OREGON HIGHER EDUCATION
COORDINATING COMMISSION

STRATEGIC CAPITAL DEVELOPMENT PLAN

SMITHGROUP | NCHEMS

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EXECUTIVE SUMMARY

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PURPOSE

The Oregon Higher Education Coordinating Commission (HECC) has adopted a visionary, strategic framework plan for advancing post-secondary goals for the state. It is within the context of this 2017–2020 strategic framework that this study was conducted to holistically review the capital needs of the State. The study's purpose is to develop a long-range planning process in support of these goals. As outlined in the solicitation documents, the state's higher education capital needs are expected to be driven by "demographic, economic, other environmental and industry factors" and this study serves to help guide the HECC evaluation of university-submitted capital project proposals. There is also the expressed expectation that this plan will promote cost-effective means to maintain and increase the utilization and productivity of existing capital assets and to be developed with input from key stakeholders.

To provide a high-level summary of state capital needs for public universities based on demographic, economic, industry, and other environmental factors

To identify potential future capital portfolio according to ideal usage and utilization

To estimate space needs for different disciplines, by degree levels and function, by region based on data availability

Developed in partnerships with public universities, stakeholdres, and legislators, with support from outside experts

This process was not intended to supersede the planning efforts of the individual governing boards and their campuses, but rather to provide a statewide perspective on capital needs. This process also did not involve a strategic planning exercise to assess the strengths of individual institutions nor does it address the strategic approach or specific project-based solutions for addressing statewide needs relative to each campus or how such initiatives might relate to future institutional roles and missions. However, as noted in the key findings and recommendations, the assessment of additional space needs for some campuses is, in fact, related to the alignment (or lack thereof) of potential new programs with issues of institutional role and mission and in relationship to state priorities.

The findings that follow were drawn from an extensive data collection effort, including but not limited to:

- Analysis of Oregon's institutions' space inventories and usage
- Aggregate data supplied by HECC on student enrollments
- Publicly available data
- Two statewide tours involving each campus, which included focus groups with institutional leaders, representatives from local education and employer communities, and facility tours.

KEY FINDINGS

1. Achieving the 40% goal of baccalaureate and above in the 40-40-20 plan is not dependent on significant capital investments in new physical facilities, but investments in capital renewal may accelerate progress toward that goal by addressing deficiencies in existing facilities

Oregon is more highly educated than the nation as a whole, with over 34% of residents in 2017 having a bachelor's degree or better. Based on population trends—aging and migration especially (where Oregon benefits from attracting college-educated residents from elsewhere)—Oregon is on a path to achieving its goal of having 40% of the population with a bachelor's degree by 2030. Achieving that level of educational attainment level by Oregon's stated target of 2025 is likely not significantly improved by substantial new investments that would take years to come online before the first students (who themselves will take time to complete a baccalaureate degree) would be impacted. Educational attainment and income go mostly hand-in-hand throughout Oregon, with higher levels of both occurring in the Portland metro area and in Benton and Deschutes counties.

However, it should be noted these data stand in stark contrast to Oregon's low high school graduation and college-going rates direct from high school, relative to the U.S. And at 24 percentage points, Oregon faces a larger-than-average gap in the educational attainment of underrepresented racial/ethnic minorities, an issue compounded by the growing diversity of high school graduating classes.

2. Enrollment history and future demographics do not forecast statewide capacity issues

As the following sections describe in greater detail, Oregon's population is aging relatively rapidly while also growing more diverse. Statewide, Oregon is anticipating relatively modest growth of about 5–7% among people with ages below 35, while larger percentage increases are expected at older ranges (apart from the 55–64 year old group), and especially among those 65 and older. Projecting out the number of high school graduates yields a small increase by 2025 before the number drops substantially. At no point in the years to come can Oregon confidently expect the number of high school graduates to exceed the 2009 peak of over 38,000, although a short-lived spike in 2025–2026 will come close to equaling it. This modest growth does not warrant significant capital expansion for two reasons. Practically speaking, it remains to be seen if any capital projects, if funded in the near term, could be brought on-line and occupied in time for the peak demand mid-decade. More importantly, though, it stands to reason that any short term enrollment peaks could be handled primarily through scheduling and staffing strategies in lieu of capital construction that will have long term, life cycle costs far exceeding the brief period of need. In fact, most campuses have more space in 2019 than they had in 2009.

In terms of additional enrollment potential, Oregon already boasts relatively high participation rates of adults compared to other states , though improvement is certainly possible. Further, Oregon can expect the number of likely college students from traditional age groups to remain relatively stable over the next decade.

However, the statewide view obscures some important regional variation. Most notably is the growth that has occurred in Central Oregon, where Deschutes County is the only part of the state with unusually large population increases in the most recent decade, and which are likely to continue. More modest growth occurred in the Portland metropolitan area, while the eastern and southern parts of the state saw their populations decline.

In general, all of these population changes mirror the statewide trend in which increases will be greatest among older residents and, to a lesser extent, middle-age ranges, including in Central Oregon. As this pertains to enrollment planning, though, there is only modest and temporary growth anticipated for the typical college aged students.

In combination with the project team's modeling efforts, Oregon's population trends indicate that demand for undergraduate enrollments is unlikely to change dramatically in the years ahead, assuming no major change in participation rates of recent high school graduates or adults. Statewide, Oregon's public four-year institutions are projected to see very little change in FTE enrollments between 2018–19 and 2029–30, peaking with just over 1,800 additional FTE in 2025–26 before experiencing a rather abrupt decline over just a couple of years. Even substantial increases in college-going and retention are unlikely to yield new sources of demand that will put a long-term strain on the existing capacity of Oregon's public four-year sector overall.

There is likely to be greater pressure on enrollment demand in the Central Oregon region, but satisfying that demand by expanding the OSU - Cascades campus substantially will likely come primarily from students from that area who currently elect to attend institutions elsewhere in the state. In some cases, reshuffling these students closer to home will likely exacerbate challenges facing Southern Oregon University and other regional institutions that are seeing the population of likely college students in their own surrounding counties fall off dramatically. In general, resident, on-campus enrollment growth is a zero net-sum game statewide.

Meanwhile, each of the individual institutions have made their own enrollment projections for the years to come and, despite the evidence of limited population growth, all of them are anticipating growth in on-campus enrollments (and some are planning to aggressively expand online programming as well). With the population projections as they are, this growth would have to come from just a few places:

- Nonresident recruitment. Some institutions—like Eastern Oregon University—are planning to more thoroughly plumb markets in other states for students. Many of Oregon's public four-year institutions are already heavily reliant on nonresident recruitment to fill undergraduate classes; it is unclear how much more attractive they can be or the extent to which the state is willing to support that growth with capital investment. Moreover, other nearby states have similar projections of likely high school graduates—growth through 2025 or 2026 followed by a substantial drop—that Oregon has. This suggests that the competition for students throughout the multi-state region will not be favorable to substantial enrollment growth over the long-term.
- Improved participation rates of in-state students. Attracting more Oregonians to attend college may be the best option. Given Oregon's relatively low college-going rate, there appears to be room to enroll a greater share of high school graduates from the state. In addition, while Oregon boasts an above-average rate of adults who are enrolled in postsecondary, it is increasingly clear that states will likely need to reach out to and enroll more adult learners. Less clear is whether new students induced to enroll in college will attend a public four-year institution as opposed to a public two-year institution, especially in a state where tuition is free for some recent high school graduates. Enrollment among adults is equally if not more difficult to predict, given the degree to which their decisions are often closely tied to prevailing economic conditions. Such volatility affects enrollment projections at four-year institutions, but it is much likelier to be concentrated in the two-year sector.
- Improved rates of transfer from public two-year institutions.
- Improved retention.

Regardless, modeling of student flows for improved college-going rates and improved retention does not significantly change the conclusion that investing in new capital construction to support enrollment growth in one region will likely have negative implications for others. Furthermore, the team's assessment of space needs does not identify significant capacity issues, although there may be localized needs as noted below.

3. There are statewide occupational needs in Health and STEM-related fields

The project team assessed the extent to which needs for new or different facilities may be driven by the need to develop academic programming in order to respond to workforce development requirements. Oregon has seen a substantial amount of economic change in the past decade, driven by steep increases in employment in industries like information and services and in financial services, while there has been a decrease in areas of historical strength, such as manufacturing and natural resources, as well as wholesale trade. These growing industries have generally greater requirements for education. Correspondingly, some of the most important sources of occupational demand anticipated in Oregon are in business, information technology, and health care.

The project team's analysis suggests there is room to grow enrollment in programs that help to fill these occupational demands, as Oregon produces relatively few graduates in relationship to numbers of employees in STEM and health care fields, and therefore would appear to be reliant on importation to get those workers. The project team generally found that institutions were not reporting feeling pinched by unmet demand in programs related to these areas, but that generally, the challenges of meeting workforce demand were driven more by a lack of students in the pipeline rather than a lack of available programs. This broad finding is not consistent across all regions or programs, as there was reportedly a challenge in program capacity in health care and, to a lesser degree, in engineering. But creating new programs to meet needs in either of these areas is enormously costly and has significant implications for institutional mission. These are discussed further in Findings 2 and 6, and the statewide summary, Section 1 of this report. In summary, though, it is not clear that the presence of any program gap identified in these findings should result in the development of new programs where they don't already exist, given a state with stable enrollment demand and the potential for alternative or collaborative program delivery. Specific programs demand gaps are discussed further below.

Statewide, Oregon sees a program demand gap for engineering technologies, engineering, and computer & information sciences. In other words, there is currently a shortage of completions to fill related occupational areas. Each of these are highly supported for increasing programs/number of completions at the bachelor's degree level, and all but engineering are also seeing a large gap at the master's degree level (engineering master's degrees see a moderate gap across the state). Within computer and information sciences, cybersecurity and data analytics saw around 2,400 job postings each in the past year. These latter growth fields do not typically have laboratory intensive or discipline-specific space needs, and the general surplus of classroom space indicates capacity for growth. However, as discussed further in this report, existing space may not be located or configured so as to effectively meet the needs of growth in these programs.

In terms of health fields, Oregon is experiencing a gap of around 1,100 for registered nurses (bachelor's degree). It should also be noted that the RN is typically an Associate degree, and none of the public universities are currently training directly for an RN. In fact, any institution that is offering a BSN is already working with OHSU to do so. Physical therapists, pharmacists, occupational therapists, and speech-language pathologists are also experiencing strong demand with few completions across the state. Other healthcare areas of interest to public universities are radiology, dieticians, dental assistants, kinesiology, and nurse practitioners. All of these program areas are experiencing moderate demand and may not be as relevant, unless for a particular region or specialized institution. This report includes a recommendation specific to statewide occupational demands in the health care fields.

Business occupations represent another area experiencing large bachelor's and master's degree gaps. However, this is a fairly broad area where graduates come from a variety of academic programs. Furthermore, all institutions have applicable programs, and business-related jobs are filled by graduates of many programs. Therefore, a concomitant space need is not identified.

Education, on the other hand, is experiencing a surplus of completions compared to job demand at the master's degree level (surplus of around 3,400). There are a high number of completions in master's degree education programs, from public universities and also from private institutions in the state. However, we believe that the imbalance is due to a significant portion of the people completing graduate programs in education who are already employed as teachers, for whom a graduate degree is the primary means for advancing earning potential. The bachelor's degree level education programs are experiencing a gap of around 1,600, although some of this gap is driven by occupations such as teacher assistants and preschool teachers that pay relatively low wages. Furthermore, it should be noted that existing academic programs should be scalable for higher enrollment if needed.

In terms of the sciences, biological & biomedical sciences bachelor's degree programs are experiencing a surplus in the state, but small gaps at the graduate levels. This is partially likely due to biology being a common field of study for students, even those who don't end up in biology fields. In addition, natural resources & conservation programs see higher gaps than physical science programs across the state. While not directly tied to the sciences, but somewhat linked, public universities expressed interest in sustainability studies and environmental studies. Both of these program areas are experiencing decent gaps (approximately 400 and 500, respectively, at the bachelor's degree level). Graduates of these types of programs can go into a wide variety of fields.

Public universities also expressed interest in public health and human development & family services. The latter is seeing a gap of almost 760 at the bachelor's degree level, with public universities comprising around 77% of state completions for the program area. Public health, on the other hand, is seeing a surplus at the bachelor's degree level when looking across three specific public health programs. Graduate public programs are somewhat more supported at the state level.

It should be noted that the relationship of supply and demand for specific jobs at specific education levels is estimated based on a methodology developed by Emsi, which appo rtions the number of openings that are anticipated based on the educational level of incumbents in the population, as well as a crosswalk between academic programs and occupations. These estimates may best be interpreted in terms of their relative magnitude, since any crosswalk between programs and occupations, and between educational levels and job occupants, will imperfectly reflect the reality of how career pathways evolve and how occupations can be linked to multiple programs (and vice versa).

4. Utilization analysis and space needs assessments also indicate some room for growth, though specific program areas may need localized attention

A detailed utilization analysis of classrooms and teaching labs was performed for all eight campuses in the study using course schedule data provided by each institution. The following chart summarizes the use of scheduled classroom space on the eight campuses in the study. Statewide, classrooms are scheduled an average of 24 hours per week. This is less than the targets recommended by the consulting team of 36 room hours of use per week for the research universities and 30 weekly room hours of use for the regional universities.

Statewide, the average student station was occupied on average 16 hours per week, whereas the recommended targets are 24 for the research universities (36 weekly room hours at 67% occupancy) and 20 for the regional universities (30 weekly room hours at 67% occupancy). The gap between actual and recommended targets indicate that there is additional capacity for accommodating any enrollment growth that may materialize.

There are also opportunities for greater classroom use through improved scheduling practices. The figure below charts the statewide averages of classroom use throughout the week, 8AM to 8PM. The percentage refers to the number of classrooms used versus the classrooms available.

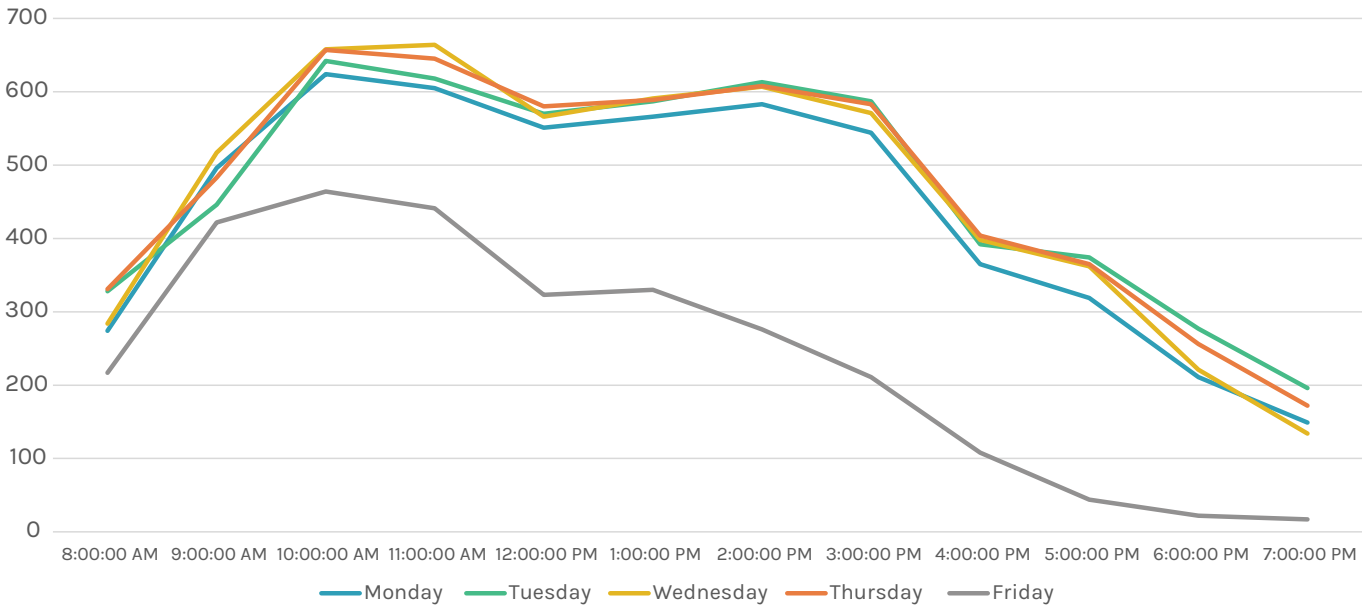
Teaching labs utilization was also analyzed using course schedules obtained from each campus.

ALL OREGON UNIVERSITIES
SCHEDULED CLASSROOM USE BY DAY & TIME

Time of Day	Monday		Tuesday		Wednesday		Thursday		Friday		Average	
	Rooms in Use	% in Use	Rooms in Use	% in Use	Rooms in Use	% in Use	Rooms in Use	% in Use	Rooms in Use	% in Use	Rooms in Use	% in Use
8:00:00 AM	274	29.5%	328	35.3%	284	30.5%	331	35.6%	217	23.3%	287	30.8%
9:00:00 AM	496	53.3%	446	48.0%	517	55.6%	483	51.9%	422	45.4%	473	50.8%
10:00:00 AM	624	67.1%	642	69.0%	658	70.8%	657	70.6%	464	49.9%	609	65.5%
11:00:00 AM	605	65.1%	618	66.5%	664	71.4%	645	69.4%	441	47.4%	595	63.9%
12:00:00 PM	551	59.2%	570	61.3%	566	60.9%	580	62.4%	323	34.7%	518	55.7%
1:00:00 PM	566	60.9%	587	63.1%	591	63.5%	589	63.3%	330	35.5%	533	57.3%
2:00:00 PM	583	62.7%	613	65.9%	607	65.3%	608	65.4%	276	29.7%	537	57.8%
3:00:00 PM	544	58.5%	587	63.1%	571	61.4%	583	62.7%	211	22.7%	499	53.7%
4:00:00 PM	365	39.2%	392	42.2%	398	42.8%	404	43.4%	108	11.6%	333	35.8%
5:00:00 PM	319	34.3%	374	40.2%	362	38.9%	365	39.2%	44	4.7%	293	31.5%
6:00:00 PM	211	22.7%	277	29.8%	221	23.8%	256	27.5%	22	2.4%	197	21.2%
7:00:00 PM	149	16.0%	196	21.1%	134	14.4%	172	18.5%	17	1.8%	134	14.4%

Total Classrooms = 930

OVERALL CLASSROOM USE BY DAY OF WEEK



Overall, the space needs assessment showed that in the Fall 2018 term the eight campuses collectively had a 9% surplus of academic and academic support space, as indicated in the following chart. Individually, there is generally a surplus of academic space and a deficit of academic support space, highlighting that while the campus may have enough space, it may need to be repurposed or reconfigured to more effectively achieve student success.

STATEWIDE SPACE NEEDS | 2018

Academic Space	Existing	Guideline	Surplus/ (Deficit)	Percent
Eastern Oregon University	79,163	37,353	41,810	53%
Oregon Institute of Technology	128,340	87,015	41,325	32%
Oregon State University - Cascades	29,708	23,021	6,687	23%
Oregon State University - Corvallis	570,148	543,204	26,944	5%
Portland State University	392,504	463,574	(71,070)	-18%
Southern Oregon University	141,832	103,658	38,174	27%
University of Oregon	479,613	442,512	37,101	8%
Western Oregon University	133,454	118,304	15,150	11%
Statewide	1,954,762	1,818,641	136,121	7%
Academic Support Space	**Existing**	**Guideline**	**Surplus/ (Deficit)**	**Percent**
Eastern Oregon University	118,547	133,261	(14,714)	-12%
Oregon Institute of Technology	154,497	135,940	18,557	12%
Oregon State University - Cascades	30,050	58,215	(28,165)	-94%
Oregon State University - Corvallis	2,635,308	2,162,998	472,310	18%
Portland State University	1,101,910	1,245,240	(143,330)	-13%
Southern Oregon University	274,919	244,692	30,227	11%
University of Oregon	1,923,368	1,809,692	113,676	6%
Western Oregon University	292,558	297,146	(4,588)	-2%
Statewide	6,531,157	6,087,184	443,973	7%
Totals Including Inactive/Conversion Space*	**Existing**	**Guideline**	**Surplus/ (Deficit)**	**Percent**
Eastern Oregon University	200,155	170,614	29,541	15%
Oregon Institute of Technology	330,662	222,955	107,707	33%
Oregon State University - Cascades	59,758	81,236	(21,478)	-36%
Oregon State University - Corvallis	3,281,064	2,706,202	574,862	18%
Portland State University	1,517,044	1,708,814	(191,770)	-13%
Southern Oregon University	420,453	348,350	72,103	17%
University of Oregon	2,408,487	2,252,204	156,283	6%
Western Oregon University	460,516	415,450	45,066	10%
Statewide	8,678,139	7,905,825	772,314	9%

* Includes academic and academic support space temporarily unused due to remodeling and rehabilitation.

Academic space is defined as:

- Classroom and Classroom Service Space
- Teaching Laboratories and Lab Service Space
- Open Laboratories and Lab Service Space

Academic support space is defined as:

- Offices and Office Service Space
- Library and Collaborative Learning Space
- Assembly and Exhibit Space
- Physical Plant Space
- Other Department Space

Guidelines were established for each of these space categories based upon nationally recognized standards, consultant experience, and unique, individual campus circumstances.

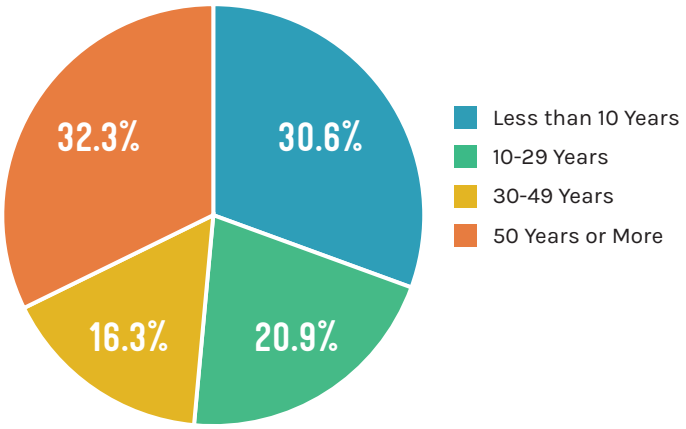
Using the student flow modeled by the project team, the modest 2029 enrollment projection did not produce any appreciable impact upon overall space needs. However, continued growth in academic programs such as Engineering, Computer Science (including IT and data analytics) and health care, may cause pressure points in these colleges. For example, OSU - Corvallis College of Engineering academic space is deficit by 98%, 67,388 ASF, even though the campus has a 5% overall academic space surplus.

5. Existing facility assets have serious age, quality and suitability issues that compromise both efficiency and effectiveness

Space assets are among the most valuable resources that a University owns. In Oregon, University space represents a $10.1B asset, as determined by current replacement values collected by the HECC. This becomes even more significant when one considers that the first cost (construction) of a facility has been shown to represent about a third of the building's life cycle cost.[1] Space is also mission critical for delivery of academic programs and a strategic resource to be deployed in support of strategic goals. It therefore merits responsible stewardship and attention.

In accordance with data collected by the HECC and reviewed and analyzed by the project team, Oregon universities control practically 20M Gross Square Feet of space in 663 buildings. Of these buildings 253, or 29%, have a renovation reported. Of the 651 buildings with an age and/or renovation reported, and accounting for the year of the renovation, almost a third (32.3%) are 50 years or older, and approximately one half (48.6%) are more than 30 years old.[2]

ALL OREGON UNIVERSITIES AGE OF BUILDING/RENOVATION (N=651)



1 Rodney Rose, "Buildings - The Gifts that keep on Taking; A Framework for Integrated Decision Making," published by APPA 1999.

2 This likely understates the age of buildings because the year of the last major renovation was used to determine a revised building age, although it is unlikely that every renovation was comprehensive in its scope. These renovations likely left some major buildings systems untouched.

This is significant because the useful life of most major buildings systems (e.g., roofing, electrical, mechanical) is typically in the 30–40 year range. The age of buildings, however, should not come as a surprise. There is a longstanding tradition of higher education in the state, with the average age of the institutions themselves over 100 years. A nation-wide construction boom in higher education saw the construction of many facilities in the 1960's and 1970's, in response to the baby boom generation. Unfortunately, these buildings are now 50–60 years old as well.

In the last 20–30 years in particular, the condition of higher education facilities has been a focus of leading organizations, such as APPA, the preeminent association of higher education facility managers and administrators, and NACUBO, the National Association of College and University Business Officers. A survey of literature from these two groups, some published jointly, forms the basis of leading best practices and recommendations.

Oregon's higher education facilities constitute both an asset and a liability. One must consider the following factors is assessing the existing building inventory:

- Mid-century buildings are purpose-built and generally inflexible
- Initial first costs may have been lowered at the expense of life cycle costs
- Older buildings are less efficient and more costly to operate
- Building Codes, including fire and life safety, have changed significantly in the last 50 years
- Environmental Health and Safety regulations have changed significantly in the last 50 years
- Depreciation and wear may be accelerated by climate, intensity of use and ongoing maintenance funding levels

A stewardship model advanced by APPA recommends annual investments in facilities equivalent to 1.5% of current replacement value (CRV) for maintenance and 2.5% for capital renewal.[3] The aim of maintenance is to preserve and sustain building operation for the functions as originally intended. However, as noted above, a fifty year old building may not be well suited for current needs, as codes, regulations and the programs it serves may have all changed. For example, a large auditorium in a 1960's classroom building may be functional as a lecture hall, however it may not meet ADA accessibility requirements. Furthermore, it would not suitable for smaller sections using an active learning pedagogy, which research has shown to yield better student learning outcomes. Therefore, two important measures of a facility condition assessment are sufficiency and also suitability.

While significant investments have been made by the state and universities in Capital Improvement and Renewal, there is a backlog of maintenance needs. In fact, by one estimate from 2016, there is a $480M backlog throughout the university system.[4] A more recent estimate of just the backlog is $635M. That number does not include the full scope of deferred maintenance which by some estimates may be $1.0M to $1.5M depending on the definition of what is deferred. Furthermore, given the age and number of unrenovated buildings in the portfolio, there is a clear need for renewal and replacement of buildings and building systems that have exceeded their useful life. This concern was uniformly expressed and consistently emphasized during interviews with administrators and facility managers conducted at each main campus. This concern was also reinforced by on-site observations during campus and facility tours.

3 Harvey Kaiser, APPA Book of Knowledge, "Capital Renewal and Deferred Maintenance." Copyright 2016.

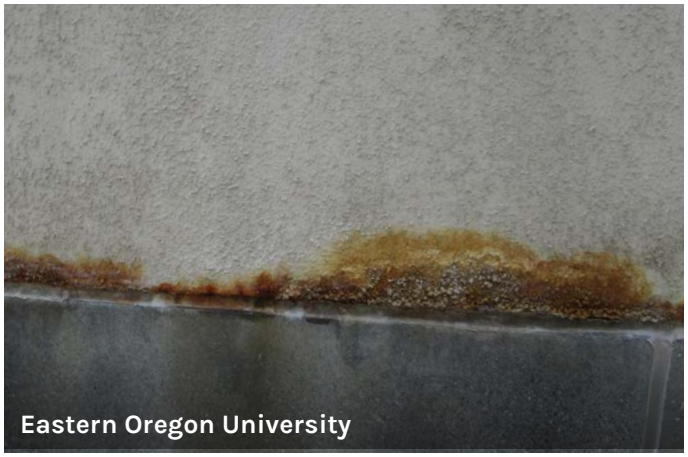
4 "Approaches to Deferred Maintenance," presented by Mike Green (VP of Finance & Administration, OSU) and Greg Perkinson (VP for Finance & Administration, SOU). Sightlines, 2016.


University of Oregon


Portland State University


Portland State University


Oregon Institute of Technology


Eastern Oregon University


University of Oregon

The space analysis supports the conclusion that the majority of university classrooms, central to student learning, are highly traditional and not well suited to accommodate new instructional modalities that research has shown to be more effective with student learning and success. For example, active learning classrooms require 25–35 assignable square feet per student station (ASF/SS), and the statewide average analyzed by this study is 19 ASF/SS. This mismatch between facilities and best practices is understandable because the field of learning science did not exist before 1990 and has rapidly advanced in the last 20 years.

Moreover, recent research funded by the National Science Foundation of women and minorities who have left STEM fields of studies indicates a large gap in the desire for active and engaging learning environments and the actual classroom experience.[5] Current theories of student success also place a premium on student engagement within a learning community or student organization and making positive connections with peers, faculty and staff. This is particularly important for first generation students for whom interpersonal connections and support systems play an important role in retention and perseverance. It is important for these students to feel welcomed and comfortable in navigating the myriad of programs and services which can help them succeed.

Evaluating the existing building inventory through the lens of data-informed learning science, older buildings are highly ill-suited for effective learning environments for the 21st Century. For example, classrooms may be improperly sized and configured, with inflexible, fixed furniture. Mid-century buildings, focused more on student through-put rather than student success, are characterized by double loaded corridors which do not provide space for group study or team work, let alone the important interactions that occur outside the classroom between students and faculty. These facilities may be efficient in delivering lectures to large number of students or circulating them from one class to another, but they are not effective at promoting student success.

It should also be noted that buildings may not be configured well for the programs they house in relation to the students they serve. As the composition and demographics of the student body has changed (along with advances in psychiatry and neuroscience), an array of student services has been developed ranging from tutoring to disability services, financial assistance to counseling. These programs, many of which did not exist in their current state 20 years ago, have often been located opportunistically as space became available and therefore do not benefit from adjacencies that are client or student-centered. Modern university buildings are student centric in both the arrangement of programs and services as well as in the type of spaces which welcome and invite students to engage in university life.

Finally, it should be noted that modern educational facilities are more efficient on a number of levels. First, space planning standards for office work environments have evolved and are typically more efficient than those of 30-50 years ago. Secondly, and importantly, two thirds of a building's life cycle cost relates to on going operations and maintenance. Modern buildings are significantly more energy efficient. The capital renewal of existing buildings offer not only enhanced effectiveness in program delivery but also greater efficiency in operational costs.

5 Melissa H. Dancy, Katherine Rainey, Roslyn Mickelson, Elizabeth Stearns, and Stephanie Moller, *Influences of teaching style and perceived care of instructor on retention of underrepresented groups in STEM.* Department of Physics, University of Colorado - Boulder, CO 80309. Department of Sociology, University of North Carolina - Charlotte, NC 28223.

6. Institution role and mission are not well defined; they lack clarity regarding mission differentiation, and for some institutions; additional space needs largely depend on this

There is a notable absence of clear, differentiated missions for Oregon's institutions of higher education. This is particularly true of OSU - Cascades where the ambiguity about mission makes the determination of space needs particularly difficult. Is the Cascades campus an extension of OSU and its mission with the attendant needs for research space as well as instructional space, or is it a regional instructional institution (like Eastern, Southern, etc.)? For purposes of our analyses we have assumed that it is a regional teaching institution. The state has sufficient research university capacity at OSU and UO. It lacks instructional capacity at the baccalaureate level in Deschutes and immediately adjacent counties. The same questions might be raised about the extent to which Portland State University should be focused on research and whether Western Oregon University should have a health care focus, for example. While both research and health care programs have regional economic and occupational value, there is a larger public policy question of where new capital investments should be made to support them, either directly or indirectly.

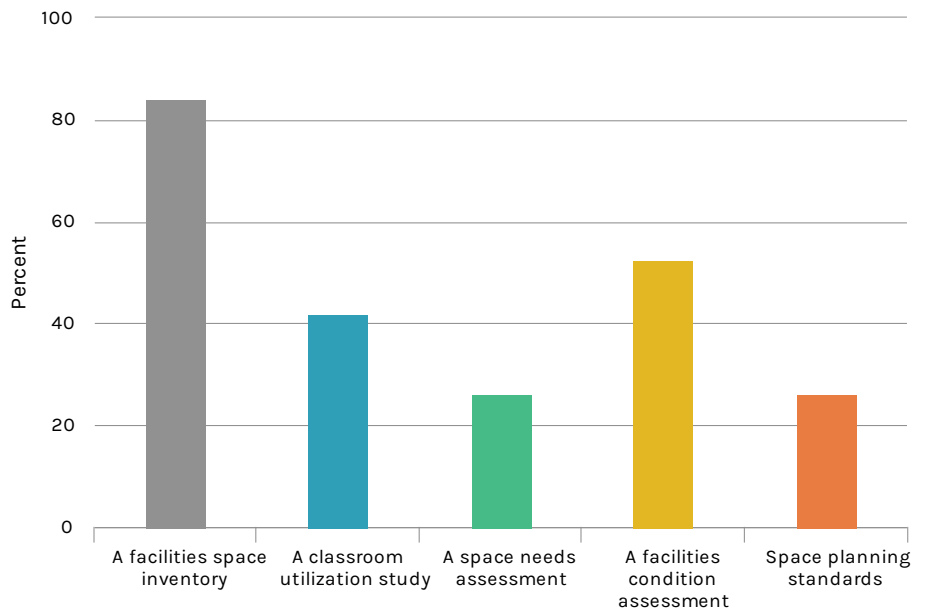
7. Statewide and Institutional capital planning practices are not fully aligned with best practices

In an ideal, integrated planning process, institutions routinely conduct strategic planning exercises that consider statewide goals as well as other external and environmental factors, such as demographics and market demands. Often a SWOT-C (strengths, weaknesses, opportunities, threats and challenges) exercise is conducted as part of the strategic planning process and this is linked to the institution's role and mission. With strategic goals identified, a facilities master planning process can be initiated with an evaluation of existing space, conditions, and utilization, followed by an assessment of the space needs which enable and support the physical implementation of institutional strategic plans. These high level needs assessments are then translated into a capital projects plan, which is often a rolling, five year list of projects updated on an annual basis.

Research and surveys conducted by the project team indicate that state governing boards, coordinating commissions and university systems have adopted a variety of policies and procedures to ensure consistent, best practices with regard to capital planning efforts. Statewide organizations in California, Connecticut, Florida, Georgia, North Carolina, North Dakota, Pennsylvania, Texas, Tennessee, Utah and Virginia, are among many others that have adopted well defined practices. Additionally, Smithgroup partnered with SHEEO (State Higher Education Executive Officers) to survey SHEEO membership regarding some of these best practices. There were almost two dozen responses from a wide variety of boards of education, coordinating commissions and university systems. These included leading organizations in California, Connecticut, Florida, Georgia, Pennsylvania, North Carolina, Ohio, Tennessee and Virginia.

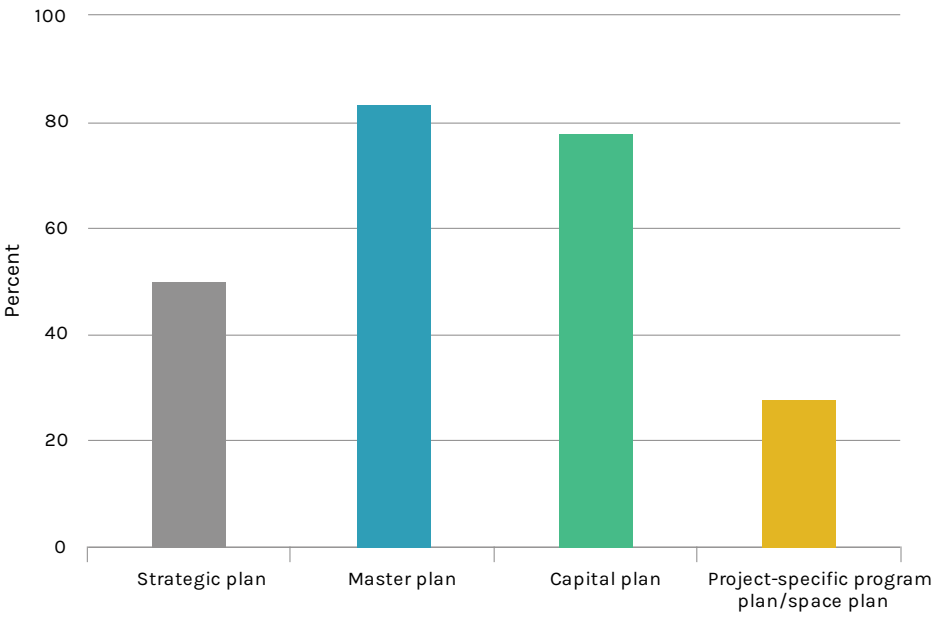
On the question of statewide or system-wide reports, an overwhelming majority (in excess of 80%) responded that a facilities inventory was required, followed by a facilities condition assessment and a classroom utilization study.

SURVEY QUESTION 3. IS THERE A STATEWIDE OF SYSTEM-WIDE REQUIREMENT TO HAVE OR REPORT (CHECK ALL THAT APPLY):



In terms of planning-specific documents that were required, a high majority required master plans and capital plans; approximately 50% required strategic plans.

SURVEY QUESTION 4. IS THERE A STATEWIDE OR SYSTEM-WIDE REQUIREMENT TO HAVE A (CHECK ALL THAT APPLY):



For this study of Oregon institutions, strategic plans, master plans and capital plans were requested of all institutions. All but one of the institutions provided a capital projects plan, but the majority did not provide either a strategic plan or a campus facilities master plan. In the SmithGroup/SHEEO survey, a majority of respondents (64%) said that a campus master was a prerequisite for capital funding appropriations.

One of the issues related to supporting the planning efforts are the staffing resources allocated to them. Of the respondents in the survey, eight identified as institutions, and of those, six (75%) reported having a planning office.

During on-campus visits and the legislative hearing attended by the project team, concerns were expressed about the prioritization process. In the survey, the highest rated factor in the state level capital funding prioritization, scoring at 80%, was the institution's own priority ranking of that project. However, in follow-up to the question, of those identifying this as a factor, 75% reported that the final prioritization was based not on each institution's #1 priority, but rather on the merits of the individual projects.

Finally, with regard to institutional role and mission, 43% reported that they were set in statute and 71% responded that they were reviewed and approved by a statewide body.

RECOMMENDATIONS

1. Invest in capital improvement and replacement

The first priority of Oregon's statewide capital plan should be to focus on the improvement and renewal of the existing capital assets. These assets, valued at $10B and consisting of over 17M GSF, should be preserved and protected through investment. One half of the existing building stock have already served their expected life cycle, but they can be renewed to extend their useful life for another life cycle. Repurposing of existing facilities is more typically more economical than constructing new, and it can lower operating costs while increasing effectiveness.

Data analysis and student flow models show that sustained resident enrollment growth is not likely due to statewide demographic projections over the next 10 years. Therefore, future capital needs will not be driven, in large part, by capacity related issues, but rather qualitative ones. Qualitative issues exist for a variety of reasons, which include: building repair backlog, building code changes, accessibility issues, changing pedagogy and evolving program needs. As part of a stewardship model of managing these assets, renewal can also improve student services and learning effectiveness. This becomes increasingly important for student success, especially within the context of increasing access to underrepresented populations.

While renovation and renewal should be considered before proposing new construction, there may be cases where rehabilitation of existing assets is shown not to be justified. In these circumstances, replacement of buildings is preferred. Removal (i.e., demolition) of inefficient, obsolete facilities with large repair backlogs and high operating costs should also be a goal of this plan.

This analysis shows that at a high level, there are sufficient amounts of space and capacity for the foreseeable future. At a more detailed and localized level, there may be mismatches between space efficiencies available and program specific space needs on a campus. In recognition of this potential, several planning process improvements are also proposed.

2. Incentivize collaboration and shared or on-line programming in ways to reduce demands for new space

Collaboration can introduce efficiencies across the system and reinforce appropriate mission differentiation if properly coordinated and incentivized. It could apply to both courses and programs, though the focus of this recommendation is at the program level since delivery of complete programs is required to meet workforce needs. An incentive mechanism to promote collaborative delivery of programs could take several forms, all of which would reduce overall demand for additional facilities:

(a) A policy that allocates tuition revenues to the institution that enrolls the student and provides the administrative and student support services that support that enrollment, and allocates the state funding associated with the FTEs taught to the institution that provides the instruction.

(b) A policy that splits the revenue (tuition plus state appropriation) in a specified way to the collaborating institutions—50/50, 60/40, etc.

(c) Creation of set-aside funding pool of funds (taken off the top of the overall appropriation amount to public institutions,) to which institutions can only gain access through collaborative instruction—student credit hours taught by one institution at the site of another institution or via distance delivery. The larger the share of collaborative credit hours taught the greater the proportion of this pool the collaborating institutions receive. The existence of this funding pool would reflect that reality that collaborative delivery has added development costs in the short term. It would also serve to provide an ongoing incentive sufficient to induce institutions to seek efficiencies through collaboration across campuses rather than develop duplicative courses and programs.

There may be other approaches that could be developed but these provide a starting point for discussion.

3. Improve and enhance statewide and institutional planning practices

3.1 Pay particular attention to the incentives in the resource allocation model and modify the model to reward improved service delivery and cost-effectiveness

3.2 Define role and mission

As noted elsewhere, there is a lack of clear differentiated mission for Oregon's institutions of higher education, and this ambiguity can lead to counterproductive competition and the potential for inefficient program delivery and capital investment.

3.3 Address strategic statewide program needs

There is a lack of clarity in the broader statewide 40-40-20 strategic plan concerning what level and kinds of degrees and credentials should be included in the first of the two 40% segments. For the scope of this project, the project team was focused only on the first 40 of Oregonians holding at least a bachelor's degree. However, the public four-year institutions offer programs at multiple degree levels, and there can be different space requirements for baccalaureate degrees and doctoral degrees in the same fields. The HECC strategic plan could offer guidance on what fields of degrees might be the focus of policy efforts and also investment.

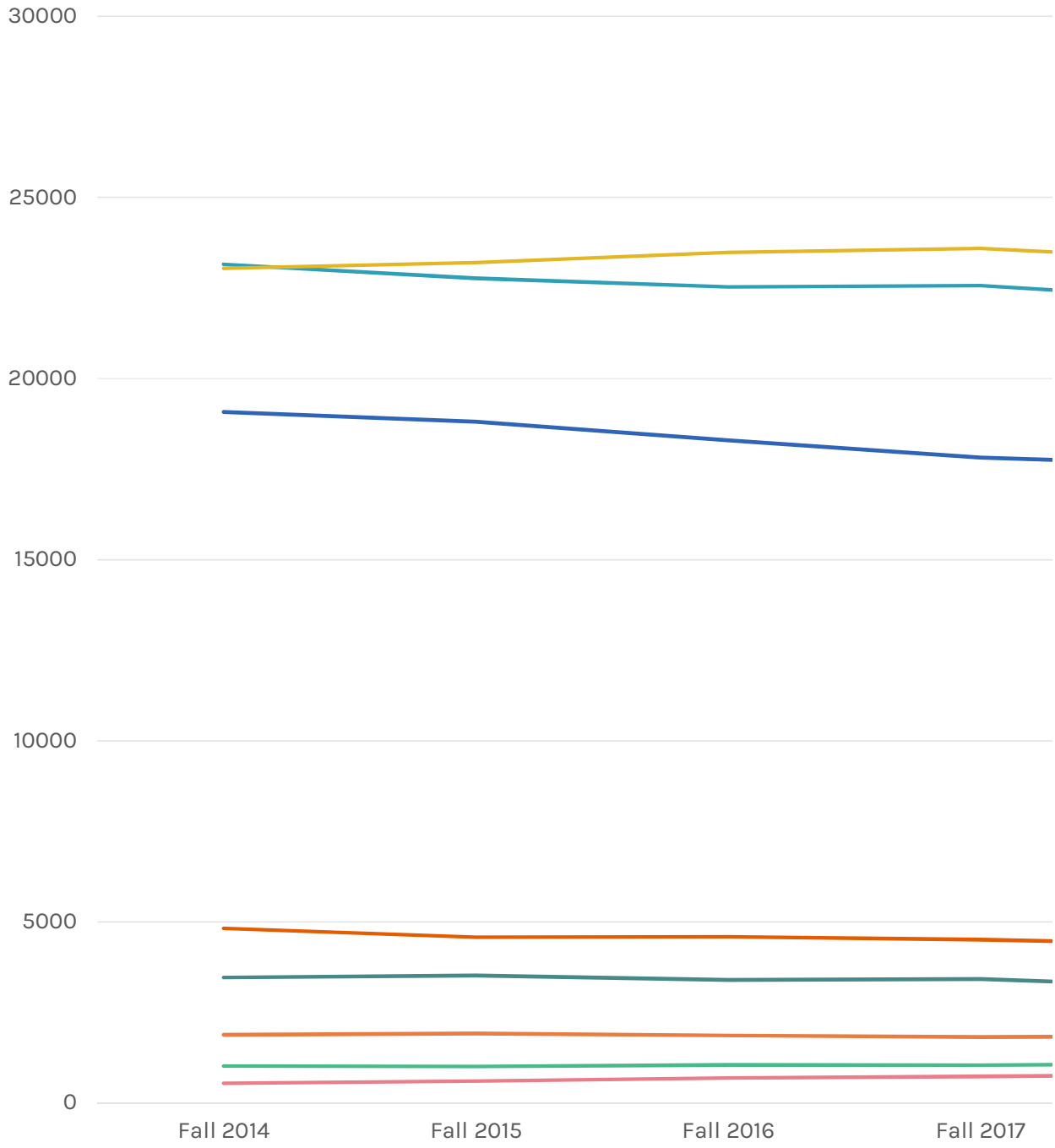
3.4 Coordinate and encourage alternative and collaborative program delivery

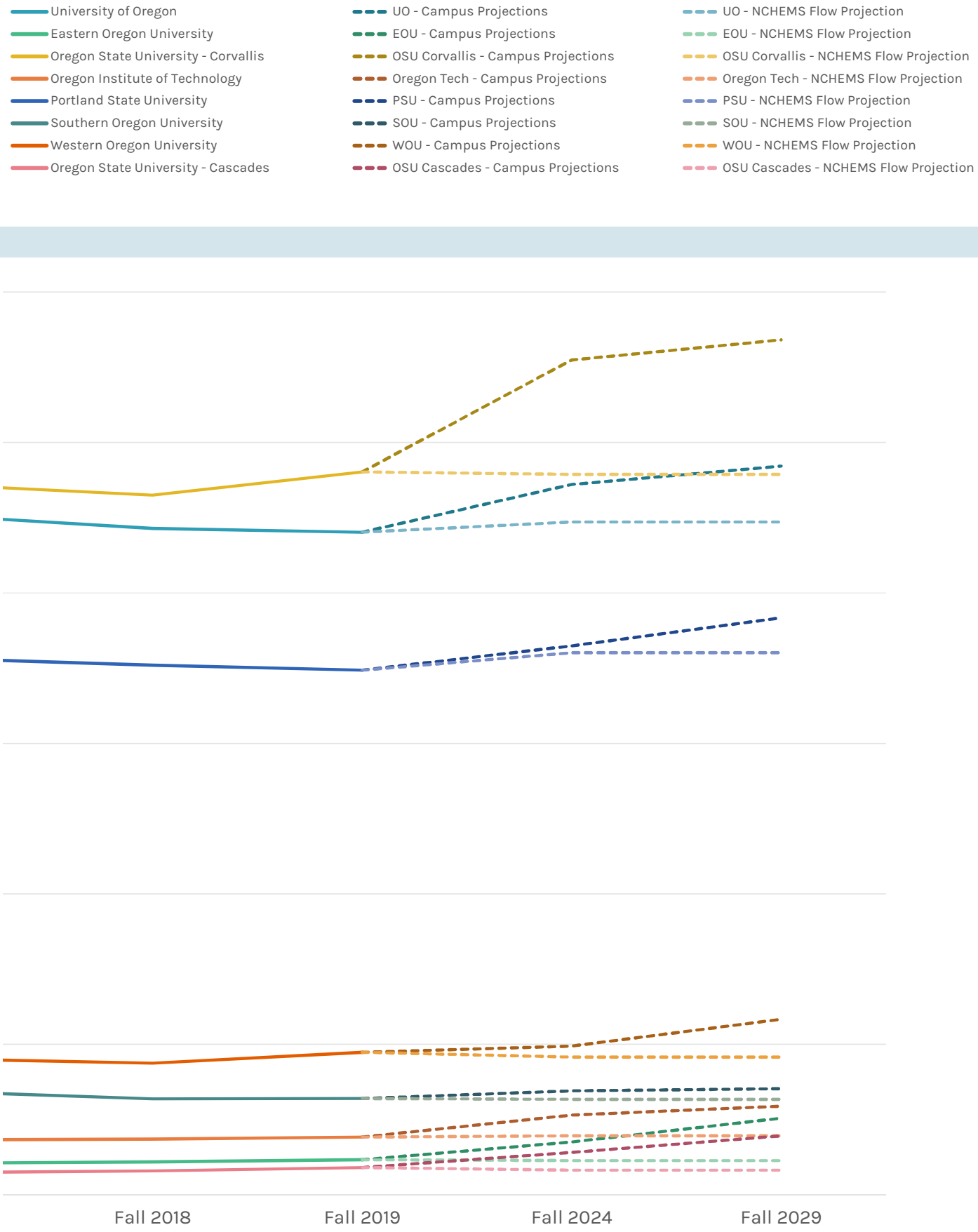
A lack of statewide coordination related to online/alternative and collaborative program delivery means that at least two institutions—Oregon State and Eastern Oregon—are engaged in developing online programming at a substantial scale. Moreover, the state lacks a means to more intentionally encourage efforts to develop and deliver programs in a complementary way across institutions—either online or in person—which could yield better efficiencies and limit expenditures on bricks-and-mortar facilities. IT and RN to BSN programs are possible examples where program demands could be met virtually. Greater flexibility in the definition of capital funding could facilitate investment in the infrastructure needed to reform curriculum and the systems that could foster collaboration across institutional boundaries.

3.5 Promulgate a coordinated and strategic approach to institutional enrollment management

As indicated in the summary of institutional enrollment projections, there is a broad disconnect between institutional optimism and demographic realities. The collection of institutional projections do not sum to a realistic statewide total, and there as no consistency in the way in which institutions developed their projections. The following diagram graphically illustrates the divergence of on-campus enrollment projections in comparison with the student flow model developed for this study, and this was addressed in the findings section on demographics.

OREGON HISTORICAL ON-CAMPUS ENROLLMENT (FTE) WITH PROJECTIONS




University of Oregon
Eastern Oregon University
Oregon State University - Corvallis
Oregon Institute of Technology
Portland State University
Southern Oregon University
Western Oregon University
Oregon State University - Cascades
UO - Campus Projections
EOU - Campus Projections
OSU Corvallis - Campus Projections
Oregon Tech - Campus Projections
PSU - Campus Projections
SOU - Campus Projections
WOU - Campus Projections
OSU Cascades - Campus Projections
UO - NCHEMS Flow Projection
EOU - NCHEMS Flow Projection
OSU Corvallis - NCHEMS Flow Projection
Oregon Tech - NCHEMS Flow Projection
PSU - NCHEMS Flow Projection
SOU - NCHEMS Flow Projection
WOU - NCHEMS Flow Projection
OSU Cascades - NCHEMS Flow Projection
Fall 2018
Fall 2019
Fall 2024
Fall 2029

However, enrollment is a major driver of space and is therefore critical to an assessment of space needs. In fact, enrollment planning and management is multi-dimensional in that they also drive factors such as student body composition, program demand, program delivery, and identity in the market place, all of which have both strategic and tactical implications. Many Oregon institutions have chosen to take a conservative approach to forecasting enrollment (and therefore tuition revenue), and this is appropriate given the demographic data. And while some institutions may grow resident, on-campus enrollment, it would be at the expense of causing losses elsewhere. Therefore, policy makers will need to balance these competing needs and a more coordinated, comprehensive approach to enrollment planning will ensure that any capacity driven capital requests are understood on a systemic basis.

There is also room for improvement to have a more granular conversation at the level of specific academic program needs, particularly as it pertains to capital improvement and renewal. As enrollment growth may be seen in one program area, there will likely be a decline in others. These declines may not necessarily offset the space needed for growth, but a systemic understanding of both leads to a more informed analysis of possible solutions.

3.6 Define terms for capital planning and embrace a broader definition of capital investment

Literature published by APPA and NACUBO identify best practices in which it is constructive to provide clear definition of capital planning terms to ensure a shared language and understanding around complex concepts in facility management. For the purpose of this study, the project team used "Capital Improvement and Renewal" to include projects which address longstanding maintenance needs, replacement of either buildings or building systems which have served their useful life, and issues of obsolescence or functional suitability. However, it was difficult to gain consensus from multiple stakeholders on the meaning of various terms, since there were different connotations or meanings associated with each. This is understandable, since those in the fields of accounting and finance, the legislature, administration, facilities management and the professional services fields of architecture and engineering all have their own governing regulations and terminologies. There has been considerable literature published on the subject of capital planning in the last 20-30 years, and a variety of terms are used such as "capital renewal and major maintenance", "renewal and replacement", "recapitalization", and "capital renewal and replacement." Therefore, it becomes useful to spell these out for developing a common language that can be used for strategic capital planning consistently with all constituent parties.

Like most other states, Oregon uses a definition of what qualifies as capital expenditures that is narrowly focused on physical assets. One drawback is that obsolete and unnecessary existing facilities cannot be demolished, even though maintaining them largely empty and unused has annual operating costs for the state and the institution's students. This may be the result of accounting definitions and bond requirements, but non-bondable options should be included as part of a comprehensive and strategic capital plan.

Finally, in the capital planning process, project categories can be defined by four basic drivers: (a) capacity need (b) facility quality (c) campus infrastructure, or (d) special need (e.g., a shared performing arts facility). (note: citation/footnote needed) Although it is not critical to adopt these project categories, it may be useful to think in these terms. The recommendation of this report is to focus on investments related to improving the quality and suitability of existing facilities, not capacity or special needs. It should be noted however, that infrastructure needs are typically not included in discussions of deferred maintenance or capital funding, and although they were not raised within the scope of this study, there may be valid needs which should be addressed.

3.7 Add professional staff at HECC with architectural/engineering or facilities experience

Many leading state systems and coordinating commissions have professional staff experienced in facilities management or credentialed in planning, architecture or engineering, who support and coordinate capital planning efforts. The Department of Administrative Services uses a model with a State Architect position, which has contributed to successful capital program management. Given the magnitude of investment in capital projects and the need to be highly strategic with future resources, very modest staffing costs can be leveraged to great gains. This will enable HECC to better support the regional institutions, while raising the level of engagement with the professionally staffed research institutions.

3.8 Require and/or fund facility space inventories and management; encourage development of uniform utilization standards

The adage that "one can only manage what one measures" is particularly applicable to space assets. In order to assess future needs, it is fundamentally necessary to first understand what space exists and how it is being used. The consistent gathering of both space and utilization data is therefore recommended.

The development and maintenance of a room-level space inventory is a clear best practice and should be a prerequisite for capital funding. It should be recognized, however, that there is a spectrum of practices across the universities, and either one-time or ongoing funding of planning and space management activities would be worthwhile. A cornerstone of university space management system is a software application to manage the university's space assets and a process (inclusive of staffing) to maintain the data. The software platform should allow for exports of space data into common formatting for use by HECC. Quantifiable data about space assets can then be used to inform capital planning decisions. The lack of consistent space data at all institutions made it exceedingly difficult to conduct this study and produce reliable space analytics comparable for all universities.

As it has been noted, "improving utilization is…the most cost effective strategy…because it improves return on existing investments."[6] Requiring reports on classroom and teaching lab utilization is also required by many coordinating boards and systems.

As also noted with funding of facility demolition, activities involving space planning and utilization may not be bondable, but should serve a key role in a comprehensive capital plan.

3.9 Develop and maintain facility condition assessments which account for both functionality and suitability to inform asset management goals

It is recommended that HECC require (and/or recommend the funding of) facility assessments to evaluate existing facilities for both condition and suitability. A facility condition assessment should consider not only the age and performance of building components and systems, but also the suitability of the facility for academic program delivery. A large, raked auditorium may be fully functional for lectures, but completely ill-suited to deliver instruction in an active-learning, team-based environment shown to have better student outcomes.

3.10 Promote Institutional Strategic and Master Planning

Each institution should routinely engage in planning activities that consider statewide needs, develop strategic goals in line with role and mission, and produce data informed facility plans.

6 "Planning and Managing Campus Facilities." Edited by William, Daigneau, copyright 2003 APPA and NACUBO.

3.11 Require that all capital project proposals include an analysis of long term operating impacts, including maintenance and renewal costs, as well as alternatives

It would be highly preferable that a prerequisite for capital project funding be that the institution have a plan for funding the lifecycle maintenance and renewal of the facility out of institutional operating funds. But this necessarily shifts the discussion from funding of capital investment to operating costs. At the least, a best practice is to ensure that these lifecycle costs are understood and acknowledged as part of a "stewardship model."[7] Additionally, a review of project alternatives ensures that less capital intensive options are considered.

3.12 Fine tune capital funding prioritization process

The project team has provided a series of comments and perspectives on the capital prioritization rubric throughout the term of the study. The overarching theme is for the process to become more responsive to statewide needs that could potentially transcend individual institution needs. As noted in the section on capital planning procedures, some systems and coordinating commissions prioritize projects on the basis of each project's merit, rather than a equal distribution of the top, board-ranked projects. Such a process helps ensures that the state's priorities are paramount. Ultimately, the rubric should align funding for capital projects with statewide strategic goals articulated by the HECC, in consideration of demographics, educational attainment, increased access, and occupational demand, among others. Heavily weighting compliance with the HECC statewide strategy moves the process toward one that is less reactive to individual institutional initiatives and proactive in supporting statewide priorities.

4. Define Institutional Role and Mission

In a survey of state higher education executive officers across the nation (jointly conducted with SHEEO) for this study, 43% of respondents indicated that role and mission were set in state statute and over 71% were reviewed regularly. Such an approach when conducted on a statewide scale will serve to coordinate both efforts and investments, result in greater efficiencies and avoid costly duplication of programs and facilities.

We therefore urge HECC to undertake an effort to more rigorously define missions for the public higher education institutions in the state. This definition should include assignment of:

a) Audiences to be served by institutions—geographic, prior academic preparation (selectivity), etc.

b) Arrays of programs to be offered—levels and academic fields, particularly professional fields

c) Unique roles—land grant, health sciences, etc.

As an example of the last point, the absence of a statewide plan for delivery of health professions education in the state results in a unbalanced and inefficient response to occupational needs. Healthcare is a growing industry in the state and almost all institutions are proposing addition of programs to train professionals in one health care specialty or another. Not including OHSU in the study leads to uncertainty about its role in this arena, especially their intent/willingness to partner with other institutions in the delivery of health professions programs. We recommend that HECC undertakes a study of the best ways to respond to programmatic needs in this arena before moving ahead with either:

- Approval of mission changes that would expand institutional missions to include health professions programs (for example, at Western)
- Approval of additional health care programs as stand-alone programs (i.e., not delivered in partnership with OSHU)

We suggest that HECC take a look at the mission statements embedded in policy in the state of Arkansas for guidance with best practices.

7 "Buildings - The Gifts that keep on Taking; A Framework for Integrated Decision Making," by Rodney Rose, published by APPA 1999.

PROCESS OVERVIEW

DATA COLLECTION

Data gathering was extensive and used multiple sources:

- Room level space inventory, requested from each institution
- Course schedule data (requested from each institution)
- Staffing data (requested from each institution)
- Research expenditures (each institution and National Science Foundation, NCES)
- Building age and GSF data (collected by HECC from each institution)
- Historical enrollment data and projections (collected by HECC from each institution)
- Demographics, Census data
- Occupational and job posting data (EMSI, plus other sources)
- Geographic regions associated with each institution (confirmed resulting regional designations with HECC)
- Strategic Plans, Master Plans, and Capital Plans (requested from each institution)
- Deferred Maintenance data
- State Architect building data
- Research of best practices, SHEEO survey, Rubric review

SITE VISITS

The project conducted site visits to each of the seven main campuses plus visits to the OSU - Cascades campus in Bend and Oregon Tech facility in Wilsonville. Meetings were held with campus representatives as deemed appropriate by each institution. Staff present ranged from facility managers, planners and architects to senior administrators. During these meetings, basic information was reviewed and discussed regarding the campus, its facilities, strategic and capital plans, enrollment plans and other data points. Time was set aside to tour campus facilities, as guided by the host institutions. This gave the team a first-hand look at the facilities and issues facing each campus.

During this first round of visits, meetings with HECC personnel, the Population Center at PSU, and legislative staff were also arranged.

The project team then undertook a second round of site visits to each of the eight campuses, during which the project team participated in meetings with educators, representatives of local employers, and workforce and economic development experts from the region. Included in the educators' meeting were institutional administrators along with representatives of the local K–12 district or districts as well as the local community

college. A major focus of the discussions concerned the institution's enrollment plans, how they developed their enrollment projections, and their intended strategies for achieving them. The site visits also addressed the institution's plans for program development or enhancement in connection to workforce and economic development needs. These conversations tied into the kind of space needs the institutions were seeing, in terms of new facilities as well as existing spaces that are no longer effectively serving a purpose.

ANALYSIS

It is increasingly evident that postsecondary education and training and related capital expenditures should be closely aligned with workforce demands, both generally—as in postsecondary education provides a wide array of transferrable skills, and specifically—as in the array of academic programs available at public institutions across the state should be capable of supplying appropriately trained talent to meet workforce goals. With that in mind, this strategic capital plan approached the needs of the state and its seven (or eight, depending on how one categorizes the OSU - Cascades campus) public four-year institutions from a regional perspective. This plan uses the state's workforce investment areas to draw regions that define each institution's primary service area, and then uses those regions to assess the extent to which demand for enrollment will come from students in those areas, as well as to assess the extent to which employment demand can be best met with what array of academic programs.

To assess the extent to which space needs may be created by additional enrollments, the project team analyzed a wide array of data addressing population trends and projections; expected enrollments from the traditional pipeline of students completing high school and enrolling directly in one of Oregon's public four-year institutions, from out-of-state students, and from non-traditionally aged adult enrollments; and from the potential improvement in retention rates.

In addition to looking at recent data, the project team also modeled the enrollment impacts of potential changes in all of these data at the state level and for each of the eight campuses, using a heuristic tool—NCHEMS' Student Flow model—which has seen common use in other states but was modified with Oregon-specific data for this project. The data used for the models relied on each institution's enrollments traced to students' county of origin within Oregon, as well as out-of-state enrollees and transfers. Scenarios of likely future enrollment took the three forms for each of the institutions (and OSU - Cascades), all of which were based on projected population change by age for the primary service area defined for each institution. These models:

1. Assumed all most recently measured rates of recruitment and retention would remain constant.
2. Assumed an across-the-board five percent increase in the most recently measured rates of recruitment and retention.
3. Estimated the across-the-board percentage increase in recruitment and retention rates that would be necessary for each institution to reach its own enrollment projection for 2030.

In addition, space models were created for each institution using the room level facility data, which was linked to enrollment, staffing and course data in specialized software developed for this purpose. The models were constructed using nationally recognized space planning guidelines and informed by the consultants' extensive experience and benchmarking data.

Linking these datasets also allowed utilization analytics to be run for classrooms and teaching laboratories, and these are summarized in the section on key findings.