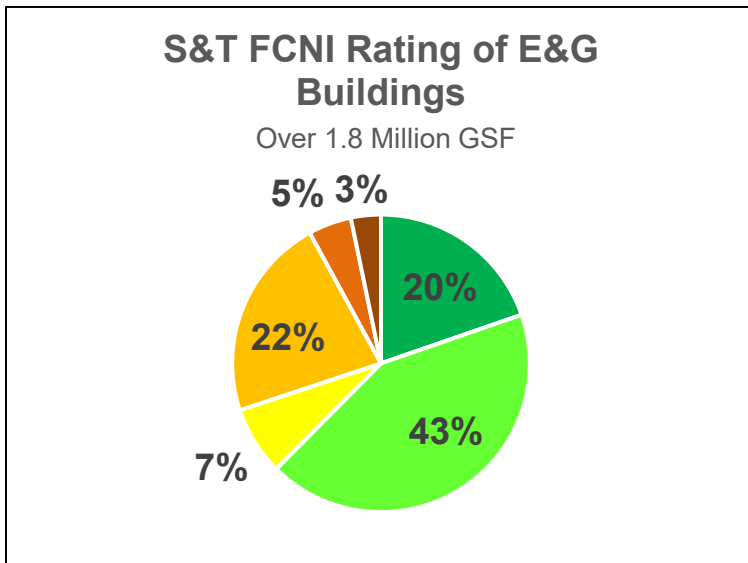


Missouri University of Science and Technology
Fiscal Years 2022 – 2027 Capital Plan

Missouri University of Science and Technology Facilities Stewardship

CRR 110.015 was established to maintain the facilities of the University of Missouri System in adequate condition to meet the needs of the University’s education and research missions. A Facilities Condition Needs Index (FCNI) of 0.30 or lower was established as the goal for the Education and General (E&G) facility portfolio. CRR 110.015 also requires each campus to annually establish its facilities needs funding (target spend) by calculating the investment required to achieve and maintain the campus FCNI goal of 0.30 or lower for its E&G facilities over the next ten years.

Missouri S&T currently has a FCNI of 0.21 and a backlog of \$185.1 million of facilities needs. Thirty percent (30%) of the E&G space on the campus falls in the category of Below Average Condition, Poor condition, or Replacement is recommended. Missouri S&T has only achieved their target spend once in the last five years and their facilities needs are growing.



E&G Facilities <i>(Dollars shown in Millions)</i>	2017	2018	2019	2020	2021
Target Spend	\$16.4	\$16.2	\$17.0	\$17.9	\$21.9
Actual Spend	\$16.9	\$14.5	\$16.9	\$13.0	\$14.1
Recurring	\$8.7	\$9.0	\$8.4	\$8.5	\$8.1
One-Time	\$8.2	\$5.5	\$8.5	\$4.5	\$6.0
Difference in Target and Actual	\$0.5	(\$1.7)	(\$0.1)	(\$4.9)	(\$7.8)
FCN Backlog	\$154.8	\$153.6	\$150.4	\$182.1	\$185.1
Deferred Maintenance	\$61.9	\$59.5	\$58.9	\$85.6	\$91.0
Plant Adaption	\$68.1	\$68.6	\$65.9	\$69.4	\$63.1
Capital Renewal	\$24.8	\$25.5	\$25.6	\$27.2	\$31.0
Recommended Target for next year	\$16.2	\$17.0	\$17.9	\$21.9	\$18.8
Campus FCNI	0.20	0.19	0.18	0.21	0.21

Facility Condition Needs Index
Excellent Condition, typically new construction (0.000 - 0.100)
Good Condition, renovations occur on schedule (0.101 - 0.200)
Fair Condition, in need of normal renovation (0.201 - 0.300)
Below Average Condition, major renovation required (0.301 - 0.500)
Poor Condition, total renovation indicated (0.501 - 0.600)
Replacement Recommended (0.600 and Higher)

Missouri University of Science and Technology: Fiscal Years 2022 - 2027 Capital Plan included in Finance Plan

Missouri S&T	2022*	2023	2024	2025	2026	2027
	Current Year	Year 1	Year 2	Year 3	Year 4	Year 5
New Construction	\$147,006,230	\$0	\$0	\$52,266,768	\$49,562,000	\$0
Missouri Protoplex – Phase One	\$13,068,182					
Arrival Court	\$9,600,000					
Subsurface Parking Garage	\$9,920,000					
Missouri Protoplex – Phase Two	\$88,668,048					
Welcome Center	\$25,750,000					
Engineering Research Lab Addition and Renovation				\$52,266,768		
Schrenk Hall Addition and Renovation – Phase III					\$52,040,100	
Renovation/Infrastructure	\$0	\$0	\$0	\$0	\$0	\$0
Total Project Cost	\$147,006,230	\$0	\$0	\$52,266,768	\$52,040,100	\$0

*Projects listed under 2022 are projects anticipated to have project approval during FY22.

Missouri University of Science and Technology: Fiscal Years 2022 – 2027 Capital Plan included in Finance Plan Funding

Projects										
#	Title	Type	Facility Needs	FCNI	Total Cost	Debt	Gifts	Internal	Federal	State
1	Missouri Protoplex – Phase One	NC	\$5.3M	0.38	\$13,068,182	\$0	\$13,068,182	\$0	\$0	\$0
2	Arrival Court	NC	\$0	0.0	\$9,600,000	\$0	\$9,600,000	\$0	\$0	\$0
3	Subsurface Parking Garage	NC	\$0	0.0	\$9,920,000	\$0	\$9,920,000	\$0	\$0	\$0
4	Missouri Protoplex – Phase Two	NC	\$0 M	0.38	\$88,668,048	\$0	\$33,668,048	\$0	\$0	\$55,000,000
5	Welcome Center	NC	\$0 M	0	\$25,750,000	\$0	\$18,750,000	\$7,000,000	\$0	\$0
6	Engineering Research Lab Addition and Renovation	NC/RE	\$13.0 M	0.49	\$52,266,768	\$0	\$26,133,384	\$0	\$26,133,384	\$0
7	Schrenk Hall Addition and Renovation – Phase III	NC/RE	\$19.1 M	0.57	\$52,040,100	\$0	\$0	\$0	\$0	\$52,040,100
Total					\$251,313,098	\$0	\$111,139,614	\$7,000,000	\$26,133,384	\$107,040,100

1. Missouri Protoplex Phase Two, Missouri S&T: Project Approval at November 2021 BOC Meeting

The Missouri Protoplex - Phase One project will construct a new General Services Building near Exit 185 to the north of Interstate 44 and Nagogami Road (Route E) and just to the north west of Fraternity Circle. The new 39,621 gross square feet (GSF), single story building includes offices, conference rooms, a training room, shop space, and storage to accommodate Facilities Operations; Design, Construction and Space Management; and Environmental Health and Safety. The building exterior façade is anticipated to be an insulated metal panel system. Once the new facility is constructed, the existing General Services building will be demolished to clear the site for the Missouri Protoplex facility construction.

As identified in Missouri S&T's 2018 Strategic Plan, the University's mission includes discovering, disseminating, preserving and applying knowledge, and fostering innovation to support economic development. In September, the Board of Curators approved Missouri S&T's 2020 Master Plan, which identified the area north of Interstate 44 at Exit 185 for a Manufacturing Technology and Innovation Campus. The purpose of the Manufacturing Technology and Innovation Campus is to broaden Missouri S&T's ability to engage with technology partners and grow economic development opportunities for Missouri. The Missouri Protoplex will be the first building in this new campus, providing space for manufacturing outreach, research, and technology development collaborations with Missouri companies. The site for this new facility is located at Exit 185 to the north of Interstate 44, east of White Columns Drive and south of Collegiate Boulevard; roughly where the existing General Services Building is located. This location provides good access and visibility from Interstate 44.

Funding for the \$13,068,182 project will be provided by gifts.

2. Arrival Court, Missouri S&T: Project Approval at November 2021 BOC Meeting

The University Drive Relocation and US Highway 63 roundabout projects, currently under construction, define a new arrival district that will pronounce the new Missouri S&T campus main entrance "a gateway into the S&T Experience". The new entrance and Arrival Court will provide an iconic and powerful first impression at the east end of the realigned University Drive. The Arrival Court will be developed around a west to east axis formed between the new roundabout and the historically significant Rolla Building, and is encircled by the existing Havener Center and proposed Student Experience Center to the north, the proposed Welcome Center to the northeast, and a future building to the south; as indicated on the current 2020 Campus Master Plan. The Arrival Court will also include vehicular circulation, accessible parking, drop-off areas, sidewalks, multiple outdoor plaza areas and features, wayfinding signage, and landscape improvements.

Missouri S&T envisions an Entry Plaza, with sodded seating areas to the north and south, adjacent to and slightly elevated from the main vehicular entrance and drop-off. Visitors would be greeted by a water feature in the area, which could house a series of sculptural

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pieces, historic artifacts, and iconic signage to promote the Missouri S&T Brand.

The Main Lawn, which unites the entry plaza and Rolla Building in an axial relationship, will gently slope from east to west, creating opportunities for informal student gatherings and recreational activities, as well as more formal events, such as outdoor lectures and graduation ceremonies. The vision is to incorporate soft and hardscape with a pedestrian walkway to accommodate emergency vehicles.

In addition to the entry plaza, an events plaza is envisioned to be sited between the Student Experience Center and the future Welcome Center. The events plaza will serve as a primary gathering point for students, providing a lively and vibrant atmosphere for casual socialization, and a venue for Missouri S&T's innovative community to engage with one another. This plaza will be a combination of hard surfaces and landscaped areas. Hard surfaces will consist of a variety of colored concrete pavers and other durable materials as determined during the design phase, and landscaped areas will include native plants as well as flowering trees. The plaza will also have a variety of seating options for students to collaborate.

Funding for the \$9,600,000 project will be provided by gifts.

3. Subsurface Parking Garage, Missouri S&T: Project Approval at November 2021 BOC Meeting

The subsurface parking garage will be located in the new arrival court immediately south of Havener Center, east of US Highway 63, west of State Street, and north of Bertelsmeyer Hall in the heart of campus. The site takes advantage of the depressed grade area between the Rolla building and the new entrance being created to campus. The parking garage will accommodate parking for a minimum 140 vehicles; the design/build process will be utilized to optimize the maximum number of parking spaces. Two pedestrian area ways will exit the structure with an elevator at one location exiting into the center of the events plaza between the new Student Experience Center and the future Welcome Center. The top of the garage will accommodate the appropriate drainage for landscaping, and shall be structurally capable of accommodating emergency vehicles on the hardscape pedestrian walkway. Mechanical ventilation, fire suppression system, security cameras and lighting will be provided as well as a climate-controlled area for the elevator.

The proposed subsurface parking garage will provide convenient and accessible parking at the new arrival court for visitors to campus while reserving prime campus real estate for future development of academic and research facilities. This parking structure will support visitor parking for Havener Center, Student Experience Center, and the future Welcome Center. Other options for parking are located on the west side of Bishop Avenue (US Highway 63). The proposed parking structure is an integral component of the arrival court that is formed at the new campus entrance created by the realignment of University Drive and the construction of the new roundabout on Bishop Avenue.

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Funding for the \$9,920,000 project will be provided by gifts.

4. Missouri Protoplex Phase Two, Missouri S&T

The new Missouri Protoplex will be the first building in the Manufacturing Technology and Innovation Campus (Innovation Campus). The new three-story building of approximately 208,000 gross square feet (gsf) will incorporate a mix of flexible high-bay spaces, lab spaces, offices and meeting areas. The Innovation Campus will be located on Collegiate Blvd where the General Services Building is currently located and will provide convenient vehicular access and critical visibility from I-44. Phase One and other enabling projects include the demolition of Compressible Flow Laboratory, Dangerous Materials Storage Facility, Temporary Research Facility, Maintenance Shed #1, Transit Depot, and the General Services Building. Phase One, currently in design, will also construct a new 29,791 gsf General Service Building on Fraternity Circle adjacent to the existing Grounds Equipment Storage Building to accommodate offices and shop space for the facilities services unit.

The Missouri Protoplex is intended to develop advanced manufacturing in Missouri and the highly skilled, future-ready workforce needed to position Missouri as a global leader in advanced manufacturing, manufacturing education, research and development, technical assistance, outreach, and entrepreneurship. The Protoplex will serve as the anchor facility for the campus and as a hub connecting industry, state and federal agencies, and colleges and universities throughout Missouri, all with the aim of developing new processes and products for Missouri manufacturers and streamlining the process of moving research and innovation from university labs to the marketplace. As Missouri's STEM-focused research university and the only university in the state that offers a manufacturing engineering degree, Missouri S&T has the expertise, location, and educational programs to lead this initiative and stimulate advanced manufacturing in Missouri and the U.S

Funding for the \$88,668,048 project will be \$55,000,000 from the State and \$33,668,048 from gifts.

5. Welcome Center, Missouri S&T

This project will construct a new two-story, 26,994 gross square feet (gsf) Welcome Center. This prominent location is part of the Master Plan's Arrival District along Highway 63. The location of the new building on the site will enhance the visibility of the iconic Rolla Building. The facility will accommodate large groups with a flexible interior for a variety of events. An auditorium and presentation space will have operable walls that open to a lobby/gallery area, creating one large, 500-seat presentation space. Small conference rooms for meetings with faculty advisors will also be provided. The facility will also accommodate offices for admissions and enrollment management departments.

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Analysis of recruitment success rates has resulted in a commitment to improve the student and parent experience during campus visits. This new facility will accommodate recruitment events in a single location through shared space and flexibility. A large lobby and gallery will display information and exhibits related to campus life and the student experience, using static and interactive displays, video, and full-scale projects. Small conference rooms for meetings with faculty advisors will overlook the lobby/gallery.

Providing a new “front door” for visitors and potential new students, this flexible facility will allow for multiple types of events within a highly branded environment, and will enhance the public perception of the University. The proposed location is key to the newly defined Arrival District and strengthens the goals of the campus master plan to create a clear and structured wayfinding experience for prospective students and visitors.

Funding for the \$25,750,000 project will be \$18,750,000 in gifts and \$7,000,000 in University funds.

6. Engineering Research Lab (ERL) Addition and Renovation, Missouri S&T

The Engineering Research Laboratory (ERL) Addition and Renovation project will construct approximately 34,600 gross square feet (gsf) on the east side of ERL and connect to the north side of Straumanis-James Hall. The project will also renovate 43,421 of existing space in the Engineering Research Laboratory building. This will create a research center of approximately 162,540 gsf that will aesthetically improve and anchor the northeast corner of the campus. The project also addresses life safety code issues, energy conservation measures, accessibility issues, and will upgrade mechanical, electrical, and plumbing systems in the ERL.

This building will provide additional interdisciplinary research space which has been identified as a high priority in both the Strategic Plan and Campus Master Plan. Since this project will house interdisciplinary research, its impact will be felt campus-wide and affects all degree programs. The project will address approximately \$13 million of facilities needs. Additional operating costs are estimated to be \$517,090 annually and will be funded through the Campus operating budget. The estimated number of students impacted annually will be 1300.

Funding for the \$52,266,768 project will be \$26,133,384 in gifts and \$26,133,384 in Federal funds.

7. Schrenk Hall Addition and Renovation - Phase III (Biosciences Building), Missouri S&T

The Schrenk Hall Addition and Renovation – Phase III will renovate Schrenk Hall (1938 & 1973) to accommodate the Chemistry and Biological Sciences departments. This will be the final phase with the renovation of 17,600 gross square feet (gsf) of the west wing and the replacement of the east wing with a new 90,400 gsf facility and atrium. This project will provide new teaching laboratories, research laboratories, and support space.

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The project also takes into consideration growth and consolidation of department entities that are spread over multiple buildings on campus.

This project is the final phase of an interdisciplinary complex dedicated to providing world-class education and research in biological sciences, chemistry, and chemical and biochemical engineering. Equipped with expanded research space, open-concept research labs and improved accessibility, this facility will leverage Missouri S&T's strengths in computational science, environmental engineering, and materials science and engineering to advance medical, environmental, and biomedical research. The building will also be home to an interdisciplinary Center for Research in Biomaterials, where students and faculty will conduct research in bio-active, bio-inspired, and bio-mimetic materials for a variety of applications. The facility will be an integral component of the student experience at Missouri S&T, since almost every student will take at least one course in one or more important foundational area of biological sciences or chemistry.

The existing 1938 Schrenk Hall East should be demolished due to its very poor condition, and the structural system is not conducive to modern building systems. The Facilities Condition Needs Index (FCNI) is 0.57 with over \$19 million in facilities needs. Missouri S&T has been committed to moving this challenging project forward in a phased approach and investing when possible, to address immediate campus needs. Recently, \$4 million was added to the Phase 2A budget of the west wing renovation for Biological Sciences Research Labs in addition to the already planned Chemistry Research and Instructional Labs. Another commitment by the campus, constructed general classrooms, that were planned for this facility, but were built as an addition to the Computer Science Building Student Classroom Learning Center. Since 2016, demand for larger classrooms has increased due to growth. This investment results in more efficient instruction serving more students that will allow them to complete their degrees faster. Both investments have reduced the project budget and overall scope of this project by \$9 million.

This project will eliminate \$19.1 million in facilities needs and will increase annual operating cost by \$187,772. Funding for the \$49,562,500 project will be from the State.

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Missouri University of Science and Technology
Strategic Projects Development Plan

FY 23 – Missouri University of Science and Technology: Strategic Development Projects Plan

Project					Funding Strategy					
#	Title	Type	Facility Needs	FCNI	Total Cost	Debt	Gifts	Internal	Federal	State
1	Innovation Campus Program Expansion	NC	\$0	0.00	\$95,000,000	\$0	\$0	\$0	\$95,000,000	\$0
2	University Center West	NC	\$0	0.00	\$7,267,050	\$0	\$0	\$7,267,050	\$0	\$0
3	McNutt Hall Addition	NC	\$0	0.00	\$10,956,750	\$0	\$10,956,750	\$0	\$0	\$0
Total					\$113,223,800	\$0	\$10,956,750	\$7,267,050	\$95,000,000	\$0

1. Innovation Campus Program Expansion, Missouri S&T

The initial concept for the Innovation Campus Expansion proposes providing additional program space in three separate buildings adjacent to the Missouri Protoplex building. These facilities will provide research, laboratory, meeting, and classroom space.

The Innovation Campus Program Expansion is intended to follow construction of the Missouri Protoplex and accommodate additional program to support pre-production, testing and development, business incubation, cyber-security, and materials, manufacturing and methods. Research that will occur on the Innovation Campus will focus on advanced manufacturing, additive manufacturing, and the development of tools and techniques to reduce production costs, lead time, improve product quality, and reliability and safety. The work will draw on the expertise of Missouri S&T faculty in aerospace, ceramic, electrical, manufacturing, mechanical, metallurgical, and systems engineering, as well as engineering management, materials science and engineering, economics, and business information and technology. The Innovation Campus will build on and broaden Missouri S&T's strong relationships with over 60 companies in the aerospace, electronics and computing, infrastructure, and the steel manufacturing industries through four consortia through which S&T conducts non-proprietary research for consortia members who benefit from this shared expertise.

These facilities will also accommodate meeting and classroom space for the education and training of high-skilled advanced manufacturing workers, collaboration among manufacturers and entrepreneurs with faculty from colleges and universities across our state, and education focused on innovation, entrepreneurship and economic development.

Funding for the \$95,000,000 project will be by Federal funds.

2. University Center West, Missouri S&T

The University Center West project will construct a 20,000 gross square feet (gsf), two-story facility at the southwest corner of Bishop Avenue and University Drive. The Center will provide space for a food service venue, offices for Campus Housing and Dining Services, and a central mail facility to serve the nearby residential complex.

This facility will provide a dining venue to serve the Residential Commons One & Two, and the University Commons building. These facilities currently do not have a dining facility. Additionally, this facility will locate the campus housing and dining staff that serve these students to a more accessible location near these large housing complexes.

Funding for the \$7,267,050 project will be provided by University funds.

3. McNutt Hall Addition, Missouri S&T

The current program calls for the addition of 18,315 gross square feet (gsf) to the north side of McNutt Hall to expand the glassblowing and metalworking laboratories on campus. The addition will also provide public spaces for exhibition, events, offices, and student collaboration rooms, and act as a new highly visible public entry plaza on the north end of campus off of Highway 63.

The design focuses on the craft and production process of student work by exhibiting the shop

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space to visitors. The shops may be viewed by visitors from walkways above the shop floor or from the dedicated viewing areas separated from the shops with glass partitions. Students will have an expanded shop area for completing glass projects in a hot, warm, and cold shop. Metalworking students will have forges, tools, and special finishing areas available to them.

The inclusion of experiential learning is a unique educational opportunity at Missouri University of Science and Technology. The University has a desire to integrate application with education, and part of the University strategy is to provide experiential learning to all students. Additionally, the University has a broad initiative to connect arts and sciences in unique ways to augment student education. Student interest in applied glass forming and metalworking has increased and there is significant impetus for shop space dedicated and designed specifically for student exploration of these materials. Dedicated glassblowing and metal working shop space will allow programs and experiential learning on campus to expand. It will also offer a tangible way to link materials engineering science to the deeper human history of art and craft.

There will be a strong emphasis on exhibition and display of student, faculty, and visiting faculty work. Additionally, exhibits through the project will provide ways to educate visitors regarding the process and the history of each craft as an art and science.

The annual operating cost is anticipated at \$109,523. The \$10,956,750 project will be funded by gifts.

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