WASHINGTON STATE UNIVERSITY

Tri-Cities Academic Building

2019-21 Request:	**$27,000,000**	**Project Type:**	**Growth**
		Project Phase:	**Construction**
Institutional Priority: # 6		**Gross Square Ft:**	**40,000**

Washington State University requests $27 million in the 2019-2021 biennium for construction of the WSU Tri-Cities Academic Building.

WSU Tri-Cities was granted the authority to expand to a four-year campus in 2007, leading to accelerated enrollment growth. This growth rate is increasing due to - WSU's strategic academic goals that focus on growth in STEM programs. The campus facilities, however, are inadequate to accommodate all the students and existing faculty. For example, the campus currently has only one suitable space for offering chemistry laboratory sections. Biology labs have to be offered off campus in leased space. Many of the campus teaching laboratories (used previously for upper division and graduate courses only), are too small and/or not equipped for teaching undergraduate lab sections of 24 students.

In the absence of adequate facilities and to meet current demand, the university is currently leasing space for additional scientific lab instruction, and faculty office space in the Tri-Cities Research District and in downtown Richland. Leasing instructional and faculty office space in several locations off campus is inefficient and costly. Growth will be impossible without expanding teaching and research facilities on campus and consolidating laboratory and classroom facilities to meet strategic needs.

The Academic Building is the highest campus priority as described in the Tri-Cities master plan. The predesign study identified an overall campus need for approximately 145,000 gross square feet. Campus space needs were prioritized into several modules. Focusing on the most critical space need, this request calls for the first, approximately 40,000 gross square foot building to house modern, right-sized STEM teaching laboratory space for first and second year students. This type of space does not currently exist on campus. While this project will reduce the need for leased laboratories, the need for leased space will not be eliminated until additional buildings are completed. Future facilities addressing projected campus growth will provide space for second and third year students and faculty offices not accommodated in this project.

This facility will be located on campus opposite the existing Bio-products, Sciences and Engineering Laboratory (BSEL) to the west, enabling collaboration and meeting projected growth in conjunction with WSU Tri-Cities' strategic STEM goals. Additionally, this facility's benefit will be leveraged through collaboration with the adjacent research campuses of the Tri-Cities Research District and the Pacific Northwest National Laboratory (PNNL). It will enable WSU Tri-Cities to support the production of the next generation of health care providers and offer additional programs in science and engineering. The building will also allow WSU Tri-Cities to enhance exposure to under undergraduate research initiatives, hands-on experiences known to bolster academic performance.

The new Academic Building and its relationship to BSEL researchers will also expand opportunities in sustainable energy and contribute to a prosperous economy through developments in the biomass industry (*Results Washington*, Goals 2 and 3). This synergistic collaboration between the WSU Tri-Cities, BSEL, and PNNL provides a unique opportunity to educate and train undergraduate and graduate students in state-of-the-art research programs and methods designed to identify new, sustainable uses for products made from biomass. Modern instructional space is essential for these initiatives as curricular innovations that engage and improve student learning also lead to increased retention in all STEM disciplines.

Institution
Washington State University
Project Title
TRI-CITIES ACADEMIC BUILDING
Project Location (City)
Richland, WA

1. Problem Statement (short description of the project – the needs and the benefits):

WSU Tri-Cities was granted the authority to expand to a four-year campus in 2007, leading to an acceleration in enrollment growth. Based on state-level planning and as the outcome of initiatives to reach WSU's strategic goals (exceptional research and innovation, and a transformative student experience) with a focus on STEM (sciences, technology, engineering, and mathematics) disciplines, this growth rate is likely to continue to increase. Currently, the campus is unable to provide a comprehensive set of academic programs nor accommodate existing academic programs with suitable space for teaching, learning and training. As a result, we must offer key laboratory instruction off-campus at other sites in Richland. Further growth in student enrollment and faculty scholarship will remain constrained without expanding the physical capacity for teaching and research, and consolidating laboratory and classroom facilities to meet strategic needs.

Even though WSU Tri-Cities is currently leasing two teaching labs, one research lab, 26 offices/cubicles, one conference room and one 3,000 square foot high-bay lab in one off-campus facility, the space available for both lecture and laboratory learning experiences for our current students is insufficient and thus prohibitive for further growth in student enrollment at the undergraduate and graduate levels. The new Academic Building is planned to accommodate the needs for our currently enrolled students and provide needed space for growth to achieve strategic goals.

The amount of leased space will continue to increase until this building is completed, at which point some of the less effective off-campus leased space will be reduced. In addition to serving existing academic programs by providing space for the university to offer additional course sections, often referred to as trailers of critical landing courses for STEM majors, (i.e., Chemistry 105/106 and 345, Biology 106/107 and 301 and Physics 101/102/201/202), the new space will enhance the basis for instruction and training across all programs at a level of quality that meets the promise extended by WSU's Carnegie designation of a Tier 1 Research institution. These landing courses are necessary for high-growth area majors such as engineering, computer and life sciences as they constitute the platform that prepares students for success in gateway courses and timely progress toward graduation with a Bachelor's degree. Currently, these courses are offered only once each academic year or have a limited number of seats available if offered more frequently due to space constraints. This capacity cap is a significant barrier to recruitment of freshmen and transfer students, and thus prohibits enrollment growth. By allowing students to enter their programs on track regardless of which semester they start, and by allowing them a timely opportunity to get back on track when they aren't successful, trailer courses reduce time and credits to degree, support student retention and success, and increase both degree production in general and four- and six-year graduation rates in particular.

The benefit of this new building will be leveraged through WSU Tri-Cities' plan and the responsibility to lead postsecondary and graduate education and training in south-central Washington. A major focus will be on interdisciplinary programming and on enhanced collaborations between the campus and adjacent research facilities within the Tri-Cities Research District including those at the Pacific Northwest National Laboratory (PNNL). WSU and PNNL recently launched three new Joint Institutes to expand research, educational and training programs in the areas of nuclear science and technology, advanced grid, and bioproducts. The campus is poised to offer the hands-on educational experiences that will lead to career opportunities in these areas and others provided by STEM-focused Hanford contractors and many others. However, the existing laboratory space for teaching and training is not adequate nor does it meet current standards for state-of-the-art instruction in the life and physical sciences.

The potential benefit of the new academic building is great: WSU will be able to provide more interns and graduates in STEM majors to the above scientific entities, and the rest of our state, helping to meet the STEM industries' recruiting needs.

2. History of the project or facility:

The planned WSU Tri-Cities' Academic Building has been a strategic priority since the Tri-Cities Master Plan was created in Fall 2008. It was developed in conjunction with concurrent master planning projects for properties adjacent to the campus for the Tri-Cities Research District (Port of Benton), Solaris Group (a private-sector developer), and PNNL, which is operated by Battelle for the US Department of Energy (DOE).

The 2015-17 predesign request and its identified baseline needs originally proposed a larger building than the one that is currently being planned. The building is being designed as a 40,000 gross square foot (GSF) facility with a total project cost estimate of $30.4 million. This first building of several following facilities will accommodate the highest priority space needs of right-sized and modern STEM teaching laboratory space. The university will plan subsequent buildings for the long-term growth expected at this campus location.

3. University programs addressed or encompassed by the project:

WSU Tri-Cities' 2015 Academic Master Plan[1] targets four cluster areas that have been identified by the National Governors' Association in their Complete to Compete Initiative as among the fastest growing occupation groups, each of which requires postsecondary education: life sciences, engineering (including bio-products), interdisciplinary technology (including computer science and digital media) as well as science, mathematics and computer science teacher education. The Academic Building will reinforce WSU Tri-Cities' core value of interdisciplinary STEM+ education by providing a synergistic space for faculty and students across a range of disciplines to collaborate and innovate in research, teaching, and learning. Each of these university programs are encompassed in the overall project for this building, which in its entirety will provide classroom, laboratory, and faculty space needed to achieve their goals.

4. Integral to Achieving Statewide Policy Goals:

Provide degree targets, and describe how the project promotes improvement on 2015-16 degree production totals in the OFM four-year public dashboard.

See **Appendix A** (includes dashboard figures and institutional targets).

a. Indicate the number of bachelor's degrees awarded at the close of the 2015-16 academic year.
5,517 bachelor degrees awarded at WSU.

b. Indicate the number of bachelor's degrees awarded in high-demand fields at the close of the 2015-16 academic year.
1,976 bachelor degrees in high-demand fields awarded at WSU.

c. Indicate the number of advanced degrees awarded at the close of the 2015-16 academic year.
1,480 advanced degrees awarded at WSU (of which **805** were in high demand fields).

The new building will allow the university to advance the statewide policy goals described below and improve the value of postsecondary learning and training at the WSU campus located in Richland. The campus vision is to increase total student enrollment to 2,500 in the next five years at this important educational site. As a result of this growth, the university anticipates a 20% increase (~80 additional degree recipients per year) in the number of undergraduate (est. 60) and graduate degrees (est. 20) awarded on the Tri-Cities campus as reflected in Appendix A. Of the increase in 80 additionally awarded degrees, 52 are estimated to be in high demand fields.

[1] https://tricities.wsu.edu/documents/2016/06/academic-master-plan-2.pdf

This building project will facilitate future growth in STEM-focused high demand bachelor's degrees in biology, chemistry, construction management and computer science / bioinformatics plus graduate degrees in Education with STEM content area endorsements including computer science. Providing dedicated space for science and engineering coursework in the new building will allow expansion of new degree offerings in other disciplines as existing classroom space becomes available.

The new building will also contribute comprehensively to growth in STEM teacher education spanning from kindergarten to graduate level. In order to promote student enrollment in the STEM fields at the university level, it is imperative to improve the instruction of science, engineering, technology and mathematics at the kindergarten through grade 12 (K-12) levels through K-12 teacher education (Results Washington Goal 1)[2]. Research-based instruction in the pedagogy of teaching science and mathematics is an important element in the training of future teachers, and the WSU Tri-Cities' teacher education program has recently added the Masters-in-Teaching (MIT) degree program to train teachers to teach mathematics and science at the secondary level. Additionally, funds awarded twice by the Washington Office of the Superintendent for Public Instruction, generous support from the Corporate Gifts Program of the Battelle Foundation and in-kind contributions from PNNL's Directorate for STEM education enable WSU Tri-Cities Education faculty to implement the competencies for teaching Computer Science by Science and Mathematics teachers in the K-12 environment. Modern teaching and training space is essention to produce effective teachers certified to teach science, mathematics and computer science at the 6-12 grade levels or to act as science specialists in the K-5 grades..

All degree programs in Education are participating in an active recruitment plan with the goal of increasing student enrollment, particularly in the high need areas of science and mathematics education, special education, as well as English as a second or foreign language. This initiative will facilitate efficient enrollment growth by providing for larger lecture classes where appropriate, and by supporting the combination of multiple sections of the same course.

The new STEM-focused teaching laboratory building and its proximity to researchers in the Bioproducts Science and Engineering Laboratory (BSEL) will expand educational and practical opportunities in sustainable energy and will contribute to a prosperous economy through developments in the biomass industry (Results Washington Goals 2 and 3)[3]. The collaboration between WSU Tri-Cities and PNNL in BSEL provides a unique opportunity to educate and train undergraduate and graduate students in cutting edge research programs and methods designed to identify new, sustainable uses for products made from biomass.

These collaborations create processes and products that are better for the environment. The research program at BSEL offers outstanding potential for benefit to residents of the state of Washington through:

- improved economic development;
- healthier rural economies;
- technology transfer to enhance the competitiveness of biomass-based businesses throughout the state;
- improved environmental quality;
- development of renewable energy systems with near-zero net greenhouse gas emissions;
- technology licensing and export;
- development of sustainable resource supplies.

The existing BSEL building has a small number of classrooms and teaching laboratories that are fully occupied. The proposed new classroom and lab building is essential to allowing WSU Tri-Cities to fully leverage the opportunity the BSEL research program provides. The new building, which will be located next to BSEL, will allow WSU Tri-Cities/BSEL and PNNL researchers to give their graduate and undergraduate students a dimension of experience and capability they cannot get in any other setting, built on an integrated education and research experience that is genuine and meaningful. Graduates of WSU Tri-Cities will be well on their way to becoming mature scholars, articulate and adept in the techniques and methods used in the STEM fields (particularly, those

[2] https://www.results.wa.gov/goals-progress/goals/world-class-education/goal-map
[3] http://www.results.wa.gov/

represented by our current strengths of biomass research and sustainable development) and ready for the challenges of professional life or advanced graduate study. These students, equipped with the education, skills and abilities they received at WSU Tri-Cities, will take and apply their expertise throughout the state as they pursue their career aspirations.

Research is vital to the state's economic growth and to excellence in teaching. The partnership between WSU Tri-Cities and PNNL serves to benefit the students at WSU Tri--Cities by expanding opportunities within the new economy (Results Washington Goal 2)[4] and also serves to benefit our state and our nation.

WSU Tri-Cities has identified four research areas of strength where the campus will continue to promote and develop excellence: life sciences, environment, energy, and food and beverage sciences. Currently focused on the production of biofuels, researchers at BSEL have transportable skills and equipment to conduct research relevant to the health sciences and bioengineering. In the life sciences, WSU Tri-Cities has recently made a cluster hire of two tenure-line faculty in biology and environmental science, began offering the BS in Biology in Fall 2017, and plans to offer a BA in Chemistry in AY 2019-20. These faculty, in collaboration with wine science faculty, the WSU Elson Floyd College of Medicine, and researchers at PNNL in the areas of Microbiome and Environmental Science will offer programs that produce the next generation of professionals and scholars prepared to apply their knowledge and skills to improve human and environmental health and sustainability. Wine Science education and training is one of WSU's latest signature programs that is headquartered on the Tri-Cities campus. As a program of academic rigor, it reliess on the quality of education and training in mathematics and the natural sciences and its continued success is thus dependent on the capacity of quality laboratory science education and training of its students.

With the largest civil works project in the country at the Hanford facility, WSU Tri-Cities faculty have conducted research in the environmental engineering and science arena for decades related to the Hanford project. Because of the 50-year life cycle of the vitrification facility, WSU, in partnership with Energy Solutions, built the Energy Solutions Engineering and Research Laboratory on campus. This facility is currently leased to Energy Solutions to conduct research and training for the Hanford pre-treatment facility. WSU faculty and staff work in partnership with Energy Solutions on this project, which in itself requires the building of sufficient capacity for teaching and research in mathematical, computational and physical sciences.

WSU Tri-Cities has collaborated with PNNL and Energy Northwest for decades in the area of energy and sustainability. Researchers at WSU have conducted research in smart grid and power systems engineering. In addition, researchers and students have conducted research on wind and solar energy. WSU Tri-Cities is also partnering with PNNL to establish graduate programs and research capabilities in smart grid, cyber security, and systems engineering. This partnership will allow WSU Tri-Cities to contribute to making regional electrical grids safe, secure, and efficient through innovative research. Research in cyber security will allow WSU Tri-Cities to make a contribution to national security. Systems engineering will allow graduates and researchers to tackle 21st century grand challenges by providing holistic solutions to the national problems. Graduate studies and research in all three areas will produce graduates who will add significantly to the nation's security and the economic health of the Tri-Cities area, the state, the nation, and the world. The proposed academic building is the key to achieving this goal.

WSU Tri-Cities research will assume an increasing role in WSU's effort to support the food and beverage industries in the state. A successful beginning of these activities in the Tri-Cities area was the Wine Science Center, created in a private-public partnership, which is one of the core anchors in this effort.In the future, WSU Tri-Cities will concentrate additional efforts on fermentation science (microbiology and bioengineering) with a focus on products derived from fruits (tree fruits and berries), vegetables and grains. WSU Tri-Cities plans to develop a major food-processing laboratory in partnership with the local food-processing industry. Academically, WSU Tri-Cities is now the campus that will foster the graduation of all WSU students in the Viticulture and Enology program, and decisions have been made to expand the offering of the degree program in Fruit and Vegetable Management at the Tri-Cities campus.

[4] https://www.results.wa.gov/goals-progress/goals/prosperous-economy/goal-map

The Academic STEM Building will contribute to the state's innovation economy as it will help provide the scientists, engineers and policy makers of the future. The development of these critically needed, skilled workers depends on both the WSU/PNNL partnership and the construction of the new Academic Building. Research, however cutting-edge and innovative, captures only a small part of the potential such a facility and these partnerships afford. By combining the research activities of the WSU/PNNL staff with a fully integrated academic building, WSU Tri-Cities can deliver on the potential of creating a new, vital engine to power Washington's economy. BSEL is one example of a partnership with PNNL, but an additional facility is necessary to continue the expansion needed to meet the university's research and graduate education goals. Research and teaching in this new facility will support work on renewable energy, studies in the broad area of applied microbiology with applications in viticulture and enology, biosystems engineering and the health sciences, and expansion of campus programs supporting the development of STEM teachers.

5. **Describe how the project promotes access for underserved regions and place-bound adults through distance learning and/or university centers:**
   a. **Is distance learning or a university center a large and significant component of the total project scope? If yes, to what degree of percentage?**

A 50% increase in distance learning capabilities is projected for science and engineering courses as all classroom and laboratories in the new building will be equipped with video streaming services and capabilities.

WSU Tri-Cities currently reaches many underserved regions and place-bound adults through distance learning technology. Of note is that the average age of WSU Tri-Cities students is approximately 26 years; the WSU system and the overall state average student age are lower. This suggests that the project will continue to reach many more working adult non-traditional students with the new capacity the building provides. The project will further enhance distance learning opportunities through additional distance learning sites that will be housed in this new facility.

Existing demand for distance course offerings cannot be met with existing capacity, hindering the ability to reach all interested place-bound students. This new building will provide new distance learning classrooms that will add to the number of courses offered via distance learning, especially in STEM- related programs.

   b. **Is the project likely to enroll a significant number of students who are place-bound or residents of underserved regions?**

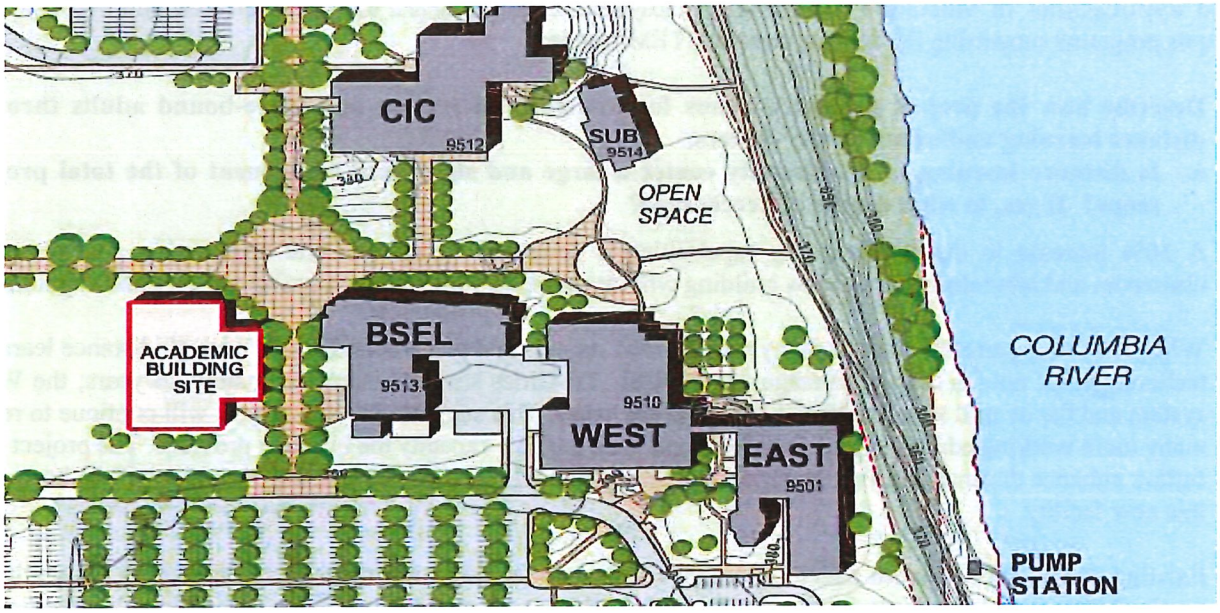
Yes. Forty percent of students at WSU Tri-Cities come from regions that are federally classified as underserved regions. According to WSU's fall 2017 Official Headcount Enrollment, 38.9% of students enrolled at WSU Tri-Cities are minority students, and 40.5% are first generation college students. However, noting recent trends, the fall 2017 freshmen class is 53% minority and 56.9% first generation; the location of this new facility will provide and expand opportunities for underserved populations.

Currently, all distance learning sites are used daily at WSU Tri-Cities. Demand for distance course offerings cannot be met with existing capacity. This limits the ability to reach all interested place-bound students simply due to limited course offerings. This new building will create new distance learning classrooms that will add to the number of classes offered via distance learning, especially in STEM programs. Further, the nearby Columbia Basin College (CBC), currently graduates more Hispanic students with A.A. degrees than any college in the state. WSU Tri-Cities has an articulation agreement with CBC to encourage transfer students to continue their education on the WSU Tri-Cities campus. CBC is the major source of transfer students for WSU Tri-Cities and as CBC grows in the number of graduates interested in pursuing a STEM degree, WSU Tri-Cities is faced with additional shortages in classroom/lab space. These shortages will be reduced by the new building.

6. **Integral to Campus/Facilities Master Plan:**

   a. **Describe the proposed project's relationship and relative importance to the institution's most recent Campus/Facilities Master Plan or other applicable strategic plan.**

The Academic STEM Building is the highest campus priority as listed at top in the Tri-Cities Academic Master Plan[5], Phase II Space Needs on page 26 of 58. It will be located opposite BSEL as shown in the master plan, pictured below. It is the next logical plot addition to the Tri-Cities campus, and more importantly, it is the most critical step to achieve the highest priority goals of; 1) Achieve national and international preeminence in innovation, discovery, and creativity, and 2) Provide a premier education and transformative experience that prepares students to excel in a global society. See also WSU Development Plan[6].



Initiating design of this building and subsequent construction are the next steps toward reducing leased space and the inefficiencies that result from teaching in disparate locations as well as provide increase access to required core curricular courses for all students. The on-campus facility will also accommodate projected growth.

   b. Does the project follow the sequencing laid out in the Master Plan (if applicable)? If not, explain why it is being requested now.

Yes, the Academic Building is the next logical addition to the Tri-Cities campus given its proximity to the existing BSEL facility on the WSU Tri-Cities 202-acre campus, as described in Phase I of the WSU Tri-Cities Master Plan. The project was developed in conjunction with concurrent master planning projects for property adjacent to the campus for the Tri-Cities Research District (Port of Benton), Solaris Group (a private sector developer), and the Pacific Northwest National Laboratory (operated by Battelle for the DOE).

7. **Integral to institution's Academic Programs Plan:**

Describe the proposed project's relationship and relative importance to the institution's most recent Academic Programs Plan.

[5] https://tricities.wsu.edu/documents/2016/05/academic-master-plan.pdf

[6] WSU Development Plan: http://couggis.wsu.edu/DevelopmentProgram/

Must the project be initiated soon in order to:

a. Meet academic certification requirements?

Yes. The engineering and computer science programs on the Tri-Cities campus underwent an ABET independent accreditation review in 2014-15. The review was successful and in September 2015 ABET granted full accreditation for electrical engineering, mechanical engineering, and computer science. A more modern and well-maintained infrastructure in laboratory space will be required for many of the computer science and mechanical, electrical, and civil engineering courses in order to maintain accreditation in view of the rising enrollment in these programs.

b. Permit enrollment growth and/or specific quality improvements in current programs?

Yes. All laboratory space for the sciences and engineering at the Tri-Cities is currently in use in existing buildings. Those programs cannot grow without building or leasing additional space. Approximately 31,400 square feet of classroom, office, and laboratory space is currently being leased off campus to house program and student needs. (Leased square feet: 16,000 ICB, 3,000 Einstein, 12,400 Lee).

c. Permit initiation of new programs?

Yes, completion of this building will permit the initiation of new programs in science, computer science and engineering as described in the Academic Master Plan. The anticipated growth in enrollment in biology will be an important component to the graduate medical facilities at the WSU Spokane campus, will allow for the creation of programs in high demand medical areas, and will prepare students for graduate health field degrees at WSU Spokane and other institutions. These programs further enhance opportunities to partner with PNNL with the addition of degree programs in the biological and physical sciences.

Consistent with WSU's Strategic Plan[7], and the WSU Tri-Cities Academic Master Plan[8], the focus is on student-centered, project-based learning in the STEM fields. Current classrooms are not configured for active learning, where students are engaged in peer-learning and group activities facilitated by the instructor. Existing classrooms can fulfill the need for conventional learning settings. The new building will become WSU Tri-Cities' main pedagogical venue for state-of-the-art laboratory and classroom instruction. Further, the Tri-Cities' Academic "STEM" Building will be located next to, and collaborate closely with BSEL and the Wine Science Center, which will provide a major thrust in achieving WSU's strategic goals to:

1) Increase productivity in research, innovation, and creativity to address the grand challenges and opportunities of the future.
2) Further develop WSU's unique strengths and opportunities for research, innovation, and creativity based on its locations and land-grant mandate to be responsive to the needs of Washington.
3) Advance WSU's reach both nationally and internationally in existing and emerging areas of achievement.

This project would leverage the campus' rich potential and unique location to create opportunities for research, innovation and creativity, especially when those opportunities also entail multidisciplinary or public-private collaborations and partnerships.

Collaboration is the hallmark of the relationship between WSU Tri-Cities and PNNL and it provides a unique opportunity to educate and train undergraduate and graduate students in the most current research programs and methods ranging from bioproducts to microbiomes.

The BSEL facility leverages the assets of industry, biomass growers and processors, sustainable development, higher education, and PNNL to develop new methods for converting all forms of biomass, including agricultural and food processing residues and wastes, into commercially valuable renewable energy and industrial products.

[7] https://strategicplan.wsu.edu/ and subsection: http://strategicplan.wsu.edu/plan/transformative-student-experience/
[8] http://www.tricity.wsu.edu/academicaffairs/masterplan.php

The existing BSEL building has a small number of classrooms and teaching laboratories that are fully occupied, so the proposed Academic Building is essential to allowing WSU Tri-Cities to fully leverage the opportunity the BSEL research program provides. The new classroom and lab building at WSU Tri-Cities will allow BSEL and PNNL researchers to give their graduate and undergraduate students a dimension of experience and capability they cannot get in any other setting, built on an integrated education and research experience that is genuine and meaningful.

In addition to achieving WSU's theme of Exceptional Research, Innovation, and Creativity, as described above, the WSU Tri-Cities' Academic "STEM" Building will support the WSU theme of Transformative Student Experience of the following goals:

1) Provide an excellent teaching and learning opportunity to a larger and more diverse student population.
2) Provide a university experience centered on student engagement, development, and success that prepares graduates to lead and excel in a diverse United States and global society.
3) Improve curricular and student support infrastructure to enhance access, educational quality, and student success in a growing institution.

The new academic building will accommodate more student enrollment in science, technology, engineering and mathematics (STEM) fields. This, in turn allows for enrollment growth in STEM+ areas such as psychology, business and fine arts as existing facilities are adapted for the unique learning environments of other disciplines. More will be done to inform prospective students about career opportunities in high-demand fields, and to actively recruit students for these occupations. Responding to this need will serve the above goals, along with WSU's themes of outreach and engagement through increasing WSU faculty, staff, and students' contributions to economic vitality, educational outcomes, and quality of life at the local, state, national and international levels.

8. Enrollment Growth:

a. Identify the number of additional full-time equivalent (FTE) state-supported students the project is expected to enable the institution to serve when the space is fully occupied. Describe the method by which the number of additional FTEs who can be accommodated by the proposed space has been calculated, and provide and explain the enrollment analysis indicating probable student demand and enrollment from project completion to full occupancy.

Based on the current plans for a $30.4 million project, a building of approximately 40,000 gross square feet (GSF) will accommodate 216 student FTEs. The predesign team used the WSU/state space standards to calculate student FTE's in the teaching labs, undergraduate research plus maker space, and classrooms plus computing facilities. Given the significant need for undergraduate STEM teaching laboratory space and the enrollment growth projections through year 2021 (**Appendix B**) along with recent increases from directed marketing campaigns already in progress, it is likely that the building will be fully utilized when completed. Additionally, there is a multiplier effect to student FTE growth on the campus and its impact since all undergraduate students are required to take at least one science laboratory credit before graduation (so the additional FTE enrollment will be larger than the 216 student FTEs in the building). Because existing campus facilities are short of undergraduate teaching lab space of the right size, offsite leased space is helping meet the short term needs; this is not an ideal or a permanent solution to the campus space needs.

Note that because this building will not accommodate all of the projected space needs, the long-term campus space needs are based on prioritized phases identified in the recent predesign study (see **Appendix C**). The pre-design team forecasted that approximately 145,000 gross square feet would be required to meet all of the STEM campus space needs (see **Appendix D**). The most critical short-term space need to be met by design and construction of the first new facility is: minimum lower level undergraduate teaching lab space = 40,000 gross square feet, and through the design process if there is any additional capacity, the next highest priority would be to include an additional 7,000 gross square feet of lower level undergraduate teaching lab space.

b. Identify how many of the additional FTE enrollments are expected to be in high-demand fields (identified in the OFM statewide public four-year dashboard) and the particular fields in which such growth is expected to occur.

Assuming the current campus student FTE ratio of STEM/high-demand and non-STEM is the same split in the future Academic Building (i.e., 64% STEM & 36% non-STEM), **Appendix E** shows the number of expected student FTEs by high-demand field at full occupancy, which totals 138 of the 216 full occupancy FTE. The top fields include: Mechanical Engineering, K-12 Education in STEM fields, Biology, Computer Science, Electrical Engineering, Civil Engineering, and Pre-Health.

9. Availability of Space/Utilization on Campus:

Describe the institution's plan for improving space utilization and how the project will impact the following:

a. The utilization of classroom space [see **Appendix F]**

Increased enrollment for Fall 2017 reflects a greater usage rate than previous years for introductory science and engineering courses. Many of the required general education courses in history and the social sciences have almost doubled in size since 2015. Overall use of classroom spaces is moving closer to the state utilization target as enrollment increases. In Fall 2015 the total number of students enrolled in college algebra and pre-calculus courses was 167 and this increased to 236 in Fall 2017. Our teaching space usage rate has been low in the past because of the higher than average age of our students due to at least two factors. 1. The campus history of providing only upper divisions courses, and 2. The large number of students who work at PNNL (with about 4,000 staff) and other companies in the Tri-Cities Research Park area and local community. Over 90% of WSUTC students work full or part time jobs while attending school. With our average age ranging between 26 to 28 years old, many of these students need to attend classes that are held outside of normal work hours.

From an education standpoint, as progress is made toward a student centered, activity-based learning model, many current classrooms are not large enough nor properly equipped/furnished to allow for a flexible space model. - Enrollment of incoming freshmen is projected to increase beyond that of the record number enrolled in Fall 2017. These numbers put increasing demand on our current classroom space especially for large general education (UCORE) courses. Moving large enrollment STEM courses (Biology 102/106/107, Chemistry 101/102/105/106, STAT 212, Physics 201/202) to the new facility will permit growth in other units on campus.

b. The utilization of class laboratory space [see **Appendix F**]

Growth in some programs is restricted not because of lack of lab space, but because existing campus buildings do not have enough lab space of the appropriate size to teach lower division students. Until 2007, the campus was authorized to teach only upper division and professional programs. In the past, typical upper division labs accommodated less than 10 students at a time. For lower division lab course offerings, however, spaces need to accommodate at least 24 students at a time. The enrollment in some programs has to be restricted because of the lack of laboratory facilities and reliance on leased space. Lab space utilization has exceeded the state target only because there are only two spaces of the right size to accommodate undergraduate laboratory sections. The rest of the lab sections are taught off campus in leased space.

A new academic building with a modern class laboratory infrastructure will be critical to the expansion of the curriculum especially the STEM curriculum. This enhances the undergraduate experience for all students since all are required to have seven credits of inquiry in the natural sciences to graduate. This facility will offer laboratories that are designed to teach within, and will be adjacent to, the BSEL complementing its research related teaching. The new facility will make courses and the associated teaching lab offerings and space use more efficient for students and faculty alike and reduce the need for off campus leased space.

WSU Tri-Cities has a significant working student population (90% of 2014 Spring graduates held part-time or full-time jobs while completing their degrees), so certain times of day have concentrated demand and are used more fully than others. The new building will allow for more student opportunities during peak time usage as well as opening other time slots for high demand classes.

10. Efficiency of Space Allocation:

a. For each major function in the proposed facility (classroom, instructional labs, offices), identify whether space allocations will be consistent with Facility Evaluation and Planning Guide (FEPG) assignable square feet standards. To the extent any proposed allocations exceed FEPG standards, explain the alternative standard that has been used, and why. See Chapter 4.0 of the Project Evaluation Guidelines for an example. Supporting tables may be included in an appendix.

Phase 1A of this project contains class laboratories for undergraduate learning. The class laboratory spaces in the program align with FEPG's Station Planning Guidelines. **Appendix G** lists the class laboratories and seat counts and provides a comparison between the FEPG's guideline and that in the space program. Class laboratories in the space program have been sized based on student seat counts, required equipment footprints and activities to take place within space. The FEPG Class Laboratories Guideline allows 35-120 square feet of assignable space per student station within class laboratories; this range of assignable space is broken down by Major CIP Groups. We are proposing 41-74 square feet per student station depending on the activity and equipment needs within the class laboratory, and in no instance does the proposed area per student exceed the FEPG's guidelines.

b. Identify the following on form CBS002:

1. Usable square feet (USF) in the proposed facility: **24,450**
2. Gross square feet (GSF): **40,000**
3. Building efficiency (USF divided GSF): **24,450/40,400 = 61%**

See also **Appendix H** - required table for project's Program-Related Space Allocation.

11. Reasonableness of Cost:

Provide as much detailed cost information as possible, including baseline comparison of costs per square foot (SF) with the cost data provided in Chapter 5.0 of the Higher Education Capital Project Scoring Process Instructions and a completed OFM C-100 form. Also, describe the construction methodology that will be used for the proposed project.

If applicable, provide Life Cycle Cost Analysis results demonstrating significant projected savings for selected system alternates (Uniformat Level II) over 50 years, in terms of net present savings.

Due to the large number of specialized STEM related teaching laboratory spaces, it is appropriate to use the "Science Labs (Teaching)" facility type from the Project Evaluation Guidelines. The midpoint of construction is expected to be 11/14/2020 which allows a a multiplier of 1.339. The allowable construction cost calculates to $414 per gross square foot and a total project cost per square foot of $585. The escalated estimate for this facility is $439 per gross square on construction costs and is $760 total project cost per square foot The standards, even with a cost index factor, do not reflect the current cost of constructing STEM-oriented science laboratories. Hopefully the legislative will mandate a review of and an update to the higher education project cost standards, which will result in standards more reflective of current science laboratory costs. The facilities have enhanced building systems for life safety (venting and environmental controls) and specialized built in equipment and technology that may not have been reflected in the 2008 Berk Cost Study.

WSU has enjoyed a great deal of success using alternative public works delivery. The Design/Build alternative public works delivery method will be used for this project as it is the fastest design process. Design/Build facilitates quick decisions, affords flexibility in decision making and drives costs down overall.

APPENDIX A

Tri-Cities Academic Bldg	Anticipated Growth in Bachelor's Degrees	Anticipated Growth in High Demand Bachelor's Degrees	Anticipated Growth in Advanced Degrees	Anticipated Growth in High Demand Advanced Degrees
2015-16 Actual	5,517	1,976	1,480	805
Additional Degrees Generated by Project	60	39	20	13
Projected Degrees with Building Project	5,577	2,015	1,500	818
Projected Growth Above 2015-16 Actual Degrees	1.1%	2.0%	1.4%	1.6%
Current 2018-19 Target	5,946	2,203	1,481	895
Percent of 2015-16 Actual over 2018-19 Target	92.8%	89.7%	99.9%	89.9%
Projected Degrees as a % of 2018-19 Target	93.8%	91.5%	101.3%	91.4%

Comments: An increase of 60 new bachelor's degrees is expected and of those 39 will be in high demand degree programs. An additional 20 advanced degrees will be awarded and 13 of those will be in high demand areas. Refer to project proposal section 4 for more details.

APPENDIX B

WSU TRI-CITIES ENROLLMENT FORECAST

		Freshmen	Sophomore	Junior	Senior	Post-Bac	Non-Degree Seeking	MS	Phd	Grad Non-Degree/ Certs	SUM (Row Total)	Actual Census Day Total
2016	Actual	213	216	377	479	47	304	117	88	27	**1868**	**1868**
2017	Predicted	240	190	416	530	47	300					
	Actual	289	221	383	515	49	262	115	89	14	**1937**	**1937**
2018	Predicted	269	226	437	555	50	283	122	91	21	**2054**	
2019	Predicted	277	223	462	608	51	283	126	92	21	**2143**	
2020	Predicted	291	230	479	651	53	283	127	93	21	**2228**	
2021	Predicted	306	242	501	684	56	283	128	93	21	**2314**	
2022	Predicted	308	249	511	710	58	283	129	93	21	**2362**	

Non degree students includes running start students. College in the High School students are not enrolled by Census day, therefore not included in these counts. College in the High School has been put on a morotorium for 2017-18.

FTE Enrollment

		Freshmen	Sophomore	Junior	Senior	Post-Bac	Non-Degree Seeking	MS	Phd	Grad Non-Degree/ Certs	SUM (Row Total)	Actual Census Day Total
2016	Actual	202.5	193.3	326.8	418.5	39.8	151.5	80.0	60.2	18.5	**1491**	**1503**
2017	Actual	274.8	197.8	332.0	450.0	41.5	130.6	78.7	60.9	9.6	**1576**	**1577**
2018	Predicted	255.7	202.2	378.8	484.9	42.3	141.0	83.4	62.2	14.4	**1665**	
2019	Predicted	263.4	199.5	400.5	531.2	43.2	141.0	86.2	62.9	14.4	**1742**	
2020	Predicted	276.7	205.8	415.2	568.8	44.9	141.0	86.9	63.6	14.4	**1817**	
2021	Predicted	290.9	216.5	434.3	597.6	47.4	141.0	87.6	63.6	14.4	**1893**	
2022	Predicted	292.8	222.8	443.0	620.3	49.1	141.0	88.2	63.6	14.4	**1935**	

16 April 2018

Source: myWSU student information system

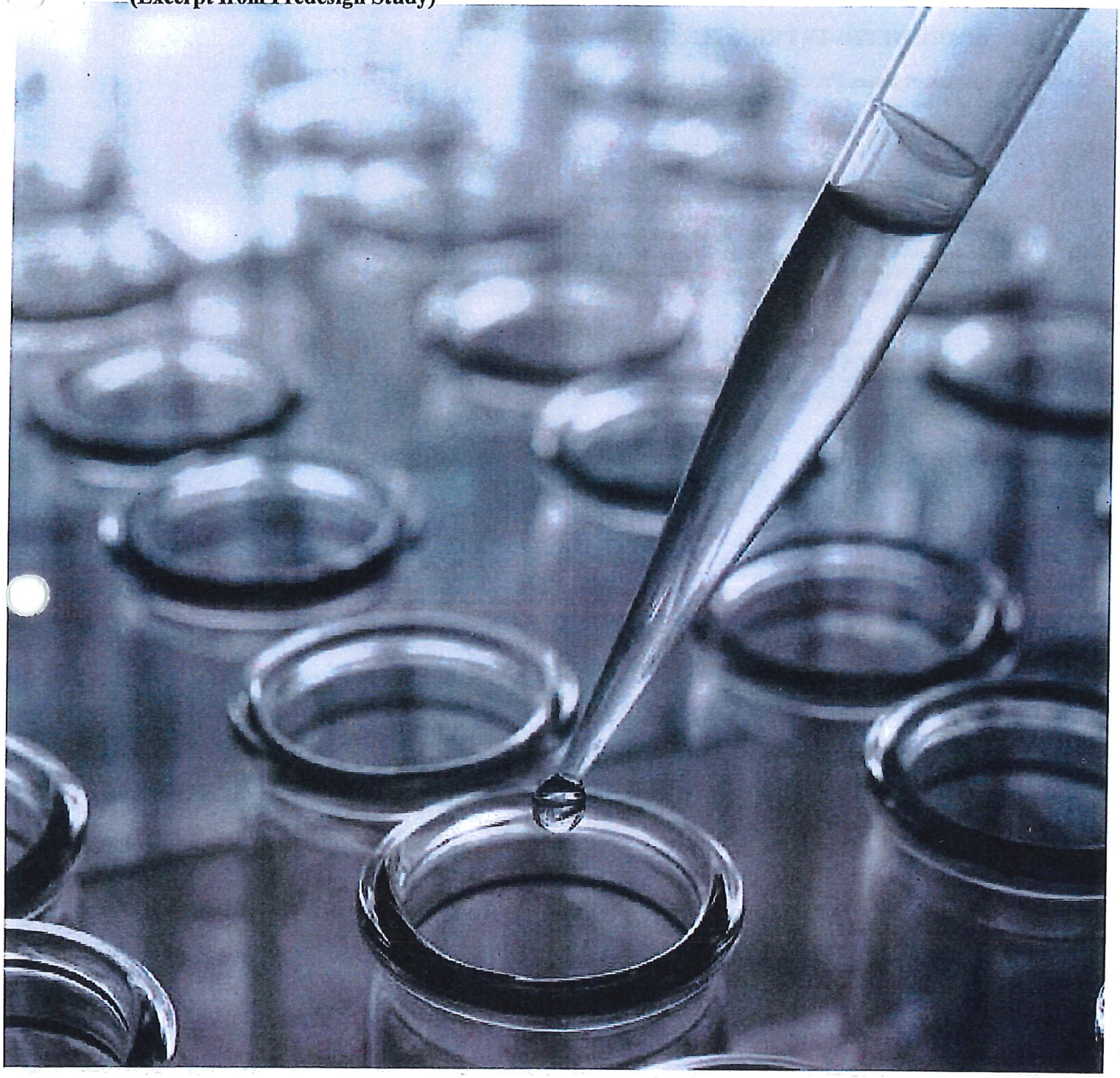
Institutional Research

Washington State University

File located in: Z:\Enrollment\Projections\Degree Projections\Enrollment & Degree Projections All WSU\2017\TriCities

APPENDIX C

SPACE NEEDS IN PRIORITIZED MODULES
(Excerpt from Predesign Study)



Washington State University Tri-Cities
Academic Building

Pre-Design Study
6/3/2016

APPENDIX C

SPACE NEEDS IN PRIORITIZED MODULES

(Excerpt from Predesign Study)

The Academic Building program was separated into three Modules with the first Module being of the highest priority for Phase I. This included: teaching laboratories and support spaces, classroom and innovation spaces and faculty offices. The first priority, teaching laboratories, proved ambitious for the initial funding so it was further separated into to sub-Modules 1A and 1B: lower division and upper division teaching laboratories and support spaces, respectively. Developing lower division teaching labs prior to upper division would add new learning space where it is in the greatest need. Each Module includes an allocation of public building, collaboration and amenity space.

Module 1A:	Lower level teaching labs, support + innovation spaces	40,400 GSF
Module 1B:	Lower level teaching labs, support + innovation spaces	7,200 GSF
Module 2:	Upper level teaching labs, support + innovation spaces	24,500 GSF
Module 3:	Classrooms + faculty offices	72,600 GSF
Module Totals:		144,700 GSF

APPENDIX D - PRIORITIZED SPACE MODULES

	SPACE NAME	AREA	QTY	SUBTOTAL NSF	COMMENT	PROTOTYPE	GROSS AREA BY MODULE (@ 60% NET TO GROSS)
PHASE 1A	PUBLIC SPACE			1,400			
	Lobby	1000	1	1,000			
	Café Space	400	1	400	Seating in Lobby		
	Multi-purpose Conference Space	4500	0	0	Presentations, Flex Learning Opportunities. 300-		
	Conference Space AV Room	150	0	0	Associated w 150 seat Classroom space		
	Conference Space Storage	331	0	0	Associated w 150 seat Classroom space		
	Catering Kitchen	200	0	0	Assumed in Café Space		
	BUILDING SUPPORT			1,745			
	Autoclave/Glasswash Room	331	1	331			
	Chem Storage	110	0	0	In Prep Labs		
	Waste Storage	221	1	221			
	Consumables Storage	110	0	0	In Prep Labs and Teaching Labs		
	Janitorial Storage	60	2	120	One per floor		
	Loading & Receiving	600	0	0			
	Building Maintenance	110	1	110			
	Main Distribution Room	221	1	221			
	Distribution Closet	110	1	110	One per upper floor		
	Server Room	221	1	221			
	Field House	331	1	331	Surveying and field equipment storage		
	Locker Room	300	0	0			
	Manifold Closet	40	2	80	One per floor		
	LOWER LEVEL TEACHING LABS			13,505			
	General Labs			6,835			
	Flex Learning Lab	1323	0	0	20 Students	TL-1A	
	Multidisciplinary Lab Classroom	1378	2	2,756	benches	TL-3A	
	Intro Lab - Biology	992	1	992	24 Students	TL-4A	
	Modular Universal Lab, 16 Seat	992	0	0	16 Students	TL-6A	
	Modular Universal Lab, 24 Seat A	1323	0	0	24 Students. Mobile Casework Tables w monitors	TL-6B	
	Modular Universal Lab, 24 Seat B	1323	1	1,323	24 Students	TL-6C	
	Modular Universal Lab, 32 Seat	1685	0	0	32 Students	TL-10B	
	Intro Lab - Chemistry A	1764	1	1,764	24 Students	TL-7A	
	Intro Lab - Chemistry B	1764	0	0	24 Students	TL-7B	
	Specialty Labs			6,670			
	Concrete Lab	1323	0	0	20 Students.	TL-8A	
	Structures Lab	992	0	0	High Bay Lab	TL-8B	
	Universal Test Lab	1323	1	1,323	30 Students	TL-8C	
	Highway Materials Lab	992	0	0	See Modular Lab - Soils/Asphalt	TL-8D	
	Signals Lab	1323	0	0	See Modular Lab - EE		
	Elementary Sim Teaching Lab	1378	0	0	Elementary Furniture Storage	TL-3B	
	Anatomy Lab	1323	0	0	Lab	TL-9A	
	Molecular Teaching Lab (Clean)	1378	0	0	24 Students	TL-3C	
	Lab Classroom - Chem	1378	1	1,378	24 Students. **Add back Qty 1 priority #3, Ref Phase 1B**	TL-3A.1	
	Flex Lab - PY	1323	1	1,323	24 Students. **Add back Qty 1 priority #2, Ref Phase 1B**	TL-1A.1	
	Modular Lab - ME	1323	1	1,323	24 Students.	TL-6C.1	
	Modular Lab - EE	1323	1	1,323	24 Students	TL-6C.2	
	Modular Lab - CE - Soils/Asphalt	1323	0	0	24 Students	TL-6C.3	

Phase 1A Continued:

	SPACE NAME	AREA	QTY	SUBTOTAL NSF	COMMENT	PROTOTYPE	GROSS AREA BY MODULE (@ 60% NET TO GROSS)
PHASE 1A	LOWER LEVEL TEACHING LAB SUPPORT			2,472			
	General Lab Support	2251	1	2,251	Support to Teaching Labs		
	Zebrafish Housing	221	0	0			
	Wind Tunnel	221	0	0	9'x3' Tunnel		
	Concrete Curing Room	110	0	0	Curing Tanks to be used		
	Large Project Storage	331	0	0	Concrete Canoe project, Steel Bridge project		
	Hydraulic Pump Room	110	0	0			
	Human Anatomy Support	331	0	0	Adjacent to Anatomy Teaching Lab		
	Cold Storage	110	0	0	W UV for Media Prep		
	Gel Doc Room	110	0	0			
	Microscopy Rm	165	0	0	First Floor		
	NMR (Future) Rm	165	0	0	First Floor		
	Tissue Culture Rm	165	0	0			
	Super Computer	221	0	0	Comp Sci		
	Visualization Cave	221	0	0	Comp Sci		
	Elementary Furniture Storage	221	0	0	K-6 scale furniture storage		
	High Density Equipment Storage	221	1	221	Physics tool storage		
	Teaching Lab Support (Outdoor)			0			
	Concrete Batching Area	662	1	662	6 Stations. Covered exterior space w access to Concrete Lab. Not included in Net SF		
	INNOVATION SPACE			3,969			
	Team Collaboration Space	165	0	0	**Add back Qty 6 priority #1, Ref Phase 1B**		
	Maker Space	1323	3	3,969	1 general use; 2 curriculum driven	IN-1D	
	COLLABORATION SPACE 1A			1,155	5% Net Area Phase 1A		
	PHASE 1A TOTAL			24,245			40,409

	SPACE NAME	AREA	QTY	SUBTOTAL NSF	COMMENT	PROTOTYPE	GROSS AREA BY MODULE (@ 60% NET TO GROSS)
PHASE 1B	LOWER LEVEL TEACHING LABS			2,701			
	General Labs			0			
	Flex Learning Lab	1323	0	0		TL-1A	
	Multidisciplinary Lab Classroom	1378	0	0		TL-3A	
	Intro Lab - Biology	992	0	0		TL-4A	
	Modular Universal Lab, 16 Seat	992	0	0		TL-6A	
	Modular Universal Lab, 24 Seat A	1323	0	0		TL-6B	
	Modular Universal Lab, 24 Seat B	1323	0	0		TL-6C	
	Modular Universal Lab, 32 Seat	1685	0	0		TL-10B	
	Intro Lab - Chemistry A	1764	0	0		TL-7A	
	Intro Lab - Chemistry B	1764	0	0		TL-7B	
	Specialty Labs			2,701			
	Structures Lab	992	0	0		TL-8B	
	Universal Test Lab	1323	0	0		TL-8C	
	Highway Materials Lab	992	0	0		TL-8D	
	Signals Lab	1323	0	0			
	Elementary Sim Teaching Lab	1378	0	0		TL-3B	
	Anatomy Lab	1323	0	0		TL-9A	
	Molecular Teaching Lab (Clean)	1378	0	0		TL-3C	
	Lab Classroom - Chem	1378	1	1,378	24 Students. **Add back Priority #3**	TL-3A.1	
	Flex Lab - PY	1323	1	1,323	24 Students. **Add back Priority #2**	TL-1A.1	
	Modular Lab - ME	1323	0	0		TL-6C.1	
	Modular Lab - EE	1323	0	0		TL-6C.2	
	Modular Lab - CE - Soils/Asphalt	1323	0	0		TL-6C.3	
	LOWER LEVEL TEACHING LAB SUPPORT			450			
	General Lab Support	450	1	450	Support to Teaching Labs		
	Zebrafish Housing	221	0	0			
	Wind Tunnel	221	0	0			
	Large Project Storage	331	0	0			
	Hydraulic Pump Room	110	0	0			
	Human Anatomy Support	331	0	0			
	Cold Storage	110	0	0			
	Gel Doc Room	110	0	0			
	Microscopy Rm	165	0	0			
	NMR (Future) Rm	165	0	0			
	Tissue Culture Rm	165	0	0			
	Super Computer	221	0	0			
	Visualization Cave	221	0	0			
	Elementary Furniture Storage	221	0	0			
	High Density Equipment Storage	221	0	0			
	Teaching Lab Support (Outdoor)			0			
	Concrete Batching Area	662	0	0			
	INNOVATION SPACE			990			
	Team Collaboration Space	165	6	990	**Add back Qty 6 priority #1**		
	Maker Space	1323	0	0		IN-1D	
	COLLABORATION SPACE 1B			207	5% Net Area Phase 1B		
	PHASE 1B TOTAL			4,348			7,247
	PHASE 1A +1B TOTAL			28,593			47,656

	SPACE NAME	AREA	QTY	SUBTOTAL NSF	COMMENT	PROTOTYPE	GROSS AREA BY MODULE (@ 60% NET TO GROSS)
FUTURE PHASE 2	UPPER LEVEL TEACHING LABS			9,867			
	General Labs			7,221			
	Flex Learning Lab	1323	0	0	20 Students	TL-1A	
	Multidisciplinary Lab Classroom	1378	1	1,378	benches	TL-3A	
	Intro Lab - Biology	992	1	992	24 Students	TL-4A	
	Modular Universal Lab, 16 Seat	992	0	0	16 Students	TL-6A	
	Modular Universal Lab, 24 Seat A	1323	1	1,323	24 Students. Mobile Casework Tables w monitors	TL-6B	
	Modular Universal Lab, 24 Seat B	1323	0	0	24 Students.	TL-6C	
	Modular Universal Lab, 32 Seat	1685	0	0	32 Students	TL-10B	
	Intro Lab - Chemistry A	1764	1	1,764	24 Students	TL-7A	
	Intro Lab - Chemistry B	1764	1	1,764	24 Students	TL-7B	
	Specialty Labs			2,646			
	Concrete Lab	1323	0	0	20 Students	TL-8A	
	Structures Lab	992	0	0	High Bay Lab	TL-8B	
	Universal Test Lab	1323	0	0	30 Students	TL-8C	
	Highway Materials Lab	992	0	0	See Modular Lab - Soils/Asphalt	TL-8D	
	Signals Lab	1323	0	0	See Modular Lab - EE		
	Elementary Sim Teaching Lab	1378	0	0	Elementary Furniture Storage	TL-3B	
	Anatomy Lab	1323	1	1,323	Lab	TL-9A	
	Molecular Teaching Lab (Clean)	1378	0	0	24 Students	TL-3C	
	Lab Classroom - Chem	1378	0	0	24 Students	TL-3A.1	
	Flex Lab - PY	1323	0	0	24 Students	TL-1A.1	
	Modular Lab - ME	1323	0	0	24 Students	TL-6C.1	
	Modular Lab - EE	1323	0	0	24 Students	TL-6C.2	
	Modular Lab - CE - Soils/Asphalt	1323	1	1,323	24 Students	TL-6C.3	
	UPPER LEVEL TEACHING LAB SUPPORT			4,127			
	General Lab Support	1645	1	1,645	Support to Teaching Labs		
	Zebrafish Housing	221	1	221			
	Wind Tunnel	221	1	221	9'x3' Tunnel		
	Concrete Curing Room	110	0	0	Controlled 100% RH		
	Large Project Storage	331	1	331	Concrete Canoe project, Steel Bridge project		
	Hydraulic Pump Room	110	0	0			
	Human Anatomy Support	331	1	331	Adjacent to Anatomy Teaching Lab		
	Cold Storage	110	1	110	W UV for Media Prep		
	Gel Doc Room	110	1	110			
	Microscopy Rm	165	1	165	First Floor		
	NMR (Future) Rm	165	1	165	First Floor		
	Tissue Culture Rm	165	1	165			
	Super Computer	221	1	221	Comp Sci		
	Visualization Cave	221	1	221	Comp Sci		
	Elementary Furniture Storage	221	1	221	mobile benches		
	High Density Equipment Storage	221	0	0	Physics tool storage		
	Teaching Lab Support (Outdoor)			0			
	Concrete Batching Area	662	0	0	6 Stations. Covered exterior space w access to Concrete Lab. Not included in Net SF		
	COLLABORATION SPACE 2			700	5% Net Area Phase 2		
	FUTURE PHASE 2 TOTAL			**14,693**			**24,489**

	SPACE NAME	AREA	QTY	SUBTOTAL NSF	COMMENT	PROTOTYPE	GROSS AREA BY MODULE (@ 60% NET TO GROSS)
FUTURE PHASE 3	CLASSROOMS			15,985			
	Team-Based Studio Classroom, Med	1,323	2	2,646	24 seats	CR-1A	
	Team-Based Studio Classroom, Sm	992	1	992	24 seats	CR-1D	
	Project-Based Studio Classroom	992	1	992	24 seats	CR-2C	
	Math Classroom	1323	1	1,323	32 seats	CR-3A	
	Case Study Tiered Classroom	2205	2	4,410	TBD	CR-4A	
	Case Study Tiered Classroom, Sm	992	2	1,984	30 seats	CR-4B	
	Case Study Tiered Classroom, Lg	2646	1	2,646	96 seats	CR-4C	
	Large Flat Floor Classroom	4300	0	0	150 seats	CR-6A	
	Simulation Observation						
	Instruction Observation Space	992	1	992	30 students. View into TL-3A w mobile casework	CR-1D	
	COMPUTING FACILITIES			6,615			
	Computing Facility, Traditional	1323	4	5,292	32 seats. One non-curriculum based space included for Gen Student Use	CR-5A	
	Computing Facility, Team Based	1323	1	1,323	30 seats	CR-5C	
	WORKSPACE			6,300			
	Dean's Office	200	0	0	WSU Standard: 200-225sf		
	Vice Chancellor Office	150	1	150	WSU Standard: 150-175sf for Department Heads, Principal Administrators & Directors		
	Asst Vice Chancellor Office	150	1	150			
	Director Office	150	1	150			
	Tenure Track Faculty Office	100	17	1,700	WSU Standard: 120-140sf. 50% factor applied to future growth hc to 2025 - target 2019		
	Adjunct Faculty Office	50	42	2,100	Shared 100		
	Clinical Faculty Office	50	12	600	hc to 2025 - target 2019		
	Instructor Office	50	3	150	Shared 100		
	Academic/Admin Staff Office	100	11	1,100	WSU Standard: 120-140sf. 50% factor applied to future growth hc to 2025 - target 2019		
	Clerical Waiting Area	150	0	0			
	Clerical FTE Workspace	75	0	0			
	Work Room	200	1	200	Copy, Mail, Storage		
	INNOVATION SPACE			5,751			
	Innovation Space (Indoor)			5,751			
	Informal Innovation Space	662	1	662			
	Incubator Space	165	1	165	Industry partner space		
	Project Team Presentation Space	242	1	242			
	Shop Space	1654	1	1,654	Includes Hot Work, 3D Printing, Metal & Woodworking Areas.		
	Shop Manager Office	100	1	100	Adjacent to Shop		
	Controlled Tool Crib/ Material Storage	220	1	220	Adjacent to Shop		
	Small Project Space	110	10	1,100	Fine Arts Request		
	Medium Project Space	165	0	0			
	Large Project Space	441	2	882	Car-sized Project Space, ME Capstone		
	Project Storage Space	242	3	726			
	Innovation Space (Outdoor)			500			
	Outdoor Project Space	400	1	400	Not included in Net SF		
	Outdoor Materials Storage	100	1	100	Not included in Net SF		
	UNDERGRADUATE RESEARCH			6,824			
	Student Research Lab - General	96	48	4,608	2 Research groups of 4/ TT Sciences Faculty member. 7 Sciences Faculty Members	SRL-1A	
	Student Research Lab - O-Chem	124	8	992	8 of total 56 students assumed to be doing organic isntructional research	SRL-1B	
	Student Research Lab - Support	32	0	0	to Lab Support		
	Student Touchdown Workspace	36	34	1,224	36sf hoteling stations. Ratio of 2 student touchdown spaces: 1 TT Faculty member		
	COLLABORATION SPACE 3			2,074	5% Net Area Phase 3		
	FUTURE PHASE 3 TOTAL			**43,549**			**72,583**
	FUTURE PHASES TOTAL			**58,242**			**97,072**
	COMPLETE PROGRAM TOTAL			**86,835**			**144,728**

APPENDIX E

WSU Tri-Cities Expected Student FTEs by STEM Field at Full Occupancy	
Field	Student FTEs
Biology	18
Chemistry	1
Deciding (academic interest in STEM)	9
Digital Technology & Culture	7
Earth & Environmental Sci	5
Mathematics	3
Physical Sciences	2
Pre-health	10
Civil Engineering	11
Computer Science	17
Electrical Engineering	12
Mechanical Engineering	24
Education (K-12 STEM)	19
TOTAL STEM student FTE	138

APPENDIX F

AVAILABILITY OF SPACE

Project Name: TriCities Academic Building

Campus location: WSU Tri-Cities Campus

REQUIRED FOR ALL CATEOGRIES EXCEPT ACQUISITION AND INFRASTRUCTURE

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	14,566
Multiply by % FTE Increase Budgeted	0%
Expected Fall 2018 Contact Hours	14,566
Expected Fall 2018 Contact Seats	906
Expected Hours per week Utilization	**16.1**
HECB GUC Utilization Standard	22
Difference in Utilization Standard	-27%

(b) General University Lab Utilization	
Fall 2017 Weekly Contact Hours	846
Multiply by % FTE Increase Budgeted	0%
Expected Fall 2018 Contact Hours	846
Expected Fall 2018 Class Lab Seats	48
Expected Hours per Week Utilization	**17.6**
HECB GUL Utilization Standard	16
Difference in Utilization Standard	10%

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.

The teaching spaces available in existing campus buildings are not the right size for undergraduate coursework. The buildings were configured for and used only for delivering upper division and professional degree programs before the Tri-Cities was granted authority to expand to a four year campus in 2007. For example, undergraduate laboratories should accommodate at least 24 students per section and the lab spaces seated less than 18 students. Undergraduate enrollment is growing and use of traditional classroom space is nearing the state standard. The campus slightly exceeds the state use standard for teaching labs because there are only two scheduled labs on campus that are the right size for the undergraduate courses. The rest of the lab sections are being held off campus in leased space. This building project will provide the types of spaces needed for the undergraduate programs, accommodate increasing enrollments, and reduce the need for off-campus leased teaching space.

APPENDIX G

WSU Tri-Cities Academic Building

EFFICIENCY OF SPACE TABLE - FEPG COMPARISON

	SPACE NAME	AREA NSF	CLASS LABORATORY SEATS	PROGRAMMED NSF PER STATION	ASF PER STATION PLANNING GUIDELINE	FEPG MAJOR CIP GROUP
PHASE 1A	LOWER LEVEL TEACHING LABS					
	General Labs					
	Multidisciplinary Lab Classroom	1378	24	57	65	Biological Sciences
	Intro Lab - Biology	992	24	41	65	Biological Sciences
	Modular Universal Lab, 24 Seat B	1323	24	55	65	Biological Sciences
	Intro Lab - Chemistry A	1764	24	74	80	Physical Sciences
	Specialty Labs					
	Universal Test Lab	1323	30	44	120	Engineering
	Lab Classroom - Chem	1378	24	57	80	Physical Sciences
	Flex Lab - PY	1323	24	55	80	Physical Sciences
	Modular Lab - ME	1323	24	55	120	Engineering
	Modular Lab - EE	1323	24	55	120	Engineering

APPENDIX H

WSU TRI-CITIES ACADEMIC BUILDING

Program-related Space Allocation
Assignable Square Feet Template

Input the assignable square feet for the proposed project under the appropriate space type below:

Type of Space	Points	Assignable Square Feet	Percentage of total	Score [Points x Percentage]
Instructional Space (Classroom, Lab, Library)	6	21,100	91.7	5.5
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Childcare	1		0.0	0.0
Faculty Offices	4		0.0	0.0
Administrative	3		0.0	0.0
Maintenance/Central Stores/Student Center	4	1,900	8.3	0.3
Total		**23,000**	**100.0**	**5.8**

OFM

365 - Washington State University
Capital Project Request
2019-21 Biennium

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Version: 10 2019-21 WSU Capital Budget Request

Report Number: CBS002
Date Run: 9/10/2018 8:49AM

Project Number: 30001190
Project Title: Washington State University Tri-Cities - Academic Building

Description

Starting Fiscal Year: 2016
Project Class: Program
Agency Priority: 6

Project Summary

Washington State University requests $27 million for construction of the WSU Tri-Cities Academic Building. WSU Tri-Cities was granted the authority to expand to a four-year campus in 2007, leading to accelerated enrollment growth. Enrollment is increasing based on directed marketing efforts and the university's strategic academic goals focused on growth in STEM programs. The campus facilities, however, are inadequate to accommodate all the students and existing faculty. For example, the campus currently has only one suitable space for offering chemistry laboratories and the majority of biology labs have to be offered off campus in leased space. Many of the campus teaching laboratories (used previously for upper division and graduate courses only), are too small and/or not equipped for teaching undergraduate lab sections of 24 students. Leasing instructional and faculty office space in several locations off campus is inefficient and costly. Growth will be impossible without expanding teaching and research facilities on campus and consolidating laboratory and classroom facilities to meet strategic needs. This project will provide modern, right-sized STEM teaching laboratory space for first and second year students. While this project will reduce the need for leased laboratories, the need for leased space will not be eliminated until additional buildings are completed. Future facilities addressing projected campus growth will provide space for second and third year students and faculty offices not accommodated in this project.

Project Description

Identify the problem or opportunity addressed. Why is the request a priority? (Provide numbers of people or communities not served, students without classroom space, operating budget savings, public safety improvements, history, or other backup necessary to understand the need for the request.) Be prepared to provide detailed cost backup.

WSU Tri-Cities was granted the authority to expand to a four-year campus in 2007, leading to accelerated enrollment growth with emphasis in STEM programs. The campus facilities, however, are inadequate to accommodate all of the students and the existing faculty. For example, the campus currently has only one suitable space for offering chemistry laboratories and the majority of biology labs have to be offered off campus in leased space. Many of the campus teaching laboratories (used previously for upper division and graduate courses only), are too small and/or not equipped for teaching undergraduate lab sections of 24 students.

In the absence of adequate facilities and to meet current demand, the university is currently leasing space for additional scientific lab instruction, and faculty office space in the Tri-Cities Research District and in downtown Richland. Leasing instructional and faculty office space in several locations off campus is inefficient and costly. Growth will be impossible without expanding teaching and research facilities on campus and consolidating laboratory and classroom facilities to meet strategic needs.

What will the request produce or construct (i.e. design of a building, construction of additional space, etc.)? When will the project start and be completed? Identify whether the project can be phased, and if so, what phase is included in this request.

This is a request for construction funding for the new Academic Building. The 2015-17 predesign and its identified baseline need, originally proposed a larger building than is currently being planned. The current request follows the predesign and design for a 40,000 gross square foot (GSF) facility with a total project cost estimate of $30,400,000. This facility will accommodate the highest space priority for right-sized and modern STEM teaching laboratory space. The university will plan subsequent buildings for the long term growth expected at this campus location.

How would the request address the problem or opportunity identified in question #1? What would be the result of not taking action?

All laboratory space for the sciences and engineering at the Tri-Cities is currently in use in existing buildings. Those programs cannot grow without building or leasing additional space. Classroom, office, and laboratory space is currently being leased off campus to house program and student needs. This amount of leased space is expected to grow by about 20% per year and will continue to grow until the Academic Building is completed. Leasing is not an ideal or a permanent solution to the campus space needs.

Growth in some programs is restricted not because of lack of lab space, but because existing campus buildings do not have enough lab space of the appropriate size to teach lower division students. Until 2007, the campus was authorized to only teach upper division and professional programs. In the past, typical upper division labs accommodated less than 10 students at a

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time. For lower division lab course offerings, however, spaces need to accommodate at least 24 students at a time. The enrollment in some programs has to be restricted because of the lack of laboratory facilities and reliance on leased space. Existing demand for distance course offerings cannot be met with existing capacity, hindering the ability to reach all interested place-bound students. This new building will provide new distance learning classrooms that will add to the number of courses offered via distance learning, especially in STEM- related programs

Which clientele would be impacted by the budget request? Where and how many units would be added, people or communities served, etc. Be prepared to provide detailed cost backup.

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With adequate facilities, the campus vision is to increase enrollment to 2,500 students in the next five years. As a result of this growth, the university anticipates a 20% increase (80 additional awardees per year) in the number of undergraduate (estimate 60) and graduate degrees (estimate 20) awarded on the Tri-Cities campus. Of the 80 additional degrees 52 of them are estimated to be in high demand fields.

A 50% increase in distance learning capabilities is projected for science and engineering courses as all classroom and laboratories in the new building will be equipped with video streaming services and capabilities. WSU Tri-Cities currently reaches many underserved regions and place-bound adults through distance learning technology. Of note is that the average age of WSU Tri-Cities students is approximately 26 years; the WSU system and the overall state average student age are much lower. This suggests that the project will continue to reach many more working adult non-traditional students with the new capacity the building provides. The project will further enhance distance learning opportunities through additional distance learning sites that will be housed in this new facility.

Does this request include funding for any IT-related costs (See the IT Appendix for guidance on what is considered an IT-related cost).

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Will non-state funds be used to complete the project? How much, what fund source, and could the request result in matching federal, state, local or private funds?

No non-state funds will be used to complete this project. None have been identified.

Describe how this project supports the agency's strategic master plan, contributes to statewide goals, or would enable the agency to perform better. Reference feasibility studies, master plans, space programming, and other analyses as appropriate.

Master Plan - The Academic STEM Building is the highest campus priority as listed at top in the Tri-Cities Academic Master Plan[1], Phase II Space Needs on page 26 of 58 (link cited in the capital program proposal document). It will be located opposite BSEL as shown in the master plan. It is the next logical plot addition to the Tri-Cities campus, and more importantly, it is the most critical step to achieve the highest priority goals of; 1) Achieve national and international preeminence in innovation, discovery, and creativity, and 2) Provide a premier education and transformative experience that prepares students to excel in a global society. See also WSU Development Plan (link cited in the capital program proposal). Construction of this building is the next step toward reducing leased space and the inefficiencies that result from teaching in disparate locations as well as provide increase access to required core curricular courses for all students. The on-campus facility will also accommodate projected growth.

Academic Plan and Statewide Goals - Completion of the Academic Building will permit the initiation of new programs in science, computer science and engineering as described in the Academic Master Plan. The anticipated growth in enrollment in biology will be an important component to the graduate medical facilities at the WSU Spokane campus, will allow for the creation of programs in high demand medical areas, and will prepare students for graduate health field degrees at WSU Spokane and other institutions. These programs further enhance opportunities to partner with BSEL and PNNL with the addition of such programs as biomedical engineering.

Consistent with WSU's Strategic Plan, and the WSU Tri-Cities Academic Master Plan, the focus is on student-centered, project-based learning in the STEM fields. Current classrooms are not configured to facilitate the flipped classroom, where students are the center of activity and the instructor is a resource, directing project-based learning. Existing classrooms can fulfill the need for conventional learning settings. The new building will be constructed with laboratory/classroom instruction as the main pedagogical venue.

The new building will allow the university to advance the statewide policy goals described below and improve the value of

OFM

365 - Washington State University
Capital Project Request
2019-21 Biennium

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postsecondary learning and training at the WSU campus located in Richland. The campus vision is to increase total student enrollment to 2,500 in the next five years at this important educational site. As a result of this growth, the university anticipates a 20% increase (~80 additional degree recipients per year) in the number of undergraduate (est. 60) and graduate degrees (est. 20) awarded on the Tri-Cities campus (Appendix A). Of the increase in 80 additionally awarded degrees, 52 are estimated to be in high demand fields.

This building project will facilitate future growth in STEM-focused high demand bachelor's degrees in biology, chemistry, construction management and computer science / bioinformatics plus graduate degrees in Education with STEM content area endorsements including computer science. Providing dedicated space for science and engineering coursework in the new building will allow expansion of new degree offerings in other disciplines as existing classroom space becomes available. The new building will also contribute to growth in STEM teacher education spanning from kindergarten to graduate level. In order to promote student enrollment in the STEM fields at the university level, it is imperative to improve the instruction of science, engineering, technology and mathematics at the kindergarten through grade 12 (K-12) levels through K-12 teacher education (Results Washington Goal 1). Research-based instruction in the pedagogy of teaching science and mathematics is an important element in the training of future teachers, and the WSU Tri-Cities' teacher education program has recently added the Masters-in-Teaching (MIT) degree program to train teachers to teach mathematics and science at the secondary level. Additionally, funds awarded twice by the Washington Office of the Superintendent for Public Instruction, generous support from the Corporate Gifts Program of the Battelle Foundation and in-kind contributions from PNNL's Directorate for STEM education enable WSU Tri-Cities Education faculty to implement the competencies for teaching Computer Science by Science and Mathematics teachers in the K-12 environment. Modern teaching and training space is essential to produce effective teachers certified to teach science, mathematics and computer science at the 6-12 grade levels or to act as science specialists in the K-5 grades.

All degree programs in Education are participating in an active recruitment plan with the goal of increasing student enrollment, particularly in the high need areas of science and mathematics education, special education, as well as English as a second or foreign language. This initiative will facilitate efficient enrollment growth by providing for larger lecture classes where appropriate, and by supporting the combination of multiple sections of the same course.

The new STEM-focused teaching laboratory building and its proximity to researchers in the Bioproducts Science and Engineering Laboratory (BSEL) will expand educational and practical opportunities in sustainable energy and will contribute to a prosperous economy through developments in the biomass industry (Results Washington Goals 2 and 3) . The collaboration between WSU Tri-Cities and PNNL in BSEL provides a unique opportunity to educate and train undergraduate and graduate students in cutting edge research programs and methods designed to identify new, sustainable uses for products made from biomass. These collaborations create processes and products that are better for the environment. The research program at BSEL offers outstanding potential for benefit to residents of the state of Washington through:

- improved economic development;
- healthier rural economies;
- technology transfer to enhance the competitiveness of biomass-based businesses throughout the state;
- improved environmental quality;
- development of renewable energy systems with near-zero net greenhouse gas emissions;
- technology licensing and export;
- development of sustainable resource supplies.

If the project is linked to the Puget Sound Action Agenda, describe the impacts on the Action Agenda, including expenditure and FTE detail. See Chapter 14.4 (Puget Sound recover) in the 2017-2019 Operating Budget Instruction.
This project is not linked to the Puget Sound Action Agenda.

Is there additional information you would like decision makers to know when evaluating this request?
This facility will be located on campus opposite the existing Bio-products, Sciences and Engineering Laboratory (BSEL) to the west, enabling collaboration and meeting projected growth in conjunction with WSU Tri-Cities' strategic STEM goals. The facility's benefit will be leveraged through collaboration with the adjacent research campuses of the Tri-Cities Research District and the Pacific Northwest National Laboratory (PNNL). It will enable WSU Tri-Cities to support the production of the next generation of health care providers and offer additional programs in science and engineering. The building will also allow WSU Tri-Cities to better retain its freshman and sophomore through on-site exposure to undergraduate research initiatives. The new Academic Building and its relationship to BSEL researchers will also expand opportunities in sustainable energy and contribute to a prosperous economy through developments in the biomass industry (Results Washington, Goals 2 and 3). This collaboration between the WSU Tri-Cities, BSEL, and the PNNL provides a unique opportunity to educate and train

OFM

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undergraduate and graduate students in state-of-the-art research programs and methods designed to identify new, sustainable uses for products made from biomass. Modern instructional space is essential for these initiatives as curricular innovations that engage and improve student learning also lead to increased retention in STEM fields.

Location
City: Richland **County:** Benton **Legislative District:** 008

Project Type
New Facilities/Additions (Major Projects)

Growth Management impacts
WSU TriCities' physical planning policies are coordinated with many agencies and government units. The Growth Management Act and its companion Traffic Demand Management legislation and the State Environmental Policy Act, however, are applicable to WSU's physical facilities and programs. Growth Management Act (GMA)-WSU will coordinate with Counties and Municipalities throughout the State to ensure compliance with GMA. WSU will avoid construction or activities which would permanently impair "critical" areas on its campuses as they are defined in the GMA. Transportation Demand Management-A companion piece of legislation sets forth a policy for Transportation Demand Management in which the State of Washington will provide leadership. The Director of the State of Washington Department of General Administration (DGA) is required to develop a commute trip reduction plan for state agencies which are Phase I major employers. WSU will conform to the plans developed by DGA. State Environmental Policy Act (SEPA)-WSU has adopted procedures set forth in the State Environmental Policy Act Handbook December 1988 and the State Environmental Policy Act Rules Chapter 197-11 Washington Administrative Code Effective April 4, 1984. Adherence to these procedures will be one of the principal means by which WSU coordinates its compliance with Growth Management requirements.

New Facility: Yes
How does this fit in master plan
Master plan - WSU Tri-Cities Campus; See http://facilitiesservices.wsu.edu/resources/pdf/masterplan/Tri-cities_plan.pdf and http://couggis.wsu.edu/developmentprogram/

Funding

Acct Code	Account Title	Estimated Total	Expenditures Prior Biennium	Current Biennium	2019-21 Fiscal Period Reapprops	2019-21 Fiscal Period New Approps
057-1	State Bldg Constr-State	30,000,000		1,500,000	1,500,000	27,000,000
062-1	WSU Building Account-State	400,000	356,000	44,000		
	Total	**30,400,000**	**356,000**	**1,544,000**	**1,500,000**	**27,000,000**

Acct Code	Account Title	Future Fiscal Periods 2021-23	2023-25	2025-27	2027-29
057-1	State Bldg Constr-State				
062-1	WSU Building Account-State				
	Total	**0**	**0**	**0**	**0**

Schedule and Statistics

Start Date	End Date

OFM

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Schedule and Statistics

	Start Date	End Date
Predesign	01/01/2016	05/01/2016
Design	1/1/2019	1/1/2020
Construction	2/1/2020	8/1/2021

	Total
Gross Square Feet:	40,000
Usable Square Feet:	24,450
Efficiency:	61.1%
Escalated MACC Cost per Sq. Ft.:	439
Construction Type:	Science Labs (teaching)
Is this a remodel?	No
A/E Fee Class:	B
A/E Fee Percentage:	7.42%

Cost Summary

		Escalated Cost	% of Project
Acquisition Costs Total		**0**	**0.0%**
Consultant Services			
Pre-Schematic Design Services		421,284	1.4%
Construction Documents		1,326,576	4.4%
Extra Services		531,164	1.8%
Other Services		430,456	1.4%
Design Services Contingency		140,584	0.5%
Consultant Services Total		**2,850,061**	**9.4%**
Maximum Allowable Construction Cost(MACC)	**17,541,729**		
Site work		947,929	3.1%
Related Project Costs		105,270	0.4%
Facility Construction		16,488,530	54.2%
GCCM Risk Contingency		1,831,393	6.0%
GCCM or Design Build Costs		2,637,558	8.7%
Construction Contingencies		1,147,612	3.8%
Non Taxable Items		0	0.0%
Sales Tax		1,991,614	6.6%
Construction Contracts Total		**25,149,905**	**82.7%**
Equipment			
Equipment		877,918	2.9%
Non Taxable Items		0	0.0%
Sales Tax		75,501	0.3%

OFM

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Cost Summary

	Escalated Cost	% of Project
Equipment Total	953,419	3.1%
Art Work Total	87,709	0.3%
Other Costs Total	334,192	1.1%
Project Management Total	1,024,823	3.4%
Grand Total Escalated Costs	30,400,109	
Rounded Grand Total Escalated Costs	30,400,000	

Operating Impacts

Total one time start up and ongoing operating costs

Acct Code	Account Title	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
FTE	Full Time Employee	3.1	3.2	3.2	3.2	3.2
001-1	General Fund-State	482,000	497,000	497,000	497,000	497,000
	Total	**482,000**	**497,000**	**497,000**	**497,000**	**497,000**

Narrative
Costs are based on calculated M&O rates by building type.

OFM

Capital Project Request

2019-21 Biennium

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Parameter	Entered As	Interpreted As
Biennium	2019-21	2019-21
Agency	365	365
Version	10-A	10-A
Project Classification	*	All Project Classifications
Capital Project Number	30001190	30001190
Sort Order	Project Priority	Priority
Include Page Numbers	Y	Yes
For Word or Excel	N	N
User Group	Agency Budget	Agency Budget
User Id	*	All User Ids

APPENDIX H

WSU TRI-CITIES ACADEMIC BUILDING

Program-related Space Allocation
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Description

postsecondary learning and training at the WSU campus located in Richland. The campus vision is to increase total student enrollment to 2,500 in the next five years at this important educational site. As a result of this growth, the university anticipates a 20% increase (~80 additional degree recipients per year) in the number of undergraduate (est. 60) and graduate degrees (est. 20) awarded on the Tri-Cities campus (Appendix A). Of the increase in 80 additionally awarded degrees, 52 are estimated to be in high demand fields.

This building project will facilitate future growth in STEM-focused high demand bachelor's degrees in biology, chemistry, construction management and computer science / bioinformatics plus graduate degrees in Education with STEM content area endorsements including computer science. Providing dedicated space for science and engineering coursework in the new building will allow expansion of new degree offerings in other disciplines as existing classroom space becomes available. The new building will also contribute to growth in STEM teacher education spanning from kindergarten to graduate level. In order to promote student enrollment in the STEM fields at the university level, it is imperative to improve the instruction of science, engineering, technology and mathematics at the kindergarten through grade 12 (K-12) levels through K-12 teacher education (Results Washington Goal 1). Research-based instruction in the pedagogy of teaching science and mathematics is an important element in the training of future teachers, and the WSU Tri-Cities' teacher education program has recently added the Masters-in-Teaching (MIT) degree program to train teachers to teach mathematics and science at the secondary level. Additionally, funds awarded twice by the Washington Office of the Superintendent for Public Instruction, generous support from the Corporate Gifts Program of the Battelle Foundation and in-kind contributions from PNNL's Directorate for STEM education enable WSU Tri-Cities Education faculty to implement the competencies for teaching Computer Science by Science and Mathematics teachers in the K-12 environment. Modern teaching and training space is essential to produce effective teachers certified to teach science, mathematics and computer science at the 6-12 grade levels or to act as science specialists in the K-5 grades.

All degree programs in Education are participating in an active recruitment plan with the goal of increasing student enrollment, particularly in the high need areas of science and mathematics education, special education, as well as English as a second or foreign language. This initiative will facilitate efficient enrollment growth by providing for larger lecture classes where appropriate, and by supporting the combination of multiple sections of the same course.

The new STEM-focused teaching laboratory building and its proximity to researchers in the Bioproducts Science and Engineering Laboratory (BSEL) will expand educational and practical opportunities in sustainable energy and will contribute to a prosperous economy through developments in the biomass industry (Results Washington Goals 2 and 3) . The collaboration between WSU Tri-Cities and PNNL in BSEL provides a unique opportunity to educate and train undergraduate and graduate students in cutting edge research programs and methods designed to identify new, sustainable uses for products made from biomass. These collaborations create processes and products that are better for the environment. The research program at BSEL offers outstanding potential for benefit to residents of the state of Washington through:

- improved economic development;
- healthier rural economies;
- technology transfer to enhance the competitiveness of biomass-based businesses throughout the state;
- improved environmental quality;
- development of renewable energy systems with near-zero net greenhouse gas emissions;
- technology licensing and export;
- development of sustainable resource supplies.

If the project is linked to the Puget Sound Action Agenda, describe the impacts on the Action Agenda, including expenditure and FTE detail. See Chapter 14.4 (Puget Sound recover) in the 2017-2019 Operating Budget Instruction.
This project is not linked to the Puget Sound Action Agenda.

Is there additional information you would like decision makers to know when evaluating this request?
This facility will be located on campus opposite the existing Bio-products, Sciences and Engineering Laboratory (BSEL) to the west, enabling collaboration and meeting projected growth in conjunction with WSU Tri-Cities' strategic STEM goals. The facility's benefit will be leveraged through collaboration with the adjacent research campuses of the Tri-Cities Research District and the Pacific Northwest National Laboratory (PNNL). It will enable WSU Tri-Cities to support the production of the next generation of health care providers and offer additional programs in science and engineering. The building will also allow WSU Tri-Cities to better retain its freshman and sophomore through on-site exposure to undergraduate research initiatives. The new Academic Building and its relationship to BSEL researchers will also expand opportunities in sustainable energy and contribute to a prosperous economy through developments in the biomass industry (Results Washington, Goals 2 and 3). This collaboration between the WSU Tri-Cities, BSEL, and the PNNL provides a unique opportunity to educate and train

OFM

365 - Washington State University
Capital Project Request
2019-21 Biennium

*

Version: 10 2019-21 WSU Capital Budget Request

Report Number: CBS002
Date Run: 9/10/2018 8:49AM

Project Number: 30001190
Project Title: Washington State University Tri-Cities - Academic Building

Description

undergraduate and graduate students in state-of-the-art research programs and methods designed to identify new, sustainable uses for products made from biomass. Modern instructional space is essential for these initiatives as curricular innovations that engage and improve student learning also lead to increased retention in STEM fields.

Location
City: Richland **County:** Benton **Legislative District:** 008

Project Type
New Facilities/Additions (Major Projects)

Growth Management impacts
WSU TriCities' physical planning policies are coordinated with many agencies and government units. The Growth Management Act and its companion Traffic Demand Management legislation and the State Environmental Policy Act, however, are applicable to WSU's physical facilities and programs. Growth Management Act (GMA)-WSU will coordinate with Counties and Municipalities throughout the State to ensure compliance with GMA. WSU will avoid construction or activities which would permanently impair "critical" areas on its campuses as they are defined in the GMA. Transportation Demand Management-A companion piece of legislation sets forth a policy for Transportation Demand Management in which the State of Washington will provide leadership. The Director of the State of Washington Department of General Administration (DGA) is required to develop a commute trip reduction plan for state agencies which are Phase I major employers. WSU will conform to the plans developed by DGA. State Environmental Policy Act (SEPA)-WSU has adopted procedures set forth in the State Environmental Policy Act Handbook December 1988 and the State Environmental Policy Act Rules Chapter 197-11 Washington Administrative Code Effective April 4, 1984. Adherence to these procedures will be one of the principal means by which WSU coordinates its compliance with Growth Management requirements.

New Facility: Yes
How does this fit in master plan
Master plan - WSU Tri-Cities Campus; See http://facilitiesservices.wsu.edu/resources/pdf/masterplan/Tri-cities_plan.pdf and http://couggis.wsu.edu/developmentprogram/

Funding

Acct Code	Account Title	Estimated Total	Expenditures Prior Biennium	Current Biennium	2019-21 Fiscal Period Reapprops	2019-21 Fiscal Period New Approps
057-1	State Bldg Constr-State	30,000,000		1,500,000	1,500,000	27,000,000
062-1	WSU Building Account-State	400,000	356,000	44,000		
	Total	**30,400,000**	**356,000**	**1,544,000**	**1,500,000**	**27,000,000**

Acct Code	Account Title	Future Fiscal Periods 2021-23	2023-25	2025-27	2027-29
057-1	State Bldg Constr-State				
062-1	WSU Building Account-State				
	Total	**0**	**0**	**0**	**0**

Schedule and Statistics

Start Date	End Date

OFM

365 - Washington State University
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Schedule and Statistics

	Start Date	End Date
Predesign	01/01/2016	05/01/2016
Design	1/1/2019	1/1/2020
Construction	2/1/2020	8/1/2021

	Total
Gross Square Feet:	40,000
Usable Square Feet:	24,450
Efficiency:	61.1%
Escalated MACC Cost per Sq. Ft.:	439
Construction Type:	Science Labs (teaching)
Is this a remodel?	No
A/E Fee Class:	B
A/E Fee Percentage:	7.42%

Cost Summary

		Escalated Cost	% of Project
Acquisition Costs Total		**0**	**0.0%**
Consultant Services			
Pre-Schematic Design Services		421,284	1.4%
Construction Documents		1,326,576	4.4%
Extra Services		531,164	1.8%
Other Services		430,456	1.4%
Design Services Contingency		140,584	0.5%
Consultant Services Total		**2,850,061**	**9.4%**
Maximum Allowable Construction Cost(MACC)	**17,541,729**		
Site work		947,929	3.1%
Related Project Costs		105,270	0.4%
Facility Construction		16,488,530	54.2%
GCCM Risk Contingency		1,831,393	6.0%
GCCM or Design Build Costs		2,637,558	8.7%
Construction Contingencies		1,147,612	3.8%
Non Taxable Items		0	0.0%
Sales Tax		1,991,614	6.6%
Construction Contracts Total		**25,149,905**	**82.7%**
Equipment			
Equipment		877,918	2.9%
Non Taxable Items		0	0.0%
Sales Tax		75,501	0.3%

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365 - Washington State University
Capital Project Request
2019-21 Biennium

*

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Project Number: 30001190
Project Title: Washington State University Tri-Cities - Academic Building

Cost Summary

	Escalated Cost	% of Project
Equipment Total	**953,419**	**3.1%**
Art Work Total	**87,709**	**0.3%**
Other Costs Total	**334,192**	**1.1%**
Project Management Total	**1,024,823**	**3.4%**
Grand Total Escalated Costs	**30,400,109**	
Rounded Grand Total Escalated Costs	**30,400,000**	

Operating Impacts

Total one time start up and ongoing operating costs

Acct Code	Account Title	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
FTE	Full Time Employee	3.1	3.2	3.2	3.2	3.2
001-1	General Fund-State	482,000	497,000	497,000	497,000	497,000
	Total	**482,000**	**497,000**	**497,000**	**497,000**	**497,000**

Narrative
Costs are based on calculated M&O rates by building type.

OFM

Capital Project Request

2019-21 Biennium

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Parameter	Entered As	Interpreted As
Biennium	2019-21	2019-21
Agency	365	365
Version	10-A	10-A
Project Classification	*	All Project Classifications
Capital Project Number	30001190	30001190
Sort Order	Project Priority	Priority
Include Page Numbers	Y	Yes
For Word or Excel	N	N
User Group	Agency Budget	Agency Budget
User Id	*	All User Ids

STATE OF WASHINGTON
AGENCY / INSTITUTION PROJECT COST SUMMARY

Agency	Washington State University
Project Name	WSU Tri Cities Academic Building
OFM Project Number	30001190

Contact Information	
Name	Jennifer Reynolds
Phone Number	509-335-1342
Email	jrahmani@wsu.edu

Statistics			
Gross Square Feet	40,000	MACC per Square Foot	$408
Usable Square Feet	24,450	Escalated MACC per Square Foot	$439
Space Efficiency	61.1%	A/E Fee Class	B
Construction Type	Science labs (teaching)	A/E Fee Percentage	7.41%
Remodel	No	Projected Life of Asset (Years)	50
Additional Project Details			
Alternative Public Works Project	Yes	Art Requirement Applies	Yes
Inflation Rate	3.12%	Higher Ed Institution	Yes
Sales Tax Rate %	8.60%	Location Used for Tax Rate	0304
Contingency Rate	5%		
Base Month	June-18		
Project Administered By	Agency		

Schedule			
Predesign Start	January-16	Predesign End	May-16
Design Start	January-19	Design End	January-20
Construction Start	February-20	Construction End	August-21
Construction Duration	18 Months		

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Project Cost Estimate			
Total Project	$28,354,545	Total Project Escalated	$30,400,116
		Rounded Escalated Total	$30,400,000

STATE OF WASHINGTON AGENCY / INSTITUTION PROJECT COST SUMMARY		
Agency	Washington State University	
Project Name	WSU Tri Cities Academic Building	
OFM Project Number	30001190	

Cost Estimate Summary

Acquisition			
Acquisition Subtotal	**$0**	**Acquisition Subtotal Escalated**	**$0**

Consultant Services			
Predesign Services	$413,753		
A/E Basic Design Services	$1,283,640		
Extra Services	$513,747		
Other Services	$399,068		
Design Services Contingency	$130,510		
Consultant Services Subtotal	**$2,740,718**	**Consultant Services Subtotal Escalated**	**$2,850,066**

Construction			
GC/CM Risk Contingency	$1,700,142		
GC/CM or D/B Costs	$2,448,530		
Construction Contingencies	$1,065,366	Construction Contingencies Escalated	$1,147,612
Maximum Allowable Construction Cost (MACC)	$16,307,315	Maximum Allowable Construction Cost (MACC) Escalated	$17,541,729
Sales Tax	$1,850,836	Sales Tax Escalated	$1,991,614
Construction Subtotal	**$23,372,189**	**Construction Subtotal Escalated**	**$25,149,905**

Equipment			
Equipment	$815,000		
Sales Tax	$70,090		
Non-Taxable Items	$0		
Equipment Subtotal	**$885,090**	**Equipment Subtotal Escalated**	**$953,419**

Artwork			
Artwork Subtotal	**$87,709**	**Artwork Subtotal Escalated**	**$87,709**

Agency Project Administration			
Agency Project Administration Subtotal	$696,692		
DES Additional Services Subtotal	$0		
Other Project Admin Costs	$0		
Project Administration Subtotal	**$951,377**	**Project Administation Subtotal Escalated**	**$1,024,824**

Other Costs			
Other Costs Subtotal	**$317,462**	**Other Costs Subtotal Escalated**	**$334,193**

Project Cost Estimate			
Total Project	**$28,354,545**	Total Project Escalated	**$30,400,116**
		Rounded Escalated Total	**$30,400,000**

Cost Estimate Details

Acquisition Costs					
Item	Base Amount		Escalation Factor	Escalated Cost	Notes
Purchase/Lease					
Appraisal and Closing					
Right of Way					
Demolition					
Pre-Site Development					
Other					
Insert Row Here					
ACQUISITION TOTAL	$0		NA	$0	

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Cost Estimate Details

Consultant Services				
Item	Base Amount	Escalation Factor	Escalated Cost	Notes
1) Pre-Schematic Design Services				
Programming/Site Analysis	$50,000			
Environmental Analysis				
Predesign Study	$363,753			
Other				
Insert Row Here				
Sub TOTAL	**$413,753**	**1.0182**	**$421,284**	Escalated to Design Start
2) Construction Documents				
A/E Basic Design Services	$888,248			69% of A/E Basic Services
Design Fees	$395,392			
Insert Row Here				
Sub TOTAL	**$1,283,640**	**1.0339**	**$1,327,156**	Escalated to Mid-Design
3) Extra Services				
Civil Design (Above Basic Svcs)				
Geotechnical Investigation	$19,100			
Commissioning	$150,000			
Site Survey	$17,147			
Testing				
LEED Services				
Voice/Data Consultant				
Value Engineering				
Constructability Review				
Environmental Mitigation (EIS)				
Landscape Consultant				
Other				
Interior Design	$27,500			
Audit	$50,000			
Honorarium	$150,000			
Special Inspections	$100,000			
Sub TOTAL	**$513,747**	**1.0339**	**$531,164**	Escalated to Mid-Design
4) Other Services				
Bid/Construction/Closeout	$399,068			31% of A/E Basic Services
HVAC Balancing				
Staffing				
Other				
Insert Row Here				
Sub TOTAL	**$399,068**	**1.0772**	**$429,876**	Escalated to Mid-Const.
5) Design Services Contingency				
Design Services Contingency	$130,510			
Other				
Insert Row Here				
Sub TOTAL	**$130,510**	**1.0772**	**$140,586**	Escalated to Mid-Const.
CONSULTANT SERVICES TOTAL	**$2,740,718**		**$2,850,066**	

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Cost Estimate Details

Construction Contracts				
Item	Base Amount	Escalation Factor	Escalated Cost	Notes
1) Site Work				
G10 - Site Preparation	$47,436			
G20 - Site Improvements	$541,038			
G30 - Site Mechanical Utilities	$187,000			
G40 - Site Electrical Utilities	$125,000			
G60 - Other Site Construction	$0			
Other				
Insert Row Here				
Sub TOTAL	**$900,474**	**1.0527**	**$947,929**	
2) Related Project Costs				
Offsite Improvements	$0			
City Utilities Relocation	$0			
Parking Mitigation	$0			
Stormwater Retention/Detention	$100,000			
Other				
Insert Row Here				
Sub TOTAL	**$100,000**	**1.0527**	**$105,270**	
3) Facility Construction				
A10 - Foundations	$612,747			
A20 - Basement Construction	$87,103			
B10 - Superstructure	$1,594,276			
B20 - Exterior Closure	$2,379,062			
B30 - Roofing	$456,406			
C10 - Interior Construction	$1,775,129			
C20 - Stairs	$227,000			
C30 - Interior Finishes	$1,202,731			
D10 - Conveying	$286,000			
D20 - Plumbing Systems	$411,145			
D30 - HVAC Systems	$2,944,996			
D40 - Fire Protection Systems	$138,573			
D50 - Electrical Systems	$2,088,494			
F10 - Special Construction	$486,552			
F20 - Selective Demolition	$0			
General Conditions				
Other				
Sub Bonding	$156,907			
GLI	$150,570			
B&O	$95,526			
BRI				
GC Bond	$213,624			
Fee				
Insert Row Here				
Sub TOTAL	**$15,306,841**	**1.0772**	**$16,488,530**	
4) Maximum Allowable Construction Cost				
MACC Sub TOTAL	**$16,307,315**		**$17,541,729**	

5) GCCM Risk Contingency				
GCCM Risk Contingency	$1,700,142			
Other				
Insert Row Here				
Sub TOTAL	**$1,700,142**	**1.0772**	**$1,831,393**	
6) GCCM or Design Build Costs				
GCCM Fee	$863,772			
Bid General Conditions	$1,584,758			
GCCM Preconstruction Services				
Other				
Insert Row Here				
Sub TOTAL	**$2,448,530**	**1.0772**	**$2,637,557**	
7) Construction Contingency				
Allowance for Change Orders	$815,366			
Other				
Owner Contingency	$250,000			
Sub TOTAL	**$1,065,366**	**1.0772**	**$1,147,612**	
8) Non-Taxable Items				
Other				
Insert Row Here				
Sub TOTAL	**$0**	**1.0772**	**$0**	
Sales Tax				
Sub TOTAL	**$1,850,836**		**$1,991,614**	
CONSTRUCTION CONTRACTS TOTAL	**$23,372,189**		**$25,149,905**	

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Cost Estimate Details

Equipment				
Item	Base Amount	Escalation Factor	Escalated Cost	Notes
E10 - Equipment	$300,000			
E20 - Furnishings	$275,000			
F10 - Special Construction				
Other				
Access Control	$50,000			
Fixed Equip (TV's, AV, Shelving)	$150,000			
Telecommunications	$40,000			
Sub TOTAL	**$815,000**	**1.0772**	**$877,918**	
1) Non Taxable Items				
Other				
Insert Row Here				
Sub TOTAL	**$0**	**1.0772**	**$0**	
Sales Tax				
Sub TOTAL	**$70,090**		**$75,501**	
EQUIPMENT TOTAL	**$885,090**		**$953,419**	

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Cost Estimate Details

Artwork				
Item	Base Amount	Escalation Factor	Escalated Cost	Notes
Project Artwork	$0			0.5% of Escalated MACC for new construction
Higher Ed Artwork	$87,709			0.5% of Escalated MACC for new and renewal construction
Other				
Insert Row Here				
ARTWORK TOTAL	**$87,709**	**NA**	**$87,709**	

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Cost Estimate Details

Project Management					
Item	Base Amount		Escalation Factor	Escalated Cost	Notes
Agency Project Management	$696,692				
Additional Services					
Onsite Supervision	$254,685				
Insert Row Here					
PROJECT MANAGEMENT TOTAL	$951,377		1.0772	$1,024,824	

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Cost Estimate Details

Other Costs				
Item	Base Amount	Escalation Factor	Escalated Cost	Notes
Mitigation Costs				
Hazardous Material Remediation/Removal				
Historic and Archeological Mitigation				
Facilities Support	$15,000			
Builder's Risk Insurance	$31,000			
Advertising, Copies	$5,000			
Misc (Travel, Fed Ex, etc)	$116,000			
Permits	$150,462			
OTHER COSTS TOTAL	**$317,462**	**1.0527**	**$334,193**	

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C-100(2018)
Additional Notes

Tab A. Acquisition
Insert Row Here

Tab B. Consultant Services
Insert Row Here

Tab C. Construction Contracts
Insert Row Here

Tab D. Equipment
Insert Row Here

Tab E. Artwork
Insert Row Here

Tab F. Project Management
Insert Row Here

Tab G. Other Costs
Insert Row Here