

# FY2014 ANNUAL REPORT COVER PAGE

**Campus or Unit:** Missouri University of Science and  
Technology

**Date of Submission:** August 1, 2014

**Prepared by:** Rose Horton

**Contact Name if there are  
questions about the report:** Rose Horton



# STRATEGIC PLANNING: ANNUAL REPORT (FY14)

---

<b>Campus or Unit:</b>	<b>Missouri University of Science and Technology</b>
<b>Lever Number:</b>	<b>1.1</b>
<b>Lever Description:</b>	<b>Require all undergraduate students to participate in some significant experiential learning activity before they graduate</b>
<b>Lever Metric:</b>	<b>All undergraduate degree programs require an experiential learning activity (by year five)</b>

## Lever/metric summary:

This lever is dedicated to student experiential learning opportunities. Establishing a framework and understanding of what constitutes experiential learning has been the year one focus. The Faculty Senate approved the definition of experiential learning in April 2014. The core principles of experiential learning are: 1) student centered rather than teacher centered; 2) active learning rather than passive learning; 3) application of learned principles to form realistic solutions to problems, issues and challenges; and 4) reflection upon the learning experience. The base and general approved definition: Experiential learning at Missouri S&T refers to learning stimulated by a variety of structured activities that differ significantly from the traditional lecture format. Experiential learning activities are designed to require students to go beyond mastering basic skills and knowledge in the application of that material to problem solving challenges. These activities involve collaboration and reflective learning and allow students to learn in environments that align with their aptitudes.

Experiential learning implementation guidelines for the campus have been established: 1) activity must be university sponsored or affiliated and the student must receive written approval of the activity from a faculty member or academic advisor; 2) the faculty member or advisor will ensure the activity is of significant duration, intensity and rigor to demonstrate successful application of learned principles; 3) the focus must be on 'learning by doing' in a creative and innovative activity that falls outside of the realm of traditional lecture; 4) a significant experiential learning activity will include a written summary reflection piece that will document the experience from the student perspective and this piece should be of a quality suitable for inclusion as an attachment to a co-curricular transcript or in an e-portfolio.

Each department has jurisdiction over their curricula and authority over what activities will meet the significant experiential learning standard. Once the department has determined an undergraduate student has satisfied the departmental requirement, the department will notify the office of undergraduate studies who will maintain records. The office will also notify the registrar's office which will update the student's degree audit status.

The next step will be to draft a guideline for meeting the degree requirements seeking input and approval from the Missouri S&T Curriculum Committee and Faculty Senate. These crucial actions should be completed in FY15.



**Action 1.1.1: Create a defining comprehensive list of activities that are supported by research as significant experiential activities**

- Sample list of activities include: undergraduate research such as OURE projects, NSF Research Experience for undergraduates, Honors Academy senior research project; co-op, summer internships or externships in industry or at a research center; significant participation on a student design team, study abroad, Missouri S&T sponsored service learning such as Psychology capstone or internship projects, Miner Challenge; significant involvement in national/international competitions such as Chem-E Car, IEEE Robotics; field trip experiences of significant duration and intensity; practicum or formalized student teaching; Missouri S&T Student Success Coaches, Peer Learning Assistant, On-Track Mentor; Resident Assistants, Programming Resident Assistants, Chancellors Leadership Academy Advisor, Joe's P.E.E.R.S, PRO Leaders, Admission Ambassadors; leadership positions within student governing boards such as Student Council, Student Union Board, PanHellenic Council, Cultural Activities Council, Inter-fraternity Council; GLVC Student Athlete Advisory Committee; year-long leadership involvement experiences in Global Leaders Institute, Chancellor's Leadership Academy, Student Leadership Conference chair, intercollegiate athletics team; leadership workshops and retreats such as Backpack to Briefcase or Sue Shear Leadership Academy; activities provided in campus residences that are judged as an effective conduit for Missouri S&T students to connect in-class experiences to their life within the campus community.

**Action 1.1.2: Incorporate experiential/service learning into the core curriculum in all degree programs at any level beginning in the freshman year**

- This action will officially begin in August 2014. The process of compiling a draft statement and detailed ways for students to complete the experiential requirement should be completed within FY15.
- Although this action has not officially begun; many departments on campus currently engage their students in experiential research opportunities. One example of experiential learning already in the curriculum is in the biological sciences department. This department has determined that enhancing experiential learning for all seniors can be accomplished by requiring a service-learning course as part of the senior capstone. Students work in groups to propose a topic area, perform research, develop, complete and present a service-learning project that relates to biological sciences. Students work closely with the Rolla and St James public schools. The positive results of this capstone project are: 1) enhances the students' sense of community responsibility; 2) enhances student skills in presenting ideas in both a written and oral format; 3) develops academic maturity; and 4) enhances the student's employability.
- Another department, civil engineering, is in the beginning phases of implementation of experiential learning. This department has increased study abroad and international opportunities and is in the process of solidifying a structured internship program with key employers who hire civil engineering graduates.



**Action 1.1.5: Career Opportunities and Employer Relations will continue to explore internship and externship opportunities in the summer and inter-sessions as well as during semesters** [Completed; ongoing]

- The original action focused on developing a list of internship and externship opportunities and that task has been completed in FY14. The action has been rewritten to ensure that internship and externship development continues.
- For the AY13/14, 40 students attended externship with 9 different employers over spring break. The campus will continue to add externship opportunities and increase student participation.
- In AY13/14, 527 students participated in an internship. Internships were comprised of: 284 different employers, representing 40 states and 3 international locations.

**Action 1.1.6: Establish experiential opportunities through peer advising and mentoring**

- Missouri S&T has a strong peer mentoring and advising program. Students who participate in this program find it extremely rewarding and feel more connected to the campus.
- The campus added this action for FY15 and will track the number of opportunities provided.

**Action 1.1.7: Identify prospective donors to expand activities at the Kummer Student Design and Experiential Learning Center through increased giving and major gifts**

- The Kummer Student Design and Experiential Learning Center serves as the business incubator and support center for 14 multi-disciplinary design teams.
- Over 600 students participate in design teams.
- In 2014, the Missouri S&T Mars Rover Team took second place in the world. The “Phoenix,” was a student designed and built remote controlled robotic rover with almost no off-the-shelf hardware or parts. The team developed the rover circuitry and utilized 3-D printing technology to design the gears and drill bits.
- The types of activities offered at the experiential center require fundraising efforts. This action will look at the number of donors to the Kummer Student Design and Experiential Learning Center and baseline data will be established in FY15.

**Action 1.1.8: Develop promotional materials to promote experiential learning to the community and to promote options for students**

- Recognizing that student awareness of experiential opportunities offered on-campus and off-campus could be a success factor, this action has been created.
- This action will track the number of promotional materials and the type of materials developed.

\* Seven actions have been added for implementation in FY15



<b>Campus or Unit:</b>	<b>Missouri University of Science and Technology</b>
<b>Lever Number:</b>	<b>1.2</b>
<b>Lever Description:</b>	<b>Foster innovation and creativity for faculty, staff, students and administration</b>
<b>Lever Metric:</b>	<b>Implement innovation projects with an 80 percent success rate Develop minor and certificate programs (1 year one)</b>

**Lever/metric summary:**

This lever focuses on enhancing innovation and creativity on campus. To accomplish the mission, key creative areas have been identified through various actions explained in this lever. The first action and primary metric is the development of an innovation team. The innovation team was formed in FY14 along with an innovation proposal form, guidelines for awarding funding, and a website. This website allows the Missouri S&T family to submit innovative proposals for the innovation team to review. Since the official team launches in FY15, proposals have not been submitted. The metric for this lever cannot be evaluated until year two. The metric specifies an 80 percent success rate in all projects. The tracking mechanisms for determining the success rate will be launched in FY15.

Developing an innovation team is important to fostering creativity but the curriculum offered to students is also imperative to the mission. The second metric is focused on developing new minor or certificate programs. The goal for this metric is to create one new program in year one. The campus completed the humanitarian engineering and science minor that will be available in fall 2014, and the metric has been achieved.

Innovative curriculum is one aspect of student learning; where students actually learn also plays an important role in the learning process. This lever also focuses on implementing a Learning Commons on campus. The library has undergone and will continue to undergo several changes to adapt not only to technology but also the way students want to utilize their learning spaces.

The last metric identified in this lever focuses on developing a series of student co-curricular events. These events have been identified for students as being innovative and creative. Events will constantly be added as new areas are discovered and identified. The campus currently measures the number of students that attend those events.



**Action 1.2.1: Create and promote an innovation team that solicits and considers creative suggestions from Missouri S&T family; empower owners for implementation. Create a small fund to implement several each year**

- In order to solicit suggestions from the entire campus, an innovation proposal form has been developed and launched on the strategic planning website. This proposal will remain on the website to allow for ongoing suggestions from the Missouri S&T family. The proposal focuses on a description of the innovative idea, the owners for implementation, expected outcomes, estimated budget and the tie in to the Missouri S&T strategic plan. The title of the idea and the description of the proposal will be posted on the website for the community to view.
- The innovation team will review the proposals and determine the status in one of three areas: 1) ready for “immediate implementation”; 2) “future implementation” for proposals that are innovative in nature but may need further discussion or are contingent upon other variables; 3) “not for implementation” for those proposals not meeting the strategic criteria. This action has a seven year duration timeframe and will continue throughout the life of the plan.

**Action 1.2.2: Implement a Learning Commons with state-of-the-art collaborative technology, practice presentation rooms, experimental technology lab with video editing and 3D printing capability for teaching, learning and research; training on how to effectively use the commons would be included**  
[Completed; ongoing]

- In FY14, this action focused on studying the feasibility of creating a Learning Commons and that task has been completed. Recognizing that a part of the Campus Master Plan and the campus strategic plan is creating innovative learning spaces the wording of the original action has been altered.
- The interior of the library has been examined strategically to focus on usable space designed to promote student collaboration.
- In the Campus Master Plan, architects analyzed the library for effectiveness and determined its location is the central gathering spot for the campus and central to student success. The long term vision includes incorporating food service with outdoor dining.
- The Learning Commons implementation has already begun. The following improvements have been implemented: 1) a new multi-media center with four new high performance CAD 3D graphic work stations that offer the latest graphic modeling software have been installed; 2) five new quick print stations have been added to expand the student printing areas and to reduce congestion during peak times; 3) an innovative co-lab space has been created with high performance computers, movable white boards and table space; 4) rooms on the second floor have been upgraded with projectors for students to utilize as practice presentation rooms; 5) the 3D printing service is open to students to create their own designs with cheaper and more rapid prototyping; 6) consolidation of the poster shop to free up more space for innovative learning areas; and 7) reference materials were relocated and two-thirds of the reference collections were folded into the circulating collection to provide more student seating on the first floor.

**Action 1.2.3: Devise a plan for TedX-like series for students, faculty and staff (e.g., experiential learning activities, professional development)**

- The target for year one is development of a plan for a TedX-like series and that task has been completed.



**Action 1.2.3 a: Council of Graduate Students will host Ted Talk style inspirational lectures to showcase ideas and “ignite” the campus and Rolla community**

- The Council of Graduate Students hosted a seminar series displaying 6-12 minute talks from faculty, staff, students and community members designed to inspire and ignite the community. A few examples of the Ted-X like presentations: 1) a faculty member presented, “So where are the toxins? Just ask Mother Nature!”; 2) a student presented “What I learned from cancer”; and 3) a local business owner presented “Craft beer defined.”
- The baseline established in FY14 is for one event per academic year and two events are planned for FY15.

**Action 1.2.5: Identify a series of co-curricular events (e.g. intersession or alternative spring break) for interdisciplinary groups of students, faculty and/or staff focused on providing solutions for problem-solving, innovation or leadership**

- A series of co-curricular events have been identified. Some examples are the Chancellor’s Leadership Academy, Miner Challenge and the National Leadership Conference.
- The Miner Challenge, a co-curricular event, has expanded on the Missouri S&T campus. Over spring break 2014, 60 students attended 1 of the 4 Miner Challenge events: 1) 10 students went to Nicaragua and worked with students on English, math and science; 2) 15 students went to Moore, Oklahoma to work with tornado disaster relief; 3) 17 students went to Boulder, Colorado to work with flood relief; and 4) 18 students went to Austin, Texas to work with service organizations focusing on elementary education, poverty and community development.
- Examples of other co-curricular events: 4 students attended the Sue Shear Institute, 80 students attended employer networking at “Springfield Day”; 120 students attended “Life after S&T,” 383 students participated in a co-op (a 4 percent increase over prior year) and 527 students participated in an internship (a 28 percent increase over prior year).
- The duration of this action is two years and currently is on target.

**Action 1.2.6: Develop minor and certificate programs in leadership, entrepreneurship, humanitarian engineering and science and creativity**

- An agreement with UMKC has been developed with an online pilot program occurring in summer 2014. UMKC is providing Missouri S&T with an online entrepreneurship course for the new entrepreneurship minor.
- The humanitarian engineering and science minor has been completed and students are able to enroll in fall 2014.
- The creativity minor is in the development process.
- This action has a metric of one course to be developed in year one and that metric has been achieved. This action is on target.

**\* Two actions have been added for implementation in FY15**



<b>Campus or Unit:</b>	<b><u>Missouri University of Science and Technology</u></b>
<b>Lever Number:</b>	<b><u>1.3</u></b>
<b>Lever Description:</b>	<b><u>Establish database of measures to define student access to faculty and staff</u></b>
<b>Lever Metric:</b>	<b><u>Metrics to define student-faculty interaction</u></b>

**Lever/metric summary:**

The primary goal for this lever is establishing benchmarks for student-to-faculty interaction and student-to-staff interaction. Interaction is an important factor for retention, student engagement and ultimately alumni engagement. Due to the importance interaction plays on student success, a definition and accepted understanding of what constitutes interaction must first be explored. A preliminary definition has been created and is under review by the Department Chairs Council and Faculty Senate. Meaningful interaction at its foundational level can be defined as any positive interaction, either on- or off-campus between faculty and students or staff and students. The smallest and seemingly insignificant informal out-of-class interactions with faculty and staff can have value and meaning.

Upon adopting the definition of interaction benchmarking ratios can then be established. Benchmarks and ratios using national standards will be calculated. The expected timeline for establishing ratios and benchmarking is within the first six months of FY15. Institutional research and assessment will provide the necessary data and work closely with academic affairs.



**Action 1.3.1: Define meaningful interaction with students**

- The definition is under review by the Department Chairs Council and Faculty Senate.
- The importance of student-faculty interaction can be demonstrated through the impact on grade point average, retention rates and student satisfaction. Interaction can be at events, during field research and even interaction outside of the classroom can have meaning.

**Action 1.3.2: Obtain data on number of faculty and other parameters**

- This action has a start date of January 2015.
- Once data has been collected, benchmarking ratios compared to national standards and comparator universities can begin.

**Action 1.3.3: Obtain data on number of professional/exempt staff and other parameters**

- This action has a start date of January 2015.
- Once data has been collected, benchmarking ratios compared to national standards and comparator universities can begin.



<b>Campus or Unit:</b>	<b><u>Missouri University of Science and Technology</u></b>
<b>Lever Number:</b>	<b><u>1.4</u></b>
<b>Lever Description:</b>	<b><u>Create professional and leadership development opportunities for faculty, staff, alumni and students</u></b>
<b>Lever Metric:</b>	<b><u>Implement professional development plans</u></b>

**Lever/metric summary:**

This lever is focused on professional development of faculty, staff, alumni and students. The first area identifies faculty development. Faculty development plans are currently in place. The department chairs have each faculty member engaged in some level of professional development. Many attend external trainings as a part of their development and some attend internal workshops. The second identified area is staff professional development. Many administrative departments engage in specialized developmental areas such as TedX Thursdays, teambuilding exercises or watching professional development webinars. A series of workshops has been created for faculty and staff development. These workshops are a ‘Lunch and Learn’ series of classroom type sessions offered on a first come first served basis. Participants can call the human resources department to sign up or go online through myLearn. The series initially includes the following trainings: 1) work-life balance; 2) civility in the workplace; 3) resiliency; 4) emotional intelligence; 5) success at work; 6) personal and professional development; and 7) teamwork and trust. Additional workshops will be developed. The next areas identified are professional development of students. The career opportunities and employer relations department provides a variety of professional workshops, resume development, how to network and negotiating a job offer for students and alumni. Once the Hasselmann alumni house is completed additional workshops and activities specifically for alumni can be developed and housed within Hasselmann.

Missouri S&T plans to go beyond the typical idea of professional development and look holistically at the individual by developing a multi-dimensional model of wellness a part of the campus strategic vision. This model will assist the faculty, staff and students through workshops that are designed to look at the whole-person to encourage lifelong health. Beginning implementation efforts have begun; student affairs staff has been trained on: counseling, understanding stressors, techniques for reducing stress, and rapid response. Sixty faculty and staff on campus have been trained on bystander intervention. Over 150 participants had a vegan lunch and have been taught about nutrition. The campus will continue to focus and develop this model and expand its efforts for impacting the mind, body and spirit of the individual.



**Action 1.4.1: Identify, develop and implement professional development plans to enhance leadership, creativity, and innovation for the staff in each department or unit**

- The target for year one was to develop a plan for professional development. This task has been completed successfully and the implementation phase has begun.
- Each of the department chairs has engaged their faculty in some form of professional development. One department example: arts, languages and philosophy had various faculty attend a week long seminar in business French while others attended a summer theatre workshop in New York. Other departments have faculty attend ABET workshops, the National Effective Teaching Institute and several become CERTI members.
- Several administrative departments perform professional development activities: several staff have attended Myers Briggs type indicator training for professional development; several staff members across multiple departments have attended the Chick-fil-A Leadercast; many have attended webinar trainings on how to utilize current software.
- Many support departments also participated in offsite trainings. An example of one department with off-site training, the University Police department had eight of its twelve members attend training.

**Action 1.4.2: Develop and implement professional development and leadership plans for students to enhance creativity and innovation**

- This action has been added for the FY15 plan but implementation efforts began in FY14.
- Leadership and cultural programs has implemented workshops and training for students. A couple of examples: a leadership and empowerment workshop has been given to TJ Hall residents and a delegation of students attended the National Student Leadership Diversity Convention in Arizona.

**Action 1.4.3: Identify, develop and implement developmental experiences designed to enhance students' interpersonal, communication and leadership skills**

- This action has been added for the FY15 plan but implementation efforts began in FY14.
- Student Affairs has been providing workshops for students and tracks the student responses from the workshops to assist in the improvement process. An example, a post survey was given to the Academy of Miner Athletics who participated in a workshop on transitioning from student to professional. Results from the workshop indicated that 77 percent of the athletes found the experience to be beneficial and even more than what they had originally expected.

**Action 1.4.4: Promote a multi-dimensional model of wellness that incorporates whole-person concept and encourages lifelong health**

- A strength and conditioning performance position has been approved. This position will be responsible for delivering workshops associated with nutrition and strength training.

\* Two actions have been added for implementation in FY15



<b>Campus or Unit:</b>	<b>Missouri University of Science and Technology</b>
<b>Lever Number:</b>	<b>2.1</b>
<b>Lever Description:</b>	<b>Employ transformative and focused faculty hiring and retention, including cluster hires in select areas of expertise to support best-in-class (BIC) achievements</b>
<b>Lever Metric:</b>	<b>Hire 12 faculty to support best-in-class signature areas Identify BIC signature areas</b>

**Lever/metric summary:**

Identifying four best-in-class, signature areas are the foundation actions for this lever. The four signature areas have been identified: 1) Advanced Manufacturing has state-of-the-art research equipment for additive manufacturing, laser processing, metal casting, and three industrially relevant national research centers. This signature area involves researchers from mechanical engineering, materials science engineering, electrical engineering, engineering management and computer science; 2) Advanced Materials for Sustainable Infrastructure has state-of-the-art research equipment for design testing of novel construction materials, metal casting, composites manufacturing and materials characterization, as well as six interdisciplinary research centers. This signature area involves researchers from civil engineering, chemistry, mining and nuclear engineering, engineering management, mechanical engineering and materials science engineering; 3) Enabling Materials for Extreme Environments focuses on developing new materials in extreme temperatures, heat fluxes and neutron radiation levels. This signature area involves researchers from chemistry, materials science and engineering, mechanical engineering, nuclear engineering and physics; 4) Smart Living which embraces infrastructures that are designed to be people centered matched with advanced technology such as transportation networks that adapt to traffic patterns or security that detects potential threats. This area will leverage Missouri S&T strengths in cyber security, sustainable energy research, big data analytics, architectural design, and behavioral and environmental psychology. This signature area will have researchers from chemical and biochemical engineering, electrical and computer engineering, engineering management and systems engineering, mathematics and statistics, mechanical and aerospace engineering, business and information technology, and psychological science.

This lever is tied to an FY15 strategic initiative dedicated to the hiring of national academy stature faculty to support the signature areas. If the strategic initiative is funded, Missouri S&T will begin the hiring process of endowed chairs, research specialists, engineering research technicians, grant writers, entrepreneurs in residence and technical illustrators dedicated to the first two signature areas. A metric tied to this lever is the hiring of one endowed chair in year three. Based on strategic initiative funding this target can be achieved.

The additional faculty support for signature areas will begin in FY15 with three cluster hires per signature area. Other additional faculty support for the signature areas begins in year four.



**Action 2.1.1: Identify two BIC areas for investment and initiate discussion on another two BIC areas**  
[Completed]

- A committee was developed to determine the process and timeline for identifying the best-in-class areas. A proposal form was created and the campus community was invited to submit and 15 proposals were submitted. An open forum was held and two were identified in January 2014, as reported in the semi-annual report.
- Discussions began in February for the next two signature areas and the same processes were utilized. Nine proposals were submitted, open forums were held and two were selected.
- This action has been completed within the first six months of strategic plan implementation.
- The first signature area is Advanced Manufacturing.
- The second signature area is Advanced Materials for Sustainable Infrastructure.

**Action 2.1.2: Develop and implement a process to transparently allocate all faculty positions to impact strategic plan and progress on unit performance measures**

- The hiring table and hiring criteria have been updated to reflect alignment with the strategic plan.
- A process on unit performance measures has been developed and is under review by senior leadership.

**Action 2.1.3: Develop and implement a process to allocate faculty raises aligned with the strategic plan to address retention and reward high productivity**

- A new process for increasing bumps in pay from assistant to associate professor and associate to full professor has been implemented. The increase for promotion to full professor will phase-in over the next three fiscal years, beginning at \$6,000 in FY15 and ending at \$10,000 in FY17. The increase for promotion to associate professor and the granting of tenure will phase-in over the next two fiscal years, beginning at \$4,000 in FY15 and ending at \$5,000 in FY16.

**Action 2.1.4: Identify and pursue companies, foundations and individual donors for charitable gifts to hire two national academy stature faculty in endowed chair positions in strategic areas #1 & #2**

- This action ties to Lever 3.9 and the comprehensive campaign.

**Action 2.1.6: Identify and pursue companies, foundations and individual donors to fund start up packages**

- Companies and donors have been identified.



**Action 2.1.7: Finalize third and fourth BIC areas for investment beginning in year two** [Completed]

- Two additional BIC, signature areas were chosen from nine proposals submitted from Missouri S&T faculty.
- The third signature area, Enabling Materials for Extreme Environments, will focus on developing new materials in extreme temperatures, heat fluxes and neutron radiation levels. One of the Grand Challenges for Engineering in the 21<sup>st</sup> century defined by the National Academy of Engineering is to provide affordable solar energy and the development of higher temperature solar collectors.
- The fourth signature area is Smart Living. This area takes a computing-centered approach to holistically integrating physical, psychological, social and cyber to help strengthen the development toward a more secure and sustainable society. The research will incorporate computing expertise with smart sensors, pervasive computing, analytics, and help to develop future smart homes and communities.

**Action 2.1.5: Hire four faculty to complement each endowed chair hired under Action 2.1.4; Action 2.1.8: Identify and pursue companies, foundations and individual donors for charitable gifts to hire two national academy stature faculty in endowed chair positions in strategic areas #3 and #4 and Action 2.1.9: Hire four faculty to complement each endowed chair hired under Action 2.1.8**

- These actions revolve around hiring faculty to support endowed chairs and developing donors to support future endowed chairs. These actions cannot take place until the initial endowed chairs have been hired.
- The targets and metrics for these actions do not begin until year four.



**Campus or Unit:** Missouri University of Science and Technology

**Lever Number:** 2.2

**Lever Description:** Leverage S&T as Missouri's technological research university  
Increase faculty by 67 T/TT and 33 NTT (16 year one)

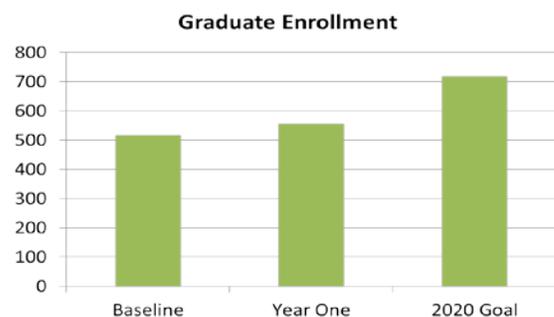
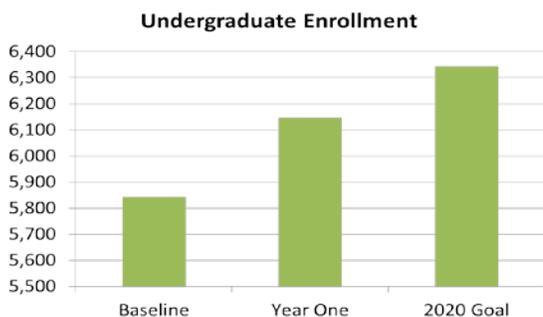
**Lever Metric:** Increase undergraduate enrollment by 500 (90 year one)  
Increase Ph.D. enrollment by 200-400 (19 year one)  
Increase number of agreements with UM campuses by 3 (1 year one)

**Lever/metric summary:**

One of the metrics associated with the lever involves staffing levels. Increasing the faculty by 100 by 2020 with 16 new hires in year one. The campus has focused on these hires with new positions starting in fall 2014: 1) tenured/tenure track: biological science, chemistry, physics, computer science (two positions) and mechanical engineering; 2) non-tenure track: chemical engineering, computer science, electrical engineering, materials science and engineering (two positions) and education. Twelve positions have been filled and seven positions are actively being pursued. The campus will hire 19 instead of the originally targeted 16. The second staffing metric identified in this lever is increasing the number of specialized and technical staff. The campus hired 1 technical staff and 26 professional staff members achieving the metric.

Although staffing is an important part of this lever, increasing the number of agreements with other UM campuses instills collaboration and enhances portfolios. The metric for year one is to establish one agreement and an agreement with UMKC for developing courses in the new entrepreneurship minor has been achieved.

Enrollment increases for both undergraduate and Ph.D. are identified as metrics in this lever. The two charts below identify the progress Missouri S&T has made towards the 2020 goal of 500 undergraduate enrollments and 200-400 Ph.D. enrollments. In year one, the undergraduate enrollment metric was 90 and the actual enrollment result was 303. The metric for Ph.D. enrollment in year one was 19 and the result was 38.



### **Action 2.2.1: Increase Missouri S&T's undergraduate enrollment by 500 by 2020**

- Missouri S&T has experienced a 4 percent increase in individual campus visitors; an increase of 147 students in the 4 open houses; a 2 percent increase in Miner Day student attendance; a 14 percent increase in freshman admits and Fly-in weekend events have increased 9 percent.
- Transfer applications have increased by 28 percent in business, humanities and social science.
- The sciences, computer science and math had an increase in transfers admitted by 43 percent.
- The business and information technology program has seen a 49 percent increase in the number of admitted students.
- The 2012 baseline for undergraduate enrollment is 5,843; undergraduate enrollment for fall 2013 was 6,146. The campus has seen an increase of 303 enrollments towards the 2020 goal of 500. The target for year one was to increase by 90 enrollments and this target has been achieved.
- New transfer course guidelines have been established for all majors with key community college partners (ECC, Jefferson College, Metropolitan Community College, Mineral Area College, Ozarks Technical Community College, St Charles Community College and St Louis Community College). Missouri S&T has posted 14 new transfer guides for each school. Thirteen of the community colleges transfer guides have large populations in underrepresented minorities and females.
- New out-of-state articulation agreements and engineering transfer guides have been signed with Richland College (TX); Ouachita University (AK); and McKendree University (IL).
- New in-state articulation and engineering transfer guides have been signed with Maryville University, Columbia College, Webster University, Westminster University and William Jewell College.

### **Action 2.2.2: Increase Missouri S&T's Ph.D. enrollment by 200-400 by 2020**

- Missouri S&T has seen an increase of 420 graduate applications being processed in Admissions.
- The fall 2013 enrollment numbers were 1,429 for graduate students seeking a Master's degree.
- The 2012 baseline for Ph.D. students is 517 with a year one target of 19. The target for year one has been achieved with an increase of 38 for a total of 555 Ph.D. enrollments.

### **Action 2.2.3: Increase the number of T/TT and (NTT) faculty members by 67 (33) (12 T/TT in conjunction with Lever 2.1 focused areas phase 1 hiring)**

- Based on 53 faculty requests; 19 faculty positions were approved in the following job classifications/departments:
- Assistant Professors (tenure track): engineering management and systems engineering (interviewing), physics (filled), biological sciences (filled), electrical and computer engineering (interviewing), mining (accepting applications), chemistry (filled), civil engineering (interviewing), geological science (accepting applications) and two mechanical and aerospace engineering (one filled; other interviewing)
- Associate Professors (tenure track): two computer science (filled) and civil engineering (interviewing)
- Assistant Teaching Professors (non-tenure track): computer science (filled), electrical and computer engineering (filled), chemical engineering (filled) and education (filled).
- Assistant Research Professor (non-tenure track): two materials science and engineering (filled)



- All of the faculty hires will also align with the strategic plan Lever 3.4 promoting inclusion and diversity. Targeted recruiting efforts are being performed to ensure underrepresented minorities and women are among candidates who are considered for these faculty hires. To date eight of the new hires are female.
- In Action 3.4.1, incentives to departments that hire underrepresented faculty will receive additional expense and equipment funds.
- The strategic plan target for year one was 16 faculty hires but the decision was made to increase the year one hires to 19 and 12 have been hired starting in fall 2014 with an additional 7 positions being actively pursued.

***Action 2.2.4: Transparently allocate as defined in Action 2.1.2 all open and new faculty positions to impact strategic plan and progress on unit performance measures***

- The target for year one was to strategically allocate 16 new faculty positions.
- The original faculty allocations directly impact the strategic plan and the campus community is aware of all allocations. This metric is on target.

***Action 2.2.5: Increase the number of technical/specialized staff members to support strategic program activities***

- The 2012 baseline for this action: 96 technical staff and 187 professional staff. In year one, the campus increased the technical staff to 97 (+1) and increased the professional staff to 213 (+26).
- The target for this action was an increase in year one and that has been achieved.

***Action 2.2.6: Missouri S&T will develop specific agreements with UM campuses and possibly other academic institutions to collaborate in delivering courses and degrees that enhance current portfolios on each campus***

- An agreement with UMKC Business School has been developed for a certificate in entrepreneurship.
- An agreement with UMSL to deliver philosophy undergraduate courses and graduate courses in MS/ISO is in the developmental process.
- Several course sharing initiatives with the UM system are in the development process: 1) MU for construction engineering and environmental engineering; 2) UMSL for classical optics, philosophy, sociology and history; 3) UMKC for electrical engineering and math.
- Discussions around an energy policy graduate certificate are also underway with all of the UM system campuses.
- Missouri S&T has signed an agreement with Shenzhen University in China for a pipeline Ph.D. program; an agreement with Hunan University in China for a dual Ph.D. program in civil engineering and an agreement with King Saud University in Saudi Arabia for a Master's degree in engineering management.



<b>Campus or Unit:</b>	<b>Missouri University of Science and Technology</b>
<b>Lever Number:</b>	<b>2.3</b>
<b>Lever Description:</b>	<b>Develop a culture of excellence in research, scholarship and creative activity among faculty, staff and students</b>
<b>Lever Metric:</b>	<b>Increase research expenditures to \$40 million (\$29 million year one) Increase citations per T/TT faculty to 20 (15 year one)</b>

**Lever/metric summary:**

There are a number of research metrics identified in this lever. The first metric is to increase research expenditures from \$28.5 million in 2012 to \$40 million in 2020. The year one metric was \$29 million and the campus exceeded this goal with net grant and contract research expenditures at \$36.3 million. The second research metric is increasing the number of invention disclosures per \$10 million research and development. The established 2012 baseline is 8.9 with a 2020 target of 10. The year one result was 9.9 with the campus close to the 2020 target. The last research metric is focused on undergraduates. Undergraduate research is an important aspect of student learning at Missouri S&T. This lever has a metric to expand the Opportunities for Undergraduate Research Experience (OURE). The year two metric is a 10 percent increase in participation. Year one established a baseline of 101 students participating in research with the office of undergraduate studies. The established baseline number will be used to calculate the year two increase.

Developing a culture of creative activity among faculty are the next two metrics identified in this lever. The first metric stipulates that Missouri S&T will host visiting world-class faculty. The year one metric is hosting five additional faculty over the baseline 2012 amount. The tracking mechanisms for 2012 were not fully established to perform an accurate comparison. The AY13/14 hosted 2 full-time faculty, 4 faculty for research in a signature area and 51 visiting faculty performing lectures and seminars. The metric for hosting an additional five faculty will be calculated off the year one results for baseline calculation. The second creative activity among faculty is increasing citations per tenured/tenure-track. The goal in 2020 is 20 citations per tenured/tenure-track faculty. The 2012 baseline information for citations per tenured/tenure-track is 14 and the year one result was 14.



**Action 2.3.1: Develop and implement performance-based resource allocation models commensurate with degree offerings, including productivity in research, scholarship and creative works**

- Each department has completed performance and productivity measures. These measures are in place for FY15 and will be tracked.

**Action 2.3.2: Identify and take actions to improve the metrics that contribute to increasing the national ranking of five graduate programs.**

- The target for year one was to identify the metrics and this preliminary analysis has been performed.

**Action 2.3.3: Be selected to lead a National Science Foundation Engineering Research Center-type center**

- The target for the first year was to submit one proposal. Missouri S&T submitted a preliminary proposal but was not identified to submit a full proposal.
- The Missouri S&T Electromagnetic Compatibility Laboratory within the Department of Electrical and Computer Engineering leads a multi-university NSF industry/university cooperative research center that is ranked among the top 10 percent of all NSF centers. This NSF center has more than 20 global industry partners, including Intel, IBM, Cisco, Sony and John-Deere. Work from this lab has spawned two start-up companies and more than 24 patents. The lab's outreach educational activities have reached more than 19,000 practicing engineers. Dr. Brice Achkir, an IEEE Fellow and Cisco Senior Scientist who leads the Cisco core technology lab stated, "I can work with Stanford and Berkley, and they are right down the road from me. I come half-way across the country to the Missouri S&T EMC laboratory because I want the best in EMC."

**Action 2.3.4: Continue establishing new sustainable industry-funded research consortia** [Completed; ongoing]

- Two consortia have been established: the Kent D. Peaslee Steel Manufacturing Research Industrial Consortium and Small modular reactor Research and Education Consortium (SmrREC).
- The Kent D. Peaslee Steel Manufacturing Research Center is a consortium of steel companies, foundries, suppliers and university researchers working together to address fundamental steel casting issues.
- The Small modular reactor Research and Education Consortium led by Missouri S&T provides its members with research results to advance the design, construction and operation of SMRs by collaborating in the development of precompetitive technologies.
- This original action was completed therefore; the campus changed the action wording and changed the duration to ongoing in order to provide a constant focus on increasing research consortia.



**Action 2.3.5: Establish programs and facilities to host visiting world-class faculty**

- Many academic departments have collaborated with world-class faculty from all over the world such as: Australia, Belgium, China, Great Britain, Ireland, Iceland, France, Germany, Italy and Turkey. Missouri S&T faculty routinely visit and make research presentations at these laboratories. In turn, many of the international collaborators have visited Missouri S&T. Visits have also occurred from renowned faculty within the United States representing universities such as Harvard and MIT; all have given seminars on the Missouri S&T campus.
- A collaborative agreement with the University of the Western Cape allows a visiting scholar to teach several courses at Missouri S&T.
- Guest lectures have occurred from faculty visiting from the University of the West Indies.
- A visiting scholar from China has been hosted for a year.
- An agreement with Tongji University provides opportunities for visiting scholars in the materials science department.
- The target for year one was an increase of five visiting faculty: two visiting faculty have been in place full time, 51 have visited for seminars/lectures and the best-in-class, signature areas have 4 visiting faculty.

**Action 2.3.8: Expand research and entrepreneurial opportunities for undergraduate students, including the Opportunities for Undergraduate Research Experiences program**

- This action does not begin implementation until July 2014.

**Action 2.3.9: Balance teaching and research relative to comparator institutions by enforcing workload policy**

- The target for year one was to develop a workload policy.
- IFC endorsed a flexible workload policy that the campuses are encouraged to implement. This endorsement is currently under review.

**Action 2.3.10: Develop and implement a new program to instill a culture of excellence in research, scholarship and creative works in early career faculty**

- This action does not begin implementation until July 2014.

**Action 2.3.11: Develop and implement a new program to instill a culture of excellence in research, scholarship and creative works in doctoral students**

- This action does not begin implementation until July 2014.

**Action 2.3.12: Develop and implement a cost share program to support students to attend national conferences to present their research results**

- This action does not begin implementation until July 2014.



<b>Campus or Unit:</b>	<b>Missouri University of Science and Technology</b>
<b>Lever Number:</b>	<b>2.4</b>
<b>Lever Description:</b>	<b>Create and implement a communication and marketing plan to raise the visibility of the campus and convey our return on investment</b>
<b>Lever Metric:</b>	<b>Percentage of General Operating Revenue dedicated to institutional marketing and visibility efforts comparable to best-in-class universities (2020 target, 1 percent)</b>

**Lever/metric summary:**

Raising the visibility of the campus remains a strategic priority. This lever identifies actions that are designed to enhance the campus reputation. The primary metric associated with this lever is the percentage of general operating revenue dedicated to marketing and the target date for this metric is 2020.

In order to standardize the marketing and create central messaging efforts, two important teams needed to be developed. One of these teams is a marketing leadership team. This team is active and continues to meet to and discuss marketing strategy. The second team is the core marketing network. This team is active and also continues to meet to discuss branding strategy.

To help determine the best strategy and marketing structure for raising visibility, the Education Advisory Board completed a report and compared Missouri S&T to other best-in-class institutions. The report has seven key observations: 1) most profiled institutions centralize marketing and communication activities; 2) integrated marketing supports the campus strategic plan; 3) brand discovery typically precedes integration; 4) chief communication officers typically reports to enrollment or advancement; 5) marketing managers are assigned to academic units; 6) academic units often make the advertising purchases at many institutions; 7) metrics are used to evaluate the success of advertisement. This report identifies that brand discovery precedes integration. Based on that understanding, requests for proposals have been submitted to marketing firms. These requests were submitted to 54 firms, of which 7 responded and 4 came on campus to present how they could develop the Missouri S&T brand. Results of those presentations will be submitted to senior leadership in the beginning of FY15.



**Action 2.4.1: Marketing Leadership Team guides the development of an integrated, campus wide communications and marketing plan** [Completed; ongoing]

- The Marketing Leadership Team was established in July 2013. The campus adjusted the wording of this action to maintain strategic focus and adjusted the duration of the action to ongoing.

**Action 2.4.2: Core Marketing Network provides consultation to the Marketing Leadership Team to establish an integrated, campus wide communications and marketing plan** [Completed; ongoing]

- The Core Marketing Network was established in July 2013. The campus adjusted the wording of this action to maintain strategic focus and adjusted the duration of the action to ongoing.

**Action 2.4.3: Through the Marketing Leadership Team and Core Marketing Network (CMN), develop a request for proposals for professional marketing consultation to: a) conduct a needs assessment regarding the desired outcome of an integrated, campus wide communications and marketing plan and b) conduct a capabilities assessment to determine our ability and readiness to conduct such a campaign (the capabilities assessment will include a communications audit of all marketing materials and assessment of any marketing research).** [Completed]

- The communications department developed a request for proposal in consultation with the marketing leadership team and the core marketing network.

**Action 2.4.4: The Marketing Leadership Team, in consultation with the Core Marketing Network, shall identify marketing staff who will be responsible for implementing the plan and shall create a professional development plan to help ensure those staff are trained to carry out their responsibilities**

- The executive director of marketing and communications has been appointed to the committee for developing Lever 1.4 (Create professional and leadership development opportunities for faculty, staff, alumni and students). Because Action 2.4.4 is closely connected to the goal in Lever 1.4, the creation of a professional development plan for marketing will require coordination with activities of Lever 1.4.
- The year one metric is to develop a plan and that task has been completed.

**Action 2.4.5: Fully commit to the Missouri S&T brand by removing references to “formerly the University of Missouri-Rolla” in all marketing materials targeting the key customer groups**

- The university has removed “formerly the” language from marketing materials targeting prospective undergraduate students.

**Action 2.4.7: Seek matching commitments to fund a portion of campus wide communications and marketing efforts**

- A draft proposal for seeking strategic funding to support the marketing efforts is under review.



**Action 2.4.8: Require all communications and marketing materials (print, web, video, etc.) to be reviewed by a central marketing team to ensure consistency of messaging appearance and tone**

- No progress on this action as it is contingent on Action 2.4.3.
- The year one target is developing a process, but the year one date range does not end until January 2015.

**Action 2.4.9: Obtain commitment from campus leadership to create a recurring budget for campus wide marketing**

- Campus leadership has budgeted \$200,000 in recurring funds for marketing.

**Action 2.4.10 a: Continually examine best-in-class institutions' practices and incorporate into Missouri S&T marketing planning, as applicable** [Completed; ongoing]

- Communications entered into an agreement with Educational Advisory Board to conduct research on marketing practices of four to eight institutions, of which the majority are technological research universities to determine best-in-class. The report has been shared with the marketing team and core network to help develop the proposals completing the action.
- Recognizing the importance of examining other institutions' best-in-class practices, the wording of this action was changed to make it an ongoing priority.
- Missouri S&T will take a few primary steps to achieving integration of marketing and communication activities: will hire an external firm to conduct research about brand recognition and reputation; will survey the campus community to evaluate the brand and host focus groups to gain additional feedback.

**Action 2.4.11: Centralize all communications and marketing operations**

- No progress on this action as it is contingent on Action 2.4.3.
- The year one target is developing a process. Preliminary plans have been discussed but other completed actions are required prior to implementation of this action.

**Action 2.4.12: Develop an annual publication of the Chancellor's Fellows Research Yearbook to enhance the visibility of graduate education**

- The Office of Graduate Studies published its first Chancellor's Fellows Research Yearbook. The yearbook lists the research topics or areas of interest, student bio and includes a photo.

\* Two actions have been added for implementation in FY15



<b>Campus or Unit:</b>	<b><u>Missouri University of Science and Technology</u></b>
<b>Lever Number:</b>	<b><u>2.5</u></b>
<b>Lever Description:</b>	<b><u>Modify our conventional methods of teaching to accommodate current, new and advanced technology that will enhance student learning and increase faculty productivity</u></b>
<b>Lever Metric:</b>	<b><u>Calculus success increased by 7 percent</u></b>

**Lever/metric summary:**

The Missouri S&T campus embraces technology and blended learning with 18 of the 19 departments offering blended classes. Blended learning represents 28 courses which provide 6,312 credit hours of blended instruction. Integrating technology has been successful to learning outcomes as witnessed in the chemistry department. The campus has redesigned the introductory chemistry course. Chemistry impacts 1,200 students per year and now allows students to choose online, blended or all face-to-face. This redesigned class has been extremely successful for student success with eight percent fewer D, F and W grades. Another high volume course in the redesign process is calculus. This class is required for over 75 percent of undergraduate students. Based on the successful chemistry redesign the metric for this lever — a seven percent increase in calculus success — is achievable.

The calculus redesign is underway and will be implemented in fall 2014, Calculus I will pilot an interactive lab. The labs currently meet two days per week for 50 minutes, are not standardized and the average class size is 50. The new interactive lab will meet one day per week for 75 minutes, will be open to any student enrolled in a Calculus I lecture, will be standardized, interactive, and limited class size to 30 students. Also launching in fall 2014, is a pre-calculus online video library. This library is comprised of short videos, with closed captioning, that will be made available to all Missouri S&T students, not just those students enrolled in calculus. There will be an extensive video series, around 30-50 individual videos, that will cover prerequisites for Calculus I. Additional videos, under future construction, will go beyond what is covered in the normal lecture. The video library will be an ongoing project to adapt to student needs.



**Action 2.5.2: Enhance resources for distance and blended learning, particularly with respect to the management and distribution of multimedia objects (Aid professors use in the classroom instead of taking a field trip)**

- All classrooms have been equipped with web cams and skype capability allowing the faculty to utilize video lectures. The classrooms have been equipped with document cameras allowing for 3D objects to be used for problem solving.
- Virtual field trips are also being utilized in the classroom. This technology allows the class to effectively study on a global scale.
- Many departments have enhanced their courses through the integration of technology and multimedia objects. Several courses have been adapted to a blended/hybrid approach. Many of these courses are being launched in fall 2014: Engineering Management 124,137, 254, 354; Physics 23, 24; Economics 344, 444, 122; Electrical Engineering 153, 271; English 20, 240, 260, 60, Mechanical Engineering 225, Technical Communications 331, 340; and Chemical Engineering 5140, 5130 and 5190.
- Campus resources being utilized: 22 departments utilized eStudio for developing class materials; 27 returning faculty used Lecture Capture along with 25 new faculty; 106 students completed Kaltura video assignments; 1,684 unique users streamed media.
- To further demonstrate how multimedia objects are used in the classroom setting, Economics 342, uses video-taped guest speakers, online discussion groups, student surveys, wiki, video assignments with Kaltura and online exams.

**Action 2.5.3: Increase instructional design support and online facilitators for teaching faculty**

- A replacement instructional designer position has been reallocated to Education Technology and the designer has started.
- Education Technology has provided workshops for faculty: 28 attended capturing the student learner; 33 attended making homework effective; 50 attended flipping a class; 3 sessions were offered in tackling emerging student issues with 154 in total attendance.

**Action 2.5.6: Create and implement a stipend program to reward faculty who incorporate Blended Learning techniques into their courses**

- The eFellows program is currently in place to reward faculty. This program has a three-tiered reward approach. Tier one, based on a complete full course redesign, has a stipend of \$5,000. Tier two, smaller scope with just one or more aspects of the course being redesigned, has a stipend of \$2,000. Tier three, has minor changes and not a complete redesign, has a stipend of \$1,000.
- FY14 tier one: English 60, Biology 222 (flipped), Biology 212 and Psychology 50.
- FY14 tier two: Engineering Management 124, Engineering Management 254, Chemistry 1, Biological Science 211 (flipped), Math 15, Electrical Engineering 153, 121, 271, 151 and Information Science and Technology 241.
- There are 15 letters of intent for classes that will be submitted to the eFellows program for FY15.



**Action 2.5.8: Redesign high-volume courses through integration of new technology and modified teaching methods to enhance student learning**

- The chemistry department redesigned general chemistry, which is the largest class on campus. The department integrated smartphone polling and texting, tablet assisted presentations, online office hours with Google handouts and AdobeConnect Sessions. The content, textbook and difficulty of assignments did not change. However, the results of this redesign have been extremely positive and have impacted student success. The redesigned classes have experienced 90 more students finishing the course with passing grades demonstrating the correlation of integrating technology to enhance learning.
- Another series of high volume courses being redesigned is Calculus I, II and III. The redesign of the calculus courses is tied to an FY14 strategic initiative granting \$132,000 one-time cost dollars to be matched with Missouri S&T one-time cost dollars of \$66,000.
- Beginning in fall 2014, Calculus I will have an interactive lab and a pre-calculus video library.
- In fall 2015, a new course “Success for Calculus” will be piloted. This course will be an option for those students who are failing Calculus I in week eight. The course will not have a GPA penalty, will be 4 credit hours (3 lecture and 1 lab) and designed to teach algebra and trigonometry in the context of calculus. The class will be offered in a blended format. This course has been sent to the departmental curriculum committee for review.
- Piloting in fall 2015, a new calculus GTA training program. The GTAs will be instructed on how to teach interactive labs, have a week long training period prior to the start of the semester and will undergo continual faculty mentoring. This pilot is a collaboration effort with the University of Michigan.
- Several other departments are working on the development of online labs: cellular biology will have a flipped and blended approach; general biology will have an online class with lab kits; microbiology lab will have a flipped lecture and online tutorials; materials testing lab will be offered online; nuclear engineering will have a video and live feed into the classroom; and general chemistry lab, introductory computer engineering lab and introductory physics labs are all being redesigned for an online/blended format.



**Campus or Unit:** Missouri University of Science and Technology

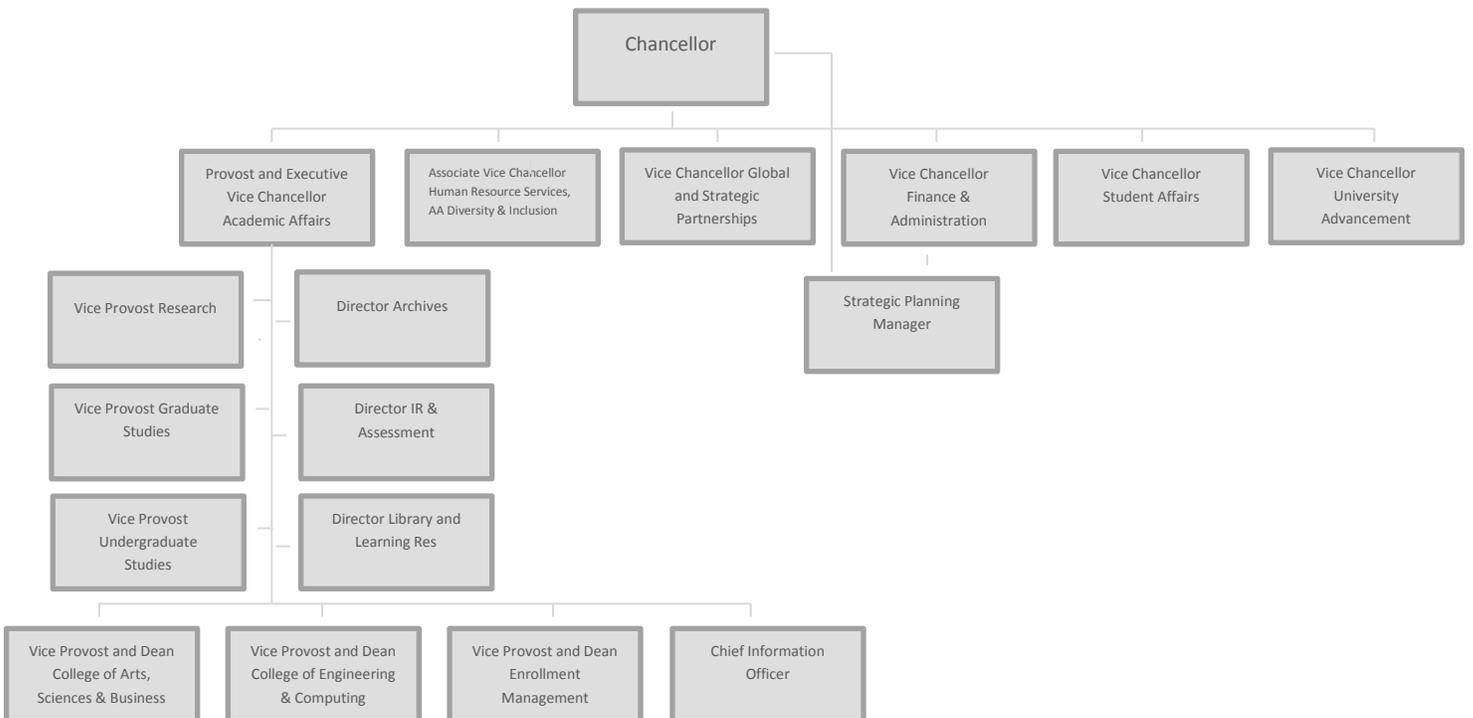
**Lever Number:** 2.7

**Lever Description:** Address administrative structural changes to facilitate strategy and enhance national visibility

**Lever Metric:** Implement administrative structural changes to facilitate strategy and enhance national visibility

**Lever/metric summary:**

The campus has implemented the structural changes needed to facilitate the campus strategy and raise the national visibility. The addition of the vice chancellor for global and strategic partnerships, adding two vice provost and deans and the addition of the strategic planning manager are a part of the campus vision. Prior to implementing these new positions, structural changes had to occur. In fulfilling a strategy, it is often necessary to change direction and realize what you need to stop doing. The decision has been made to eliminate the vice provost of academic affairs position. The new campus structure is demonstrated below.



**Action 2.7.1: Implement the organizational structure appropriate to strategic plan**

- The position of vice provost for academic affairs has been eliminated and two new vice provost and dean positions will provide academic oversight. The vice provost and dean positions will enhance the national visibility of the campus at local, regional and national meetings.
- Robert Marley has been named as the next provost and executive vice chancellor at Missouri S&T. Marley will begin his duties in July.
- Stephen Roberts has been named as the new vice provost and dean for the College of Arts, Sciences and Business. He will oversee: Army and Air Force ROTC; arts, languages and philosophy; biological sciences; business and information technology; chemistry; economics; English and technical communication; history and political science; mathematics and statistics; physics; psychological science and teacher certification programs. Roberts will join Missouri S&T in August.
- Ian Ferguson has been named the new vice provost and dean for the College of Engineering and Computing. He will oversee: chemical and biochemical engineering; civil, architectural and environmental engineering; computer science; electrical and computer engineering; engineering management and systems engineering; geosciences and geological and petroleum engineering; materials science and engineering; mechanical and aerospace engineering; and mining and nuclear engineering. Ferguson will join Missouri S&T in August.
- One of the organizational structure changes is the addition of the vice chancellor for global and strategic partnerships who will oversee international affairs, global and online learning; and a new office of corporate relations. Kent Wray, former provost and executive vice chancellor for academic affairs, has moved into this new role.

**Action 2.7.2: Hire Strategic Planning and Progress Manager (SPPM) [Completed]**

- This action was completed in January 2014.



<b>Campus or Unit:</b>	<b>Missouri University of Science and Technology</b>
<b>Lever Number:</b>	<b>3.1</b>
<b>Lever Description:</b>	<b>Evaluate current academic programs and create, modify, eliminate or combine in order to ensure a relevant portfolio that supports Missouri S&amp;T's Carnegie classification as a national research university</b>
<b>Lever Metric:</b>	<b>Increase department determined productivity measures by 10 percent (by 2020)</b>

**Lever/metric summary:**

All academic affairs departments have established productivity measures. These measures have been divided into two primary areas; external measures that are designed for comparison to other institutions and internal measures that are designed for departmental comparisons at Missouri S&T. The academic departments' external measures have been grouped together by highest degree offered.

Group A consists of: arts, languages and philosophy; economics; history and political science. The external measures selected are: student credit hours per full-time employee, degrees awarded per tenured/tenure-track faculty, scholarly refereed activity per tenured/tenure-track faculty and the student survey results from the Committee for Effective Teaching, per full-time employee.

Group B consists of: chemistry, math and physics. The external measures selected are: total degrees awarded per tenured/tenure-track faculty, research dollars generated per tenured/tenure-track faculty, publications per tenured/tenure-track faculty and citations per tenured/tenure-track faculty.

Group C consists of: chemical and biomedical engineering; civil, architectural and environmental engineering; electrical and computer engineering; mechanical and aerospace engineering; mining and nuclear engineering. The external measures selected are: Ph.D. enrollment per tenured/tenure-track faculty, research expenditures per tenured/tenure-track faculty and archival publications per tenured/tenure-track faculty.

Group D consists of: biological science, business information and technology, English and technical communication and psychological science. The external measures selected are: peer reviewed publications per tenured/tenure-track faculty and number of degrees awarded per tenured/tenure-track faculty. Several departments selected one measure that relates specifically for their goals. Biological science will also measure external funding. Business and psychology will measure the percent of faculty with journal publications.

With the completion of the productivity measures in FY14, this lever is on target. Analysis of year-over-year productivity can begin in FY15.



**Action 3.1.1: Continue performing comparisons of academic department productivity to peer institutions** [Completed; ongoing]

- All departments have performed comparisons and completed productivity measures completing this action.
- The campus changed the wording of the action to reflect an ongoing priority of continual evaluation to comparator productivity.

**Action 3.1.2: Identify and take actions to improve the metrics that contribute to increasing the national ranking of all graduate programs**

- The development of departmental productivity measures and strategic plan strategy metrics aid in the development of internal processes that improve efficiencies and increase outcomes for graduate programs.

**Action 3.1.3: Evaluate the need for new or elimination of existing degree programs**

- Based on an initial examination of programs, the campus has added new degree offerings: Master of Science in Industrial Organizational Psychology and a PhD in Explosives Engineering are added degrees.
- New graduate certificate programs that have been developed by business and information technology: digital media; digital supply chain management; mobile business and technology; electronic and social commerce; entrepreneurship and technological innovation; and business analytics and data science.
- The campus has received approval for offering a Bachelor of Arts in Multidisciplinary Studies with an area of concentration in elementary education and an emphasis in mathematics or science. The campus is partnering with the Rolla Public Schools in developing a strong clinical component which will be an asset for the student learning experience.
- A biomedical engineering minor is in the development phase.



<b>Campus or Unit:</b>	<b><u>Missouri University of Science and Technology</u></b>
<b>Lever Number:</b>	<b><u>3.2</u></b>
<b>Lever Description:</b>	<b><u>Centralize corporate relations to improve service to existing partners and to identify and establish new partnerships for the purpose of increasing/enhancing research, economic development, credit and non-credit education, philanthropy and the hiring of our graduates</u></b>
<b>Lever Metric:</b>	<b><u>Number of corporate partnerships</u></b>

**Lever/metric summary:**

The structure for the Office of Global and Strategic Partnerships has been identified. The new vice chancellor role is in place. This lever will look at the number of corporate partnerships, the development of a web page and creating a corporate relations database management system. This lever and its identified metrics are behind the original target dates. The campus made strategic decisions that prioritized other actions subsequently placing this lever behind. This lever will begin measuring progress in FY15.



**Action 3.2.1: Create a corporate relations office and determine the role it should play in assisting the various interests within the Missouri S&T community in establishing appropriate relationships with external constituents**

- The office role has been determined but the campus did not meet the year one timeline for implementation. Implementation will begin in FY15.

**Action 3.2.3: Develop a funding mechanism to support the office and its activities**

- The development of a funding mechanism has been identified.

**Action 3.2.6: Broadly identify needs of external constituents that could be met by Missouri S&T**

- A study to determine the needs of external constituents has been completed and is ready for implementation. Implementation of this action will begin in September 2014.

**Action 3.2.7: Determine mechanisms to develop reciprocal partnerships**

- This action will begin in FY15 under the leadership of the vice chancellor for global and strategic partnerships.

**Action 3.2.8: Develop a method for evaluating the relative strength and breadth of the partnerships with external constituents (research, student hiring, giving, distance courses, board memberships, etc.)**

- The start date for this action is September 2014.

**Action 3.2.9: Develop a matrix that reflects the multiple results of Action 3.2.1 above and provides an overall indication of the strength of the relationship and helps identify paths to maintain, strengthen or expand the partnership**

- The start date for this action is September 2014.

**Action 3.2.10: Create a concierge approach to corporate relations including a web presence that supports the mission of the office**

- The start date for this action is September 2014.

**Action 3.2.11: Develop a marketing plan to communicate the benefits of the office to key customers**

- The start date for this action is September 2014.

**Action 3.2.12: Work with Information Technology to create a “customer relations” management database that provides easy access to usable and actionable information**

- The start date for this action is September 2014.



<b>Campus or Unit:</b>	<b><u>Missouri University of Science and Technology</u></b>
<b>Lever Number:</b>	<b><u>3.3</u></b>
<b>Lever Description:</b>	<b><u>Improve facilities to enhance research and student learning, and expand experiential learning</u></b>
<b>Lever Metric:</b>	<b><u>Upgrades to instructional and research laboratories</u></b>

**Lever/metric summary:**

This lever is linked to an FY14 funded strategic initiative proposal. The proposal calls for expansion of instructional laboratory equipment at a level of \$500,000, plus \$500,000 in non-appropriated funds. In addition Missouri S&T will provide \$460,000 for personnel time and \$32,500 for grand openings.

Missouri S&T sought proposals for laboratory enhancements from faculty and received 11 proposals. All of the 11 proposals were approved due to their high level of innovation and overall impact to the strategic plan. The proposals total cost is \$1.4 million. The additional funds needed over the strategic initiative will be reallocated.

The approved lab improvements are: 1) the computer science department will be upgrading servers and adding computer equipment; 2) the physics department will be upgrading equipment and software; 3) chemical engineering will be upgrading Delta V process controls equipment; 4) nuclear engineering will add a liquid scintillation detector; 5) mechanical and aerospace engineering will upgrade the gas turbine engine; 6) chemistry will purchase field flow fractionation equipment; 7) chemistry will purchase a nuclear magnetic resonance spectrometer; 8) geology and geophysics will upgrade microscopes; 9) electrical and computing will add additional control systems equipment; 10) mining will purchase a rock test system; and 11) petroleum engineering will purchase a high-temperature, high-pressure rheometer.



**Action 3.3.1: Leverage strategic funds for instructional laboratories with matching funding from non-appropriated sources**

- All departments which have secured match funding have begun planning the upgrades, purchasing equipment or performing renovation.

**Action 3.3.2: Continue exploring plans and processes for acquiring matching funding for research equipment in areas that have high return on investment to be matched with non-appropriated funds**

[Completed; ongoing]

- The university developed the Campus Master Plan for improving the facilities to foster innovation, creativity and expand experiential learning.
- The original action was focused on exploring plans for match funding and that was completed. The wording was changed because campus continually explores various avenues for acquiring new research equipment making this action ongoing.

**Action 3.3.4: Continue evaluating all campus facilities for their readiness for sustainable growth and return on investment** [Completed; ongoing]

- The Campus Master Plan has been completed and was approved by the Board of Curators at their April meeting. The plan evaluated all campus facilities for sustainable growth.
- The original action focused on evaluating facilities through the master planning process has been completed. The campus changed the wording of the action and will continue to evaluate facilities and ensure alignment with strategic priorities making this an ongoing effort.

**Action 3.3.5: Develop and disseminate a research infrastructure database to help departments share equipment**

- A process has been developed and discussions will occur with the new provost.

**Action 3.3.7: Investigate building a Learning Commons to enhance student learning and research. This facility should allow for reconfiguration as needs change, technologies evolve, and the student population changes. It should include as much hands-on technology as possible, available to all, in an interdisciplinary environment** [Completed; ongoing]

- An analysis of the work areas and access for student learning has been utilized to determine preliminary drawings of the Learning Commons which aligns with Lever 1.2, Action 1.2.2.
- The Campus Master Plan details the Learning Commons completing the action for investigating the building of a commons. This action will continue to be explored addressing changing needs and technological advances.



**Action 3.3.10: Implement Learning Space Design Guidelines based on standard practices to guide the design of all learning spaces on campus**

- Learning space guidelines have been created and provide a framework for classroom spaces that contain presentation technology. They highlight the most common points of convergence at which architecture and audio-visual technology intersect. One of the crucial elements is to define boundaries of assignable space understanding the relationship between maximum depth of a room and minimum ceiling height. The readability of projected images is a crucial factor for student learning. Analyzing viewing angles, screen placement, window treatments for diffusing natural light, speaker location, furniture type and layout, noise criteria and instructor work stations are all criteria that should be considered.



<b>Campus or Unit:</b>	<b>Missouri University of Science and Technology</b>
<b>Lever Number:</b>	<b>3.4</b>
<b>Lever Description:</b>	<b>Promote inclusion and increase diversity of faculty, staff and students to remain relevant and competitive in a global environment</b>
<b>Lever Metric:</b>	<b>Increase the number of underrepresented minority/female faculty/staff/students(+2 faculty and +10 students year one)</b>

**Lever/metric summary:**

Academic research, as well as Fortune 500 companies and other global enterprises, has long established that people who are well educated in their discipline and who are capable of working collaboratively in a team made up of people with various characteristics and differences will be the most successful in today’s educational, community and business environment. Missouri S&T recognizes that creating an inclusive and diverse environment enhances student learning and success. Creating a diverse and inclusive environment is determined through two fundamental areas of focused faculty and staff hires and student demographics.

The first area and identified metric for this lever was to hire two underrepresented minority or female faculty in year one. As part of the Lever 2.2 hiring, eight or more female faculty have been hired and will begin in fall 2014. The metric has been achieved.

The second area focused on diversity of student demographics. This lever also identifies that increasing diversity in the student population will enhance the campus learning objectives. The goal for year one was an additional ten female or underrepresented minority students. The amount of female students enrolled in fall 2012 was 1,732 and the year one result was 1,839 which represent an increase of 107 female students. The campus is far exceeding the strategic plan identified metric.

A targeted way for attracting a diverse student demographic is through the development of articulation agreements. An identified metric for this lever was one new agreement in year one. Missouri S&T signed three agreements that specifically targeted community colleges or universities with high underrepresented or female populations. The campus signed articulation agreements with Richland College (TX); Ouachita University (AK); and McKendree University (IL). The metric for this lever has been achieved.



**Action 3.4.1: To increase diversity of faculty and staff, provide incentives to the hiring departments that select qualified underrepresented minorities**

- Several diversity offices from universities that utilize incentives to encourage departments to hire underrepresented faculty have been contacted to seek out the best-in-class practices.
- A letter has been sent to all departments stating that “a list of all applicants to be invited to campus for interviews shall be submitted to the provost in advance of invitations to an interview being extended.” The letter also states that “if the list of applicants of those to be invited to campus for interviews does not include a sufficient number of underrepresented minority or female applicants, the process will be delayed while the committee extends its search and broadens the applicant pool.”
- This process, along with increased support and training offered by human resources, for search committees, should encourage and verify that diversity in hiring practices is a priority at Missouri S&T. To further demonstrate the dedication those departments that attract an underrepresented minority or female faculty member to join the department will receive a \$10,000 incentive to the department’s E&E budget. The department will retain the \$10,000 funds as long as that faculty member remains with the department.

**Action 3.4.2: To increase diversity of students, explore scholarship funding to be more competitive with underrepresented minorities/female/student recruitment**

- Scholarships funding sources for women include: Boeing, Ford, AT&T, Halliburton and UTC.
- Scholarship funding sources dedicated for student diversity include: Ameren, Ballard, Carter, Caterpillar, Chevron, Emerson, Finley, GM, John Deere, and NACME.

**Action 3.4.3: Set up transfer articulation agreements with two-year institutions with large underrepresented minority populations**

- Richland College (TX) signed an articulation agreement. Scholarship amounts will be similar to those provided to the Atlanta University Consortium.
- Articulation agreements with Ouachita University (AK) and McKendree University (IL) have also been signed.

**Action 3.4.5: Develop and provide professional development and training for staff, faculty and students that provides awareness of diversity and inclusion issues and encourages them to develop skills that will make our campus a warm and welcoming environment**

- Diversity and inclusion training has been developed and delivered to over 130 Missouri S&T faculty and staff.

**Action 3.4.6: Develop a comprehensive diversity and inclusion plan that would incorporate various action items**

- A comprehensive plan is still in the process of being developed.



**Action 3.4.7: Bring to campus underrepresented faculty as visiting scholars**

- Several departments brought underrepresented faculty to Missouri S&T as guest speakers. The campus continues to work on solidifying a plan for increasing underrepresented visiting faculty.

**Action 3.4.9: Review, revise and create policies that support work-life balance**

- Several departments on campus have developed work-life balance policies. A standardized policy is still in the developmental process.

**Action 3.4.10: Evaluate and enhance faculty recruitment process and practice**

- The recruitment process has been enhanced as evidenced by the amount of female faculty hires for fall 2014. Targeted advertising will continue to ensure that underrepresented minority and female faculty are considered in the hiring process.

**Action 3.4.11: Explore collaborative partnerships for early childhood education, child development programs and facilities to enhance faculty recruitment and retention. Evaluate opportunities through campus master planning process**

- The Rolla school system is leading a community taskforce to study facility and funding options. Missouri S&T is and will continue to be an active participant.

**Action 3.4.12: Develop and deliver regular workshop training sessions for faculty and staff on compliance, Equal Employment Opportunity and recruitment practices**

- Workshops conducted by the employee assistance practitioner will cover diversity and inclusion and recruitment practices.
- As a result of strategic initiative funds, the campus added the employee assistance practitioner.

**Action 3.4.13: Design, launch and maintain a Diversity and Inclusion website to promote inclusion and diversity**

- The diversity and inclusion website has been launched. The website consists of a monthly newsletter, a workshop schedule and helpful tips are displayed.

\*Three actions have been added for implementation in FY15



<b>Campus or Unit:</b>	<b>Missouri University of Science and Technology</b>
<b>Lever Number:</b>	<b>3.5</b>
<b>Lever Description:</b>	<b>Create and implement a plan for student and alumni lifetime engagement strategy</b>
<b>Lever Metric:</b>	<b>A significant increase in graduating students maintaining a continued relationship with Missouri S&amp;T A significant increase in the number of donors and money raised An increase in the number of alumni who re-engage with the campus by attending events, activities, organizations</b>

**Lever/metric summary:**

It has been determined that in order to devise a strong alumni strategy two teams would need to be developed to fully analyze external comparators and internal practices. The external team has been assisted with a report completed by The Educational Advisory Board’s (EAB) research on “First-Year Experience Programs and Lifelong Engagement.” The EAB report consists of four main areas: 1) profiled institutions establish comprehensive first-year experience programs to support a student’s transition to higher education and teach the institution’s traditions and values. Pre-enrollment and new student orientation sessions teach students about the school’s history; 2) alumni participate in recruitment events and host celebratory galas for the first-year students. The inclusion of alumni in prospective and admitted students demonstrates the importance of lifelong engagement to incoming students; 3) students serve as orientation leaders during first-year experience program sessions. Staff interviews student applicants in the fall and trains selected leaders in the spring. Student leaders serve as counselors to first-year students and their guests during summer orientations; 4) online survey evaluations for participants after program sessions to collect feedback on how to improve orientation programming. The staff administers the surveys to attendees after orientation via online survey links offered through Survey Monkey, an internally developed system, or external partners such as Hobson’s. The surveys include both quantitative and qualitative feedback mechanisms. Based on the information provided in the EAB report the external audit team has met to discuss establishing a signature event focusing on first-year experience and centralizing the effort from the top down. Discussion of a spring semester event to congratulate students on their completion of their first semester and to welcome them into the Alumni Association has occurred. The spring has been chosen because the Greek Retreat and Greek Academy events occur during that time and those events have a high level of alumni involvement with current students. The next discussion area revolves around developing a “Miner” first-year experience that is centralized and strategic encompassing. This experience will build a stronger foundation for alumni involvement. The internal team comprised a list of 90 cross divisional key activities dedicated to engagement. The key activities and the EAB report will guide the campus in the alumni engagement strategy.



**Action 3.5.1: Utilize the library and archives in creating collaborative online areas where alumni can view yearbooks, the Miner, photos and other memorabilia. As we digitize these collections, we can engage alumni in identifying people, events, and in telling stories online**

- The library has begun digitizing yearbooks, the Miner and photos.
- The library is working on a tracking mechanism and a sample survey to track alumni satisfaction and usage. These alumni tracking measures will be developed in FY15.

**Action 3.5.2: Create lifetime email addresses that support contact and engagement**

- The university system's technological capabilities now allow assigning lifetime email addresses to members of the Missouri S&T community (students, employees and alumni).

**Action 3.5.3: Create a multifaceted engagement program that brings students through graduation and to the Academy levels**

- The group analyzing alumni engagement consists of six student affairs members, three university advancement members, two undergraduate studies members, one enrollment management member and one communications member.
- Each team member submitted a list of current activities hosted by their department/area where they engage with prospective students, enrolled students and/or alumni. Following this task, the team was divided into two primary sub teams: internal audit and external audit.
- The External Audit Team consists of three university advancement members and four student affairs members. This sub-team has been tasked with reviewing lifetime and engagement best practices in higher education.
- The Internal Audit Team consists of two student affairs members, one university advancement member, two undergraduate studies members, one enrollment management member, and one communications member. This sub-team has been tasked with reviewing the lifetime engagement activities that are already occurring on the Missouri S&T campus and determine what populations they are impacting.
- The Internal Audit Team compiled a cross divisional list of activities that contribute to student and alumni engagement. These activities have the highest impact on social integration and fostering institutional loyalty. Over 90 key points of engagement have been identified as significant opportunities for impactful contact. These 90 activities have been divided into 10 categories: pre Missouri S&T involvement; curricular involvement; social integration and community development; academic recognition; student leadership; student and alumni interaction; institutional loyalty and reputation; and philanthropy.

**\*Six actions have been added for implementation in FY15**



<b>Campus or Unit:</b>	<b>Missouri University of Science and Technology</b>
<b>Lever Number:</b>	<b>3.8</b>
<b>Lever Description:</b>	<b>Exercise leadership in sustainability on campus and in the community by modeling sustainable practices in daily operations and practicing environmental stewardship</b>
<b>Lever Metric:</b>	<b>A comprehensive sustainability plan created and approved</b>

**Lever/metric summary:**

This lever is dedicated to the development of a comprehensive sustainability plan. This plan covers areas such as academics, campus initiatives and partnerships.

The first area of the plan analyzes the courses relating to sustainability. The campus recognizes that raising awareness and social consciousness can occur through academics. Currently, Missouri S&T offers minors in sustainability, global studies and global sustainable economics. Future additional programs will be explored.

The next area of the sustainability plan involves campus initiatives. The first initiative revolves around transportation. The campus offers environmentally friendly forms of transportation. Alternate transportation methods have been created by offering students free rides on the ebus and pedestrian bike baths. The second initiative was studying solar energy. The Solar Village which consists of four solar powered homes is a sustainable initiative. In FY15, the village launches a micro-grid that connects the solar houses and will track and measure the results of how people interact with energy management. This research could help power companies determine if there is feasibility of utilizing grids for community development. Solar Village has won the “Chill Out” sustainability award. The largest initiative on campus is the sustainable energy geothermal project. This project provides heating and cooling to 17 buildings on campus and cuts energy usage by 50 percent, reduces carbon dioxide emissions by 25,000 tons per year and decreases the water usage by 8,000,000 gallons per year. Initial estimates are an annual savings of \$1 million with future projected savings of \$2.8 million annually. The next initiative is a waste management plan. Environmental Health and Safety developed a waste minimization program that encourages campus personnel to reduce the amount of chemical waste generated and disposed by Missouri S&T. The last initiative is new construction evaluation. Evaluating new construction for sustainability by utilizing Leadership in Energy and Environmental Design, LEED, certification standards is a campus standard. The Technology Development Center received the Silver LEED certification.

The last area of the plan is partnerships. The campus has partnered with the Alliance for Resilient Campuses (ARC) an initiative from Second Nature, which is focused on efficient and eco-friendly campuses.



**Action 3.8.1: Stabilize long-term funding for the Office of Sustainable Energy and Environmental Engagement**

- The office has general revenue allocation of \$160,000 for FY15.

**Action 3.8.2: Led by the office of Sustainable Energy and Environmental Engagement, initiate and create student awareness programs and associated funding vehicles to promote our sustainable research and campus initiatives**

- The campus has several initiatives dedicated to sustainable energy. The first initiative is the Solar Village, the living laboratory consisting of four solar powered homes that utilizes a solar grid and smart grid power system.
- The geothermal project is an initiative dedicated to sustainability and will be completed in fall 2014. The geothermal project allowed the power plant, a 1945 coal and wood chip boiler system, to be shut down in May 2014.

**Action 3.8.3: Create in conjunction with Physical Facilities and Environmental Health and Safety, a sustainable waste management plan for all university waste**

- The waste minimization program provides resources for the campus to demonstrate sustainable practices through green chemistry and hazardous waste reduction.
- The chemical pickup request program provides campus personnel with a user friendly method for requesting disposal of hazardous materials in a safe and environmentally sound manner.
- Missouri S&T has received a certification of registration from American Systems Registrar (ASR) stating that Missouri S&T has established an environmental management system that conforms to ISO:14001. This certification conveys to the public the campus is committed to stewardship of our resources. Missouri S&T was the first institution of higher education to receive this certification.

**Action 3.8.5: Create and promote an alternative transportation culture, focused around simple transportation methods, including pedestrian and cycling, to improve alternative transportation infrastructure over the next five years**

- Public transportation is a viable mode of transportation for Missouri S&T students. To promote energy independence and help protect the environment an electrically powered bus began routing students in April 2014. The bus completes a loop around the Missouri S&T campus twice an hour beginning at 7:30 a.m. to 4 p.m. Monday through Friday. It leaves its terminal at E3 Commons and making stops at Miner Village, Emerson Hall, Centennial Hall, Havener Center and Gale Bullman Multi-Purpose Building before returning to E3 Commons.
- Another form of transportation is pedestrian biking. New bike paths are being developed around the campus and additional bike racks have been installed.
- A bike friendly committee has been established to offer additional recommendations.



**Action 3.8.6: Investigate existing and new courses for sustainability awareness for faculty, staff and students**

- Missouri S&T currently offers minors in sustainability, global studies and global sustainable economics. Once the new vice provost and deans are on board, a further review of additional programs will begin.

**Action 3.8.7: Create campus sustainability project revolving fund that will allow savings to be invested back into the fund to underwrite future projects**

- The campus is exploring ideas on how to develop a revolving fund.
- The Office of Sustainable Energy and Environmental Engagement have received several grants and contracts funding future projects.

**Action 3.8.8: Track energy, environmental and sustainable research on campus**

- Plans are being developed to track all research. The Office of Sponsored Programs tracks grants and contracts including those involving energy, environmental and sustainability.

**Action 3.8.13: Analyze new construction with U.S. Green Building Council LEED (Leadership in Energy and Environmental Design) principles, and pursue LEED certification when appropriate**

- LEED standards and principles were applied to the new James E. Bertelsmeyer Hall for Chemical and Biochemical Engineering Building; the Technology Development Center; and the Kummer Student Design and Experiential Learning Center.
- These principles have aided the campus in achieving a Silver STARS (Sustainability Tracking Assessment and Rating System) rating. This rating, performed by the Association for Advancement of Sustainability in Higher Education evaluating the areas of education and research; operations and planning; and administration.

**\*Two actions have been added for implementation in FY15**



<b>Campus or Unit:</b>	<b>Missouri University of Science and Technology</b>
<b>Lever Number:</b>	<b>3.9</b>
<b>Lever Description:</b>	<b>Conduct a comprehensive fundraising campaign to secure private support for identified campus priorities</b>
<b>Lever Metric:</b>	<b>Positive annual growth of 1 percent (2020) Renewal rate of all donors 66 percent (2020) Renewal rate of alumni donors 75 percent (2020)</b>

**Lever/metric summary:**

A comprehensive campaign is critical for the Missouri S&T campus. As state dollars decrease, the dependence on outside funding sources is a necessity for capital improvements and achieving strategic goals. The comprehensive campaign will likely be dedicated to improving learning and experiential opportunities, improving facilities, providing additional endowed faculty positions and improving access to scholarships. Leaders within university advancement have been working formally and informally with leaders on campus in the planning efforts for the campaign. The feasibility study has preliminary results that suggest a fundraising target of \$150 million is achievable, which represents a 17 percent increase in total giving over the prior campaign. Actions identified in Lever 3.9 for FY14 and FY15 are the necessary steps in preparation for launching the comprehensive campaign.

There are three primary metrics identified in this lever. The first metric was renewal rates for all donors. The 2012 renewal rate for all donors was 66 percent; the 2013 renewal rate for all donors remained consistent at 66 percent; and the 2014 renewal rate for all donors increased to 67 percent.

The second metric was renewal rate for alumni donors. The 2012 renewal rate for alumni was 74 percent and the 2013 renewal rate for alumni donors declined to 68 percent. The campus has seen an increase to a 74 percent renewal rate for alumni donors in 2014.

The third metric identified in this lever was annual funding. The FY12 baseline for annual funding is \$10.7 million and the FY14 annual funding has seen a dramatic increase to \$13.8 million. This increase of annual funding was in part due to the alumni participation rate increasing to 16 percent.



**Action 3.9.1: Conduct wealth screening and data validation** [Completed]

- The wealth screening has been completed.
- A comprehensive review and validation of the wealth screening results by Missouri S&T Prospect Research staff has been completed.

**Action 3.9.2: Initiate partnership with consulting/research firm** [Completed]

- The partnership initiated in July 2013 produced custom research to aid in the fundraising process. Two custom research briefs have been completed: professional development of staff and access to information about development best practices and emerging issues. This research will assist in prioritization of comprehensive campaign actions.

**Action 3.9.3: Review, update and approve gift acceptance policy** [Completed]

- This policy has been reviewed and updated by the development staff. This update has been approved by senior leadership.

**Action 3.9.4: Review update and approve naming policy**

- Review of the naming policy is in progress with recommended updates and final approval expected in early FY15.

**Action 3.9.5: Develop campaign timeline with associated milestones** [Completed]

- The estimated timeline has been completed. The additional milestones can be completed once the feasibility study information is compiled.
- The approved master plan and campaign case for support have been completed. The timeline will be populated with additional milestones with the feasibility information.

**Action 3.9.6: Develop plan and proposal for staffing requirements** [Completed]

- A plan for staffing requirements has been completed.

**Action 3.9.7: Conduct feasibility study** [Completed]

- The feasibility study has been completed.

**Action 3.9.8: Participate in process of updating master plan to advise on fundraising opportunities and targets** [Completed]

- Projects for fundraising have been prioritized through the master planning process. This prioritization is reflected in the capital list submitted to the UM system.

**\*Twenty-seven actions have been added for implementation in FY15**



<b>Campus or Unit:</b>	<b>Missouri University of Science and Technology</b>
<b>Lever Number:</b>	<b>4.1</b>
<b>Lever Description:</b>	<b>Create a comprehensive distance and online education strategy</b>
<b>Lever Metric:</b>	<b>Increase the number of distance/online courses offered per year from a baseline of 200 to a target of 300 per year (2020)</b> <b>Increase the number of distance/online students enrolled per year from a baseline of 1,513 to 2,013 (2020)</b>

**Lever/metric summary:**

Increasing distance and online programs is a campus priority. Our success in this area can be demonstrated by our third party rankings. *US News & World Report* ranks the computer information technology program as #5 among public universities and #8 overall; the engineering programs rank as #13 among public universities and #17 overall; the newly developed online business program ranks as #50 among public universities and #70 overall.

Our dedication to online course development can also be demonstrated by the amount of instructors utilizing the education technology eStudio. Education technology logged 269.5 hours and over 180 sessions with instructors developing online courses. It is clear that online courses are a top priority for the campus.

A metric identified in this lever was the number of distance/online courses offered per year. The campus has increased the number of distance/online courses. In 2013, the campus had 320 online courses and increased the number to 329 in 2014. The 2020 target for distance/online courses was 300 per year but based on the campus accomplishments and strategic focus in 2013 and 2014; this goal will be recalculated for FY16.

Missouri S&T has also experienced an increase in the number of distance/online students enrolled per year. The campus had 2,553 students enrolled in distance/online in 2013 and 2,881 students in 2014. The 2020 target for the number of students enrolled online in the fall semester is 2,013 and the fall enrollment for 2013 was 1,762 representing an increase of 249 students.



**Action 4.1.1: Conduct a focused market study analysis to serve as the foundation for a comprehensive distance and online education strategy**

- Regular meetings have been held involving global learning and education technology to define and coordinate areas of cooperation. As a result, instructional design capabilities are being shared and distance video facilities have been made available to produce course segments for online courses being created for on campus students. The Video Communications Center is currently being utilized for the calculus redesign.
- Funding for this area has been linked to a strategic initiative proposal; expanding instructional laboratory equipment at a level of \$500,000, a portion of these allocated funds (approximately 20 percent) will be used to configure laboratories for remote access.

**Action 4.1.2: Bring together distance and online programs under one umbrella so as to leverage advantages of both, to pool resources, and to eliminate confusion**

- An instructional designer has been hired by global learning and is physically housed with current instructional designers and instructional technicians in education technology.
- The new vice chancellor for global and strategic partnerships will oversee a combined unit to eliminate any confusion and help leverage resources for both distance and online.

**Action 4.1.4: Increase our focus on the professional non-credit distance education portfolio**

- A series of non-credit courses has been developed focused on addressing issues in the pipeline industry. These courses have been added to the paint technology courses that are marketed to GM. In the spring 2014, five additional courses were developed for GM (including one in corrosion) and one additional course for pipeline technology.

**Action 4.1.5: Involve library to work on storage, usage and copyright issues involving online resources including multimedia**

- The library is working with global learning on a plan for storage, usage and copyright. The plan will be developed in FY15.

**Action 4.1.6: Create an incentive program to encourage departments and faculty to offer more online, blended and distance courses**

- An incentive program has been created that returns 40 percent of the gross revenue to the academic department that produces the distance courses. This incentive encourages departments to develop new distance offerings. Thirteen departments generated over \$2.8 million during the spring 2014 semester with courses for working professionals.

**Action 4.1.7: Leverage existing success and resources from distance education program to expand into more online or asynchronous course offering**

- The new instructional designer has been hired and is housed with the chief information officer's instructional designers to promote idea sharing.



<b>Campus or Unit:</b>	<b>Missouri University of Science and Technology</b>
<b>Lever Number:</b>	<b>4.2</b>
<b>Lever Description:</b>	<b>Enhance instructional labs and methods of developing lab experiences</b>
<b>Lever Metric:</b>	<b>Increase the number of redesigned instructional lab courses by 5 (year five)</b>

**Lever/metric summary:**

Enhancing instructional labs requires a solid understanding on how to assess outcomes in an online format. A redesign guide has been developed by education technology. This guide helps to determine the type of lab redesign that will need to be developed. Instructors are asked to evaluate their class and think about ‘why’ they offer the lab in the current format. The instructor’s analysis includes: 1) determines the course outcomes; 2) analyzes the current activities and compares against the course outcomes; 3) works with education technology to determine if the lab is all online; 4) if the lab is all online then it may require lab kits for remote experimentation, online simulations, virtual lab activities or remote control of lab equipment; 5) or if a blended approach to lab redesign where the content is being delivered online and students come to class for an intensive set of labs. Once the instructors determine which approach is appropriate for their class, education technology can assist with the redesign process. All redesigned labs are evaluated for pedagogical considerations and course design. The areas examined are course overview and introduction; learning objectives; assessment and measurement; resources and materials; learner engagement; course technology; institutional services; and accessibility features. A standardized rubric has been developed for this evaluation process.

Missouri S&T is in the process of redesigning nine labs. The metric identified for this lever is five redesigned labs by year five and the campus will exceed this metric. Biology and chemistry redesigned labs will be piloted in fall 2014. Several redesigned labs will be 100 percent online. The online labs will have kits that can be mailed to students. Instructors are working on what experiments can be performed at a student’s home with a minimal cost. Civil engineering is redesigning materials testing with an online lab. As depicted in the first photo, the materials needed for the direct shear stress experiment: a cookie cutter, clay, play-dough and a bearing. The second photo depicts the elasticity experiment which requires Neutrogena soap, plastic cutlery and polarized filters.



Direct Shear Stress



Photo elasticity



**Action 4.2.1: Explore how to partner with other universities, community colleges, high schools or extensions to deliver lab experiences**

- The Department of Electrical and Computer Engineering (ECE) plans to strategically hire a NTT faculty member to develop labs to support circuits and electronics courses taught at community colleges. This hire is planned for fall 2014.
- This new faculty member will refresh the sophomore circuit labs and develop blended learning for the sophomore electrical and computer engineering courses. Online labs will be developed allowing students at community colleges to take the labs as supplemental courses to what their institution is currently offering. This distance lab would keep transfer students from being a semester behind and allow for a faculty connection with those students prior to them physically being on campus.
- This lever can also be tied to a funded strategic initiative, where a portion of allocated funds (approximately 20 percent) will be used toward configuring laboratories for remote access.

**Action 4.2.2: Develop model frameworks and strategies for evaluating and redesigning instructional lab courses for blended/online delivery**

- Education technology asks the faculty to review their class and take the approach of understanding why they teach the class the way they currently teach it. The course goals and learning objectives can then be established. Once that initial framework has been completed, the determination of the appropriate delivery model can be made.
- A handbook for use by the instructors has been developed by education technology.



<b>Campus or Unit:</b>	<b>Missouri University of Science and Technology</b>
<b>Lever Number:</b>	<b>4.5</b>
<b>Lever Description:</b>	<b>Engage in transformative doctoral student recruiting/retention and placement</b>
<b>Lever Metric:</b>	<b>Increase the number of publications per research—based graduate degree awarded by 15 (2020)</b> <b>Increase the total student support per funded graduate student to \$17,500 (2020)</b> <b>Increase Ph.D. enrollment by 200-400 (2020)</b>

**Lever/metric summary:**

This lever is tied to an FY15 strategic initiative. This initiative, if funded, will enhance the recruitment process for Ph.D. students by providing stipends for GRAs/GTAs and will increase the amount of scholarships available. Scholarships are an important component for increasing enrollment. This lever’s first metric is to increase Ph.D. enrollments by 200-400 in 2020. Lever 2.2 demonstrates the campus is on target to achieving this metric with a year one result of 38 enrollments.

Due to the campus’ focus on successful Ph.D. students, several metrics are identified within this lever. The second metric is to increase the number of publications per research-based graduate degree awarded. The 2012 baseline is 12 with the 2020 goal of 15. Unfortunately, the year one resulted in a decline from the 2012 baseline data with only 10 publications per research-based graduate degree awarded.

The third metric for this lever is the total student support per funded graduate student. The 2012 baseline data is \$13,700 with a 2020 goal of \$17,500. Year one resulted in an increase to \$14,250 placing this metric on target for reaching the 2020 goal.

The last metric identified in this lever also directly impacts the recruitment of Ph.D. students. The campus committed to increasing the number of memorandum of understandings and articulation agreements with other universities. A memorandum of understanding has been signed with Huazhong University of Science and Technology (HUST). The electrical and computer engineering department offered a summer internship program for graduate students from HUST. Based on a selection process, six students participated in this internship program which included research and cultural exchanges. Based on student performance, three students have been offered graduate research assistantships and another student has decided to attend Missouri S&T without funding assistance.



**Action 4.5.1: Develop a plan to provide fully covered tuition for doctoral students on appointments and explore implementation** [Completed]

- A 13 person committee has been formed to address all issues relating to Ph.D. enrollment, retention and placement. The committee has been tasked with developing a plan to provide fellowships/assistantships and other financial incentives for additional doctoral students and to budget those funds for FY15 and beyond.
- Subcommittees have been formed in core areas: analyze GRA bridge funding, creating an endowment for recruiting high quality doctoral students, and cost analysis on providing dissertation writing center to doctoral students who have completed their comprehensive exams.
- A comprehensive plan has been developed based on the committee recommendations.

**Action 4.5.3: (Recruit) Develop memorandum of understandings and articulation agreements with reputed national and international schools to recruit high quality doctoral students**

- In addition to the HUST memorandum of understanding, three others have been signed with Indian institutions and one additional memorandum of understanding with an institution in China.
- An agreement with key lab construction materials at Tongji University offers an exchange of Ph.D. students and visiting scholars.

**Action 4.5.4: (Recruit) Develop a marketing plan to promote comprehensive Missouri S&T graduate leadership and excellence**

- The communications department and senior leadership will be deciding on the marketing agency the campus will utilize for brand development. Until this determination is completed, a fully developed graduate marketing plan cannot begin.
- The Office of Graduate Studies has developed a Chancellor's Fellows Research Yearbook as described under Action 2.4.12.

**Action 4.5.6: (Retain) study GRA "bridge funding" between faculty grant funding and graduation** [Completed; ongoing]

- The bridge funding study and analysis has been completed.
- The action was completed. The campus will now begin developing processes to address "bridge funding" making this action ongoing.

**Action 4.5.7: (Retain) Conduct a feasibility study and develop a plan for a Graduate Resource/ Success Center/Graduate Learning Commons to help students in the timely completion of their degrees, and to facilitate greater student/faculty/staff interaction**

- The Office of Graduate Studies and the library director are meeting to discuss the possibility of a graduate resource center being housed in the library.



**Action 4.5.9: Develop and implement a plan for a comprehensive graduate student division of Career Opportunities and Employer Relations (COER)**

- Initial discussions revolving around this action have occurred with the Office of Graduate Studies and COER. Further development on this action is planned for FY15.

**Action 4.5.16: (Retain) Perform cost analysis on providing dissertation writing fellowship to doctoral students who have completed their comprehensive exams [Completed]**

- Cost analysis research has been conducted and the analysis completed.

**Action 4.5.17: (Retain) Promote workshops/seminars/social events to encourage more camaraderie and exchange of research ideas among doctoral students from various disciplines**

- A total of 60 events have been promoted on campus: 88 students attended graduate student orientation; 110 students attended thesis and dissertation formatting; 27 attended a workshop on writing a successful thesis; 54 attended a presentation provided by Senator Dan Brown; 40 students attended a workshop on learning to use LaTeX; 8 students attended a workshop on smart social networking and 10 students attended a stress management workshop.

**Action 4.5.24: Determine the feasibility of implementing a fully electronic graduate application management and review system**

- Feasibility has been determined and plans are in place to implement a fully electronic graduate application system in FY15.

**\*Four actions have been added for implementation in FY15**

