PREAMBLE

The Engineering Education and Design Center which is schedule for completion and occupancy in Fall, 2022 will transform the College of Engineering. Moreover, this will be a shining light that will benefit the campus as a whole. Completion of the EEDC will be approximately three years into the five-year planning cycle for this strategic plan. While some of the benefits of the EEDC can be achieved in anticipation of its completion, many others can only be obtained once the project is completed. For this reason, the completion time for some implementation strategies given below extend to FY30.

Student Project Design Suite in Engineering Education and Design Center.

A preliminary draft of the Executive Summary was sent to the engineering department chairs, SET director, Director of the Advanced Manufacturing Center, Director of the Process Development Center, commanding officers of the UMaine Army and Navy ROTC detachments, and members of the College of Engineering Dean’s Advisory Council. Some members of these groups had an opportunity to comment on the draft. Moreover, although faculty had a direct role in developing the unit level statements, the compressed time frame precluded their reviewing the Executive Summary. Thus, additional discussion and refinement of the College of Engineering’s goals, strategies, and key indicators is needed. For this reason, this document is labeled as DRAFT.
EXECUTIVE SUMMARY

Fostering Learner Success

GOAL: Enhance cross-disciplinary, hands-on, learning opportunities for students in engineering and beyond.

- **Strategy #1** - Open the Engineering Education and Design Center (EEDC) for classes as scheduled in Fall 2022.
  - **Key indicator** - Complete $75 to $77-million fundraising goal no later than November 2019.
  - **Key indicator** - Obtain final approval from the Board of Trustees no later than January 2020.
  - **Key indicator** - Break ground no later than April 2020.
  - **Key indicator** - Substantial completion of construction no later than June 2022.
  - **Key indicator** - EEDC fully equipped and occupied by September 1, 2022.

- **Strategy #2** - Upgrade remaining College of Engineering buildings to meet the long-term learning needs of our students, faculty, and staff. The path toward implementation of this strategy will be determined in partnership with Facilities Management. This will include complete renovation of Boardman Hall, Barrows Hall, Jenness Hall, and Crosby Lab. If renovation is not functionally and/or financially viable, replacement buildings will be constructed. Partnerships with other STEM disciplines will be explored to address overall campus laboratory needs.
  - **Key indicator** - Complete concept level plans and cost estimates no later than December 2020.
  - **Key indicator** - Funding to renovate/construct first building approved by state legislature no later than June 2021 and approved by voters no later than November 2021.
  - **Key indicator** - Renovation/construction of first building starts no later than August 2023.

- **Strategy #3** - All students in engineering will have at least one cross-disciplinary learning experience that complements or is integrated with the existing strong hands-on experiences in our programs. Execution of this strategy relies on having suitable space and state-of-the-art tools, equipment, and software. Thus, the EEDC’s multidisciplinary student project design suite, collaborative classrooms, and team meeting rooms are essential to this strategy. To fully realize this strategy, renovation/replacement of Boardman, Barrows, Jenness, and Crosby must be completed.
  - **Key indicator** - Number of engineering students who engage in cross-disciplinary, hands-on, learning opportunities. All students starting with the Class of 2024 will have met this goal.
  - **Key indicator** - Currency of tools, equipment, and software available to students.
• **Strategy #4** - Develop a college-wide internship program that is fully coordinated with the Career Center. This program will seamlessly connect prospective employers with job candidates using continuously updated databases of student resumes and job openings.
  
  - **Key indicator** - Percent of engineering students who complete at least one significant internship, coop, or laboratory research experience prior to graduation will increase from 80% to 95%.
  - **Key indicator** - Number of companies attending the annual engineering job fair will increase from 159 in October 2019 to 200 by October 2022. Number of companies that attend the fair and offer internships/co-ops will increase from 113 in October 2019 to 150 by October 2022.

**GOAL:** Enhance student success by improving undergraduate advising.

• **Strategy #1** - Develop advising handbooks with sections for faculty advisors and students. This will start with college-wide guidelines that will be supplemented by unit specific information. For most units, the latter largely exists. This will be followed up by devoting a portion of a spring and fall academic unit faculty meeting to advising training.
  
  - **Key indicator** - College-wide advising handbook created by December 2019.
  - **Key indicator** - Unit-specific details finalized and training completed by March 2020.

• **Strategy #2** - Explore creation of a centralized advising center that will take on a portion or all responsibilities for undergraduate advising. This will be done by the creation of a committee with one representative from each academic unit, the College’s Advising and Internship Coordinator, and the Associate Dean for Academics and Research. The Associate Dean will chair the committee. The committee will examine current undergraduate advising practices in UMaine’s five academic colleges and engineering colleges at peer institutions, as well as, a review of literature on best practices for undergraduate advising. The committee will hold focus groups with current undergraduates to assess the effectiveness of the current advising model and determine how advising can better meet student needs. Similarly, the committee will hold focus groups or forums with engineering faculty and administrative staff. The committee will make recommendations, including budget implications, for changes in our undergraduate advising practices along with the expected effect on student success. The recommendations will be made to the College of Engineering Executive Committee for possible adoption.
  
  - **Key indicator** - Report completed by April 1, 2020.
  - **Key indicator** - If additional positions are needed to implement the plan, begin requesting positions in the FY22 faculty and staff positions request.
GOAL: Enhance learning opportunities for M.S. and Ph.D. students by offering a diverse range of 500 and 600 level courses.

- **Strategy #1** - Increase number of tenured/tenure-eligible faculty in the College from 64\(^1\) to 100\(^2\) by September 2030 to increase the breadth and depth of 500 and 600 level courses. This is essential to having the capacity to reach this goal.
  - **Key indicator** - Number of tenured/tenure-eligible faculty.

- **Strategy #2** - Each tenured/tenure-eligible engineering faculty member offers at least two 500 and/or 600 level courses per year, while maintaining a total teaching load of 3 or 4 courses per year as appropriate for an individual faculty member’s research productivity.
  - **Key indicator** - Number of 500 and 600 level courses that meet minimum enrollment requirements increased by 60% by September 2030.

- **Strategy #3** - Market enhanced learning opportunities for M.S. and Ph.D. students to increase graduate student application rate and enrollment.
  - **Key indicator** - Graduate student enrollment.

- **Strategy #4** - Seek input from industry on the mix of graduate courses that are most needed in the workplace.
  - **Key indicator** - Number of courses that meet industry needs.

GOAL: Enhance the learning opportunities for undergraduate and graduate students by embracing flipped classroom, active learning, hybrid delivery, experiential learning, and other innovative teaching methodologies.

- **Strategy #1** - Increase the number of engineering course taught using innovative teaching methodologies by making full use of the resources provided by the Center for innovation in Teaching and Learning.
  - **Key indicator** - At least half of engineering faculty will have received training in innovative teaching methodologies by September, 2020.

- **Strategy #2** - Make full use of the active learning classrooms that are already available on campus and the additional active learning classrooms that will be in the EEDC.
  - **Key indicator** - At least half of engineering classes will be taught using innovative teaching methodologies by the Fall, 2023 semester.

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\(^2\) These numbers do not include lecturers under the assumption that they do not teach graduate level courses.
- **Strategy #3** - Develop and expand formal college wide experiential learning opportunities by utilizing collaborative relationships with engineering research centers and external partners.
  - Key indicator - Number of experiential learning opportunities created.
  - Key indicator - Increased first year student retention due to experiential learning opportunities.

**GOAL:** Enhance learning opportunities for all by increasing the diversity of our students, faculty, and staff. Engineers design solutions that affect everyone. The College of Engineering firmly believes that the quality of solutions increase as the gender and ethnic diversity of engineers increase.

- **Strategy #1** - Increase the gender and ethnic diversity of faculty and staff hires.
  - Key indicator - Gender and ethnic diversity of faculty and staff hires. At least 40% of faculty and engineering staff hires will be women or minorities.

- **Strategy #2** - Increase the gender and ethnic diversity of the engineering student body.
  - Key indicator - At least 30% of the engineering student body will be women or minorities by Fall 2024.

- **Strategy #3** - Provide additional opportunities for cultural and diversity training for College of Engineering faculty, staff, and students.
  - Key indicator - Number of faculty, staff, and students who effectively implement what they learned in diversity training.

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**Creating and Innovating for Maine and Beyond**

**GOAL:** Increase funded research from a three year average of $14-million per year\(^3\) to $28-million per year\(^4\) by FY30.

- **Overall Key Indicator** - Annual grant funding.

- **Strategy #1** – Increase research funding per faculty member by hiring two full-time grant writers dedicated to the College of Engineering.
  - Key indicator - First full-time grant writer on staff by FY22. Second full-time grant writer on staff by FY25.

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\(^3\) Total of funding through Sponsored Programs and Department of Industrial Cooperation.

\(^4\) Based on 80 tenured/tenure eligible faculty, not including SET faculty, with an annual research productivity of $350,000 per faculty member.
- **Key indicator** - Annual grants received per tenured/tenure eligible faculty member, exclusive of faculty in School of Engineering Technology, will increase from the current value of $250,000 to $350,000 by FY25.
- **Key indicator** - Number and dollar value of proposals submitted by College of Engineering.
- **Key indicator** - Success rate of grants submitted by College of Engineering.

- **Strategy #2** - Increase number of successful grants with a dollar value greater than $1-million from the current 5 per year to 10 per year by increasing collaborations with faculty and research centers across campus as well as writing more effective proposals.
  - **Key indicator** - Number of grants with dollar value greater than $1-million increases to 10 by FY24.

- **Strategy #3** - Grow research capacity of the College of Engineering by increasing the number of tenured/tenure-eligible faculty from 645 to 100 by September 2030.
  - **Key indicator** - Number of tenured/tenure-eligible faculty.

- **Strategy #4** - Complete and fully equip the biomedical engineering research laboratory in the Engineering Education and Design Center.
  - **Key indicator** - Biomedical engineering research laboratory completed on schedule and ready for use by September 2022.
  - **Key indicator** - 75% of biomedical engineering research laboratories are fully equipped by September 2022 and 100% equipped by September 2024.

- **Strategy #5** - Establish at least one new major research center by FY25 and two by FY30.
  - **Key indicator** - Number of major research centers established.

- **Strategy #6** - Hire two grant account managers and two technical support staff by FY25. Hire an additional two grant account managers and two technical support staff by FY30.
  - **Key indicator** - Number of account managers and technical support staff hired.

### Growing and Advancing Partnerships

**GOAL:** The most important role that the College of Engineering plays in advancing the economy of Maine and beyond is to provide highly educated engineers to meet the workforce needs of our private and public sector partnerships. To this end, the College of Engineering will

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grow the number of undergraduates from 1,827 undergraduates and 168 graduate students in Fall, 2018 to 2,125 undergraduates and 250 graduate students by Fall, 2025, and then 2,750 undergraduates and 400\(^6\) graduate students by Fall, 2030. Due to capacity limitations prior to the EEDC coming on line, there is more growth in the second period relative to the first period. Moreover, the EEDC will be a major draw for both undergraduates and graduates who come to UMaine to study engineering. This growth will happen while maintaining an undergraduate student: faculty ratio of 20:1 for engineering programs and 30:1 for engineering technology programs.

**Overall Key Indicator** - Headcount undergraduate and graduate students.

- **Strategy #1** - Open the Engineering Education and Design Center (EEDC) for classes as scheduled in Fall 2022 (same as listed under *Fostering Learner Success*).
  - **Key indicator** - Complete $75 to $77-million fundraising goal no later than November 2019.
  - **Key indicator** - Obtain final approval from the Board of Trustees no later than January 2020.
  - **Key indicator** - Break ground no later than April 2020.
  - **Key indicator** - Substantial completion of construction no later than June 2022.
  - **Key indicator** - EEDC fully equipped and occupied by September 1, 2022.

- **Strategy #2** - Upgrade remaining College of Engineering buildings to meet the long-term learning needs of our students, faculty, and staff. The path toward implementation of this strategy will be determined in partnership with Facilities Management. This will include complete renovation of Boardman Hall, Barrows Hall, Jenness Hall, and Crosby Lab. If renovation is not functionally and/or financially viable, replacement buildings will be constructed. Partnerships with other STEM disciplines will be explored to address overall campus laboratory needs (same as listed under *Fostering Learner Success*).
  - **Key indicator** - Complete concept level plans and cost estimates no later than December 2020.
  - **Key indicator** - Funding to renovate/construct first building approved by state legislature no later than June 2021 and approved by voters no later than November 2021.
  - **Key indicator** - Renovation/construction of first building starts no later than August 2023.

- **Strategy #3** - Increase number of engineering faculty, inclusive of tenured/tenure eligible faculty and lecturers to 97 by Fall 2025 and 125 by Fall 2030.
  - **Key indicator** - Number of engineering faculty.

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\(^6\) Assumes four graduate students per tenured/tenure eligible faculty, exclusive of SET faculty.
• **Strategy #4** - Increase support staff (administrative assistants, professional academic advisors, and teaching laboratory support technicians) from roughly 13 FTE today to 17 by Fall 2025 and then 21 FTE by Fall 2030.
  - **Key indicator** - Number of support staff.

• **Strategy #5** - Strengthen undergraduate recruiting efforts conducted by the College and by an even stronger partnership with the UMaine Admissions Office.
  - **Key indicator** - Undergraduate student headcount.
  - **Key indicator** - BS degrees granted.

• **Strategy #6** - Strengthen partnerships with UMaine Army and Navy ROTC detachments to increase the number of cadets and midshipmen who are engineers to enhance our nation’s defense.
  - **Key indicator** - Increase number of Army cadets who are engineers from 15% of their program total today to 30% by Fall, 2024.
  - **Key indicator** - Increase number of Navy/Marine midshipmen who are engineers from 4 today to 20 by Fall, 20247.
  - **Key indicator** - Increase the number of National Guard and Reserve cadets and midshipmen who both add to the number of engineers working in the civilian sector and serve our nation though the Army and Navy.

• **Strategy #7** - Strengthen College of Engineering’s partnerships with the other campuses in the University of Maine System through the Maine Engineering Pathways Program (1+3 program) and with community colleges through articulation agreements.
  - **Key indicator** - Number of engineering students who transfer to UMaine from other campuses in the UMS and the Maine Community College System.
  - **Key indicator** - Number of articulation agreements with programs in the Maine Community College System.

• **Strategy #8** - Strengthen graduate student recruiting efforts within the College of Engineering through stronger partnerships with the Graduate School and Office of International Programs.
  - **Key indicator** - Graduate student headcount.
  - **Key indicator** - MS and PhD degrees granted.

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7 There are nuances in the Army and Navy ROTC programs that make it logical to use a % for Army and absolute numbers for Navy.
GOAL: Increase focused offerings of on-line B.S., graduate certificates and M.S. degrees to meet the needs of businesses in Maine and beyond.

- **Strategy #1** - Build on the success of the on-line B.S. in surveying engineering and surveying track of the Professional Science Masters in Engineering and Business, which demonstrates the potential of a highly focused offerings taught by a faculty member with an international reputation, by launching two additional graduate focus areas (these could be certificates, PSM tracks, or traditional MS degrees). Additional on-line B.S. degrees will be explored. These will be supported by robust marketing studies to identify areas that appear promising.
  - **Key indicator** - Number of online B.S., graduate certificates, PSM tracks, and M.S. degrees.
  - **Key indicator** - Number of students enrolled in online B.S., graduate certificates, PSM tracks and M.S. degrees.

GOAL: Increase partnerships with industries, health care providers, government agencies, non-profits, and citizens to provide engineering solutions that enhance our economy, improve our health, and overall quality of life.

- **Strategy #1** - Increase projects funded through the Department of Industrial Cooperation from $1.9-million (3-year average) to $3.5 million by FY25. This will be accomplished by increasing staff and equipment to further leverage the expertise and capabilities of the Advanced Manufacturing Center, Process Development Center, and College faculty and staff, as well as undergraduate and graduate students.
  - **Key indicator** - Department of Industrial Cooperation project revenue.
  - **Key indicator** - Number of projects with outside partners.

- **Strategy #2** - Increase number of senior capstone projects that are completed in partnership with industry, health care providers, government agencies, non-profits, and citizens.
  - **Key indicator** - Number of completed capstone partnership projects.
  - **Key indicator** - Number of students involved in projects with partnerships.
  - **Key indicator** - Number of projects deemed successful by partner surveys.

GOAL: Increase partnerships with K-12 schools and Maine Department of Education to address the needs for Engineering (“E”) and Technology (“T”) in STEM education.

- **Strategy #1** - Increase the College educational service to K-12 schools through the development of level appropriate engineering and technology courses and curricular materials.
- **Key indicator** - Number of partnerships with Maine K-12 schools.
- **Key indicator** - Number of engineering and technology courses developed for different grades.
- **Key indicator** - Number of K-12 schools implementing engineering and technology courses in their curricula.

- **Strategy #2** - Increase partnership with the Maine Department of Education and legislators for developing engineering-educated in-service and pre-service K-12 teachers and establishing an “Engineering and Technology Endorsement” enabling these teachers to teach in K-12 schools.
  - **Key indicator** - Number of teachers participating in the College teacher training programs.
  - **Key indicator** - Establishing the Maine “Engineering and Technology Endorsement.”
  - **Key indicator** - Number of engineering-educated teachers teaching in Maine K-12 schools.

- **Strategy #3** - Increase funding from National Science Foundation, Maine Department of Education, other government agencies, industry, and private organizations augmenting the institutional support for K-12 outreach programs.
  - **Key indicator** - Number of awards submitted and received.
  - **Key indicator** - Number of local and national partnerships developed.
  - **Key indicator** - Number of professional staff hired to support K-12 outreach programs.
Department Specific Goals

Chemical & Biological Engineering

- Appropriate professional technical staff support should be provided to engineering students, both undergraduate and graduate, given the complexity of tools and equipment they are required to handle. Departments do not currently have these sorts of resources.

- Appropriate professional grants management staff support to PIs given complexities of grant administration that go far beyond research and mentoring research assistants/associates and managing Co-PIs and leading the project team. Departments do not have adequate administrative assistance capacity.

- A Managed framework for access to special materials and data (for example tissue samples and health records from EMMC, MSW-derived cellulose from Hampden facility, and Biochar for soil amendment studies) through chain-of-custody, compliance with use and disposal, responsible sharing so faculty and student researchers can focus on using them rather than getting them.

We can teach, do research and public service, but lack much needed administrative support infrastructure at the institutional level.

Civil & Environmental Engineering

- Improve Boardman Hall teaching facilities, laboratories, and basic infrastructure to ensure sufficient capacity for growth, 21st century functionality, and attractiveness to prospective students.

- Increase the graduate student population to 4-5 students per FTE faculty member, with growth in funded students (RAs and TAs) as well as coursework MS/ME students in areas important to the profession and Maine’s economy.

- Grow the size of the faculty to approximately 20 with a series of hires in targeted areas of high research potential while simultaneously increasing staff support as required to ensure efficient operation.

- Increase the undergraduate student population to 350-400 students in concert with growth in faculty and associated support staff.

- Maintain the department’s high student retention and graduation rates while expanding capabilities and growing as detailed above.

- Maintain the department’s high research productivity while expanding capabilities and growing as detailed above.
Civil and Environmental Engineering - College of Engineering Goals Suggested by Department

- Develop a college-wide internship program that is fully coordinated with the Career Center. This program will seamlessly connect prospective employers with job candidates using continuously updated databases of student resumes and job openings.
- In coordination with item (1), implement an undergraduate advising center staffed by trained advisers who can work directly with undergraduates from all engineering majors on course scheduling and transfer credit assessment. (This might allow the implementation of a hybrid advising model, where early-stage students are advised by their home department faculty to foster a sense of community, and transition to the advising center in their second or third year.)
- Improve visibility of the college and its programs in all Maine high schools to maximize applications and yield from instate students.

Electrical & Computer Engineering

Fostering Learner Success

**Goal:** Fully fund undergraduate programs using base-budget (E&G) funding: Maintain 20:1 Student to E&G-funded faculty ratio.
  - **Key indicator:** Desired ratio is achieved.

**Goal:** Retain existing talent pool.
  - **Strategies:** Maintain salary parity with peer institutions for employees.
    - **Key indicator:** Monitor faculty, staff salaries with respect to peer institution averages.

**Goal:** Establish competitive salaries and start-up packages for recruitment of new faculty.
  - **Key indicator:** Recruitment of additional personnel.

**Goal:** Repair and maintain infrastructure on campus by fully funding Facilities Management. Strategies: Replace all windows in Barrows Hall. Remove all asbestos in everywhere on campus.
  - **Key indicator:** Barrows windows are replaced.

**Goal:** Increase undergraduate enrollment to 300 students by 2025. Strategies: Maintain and improve undergraduate recruitment strategies, including outreach to schools and participation in department and facility tours. Improve web visibility. Move web/social media responsibilities away from faculty.
  - **Key indicator:** Monitor undergraduate enrollment.

**Goal:** Maintain undergraduate student/faculty ratio of 20 or less.
  - **Strategies:** Recruit new faculty
    - **Key indicator:** Student/faculty ratio is 20 or less.

**Goal:** Increase underrepresented student enrollment from 15% to more than 20% by 2025.
- **Strategies:** Work with Undergraduate Admissions to increase the women and minority student applicant pool and increase admissions yield with targeted recruitment.
  - **Key indicator:** Underrepresented student enrollment increase.

**Goal:** Have tighter integration between majors and humanities. An example would be having English department faculty work directly with faculty from other majors to improve student writing skills.

**Goal:** Increase the number of graduate courses taught.
- **Strategies:** Hire new faculty, freeing Professors from basic courses
  - **Key indicator:** Number of graduate courses that are offered by ECE faculty

**Goal:** Increase the number of Dept. TA’s and RA’s to engage graduate student in teaching and/or research

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**Creating and Innovating for Maine and Beyond**

**Goal:** Increase graduate enrollment to 30 graduate students by 2025
- **Strategies:** Collaborate with Graduate School for targeted graduate student recruitment.
  Expand research areas into areas of interest to current undergraduates.
  - **Key indicator:** More graduate students.

**Goal:** Increase ELE and CEN funded research to average $2.5M/year and provide external support for 20 graduate students per year by 2025.
- **Strategies:** Diversify ELE and CEN research areas through new hires and interdisciplinary research.
  - **Key indicator:** Funded grant amounts.

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**Growing and Expanding Partnerships**

**Goal:** Increase the percentage of senior projects and graduate theses that are associated with Industry, Government, or non-profits.
- **Strategies:** Make and maintain contacts with Maine based industries, government and non-government organizations
  - **Key indicator:** Number of contracts through OIED supporting undergraduate & graduate students; number of capstone and thesis projects relevant to state industry, government and non-government agencies
Mechanical Engineering

Fostering Learner Success

- In five years, x% of engineering students will have at least one internship or co-op engagement prior to graduation. *
- The average 6-year graduation rate in engineering will increase to y% in five years. *
- In five years, at least one student team in each engineering major will participate in a major national competition.
- The University of Maine will be among the top 100 public universities in the US News & World Report rankings for engineering in five years.
- The faculty positions in STEM programs at UMaine will grow to a student-to-faculty ratio of 20 in five years.
- The University will double funding for TA positions in STEM programs in five years.

Creating and Innovating for Maine and Beyond

- The number of PhD and MS degrees in engineering will grow to a total of xx / year in five years. *
- The graduate student population in the College of Engineering will increase by z% in five years. *
- The College of Engineering will offer 1 PhD and 3 MS programs online in five years.
- The University will have two-distance technology classrooms in each academic building in five years.

Growing and Expanding Partnerships

- The University will fund five summer faculty fellowships per year in five years.
- The University will fund five summer graduate internships per year in five years.
- All graduate students will be charged in-state tuition in five years.
- Employees of Maine-based entities will receive a 25% tuition discount in five years.

School of Engineering Technology

Fostering Leaner Success

- Monitor and report on first year student retention by program
  - Establish continuous improvement targets and plans to achieve targets
- Breakdown departmental silos by developing joint department teams to improve student outcomes. (i.e. LAS/ENG joint task force to improve student math performance.
- Examine approaches to student advisement and implement goals for each college with regard to student satisfaction with advising.

Creating and Innovating for Maine and Beyond

- To support innovation and creation of new knowledge and technology, we need to fundamentally change how approach research. Faculty are natural entrepreneurs. They will put their time into tasks that benefit themselves, their program and their college. Successful research-intensive universities develop a reward structure to nurture this. We need to begin returning 50% of all indirect funds generated by researchers back to their home department. The department chair can then provide half of those funds to the principle investigator to enhance their research and program. The other half can be used to support research infrastructure within the department and to help early career researchers get started.

Growing and Advancing Partnerships

- We need to continue to grow our partnerships with feeder programs at the community colleges and report our progress annually.
- We need to develop strategies with Maine’s largest companies on ways to partner on research. This is a large growth opportunity.
- We need to identify key areas of distinction for each College, Department, and program and target ways to focus only on those areas.
- We need to engage more with local civic organizations to acquire valuable input as well as cultivate strategic allies for joint goals.

Advanced Manufacturing Center (AMC)

Fostering Learner Success

Goal - Integrate more research centers into the formal learning process. Students gain a large amount of experiential learning working at centers like the AMC and ASCC but what prevents us from taking on more students and learning opportunities is our budgets.

Strategies - Increase funding to AMC to cover student training. At AMC almost 40% of our student working time can be categorized as training, but with a majority of our funding from paying private industry partners we have a difficult time covering costs and expanding our student training mission.

Key Indicator - Increased # of students that can participate in experiential learning at UMaine engineering research centers.
Creating and Innovating for Maine and Beyond

Goal - The AMC's recent MTI funded grant The Center For Additive Manufacturing of Metals (CAMM) is a perfect example of a public private partnership where the University is able to secure critical new investment, then provide private industry research and workforce development to rollout the new advanced manufacturing technology to increase operational efficiency and capability's. Many small companies in Maine will not invest in new cutting edge technologies unless they are able to partner with a group like the AMC where we can assist them in the critical development of technology use, provide real world costing estimates, and help train their staff. Metal 3d printing is one of those unique technologies where the private industry wants to utilize the technology as fast as possible, and with CAMM's 35 company consortium we can easily fulfill that mission.

Strategies - University system Client Relationship Data Management (CRM) system. A University wide CRM system would be a invaluable resource to provide Maine clients with coordinated assistance from across all centers and Campuses.

Key Indicators - Number and value of DIC funded client projects

Growing and Advancing Partnerships

Goal - As director of the AMC I feel we have an outstanding outreach mission and process and could be a model for many centers on campus with similar missions. Yearly we are able to recover almost 80% of our operating costs, and are able to engage companies from one person startups to very large multinational corporations. With the AMC small staff and students we engage over 50 Maine companies and complete over 200 projects per year. Our projects range from 3d printing a small metal part, to designing and building a completely custom automated plastic bag welding system.

Based upon our first quarter survey data from the Maine Manufacturing Extension Partnership we helped Maine companies gain $8.3M in new sales, $10.9M in retained sales, create 55 jobs, $2M in new investment and realize $595K in cost savings over the past year for a small subset of our clients.

Strategies - Additional investment in new equipment to stay relevant, and a reliable funding source to cover operating overhead like the Directors salary so that they can continue to provide company outreach, grant writing, student training, and new project development for the center. Additionally to keep valuable staff members at our centers we need a more proactive performance based review and compensation process that is much more flexible than the current system allows.

Key Indicators - Number and value of DIC funded client projects