

Missouri University of Science and Technology Draft Strategic Plan

Elevating Missouri Through Research and Education (Updated 2-20-18)

Mission of the University of Missouri System:

The mission of the UM System, as a land-grant university and Missouri's only public research and doctoral-level institution, is to discover, disseminate, preserve and apply knowledge. The university promotes learning by its students and lifelong learning by Missouri's citizens, fosters innovation to support economic development, and advances the health, cultural; and social interests of the people of Missouri, the nation, and the world.

Missouri S&T Mission:

Missouri S&T integrates education, research and application to create and convey knowledge that serves our state and helps solve the world's great challenges.

Missouri S&T Vision:

Missouri S&T will be the leading public technological research university for discovery, creativity and innovation. We will cultivate curiosity, creativity and confidence in our graduates. We will be the institution of choice for partners around the world seeking a highly qualified, talented and entrepreneurial workforce; innovative research; relevant educational programs, products and services; and technology and ideas to solve the great challenges of our time.

Introduction and Overview:

Missouri University of Science and Technology is a great place to work, to learn, to teach, and to extend the boundaries of knowledge. Because it attracts talented and forward-thinking faculty, staff, and students, Missouri S&T plays a crucial role in solving some of Missouri's, and the nation's, most complicated and urgent problems. Our university has a long history of achievement and success, and enjoys a current climate that emphasizes high-quality educational experiences and high-impact research productivity. As one of Missouri's first land-grant universities, we take seriously our charge to serve the citizens of Missouri not only by educating its workforce, but also by providing valuable economic opportunities that empower the state. The recent strategic planning process has provided our campus the opportunity to reflect on our values and articulate our goals for the future. Our resulting document will guide our efforts to maintain excellence in many areas and to strengthen our position as Missouri's flagship public university for STEM education and research.

This document was developed by Missouri S&T's Strategic Planning Committee (SPC), which includes faculty, students, staff, and administrators representing a wide variety of units and interests across the campus. Drawing on literally hundreds of years of its own collective experience at S&T, as well as input from diverse stakeholders across our campus, the SPC has developed a plan that foregrounds some important aspirational goals for our university. This plan also emphasizes our ongoing efforts to remain a unique, vibrant, and innovative community that embraces continual improvement, prepares students for success in a global economy, and instills in them an appreciation of differences and a culture of inclusion.

Through the five specific Compacts, Missouri S&T articulates its commitment to many dimensions of student success, high-impact research and scholarship, active and far-ranging engagement and outreach, welcoming inclusivity, and effective, thoughtful, and transparent stewardship of our resources. In its broadest strokes, Missouri S&T's strategic plan emphasizes the value that it brings to the state (and beyond) and the opportunities it provides for its students, faculty, staff, alumni, employers, industry partners, and other stakeholders both within and beyond Missouri. Thus, the SPC refers to this plan as "Elevating Missouri Through Research and Education." The following narrative and tables will explain in detail how S&T aspires to meet these goals.

The Five Missouri Compacts:

Missouri S&T Compact for Excellence in Student Success

Fostering student success is the most fundamental goal of any university. Missouri S&T plans to improve the quality of our students' experiences by approaching our teaching and learning environments holistically. We will enhance our students' access to the curricular, professional developmental, and professional advising so crucial to their success both during and after their time at S&T. We will increase the quality and accessibility to wellness services, including those focused on mental, physical, and financial health. And we will continue to provide students with the diverse, creative, innovative, experiential, and entrepreneurial opportunities that will maximize their future career success and allow them to make significant contributions to our state and nation.

Student success is inextricably linked to teaching excellence, and Missouri S&T pledges to support the innovation and excellence of our faculty members by establishing and maintaining beneficial programs that focus on mentorship, effective teaching strategies, and creative approaches to course material. Furthermore, Missouri S&T will not only guide developing instructors toward such programs, but also recognize and celebrate accomplished educators in order to raise the visibility and appreciation of those faculty members making such important contributions to students' educational experiences.

Positive student programs and excellent instructors can only have an impact on students if those students actually have access to our university. Thus, even as we seek recognition as a highly selective state university, S&T endeavors to increase efforts to recruit talented students from on underserved areas of our state, first-generation students, and students who are members of underrepresented minorities. We will implement programs encouraging open-source textbooks and other strategies that reduce the cost of higher education for students. We will increase our retention rates and graduation rates by focusing on programs that improve students' first-year experiences, and we will reach out to our UM partner campuses to provide additional access to collaborative programs that leverage opportunities across the system. In short, we will work on many fronts to make Missouri S&T as affordable and accessible as possible to students who will benefit from, and succeed in, our many degree programs.

Missouri S&T Compact for Excellence in Research and Creative Works

Missouri S&T is a research university, and the knowledge created by members of our community serves as a beacon for the state of Missouri. The research endeavor is at the heart of our campus; as a result, our culture of research and scholarship is very strong. Missouri S&T

aspires to intensify this culture of research and scholarship even further, however, through highly focused and goal-driven recruitment and retention strategies for research-active faculty, improved processes to increase faculty engagement, and increased quality and impact of published scholarship in a wide range of disciplines.

Of primary importance to this strategic plan is Missouri S&T's unwavering commitment to achieve the highest classification in the Carnegie Classification of Institutions of Higher Education. Currently, Missouri S&T is included in the list of R2: Higher Research Activity universities; we aspire to be among the list of R1: Highest Research Activity universities by 2028. Doubling our annual research expenditures by 2025 and reaching an annual expenditure of \$100M by 2028 is an audacious but achievable goal that will contribute to this higher ranking and raise our stature on the national and international stage. To reach this goal, we intend to focus considerable efforts on increasing our Ph.D. student enrollment and our annual number of doctoral degrees granted, and improve the effectiveness of faculty obtaining extramural funds to support graduate students and postdocs. Our faculty has the capacity, the talent, and the passion to elevate our campus to this highest classification of research universities. A campus-wide prioritization of this Compact will, we are certain, lead to impressive and tangible results in the near future, including, but not limited to, a rise in individual program rankings and the successful recruitment of the highest caliber faculty and graduate students.

Missouri S&T Compact for Excellence in Engagement and Outreach

Increasing the value and opportunity that Missouri S&T provides our stakeholders boils down to how well we engage with and reach out to individuals and groups across Missouri and beyond. Our state faces numerous daunting challenges in areas including education, technological innovation, health and wellness, business and economics, infrastructure, workforce development, and many more. Missouri S&T understands its responsibility to help solve these challenges, and recognizes that the work done on our campus benefits not only current students, but also public- and private-sector partners, national laboratories, K-12 educators and their students, and Missouri citizens from all walks of life. Missouri S&T already has robust relationships with many such partners, but we pledge to do more to increase opportunities for engagement with members of all these groups. By focusing our efforts to extend the power and reach of our campus, we will increase the numbers of industry and government partners, scientific and intellectual communities, and Missouri citizens directly touched by and affected by the important work we do at Missouri S&T.

Missouri S&T Compact for Inclusive Excellence

At Missouri S&T, we strive to embrace diversity in its many forms, and to create a welcoming, inclusive, and supportive environment in which to learn, to teach, and to work. Our university's strength flows from our wide range of experiences, backgrounds, disciplinary specialties, and perspectives, and we believe in treating all members of our campus community with respect. Because we know that increased diversity leads to increased opportunities for all, Missouri S&T is committed to fostering an inclusive environment that celebrates diversity. We understand that diversity promotes collaborations and increases the impact of the work we do at Missouri S&T. Thus, we intend to implement aggressive recruitment and retention plans targeted at faculty,

staff, and students from underrepresented groups, as well as provide additional professional development opportunities related to diversity and inclusion. In short, Missouri S&T pledges to make every effort to provide a safe and respectful atmosphere for all, especially for members of underrepresented groups, and to promote these values and practices that celebrate diversity within communities beyond our campus.

Missouri S&T Compact for Excellence in Planning, Operations and Stewardship

As a public research university, we at Missouri S&T understand our obligations to the citizens of Missouri who provide many of the resources required for us to achieve our goals. Responsible and transparent stewardship of these resources is at the heart of our mission to serve this state and its people. We believe that some of our business processes can be streamlined to yield efficiencies, and that our budget processes can more effectively support the strategic objectives identified in this plan. Missouri S&T commits to offering salaries commensurate with recruiting and retaining the most talented faculty and staff, in order to achieve the ambitious objectives outlined in these Compacts. Finally, we pledge to leverage the strengths and collaborative possibilities that exist within the four-campus university system model in order to optimize the research, teaching, and engagement conducted on our campus.

Conclusion:

Achieving the many aspirational outcomes described in the Missouri Compacts will not be easy. We believe, though, that thoughtful, transparent, and goal-driven decisions about how best to reallocate resources to reach the objectives outlined in this plan will yield outstanding results. Many questions about the implementation of these Compacts remain, especially about the nature, source, and specific amount of resources that will be dedicated to achieving these outcomes. As budgets solidify and this plan evolves, however, details about resources will surely become clearer.

Resources are an undeniably important catalyst for implementing a strategic plan, but Missouri S&T recognizes that they are not the only catalyst. The passions and aspirations of talented faculty, staff, and students are the fuel behind all manners of success on a university campus. The process of developing these five Missouri Compacts has given our campus the opportunity to reflect on the many things that we already do well, and to heighten our excitement about tackling the challenges that lie ahead. We at Missouri S&T feel confident that our efforts in the service of our “Elevating Missouri Through Research and Education” plan will make our campus an even greater place to work, to learn, to teach, and to conduct research that will continue to transform our state and change the world.

MISSOURI S&T WILL ELEVATE MISSOURI THROUGH RESEARCH AND EDUCATION

Missouri S&T Compact: Excellence in Student Success

Striving for excellence in academic quality and diversity, learning experiences, flexible paths to learning and degree completion, professional development, retention and graduation rates, career outcomes, affordability, debt at graduation and loan default rates.

OBJECTIVE 1: INCREASE QUALITY OF THE STUDENT EXPERIENCE

Strategy	Primary Sub-goal supported	Unit Owner/ Administrative Manager	Metric
Provide student services and experiences to maximize career success	Career Outcomes	Career Opportunities/ Vice Chancellor for Student Affairs	Increase career outcomes rate to 95% by 2028 from 81% in 2017; increase the number of national and international student awards fourfold by 2028: Gates Cambridge, Goldwater, Rhodes, Fulbright, NSF Graduate Fellows, DOE Fellows, DOD Fellows, NIH Fellows, Gates Millennial and NASA Fellows
Enhance access to and quality of services to improve mental health, physical well-being, and financial wellness	Other	Vice Chancellor for Student Affairs	Meet or exceed a counselor satisfaction level of 90% by 2025; meet or exceed an 85% of eligible students reporting that the health and wellness services provided are meeting their needs by 2025; meet or exceed a 10% increase in intramural participation based on existing capacity
Improve curricular, professional and developmental advising and mentoring	Other	Chairs/Vice Provost for Academic Support	Improve student satisfaction survey, retention and graduation rates
Improve the quality of first-year experience by restructuring Freshmen Engineering and other first-year programs in non-engineering departments and implement an “all-majors” first-year experience	Retention	Chairs, Vice Provost and Deans/Provost	Increase retention rate to 90% by 2028 from 81% in 2017; increase retention rate of Pell recipients to 85% by 2028 from 73% in 2017; increase retention rate of underrepresented minority students to 88% by 2028 from 78% in 2017
Raise Missouri S&T admission status from “selective” to “highly selective” improving the ability to recruit highly qualified students	Other	Vice Provost for Enrollment Management/Provost	Increase mean ACT score to 31 by 2028 from 29 in 2017; increased application rate of high achieving students

OBJECTIVE 2: CONTINUE TO SUPPORT TEACHING EXCELLENCE

Promote teaching excellence through mentorship and programs that enrich the quality and effectiveness of teaching	Academic Quality	Faculty, Chairs, Vice Provost and Deans/ Provost	Number of programs developed and implemented by CAFE by 2025
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Support the development of innovative teaching methods and strategies	Academic Quality	Faculty, Chairs, Vice Provost & Deans/Provost	Number of faculty supported in CAFE eFellows program; number of faculty served in CERTI/CAFE Mini-Grant program
Review student evaluation of teaching scores each term to address instances of high performance with accolades and appreciation and instances of poor performance with guidance and expectations for improvement	Professional Development	Faculty, Chairs, Vice Provost & Deans/Provost	All faculty with teaching scores below a 2.0 will engage in CAFE mentoring activities; an evaluation of post-mentoring teaching scores will be evaluated
OBJECTIVE 3: MAINTAIN AFFORDABILITY AND OPPORTUNITY			
Increase opportunities and recruitment from underserved parts of the state focusing on first-generation and underrepresented students	Degree Completion	Vice Provost for Enrollment Management, Academic Support/Provost	Increase the number of first-generation students to 1,000 by 2028 from 661 in 2017; increase the number of underrepresented students to 1,100 by 2028 from 796 in 2017; increase on-campus undergraduate enrollment to 8,500 by 2028 from 7,969 in 2017
Increase utilization of open source textbooks and encourage faculty to produce open source materials	Debt at Graduation	Faculty/Chairs	Increase the number of courses utilizing open source textbooks by 40% by 2028 from 1% in 2017
Create an institutional process for recruiting and admitting non-thesis master's degree students with focus on 4+1 programs	Other	Faculty, Chairs, Vice Provost & Deans/Provost	Increase on-campus masters enrollment to 650 by 2028 from 500 in 2017
Increase flexible pathways to degree completion	Flexible paths to learning	Vice Provost for Global Learning	Increase percentage of distance learning and online courses as measured by SCH to 25% of total in 2028 from 6% in 2017
Increase opportunities to shorten time-to-degree completion for both undergraduate and graduate students (including focus on 2 nd to 3 rd year retention efforts, financial aid strategies, etc.)	Graduation Rates	Chairs, Vice Provost & Deans/Provost	Increase six year graduation rate to 80% by 2028 from 64% in 2017; increase six year graduation rate of Pell recipients to 70% by 2028 from 56% in 2017; increase six year graduation rate of underrepresented minority students to 70% by 2028 from 49% in 2017
Promote curricular activities such as advanced placement testing and transfer credits	Debt at Graduation	Chairs, Vice Provost & Deans/Provost	Reduce debt at graduation for undergraduate students to be at the 25 th percentile by 2028
Develop new collaborative programs with UM System campuses designed to increase the pipeline of transfer students	Other	Registrar/Provost	Partner with UM System campuses to ensure seamless transition of transfer students

Missouri S&T Compact: Excellence in Research and Creative Works

Striving for excellence in intellectual merit and broader impact, extramural research, high-quality publications and citations, faculty awards and recognition, curated exhibits and juried performances.

OBJECTIVE 1: BUILD A CULTURE OF RESEARCH AND SCHOLARSHIP

Strategy	Primary Sub-goal supported	Unit Owner/ Administrative Manager	Metric
Build a culture of research priority through goal-driven resource allocation, faculty hiring and retention efforts, and improved faculty engagement	Extramural Research	Vice Provosts, Vice Chancellors/ Chancellor	Manage workload policy to equitably distribute faculty time for scholarly activity by 2020; develop and implement departmental proactive recruitment and retention plans for top researchers by 2025
Increase quality of scholarly works including creative works, curated exhibits and juried performances	Curated Exhibits & Juried Performances	Faculty/Chairs	Increase the number of citations by 30% by 2028; increase the number of publications by 30% by 2028; increase the number of juried performances by 10% by 2028; increase the number of curated exhibits by 10% by 2028

OBJECTIVE 2: ACHIEVE HIGHEST CLASSIFICATION IN CARNEGIE RANKINGS

Increase annual research expenditures by 100%	Extramural Research	Vice Chancellor for Research and Dean of Graduate Studies/ Chancellor	Increase annual research expenditures to \$70M by 2025 from \$35M in 2017; increase annual research expenditures to \$100M by 2028
Increasing research expenditures will increase faculty recruiting efforts for PhD students	Extramural Research	Vice Chancellor for Research and Dean of Graduate Studies	Increase on-campus PhD enrollment to 850 by 2028 from 654 in 2017
Increase doctoral degree productivity	Broader Impact	Chairs/Vice Provost & Deans	Increase the number of doctoral degrees granted to 150 by 2028 from 88 in 2017

Missouri S&T Compact: Excellence in Engagement and Outreach

Strive for excellence by building a climate that values the diverse background, experiences and perspectives of each individual; effective programs for educational, health, cultural, economic and social outreach with local, state and global communities; and innovative partnerships with industry for economic and workforce development.

OBJECTIVE 1: INCREASE VALUE AND OPPORTUNITY FOR OUR STAKEHOLDERS THROUGH OUTREACH

Strategy	Primary Sub-goal supported	Unit Owner/ Administrative Manager	Metric
Increase awareness of, and improve access to, university expertise and capabilities to engage MO citizens	Programs for Educational, Health, Cultural, Economic and Social Outreach	Vice Provosts, Vice Chancellors/Chancellor	Increase the number of MO citizens engaged in S&T outreach activities by 50% by 2028; increase the number of engaged student, faculty, staff, and alumni by 50% by 2028
Increase agreements with industry, national laboratories, and external partners	Innovative Partnerships with Industry	Vice Provosts, Vice Chancellors/Chancellor	Increase the number of master agreements to 10 by 2028 from 2 in 2017
Increase positive economic and social impact of technical innovation and application	Innovative Partnerships with Industry	Vice Provosts/Vice Chancellor for Research	Increase the annual number of patents issued to 30 by 2028 from 15 in FY17; increase the number of disclosures to 80 by 2028 from 47 in FY17; increase the amount of industry funded research to \$20M by 2028 from \$7M in 2017
Capitalize on student engagement within the community through internships, co-ops, summer camps, and competitions held on campus	Programs for Educational, Health, Cultural, Economic and Social Outreach	Career Opportunities, Vice Provosts/Vice Chancellors	Increase the number of K-12 students engaged in S&T activities to 6,000 by 2028 from 4,117 in 2017; increase the number of students on MO co-ops to 450 by 2028 from 348 in 2017; increase the number of students on MO internship to 350 by 2028 from 232 in 2017; increase the number of students attending summer camps to 600 by 2028 from 470 in 2017
Realign innovation and entrepreneurship system to focus on student and faculty training programs; technology management	Innovative Partnerships with Industry	Vice Provosts/Vice Chancellor for Research	Increase the number of I-Corps mentors to 50 by 2028 from 20 in 2017; increase the number of faculty and

that serve clients; industry engagement that leads to long-term relationships for workforce development			staff who attend KEEN workshops to 20 by 2028 from 7 in 2017
OBJECTIVE 2: INCREASE THE IMPACT OF OUTREACH AND EDUCATIONAL SUPPORT FOR MISSOURI			
Provide increased support for students and teachers in K-12, particularly in underserved areas and in STEM disciplines	Programs for Educational, Health, Cultural, Economic and Social Outreach	Faculty/Vice Provost & Deans	Increase the number of counties participating in Project Lead the Way to 70 by 2028 from 58 in 2017; increase the number of educators participating in the South-Central Regional Professional Development Center by 3% in 2028; increase the number of participants in Teaching and Learning Technology conference to 350 by 2028 from 262 in 2017

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Missouri S&T Compact: Inclusive Excellence

Comprehensively integrate inclusion efforts into the areas of access and success, campus climate and intergroup relations, education and scholarship, institutional infrastructure, community engagement

OBJECTIVE 1: FOSTER AN INCLUSIVE ENVIRONMENT THAT VALUES DIVERSITY

Strategy	Primary Sub-goal supported	Unit Owner/ Administrative Manager	Metric
Implement the Inclusive Excellence Framework to provide a campus atmosphere that creates a safe and respectful place for all, especially underrepresented groups, and promote the same values in the community	Campus Climate and Intergroup Relations	Vice Provosts, Vice Chancellors/ Chief Diversity Officer	Improve campus climate survey results: Underrepresented minority faculty, staff and student satisfaction to 80% by 2028 from 70% in 2017; female faculty, staff and student satisfaction to 86% by 2028 from 76% in 2017; international student satisfaction to 70% by 2028 from 60% in 2017; disabled satisfaction to 77% by 2028 from 67% in 2017; veteran satisfaction to 80% by 2028 from 70% in 2017, multiple race satisfaction to 72% by 2028 from 62% in 2017
Provide additional professional development opportunities related to diversity and inclusion	Access and Success	Vice Provosts, Vice Chancellors/ Chief Diversity Officer	Increase the number of additional professional development opportunities to 70 by 2028 from 52 in 2017
Develop and implement a campus faculty and staff recruitment, hiring and retention plan based on best practices	Institutional Infrastructure	Vice Provosts, Vice Chancellors/ Chief Diversity Officer	Increase underrepresented faculty to 10% by 2028 from 4% in 2017; increase underrepresented staff to 10% by 2028 from 5% in 2017
Develop and implement a campus undergraduate and graduate student recruitment plan based on best practices	Access and Success	Vice Provost for Enrollment Management/Vice Provost & Deans	Increase underrepresented minority undergraduate students to 20% by 2028 from 7% in 2017; and increase underrepresented masters and PhD students to 15% by 2028 from 7% in 2017

Missouri S&T Compact: Excellence in Planning, Operations and Stewardship

Strive for excellence in long-term planning processes for operating and capital needs, measures of accountability visible to all stakeholders, processes, practices, and policies that encourage collaborations and progress across the four institutions of the UM System, and a change in organizational structures to achieve the objectives of the research, teaching and engagement mission.

OBJECTIVE 1: INCREASE TRANSPARENCY AND EFFICIENCY OF BUSINESS SERVICES AND FISCAL OPERATIONS

Strategy	Primary Sub-goal supported	Unit Owner/ Administrative Manager	Metric
Evaluate and redesign campus units' funding model and service providers to increase efficiency and transparency	Measures of Accountability Visible to All Stakeholders	Vice Chancellor for Finance and Operations	Identify the number of charge back units; number units' redesigned; report on percentage completed
Redesign the budget revenue and the budgetary process to more effectively support campus wide strategic objectives	Long-term Planning Processes for Operating and Capital Needs	Vice Provosts, Vice Chancellors/ Vice Chancellor for Finance and Operations	Evaluate and refine the budget revenue distribution model; dollars allocated to the MO Compact
Develop a written comprehensive compensation and merit policy for faculty and staff	Measures of Accountability Visible to All Stakeholders	Vice Provosts, Vice Chancellors/ Vice Chancellor for Finance and Operations	Plan developed, approved and implemented to achieve faculty and staff salaries to be competitive with our peers
Improve effective utilization of carryover	Long-term Planning Processes for Operating and Capital Needs	Vice Provosts, Chairs/Vice Chancellor for Finance and Operations	Establish an acceptable reserve range for gifts; meet System mandated reserve for maintenance and repair; meet change in operating net assets; meet recommended range established by controller's office for divisions and departments
Implement business analytics to improve recruitment and retention of students, program prioritization, and research investments	Long-term Planning Processes for Operating and Capital Needs	Vice Provosts, Vice Chancellors/ Vice Chancellor for Finance and Operations	Program prioritization will identify areas for investment in MO Compacts
Streamline and improve efficiencies at Missouri S&T by eliminating customization of business processes, practices and policies that reduce collaboration among the four campuses	Processes, Practices, and Policies that Encourage Collaborations	Vice Provosts, Vice Chancellors/ Vice Chancellor for Finance and Operations	Implementation will yield savings to be invested in MO Compacts

Reduce non-personnel unrestricted discretionary spending and reinvest those resources for Missouri Compacts for Student Success, Research, Engagement and Inclusive Excellence	Long-term Planning Processes for Operating and Capital Needs	Vice Provosts, Vice Chancellors/ Vice Chancellor for Finance and Operations	Reduce non-personnel discretionary spending by 20% by 2028; savings to be invested in MO Compacts
Implement changes needed to accomplish the objectives of the Administrative Review (PWC) to enhance Missouri S&T	Change in Organizational Structures to Achieve Objectives of Research, Teaching and Engagement Mission	Vice Provosts, Vice Chancellors/ Vice Chancellor for Finance and Operations	Number of changes completed; implementation will yield savings to be invested in MO Compacts

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