerings most related to each of the 14 programs. The questions addressed in the meetings included:

   1. Do you think the proposed program as described is viable and a good idea for your academic area and WSU Vancouver? If so, what are your thoughts on the description of the program? How would you refine the description? If you don't view the program as viable and a good idea, what changes would you make so that it might be?

   2. What implications do you think the potential program has for the growth of current academic programs at WSU Vancouver? For example, what current programs will likely need to grow as a result of it? Are there minors that would likely need to be become majors? Majors that will likely need to expand to the master's level?

   3. What natural connections do you see the potential program having with current WSU Vancouver programs, in terms of faculty expertise, budget, facilities, and equipment? More specifically, which ones would be easiest to implement in terms of the availability of these critical elements?

4. Based on the expertise and interests of your faculty, what implications do you think the potential program has for research in your academic area and WSU Vancouver overall?

From these discussions and subsequent meetings of the Vice Chancellor for Academic Affairs and the Academic Directors, the list of potential new programs was ultimately narrowed to 8.

E. **Identify Potential Growth in Current Programs**: Simultaneous with identifying potential new programs, the consultants, with the assistance of the Chair of the Academic Planning Advisory Committee and later the Research Specialist for Campus Effectiveness, developed a enrollment and interest table that showed:
- WSU Vancouver academic program and degrees
- Enrollment trends
- Levels of student interest
- Level of regional need and support as measured by workforce data and the views of regional leaders and practitioners

This information led to identifying growth opportunities for current programs.

At this point in the process, a meeting was held with the Chancellor that involved the consultants, the Vice Chancellor for Academic Affairs and the Chair of the Academic Planning Advisory Committee, to provide the Chancellor a full briefing of the project to date and to discuss the remaining steps in the process, including review by the WCU Vancouver academic community and the WSU System.

This was followed a few weeks later by a second academic town hall meeting, attended by approximately the same number of participants as the first (100), to share the results of the foregoing planning steps.

F. System Review: A WSU system-wide academic planning meeting was held in Pullman in early July where the WSU Vancouver Chancellor and Vice Chancellor for Academic Affairs presented WSU Vancouver's thinking about new programs it wished to take forward, including proposed timelines for implementation: near-, mid-, and long-term. The reception was positive.

G. Develop Enrollment Projections and Potential Rollout Schedule: Following the system-wide review, the consultants developed a table of a projected of rollout of the eight new programs over a 15 year period. It was based on input by the Vice Chancellor for Academic Affairs and the Academic Directors on the timing for implementing programs given existing resources, the initial headcount enrollments, and the estimated retention rates. Three enrollment scenarios were developed: moderate growth, conservative growth and optimistic growth. They also developed a projection of WSU Vancouver's headcount enrollment in current programs, also based on conservative, moderate and optimistic growth scenarios.

H. Identify Implications for WSU Vancouver's Vision and Mission Statements: This project focused on identifying new and expanded academic programs rather than the broader strategic plan. However, it also produced information that had implications for WSU Vancouver's vision and mission. These were identified and discussed.

C.1. Campus and Community Discussions

Discussions with WSU Vancouver Faculty, Administration, Professional Staff and Students

Town Hall Meeting

A number of thoughts and ideas from the small-group discussions held at the initial academic town hall meeting which formally initiated the planning process.

Questions posed regarding what programs and research small groups would present to a major donor, new or expanded programs and research that could occur through greater collaboration and the optimal role of online education drew many thoughtful responses:

Potential New/Expanded Programs (number of times cited in parentheses)

- 3D printing/software development
- Autism research
- Brewery industry - fermentation science
- Civil Engineering
- Communication related programs (4)
- Counseling MS/MA (2)
- Criminal Justice
- Cyber Security
- Electrical Engineering MS (3)
- Engineering & computer science
- Environmental issues
- Fine arts
- Freedom and justice studies
- Geography /urban studies
- Graphic Design
- Health and fitness
- Health care programs/administration (2)
- Hospitality
- International business (2)
- Leadership program
- Mathematics (2)
- Non-profit administration
- Nutrition
- Nursing: four-year BSN (2)
- Optometry
- Professional Science Masters: Administration, Policy, Science
- Master's in Social Work
- Veterinary School

Potential WSU Vancouver Multi/Interdisciplinary Programs

- Sustainability
- Entrepreneurship
- Biomedical/neuroscience
- Bioengineering
- Environmental engineering
- Health administration and technology
- Informatics/Big Data
- Interdisciplinary focus on aging
- General calls for interdisciplinary studies/units

Potential WSU Vancouver Centers

- High tech incubator
- Think tank - basic research and idea generation
- "Research to Practice" entrepreneurship center
- Center for renewable energy
- Community health center blending research, teaching, and service
- Incubator/R&D for socially conscious start-ups
- Center for Social and Environmental Justice

Potential Community Partnerships

- Study abroad center
- Internship center
- Research-to-practice center/entrepreneurship
- Tech commercialization
- Collaborative teacher/teaching education
- Co-located industry/government agencies
- Music - theater community partnerships
- International partnerships
- Internships across different areas
- Off-site local high school/community college

- Community health center collaboration

Potential Online Offerings

- Health/biomedical programs
- Environmental studies
- Certificate programs
- Extension offerings for NSF REU Program
- Access for students with scheduling constraints
- Professional/career development for faculty

Potential Program Collaborations within WSU Vancouver, with other WSU campuses and other Universities

Biological Sc.

- Bioengineering
- Biomedical Science
- Biofuels

Business

- Technology commercialization (Business-Engineering-CMDC)
- Marketing-technology
- Organizational studies: (I/O psychology; business; human development)
- Advertising (Business-CMDC)
- Interdisciplinary leadership

Health/Social Sc.

- Psych.-Nursing
- Nursing-Neuroscience
- Health Care Administration (Business-Biology-Nursing)
- Integrative Health
- Public Policy (Health, Environmental Leadership)
- Ethnic studies

Engineering

- Human-machine interface
- Manufacturing & Society
- Physics-Engineering
- Environmental Engineering
- Renewable Energy

Potential Center Collaborations within WSU Vancouver, with other WSU campuses and other Universities

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- Social and Environmental Sustainability
- Healthy Neighborhoods
- Technology Commercialization
- Integrative Health
- Robotics
- Smart Cities
- Big Data/Analytics
- Innovation Economic Development
- Research to Practice

Student Forum

The Student Forum yielded a number of academic programs that the students *wished* WSU Vancouver would offer (or offered more of) to either round out their own academic program or as an alternative to their current academic major:

Arts & Sciences

- Communications
- Writing as a Craft
- Gender Studies
- Philosophy
- International Studies (B/M)
- Arts
- Pre-Law
- Law
- Political Science
- Clinical Counseling (M)
- Sports History
- Math
- Foreign Languages
- Public Affairs (M)

Business

- More electives /minors
- Sports Mgt.
- International Business
- Hospitality
- MIS
- Management & Ops
- Marketing
- Fashion Design Marketing
- Healthcare Adm. (B/M)

Engineering/Computer Sc.

- Electrical Engr. (M)
- EE electives
- Robotics
- Power Engr.
- Renewable Engr.
- Computer Engr.
- Biomedical Engr.
- Civil Engr.

Agriculture/Nat. Resources

- Sustainability
- Agriculture

Education

- Physical Education

Health Professions

- BSN
- Physical Therapy

Discussions with Regional Leaders and Practitioners

The consultants had conversations held with approximately 60 regional leaders and practitioners (listed in the Appendix) that resulted in a number of potential programs. The individuals fell into two broad categories:

- Education, Health Care, Social Services and Community Development
- Heavy Industry, High Tech Manufacturing, Software Development, Energy/Utilities, and the Environment

General Observations

1. A strong liberal arts core was seen as the essential by everyone.

2. Work experience is also seen as highly desirable and regional leaders are interested in having WSU Vancouver students as interns. However, they often feel hampered by difficulties in finding the right place to post the opportunities and that students cannot easily work in internships due to their class schedules. Students from programs requiring internships, such as MAP and DTC, are in particularly high demand. These observations suggest that WSU Vancouver could benefit by a centralized "internship cooperative" that cuts across all programs, is easily recognizable and could serve as hub for outside organizations and for students.

3. All of the leaders and practitioners were interested in students with strong interpersonal skills, problem solving and communication skills.

4. There is a general preference for graduates from Washington institutions because leaders noted that they tend to remain in the region and their organizations feel a stronger connection to the institution.

These observations align with the following findings of a 2013 study by the Georgetown Center for Education on the educational requirements for jobs of the future. (https://georgetown.app.box.com/s/tll0zkxt0puz45hu21g6).

Skill by Intensity of Use	Description
1. Active listening……	Giving full attention to what other people are saying, taking time to under-stand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
2. Speaking……..	Talking to others to convey information effectively
3. Reading comprehension……..	Understanding written sentences and paragraphs in work-related documents
4. Critical thinking……..	Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions, or approaches to problems.
5. Writing……..	Communicating effectively in writing appropriate for the needs of the audience.
6. Monitoring……	Monitoring or assessing performance of oneself, other individuals, or organizations to make improvements or take corrective action
7. Coordination……..	Adjusting actions in relation to others' actions
8. Social perceptiveness……..	Recognizing others' reactions and understanding why they react as they do.
9. Judgment/decision-making….	Considering the relative costs and benefits of potential actions to choose the most appropriate one.
10. Complex problem-solving…….	Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.
11. Active learning……	Understanding the implications of new information for both current and future problem-solving and decision-making
12. Time management…….	Managing one's own time and the time of others
13. Mathematics……	Using mathematics to solve problems.
14. Negotiation……..	Bringing others together and trying to reconcile differences

15. Science……. Using scientific rules and methods to solve problems

Education, Health Care, Social Services and Community Development

a. Social Work – Regional leaders report a growing need for social and mental health workers, brought on by increased local demand by local social service agencies and by requirements for greater intervention and prevention in the Affordable Care Act. Moreover, the profession appears to be moving toward a new direction, with fewer services offered in an office or on-staff in a residential or psychiatric facility and more as part of a SWAT team of social workers who go into homes and schools to work with troubled children and families. There isn't a social work program, per se, at WSU Vancouver. The closest is a degree in social science or sociology. There appears to be opportunity for WSU Vancouver to build a program, particularly at the graduate level, that reflects the newer approach to the profession. It could serve local needs and draw students looking for a more modern approach.

   Additional dialog took place with the leadership of five local community development and health care leaders to ask if they would hire graduates with a master's degree in human services, with a curriculum that emphasized the newer approach. Three of the five said they would while the other two preferred graduates with an MSW degree.

b. Programs built around the Port of Vancouver -- According to officials at Clark College, Vancouver higher education has very little in this area. Hence, there could be opportunity for Clark College and WSU Vancouver if the data show there are sufficient jobs in areas such as port management, port/homeland security, and logistics; and if PSU hasn't already satisfied the need.

c. Applied/Engineering/Manufacturing Technology – There were consistent comments about the importance of engineering that is less theoretical and more hands-on to serve on plant floors managing and solving day-to-day problems.

d. Computer Science/Engineering – WSU Vancouver's programs and the new $38 million Engineering and Computer Science Building are viewed as positioning WSU Vancouver to quickly advance in these areas.

e. Direct/Rapid Digital Manufacturing – Clark College is developing programs in composite engineering, prosthetics and 3-D printing. Since WSU Vancouver already has programs in computer science, there is potential for WSU Vancouver to partner with Clark College on 2+2 programs in these emerging areas.

f. Cyber-Security -- Clark College also plans to move into this area. Given that WSU Vancouver has a minor in criminal justice, has programs in computer science and engineering, is located near a port and is close to high-tech firms, there is potential for a program that addresses cyber-security, perhaps in a 2 + 2 partnership with Clark College.

g. "Creative Computer Applications"-- Graphic design, digital media, product design, and toy design were mentioned by Clark College and HS guidance counselors as areas of increasing interest.

h. Fund Raising Management -- When asked its major challenges, all non-profits mentioned the need for fund raising and difficulty finding trained professionals in the area. A program at the graduate level could addresses this need (e.g., http://ce.columbia.edu/fundraising-management)

i. International Studies: Conversations often touched on Vancouver's strategic geographic position: a port city on the Pacific Rim with a large number of Asian residents and growing Hispanic population. Many thought this could be leveraged with programs in such as areas as international business, foreign policy, languages and disciplines preparing students for the diplomatic corps.

j. Environmental Science, Sustainability and Bio-Engineering: These areas were mentioned as high student interest areas by high school guidance counselors and Clark College academic advisors. The

primary question is what WSU Vancouver's niche in the field is and whether or not there is sufficient need for program expansion given the proliferation of programs in these fields.

k. Law Enforcement: Local agencies, are increasingly hiring a more diverse workforce (social work, psychology, mental health, engineers, etc.) rather than strictly criminal justice majors and expressed an interest in working with WSU Vancouver to develop multi-disciplinary programs aimed at careers in law enforcement.

l. Pre-Health-Profession Programs, e.g., Pre-Med, Pre-Vet, Pre-Physical Therapy: Pre-professional programs are high interest areas for which, according to high school guidance counselors and Clark College academic advisors, WSU Vancouver does not have sufficient visibility. While WSUV students interested in these areas are advised into certain majors and there are counselors to assist, but the perception is that there isn't a high enough profile for these programs on the WSU Vancouver website or an office students can go to that focuses on pre-health-profession programs.

m. Health Care -- Local health care leaders indicate that Vancouver is experiencing considerable under-the-radar growth in health care as the Vancouver health care industry emerges from shadow of Portland. (Salmon Creek Medical Center, alone, hired 170 in the last year, with similar experiences at other major health centers). The hardest-to-hire areas requiring a four-year degree are:
   - Pharmacists
   - Physical therapists/Occupational Therapists
   - Health Care information technologists/informatics
   - Nurses
   - Nurse Practitioners
   - Physician's Assistants
   - Speech and Language Pathologists

n. Bioinformatics -- Beyond the call for health care information technologists cited above, health care leaders mentioned that bioinformatics is a growing need that will grow further as a result of the Affordable Care Act.

o. Psychologists/Mental Health Workers -- Cited as "different from social workers," this area covers psychologists/clinicians who can work hand-in-hand with schools officials and with and social and health care workers in addressing psychological disorders, drug rehabilitation, and other mental health issues.

p. Special Education -- Turnover is expected at all levels of K-12, but special education was cited as an area of particular need.

q. Entrepreneurship – Several individuals cited the need for a program in entrepreneurship because of the region's many high-tech start-ups and the number of small, family owned businesses that the next generation will take over.

r. Some mentioned Washington and the Pacific Northwest's long history in natural resources and its outdoor culture and, perhaps, opportunities for WSU Vancouver in fields related to these areas:

   i. Fire Science – Reflecting the fact that over half of Washington remains forested and that timber, though lower than in the past, remains a large industry

   ii. Hatchery Science/Aquaculture – This is a significant and growing modern industry in Washington (http://wdfw.wa.gov/hatcheries/overview.html)

   iii. Recreation/Outdoor Adventure -- Park rangers, ecotourism, camp management, natural resources, and environmental interpretation were seem as areas having potential program implications. (e.g., http://www.ithaca.edu/hshp/depts/rls/oalinfo/immersionsemesterprogram/the).

Heavy Industry, High Tech Manufacturing, Software Development, Energy/Utilities, and the Environment

a. Mechanical Engineering -- The preferred school for mechanical engineers is currently OSU. Employers believe that WSU Vancouver mechanical engineering graduates will benefit as its program matures, adding more electives and graduating more students. The new semiconductor processing lab was viewed positively. There was some interest in a Semiconductor/MEMS processing MS. There is interest in WSU Vancouver interns in all engineering disciplines.

b. Electrical Engineering/Computer Engineering -- The preferred school in most cases for EE is OSU. Electrical engineers at all levels are in demand; however, a Masters degree in electrical engineering is particularly desirable. Electrical controls engineers and computer engineers (hybrid between computer science and EE) are especially hard to find, with masters or Ph.D. graduates in most demand. There are times when students working toward a master's degree through an employee sponsored program choose PSU because WSU Vancouver does not have full options. Other desires that could be designed into the curriculum are skills that enable electrical engineers to communicate with ME and IT.

c. Industrial/Manufacturing Engineering – IE/ME graduates, with an understanding of lean manufacturing, process improvement, scheduling, etc. are in demand in both high tech and more traditional industries, and are extremely hard to find.

d. Robotics -- Electrical / mechanical engineering hybrid, with coursework in pneumatics, vacuum, automation, CAD, and 3D modeling, are difficult to find.

e. Power Engineering -- Control system design and power engineering are increasingly important with smart grid, introduction of renewable energy into the grid, and more complex energy marketing schemes. OSU has a highly respected program and does research in this area.

f. Renewable Energy/Energy Efficiency/Sustainability – OIT's campus in Wilsonville, just outside of Portland (http://www.oit.edu/wilsonville) has developed one of the first renewable energy degrees in the country and its students are highly sought after for domain knowledge and the hands on nature of the training. It does not have capacity to meet demand, so this could be an opportunity for WSU Vancouver.

g. Materials/Ceramics/Photonics Engineering – Many local industries are materials based – semiconductors, ship building, aeronautics, renewable energy, photonics, and structural materials. There is a need for materials science/materials engineering to meet the demand in these industries. However, a degree engineering or science is less important than domain knowledge. Another component of materials science/materials engineering is materials joining technology including welding. PSU is known for having excellent welding technologies.

h. Chemical Engineering—Chemical engineers are used in the high tech manufacturing industries as well as in process industries such as paper and pulp. Chemical engineers and/or environmental engineers are often also responsible for maintaining clean water discharges into the environment. CE was mentioned less often than ME, EE, or IE as a hard-to-hire major, and reactions were mixed on whether or not there is a need for additional CE graduates in the area.

i. Business/Accounting/Finance/Marketing/Professional Sales – WSU Vancouver has a good reputation for supplying local businesses. There was little commentary around improvement except for potentially more interdisciplinary programs such as engineering/professional sales or MIS/ computer science. Also mentioned was that earning an MBA at WSU Vancouver while fully employed was difficult. Further, there is desire for WSU Vancouver interns.

j. Logistics: Supply chain management talent is viewed as relatively easy to hire. However, supply chain *analysts* are viewed as more difficult. The ideal candidate was described as a "data geek" with a hybrid degree between IT and logistics. Companies have tended to find non-traditional candidates for jobs in logistics so are unaware of any programs in the Northwest. The demand for logistics did not revolve around the port which was viewed as more oriented towards commodities and non-college-degree jobs such as crane operators and longshoremen.

k. Environmental and Natural Sciences MS and Ph.D.: There are very specific talents necessary for the research being done around fisheries, watershed management, forestry, and recreation management. Sub- specialties that are in demand include: fish nutrition, fish ecology, wildlife nutrition, wildlife ecology, conservation genetics, migrating birds, endangered species management, fish and wildlife physiology, ecosystem modeling, quantitative ecology, natural resources management, watershed management, hydrology, meteorology, fisheries management, recreation management, environmental engineering. Hiring organizations are a mix of federal, state, international, and tribal organizations that must work together and the desire for academic institutions to play a coordinating role is sought. There are also abundant research opportunities, especially for an academic institution that can apply for federal funding.

l. Digital Analysis/Visualization: WSU Vancouver's current Digital Technology and Culture (DTC) program was mentioned by many as a unique program (on both sides of the river) in high demand due to the unique curriculum and that the students are expected to do to projects in the community. As 3-D printing applications expand, demand will grow even more. Whether as part of DTC or some hybrid between it and computer science, visualization and modeling are expected to increase in demand with the growth of big data in applications including healthcare, energy, and remote sensing.

m. Computer Science/Software Engineering – Many noted that there is an acute shortage of software engineers nationwide but that is even more acute in the Pacific Northwest and in the Portland MSA. Of particular concern by industry leaders is the loss of software engineers to California. They indicated that the computer science program at WSU Vancouver could greatly expand to meet these needs. They mentioned the need for both applied and research computer scientists and that database architecture, data warehousing, cloud computing, big data analysis, and software design are all areas in demand. Practitioners advised breaking down broader, computer science curriculum into specific sub-disciplines in order to better orient students to the jobs in that area.

   PSU and OSU are preferred schools in the area. PSU's internship program is respected and in use by numerous companies. PSU is also the preferred school for industry professionals looking to take refresher coursework which is not appropriate for online instruction. Industry leaders indicated that the sequence of course offerings and use of credits for internships makes it difficult for WSU Vancouver students to take internships.

<u>Other Observations</u>

The conversations with leaders and practitioners identified other regional needs not directly related to academic programs, but that represent significant areas of opportunity for WSU Vancouver:

a. Center for Professional Development - Ongoing training and development was cited as a need by most of the individuals in K-12 education, health care, social services and community development. Public safety and service organizations also think WSU Vancouver could assist in areas like leadership development, succession planning, staff training, and development.

   A conference facility associated with professional development tailored for the working professional, with perhaps a hotel component which could also serve as a laboratory for the hospitality management program could serve the in-service training for teachers, healthcare, and social workers; and could make WSU Vancouver a potential destination for regional conferences.

b. Center for Collaboration/Thought Leadership -- Leaders across all sectors believe that WSU Vancouver could become *the* center for research and discussion on regional issues -- the "kitchen table" for

Vancouver and Southwest Washington. They urged WSU Vancouver to push for greater involvement and recognition by Portland based agencies and initiatives, e.g., getting on the right boards, visiting companies in Oregon, and to showing up at high profile meetings. This could result in partnerships with the community and other educational institutions and social organizations to address regional issues, e.g.,

- Research and assessment of programs addressing social problems in a fact-based, non-partisan way
- Grant-supported cooperative program with Clark College and Council for the Homeless to provide special programming for homeless students
- Grant-supported partnership (e.g., Community Foundation of Southwest Washington; United Way) to address childhood/intergenerational poverty
- Bringing diverse environmental organizations together for the purpose of research, cooperation and public policy (e.g. invasive species, climate change, recreation management)
- Being the "honest partner in the room" around research and public policy locally
- Working in conjunction with economic development agencies for federal grants – many times involving multiple jurisdictions and institutions
- Work with High Tech Industry Council, high school, and community colleges to determine which internships are appropriate for which level of educational institution
- Work with local economic development agencies and companies to provide consulting, research, and internships to help grow local companies

Beyond community issues, a comprehensive Center for Collaboration/Thought Leadership could focus on *all* aspects of collaboration, e.g.,

- Interdisciplinary teaching
- Interdisciplinary research
- Community research
- Undergraduates/faculty research
- Research partnerships with other institutions

c. Research Park - Some individuals cited the Vancouver's potential to become a technology center, particularly referencing the State's designation of the City as an Innovative Partnership Zone (IPZ): http://www.cityofvancouver.us/ced/page/state-names-vancouver-digital-technology-zone-key-new-economic-growth. They noted that WSU Vancouver would have to be a major partner if an entity like this is to come to fruition. The Association of University Research Parks can be a useful source for information: http://www.aurp.net/.

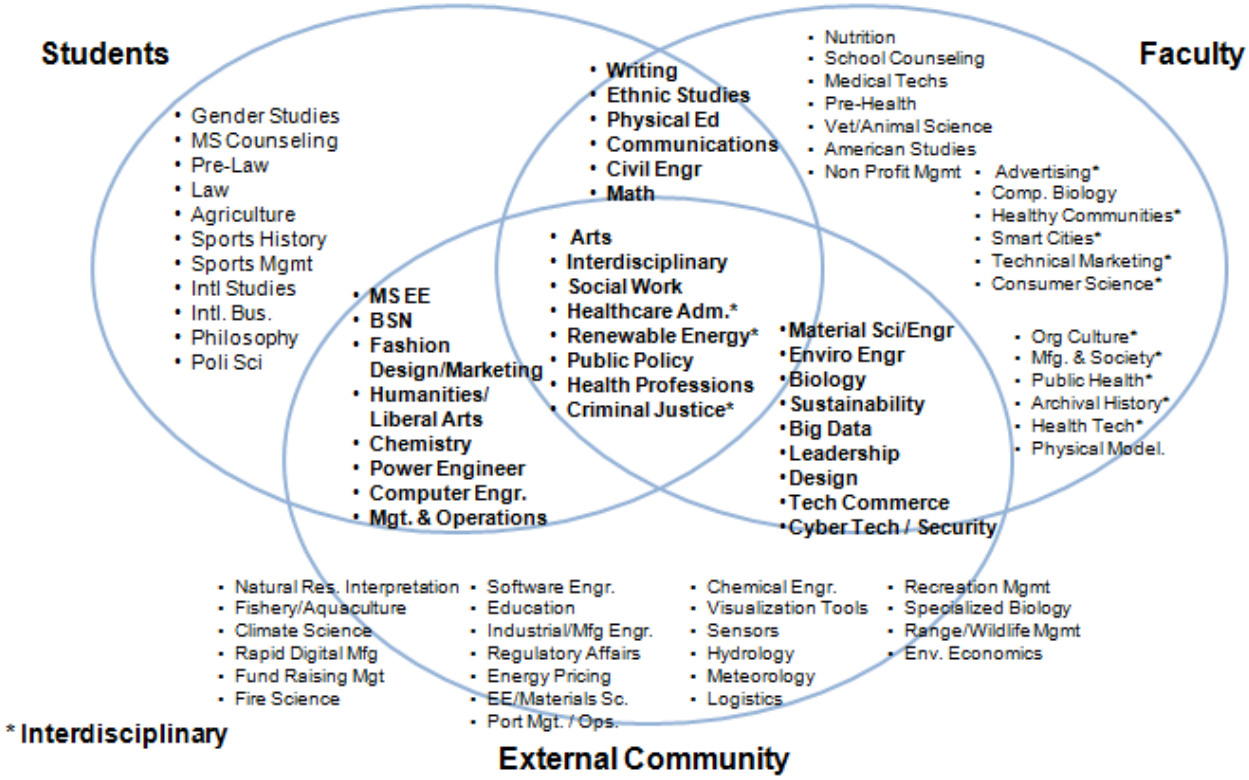
d. Become the dominant four-year partner at Lower Columbia College's Regional University Center. A top priority of the president of LCC is to expand higher education opportunities for Longview and surrounding region by fully developing the Lower Columbia College Regional University Center (http://www.lowercolumbia.edu/programs/u-center/index.aspx), which just opened in October 2013. Indications are that LCC sees and prefers WSU Vancouver as its major four-year partner, beginning with the Nursing program and then on to other areas to create a comprehensive set of academic offerings similar to other multi-institutional teaching centers such as the Macomb University Center in Michigan (http://www.macomb.edu/University+Center/) and the Universities at Shady Grove in Maryland (http://www.shadygrove.umd.edu/).

Summary of Internal and External Conversations

An analysis of the internal and external conversations resulted in the following graphic showing the feedback from the groups in general programmatic categories, with overlaps in bold font.

These categories were corroborated by results of the student interest surveys of WSU Vancouver and Clark College students and local High School graduates.

While not exclusively limited to them, the programs in bold font within overlapping circles received particular attention in the subsequent steps of the planning process.



C. 2. Selection Criteria

While factors such as faculty, student and community interest and workforce needs are important to identifying new programs, more important are fundamental factors related to WSU Vancouver's values and aspirations. Considerable time and effort went into determining these criteria.

The process of selection began with the consultants providing the Academic Planning Advisory Committee a list of the potential selection criteria. From these as a base, the Academic Planning Advisory Committee arranged forums within the academic units which produced a lengthy list:

1. Contributes to distinction
2. Contribution to broad foundational knowledge
3. Contribute to region's economic development
4. Cost and Feasibility
5. Contributes to cultural literacy
6. Employability of graduates
7. Entrepreneurship
8. Generates leadership to meet the challenges of the 21st century
9. Interdisciplinarity
10. International (programs, students)
11. Needed and supported by corporations, public sector, including social agencies, school districts
12. Number of jobs, based on projected openings and supply of graduates from competitive institutions
13. Opportunities for community engagement (faculty/staff outreach based on expertise, student engagement)
14. Opportunities to collaborate:
    a. Within WSU Vancouver and WSU
    b. With other Institutions
    c. With Organizations Outside of Higher Education (K-12; Cities; Hospitals, etc.)
15. Possibilities for experiential learning, e.g., Internships, UG/graduate research on community/regional issues
16. Possibilities for research -- Faculty (academic , applied) and Students (undergraduate, graduate)
17. Student Interest
18. Synergy with existing programs and research
19. Uniquely contributes to excellence/distinctiveness in the region.
20. Ability to attract funding, e.g., grants; gifts (private; foundations)
21. Ability to attract distinctive and highly qualified faculty that can be tenured, promoted
22. Alignment with city, state and regional, national and international goals
23. Alignment with WSU, WSU Vancouver mission or strategic plan

A subcommittee of the Academic Affairs Advisory Committee and then the full Committee discussed the list and narrowed the list of selection criteria to the following:

1. Opportunities to collaborate:
    a. Within WSU Vancouver and WSU
    b. With other institutions
    c. With organizations and industry outside of higher education

2. Opportunities for community engagement (defined as "community based involvement with respect to both teaching and research, including: community-based practicums, experiential learning, community engaged scholarship, community integration, and service to the community").

3. Ability to deliver cutting edge programs and research.

4. Ability to attract funding (e.g. grants, gifts, private funds).

5. Contributes to the region's economic development includes transfer of research discovery to private and public sector; and activities and programs supporting regional growth and competitiveness.

C.3. Population and Demographic Trends

While not an enrollment management study, the planning process looked broadly at population and demographic trends to identify dynamics that could impact growth of academic programs.

The following data indicate that the traditional pools from which WSU Vancouver has historically drawn students will experience modest growth, with annual increases hovering around 1%. This means that growth at the University will require careful enrollment management strategies, such as:

- Outreach efforts that target students choosing not to attend college
- Targeting Hispanic and Asian students, groups which will experience the greatest growth in the coming years
- Catering to non-traditional students, particularly retirees, the fastest growing population group
- Attracting students from out of the immediate area

Growth will also require strategic growth in selected academic areas to attract students to WSU Vancouver who would otherwise go elsewhere.

State of Washington and Clark County

Using 2010 as the base year (the latest hard data from a US Census), Washington is projected to experience modest population growth -- 10.22% by 2020 and 15.89% by 2025. This growth is a positive sign, but it represents a slowdown relative to the prior fifteen year period when, using 1995 as the base year, the State grew by 17% 1995-2005 and 26% 1995-2010.

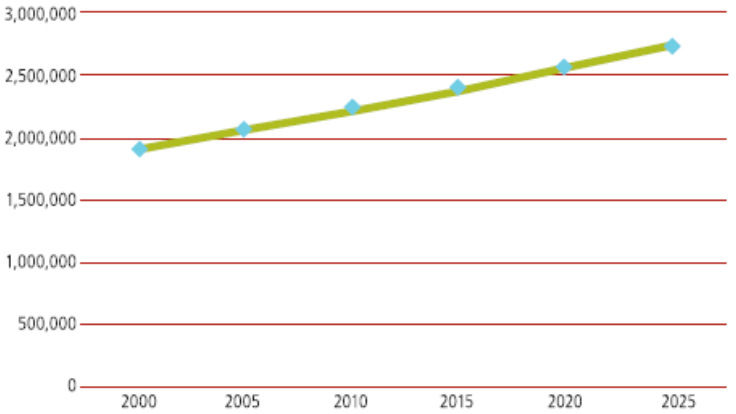
Clark County, using 2010 as the base year, is projected to grow at a slightly higher rate over the same periods -- 12.35% and 19.46% respectively; and will remain among the top-ten fastest growing counties in Washington. However, this represents a significant slowdown from the prior fifteen year period when Clark County experienced a growth of 40% 1995-2005 and 54% 1995-2010. (WA County Growth Projections to 2040; WA Population by State, Count & City from 1990)

County	2010	2020	Growth Over 2010	% +/-	Rank	2025	Growth Over 2010	% +/-	Rank
1. Franklin	78,163	100,926	22,763	29.12%	1	115,142	36,979	47.31%	1
2. Grant	89,120	104,078	14,958	16.78%	2	112,525	23,405	26.26%	2
3. Adams	18,728	21,640	2,912	15.55%	3	22,964	4,236	22.62%	3
4. Thurston	252,264	288,265	36,001	14.27%	4	307,930	55,666	22.07%	4
5. Douglas	38,431	43,619	5,188	13.50%	5	46,662	8,231	21.42%	5
6. Benton	175,177	197,806	22,629	12.92%	6	210,803	35,626	20.34%	6
7. Snohomish	713,335	805,015	91,680	12.85%	7	857,939	144,604	20.27%	7
8. Clark	**425,363**	**477,884**	**52,521**	**12.35%**	**8**	**508,124**	**82,761**	**19.46%**	**9**
9. Whatcom	201,140	225,307	24,167	12.02%	9	241,138	39,998	19.89%	8
10. Mason	60,699	67,545	6,846	11.28%	10	71,929	11,230	18.50%	10
11. Yakima	243,231	269,347	26,116	10.74%	11	282,057	38,826	15.96%	14
12. Kittitas	40,915	45,255	4,340	10.61%	12	47,949	7,034	17.19%	11
13. Pierce	795,225	876,565	81,340	10.23%	13	923,912	128,687	16.18%	13
14. Kitsap	251,133	275,546	24,413	9.72%	14	289,265	38,132	15.18%	15
15. Skagit	116,901	128,249	11,348	9.71%	15	136,410	19,509	16.69%	12
16. King	1,931,249	2,108,814	177,565	9.19%	16	2,196,202	264,953	13.72%	16
Total State	6,724,540	7,411,977	687,437	10.22%		7,793,173	1,068,633	15.89%	

Oregon population projections are very similar, with the State projected to grow by 10.8% 2010-2020 and 17.7% 2010-2025. This represents a slight drop from the prior fifteen year period when, using 1995 as the base year, Oregon grew by 14%1995-2005 and 21% 1995-2010.
Oregon Demographic Forecast

Portland/Vancouver MSA

Looking beyond Clark County to the seven county area making up the Portland/Vancouver MSA, the population is also expected to grow -- by 13% 2010-2020 and 22% 2010-2025, which are slightly higher rates than the growth of Clark County. However, like Clark County, this represents a significant slowdown from the prior fifteen year period.
Portland 2030: A Vision for the Future



Sources: Oregon Department of Economic Analysis; Washington State Office of Financial Management
* Data for Clackamas, Columbia, Multnomah, Washington and Yamhill counties in Oregon and Clark County in Washington.

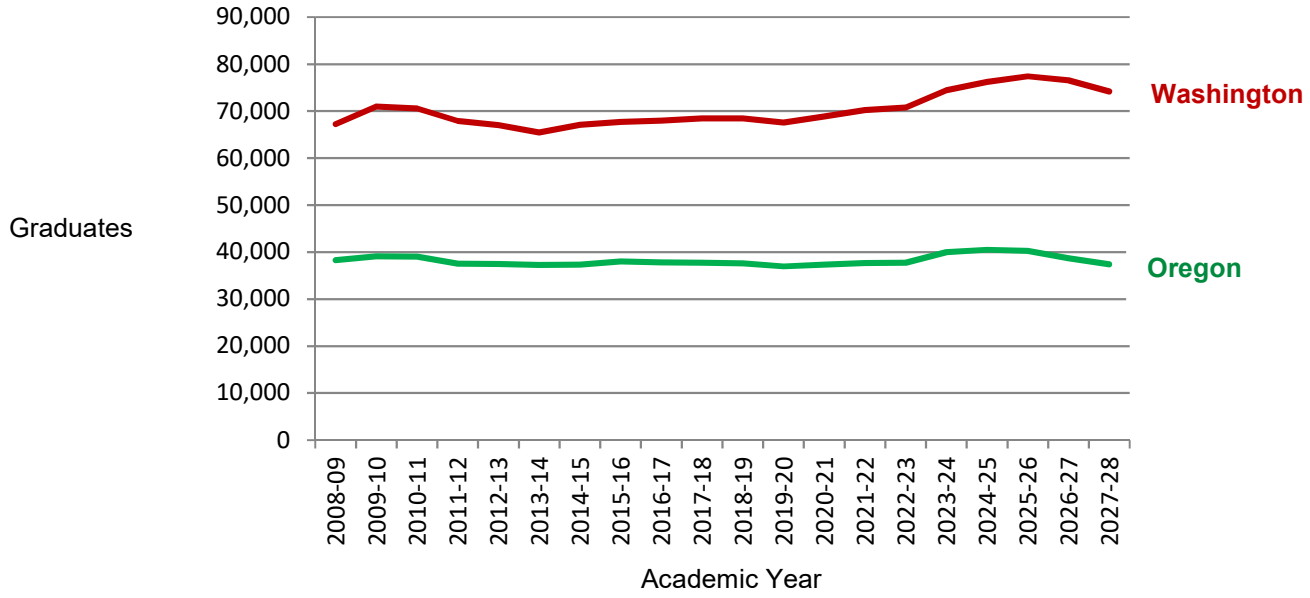
Clark County College-Age Forecast

Clark County provides the largest number of students to WSU Vancouver. When examining its college-aged population, one finds that the age ranges for the data do not precisely match the traditional college period. But by adding the figures in the 15-30 age range for Clark County in the table below -- a broad time frame that includes the normal years for undergraduate and graduate study – one can see that this group will grow 2010-2020 and 2010-2025 by 11.1% and 13.2% respectively. This is about the same rate of growth as for the State and County. The greatest growth will occur in the over-65 age range, where the population is projected to grow by 56% and 88% over the same time periods.

Age	2010	2020	Growth Over 10 Years	% =/-	2025	Growth Over 15 Years	% =/-
Total	425,363	477,884	52,521	12.35%	508,124	82,761	19.46%
0-4	29,429	31,666	2,237	7.60%	33,539	4,110	13.97%
5-9	31,139	30,934	-205	-0.66%	33,876	2,737	8.79%
10-14	32,840	32,917	77	0.23%	32,841	1	0.00%
15-19	**30,021**	**31,570**	**1,549**	**5.16%**	**31,708**	**1,687**	**5.62%**
20-24	**24,383**	**27,600**	**3,217**	**13.19%**	**27,775**	**3,392**	**13.91%**
25-29	**26,418**	**30,618**	**4,200**	**15.90%**	**32,019**	**5,601**	**21.20%**
30-34	28,467	31,877	3,410	11.98%	34,407	5,940	20.87%
35-39	29,691	30,785	1,094	3.68%	33,796	4,105	13.83%
40-44	29,997	30,451	454	1.51%	31,882	1,885	6.28%
45-49	31,452	32,145	693	2.20%	31,116	-336	-1.07%
50-54	30,440	30,781	341	1.12%	32,434	1,994	6.55%
55-59	28,119	31,701	3,582	12.74%	30,366	2,247	7.99%
60-64	24,257	28,806	4,549	18.75%	30,753	6,496	26.78%
65-69	16,888	25,499	8,611	50.99%	27,796	10,908	64.59%
70-74	11,194	20,824	9,630	86.03%	23,943	12,749	113.89%
75-79	7,916	13,443	5,527	69.82%	18,762	10,846	137.01%
80-84	6,304	8,073	1,769	28.06%	11,203	4,899	77.71%
85+	6,408	8,194	1,786	27.87%	9,908	3,500	54.62%

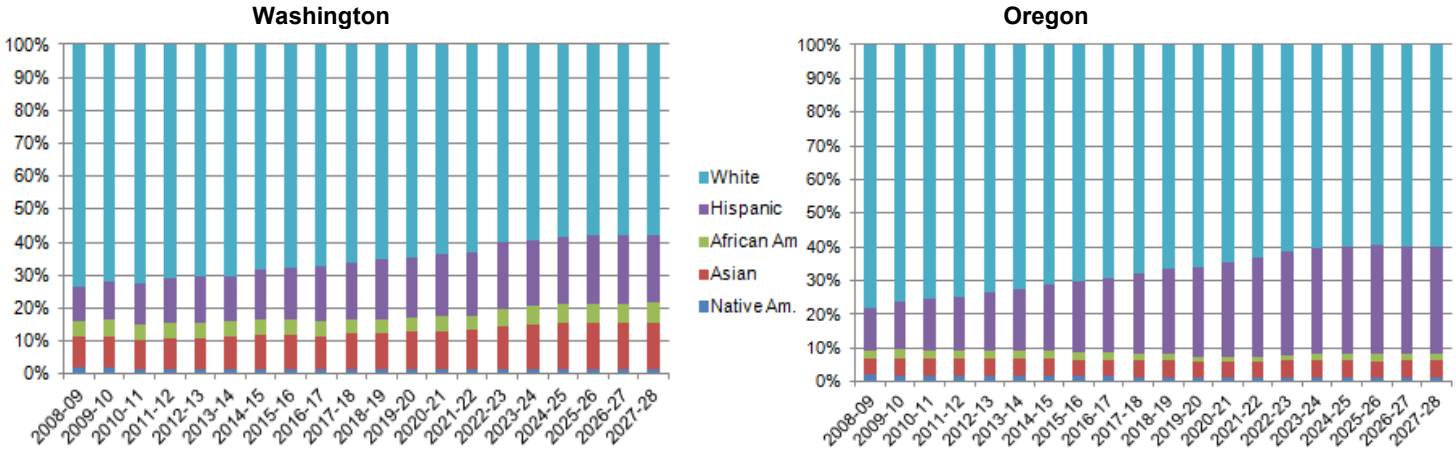
Number of Washington and Oregon High School Graduates

According to a 2012 report of the Western Interstate Commission for Higher Education (WICHE; *Knocking on the College Door*, http://www.wiche.edu/info/publications/knocking-8th/knocking-8th.pdf), 65,451 students were projected to graduate from high school in Washington in 2014, with the number rising moderately, peaking at 77,405 in 2025 – an average annual growth of 1.3%. During the same period, Oregon is projected to graduate 37,323 and 40,277 students, which is an annual average growth of .7%.



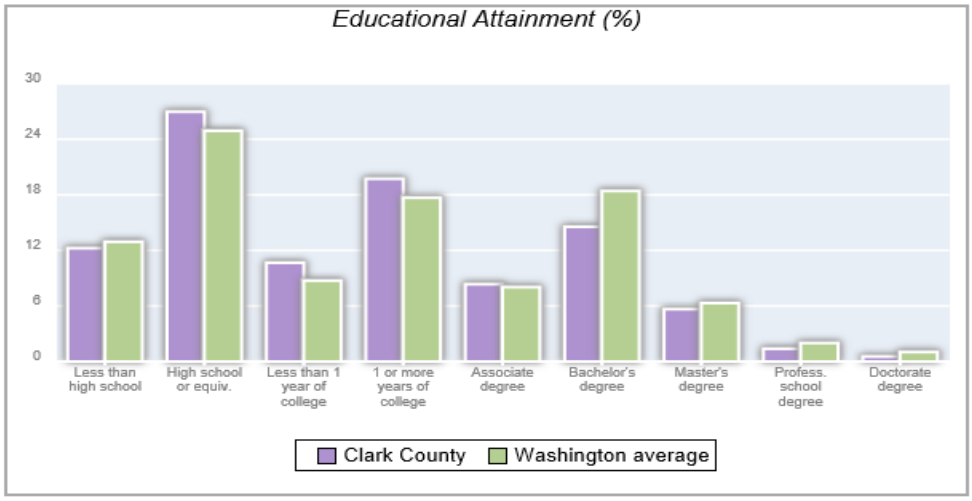
Demographics of Washington and Oregon High School Graduates

Projections of the race and ethnicity of Washington high school graduates show a steady growth in Hispanic and Asian gradates with a commensurate drop in White graduates. Oregon is also showing a growth in Hispanic students, but holding steady in the number of Asian graduates.



Educational Attainment

Data indicate that Clark County lags behind the State as a whole in on the percentage of the population with a bachelor's degree and, to a lesser degree, behind as well at the master's and professional/doctoral levels.



http://www.city-data.com/county/Clark_County-WA.html

Location Preferences of College-Bound High School Graduates

Nationally, college-bound students graduating in 2014 who took the SAT were most interested in colleges and universities in their home State. Data indicate that Washington high school students have similar preferences.

The following table shows the 45 institutions receiving the most score reports from Washington high school students who took the SAT. Keeping in mind that students can designate multiple institutions to which to send their SAT results, two-thirds of the scores of Washington high school graduates were sent to Washington institutions and 8.7% to Oregon institutions. Hence, these data show a general preference by Washington high school graduates to remain in-state to continue their education.

Institution	State	Type	Number of Students	Percent
University of Washington	WA	Public	11,391	
Washington State University	WA	Public	11,212	
Western Washington University	WA	Public	7,466	
Central Washington University	WA	Public	4,357	
Eastern Washington University	WA	Public	4,228	
Gonzaga University	WA	Private	2,837	
Seattle University	WA	Private	2,660	
Seattle Pacific University	WA	Private	2,363	
University of Washington Bothell	WA	Public	1,907	
Pacific Lutheran University	WA	Private	1,616	
Whitworth University	WA	Private	1,362	
University of Washington Tacoma	WA	Public	1,361	
University of Puget Sound	WA	Private	904	
Whitman College	WA	Private	793	
Evergreen State College	WA	Public	648	
			55,105	**67.2%**
University of Portland	OR	Private	1,992	
Oregon State University	OR	Public	1,700	
University of Oregon	OR	Public	1,562	
Portland State University	OR	Public	667	
George Fox University	OR	Private	630	
Willamette University	OR	Private	617	
			7,168	**8.7%**

All Others (24)	-	-	**19,829**	**24.1%**
Total	-	-	**82,109**	**100%**

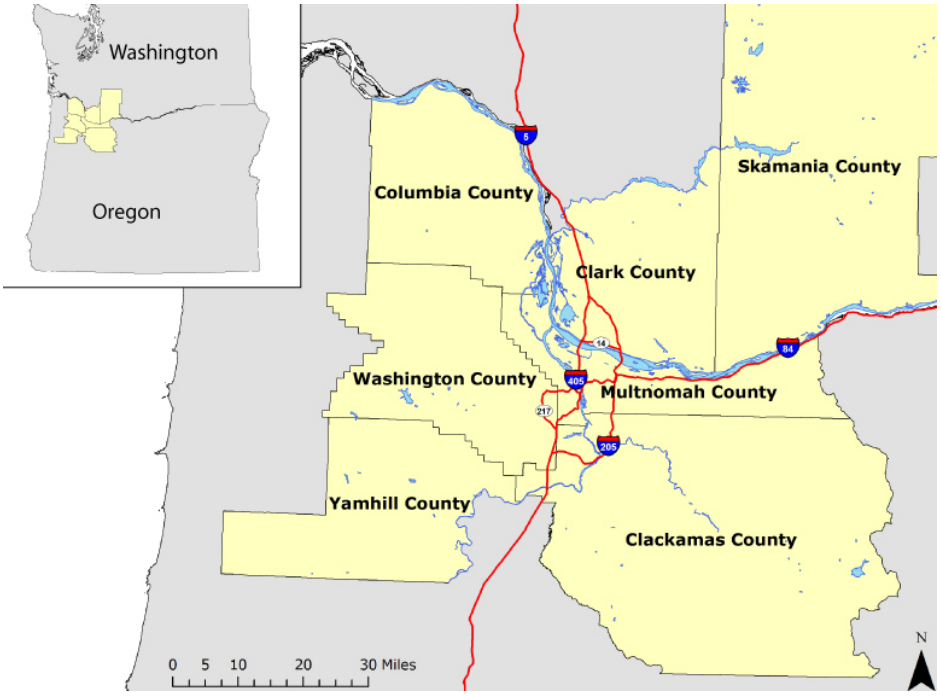
C.4. Regional Workforce Supply and Demand

Along with other factors such as the ideas and aspirations of the University, the thoughts local leaders and practitioners, student interests, population and demographic changes, and enrollment trends in current programs, an analysis of workforce supply and demand played a role in assessing new program opportunities for WSU Vancouver,

Supply and demand studies that are specific to potential programs at WSU Vancouver are presented later in this report.

This section presents the region covered by the study, a broad overview of the fastest growing careers sectors and the sources of graduates to meet the demand.

WSU Vancouver officials indicated that approximately 75% of WSU Vancouver graduates remain in the area. Hence, for purposes of analyzing the need for college-educated workers, demand was calculated using data from the Portland/Vancouver Metropolitan Service Area (MSA), a seven county area ranging 50-100 miles from Vancouver, with a population of approximately 2.25 million.



Workforce Demand

The Washington State Economic Security Department (WA-ESD) is the primary source for objective workforce projections used in this study. Derived by surveying employers in the area, the WA-ESD projections cover 10-year periods and are updated at least once every two years.

The WA-ESD projections take into account growth in each sector, retirements and other factors that affect demand.

Using 2010 as a base, following is a snapshot of the fastest growing jobs requiring a minimum a bachelor's degree in the Portland/Vancouver MSA:

Portland MSA High Growth Sectors (Requiring at Least BA//BS)	2010 Jobs (000)	2020 Jobs (000)	Growth	%Growth
1. Education	51,843	60,802	8,959	17%
2. Business Operations	34,337	40,495	6,158	18
3. Business	26,918	31,967	5,049	19
4. Engineering	27,715	33,150	5,435	20
5. Computer Science	21,918	26,686	4,768	22
6. Registered Nurses	19,257	23,957	4,700	24
7. Finance	12,683	15,097	2,414	19
8. Technical Sales	10,787	12,790	2,003	19
9. Social Work/Human Development	7,307	8,966	1,659	23
10. Accounting	8,145	9,907	1,762	22
11. Counseling/Psychology/Therapy	7,632	9,319	1,687	22
12. Life Sciences	5,664	7,137	1,473	26
13. Training/Leadership	5,816	6,931	1,115	19

For purposes of comparison and to identify any high-growth or emerging fields, nationally, that may not have impacted the local region yet, but could in the future, WA-ESD projections of the fastest growing jobs for the Portland/Vancouver MSA were compared to national data from the U. S. Department of Labor (US-DOL) and the Department of Commerce (US-COC). Following are the fastest growing jobs requiring a four-year degree at the national level:

US Fast Growth Sector (Requiring at Least BA//BS)	2010 Jobs (000)	2020 Jobs (000)	Growth (000)	% Growth
1. Financial Services	24,400	30,390	5,990	25
2. Healthcare	15,670	19,810	4,140	26
3. Professional & Business Services	9,690	12,130	2,440	25
4. Leisure & Hospitality	12,930	15,320	2,390	18
5. Government/Public Education	18,120	20,180	2,060	11
6. Wholesale & Retail Trade	19,450	21,510	2,060	11
7. Personal Services	7,420	8,680	1,260	17
8. Private Education	3,450	4,400	950	28
9. Construction	7,370	8,290	920	12
10. Transportation and Utility Services	5,520	6,250	730	13
11. Manufacturing	10,070	10,490	420	4
12. Natural Resources	3,860	4,260	400	10
13. Information Services	2,650	2,890	240	9

The data do not as much show fields at the national level that could eventually impact the Portland/Vancouver MSA as differences. While the Portland/Vancouver MSA and nation both show high growth in education, financial

services, business-related fields, and health care, the Portland/Vancouver MSA data show higher growth in technology-related fields (e.g., engineering, technical sales), human development (e.g., social work/human development and counseling/psychology/therapy) and life sciences. National data show higher growth in leisure and hospitality, construction, transportation and utility services, manufacturing and natural resources.

An analysis of employment fields most related to potential program for WSU Vancouver is presented in a later section of this report.

Workforce Supply

To synchronize with the geographical area used to calculate demand, supply was defined as the number of graduates from institutions within 100 miles of Vancouver.

The Integrated Postsecondary Education Data Systems (IPEDS) of the National Center for Education Statistics provided data on workforce supply (IPEDS College Navigator). IPEDS lists the number of annual degrees awarded by each institution annually by major program area.

It is useful to point out in this context that, while regional firms hire graduates from outside Washington and Oregon, there are two important considerations that impact WSU Vancouver and its potential new programs and expansions of its existing programs:

- As mentioned earlier in this report, leaders of Washington corporations, business and other organizations expressed a preference for regional graduates, most notably from Washington, because they tend to stay and employers feel a stronger connection to the programs, faculty, and students, particularly students who have been interns.
- There are no other Washington public institutions within 100 miles of Vancouver for Washington high school graduates to attend. Even taking into account the “Border Bill,” this gives WSU-Vancouver, with its in-state tuition, a financial advantage over comparable Oregon public and private institutions.

The following map shows WSU Vancouver’s geographic advantage in the State of Washington. The closest Washington public four-year institution is Evergreen State University, about 100 miles to the north. The closest private institution in Washington is also a considerable distance -- the closest being Saint Martin University, also about 100 miles to the north.

. Source: http://www.washington.edu/dreamproject/files/2012/05/2012-Participant-Workbook-p12-132.pdf

C.5. Enrollment in Current Programs

Data on WSU Vancouver enrollment were compiled on the table on the following page to assist in determining the level of interest in current programs and for use as one of several variables in projecting potential growth in current programs.

Please note the following regarding the table:

- Different years are used for earned degrees and certified majors due to a recent change in software systems that limited the ability to draw consistent longitudinal data for earned degrees prior to 2007. Nevertheless, firm data for 2007 - 2012 were available, making it possible to observe five-year enrollment trends.
- There are empty enrollment cells for neuroscience and hospitality management because the programs are new
- Certification requirements for majors differ by program. However this did not affect the analysis since longitudinal trends *within* programs were observed rather than by comparisons across programs.

Following are definitions and how the table was utilized:

Column A	Programs currently being offered by WSU Vancouver
Columns B, C, D	Specific levels of programs offered: minor, major or masters
Column E	Number of minor degrees awarded in 2013 in areas where the minor is offered.
Column F	Ranking of the number of minors awarded, using the following scale: 0-10: Low 11-20: Medium 21-33: High

Column G — Number of baccalaureate degrees awarded in 2012 and a the trend since 2007 using the following scale:

↓ Downward trend
↑↓ Mixed
↑ Upward trend

Column H — Number of master's degrees awarded in 2012 and the trend since 2007 using the following scale, with the exception of accounting, which is being phased out at WSU Vancouver:

↓ Downward trend
↑↓ Mixed
↑ Upward trend

Column I — Number of certified majors in 2011 and the enrollment trend since 2003, using the following scale:

↓ Downward trend
↑↓ Mixed
↑ Upward trend

Column J — The enrollment growth score calculated by taking the average of the enrollment columns and assigning the following numerical values to the growth scores in Columns F, G, H, and I:

- 1 for Low number of minors awarded, or downward trend (↓) in the number of degrees or certified majors
- 2 for Medium number of minors awarded, or mixed trend (↑↓) in the number of degrees or certified majors
- 3 for High number of minors awarded, or upward trend (↑) in the number of degrees or certified majors

Note that programs being phased out (accounting at the master's level) or new programs (hospitality management and neuroscience) are not included in the calculations of the growth score.

Column K — A calculated enrollment growth ranking, based on the following scale:

1.0 - 1.9 Low
2.0 - 2.4 Medium
2.5 – 3.0 High

Enrollment in Current Programs
Washington State University Vancouver

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
WSUV Academic Program	Level			Degrees Awarded '13 & Rating		Degrees Awarded & Trend '07-'12		No. Certified UG Majors Fall '11 & Trend: '03 – '11	Enrollment Growth Score and Rating	
	Mi	Maj	Mas	No.	Low/ Med/ High	Bach May 12	Mas May 12		Score	Low/ Med/ High
Accounting [a.]		x	x [a.]			45 ↑	a.	99 ↑↓	2.5	H
Anthropology [b.]	x	x		5	L	12 ↑↓		40 ↑	2.0	M
Addiction Studies	x			12	M				2	M
Aging	x			1	L				1	L
Biology	x	x		5	L	83 ↑		176 ↑	2.3	M
Business Adm.	x	x	x	32	H	24 ↑↓	16 ↑↓	46 ↑↓	2.25	M
Chemistry	x			10	L				1	L
Communication	x			2	L				1	L
Computer Science	x	x	x	2	L	15 ↑	1 ↑↓	27 ↑	2.25	M
Criminal Justice	x			0	L				1	L
Digital Tech/Culture	x	x		1	L	37 ↑		86 ↑	2.3	M
Education		x				31 ↓		59 ↓	1	L
Ed: Teaching (MIT-E)			x				21 ↑↓		2	M
Ed: Teaching (MIT-S)			x				7 ↑↓		2	M
Education: Ed.M.			x				33 ↑↓		2	M
Electrical Engr.		x				11↑		21 ↑	3	H
English [b.]	x	x		5	L	40 ↑		81 ↑↓	2.0	M
Earth & Environ. Sc.		x				7 ↑↓		30 ↑	2.5	H
Environmental Sc.	x		x	3	L		8 ↑		2	M
Finance		x				22 ↑		57 ↑↓	2.5	H
Fine Arts [b.]	x			2	L				1	L

History [b.]	x	x		4	L	15 ↑↓		46 ↑	2	M
Hospitality Bus. Mgt. [c.]		x				c.		c.	c.	c.
Human Dev.	x	x		14	M	51 ↑↓		127 ↑↓	2	M
Humanities [b.]		x				22 ↑↓		46 ↑	2.5	H
Mgt. & Operations		x				25 ↑		37 ↑↓	2.5	H
Mgt Info. Sys. (MIS)		x				15 ↑↓		31 ↑↓	2	M
Marketing/Prof. Sales		x				10 ↑↓		37 ↑	2.5	H
Mathematics [b.]	x			9	L				1	L
Mechanical Engr.	x	x	x	0	L	53 ↑	5 ↑↓	60 ↑	2.25	M
Neuroscience [c.]	x	x		c.	c.	c.		c.	c.	c.
Nursing		x	x			36 ↑	36 ↑	72 ↑↓	2.7	H
Political Science	x			2	L				1	L
Psychology	x	x		26	H	80 ↑		115 ↑	3	H
Public Affairs		x	x			18 ↑↓	7 ↑	42 ↓	2	M
Social Sciences		x				111 ↑			3	H
Sociology	x	x		3	L	10 ↑		31 ↑	2.3	M
Spanish	x			12	M				2	M
Women's Studies	x			3	L				1	L
Zoology	x			6	L				1	L

General Notes:
Table does not include does not include doctoral programs.

Rankings:
Rankings of minors in Column F:
0-10: Low
11-20: Medium
21-32: High
Enrollment growth Ranking in Column J:
1-1.9: Low;
2-2.4 Medium;
2.5-3 High

Footnotes:
WSUV masters in accounting being phased out, hence number of master's degrees awarded not included in calculating enrollment growth score or ranking
General education core
New program, hence enrollment data not yet available

C.6. Student Interests

Student information from several sources was used to assess student interests:

1. National, State, Regional and Local Student Interests comprised of:
   a. College Board data on the college-bound students from across the country in 2013
   b. College Board data on the intended majors college-bound students from Washington and Oregon in 2013
   c. Degrees earned in 2013 from two-year schools within 100 miles of Vancouver
   d. Interests of 2013 local high school graduates
2. Interests of WSU Vancouver undergraduate students
3. Interests of WSU Vancouver graduate students
4. Interests of Clark College students

This summarizes the findings of these four sources and converts them to rankings of low, medium and high that are used to assess the growth potential of existing programs at WSU Vancouver.

1a. Student Interests: Nation

Though the vast majority of WSU Vancouver students come from the immediate area, it is useful to examine national data to note any larger trends that might affect WSU Vancouver, observe how Washington and Oregon college-bound students compare with their counterparts across the country and to assure that the University's offerings are in align with interests outside the area should WSU Vancouver decide to broaden its geographical reach for students.

Following are the intended academic majors of all college-bound high school students across the nation who took the SAT in 2013, with the highest areas (>3%) in bold.

Intended Academic Major	No.	%
Health Professions	**262,528**	**19.0**
Business Management, Marketing & Related Programs	**157,745**	**11.4**
Engineering	**132,275**	**9.6**
Visual and Performing Arts	**98,725**	**7.1**
Biological & Biomedical Sciences	**93,771**	**6.8**
Psychology	**65,319**	**4.7**
Education	**62,119**	**4.5**
Security & Protective Services	**44,364**	**3.2**
Communication, Journalism & Related Programs	38,011	2.8
Legal Professions & Studies	36,942	2.7
Computer & Information Sciences & Support Services	36,515	2.6
Social Sciences	24,172	1.8
Architecture & Related Services	23,231	1.7
Physical Sciences	21,057	1.5
Engineering Technologies	19,133	1.4
English Language & Literature/Letters	17,768	1.3
History	14,919	1.1
All Others (each <1%) + Undecided	232,271	16.8
Totals	**1,380,865**	**100%**

College Board Profile of 2013 Seniors

Examining these data and those that follow indicate that national data on interests are similar to college-bound students from Washington and Oregon.

1b. Student Interests: Washington and Oregon

Following are the interest areas of college-bound high school students in Washington and Oregon who took the SAT in 2013, with the highest areas (>3%) in bold:

Intended Academic Major	WA No.	%	OR No.	%	Total	%
Health Professions	**6,597**	**19.4**	**3,512**	**21.4**	**10,109**	**20.0**
Business Management, Marketing & Related Programs	**3,627**	**10.7**	**1,701**	**10.3**	**5,328**	**10.6**
Engineering	**3,462**	**10.2**	**1,544**	**9.4**	**5,006**	**9.9**
Visual and Performing Arts	**2,367**	**7.0**	**1,195**	**7.3**	**3,562**	**7.1**
Biological & Biomedical Sciences	**2,220**	**6.5**	**977**	**5.9**	**3,197**	**6.3**
Education	**1,728**	**5.0**	**786**	**4.8**	**2,514**	**5.0**
Psychology	**1,586**	**4.7**	**760**	**4.6**	**2,346**	**4.7**
Computer & Information Sciences & Support Services	981	2.9	380	2.3	1,361	2.7
Security and Protective Services	901	2.7	442	2.7	1,343	2.7
Communications, Journalism & Related Programs	845	2.5	405	2.5	1,250	2.5
Legal Professions & Studies	737	2.2	330	2.0	1,067	2.1
Social Science	613	1.8	283	1.7	896	1.8
Physical Sciences	582	1.7	286	1.7	868	1.7
English Language & Literature/Letters	546	1.6	269	1.6	815	1.6
Architecture & Related Programs	504	1.5	213	1.3	717	1.4
Engineering Technologies	427	1.2	185	1.1	612	1.2

All Others (each <1%) + Undecided	6,248	18.4	3,166	19.3	9,414	18.7
Totals	**33,971**	**100%**	**16,434**	**100**	**50,405**	**100%**

College Board 2013 Profile of WA Seniors; College Board 2013 Profile of OR Seniors

1c. Earned Degrees: Regional Community Colleges

Since community college transfers constitute a large portion of students attending WSU Vancouver, data on the earned degrees at regional community colleges is useful. The following chart using IPEDS data shows the degrees granted from 2 year institutions within 100 miles of Vancouver in 2013. As expected, the largest number majored in general/liberal studies to complete their general education requirements for transferring to a four-year institution. The highest number of degrees (>3%) are in bold.

Fields of Study	AA/AS	%
General / Liberal Studies	**6,419**	**47.9**
Health Related	**2,232**	**16.7**
Business	**1,031**	**7.7**
Law Enforcement/Security/Fire	**645**	**4.9**
Food / Other Services	**497**	**3.7**
Beauty / Personal Services	**473**	**3.5**
Engineering Support / Tech	392	2.9
Computer Technology	358	2.7
Maintenance & Repair	295	2.2
All Others (each <1%)	1,050	7.8
Totals	**13,392**	**100%**

IPEDS College Navigator

1d. Student Interests: Local High School Graduates

A survey of 1,026 local high school graduates in 2013 yielded the following results, with the highest areas of interest (>3%) in bold.

Career Interest	No.	%
Health Sciences	**194**	**18.9**
STEM	**154**	**15.0**
Arts, AV Technology & Communications	**153**	**14.9**
Business	**124**	**12.0**
Education	**83**	**8.1**
Human Services	**81**	**7.9**
Law Enforcement, Public Safety & Security	**72**	**7.0**
Agriculture, Food, & Natural Resources	**41**	**4.0**
Marketing Sales & Services	**33**	**3.2**
Architecture & Construction	29	2.8
Government & Public Administration	23	2.2
Hospitality & Tourism	19	1.9
Manufacturing	10	1.0

Transportation, Distribution & Logistics	10	1.0
Totals	**1,026**	**100%**

Summary of National, State, Regional and Local Student Interests

Following is a summary of the national, Washington, Oregon, regional and local data above, with the programs of greatest interest listed in descending order. If a program area was cited >3% of the time by three or four groups, it was rated a High interest area; if ranked >3% by two of the groups, it was rated of medium interest; and if ranked >3% by one of the groups, it was rated of Low interest. Programs ranked medium or high are shown in bold.

Academic Area	Nation	WA/OR	Region		Times Cited	Rank
			CC	HS		
	>3%	>3%	>3%	>3%		
Business	**x**	**x**	**x**	**x**	**4**	**H**
Health Professions	**x**	**x**	**x**	**x**	**4**	**H**
Education	**x**	**x**		**x**	**3**	**H**
Engineering	**x**	**x**		**x**	**3**	**H**
Psychology/Human Services	**x**	**x**		**x**	**3**	**H**
Biological/Life Sciences	**x**	**x**		**x**	**3**	**H**
Visual & Performing Arts	**x**	**x**		**x**	**3**	**H**
Law Enforcement	**x**		**x**	**x**	**3**	**H**
Food/Other Services				x	1	L
Beauty/Personal Services				x	1	L
Agriculture, Food & Natural Resources				x	1	L

2. WSU Vancouver Survey of Student Interests – Undergraduate Programs

In Spring 2014, 1,051 WSU Vancouver students were surveyed to identify new programs or program opportunities. (The survey and detailed results are shown in the Appendix.) When asked if they were in their preferred major, 79% of the students responded affirmatively. If not, students were asked their preferred major. Weighted and unweighted averages were calculated, with further analysis showing minimal differences; hence the unweighted responses were used in the analysis. Programs with greater than 10 responses were chemistry, psychology, biology, communication, business administration, criminal justice, anthropology, nutrition, and political science.

Of these programs, WSU Vancouver currently offers:

- Bachelor's degrees in psychology, biology, and business administration
- Minors in chemistry and communication, indicating that these are potential expansion areas for the major

Students were then asked a broader question to which all could respond: Are there any programs not offered at WSU Vancouver that should be? As before, unweighted responses were used.

Chemistry and communication appear again, along with two other programs, (music/arts and mathematics) for which WSU Vancouver offers a minor, but not a major.

The following table shows the programs cited 10 or more times, with programs cited 10 through 15 times ranked as Low; 16 through 20 as Medium and greater than 20 as High. Programs ranked as either medium or high are shown in bold.

Program	Citations	Rank
Chemistry	**40**	**H**

Music/Arts	**36**	**H**
Communication	**23**	**H**
Mathematics	**16**	**M**
Medicine	12	L
Political Science	12	L
Psychology	12	L
Criminal Justice	10	L
Law	10	L
Philosophy	10	L

3. WSU Vancouver Survey of Student Interests – Masters Programs

The same 1,051 students as responding to questions about the undergraduate programs were also asked if they plan to pursue a graduate degree and, if so, their first, second and third choices. Fifty-eight percent of the students (611) responded that they plan to continue.

Once again, unweighted responses were used.

The table below shows the programs referenced 10 or more times, with citations of 10 through 15 rated as Low; 16 through 25 as Medium and greater than 25 as high. Programs ranked as either medium or high are shown in bold. Not shown are responses for professional programs which WSU Vancouver is not authorized to offer: medicine; law; physical therapy; veterinary medicine; and physician assistant.

Program	No. Times Cited	Rank
Psychology	**99**	**H**
Business	**73**	**H**
Social Work/Human Dev./Counseling	**58**	**H**
Elementary Education	**43**	**H**
Accounting	**30**	**H**
History	**29**	**H**
Anthropology	**27**	**H**
Nursing	**22**	**M**
Finance	**22**	**M**
Mechanical Engineering	**21**	**M**
Neuroscience	**20**	**M**
English	**20**	**M**
Biology	**20**	**M**
Public Affairs	**18**	**M**
Computer Science	**18**	**M**
Sociology	**17**	**M**
Teaching	13	L

Political Science	12	L
Marketing	12	L
Electrical Engineering	10	L

Of the high- and medium-interest programs, WSU Vancouver does not offer the master's degree in social work/human development, for which a new program has been proposed; accounting, which was recently phased out as a Vancouver program by the WSU system; history; anthropology; finance; neuroscience; English; biology; and sociology. These, then, are potential expansion areas for masters programs.

4. Clark College Survey of Student Interests

Clark College provides WSU Vancouver the largest number of community college transfers. To determine their program interests, 393 of Clark College students were surveyed in Fall 2013. The survey, shown in the Appendix with the detailed results, was comprehensive and, among its questions, asked students to check their areas of interest ("all that apply") across a broad array of academic degree options; then their top three areas of interest.

Aggregating data from the checked areas of interest and top three areas of interest, the following programs had the highest interest, being cited by 10% or more of the students across all measures of interest. 10-15 citations is ranked as Low; 16 through 25 as Medium and greater than 25 as high. Programs ranked as either medium or high are shown in bold.

Program	No. Times Cited	Rank
Psychology	**32**	**H**
Business Administration/Management	**41**	**H**
Education	**25**	**M**
Biology	**23**	**M**
Pre-Health/Medical	**22**	**M**
Nursing	**21**	**M**
Computer Science	**18**	**M**
Fine Arts	**17**	**M**
Chemistry	14	L
Mechanical Engineering	13	L
Criminal Justice	12	L
Accounting	12	L
English	10	L
Electrical Engineering	10	L

C.7. Potential New Programs

This section summarizes potential new programs WSU Vancouver, drawing on all of the research data previously presented. Particular emphasis was placed on the feasibility of potential program based on regional need as measured by supply and demand; the support of regional leaders and practitioners; the level and location of the competition; and the selection criteria. An objective analysis of is these factors is essential to be certain that potential programs can attract sufficient students for them to be viable.

The many program interest areas were cross-walked with the data on workforce demand, treating the broad job categories (e.g., Business) and subcategories (e.g., Accounting, Finance, Operations) as academic disciplines and sub-disciplines, respectively, which were then compared to data on supply from IPEDS.

Tables summarizing relevant data for occupations related to each potential program were tabulated. The tables included:

- Workforce data on supply and demand
- Potential degree level (Bachelors, Masters; Professional/Doctoral)
- Level of corporate and community support (Low, Medium or High)
- Regional competition
- Initial categorization by the consultants (Low, Medium or High) on some of the selection criteria.

As an example, following is the table on Business:

				Workforce Data				Competition					Critera					
	Program	Level	Range	Demand	Supply	Unmet Need	Corporate & Community Interviews	WSU	WA PUB	WA PRV	OR PUB	OR PRV	Oppty to Collaborate	Oppty Community Engagement	Cutting Edge	Attract Funding	Contr. To Economic Dev.	Address 21rst Century Challenges
Business Related Programs																		
1	General Business	B/M/P	MSA	1631	2780	-1149	L/M	Y	50	205	1045	1480		L/M	N		M	N
2	Finance	B/M	MSA	546	336	210	M	Y	22	0	268	46		M	N		M	N
3	Accounting	B	MSA	371	493	-122	L	Y	51	16	275	151		L	N		L	N
4	Operations	B/M	MSA	1388	301	1087	H	Y	25	0	230	46		M/H	N		H	N
5	HR / Training / Dev	B/M	MSA	230	212	18	L/M	Y	51	0	89	72		M	N		M	Y

The tables were presented and discussed at an extended meeting of the Academic Planning Advisory Committee (APAC) and, based on the data, the group identified 21 programs for additional analysis:

1. Social Work
2. Post Secondary Education Teaching
3. Post-Secondary Administration
4. Special Education
5. Manufacturing/Industrial Engineering
6. Transportation/Logistics
7. Fund Raising Management (Masters)
8. Computer Engineering
9. Electrical Engineering (Masters)
10. Power Engineering
11. Sales Engineering
12. Energy Engineering
13. Materials Engineering
14. Robotics
15. Remote Sensing
16. Environmental Specializations, e.g., engineering, policy
17. Cybersecurity
18. Business Intelligence/Analytics
19. Bioinformatics
20. Physical/Occupational Therapy
21. Speech/Language Pathology

Following the meeting, APAC deliberated further on the data, including taking into account the remaining selection criteria, and narrowed the list to 14 programs, categorized as follows:

High Priority

1. Social Work/Human Services - Masters
2. Computer Engineering
3. Electrical Engineering - Masters
4. Data Science: business intelligence, analytics, bioinformatics
5. Environmental Engineering
6. Entrepreneurship
7. Software Engineering
8. Neuroscience (placed on the list, though an existing program, to determine potential growth areas)
9. Mental Health: counseling, substance abuse, rehabilitation, criminal justice
10. Operations & Supply Chain Management: production planning, transportation, logistics

Lower Priority

11. Manufacturing/Industrial Engineering
12. Power Engineering
13. Materials Engineering
14. Remote Sensing/Robotics

Additional analysis of these 14 programs took place, looking deeper at the level of competitiveness of programs within 100 miles, plus, to be conservative, programs offered at the two Washington flagship campuses; the proximity of competitive programs to Vancouver; tuition costs; institutional reputational rankings; and the extent of student interest.

For example, looking at Computer Engineering, following are the demand data until the year 2020. In sum, 101 positions with a minimum requirement of a bachelor's degree are projected to be available each year.

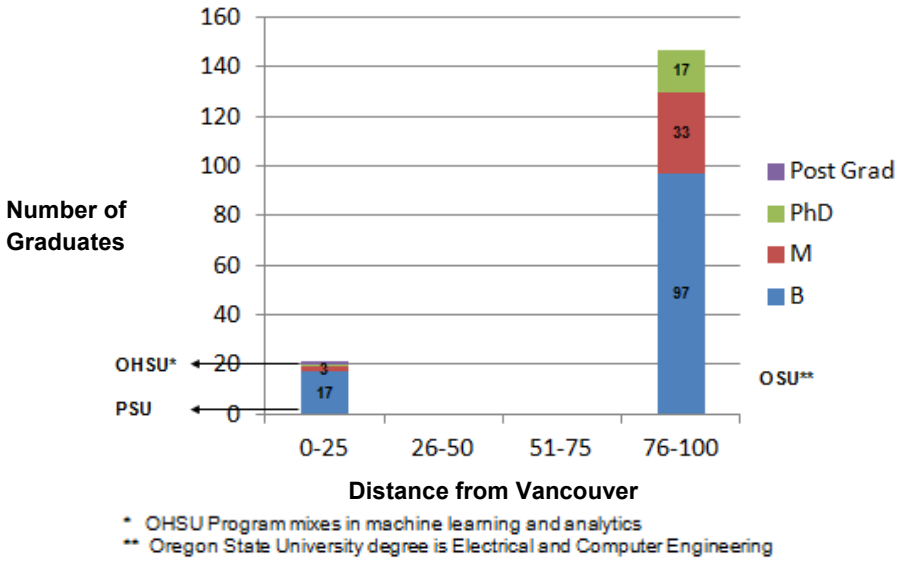
	Employment 2010	Employment	Growth	Annual	Annual	Total	Minimum

Description		2020 Est.		New	Replacements	Annual	Degree
Computer Engineers	4,488	4,871	15.4%	38	63	101	Bach

Following are the projected annual supply from competing institutions in computer engineering:

Program	Distance	State	Graduates				Reputational Ranking from External Interviews	Tuition for WA Residents
			Bach.	Masters	Doctorate	Post Grad		
WSUV	0	WA					H	$11,400
PSU	0-25	OR	17			1	M	$23,000
OHSU	0-25	OR		2	1		N/A	$21,000
OSU	76-100	OR	97	33	17		M	$22,000
Pacific Lutheran	76-100	WA	0				N/A	$33,000
UW	100+	WA	56				H	$12,000
WSU-P	100+	WA	21	5			H	$11,400

Graphing these data below, one can see that there is only a supply of 20 graduates annually within a 75 mile radius of Vancouver, with each institution having considerably higher tuition for Washington residents, making Computer Engineering a highly feasible new program for WSU Vancouver.



All 14 potential programs were studied in a similar way and, based on these analyses, the programs were categorized most, moderately and least feasible, as follows:

Most Feasible	*Moderately Feasible*	*Least Feasible*
Computer Engineering	Social Work/Human Services – Masters	Electrical Engineering
Data Science	Environmental Engineering	Neuroscience
Entrepreneurship	Mental Health	
Software Engineering	Power Engineering	
Operations & Supply Chain Management	Materials Engineering	
Manufacturing/Industrial Engineering	Remote Sensing/Robotics	

These results and a description of each potential program were presented to the Academic Planning Advisory Committee and the Academic Leadership Council after which the Academic Directors, the Vice Chancellor for Academic Affairs and the consultants met in subgroups consisting of the Academic Directors academic offerings related most to each of the 14 programs. The full set question was listed in an earlier section. They included:

- When could each program begin and at what level?
- What is the start-up enrollment for each program and anticipated retention rate?
- What are the implications for research by having this program?

As a result of these meetings and subsequent deliberations by the Academic Directors, the following eight programs were identified as those the University would pursue. The programs can be treated as complete in and of themselves or as starting points for creating multiple tracks within programs, or creating new interdisciplinary programs with other academic departments.

As tools for the Academic Director for further discussions with faculty, academic coordinators and others, the consultants developed profiles of recognized programs at other institutions for each potential program. The profiles are included in the Appendix.

The programs were presented by the Chancellor and Vice Chancellor for Academic Affairs at a Washington State University system-wide academic planning meeting and received support.

Near-Term Implementation (2 Years)

1. Master's (MA and MS) in Mental Health and Human Services

Brief description: The degree is envisioned as a multifaceted, interdisciplinary program with tracks in areas such as clinical psychology, addiction studies and prevention, human service management, and criminal justice. A track in psychological research will also be explored. A multitrack approach is consistent with existing programs at other universities and is well-suited to WSU Vancouver, which has considerable faculty strengths in mental health and human services across multiple programs. The degree would likely include a combination of classroom and practical experiences designed to enhance skills in responding to families or individuals facing oppression, crisis, mental health concerns, poverty, substance abuse, homelessness and other related issues. Advocacy, proposal writing, family work and group facilitation would likely also be addressed. An MS curriculum would be offered to students who are interested in psychological research.

Synergy with existing programs and research: Human Development, Psychology, Addiction Studies, Criminal Justice, and Sociology.
Demand: Local social service and health care leaders reported a strong demand for skilled mental health professionals to meet a broad array of regional needs, including substance abuse, behavioral disorders, clinical counseling, and human services. Health care, including mental health care, is a high growth area nationally and this demand is reflected locally. WSU Vancouver students also express strong demand for the program. Psychology and human development are large undergraduate majors on campus and many of these students are interested in pursuing a Master's degree. These students now must go elsewhere. The

Master's's program would also serve locally-employed mental health professionals who are seeking an advanced degree.

2. MS in Electrical Engineering

Brief description: WSU Vancouver already offers an undergraduate electrical engineers major. This proposal envisions extending the degree to the master's level. A BS degree is sufficient for many entry level jobs; however, a master's degree could increase employment opportunities to include advanced research and development or academic jobs. The MS in EE is currently offered in Pullman and Tri-Cities.

Synergy with existing programs and research: This MS degree will grow out of the strong independently accredited undergraduate EE program already in existence in WSU Vancouver's School of Engineering and Computer Science (ENCS). The ENCS currently has MS degrees in both Computer Science and Mechanical Engineering. In addition, it has BS degrees in EE, ME and CS. It is vital for the research success of the EE faculty in Vancouver to have the opportunity to work with Master's's students.

Demand: A BS degree is sufficient for many entry level jobs; however, a Master's's degree will increase employment opportunities to include advanced research and development or for some academic jobs. The Department of Labor data show a 10% increase in demand for Master's level electrical engineers. In addition, many companies initially hire new graduates with MS degrees into an entry-level position for a BS-EE degree. Therefore, some of the demand for the BS-EE degrees is also filled with MS-EE graduates. Typically, those with the MS degree are quickly promoted within the company due to their advanced training. Clark County is home to many high-tech industries including WaferTech, SEHAmerica, nLight and Sharp Microelectronics Labs, whose business primarily is focused on silicon wafer production, micro/nano device fabrication, and R&D for next generation electronic devices. The presence of the high-tech industry creates a very high potential for research collaborations for EE faculty and the future MS-EE graduate students in Vancouver. Experience from existing programs shows that such collaborations naturally lead to employment opportunities for WSU Vancouver students. According to a 2013 study by the Technology Alliance, engineering Master's's degree production in WA declined to last place among 20 peer states. There is a deep disconnection between the state's competitiveness and its ability to produce talent with advanced degrees. The proposed MS-EE degree will contribute to closing the gap.

3. BA in Entrepreneurship in the Business Administration Degree

Brief description: This degree would focus on preparing students to start or advance an entrepreneurial venture, and includes the theoretical and applied knowledge necessary to meet the financial, analytical, technological, communication and operational demands in a newly formed organization.

Synergy with existing programs and research: The College of Business at WSU Vancouver currently offers core business curriculum and several electives that would be included as part of this major. Adding this major would build on the success with the capstone curricular experience at WSU Vancouver, called the Business Growth Mentor and Analysis Program (MAP). MAP puts students into the community working with small and newly formed business and nonprofit organizations where students, with guidance from seasoned business professionals and faculty instruction, provide actionable recommendations for business owners. MAP has been successful in raising external funding to support the program and would be even more attractive with the addition of the entrepreneurship degree. On the research side, multiple faculty are engaged in research programs that explore a various dimensions of entrepreneurship theory and practice.

Demand: With SW Washington experiencing some of the strongest population growth in the state, an attractive location, lower cost of living, and active economic development efforts to provide entrepreneurs an attractive region to launch a new venture, the demand for entrepreneurship expertise is expected to grow. Vancouver was recently awarded an Innovative Partnership Zone (IPZ) designation by the State of Washington Department of Commerce. Only 18 communities in the State have earned this designation. IPZ is creating the environment for collaboration that is expected to lead to new technologies, marketable products, and job creation. A new industry cluster in applied digital technology is already emerging as a result of the IPZ

implementation. Having an entrepreneurship program at WSU Vancouver will help to accelerate the IPZ success. MAP currently works with entrepreneurs and a number of the entrepreneurs are WSU students from programs across campus. Because of this and other data collected by Penson, it emerged as a new academic program with strong demand potential.

Mid-term (4 Years)

4. BS in Software Engineering

Brief description: A software engineering degree teaches many of the duties of a software engineering professional, including how to develop large-scale software products that often utilize distributed computing hardware. A typical software engineering degree curriculum includes courses in structured query languages, object-oriented software engineering, math, science, and liberal arts, and several programming languages and operating systems. While many computer science degrees cover these topics, a degree in software engineering is more specific to software development in teams, software architecture, extensive testing, and deployment. These skills are sought after by firms specifically wanting software developers.

Synergy with existing programs and research: This program can easily grow out of WSU Vancouver's existing Computer Science program.

Demand: this program proposes to address the high demand for software engineers brought on by software innovations that have continually upgraded nearly every aspect of private and commercial life. The Department of Labor data show a 22% growth rate in careers in this area.

5. BS in Computer Engineering

Brief description: Computer engineering, as proposed here, would integrate electrical engineering and computer science as required to develop computer hardware and embedded software. Computer engineers usually have interdisciplinary training in electrical engineering and computer science. Computer engineers are involved in many hardware and software aspects of computing, from the design of individual microprocessors, personal computers, and supercomputers, to circuit design. Computer engineering not only focuses on how computer systems work, but how they integrate into the larger picture. Usual tasks involving computer engineers include writing low-level software and firmware for embedded microcontrollers, designing VLSI chips, designing analog sensors, designing mixed signal circuit boards, and designing operating systems.

Synergy with existing programs and research: This program can easily grow out of WSU Vancouver's existing CS and EE undergraduate programs, with laboratory facilities readily being able to support the new program.

Demand: The Department of Labor data show a 15.4% growth rate in careers in this area. A 2013 study by the Washington Student Achievement Council indicates the largest gap (146%) between degree production rates and industry demand in computer science and engineering fields.

Longer-term (6 Years)

6. **BA in Operations Analysis and Supply Chain**

Brief description: The operations analysis and supply chain management degree, as proposed here, focuses on the efficient and rapid transport of products and information. Courses could include financial management, project and supply chain management, marketing, transportation policy, logistics management, customer relations, operation systems, material management, quality control, international finances and trade, inventory control, production forecasting and scheduling, purchasing and materials management, quality control, service analysis and design, and management of working capital for the manufacturing and distribution of a product.

Synergy with existing programs and research: Students in this degree program would take the College of Business core curriculum which currently exists. Many of the electives in this major are also currently offered.

Demand: The SW Washington metro region is known for its supply chain and logistics capabilities. Located near several major ports and home to global manufacturing companies, the region's demand for capable supply chain managers continues to grow. Career paths in government and the private sector include inventory control, manufacturing, materials management, plant or facility management, purchasing, quality control, and special projects. A pilot effort to offer electives in supply chain management proved successful with growing student demand as well as designated scholarship funds.

7. BS and/or MS In Data Science

Brief description: Data science, as proposed here, would prepare students to work with heterogeneous, real-world data (ranging from tweet streams to mouse clicks and GPS coordinates) and to extract insights from the data using the latest tools and analytical methods. Data science programs often emphasize the importance of asking good research or business questions as well as the ethical and legal requirements of data privacy and security. Programs generally include research design and applications for data and analysis, storing and retrieving data, exploring and analyzing data, identifying patterns in data, and effectively visualizing and communicating data. The curriculum enables students to imagine new and valuable uses for large datasets; retrieve, organize, combine, clean, and store data from multiple sources; apply appropriate data mining, statistical analysis, and machine learning techniques to detect patterns and make predictions; design visualizations and effectively communicate findings; and understand the ethical and legal requirements of data privacy and security. As an interdisciplinary program, the curriculum could include machine learning and math/ statistics learning as well as coursework along industry verticals such as bioinformatics, banking, insurance, energy, business, etc.

Synergy with existing programs and research: there is potential for collaboration with Computer Science, Business (MIS), Mathematics, Psychology, and other existing programs.

Demand: The feasibility study showed a strong demand and job growth, reflecting national trends.

8. BS in Environmental Engineering

Brief description: Environmental engineering, as proposed here, would focus on preventing and resolving environmental problems, including air pollution control, industrial hygiene, toxic materials control, and land management. The duties of an environmental engineer range from planning and designing an effective waste treatment plant to studying the effects of acid rain on a particular area. A bachelor's degree in environmental engineering emphasizes math and science courses as well as classes specific to environmental engineering such as air pollution engineering, environmental risk assessment, and principles of environmental engineering.

Synergy with existing programs and research: Potential for collaboration with existing Environmental Science program and with the existing Engineering programs.

Demand: Career opportunities include consulting, research, corporate, and government positions. The Department of Labor data show a 15% growth rate in careers in this area.

C.8. Potential Areas of Growth in Current Programs

The table on the following page summarizes the factors that impact the potential growth of current programs:

- Enrollment trends in current programs
- National, State, Regional and Local data on Student Interests
- Interests of WSU Vancouver undergraduate students
- Interests of WSU Vancouver graduate students
- Interests of Clark College students
- External support, as measured by workforce needs and comments by regional leaders and practitioners

All current WSU Vancouver programs link to and have growth potential from the eight new programs identified in an earlier section of this report, whether by direct degree requirements, prerequisites or electives; by expanded program or research opportunities; or by being a part of the core curriculum requirements for the degree.

Please note the following:

1. Rankings on student interest in columns F, G, H, and I were derived from the findings in the Summary of Student Interest detailed in a previous section of this report. The rankings were inserted into the table based on the nature of the survey and examining how interests crosswalk to existing programs.
2. WSU Vancouver offers formal programs in all of the medium- and high-interest areas with the exception of professional programs the campus is not authorized by the WSU System to offer, e.g., medicine, law.

3. Some of the interests had one-to-one links to current programs, such as nursing and mechanical engineering. Others were broad, such as business or psychology/human development. In the latter cases, the impact on current programs was read more broadly. For example, a high interest in business was interpreted to impact all business programs (accounting, business administration, finance, etc.) and high interest in psychology/human development was interpreted to impact all related programs (addiction studies, aging, human development, etc.)
4. The rankings in Columns E.-J. Columns were treated equally and not weighted.
5. Cells with a dash signify no interest or interest so low as to not meet the minimum threshold.
6. The rankings for External Need and Support (Column J) are an amalgam of the research on workforce supply and demand and comments by regional leaders and practitioners. Traditional liberal arts programs were not identified in the supply and demand study as medium or high; yet, as reported in an earlier section of this report, regional leaders and practitioners stressed the importance of the liberal arts for teaching the writing and the critical/creative-thinking skills necessary for the success of their organizations. Hence, liberal arts programs were assigned a ranking of medium (M) in Column J.
7. To arrive at an assessment of overall potential growth in the final column, a low ranking (L) in Columns E, F, G, H, and I was assigned 1 point; a medium ranking (M), 2 points; and high ranking (H), 3 points.
8. Points across all six factors were summed and a potential growth scale applied. Programs summing 1 through 5 were given a potential growth ranking of Low; >5 through 9, Medium; and >9 through 13, High.
9. The analysis shows nine programming having high growth potential and 16 medium growth potential.

High Potential Growth	**Medium Potential Growth**	
Accounting	Anthropology	Education
Business Administration	Addiction Studies	Education: Teaching (MIT-E)
Electrical Engineering	Aging	English
Finance	Biology	Earth & Environmental Science
Fine Arts	Communication	History
Human Development	Computer Science	Management & Operations
Mechanical Engineering	Criminal Justice	Management Information Systems (MIS)
Nursing	Digital Technology and Culture	Marketing/Prof. Sales
Psychology		

Enrollment and Interest Data on Existing Minors, Majors and Masters
Washington State University Vancouver

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)
	Level			Enroll-ment Trends	Nation/State/ Regional Student Interests	WSUV Student Interests		Clark College Student Interests	Regional Need and Support	Potential Growth	
	Min	Maj	Mas	Low/Med/ High		UG Programs Low/Med/ High	Masters Programs Low/Med/ High	Low/Med/ High	Low/Med/ High	Total	Ranking
Accounting [a.]		x	x [a.]	H	H	-	H	L	M	12	**H**
Anthropology [b.]	x	x		M	-	-	H	-	M	7	**M**
Addiction Studies	x			M	H	-	-	-	H	8	**M**
Aging	x			L	H	-	-	-	H	7	**M**
Biology	x	x		M	H	-	M	M	-	9	**M**
Business Adm.	x	x	x	M	H	-	H	H	M	13	**H**
Chemistry	x			L	-	H	-	L	-	5	
Communication	x			L	-	H	-	-	M	6	**M**
Computer Science	x	x	x	M	-	-	M	M	H	9	**M**
Criminal Justice	x			L	H	L	-	L	M	8	**M**
Digital Tech/Culture	x	x		M	H	-	-	-	H	8	**M**
Education		x		L	H	-	-	M	-	6	**M**
Ed: Teaching (MIT-E)			x	M	H	-	H	-	-	8	**M**
Ed: Teaching (MIT-S)			x	M	H	-	-	-	-	5	

Education: Ed.M.			x	M	H	-	-	-	-	5	
Electrical Engr.		x		H	H	-	L	L	H	11	**H**
English [b.]	x	x		M	-	-	M	L	M	7	**M**
Earth & Environ. Sc.		x		H	-	-	-	-	M/H	5.5	**M**
Environmental Sc.	x		x	M	-	-	-	-	M/H	4.5	
Finance		x		H	H	-	M	-	M	10	**H**
Fine Arts [b.]	x			L	H	H	-	M	M	11	**H**
History [b.]	x	x		M	-	-	H	-	M	7	**M**
Hospitality Bus. Mgt. [c.]		x		c.	H	-	-	-	M	5	
Human Dev.	x	x		M	H	-	H	-	M/H	10.5	**H**
Humanities [b.]		x		H	-	-	-	-	M	5	
Mgt. & Operations		x		H	H	-	-	-	H	9	**M**
Mgt Info. Sys. (MIS)		x		M	H	-	-	-	M/H	7.5	**M**
Marketing/Prof. Sales		x		H	H	-	L	-	-	7	**M**
Mathematics [b.]	x			L	-	M	-	-	M	5	
Mechanical Engr.	x	x	x	M	H	-	M	L	H	11	**H**
Neuroscience [c.]	x	x		c.	H	-	M	-	-	5	
Nursing		x	x	H	H	-	M	M	H	13	**H**
Political Science	x			L	-	L	L	-	-	3	
Psychology	x	x		H	H	L	H	H		13	**H**
Public Affairs		x	x	M	-	-	M	-	-	4	
Social Sciences		x		H	-	-	-	-	-	3	
Sociology	x	x		M	-	-	M	-	-	4	
Spanish	x			M	-	-	-	-	-	2	
Women's Studies	x			L	-	-	-	-	-	1	
Zoology	x			L	H	-	-	-	-	4	

General Notes:

- The table does not include doctoral programs.
- Cells with a dash signify no interest or interest so low as to not meet the minimum threshold.
- In Columns E, F, G, H, a ranking of L was assigned 1 point; M, 2 points; and H, 3 points. An M/H ranking in Column J was given 2.5 points.
- Balancing the low level of workforce need with the high emphasis placed by regional leaders and practitioners on the liberal arts, programs designated by footnote b. were ranked as Medium in Column J, Regional Need and Support
- The growth rankings in Column L are derived from the total in Column K. 1-5, Low; >5-9, Medium; and >9 -13, High.

Footnotes

a. WSUV Masters in accounting being phased out
b. General education core viewed as fundamental, linking with all new degree programs.
c. New program, hence enrollment data not yet available

How to use the foregoing findings for considering growth in current programs is best left to WSU Vancouver academic leadership and faculty but, for example, one or more of the following are among possible considerations:

- Retain the degree level where it is and provide more resources for the program to grow
- Create an UG major either by elevating the minor to a major or retaining the minor and add a major
- Create a masters degree

Focusing on the high potential growth areas, following are examples of options and questions:

Program/Option	Grow Current Degree Program	Consider UG Major	Consider Masters Degree	Remarks and Questions
Accounting	x			Capacity for masters exists, but no longer an option due to Systemwide action. Possibility for expanding the accounting focus within the MBA?
Business Administration	x			Minor, major and Professional MBA already offered by WSU Vancouver. Possibility of a daytime MBA?
Electrical Engineering			x	Electrical Engr. Is one of 8 new potential programs identified for WSU Vancouver
Finance	x			Possibly a full concentration within the MBA or "focus area" similar to accounting?
Fine Arts		x		Possibility of creating 2+2 options with fine/performing arts programs at Clark College?
Human Development			x	A possible track of Mental Health and Human Services, one of 8 new programs identified for WSU Vancouver
Mechanical Engineering	x			
Nursing	x			
Psychology	x			A possible track of Mental Health and Human Services, one of 8 new programs identified for WSU Vancouver

C.9. Projected Rollout of New Programs and Overall Enrollment

Rollout of New Programs

To develop a schedule for the rollout of new programs, an enrollment model was developed using *estimates* on the following provided by the Vice Chancellor for Academic Affairs and the Academic Directors:

- Start year
- Start-up enrollment
- Maximum enrollment
- First year retention rate for bachelor's programs
- Graduation rate (For modeling purposes, time to graduation was assumed to be four for bachelor's programs and two for master's programs.)

New Programs	Degree Level [b.]	Start Year [c.]	Starting Enroll-ment	Maximum Enroll-ment	1st Year Retention Rate	Graduation Rate
Electrical Engineering	M	'15-'16	4	6	-	90%
Entrepreneurship	B	'15-'16	15	40	65%	50%
Mental Health & Human Services: Track 1 [a.]	M	'16-'17	8	12	-	90%
Mental Health & Human Services: Track 2 [a.]	M	'17-'18	8	12	-	90%
Mental Health & Human Services: Track 3 [a.]	M	'17-'18	8	12	-	90%
Computer Engineering	B	'17-'18	13	20	70%	60%
Software Engineering	B	'18-'19	10	20	70%	60%
Data Science	B and/or M	'19-'20	9	15	70%	60%
Ops. Analysis & Supply Chain Mgt.	B	'19-'20	8	35	70%	60%
Environmental Engineering	B	21-22	5	34	70%	60%

a. Mental Health & Human Services modeled to have three degree tracks
b. Data science may be at the bachelor's and/or master's level. For purposes of modeling the new program roll-out, it is assumed to start at the bachelor's level. Masters' degrees in computer, software and environmental engineering are also possible following the first baccalaureate graduating class. For purposes of modeling the new program rollout, only bachelor's degrees are included.
c. The start year is flexible and subject to adjustment based on circumstances. For purposes of modeling a new program roll-out, 2015-16 was used as the start year.

The following is a guide to the new program roll-out and overall enrollment table below:

Rows 2-14: The result of using the above factors as input variables for a roll-out model that is treated as a moderate growth projection.

Rows 15-16: The result of conservative and optimistic growth scenarios, developed by altering retention and growth rates

Rows 19: The result of applying WSU Vancouver's enrollment-growth target of 5%/year on Fall '14 enrollment that will result from a variety of factors, including regional population growth, enhanced enrollment management efforts, growing interest in current programs as summarized in Section C.8. of this report, and the residual effect of the eight new programs – e.g., general education requirements; prerequisites

Rows 20-21: The result of conservative (4%/year) and optimistic (6%/year) growth projections

Row 23: Fall '14 enrollment of 3,264

Rows 26-28: The total projected enrollment for WSU Vancouver based upon the preceding moderate, conservative and optimistic growth scenarios.

Enrollment growth numbers for the moderate scenario are highlighted in yellow.

Projected Rollout of New Programs and Overall Enrollment

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)
1	**New Programs-Academic Year**	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	23-24	24-25	25-26	26-27	27-28	28-29	29-30
2	Electrical Engineering MS	4	9	11	12	12	12	12	12	12	12	12	12	12	12	12
3	Entrepreneurship	15	32	54	84	100	112	118	118	118	118	118	118	118	118	118
4	Mental Hlth. & Human Services-Track		8	17	19	20	22	23	23	23	23	23	23	23	23	23
5	Mental Hlth. &Human Services-Track 2			8	17	19	20	22	23	23	23	23	23	23	23	23
6	Mental Hlth. &Human Services-Track 3				8	17	19	20	22	23	23	23	23	23	23	23
7	Computer Engineering			13	25	37	49	55	58	59	59	59	59	59	59	59
8	Software Engineering				10	18	28	39	44	49	55	58	59	59	59	59
9	Data Science					9	17	24	34	39	42	44	45	45	45	45
10	Ops. Analysis & Supply Chain					8	17	29	45	61	79	92	101	104	104	104
11	Environmental Engineering							5	10	16	20	24	28	28	30	30
12																
13	**Growth from New Programs**															
14	*Moderate*	19	49	103	175	240	296	347	389	423	454	476	491	494	496	496
15	*Conservative*	18	44	89	144	201	243	279	311	332	354	372	386	395	398	399
16	*Optimistic*	21	57	118	200	286	356	428	491	544	580	606	619	624	627	629
17																
18	**Growth on Fall '14 Headcount of**															
19	*Moderate - 5%/year*	163	335	514	703	902	1,110	1,329	1,558	1,800	2,053	2,319	2,598	2,891	3,198	3,522
20	*Conservative - 4%/year*	131	266	408	554	707	866	1,031	1,203	1,382	1,568	1,761	1,962	2,171	2,388	2,614
21	*Optimistic - 6%/year*	196	403	623	857	1,104	1,366	1,644	1,938	2,250	2,581	2,932	3,304	3,698	4,116	4,558
22																
23	**Fall 2014 Headcount**	3.264	3.264	3.264	3.264	3.264	3.264	3.264	3.264	3.264	3.264	3.264	3.264	3.264	3.264	3.264
24																
25	**Total Headcount**															
26	*Moderate*	3,446	3,648	3,881	4,142	4,406	4,670	4,940	5,211	5,487	5,771	6,059	6,353	6,649	6,958	7,282
27	*Conservative*	3,413	3,574	3,761	3,962	4,172	4,373	4,574	4,778	4,978	5,186	5,397	5,612	5,830	6,050	6,277
28	*Optimistic*	3,481	3,724	4,005	4,321	4,654	4,986	5,336	5,693	6,058	6,425	6,802	7,187	7,586	8,007	8,451

C.10 Implications for WSU Vancouver Vision and Mission Statements

WSU Vancouver's 2011-16 Strategic Plan (http://admin.vancouver.wsu.edu/office-chancellor/wsu-vancouver-vision-statement) includes the following Vision and Mission statements:

- **Vision:** *"WSU Vancouver will be valued by its community as a vibrant, diverse, urban research campus that provides students with access to distinctive academic programs with an emphasis on applied and translational science and technology, leadership, and sustainability."*
- **Mission:** *"WSU Vancouver is an engaged research university committed to increasing access to higher education in Southwest Washington. The university is dedicated to offering world-class undergraduate and graduate degrees via student-centered, relevant education; advancing knowledge and creativity; and engaging with the community."*

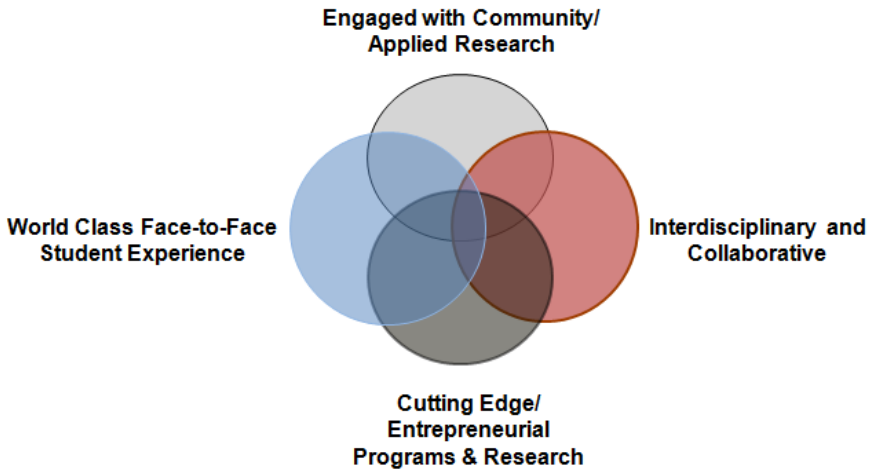
At the initial Town Hall Meeting, the first question asked of participants in their small groups was, "Looking into a crystal ball to its ideal future, what is WSU Vancouver most known for?"

This question is important because the responses provide insight to the collective academic vision of the institution, a driver of not only academic programming but the larger aspirations of the faculty and the University.

The number of vision elements was voluminous. When each small group was asked to look over their list and identify their top, the following patterns emerged:

What WSU Vancouver is Most Known For	% Time Appearing in Top 3
1. Community Engagement / Applied Research	24.3%
2. World Class Face to Face Student Experience	21.6
3. World Class/Cutting Edge/Entrepreneurial Programs & Research	18.9
4. **Specific Program Suggestions**	10.8
5. Unique Identity & Location	10.8
6. Undergraduate Research / Experiential Activities	8.1
7. Interdisciplinary Programs & Research	5.4
8. Diversity	5.4
9. Positive / Vibrant Campus Community	5.4
10. High Quality Graduate Research & Education	5.4
11. Other	2.7

These characteristics ultimately cluster around four major overlapping themes describing the ideal qualities of WSU Vancouver. Should the University choose to do so, these themes could be incorporated into the vision and mission statements.



Examining the vision elements that gave rise to the themes, following are descriptions of each:

- **Community Engagement/Applied Research** refers to WSU Vancouver's community-based involvement for both teaching and research, including community-based internships, experiential learning, community-engaged scholarship, community integration, and service to the community. The emphasis is on conducting problem-based research that could be of practical applied value to our surrounding community.

- **World Class Face to Face Student Experience** refers to the ability of WSU Vancouver to offer a premier personalized educational experience in the context of a world class RU/VH University. (Research University – Very High). Undergraduates engage in cutting edge research while retaining the experience of a small campus "liberal arts" context with small classes. This WSU Vancouver experience offers students high quality accessible education at the tuition rate of a public state university, lifelong learning, and personal development.

- **Cutting Edge/Entrepreneurial Programs & Research** refers to WSU Vancouver's ability to deliver cutting edge entrepreneurial programs and research in an innovative urban campus setting. Its world class signature programs and research conducted in high quality facilities, coupled with innovative delivery, maintain WSU Vancouver's reputation as a small campus that delivers on teaching excellence, outstanding research, as well as meeting the region's workforce needs.

- **Interdisciplinary and Collaborative** refers to the development and promotion of programs that are multi-disciplinary and reward collaboration and research across the disciplines; and reflects a desire to focus on engaging undergraduates in student-faculty research and providing them with hands-on experiential activities.

Penson Associates, Inc.
The Research and Consultation Firm

D

meeting minutes

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MEETING MINUTES

TO: The File

FROM: Becky Barnhart, AIA
Principal-in-Charge

DATE: March 12, 2018

SUBJECT: Minutes of the Meeting
Held March 8, 2018
WSU Vancouver Life Sciences Predesign
WSU Project No. 9748-2018
Integrus Project No. 21804.01

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Parties In Attendance:
Lynn Valenter, WSU Vancouver, Vice Chancellor
Bill Hooper, WSU Vancouver, Associate Vice Chancellor for Facilities Services
Jason Baerlocher, WSU Facilities Services
Brian Carter, Integrus Architecture
Becky Barnhart, Integrus Architecture

The following is a record of the author's understanding of comments made and direction given. Written clarifications or corrections should be directed to Integrus Architecture within seven days of the date of publication of these minutes.

A kickoff meeting was held on March 8, 2018 to review committee structure, potential meeting dates, and overall process in preparation for the WSU Vancouver Life Sciences predesign effort.

I. Lynn noted that Life Sciences is a high-profile project on the campus and there is some sensitivity regarding decision making. Structure of the committees and the overall process were discussed with the following structure decided upon to address both the short timeline for the study (due to the State on July 1, 2018) and create an inclusive process that collects input from a broader group.

II. Predesign Participants
   A. Steering Committee
      1. A Steering Committee will be formed for the project that represents campus leadership and individual representatives from the various user groups.
      2. The Steering Committee will guide and direct the design team in prioritizing user group requests.
      3. Primary representatives from the individual user groups will attend both individual sessions as well as the Steering Committee sessions.
      4. Marisa will assist in facilitating meeting dates, etc. for the campus.

B. User Groups
1. Discussion was held regarding the number and identity of the user groups for the predesign effort. Following subsequent email conversation, a series of five user groups and their primary representatives were identified as follows:
   a. Vivarium - Ali Coffin
   b. Nursing and Medical School - Linda Eddy
   c. All Sciences - Marc Kramer (Biology and Environmental Sciences)
   d. Teaching Labs - Amy Wharton
   e. Neuroscience and Experimental Psychology - Christine Portfors
2. Sessions with user groups will be designed to collect information that can be taken to the Steering Committee for consideration.
   a. It was suggested that each session with the user groups provide a high-level overview of the predesign process.

C. Campus Systems
1. Facilities will be represented on the Steering Committee by Bill Hooper, Associate Vice Chancellor for Facilities Services.

III. Proposed Process

A. Work Session 1: Information Collection
1. March 28 was tentatively identified for Work Session 1, pending Steering Committee availability.
2. The day will begin with a tour of existing facilities from 8 a.m. to 9 a.m. and continue with a meeting of the Steering Committee. Individual user group sessions (45-minutes each) will follow and a wrap up session with the Steering Committee will close out the day.
   a. Integrus will provide a tentative agenda for this work session showing user group time blocks and identities to WSU Vancouver.
   b. WSU Vancouver will coordinate the assignment of user groups to the individual time slots.
   c. Once Integrus has received the user group assignments, a finalized agenda will be distributed.
   d. Lynn will coordinate a location for this work session with classroom amenities for a PowerPoint presentation.
3. Integrus will compile a questionnaire that can be sent to the user groups in advance of this Work Session for the Steering Committee to forward on to individual participants. The goal of this effort is to expand the outreach for the overall study beyond the participants of the steering committee.
   The questionnaire will ask questions about:
   1) teaching labs needed
   2) the highest need of each individual group
   3) the highest need on campus (in general)

B. Work Session 2: Initial Findings and Recommendations
   1. Tentative dates for Work Session 2 were identified as April 19 or 20, 2018. A single day is anticipated as this meeting will be an extended work session with the Steering Committee.
      a. WSU Vancouver will facilitate a Doodle poll for the two days and see which one best fits existing schedules.
   2. The goal of Work Session 2 will be to present a preliminary program space summary (and associated scaled diagram) and building siting options for review and consideration.
      a. WSU Vancouver requested that Integrus make preliminary recommendations at the Steering Committee meeting.
      b. A PowerPoint presentation should be available that Steering Committee members can take back to the user groups.
      c. A separate meeting between Integrus' IT/MEP and Civil consultants and campus representatives from each department will occur during this work session.

C. Work Session 3: Presentation of Findings
   1. Work Session 3 will likely be separated into two different days. One meeting will occur with the Cabinet and the second with the Steering Committee.
      a. Cabinet meetings typically occur on a Tuesday. May 6, 2018 was presented as a potential date.
      b. May 15, 2018 is the last day that faculty on are on contract for the campus. May 14, 2018 would be the last date for this session to occur.

IV. Team Communication
   1. All communication should be routed through Jason Baerlocher. Jason will forward documents from WSU Vancouver to Integrus.
   2. Final decisions on the predesign will come from the WSU Vancouver Chancellor via the Cabinet.
   3. WSU Vancouver prefers that email be used as the primary communication. If larger files are needed a Newforma site can be set up to facilitate file transfer.
   4. Integrus will draft meeting minutes from each session and provide them to Jason for further distribution.

V. Supporting Documents
   1. Kelly Keene, WSU Pullman, is currently heading up the effort to update the WSU Vancouver Master Plan. Jason will see if he can get a copy of the current plan for consideration.
   2. An Academic Plan and Enrollment Management Plan for the campus are available. Lynn will forward these documents to Jason.
   3. Strategic Plan for the campus is available online.
   4. Jason Baerlocher will pull data from the WSU system on FTE data, growth, etc.

VI. General Campus Information
   1. All the classrooms on campus are considered general use.
   2. Research labs are separated by discipline.
   3. The neurology degree was added three years ago.
   4. The campus is out of wet labs and research labs.
   5. There are 150 doctoral faculty on the campus conducting over $5 million in sponsored research each year.

6. The current vivarium on campus was retrofit within an existing space and houses rats, mice, and fish.

VII. Vancouver Campus Planning, Systems, and Parking

A. Campus Organization
   1. The Mt. St. Helens corridor is primarily composed of the STEM disciplines.
   2. The Mt. Hood corridor is primarily non-STEM and general disciplines.
   3. Infrastructure for a future building has been provided beyond the Clark Building.

B. Boilers and Chillers
   1. An assessment of existing boiler and chiller capacity on the campus will be needed.
      a. PAE had previously conducted a study. WSU will see if the PAE study can be provided to the Integrus team for review in assessing future campus needs.
      b. If a chiller is required, the project will bear the additional cost.
      c. Additional chilling capacity is anticipated as the Engineering Building required a chiller at the time of that project.

C. Electrical System
   1. It is not yet known if PAE also conducted a study of the campus electrical system.
   2. Switchgear are efficient but there is the potential that additional conductors are needed.
   3. If an electrical study is available, the Integrus team will utilize in their assessment. If not, an additional assessment of the electrical system might be needed within the predesign scope.

D. Data Communications
   1. There is the potential for a connection to the data communications network at the access road. Additional discussions with the Port of Ridgefield will likely be taking place in the future. WSU Vancouver might want to add conduit connections towards the new building site to have this capability ready in the future.

E. Parking
   1. Previous studies had indicated that 300 spaces of underground parking should be included in the project.
      a. Additional parking will be a requirement; however, the Master Plan is currently reviewing options.
      b. It's likely that surface parking will be a part of the project.
      c. Jason Baerlocher will begin the process of acquiring a geotechnical study once a site has been selected. Heavy clay with sporadic rock formations are anticipated.

Routing:
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David van Galen, Integrus Architecture
Burcin Moehring, Integrus Architecture

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MEETING MINUTES

TO: The File

FROM: Daniel Gero, AIA
Project Architect/Designer

DATE: April 12, 2018

SUBJECT: Minutes of Workshop 1 – All Sciences
Held March 28, 2018
WSU Vancouver Life Sciences Building Pre-design
WSU Project No. 9748-2018
Integrus Project No. 21804.01

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Alex Dimitrov, WSU Vancouver, Mathematics, Neuroscience
Stephen Henderson, WSU Vancouver, School of the Environment
Cheryl Shultz, WSU Vancouver, Biological Sciences
Cynthia Cooper, WSU Vancouver, Molecular Biosciences
Allison Coffin, WSU Vancouver, Neuroscience, Biological Sciences
Bala Krishnamoorthy, Mathematics
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Becky Barnhart, Integrus Architecture
Daniel Gero, Integrus Architecture
Burcin Moehring, Integrus Architecture

The following is a record of the author's understanding of comments made and direction given. Written clarifications or corrections should be directed to Integrus Architecture within seven days of the date of publication of these minutes.

I. Some of the faculty participating in this workshop met prior and produced a document outlining their needs. Once forwarded to Jason Baerlocher, he will provide the document to the design team.
II. Faculty are currently distributed across several buildings. More opportunity for collaboration among disciplines is desired in areas of both research and teaching.
III. Biology is the largest major on campus, environmental and neuroscience are also large.
IV. There is a critical lack of wet lab research space.
    A. Lack of space has limited the ability to search for additional faculty as there is no appropriate space to accommodate the work.

B. Some faculty are sharing wet lab space; however, when this has occurred it has been based off space available, rather than synergies which might be found between the areas of research.
C. The graduate student office was converted to laboratory space; it needs to be recreated in the future facility.

V. Current storage space is grossly inadequate. Closets have been renovated into research laboratories, however, this results in storage within the laboratories themselves. Provision of additional storage space could increase overall efficiency if it was properly located. In some cases, samples are being disposed of prior to analysis as there is no place to store them in the interim.

VI. A separate printer/plotter space is needed. The current one is located inside the instrument lab and its location is limiting the lab's use.

VII. Shared laboratories are culturally desirable to the Sciences, but research should be paired based on similar or parallel needs.

VIII. The existing greenhouse is not adequately sized for its current utilization
A. Used for both research and teaching by the School of Environmental science, biology, molecular biology
B. An adjacent covered but secure outdoor storage yard would be helpful for storage of soil experiments.
C. There is not enough space in the current greenhouse to store waste soil and the various tools used within the greenhouse.
D. The greenhouse must accommodate a large amount of externally funded research.

IX. Environmental biology: The ideal lab would accommodate 4 occupants.

X. Molecular biology: WSU Pullman built laboratories accommodating 12 occupants. This brought them to the next level in grants.
A. 20% of federal all federal research grant dollars are currently allocated to biosciences.

XI. Graduate students are the workforce of grants. The new facility needs to include amenities that would attract more.
A. Lounge/work areas outside the laboratory would accommodate the graduate student lifestyle.
B. Should build scholarship, community.

XII. Other lab: 8 occupants including PI, post-doc, grad students. Currently too cramped, limiting function.

XIII. Mathematics: doesn't need lab, but needs office space for 7 grad students and a computer laboratory.
A. Dedicated space is needed for the quantitative (math) tutoring center
B. 2-3 tutors at a time.
C. Existing has 28 seats. Need 40.

XIV. Environmental science: 3 occupants in laboratory. Program predominantly includes field work which carries a heavy demand for instrumentation and storage.
A. Need loading/storage zone for staging instrumentation
1. Roll-up doors
2. Adjacent climate controlled environmental chambers for sample storage
3. Cold/freezer storage
4. Small area for procedures/experiments – dirty area

XV. Back-up power is needed for all environmental chambers.

XVI. Teaching labs should be planned for 24 seats.

XVII. A common instrumentation lab for shared equipment should be considered.

END

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Ross Jarvis, SCJ Alliance
Geoff McMahon, AEI Affiliated Engineers
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MEETING MINUTES

TO: The File

FROM: Daniel Gero, AIA
Project Architect/Designer

DATE: April 12, 2018

SUBJECT: Minutes of Workshop 1 – Neuroscience & Experimental Psychology
Held March 28, 2018
WSU Vancouver Life Sciences Building Pre-design
WSU Project No. 9748-2018
Integrus Project No. 21804.01

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Experimental Psychology

I. Human subject research is conducted, requiring private spaces for interviews.
   A. Primarily one-on-one
   B. No special equipment
   C. Need community access with clear wayfinding for public
II. 5 faculty in shared research space
III. Need separated space for 6 research assistants
IV. Currently in classroom building (CLS 116). In a large open area. There are currently no interview rooms which makes confidentiality difficult.
V. Addiction research - requires confidentiality within space as well as sensitivity regarding who will be seen entering the area (this is a barrier to recruitment for future participants.
VI. The following rooms are needed:
   A. PI offices
   B. (1) Room for 6 research assistants
   C. Group room
   D. 2 or 3 differently sized interview rooms

E. Observation room with one-way glass
F. MRI room would expand research capabilities exponentially
G. Physical activity room to accommodate 2-3 people
1. Will have eye-tracker and exercise equipment
2. Shared storage for housing paper data-collection. Files are double locked, within the cabinet and behind an office door.

VII. Graduate student interaction with other science disciplines would be beneficial, as well as with business students.

VIII. Health/physiological elements of psychology are integrated into research.
A. Blood draw, saliva sample – cortisol
B. Exercise physiology, blood gasses
C. Shared physiology laboratory space useful

IX. There is some potential overlap of equipment between Neurosciences and Psychology.

<u>Neuroscience</u>

I. Combination of two open laboratory spaces with smaller, closed laboratories for electrophysiology and behavioral study on animals. 3-4 rooms total are needed for mice.
II. Secure spaces are needed for the storage of drugs used in studies including cocaine, methamphetamines and other controlled substances. 2 locked doors are required for security and tracking purposes.
III. Laboratory transparency is desirable where appropriate, but must be restricted due to the presence of animal studies.
IV. Provide growth in laboratories for 2 additional faculty, for a total of 8.
V. Provide a collaborative lounge.
VI. Faculty offices should be accessible from graduate student areas.
VII. It is desirable to have graduate students in close proximity to the laboratories.

END

Routing:
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integrus ARCHITECTURE

MEETING MINUTES

TO: The File

FROM: Daniel Gero, AIA
Project Architect/Designer

DATE: April 12, 2018

SUBJECT: Minutes of Workshop 1 – Nursing and Medical School
Held March 28, 2018
WSU Vancouver Life Sciences Building Pre-design
WSU Project No. 9748-2018
Integrus Project No. 21804.01

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Shelly Fritz, WSU Vancouver, College of Nursing
Dawn Garson, WSU Vancouver, College of Nursing
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The following is a record of the author's understanding of comments made and direction given. Written clarifications or corrections should be directed to Integrus Architecture within seven days of the date of publication of these minutes.

Linda Eddy noted that both Nursing and Medicine have accreditation requirements for provision of equitable facilities across multiple campuses. For example, the Vancouver Nursing facility should have the same provisions that are seen at WSU Spokane. However, different tracks are taught at the two locations so the physical requirements for space will be slightly different. Spokane teaches prelicensure Nursing which focuses on basic assessment whereas student in Vancouver already have an RN and are working towards a BSN or Doctor of Nursing.

Medical Program

I. Administrative and Faculty space
   A. Office for Associate Dean Kevin Murray
   B. Flexible office for temporary assignment or itinerant use
   C. 2-3 Workstations for part-time faculty clinicians
II. Study and laboratory space for medical students only.
   A. Required for accreditation
   B. 24-hour access to lockers and coat racks
   C. Study & Lounge for 10-12 people
   D. Classroom for 20 people

III. Library Room 240 is currently being renovated for this use, so this space may not be needed in new Life Sciences building.

College of Nursing

I. A Standardized Patient Clinical Laboratory is needed to teach scenario-based learning.
   A. Existing assessment space is too small for 14 current students.
   B. Central area within the laboratory could be flex space with classroom seating. Outpatient assessment areas with exam tables should be located around the perimeter.
   C. 25 typical Nursing students are anticipated including growth. Current class size is 15-18.
   D. 35-40 students during collaborations with Medicine or Psychology. There is a strong desire to encourage inter-campus collaboration to grow research and improve community outreach.
   E. Need multiple digital screens on multiple teaching walls
   F. 2-3 Smaller, flexible rooms should be located around the edges of the Standardized Patient Clinical Laboratory for activities that require privacy or the ability to test student skills in a simulation environment.
      1. For example, pelvic and prostate exams are part of the curriculum.
      2. Recording equipment is needed for playback learning within one of the rooms
      3. Provide observation space with one-way glass into one of the small rooms
      4. There was interest in the ability to mock-up an in-home environment within one of the perimeter rooms. This set up might be helpful in scenarios practicing the use of Telehealth, which is a growing area within the field.
      5. Lots of adjacent storage is needed to secure expensive equipment and mannequins used within the laboratory.
      6. A place to sanitize and securely store Telehealth equipment is also needed. Sanitization is bleach based.
         a. This equipment is typically deployed from the Pullman campus but is sometimes returned to the Vancouver campus where is needed to be cleaned and stored for future use.
         b. Use of Telehealth equipment is increasing and there is a desire to be able to deploy equipment from WSU Vancouver in the future.

II. 12 faculty offices

III. 3 or 4 Administrative workstations

IV. There is large demand for AMS rooms with cameras and teleconferencing capability.
   A. 15 students typically
   B. There are not many AMS rooms available on campus in the 20-person size range.
   C. How much should this project anticipate high-tech teaching tools of future?
      1. Computer science, data analysis, and bio-feedback usage will increase in the future, requiring massive data storage and infrastructure.
         a. Hard storage server room: 400 sf +/-
         b. Needs to be HIPA compliant, secure and private
         c. Secure data storage needs are currently provided within the Engineering Building on campus.

Research Program

I. Provide interdisciplinary collaborative grant-management space
   A. Undergrads and graduates should be located together
   B. Offices and meeting rooms for digital conferencing across state should be incorporated

END

Routing:
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MEETING MINUTES

TO: The File

FROM: Daniel Gero, AIA
Project Architect/Designer

DATE: April 12, 2018

SUBJECT: Minutes of Workshop 1 with the Pre-design Steering Committee
Held March 28, 2018
WSU Vancouver Life Sciences Building Pre-design
WSU Project No. 9748-2018
Integrus Project No. 21804.01

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Parties in Attendance:
Lynn Valenter, WSU Vancouver, Vice Chancellor
Bill Hooper, WSU Vancouver, Associate Vice Chancellor for Facilities Services
Christine Portfors, WSU Vancouver, Associate Vice Chancellor, Neuroscience / Biology
Linda Eddy, WSU Vancouver, Director & Associate Dean, College of Nursing
Amy Wharton, WSU Vancouver, Director & Associate Dean, College of Arts and Sciences
Allison Coffin, WSU Vancouver, Associate Professor of Neuroscience
Marc Kramer, WSU Vancouver, Associate Professor of Environmental Chemistry
Jason Baerlocher, WSU Facilities Services
David Van Galen, Integrus Architecture
Becky Barnhart, Integrus Architecture
Daniel Gero, Integrus Architecture
Burcin Moehring, Integrus Architecture

The following is a record of the author's understanding of comments made and direction given. Written clarifications or corrections should be directed to Integrus Architecture within seven days of the date of publication of these minutes.

Two meetings were held with the Pre-design Steering Committee on March 28, 2018. The first took place before a series of workshops also held that day with other subcommittees; the second took place after them. The purpose of the meetings was to identify WSU Vancouver's goals for a new Life Sciences Building, thereby forming the basis for the Pre-design effort.

First Meeting – Preview of Day's Discussion

I. Lynn noted that a Master Planning effort is taking place concurrently with the Pre-design Study, and that the Master Plan shall reflect the siting recommendations of this Study, not the other way around.
II. Jason noted that the purpose of today's workshops is to identify problems and challenges that we hope to solve through the development of a new facility, not so solve the problems themselves.
III. Becky stated that the Design Team's hope for these workshops is to hear from the members of the steering committee and faculty sub-committees to develop a clear

understanding of their goals. She and Burcin then presented an overview of the Pre-design process, specifically geared toward forward-thinking design of university science facilities.

IV. Following the presentation, the group generated a list of goals for a new facility, as well as amenities it could include. These should be addressed in the Pre-design Study:
- A. A functional vivarium
- B. Unification of science disciplines. These are currently distributed in several buildings on campus. Bringing them together in one building would foster interdisciplinary collaboration and provide an economy of shared resources.
- C. Teaching laboratories that will attract students.
- D. Research laboratories that will attract new faculty – both wet and dry.
- E. High functioning standardized clinic space and practice labs, located for interaction with other science programs, especially medical sciences.
- F. Space that would address Medicine's accreditation needs.
- G. Collaborative research space with teleconferencing.
- H. An "incubator" space for entrepreneurial science programs involving the university and local community
  1. Includes a laboratory or "maker" space
  2. Serves student start-up companies
  3. Examples of model incubator spaces:
     - a. Engineering building
     - b. Everett campus
     - c. CID Bioscience
     - d. Nursing building on Pullman campus
- I. Adequate laboratory storage and other amenities

V. Various building sites were identified for analysis by the Design Team.
- A. Site 1 – North of Clark Center / West of the Mt St Helens View Corridor.
  1. An advantage of this location is that it is adjacent to the Science Building and the Clark Building, which could be adapted to house Nursing if it were to be purchased by the University.
  2. Visibility from the parking lot to the east would provide clear wayfinding.
  3. Infrastructure would only need to be incrementally increased.
- B. Site 2 – North of Engineering & Computer Science Building / east of the Mt St Helens View Corridor.
  1. Advantages of this location include:
     - a. Adjacency to the Computer Science program for analysis and modelling of Life Sciences' research data, as well as potential for greater collaboration.
     - b. The slope of the site could accommodate a bermed lower level vivarium, where it would have direct vehicular access while being relatively out of sight.
- C. Site 3 – Northeast of Engineering & Computer Science Building / further east of the Mt St Helens View Corridor.
  1. This site's distance from the View Corridor would give it a background presence relative to other buildings. Its adjacency to future parking would have some advantages as well.

VI. Project milestones were reviewed
- A. April 24, 2018 - Next meeting of the WSU Steering Committee with the Design Team, to include:
  1. Presentation of content for review and comment
  2. Attendance by consulting Civil and Mechanical Engineers
  3. Two hour open-house in the morning

4. Steering Committee meeting in the afternoon

B. May 8, 2018 – Presentation of Pre-design study to Cabinet
C. May 9, 2018 - Presentation of Pre-design Study to Steering Committee.
D. July 01, 2018 - Pre-design Study submittal deadline to State of Washington

Second Meeting – Summary of What We Heard

I. Following the day's workshops with faculty subcommittees, the Design Team reconvened with the Steering Committee to summarize findings. Daniel presented an initial list of salient common desires that had been voiced in more than one meeting, and the group refined it into the items that follow.

A. Create the opportunity for inter-disciplinary spontaneous interaction and collaboration at all levels: faculty, post-doctoral, graduate, undergraduate.
B. Flexible, adaptable research laboratories, with the ability to apply specialized environmental controls in small rooms for side experiments or storage.
C. Adequate grad student offices and lounges, with adjacency to laboratories, faculty offices, scholastic lounges with refreshments
D. Small group study space (backfill?)
E. "Incubator" space for community engagement
F. Exterior access and storage for field research
G. More vivarium spaces
H. Expanded greenhouse and protected outdoor experimentation/demonstration space
I. Science on display to pique undergraduate interest, visibility of laboratories where appropriate
J. Sensitivity to privacy of some programs – animal research, psychology, etc.
K. Availability of large scale digital data collection and storage
L. 20-person meeting room, general conference rooms with digital teleconferencing (review utilization for global campus compatibility – AMS [Academic Media Services])
M. Shared major instrumentation facility with satellite instrumentation rooms
N. 24 station teaching laboratories
O. Division of teaching laboratories to prevent contamination, with appropriately compartmentalized preparation rooms
P. Adequate back-up power

END

Routing:
Jason Baerlocher, WSU Facilities Services
Becky Barnhart, Integrus Architecture
David van Galen, Integrus Architecture
Burcin Moehring, Integrus Architecture
Ross Jarvis, SCJ Alliance
Geoff McMahon, AEI Affiliated Engineers
Dean Eriksen, AEI Affiliated Engineers
Polly Thrall, AEI Affiliated Engineers

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MEETING MINUTES

TO: The File

FROM: Daniel Gero, AIA
Project Architect/Designer

DATE: April 12, 2018

SUBJECT: Minutes of Workshop 1 – Teaching Laboratories
Held March 28, 2018
WSU Vancouver Life Sciences Building Pre-design
WSU Project No. 9748-2018
Integrus Project No. 21804.01

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Adenike Otoikhian, WSU Vancouver, Chemistry, CAS
Chris Jaynes, WSU Vancouver, Chemistry
Joshua Olson, WSU Vancouver, Instructional Laboratories
Chuck Harrsch, WSU Vancouver, Information Technology
Mike Berger, WSU Vancouver, Biology
Dawn Freeman, WSU Vancouver, Biological Sciences, School of the Environment
Gretchen Rollwagen-Bollens, WSU Vancouver, Biological Sciences, School of the Environment
David Van Galen, Integrus Architecture
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Daniel Gero, Integrus Architecture
Burcin Moehring, Integrus Architecture

The following is a record of the author's understanding of comments made and direction given. Written clarifications or corrections should be directed to Integrus Architecture within seven days of the date of publication of these minutes.

I. Chemistry
   A. Existing chemistry laboratories (organic chemistry and general) do not currently have enough hood space.
   B. Individual student hoods are desirable throughout the laboratory for hands-on-teaching.
   C. Organic and General Chemistry laboratories typically have 24 students.
   D. WSU is planning to offer a BA degree in chemistry, which will increase popularity of an already popular subject.
   E. Chemistry laboratory usage is 160% of standard.

II. Biology
   A. Introductory biology laboratories could be utilized for early undergrad exposure to the laboratory experience using the CURE approach (Course-based

Undergraduate Research Experiences). This approach has worked well for students with non-traditional and diverse backgrounds.

B. Flexible laboratory space would serve off-campus students in mentored research.

III. Configure workspace/benchspace for easy interaction with students. Island benches, with teaching walls on all sides, for example

IV. Staging in prep area (room 110) should be 3x larger than current, and should accommodate 3 occupants preparing experiments.

A. If this were more than one space it would need an additional person to manage.

B. A centralized inventory room would economize purchasing and dispensing.

V. Room 101 is overutilized by too many disciplines. Dawn is going to write down which laboratories work well together and provide that information to the design team for future consideration.

VI. Chemistry laboratories and storage should be located on an upper floor for fire safety. Synergistically, this locates required exhaust closer to roof.

VII. The stock room should be adjacent to a laboratory.

VIII. The Ideal physics laboratory would have a black-out space.

IX. A back corridor is recommended for circulating chemical carts, connecting preparation/storage areas to laboratories. This reduces conflict/safety concerns resulting from circulating laboratory carts in corridors with general building users.

X. Provide separate storage areas for aquarium supplies, field equip, geology, chemicals, biological samples, etc., so that equipment and supplies do no contaminate one another.

XI. Additional 20-person AMS (Academic Media Services) classrooms are needed on campus.

XII. A shared instrumentation laboratory with satellite rooms should be considered.

END

Routing:
Jason Baerlocher, WSU Facilities Services
Becky Barnhart, Integrus Architecture
David van Galen, Integrus Architecture
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Ross Jarvis, SCJ Alliance
Geoff McMahon, AEI Affiliated Engineers
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Polly Thrall, AEI Affiliated Engineers

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MEETING MINUTES

TO: The File

FROM: Daniel Gero, AIA
Project Architect/Designer

DATE: April 12, 2018

SUBJECT: Minutes of Workshop 1 – Neurology and Biosciences, regarding the vivarium
Held March 28, 2018
WSU Vancouver Life Sciences Building Pre-design
WSU Project No. 9748-2018
Integrus Project No. 21804.01

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Parties in Attendance:
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Barb Sorg, WSU Vancouver, Neuroscience
Allison Coffin, WSU Vancouver, Neuroscience
Jonah Piovia-Scott, WSU Vancouver, Biology
Cynthia Cooper, WSU Vancouver, School of Molecular Bioscience
David Van Galen, Integrus Architecture
Becky Barnhart, Integrus Architecture
Daniel Gero, Integrus Architecture
Burcin Moehring, Integrus Architecture

The following is a record of the author's understanding of comments made and direction given. Written clarifications or corrections should be directed to Integrus Architecture within seven days of the date of publication of these minutes.

I. Zebrafish Laboratory 1 (Cynthia Cooper, VSCI 210)
   A. Could be combined with Allison Coffin's zebrafish in other building
   B. Current space is adequate but was originally retrofitted from a storage room.
      1. Additional space would be needed for expansion if grants are received
   C. Flooding is a problem
      1. Caused by tank feeds left out of tank
         a. Occurs as a matter of course, just need functional floor drain
   D. Adequate back-up power for life-supporting systems is needed or research is lost, even during routine shut-downs.
   E. Need quarantine room for contaminated specimens.
      1. Embryos are bleached prior to being brought into the main colony.
      2. Bringing in new larvae takes approximately 5-6 months.
      3. Quarantine room would allow new specimens to be brought in more quickly, effectively increasing research capacity.

II. Amphibian Laboratory (Jonah Piovia-Scott, VSCI 219)
   A. Space too small, 3-4x current size would be adequate

B. Adequate back-up power needed for routine shut-downs
   1. Currently only one backup generator for campus. Need to investigate potential need to increase generator capacity to support research on campus.
C. Specialized Climate control
   1. Temp and humidity
   2. Separate environmental chambers for experiments (15 degrees Celsius)
D. Biosafety
   1. Quarantined sensitive biological conditions
   2. Provide BSL 2.
   3. Other campus laboratories will be Level 1 or 2. There are no Level 3 or 4 laboratories on campus.
E. Provide separate access for spaces used by others such as a shared cold room.
F. Researchers collaborate with WSU Pullman campus. Experiments are conducted in Vancouver, samples are run in Pullman.

III. Zebrafish Laboratory 2 (Allison Coffin, VCLS 320)
   A. Current space is adequate
   B. Could expand into other species (juvenile salmon or midshipman fish)
      1. Several smaller flexible aquatic spaces w climate control for other species
   C. Sharing space with other zebrafish program would be ideal to maximize efficiencies inherent in proximate locations. Currently hand-cleaning tanks

IV. Mouse Laboratory (Christine Portfors, VCLS 317B)
   A. Currently have one room for all the mice on campus.
   B. Need quarantine to accommodate genetically modified animals or animals from other institutions.
   C. Multiple rooms for housing mice would be ideal.
   D. Separate food storage, bedding storage/disposal, cage wash (clean/dirty storage) into dedicated spaces. These needs are currently accommodated in the same space where mice are kept.
   E. Provide surgical space in individual vivaria.
   F. Elevator access should be design with security and visibility in mind.
   G. Complaints about rodent smells and transporting of animals have occurred.

V. Rat Laboratory (Barb Sorg, VCLS 317A)
   A. Also works on Pullman campus in Biotech Building
   B. Chronic testing rooms and lab equipment rooms are needed. Some testing occurs in 20-minute increments, so it is difficult to accommodate the various cycles in the current facility.
   C. Provide separate breeding room (male and female rats are currently housed together)
   D. Provide sinks in every room, but especially in holding rooms.
   E. Provide air distribution for individual cages
   F. Acoustic isolation is important. Current facility has a separate acoustic chamber to accommodate studies.

VI. General comments
   A. Campus has never had dedicated, specialized animal space. Current spaces have all been retrofitted.
   B. Ideally, a loading area with appropriate security and visual screening should be provided.
   C. Consider vertical organization with cleaning in basement
   D. Provide acoustic separation between laboratories

1. Sound from behavioral experiments can cause interference

E. Want to double number of researchers
   1. Doubled area of space is not necessarily needed
   2. Flexible rooms with the ability to have climate control should be incorporated. These spaces could be modified over time to accommodate different species with small scale renovations.

F. Vivarium is strictly for research, not teaching.

G. Desire work area for tracking animal inventory, etc.

END

Routing:
Jason Baerlocher, WSU Facilities Services
Becky Barnhart, Integrus Architecture
David van Galen, Integrus Architecture
Burcin Moehring, Integrus Architecture
Ross Jarvis, SCJ Alliance
Geoff McMahon, AEI Affiliated Engineers
Dean Eriksen, AEI Affiliated Engineers
Polly Thrall, AEI Affiliated Engineers

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MEETING MINUTES

TO: The File

FROM: Daniel Gero, AIA
Project Architect/Designer

DATE: May 14, 2018

SUBJECT: Minutes of Workshop 1 – All Sciences
Held April 24, 2018
WSU Vancouver Life Sciences Building Pre-design
WSU Project No. 9748-2018
Integrus Project No. 21804.01

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Parties in Attendance:
Lynn Valenter, WSU Vancouver, Vice Chancellor
Bill Hooper, WSU Vancouver, Associate Vice Chancellor for Facilities Services
Jason Baerlocher, WSU Facilities Services
Jean Duffett, WSU Facilities Services
Dennis Giles, WSU Facilities Services
David Zilavy, WSU Facilities Services
Becky Barnhart, Integrus Architecture
Daniel Gero, Integrus Architecture
Burcin Moehring, Integrus Architecture
Bruce McLay, Affiliated Engineers, Incorporated (MEP)
Ross Jarvis, SCJ Alliance (Civil)

The following is a record of the author's understanding of comments made and direction given. Written clarifications or corrections should be directed to Integrus Architecture within seven days of the date of publication of these minutes.

I. Becky reviewed goals and timeline.
II. Jason gave a brief overview of the predesign process.
III. Daniel distributed 11x17's showing three site options showing existing utilities. Also presented three architectural schemes corresponding to the sites that were identified in the previous Steering Committee meeting.
   A. Scheme 1 – the "Science Courtyard" scheme - is an L-Shaped building immediately north of computer sciences, connected to it by a sunken plaza.
   B. Scheme 2 – the "Science Corridor" scheme - is an east-west oriented bar building, also north of computer sciences, connected to it by a sunken plaza, but situated further east of Scheme 1.
   C. Scheme 3 – the "Science Connection" scheme – is located north of existing Clark Center.
IV. Discussion on the site options/schemes above:

A. Dennis – 2" gas line from St. Helens corridor comes into VECS (Engineering & Computer Science) where sunken plaza is shown in schemes 1 & 2. Electrical service is between VECS and VPB (Physical plant). Chilled and domestic Water might be coming into the north side of VECS.

B. First plan is reflective of Master planning concept of subordinate quads. (Not all plans reflect parking).

C. Lynn noted that physical proximity to VECS is not as strong; computer science is not considered traditional sciences.

   1. Jean – It may depend upon whether the quantitative skills center moves. If it moves into the new facility there could be a stronger tie.

D. Jean has an interest in how buildings are accessed, which can be challenge on this campus. Parking and accessible ADA parking is abundant in the north lot.

E. Bill Hooper noted that accessible entrances should not be perceived as back doors to the building.

F. Bill noted that the building's siting and footprint should consider that of the building that comes next. Daniel talked through how all three schemes do that, based on the masterplan concept of hierarchical open spaces along the Mt St Helens corridor.

G. Dennis – Main utilities are in Mt St Helens corridor. In past developments, the chilled water line was updated as it was extended.

H. Bruce – Direct buried utilities are interspersed with vaults in the existing conditions. Future distribution must consider whether an existing vault can be used or whether a new one is needed?

I. It was noted that there are plans for a future loop on chilled water, and there is concerned about condition of three original chillers.

   1. Bruce – when they studied capacity there was a high level of diversity of use. There should be plenty of chilled water capacity on campus. The question is whether to replace a 750 ton unit in order to provide redundancy.
   2. Lynn noted that the PAE study was prompted by this concern. The entire campus had 900 ton capacity including existing science building. Capacity was added, but not as much as was originally anticipated. Currently have 1650 ton capacity.
   3. Dennis note concern for long term maintenance, viability, and reliability of existing chillers, and Bill stated they are interested in long term viability. The units have "blind flanges," which increased their serviceability.
   4. Lynn feels capacity is adequate. Bruce stated the most demanding building might take 300 tons. On a 100 degree day might be up to 1200 tons based on current demand.
   5. Jason – WSU should look at long term maintenance and viability.
   6. Bill would prefer to get rid of a unit. Development of a new building offers the opportunity to improve the infrastructure. Lynn thinks it's wiser to upgrade existing units, wants to explore ramifications of upgrading existing chilled water plant.
   7. Dennis asked if there is an option for a process water chiller in the buildings. Numbers 1 and 2 are 23 years old. Number 4 is from 2002/2004, and is a more efficient chilled water. How much can we increase capacity with existing feed? Number 4 will accommodate VFD's. Others can't handle this.
   8. Bruce says 300 per ton. Order of magnitude is $200,000 to $300,000.

9. Bill can provide additional information on gas line and chilled water line locations. Jason emailed IA as-builts for VCES during the meeting.

J. Bill likes efficiencies of courtyard for removing waste and servicing utilities. WSU hauls waste.

1. *Bags are brought to facilities. Use utility quad and move a 2 yard dumpster with waste. Recyclables bagged and hauled and stored at Facilities. Hazardous materials – small golf cart pick up. WSU delivers to each lab individually. Not a central storage area. Gas cylinders are contracted. Per Bill, one of largest nuisances is animal waste. These cans bring materials by vacuum to the dock. For animal waste would be good. On this campus.*

V. Utility metering was discussed.

A. Electrical

1. Dennis - Meter down to sub distribution panel if there is specific research that might require a lot of power. WSU has a Schnieder system. Metering down to electrical panel would be preferred.

B. Water

1. Dennis – It would potentially be desirable to meter down to laboratories. to encourage good choices or conservation; DI and RO water would be possible.
   a. Lynn – This is the right approach to metering.
   b. Dennis – meters can also be used to target leaks.
2. Chilled water both is gas and electric. Electrical system has software that reports back to control room. Gas system requires physically going to each building to take readings. There is a master meter but it doesn't take readings at each building. Sewer meters take readings going off site. *Domestic into boilers (make up water).* Irrigation system has separate meters.
3. Lynn's understanding is that we meter to control use or charge back, and that WSU can get cost coverage from federal government to cover utilities instead of charging the individual researchers. *Bill asked about maintenance of systems. Can't charge federal government. Per Lynn only add on costs for maintenance only on specialized equipment.*
4. *Dennis – Some buildings have LEED reporting.*
5. It was noted that there are currently a number of fume hoods that are not really in use, as well as a lot of equipment that needs chilled water. This should be avoided.
6. *Building management is Allerton or Siemens.*
7. *Chilled water meter flow in and flow out. Bridge tender at each building depending on demand. Square D. Have an MEP specifications sheet from ECS building. Capital should have it. Jason will package up all of science building.*
8. Fire system is Simplex. Dennis noted concern over proprietary system. WSU is open to a third-party system or an open system. *Fully addressable system. Have a dialer at Physical Plant. All campus reports to that unit. Pullman has had nothing but problems with Siemens into the simplex per Jason.*

VI. Sustainability goals

A. Jason noted that there is an exemption to the LEED Silver requirement.

B. The primary goal in WSU's strategic plan is diversity.

C. Lynn – storm water should have more emphasis. *Integrating it. There is no interest in purchasing points.* In general, solutions and philosophies incorporated into the building should be sustainable.

D. *We* will fill out a rough LEED checklist as part of the predesign process.

E. WSU has some interest in the use of a chilled beam system. Bruce noted this could be considered in the Life Sciences building, but that the ventilation demands in the Vivarium are too high. This would be true for fume hood dense buildings as well.

VII. General notes:

A. There is a new pumped sewer station on NE 50th Ave, with force main on the access road to the loop. This is a BPA line that runs down the right of way.

B. There will be 4" dark fiber conduit coming from NE 50th Ave which needs to get to the view corridor.

C. *Irrigation well…have a plate to plate heat exchanger. Have looked at geothermal cooling*

D. Existing classrooms have CAT 6 E fiber optic cable. Michael Stamper (IT) is on the steering committee. ECS runs on its own network, a GPON system.

E. The County has a requirement for quantity of parking stalls. Contact Don Hardy.

F. The DRAFT Master Plan will be done in July 2018. It will contain no new *DIS*.

G. This Predesign Study shall conform to the previous storm water manual. *We will voluntarily comply with new regulations but will grandfather-in the calculations. Redevelopment provisions in current code – WSU Vancouver is grandfathered.*

H. Ross – The Mt St Helens view corridor provides fire truck access. Various site alternates might need to provide additional access or extend around the buildings.

I. A 45' boom lift is used to service existing buildings for washing windows, servicing gutters, cleaning, etc.

J. Emergency Power.

1. The generator is adequately sized, but cable and infrastructure is not. The plan has been to increase it.
2. There are 2 generators. *One for life safety CAT 350 and then a 1000KW outside building (main). Have to keep an eye on number of emergency circuits go into a building. Have to keep within 350 kw on wire. Have transfer switches at each building Life safety and then there is optional load. Cabling to each building and coming from generator itself has been the problem. Upsize at plant occurred when it "t" to go north.*

END

Routing:
Jason Baerlocher, WSU Facilities Services
Becky Barnhart, Integrus Architecture
David van Galen, Integrus Architecture
Burcin Moehring, Integrus Architecture
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integrus ARCHITECTURE

MEETING MINUTES

TO: The File

FROM: Daniel Gero, AIA
Project Architect/Designer

DATE: May 15, 2018

SUBJECT: Minutes of Workshop 1 with the Pre-design Steering Committee
Held March 28, 2018
WSU Vancouver Life Sciences Building Pre-design
WSU Project No. 9748-2018
Integrus Project No. 21804.01

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Parties in Attendance:
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Christine Portfors, WSU Vancouver, Associate Vice Chancellor, Neuroscience / Biology
Linda Eddy, WSU Vancouver, Director & Associate Dean, College of Nursing
Amy Wharton, WSU Vancouver, Director & Associate Dean, College of Arts and Sciences
Allison Coffin, WSU Vancouver, Associate Professor of Neuroscience
Marc Kramer, WSU Vancouver, Associate Professor of Environmental Chemistry
Michael Stamper, WSU Vancouver, Campus CIO, Information Technology
Jason Baerlocher, WSU Facilities Services
Becky Barnhart, Integrus Architecture
Daniel Gero, Integrus Architecture
Burcin Moehring, Integrus Architecture
Bruce McLay, Affiliated Engineers, Incorporated (MEP)
Ross Jarvis, SCJ Alliance (Civil)

The following is a record of the author's understanding of comments made and direction given. Written clarifications or corrections should be directed to Integrus Architecture within seven days of the date of publication of these minutes.

I. Project Goals discussion:
   A. Lynn asked that faculty office space be added to the list of goals for the project.
      1. Whole unit doesn't need to relocate. Need faculty office space in proximity to teaching labs, etc.
   B. Add specialized classroom partnering with lab experiences for hands-on-stem education - hybridized classroom and research space.
   C. Lynn – Number's 1-4 are non-negotiable.
   D. Incubator space could be back-filled and easy to fund-raise, could be a wish list item.
   E. Goal 4 should say, "Research laboratories (wet and dry) including flexible and adaptable instrumentation that attract and retain new faculty."

F. Linda – Medical School is captured by Goal 7, "Acknowledging the role of graduate students.
   1. Nursing wants inter-professional interaction between Nursing and Medical.

II. The group collaboratively worked the program Space List to arrive at the attached. Salient direction from the group is summarized as follows:
   A. Priority #1:
      1. New teaching labs
         a. (1) nursing simulation
         b. (2) chemistry/physics
         c. (3) biology/environmental sciences
   B. Priority #2:
      1. Vivarium
         a. Christine: need to identify spaces that should be included in the vivarium that current are not.
         b. Christine would like everyone to vet the total size of vivarium space.
            1) IA will send an updated list
         c. Which researchers need to be in the building?
            1) Those who have research already in the Vivarium.
            2) Marc – 4-6 researchers.
         d. Vivarium – 750 sf each
   C. Neuroscience/Biology:
      1. 6 current vertebrate animal users. Ideally 10 people utilizing vertebrate animals: Coffin, Cooper, Sorg, Portfors, Morgan, Piovia-Scott. 4 additional would be for future researchers.
   D. Lynn's tally:
      1. Teaching labs – 7,000 sf
      2. Vivarium – 6,000 sf
      3. Research – 15,000
         a. 10 vertebrate Vivarium Labs at 750 sf each
         b. 10 biology/environmental science Labs at 750 sf each
   E. Psychology will not be included. It spaces are ideal for backfill.
   F. A two-hour conference call with this group will be held on Tuesday, May 1 at 9 am to 11 am. These revisions will be incorporated and collaborative refinement will continue.

III. Daniel presented three architectural schemes corresponding to the sites that were identified in the previous Steering Committee meeting.
   A. Scheme 1 – the "Science Courtyard" scheme - is an L-Shaped building immediately north of computer sciences, connected to it by a sunken plaza.
   B. Scheme 2 – the "Science Corridor" scheme - is an east-west oriented bar building, also north of computer sciences, connected to it by a sunken plaza, but situated further east of Scheme 1.
   C. Scheme 3 – the "Science Connection" scheme – is located north of existing Clark Center.

IV. Discussion on the site options/schemes above:
   A. Courtyard scheme. First groups leaned more towards site 1 and site 2.
   B. Allison Coffin – Greenhouse on ground level is more desirable.
   C. Lynda likes corridor scheme because it flows better.
   D. Both schemes (courtyard and corridor) can show off greenhouse as a learning tool.

E. A covered outdoor storage area/research space with fence is needed. Must be secure and partially covered. 8 faculty had identified as a need. More of a service area than a show area.

F. Scheme 2 – the "Science Corridor" scheme – is preferable.
   1. Bill Hooper mentioned that daylighting in the area between the two buildings should be studied
   2. Bill also noted the possible shared service areas is between existing VECS and the proposed scheme would be desirable.
   3. Marc noted that outdoor circulation continuity between proposed building and VSCI should be developed for researchers with carts.

END

Routing:
Jason Baerlocher, WSU Facilities Services
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E

update to academic programs plan

Update to Academic Programs Plan
Fall, 2016

Introduction: In Fall 2014 a year-long academic planning process undertaken with the help of Penson Associates consulting was completed, resulting in a plan for 8 new degrees to be developed in the short- mid- and long-term. Since that time progress has been made on degree development, and some degree programs have been developed at the WSU system level, changing the Vancouver campus plans and timelines for implementation. It is timely, therefore, to provide an update incorporating these changes, and addressing the call in the newly-adopted campus strategic plan to 1. implement the academic plan on a defined schedule; 2. consider new degree program opportunities arising outside of the existing academic plan.

The Penson report included three main elements: 1. a projection of current degrees with high and medium grown potential; 2. a list of high-demand majors offered by WSU but not currently offered at Vancouver, identified through national and local survey data; 3. 8 new degrees to be developed for implementation at Vancouver.

1. Growth in current degrees with high potential

The Penson report identified existing degree programs which have high or medium potential for growth. The following chart details the number of degrees granted in each of these degrees 2013-2015. While the overall trend is toward growth, with 6% more degrees granted across all bachelor's and master's programs in 2015 over 2013, there was not a significantly higher rate of growth in the identified high potential and medium potential programs. The group of identified high potential programs grew 4.8% overall, while the medium potential programs grew 6.7%. Two programs in the high potential group do show significant and consistent growth in this period: BS Electrical Engineering and BS Mechanical Engineering. In the medium potential group only the BA in Digital Technology and Culture shows consistent and significant growth.

Number of Degrees Granted	Academic Year				
	2013	**2014**	**2015**		
High Potential					
BA in Business Administration	137	137	134		
BS in Electrical Engineering - Vancouver	19	31	33		
BS in Mechanical Engineering - Vancouver	38	44	53		
BS in Psychology	80	90	72		
Master of Business Administration	11	23	6		
MS in Mechanical Engineering	8	9	9		
Total	**293**	**334**	**307**	**2-Year Growth**	**4.8%**
Medium Potential					
BA in Anthropology	13	10	18		
BA in Digital Technology and Culture	38	40	56		
BA in Education	28	36	29		
BA in English	23	22	11		
BA in History	13	13	11		
BS in Biology	62	66	68		
BS in Computer Science - Vancouver	20	19	21		
BS in Earth & Environmental Science	0	0	6		
BS in Environmental Science	13	14	7		
MA in Anthropology	0	0	2		
MA in Education	1	0	0		
Master of Education	26	12	19		
Master in Teaching	32	23	38		
MS in Biology	0	0	1		
MS in Computer Science	1	5	4		
MS in Environmental Science	7	9	4		
MS in Mechanical Engineering	8	9	9		
Total	**285**	**278**	**304**	**2-Year Growth**	**6.7%**
Not Previously Identified for Growth Potential					
BA in Computer Science	1	0	0		
BA in Hospitality Business Management	0	0	3		
BA in Human Development	47	53	52		
BA in Humanities	12	13	16		
BA in Public Affairs	13	17	18		
BA in Social Sciences	112	83	106		
BA in Sociology	6	10	12		
BS in Neuroscience	0	2	5		
BS in Nursing	45	58	54		
MA in History	2	0	0		
Master of Accounting	8	6	6		
Master of Education (English Language Learners)	1	0	0		
Master of Nursing (APH)	0	1	5		
Master of Nursing (Comnty-Based/Pop Focused Care)	7	5	5		
Master of Nursing (Family Nurse Practitioner)	19	20	11		
Master of Nursing (Psych/Mental Hlth Nurse Pract)	10	4	0		
Master of Public Affairs	5	3	5		
MS in Zoology	0	0	1		
Doctor of Education	1	2	1		
Doctor of Education (Educational Leadership)	5	0	5		
Doctor of Nursing Practice (FNP)	0	0	2		
Doctor of Philosophy (American Studies)	0	0	1		
Doctor of Philosophy (Anthropology)	0	0	1		
Doctor of Philosophy (English)	0	0	2		
Doctor of Philosophy (Enviro and Nat Resource Sci)	0	0	1		
Doctor of Philosophy (Political Science)	0	1	0		
Doctor of Philosophy (Psychology)	0	2	0		
Total	**294**	**280**	**312**	**2-Year Growth**	**6.1%**

2. High-demand majors offered by WSU but not currently offered at Vancouver
The Penson report looked at national survey and local survey data and identified the most in-demand majors not currently offered in Vancouver as Communication, Chemistry and Mathematics.

In 2015-2016, proposals to extend the BA in Communication and the BS in Mathematics to Vancouver were approved by the Faculty Senate and the Board of Regents, then submitted to NWCCU for approval. Implementation of both majors is anticipated for Spring 2017.

In 2015-16, a BA in Chemistry was approved for the Pullman campus. The creation of the BA opens a pathway for Vancouver to extend the degree as it would not require the campus to add lab capacity, as would the existing BS degree; a feasibility study to extend the BA degree is currently underway.

3. 8 new degrees to be developed for implementation at Vancouver
The 8 new degree programs were divided into Near-term Implementation (2 years), Mid-term Implementation (4 years), and Longer-term Implementation (6 years). Because of developments internal to Vancouver and developments in the WSU system, the timeline has been adjusted.

Degree	Status	New proposed timeline
Near-term Implementation		
Master's in Mental Health and Human Services	still in development, with major changes to the format originally envisioned	Mid-term
MS Electrical Engineering	Approved by Senate & Regents spring 2016; awaiting NWCCU approval	Implement Spring 2017
Entrepreneurship major in the BA Business Administration	Proposal to extend the major to Vancouver approved by Senate & Regents spring 2016	Implement Fall 2016

Mid-term Implementation		
BS Software Engineering	Opportunity for a state budget funding request has arisen; proposal to create an option within Computer Science degree under development	Depending upon funding, proposal to be submitted 2016-17
BS Computer Engineering		remains unchanged
Longer-term Implementation		
BA Operations Analysis and Supply Chain	Opportunity for a state budget funding request has arisen; possible cooperation with Everett on delivery of degree. Proposal under discussion	Depending upon funding, proposal to be developed 2016-17, possible fall 2018 implementation
BS/MS Data Science	Degree developed with multi-campus participation. Approved for Pullman Spring 2016 (awaiting NWCCU approval). Existing degree has multiple options. One or more options may be extended to Vancouver	Possibly fall 2018 implementation
BS Environmental Engineering	Position funded through Grand Challenge reallocation to be located at Vancouver may jump-start this program	remains unchanged

Vancouver Strategic Plan 2016-2021

The new strategic plan calls for consideration of new degree program opportunities arising outside of the existing academic plan. The BA in Human Biology, a proposal developed in Pullman, is one such opportunity. If approved, it could easily be extended to Vancouver and would be attractive to students looking for a pre-med major.

See appendix.

Updated plan for new academic programs

The following chart represents the adjusted timeline for development and implementation of new degree proposals:

Degree	Status	Projected Implementation
Entrepreneurship major in BA Business Administration	Approved	Fall 2016
MS Electrical Engineering	Approved by Senate & Regents spring 2016; awaiting NWCCU approval	Fall 2017
BA Communication	Approved by Senate & Regents spring 2016; awaiting NWCCU approval	Spring 2017
BS Mathematics	Approved by Senate & Regents spring 2016; awaiting NWCCU approval	Spring 2017
BA Chemistry	Feasibility study to extend degree in process	Fall 2018
BA Human Biology	Proposal developed in Pullman to be submitted for approval	Fall 2018
BS Software Engineering	Opportunity for a state budget request has arisen; proposal to create an option within Computer Science degree under development	Depending upon funding, proposal to be submitted 2016-17; possible fall 2017 implementation
BA Operations Analysis and Supply Chain	Opportunity for a state budget request has arisen; possible cooperation with Everett on under discussion	Depending upon funding, proposal to be developed 2016-17, possible fall 2018 implementation
Master's in Mental Health and Human Services	still in development, with major changes to the format originally envisioned	Fall 2018
BS/MS Data Science	Degree developed with multi-campus participation. Approved for Pullman Spring 2016 (awaiting NWCCU approval). Existing degree has multiple options. One or more options may be extended to Vancouver	Possibly fall 2018 implementation
BS Computer Engineering		mid-term
BS Environmental Engineering	Position funded through Grand Challenge reallocation to be located at Vancouver may jump-start this program	longer-term

Appendix

Degree/minor/certificate proposals submitted

Degree/certificate	stage of process	Proposer	Timeline
Certificate and minor, Molecular Biosciences	proposal rejected by VCAA; currently being revised	John Bishop	resubmit Fall 2016
Certificate in Game Studies and Design	Currently under review	Dene Grigar	Resubmit Fall 2016

Potential new degrees/minors/certificates under discussion (not formally submitted or approved at any level)

Degree	Department(s)	Interested parties	Timeline
Professional Science and Technology Writing Certificate	ENGL	Wendy Olson	Approved for 2016 start
BS-Biology new option	SBS	John Bishop	Fall 17
BS-Zoology pre-med option	SBS	John Bishop	Fall 17
BS - Molecular Biology	SMB	John Bishop	2018 or later
Popular Culture minor	CCGRS	Luz Maria Gordillo	2017